



# ***Adit 600***

## *USER MANUAL*

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Part Number: 770-0009-JE

Product Release: 10.1.1

August 2009

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E-mail: [access-support@Force10Networks.com](mailto:access-support@Force10Networks.com)  
Phone: (US) 866-887-4638  
Phone (International/Direct): 1-707-665-4355

### **Supporting Software Versions:**

Adit 600 Controller 10.1.1  
IP Router 2.97  
CMG Router 2.97  
Terminal Server Router 2.97  
Multi-Service Router (MSR) 2.1

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# PREFACE

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## Compliance

### ***Safety of Information Technology Equipment***

The Adit 600 is safety certified by MET Laboratories, Inc. and is compliant with the following safety standards:

- UL60950 3rd Edition
- CSA C22.2 No. 60950 3rd Edition
- EN60950:2000
- AN/NZS 60950 3rd Edition
- IEC 60950 3rd Edition

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**WARNING!** THIS DEVICE IS REQUIRED TO HAVE A PERMANENT EARTH GROUND CONNECTION. SEE CHASSIS GROUND CONNECTOR ON PAGE 3-7 FOR GROUNDING REQUIREMENTS.

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### ***FCC Requirements, Part 15***

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation

This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the Federal Communications Rules. These limits are designed to provide reasonable protection against harmful interference when equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at the user's own expense.

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**NOTE:** See *Compliant Installation* on page 3-2 for installation instructions to meet FCC Part 15 requirements.

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## FCC Requirements, Part 68

This equipment complies with Part 68 of the FCC rules and the requirements adopted by the ACTA. On the rear panel of this equipment is a label that contains, among other information, a product identifier in the format US:AAAEQ##TXXXX. If requested, this number must be provided to the telephone company.

FCC Registration Number: US: 2Z6DW03B65743  
Ringer Equivalence Number (REN): 0.3B  
Service Center in the USA: Force10 Networks, Inc.  
350 Holger Way  
San Jose, CA 95134-1362

The Facility Interface Code (FIC) associated with each private line application represents the type of service that will be provided by the telephone company. The following are currently registered:

Port	FIC	SOC	Jack
TDM Dual T1 1.544Mbps	04DU9-BN	6.0N	RJ48C
TDM Dual T1 1.544Mbps	04DU9-DN	6.0N	RJ48C
TDM Dual T1 1.544Mbps	04DU9-1KN	6.0N	RJ48C
TDM Dual T1 1.544Mbps	04DU9-1SN	6.0N	RJ48C
Quad T1 1.544Mbps	04DU9-BN	6.0N	RJ48C or RJ48M
Quad T1 1.544Mbps	04DU9-DN	6.0N	RJ48C or RJ48M
Quad T1 1.544Mbps	04DU9-1KN	6.0N	RJ48C or RJ48M
Quad T1 1.544Mbps	04DU9-1SN	6.0N	RJ48C or RJ48M
FX0	02LS2	9.0F	RJ21X
FX0	02GS2	9.0F	RJ21X
FXS 8C, FXS 8D	OL13C	9.0F	RJ21X
HD Quad DS1/E1 1.544Mbps	04DU9-BN	6.0N	RJ48C or RJ48M
HD Quad DS1/E1 1.544Mbps	04DU9-DN	6.0N	RJ48C or RJ48M
HD Quad DS1/E1 1.544Mbps	04DU9-1KN	6.0N	RJ48C or RJ48M
HD Quad DS1/E1 1.544Mbps	04DU9-1SN	6.0N	RJ48C or RJ48M
Quad DS1 ADPCM 1.544Mbps	04DU9-BN	6.0N	RJ48C or RJ48M
Quad DS1 ADPCM 1.544Mbps	04DU9-DN	6.0N	RJ48C or RJ48M
Quad DS1 ADPCM 1.544Mbps	04DU9-1KN	6.0N	RJ48C or RJ48M
Quad DS1 ADPCM 1.544Mbps	04DU9-1SN	6.0N	RJ48C or RJ48M



**Plug and Jack Statement**

A plug and jack used to connect this equipment to the premises wiring and telephone network must comply with the applicable FCC Part 68 rules and requirements adopted by the ACTA. A compliant telephone cord and modular plug is provided with this product. It is designed to be connected to a compatible modular jack that is also compliant. See installation instructions for details.

**Ringer Equivalence Number (REN)**

The REN is used to determine the number of devices that may be connected to a telephone line. Excessive RENs on a telephone line may result in the devices not ringing in response to an incoming call. In most areas, the sum of the RENs should not exceed five (5.0). To be certain of the number of devices that may be connected to a line, as determined by the total RENs, contact the local telephone company. The REN for this product is part of the product identifier that has the format US:AAAEQ##TXXXX. The digits represented by ## are the REN without a decimal point.

If the Adit 600 causes harm to the telephone network, the telephone company will notify you in advance. If advance notice proves impractical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe such action is necessary.

The telephone company may make changes in its facilities, equipment operations, or procedures that could affect the operation of the Adit 600. If this occurs, the telephone company will provide advance notice so that you may make necessary modifications to maintain uninterrupted service.

If you experience trouble with the Adit 600, please first contact the distributor or dealer from which you purchased the product and then, as a second point of contact, contact Force10 Networks for repair and/or warranty information.

If the trouble is causing harm to the telephone network, the telephone company may request that you remove the Adit 600 from the network until the problem is resolved. User repairs must not be made. Doing so will void the warranty.

Do not install the Adit 600 on public coin service provided by the telephone company. Connection to Party Line service is subject to state tariffs. (Contact your state public utilities commission for further information.)

To minimize damage caused by local lightning strikes and other electrical surges, it is recommended that the customer install an AC surge arrestor in the AC outlet to which the Adit 600 is connected.

## Industry Canada ICES-003

### English

This class A digital apparatus complies with Canadian ICES-003.

### French

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

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**NOTE:** See Installation Instructions and *Ferrite Beads (Europe, Australia and Canada)* on page 3-4.

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## Industry Canada CS-03

This equipment meets the applicable Industry Canada Terminal Equipment Technical Specifications. This is confirmed by the registration number. The abbreviation, IC, before the registration number signifies that registration was performed based on a Declaration of Conformity indicating that Industry Canada technical specifications were met. It does not imply that Industry Canada approved the equipment.

The Ringer Equivalence Number (REN) for this terminal equipment is 0.3. The REN assigned to each terminal equipment provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination on an interface may consist of any combination of devices subject only to the requirement that the sum of the Ringer Equivalence Numbers of all the devices does not exceed five.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telephone company. The equipment must also be installed using an acceptable method of connection. The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be coordinated by a representative designated by the supplier. Any repairs or alternations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

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**CAUTION!** USERS SHOULD NOT ATTEMPT TO MAKE SUCH CONNECTIONS THEMSELVES, BUT SHOULD CONTACT THE APPROPRIATE ELECTRIC INSPECTION AUTHORITY, OR ELECTRICIAN, AS APPROPRIATE.

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## Europe EN55022 and AS/NZS CISPR22

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**WARNING!** THIS IS A CLASS A PRODUCT. IN A DOMESTIC ENVIRONMENT THIS PRODUCT MAY CAUSE RADIO INTERFERENCE IN WHICH THE USER MAY BE REQUIRED TO TAKE ADEQUATE MEASURES.

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**NOTE:** See Installation Instructions and *Ferrite Beads (Europe, Australia and Canada)* on page 3-4.

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## Self-Declaration of Conformity for CE

We,

Supplier: **Carrier Access**  
**5395 Pearl Parkway**  
**Boulder, Colorado 80301**  
**USA**

declare under our sole responsibility that the product,

**ADIT 600**

to which this declaration relates, conforms with the following standards or normative documents:

<u>Document No.</u>	<u>Title</u>	<u>Edition/Date of Issue</u>
EN 60950	Safety of Information Technology Equipment	2000
EN 55022	Information Technology Equipment - Radio Disturbance Characteristics - Limits and Methods of Measurement	1998
EN 55024	Information Technology Equipment - Immunity Characteristics - Limits and Methods of Measurement	1998
EN 300 386	Electromagnetic Compatibility and Radio Spectrum Matters (ERM); Telecommunication Network Equipment; Electromagnetic Compatibility (EMC) Requirements	2001
EN 61000-3-2	Electromagnetic Compatibility - Part 3-2: Limits for harmonic current emissions	2000
EN 61000-3-3	Electromagnetic Compatibility - Part 3-3: Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems	1995, A1:2001

The product is in accordance with the provisions of the following directives:

<u>Directive No.</u>	<u>Title</u>
1999/5/EC	R&TTE Directive
73/23/EEC	Low Voltage Directive
89/336/EEC	EMC Directive

In Boulder, Colorado, USA on .....

(Place and date of issue)

*Mildred Gonzalez*  
 (Mildred Gonzalez, Quality Manager)

1-16-04

1/19/04

(Signature, Date)

*Betty Schubert*  
 (Betty Schubert, VP of Customer Assurance)

01-16-04

(Signature, Date)

Form Owner: Compliance Engineering  
 Form #CF-393

Page 1 of 1

Rev. B  
 11/14/03

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## Safety Information

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**CAUTION!** ALWAYS USE CAUTION WHEN INSTALLING TELEPHONE LINES. READ THE CAUTIONS BELOW FOR DETAILS ON SAFETY GUIDELINES TO PREVENT INJURY.

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- **Never touch uninsulated telephone wires and terminals** unless the telephone line has been disconnected at the Network Interface (NI) as voltage potentials as high as 300 VAC may be present across the transmit and receive pairs
- **Only use No. 26 AWG or larger** telecommunication line cord, to reduce the risk of fire
- **Never install telephone wiring during a lightning storm**
- **Never install telephone jacks in wet locations** unless the jack is specifically designed for wet locations
- Refer to the installation section of this manual for a safe and proper installation procedure. All wiring external to this equipment should follow the current provision of the National Electrical Code

## Notices

This manual contains important information and warnings that must be followed to ensure safe operation of the equipment.

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**DANGER!** A **DANGER** NOTICE INDICATES THE PRESENCE OF A HAZARD THAT CAN OR WILL CAUSE DEATH OR SEVERE PERSONAL INJURY IF THE HAZARD IS NOT AVOIDED.

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**CAUTION!** A **CAUTION** NOTICE INDICATES THE POSSIBILITY OF INTERRUPTING NETWORK SERVICE IF THE HAZARD IS NOT AVOIDED.

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**WARNING!** A **WARNING** NOTICE INDICATES THE POSSIBILITY OF EQUIPMENT DAMAGE IF THE HAZARD IS NOT AVOIDED.

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**NOTE:** A *Note* indicates information to help you understand how to perform a procedure or how the system works. Notes should be read before performing the required action.

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## ***Electrostatic Discharge (ESD) Precautions***

ESD can damage processors, circuit cards, and other electronic components. Always observe the following precautions before installing a system component.

1. Do not remove a component from its protective packaging until ready to install.
2. Wear a wrist grounding strap and attach it to a metal part of the system unit before handling components. If a wrist strap is not available, maintain contact with the system unit throughout any procedure requiring ESD protection.

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**WARNING!** INTEGRATED CIRCUITS (ICs) ARE EXTREMELY SUSCEPTIBLE TO ELECTROSTATIC DISCHARGE. UNLESS YOU ARE A QUALIFIED SERVICE TECHNICIAN WHO USES TOOLS AND TECHNIQUES THAT CONFORM TO ACCEPTED INDUSTRY PRACTICES, DO NOT HANDLE ICs.

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The ESD warning label appears on packages and storage bags that contain static-sensitive products and components.

## Warranty

Force10 Networks warrants to BUYER that Product Hardware will be free from substantial defect in material and workmanship under normal use in accordance with its Documentation and given proper installation and maintenance for period of five years from the date of shipment by Force10 Networks.

Force10 Networks warrants that the Licensed Software, when used as permitted under its License Terms and in accordance with the instructions and configurations described in the Documentation (including use on Force10 Networks product or a computer hardware and operating system platform supported by Force10 Networks), will operate substantially as described in the Documentation for a period of ninety (90) days after date of shipment of the Licensed Software to BUYER.

This warranty shall not apply to Products or Software that have been either resold or transferred from BUYER to any other party. Any such transfer voids the above warranty and related licenses. Force10 Networks offers expanded product care beyond what is covered by the warranty through different support plans. The plans are designed to maximize network availability through advance replacement for defective equipment. Please contact your Force10 Networks representative for support program details.

### Warranty Procedure

BUYER must promptly notify Force10 Networks of any defect in the Product or Software and comply with Force10 Networks' return/repair policy and procedures. Force10 Networks or its agent will have the right to inspect the Product or workmanship on BUYER's premises. With respect to a warranty defect in Product hardware reported to Force10 Networks by BUYER during the warranty period, Force10 Networks, as its sole obligation and BUYER's exclusive remedy for any breach of warranty, will use commercially reasonable efforts, at its option, to:

- a. repair, replace, or service at its factory or on the BUYER's premises the Product, or component therein, or workmanship found to be defective so that the Product hardware operates substantially in accordance with Force10 Networks Documentation; or
- b. credit BUYER for the Product in accordance with Force10 Networks' depreciation policy.

With respect to a warranty defect in the Licensed Software reported to Force10 Networks by BUYER during the 90-day software warranty period, Force10 Networks, at its own expense and as its sole obligation and BUYER's exclusive remedy for any breach of the software warranty, will use commercially reasonable efforts to, at its option,

- a. correct any reproducible error in the Licensed Software, or
- b. replace the defective Licensed Software, as follows:
  - Should a Severity 1 or 2 warranty defect with the Software occur during the 90-day warranty period, Force10 Networks will provide, in its sole determination, either
  - 1. software to resolve the defect to be downloaded into the affected units by the BUYER or
  - 2. a documented workaround to address the issue.

Severity 1 issues are failures of the Licensed Software to comply with the Force10 Networks software specifications and that completely or severely affect the Force10 Networks Product and its traffic or service capacity, or maintenance or monitoring capabilities.

Severity 2 issues are failures of the Licensed Software to comply with the Force10 Networks software specifications and that result in a major degradation of the Force10 Networks Product so as to impact its system or service performance, or significant impairments to network operator control or effectiveness. Should a Severity 3 warranty defect with the Licensed Software occur during the 90-day warranty period, Force10 Networks will provide assistance to Buyer to determine if a solution or workaround will be provided in a subsequent software release following the reported issue.

Severity 3 issues are defined as failures of the Licensed Software to comply with the Force10 Networks software specifications but that do not significantly impair the function or service of the Force10 Networks Product or the system.

Determination of Severity 1, 2 or 3 shall be made solely by Force10 Networks following receipt of the reported problem. Refurbished material may be used to repair or replace the Product.

BUYER shall bear the risk of loss for Products or Software returned to Force10 Networks for repair, replacement, or service, and the same must be shipped pre-paid by BUYER.

Requests for warranty services and troubleshooting must be made to, and will be provided by, the Force10 Networks Customer Support Center via telephone during the warranty period and during normal business hours. Normal business hours for Force10 Networks Customer Support Center are 7:00 a.m. to 6:00 p.m. Mountain Standard Time, Monday through Friday, excluding weekends and standard Force10 Networks recognized holidays.

### ***Limitation of Warranty & Limitation of Remedies***

Correction of defects by repair, replacement, or service will be at Force10 Networks' option and constitute Force10 Networks' sole obligation and BUYER's sole and exclusive remedy under the limited warranty. Any such error correction or replacement provided to BUYER does not extend the original warranty period for hardware or software, respectively.

Force10 Networks assumes no warranty or other liability with respect to defects in the Product or Software caused by:

- a. modification, repair, storage, installation, operation, or maintenance of the Product or Software by anyone other than Force10 Networks or its agent, or as authorized and in accordance with the Force10 Networks Documentation; or
- b. the negligent, unlawful or other improper use or storage of the Product or Software, including its use with incompatible equipment or software; or
- c. fire, explosion, power failures, acts of God, or any other cause beyond Force10 Networks' reasonable control; or
- d. handling or transportation after title of the Product passes to BUYER.

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The foregoing summarizes Force10 Networks' entire product and software warranties, which are subject to change without notice.

### ***Warranty Product Returns***

Before returning any equipment to Force10 Networks, first contact the distributor or dealer from which you purchased the product.

A Return Material Authorization (RMA) number is required for all equipment returned to Force10 Networks. Call Force10 Networks Customer Support at 1-866-887-4638 (US) or 1-707-665-4355 (International/Direct) for RMA number, repair/warranty information and shipping instructions. Be prepared to provide the following information:

- Force10 Networks serial number(s) from the system chassis or circuit card(s)
- Name of distributor or dealer from which you purchased the product
- Description of defect



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# CHAPTER 1

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## ***Adit 600 Base Platform***

### **In this Chapter**

- Overview
- Features
- Controllers
- Service Cards
- Power Supplies
- Local and Remote Management
- Technical Specifications
- Chassis

## Overview

---

**NOTE:** This manual contains information about E1 support. E1 is NOT supported in this release of the Adit 600 Controller. It will be supported in a future release.

---

The Adit 600 Multi-Service Delivery Terminal is the ideal solution for delivering carrier-quality broadband voice and data services to small and medium-sized businesses. It enables ILECs, CLECs, wireless mobility carriers, MSOs, and IXC's to offer their customers a wide variety of voice and high-speed data services using the most economical broadband transport.

The Adit 600 defines a new class of equipment that combines multi-network access and multi-service delivery into one platform. The result is an extremely cost-effective, compact, and flexible solution that enables service providers to deliver business voice, IP, high-speed data, and private line services using the most economical broadband access available over wireline and wireless networks.

The modular Adit 600 platform supports the needs of service providers faced with a changing array of network technologies, transport media, and customer service interfaces. Its expandable architecture allows service providers to scale across service types, network architectures, and bandwidth requirements to fit a dynamic service delivery environment.

Hot-swappable service cards provide the physical, electrical, and logical connections for analog line terminations, PBX interfaces, LAN to WAN connectivity, serial interfaces, and network access. Customer interface types include Routed Ethernet, FXS, FXO/DPT, V.35, V.35/V.54, RS-232, OCU-DP, ISDN BRI, Terminal Server Router (TSR), P-Phone (Meridian Digital Centrex), Single-channel POTS, and T1 or E1. Any service card can be placed in any of the six available slots. New revenue-generating services can be added easily by installing a new card.

In addition, the Customer Media Gateway (CMG) and Multi-Service Router (MSR) cards enable the Adit 600 to provide a cost-effective migration path to IP-based softswitching infrastructures. The CMG card uses the MGCP protocol, while the MSR card uses the SIP protocol. Both can be deployed in the same Adit 600 chassis. In addition to VoIP services, the MSR card also enables VPN routing and T.38 Fax Relay services.

## **Features**

- Allows any service connection or network access line to be deployed in any slot
- Provides integrated 18 T1 or E1 port digital cross-connect for service grooming and restoration
- Flexibly provisions a broad variety of services within a single Adit 600 chassis occupying just 2 rack units of equipment space
- Supplies integrated dual T1/E1 CSU/DSUs and SNMP management on the Controller
- Supports VoIP (SIP) services through the Multi-Service Router (MSR) card and VoIP (MGCP) services through the Customer Media Gateway (CMG) card
- Supports VPN routing through the MSR card
- Supports T.38 Fax Relay through the CMG card and MSR card
- Supports SSH and SNMPv3
- Enables remote SNMP and Telnet provisioning, monitoring, and testing of services and network conditions
- Supports GR-303 remote terminal management from Access Navigator host software

## Controllers

The Controllers manage all service cards installed in the unit and have an integrated Dual T1/E1 CSU/DSU functionality and an integrated 1/0 DS0 digital cross-connect for service grooming. Currently there are two Controllers for the Adit 600:

- Dual T1 Controller
- Dual E1 Controller

---

**NOTE:** E1 is not supported in this release of the Adit 600 Controller. It will be supported in a future release.

---

There is a wide variety of service cards, however all cards do not operate with both the T1 and E1 Controllers. The following chart identifies which cards can be installed in a system with each Controller. **Note:** Many of these cards require a minimum software level on the Controller, see Technical Specifications in the specific card chapter.

Service Card/Power Supply	E1 Controller	T1 Controller
4-Wire E&M	X	X
FXO	X	X
FXS 4G		X
FXS 5G	X	X
FXS 8A		X
FXS 8B	X	X
FXS 8C	X	X
FXS 8D	X	X
FXS International (E1 FXS)	X	
ISDN BRI	X	X
OCU-DP		X
P-Phone		X
POTS (without modem)	X	X
RS-232 (limited configuration)		X
V.35 and V.35/54 cards	X	X
IP Router	X	X
CMG Router	X	X
CMG-02 Router	X	X
Multi-Service Router (MSR)		X
Terminal Server Router	X	X
Quad DS1 ADPCM		X
Quad T1		X
Quad E1	X	
Quad DS1/E1 (hardened)	X	X

## **Service Cards**

All service cards are hot-swappable and can be installed in any of the 6 service slots of the Adit 600 chassis.

---

**NOTE:** E1 is not supported in this release of the Adit 600 Controller. It will be supported in a future release.

---

### **Four-Wire E&M/TO Service Card**

The Four-Wire E&M/TO service card provides four analog voice connections with standard RJ-48 jacks, one for each analog port. The card digitizes the analog signal and maps the four analog voice ports from 4-wire radios, telephone switches, or data modems into four DS0 time slots of a T1 or E1 access link.

### **FXS Service Cards**

The FXS service card is an 8 port Foreign Exchange Station line card. Delivers either outside phone lines or on-premise customer business line services from T1 access circuits. Currently there are multiple versions of this card for various applications, see *Chapter 10, FXS Voice Card* for additional information.

### **FXO Service Card**

The FXO service card is an 8 port Foreign Exchange Office (FXO) or Dial Pulse Termination (DPT) line card. Delivers high-density provisioning of Direct Inward Dialing (DID) or FX0 telephone services from T1 or E1 access circuits.

### **ISDN BRI Service Cards**

The ISDN Basic Rate Interface (BRI) service card is available in a Dual, Quad or Octal port option. The ISDN BRI service delivery interfaces enable delivery of high-density, standards based, ISDN BRI services of T1 access circuits. **Note:** These cards are no longer manufactured.

### **OCU-DP Service Cards**

The OCU-DP service card is available in a Single or Quad port option. The OCU-DP interface service allows Digital Data Service (DDS) circuit terminations on the Adit 600 platform. Provides the electrical and physical termination of a 4-wire DDS baseband connection which interfaces with a remote CSU/DSU. **Note:** These cards are no longer manufactured.

### **P-Phone Service Card**

The Octal P-Phone (EBS) service card enables service providers to deliver Centrex services via existing Nortel Electronic Business Set (EBS/P-Phone) telephones. This card installed in the Adit 600 is hosted from a Access Navigator via GR-303 from a Nortel DMS Class 5 Switch. **Note:** This card is no longer manufactured.

### ***POTS Service Card***

A Single Channel POTS service card provides wireless service providers a standard FXS voice circuit for communications, with the operations support group under conditions where the cell site radios are being serviced. **Note:** This card is no longer manufactured.

### ***Quad DS1 ADPCM Service Card***

The 4 port T1 service card can compress and groom voice traffic, which increases bandwidth utilization and reduces costs. Using Adaptive Differential Pulse Code Modulation (ADPCM), this card compresses selected voice timeslots from one of the T1 ports. **Note:** This card is no longer manufactured.

### ***Quad T1 Service Card***

The 4 port T1 service card enables cost-effective provisioning and expansion of T1 bandwidth with full non-blocking digital cross-connection of all timeslots to any Adit service card. In a Adit 600 with T1 Controller, up to 432 DS0 user capacity. **Note:** This card is no longer manufactured; it has been replaced by the Quad DS1/E1 service card.

### ***Quad E1 Service Card***

The 4 port E1 service card enables cost-effective provisioning and expansion of E1 bandwidth with full non-blocking digital cross-connection of all timeslots to any Adit service card. In a Adit 600 with E1 Controller, up to 558 DS0 user capacity. **Note:** This card is no longer manufactured; it has been replaced by the Quad DS1/E1 service card.

### ***Quad DS1/E1 Service Card***

This service card is a combined, hardened version of the Quad E1 and the T1 Service card above, and is configured for DS1 or E1 with a single CLI command.

### ***RS-232 Service Card***

The Dual port RS-232 service card provides support for RS-232 synchronous data transport at selectable data rates over a DS0 channel on the Adit 600. **Note:** This card is no longer manufactured.

### ***V.35 and V.35/54 Service Cards***

The Dual port V.35 interface service card provides connectivity to high-speed serial synchronous Data Terminal Equipment (DTE) devices. **Note:** The V.35 card is no longer manufactured.

### ***IP Router Service Card***

The Single port Router card that provides up to 60 DS0s of bandwidth or up to 24 WANS connections per Router card. **Note:** This card is no longer manufactured.

### ***Customer Media Gateway (CMG) Router Service Card***

The CMG Router cards provide all IP Router card functions and features, along with VoIP (MGCP) features.

### ***Multi-Service Router (MSR) Service Card***

The MSR card provides VPN routing, T.38 Fax Relay, and VoIP (SIP) features.

### ***Terminal Server Router (TSR) Service Card***

The Terminal Server Router card provides all IP Router card functions and features, with the added features of a selectable four port RS-232 and 10/100Base-TX Ethernet switch with dedicated routing functionality.

## ***Power Supplies***

### ***115 VAC/-48 VDC Power Supply/Charger***

Enables the Adit 600 to be powered from either 115 VAC or -48 VDC sources, and includes an integral battery charger and ringing generator.

### ***230 VAC/-48 VDC Power Supply/Charger***

Enables the Adit 600 to be powered from either 230 VAC or -48 VDC sources, and includes an integral battery charger and ringing generator.

### ***24 VDC Power Supply***

Provides the Adit 600 with a +24 VDC power source.

## ***Local and Remote Management***

The Controller cards have several local and remote management options available. Front-panel LEDs quickly communicate alarm, system and line status. The cards can be configured and managed locally through the RS-232 or Ethernet management connections using a Command Line Interface (CLI).

A number of remote management options are available to reduce truck roll costs for most maintenance and troubleshooting activities. The in-band DS0 management channel on the controller delivers 64 Kbps remote access to the Adit 600 without incurring additional facilities costs. Alternatively, a separate Ethernet facility can be deployed to support out-of-band SNMP network management.

## **Technical Specifications**

---

**NOTE:** E1 is not supported in this release of the Adit 600 Controller. It will be supported in a future release.

---

### **Platform Features**

- Wide selection of service cards
- Hot-swappable service cards
- Integrated 1:0 Digital Cross Connect Switching with 18 full T1/E1s

### **Basic System**

The Adit 600 basic configuration has the following:

- Two T1/E1 network interfaces
- Maximum capacity of 48 voice channels, on 6 eight-channel cards
- 6 x universal service cards
- Status and alarming LEDs

### **Management**

- SNMP management over 10Base-T or dedicated DS0
- SNMPv3 (release 9.8 and above)
- SSH and Secure Copy (release 9.6 and above)
- Remote management over T1 ESF Facility Data Link or dedicated DS0

### **Management Ports**

- RS-232 Craft Port for connection through any VT100 terminal, PC, or modem for remote management using Command Line Interface (CLI)
- 10BaseT Ethernet Port for management of the Controller card

### **Network Interface**

- T1/E1
- Framing: SF (D4) or ESF
- Line code for T1: B8ZS and AMI
- Framing for T1: SF (D4) or ESF
- Framing for E1: 16 Frame with or without CRC
- Line code for E1: AMI and HDB3



## **Network Standards**

- ANSI/TIA T1.403 ESF FDL
- T1.403-1995

## **Clocking**

- T1/E1 loop timing with hold-over
- Internal 4E Stratum clock with hold-over

## **Alarms**

- External Alarm: 6-pin connector (rear), 1 input, 2 outputs for major/minor alarms
- T1: LOS, BPV, Yellow, LOF/AIS

## **Testing and Diagnostics**

- T1 loop code
- V.54 loop codes, QRSS, 2047, 220-1, 215-1 test patterns

## **Power**

- Standard 115VAC/-48VDC Power Supply/Charger
- Optional 24/-48VDC Power Supply
- Options 230VAC/-48VDC Power Supply/Charger

## **Rear Chassis Interfaces**

- 1 x RS-232 DB-9 female jack
- 1 x 2 pin modular plug for AC or DC power feeds (depending on power supply installed)
- 1 x 2 pin modular plug for -48 V/Battery (with 115V Power Supply installed)
- 1 x 10/100Base-T Ethernet RJ-45 jack
- 2 x RJ-48C jacks
- 2 x 6 pin modular receptacle for alarm relay output
- 2 x 25 pin Telco connectors
- 2 x 3/16 inch threaded stud for grounding

## ***Regulatory Approvals***

### **USA**

- UL60950
- FCC Part 15, Class A
- FCC Part 68

### **Canada**

- CSA C22.2 No. 60950-00
- ICES-003, Class A
- CS-03

### **European Union**

- EN55022, Class A
- EN60950
- EN6100-3-2, Harmonics
- EN6100-3-3, Flicker
- EN55024, Immunity
- EN 300 386 V1/3/1, CPE
- CTR12 and 13

### **Brazil**

- Anatel Certification

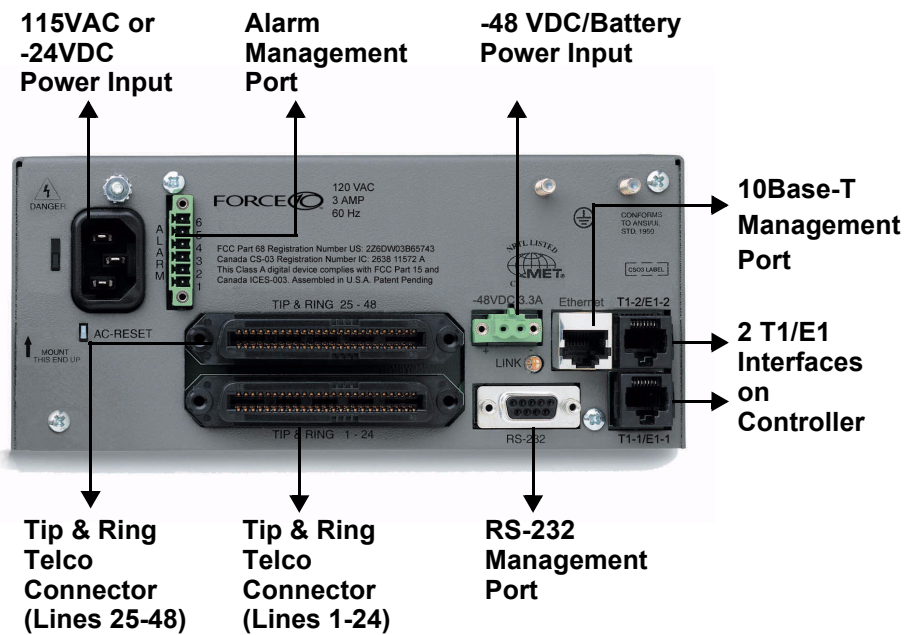
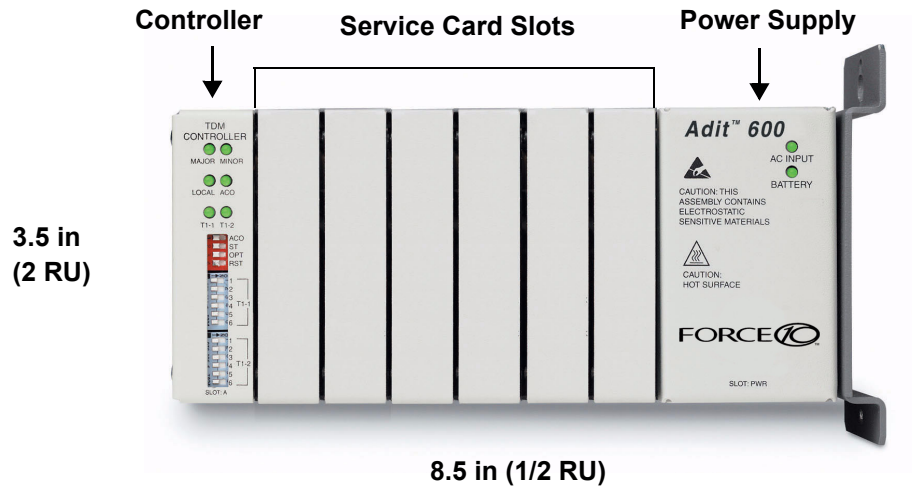
### **Australia/New Zealand**

- A-Tick

## ***Physical Information***

- Dimensions: 3.5 in. (H-2 RU) x 8.5 in. (W) x 12 in. (D)  
8.9 cm (H) x 21.6 cm (W) x 30.5 cm (D)
- Weight: 7 lbs. (3.2 kg) base unit (with Power Supply and Controller)

## Chassis





# CHAPTER 2

---

## ***Physical Installation***

### **In this Chapter**

- Unpacking and Inspection
  - Installation Environment
- Assembly of Adit 600
- Wall Mounting
- Adit 600 Speedway (Optional Feature)
- Rack Mounting (Optional Feature)

## **Unpacking and Inspection**

---

**WARNING! OBSERVE PRECAUTIONS FOR HANDLING ELECTROSTATIC DEVICES.**

---

1. Inspect containers for damage during shipment. Report any damage to the freight carrier for possible insurance claims.
2. Compare packing list with office records. Report any discrepancies to the office.
3. Open shipping containers, be careful not to damage contents.
4. Inspect contents and report any damage.
5. If equipment must be returned for any reason, carefully repack equipment in the original shipping container with original packing materials if possible.
6. If equipment is to be installed later, replace equipment in original shipping container and store in a safe place until ready to install.

## **Installation Environment**

The environment in which you are installing the Adit 600 must meet the following conditions:

- Operating temperature range: 32° to 104° F (0° to 40° C)
- Storage temperature range: -40° to 158° F (-40° to 70° C)
- Cooling method is by free air convection, requires long axis of unit to be mounted horizontally
- Maximum operating altitude: 10,000 ft. (3,048 m)
- Maximum non-operating altitude: 40,000 ft. (12,192 m)
- Relative humidity (non-condensing) range: 0 to 95%

For operation outside the defined environment requirements, the Adit 600 must be placed in an environmentally controlled enclosure.

## **Assembly of Adit 600**

The cards should be positioned in the Adit 600 chassis as follows:

Note: Slots are labeled on the top and the bottom of the chassis.

- Power Supply in the POWER Slot
- E1 or T1 Controller in Slot A
- Service Cards can be in any slot 1 through 6.  
**Note:** When an Adit 600 is mounted to the wall, cards that use the front cable connections should be loaded from Slot 6 to 1. This will minimize card access issues due to cable interference.
- Always install blank faceplates in any unused slots.

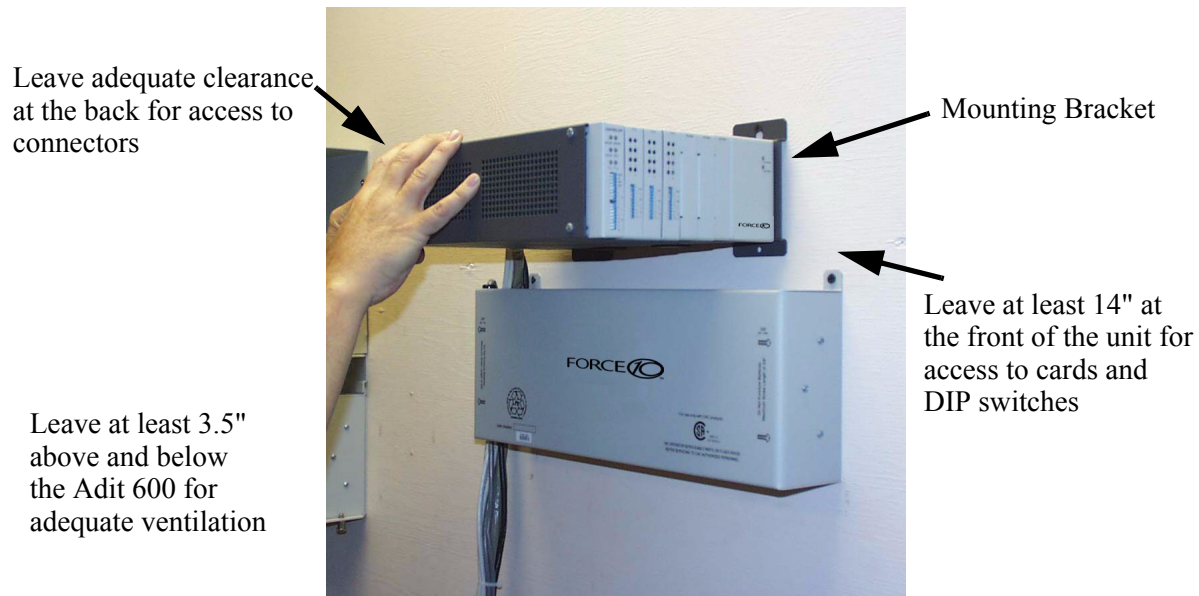


Service Card Slots

## Wall Mounting

Before beginning the mounting process, verify that the area meets the following requirements:

- A stable environment
- Clean and free from extremes of temperature, shock, vibration and EMI
- Meets the all installation environment requirements, see *Installation Environment* on page 2-2.



The Adit 600 is delivered with a mounting bracket attached for quick and easy wall mounting, as shown in the illustration above.

To install the unit to the wall, attach the unit using the four screws provided, one at each bracket foot.

---

**NOTE:** Do not mount the Adit 600 in any other orientation than shown above.

---



## **Adit 600 Speedway (Optional Feature)**

The Adit 600 Speedway Installation Kit (P/N 710-0024) is designed to reduce the time of installation and to strengthen the assembly to the wall.

The Speedway holds one Adit 600 and one Battery, with an optional second Battery shelf (P/N 710-0025). The Adit is secured to a Swing Plate, that allows the Adit to swing away from the wall to give full access to the unit. The Battery sits below the Adit on a shelf secured by front pins. The second Battery option sits on a shelf below the first Battery.

The Adit 600 is secured to a swing plate, which allows the front of the Adit to swing away from the wall giving full access to the unit for removal or installation of service cards. The battery backup unit sits below the Adit on a shelf secured by front pins. The shelf for the second battery backup unit sits below the first battery. A Y-cable (P/N 005-0091) is provided, allowing the two batteries to be connected together for double the backup.

Adit 600 Speedway  
with one battery



Adit 600 Speedway  
with second battery option

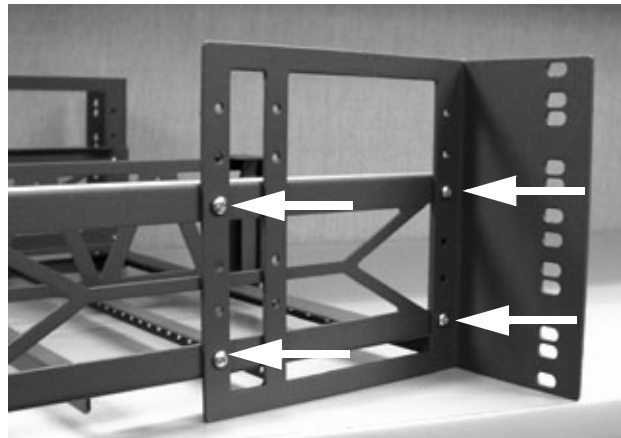


## **Rack Mounting (Optional Feature)**

Rack mounting kits (P/N 710-0019 NEBS version, 710-0016 non-NEBS version) are available for both 19 and 23 inch racks.

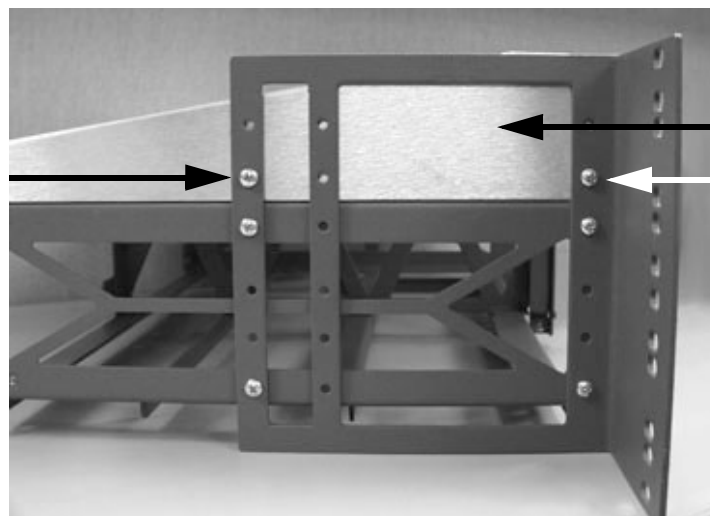
***To rack mount the Adit 600, follow the instructions below:***

1. Attach bracket ears to rack mounting bracket using four #8-32 x 3/16" screws on each side.



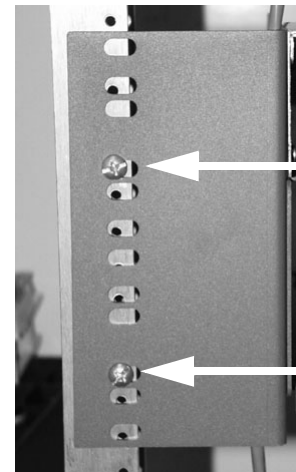
**Bracket Ear  
Left Side View**

2. Attach heat baffle to bracket ears using two #8-32 x 5/16" screws on each side.



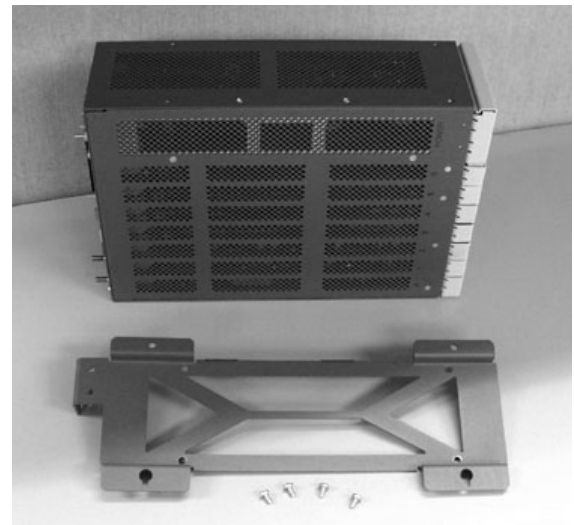
**Heat Baffle  
Left Side View**

3. Attach rack mounting bracket ears to rack using two #12-24 x 5/8" rack mounting screws on each side.



**Front View**

4. Remove wall mount and screws from Adit 600 unit.



5. Slide the Adit 600 unit into rack mounting bracket.



**Thumbscrew**

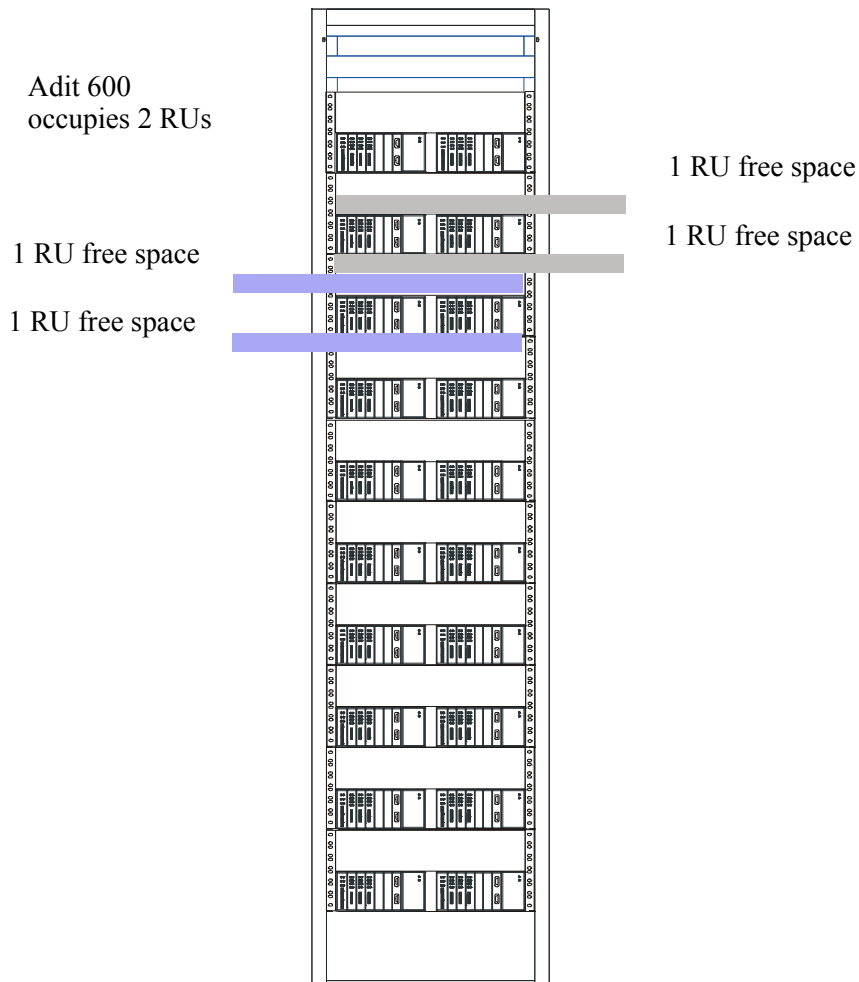
6. Swing the front latch up to secure the Adit 600 unit(s), and tighten thumbscrew.

## Physical Installation

### Rack Mounting (Optional Feature)

---

As many as 20 Adit 600 units can be mounted on a single 7 foot rack, as shown in the following illustration (2 Adits are mounted side-by-side and 10 high).



Adit 600 = 2 RUs (3.5 inches) Spacing = 1 RU above and below for **each** unit.

---

**NOTE:** the mounting brackets are 7 inches high and will not allow units to be mounted closer than recommended. The provided heat baffle will occupy this space with the NEBs compliant installation site.

---

# CHAPTER 3

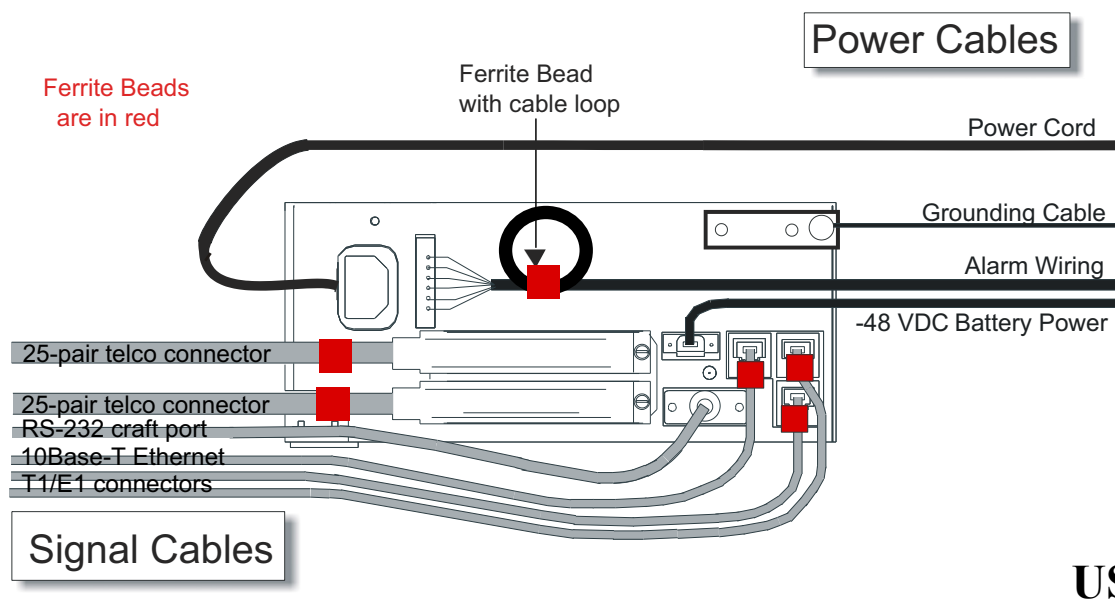
---

## ***Electrical Installation/Cabling***

### **In this Chapter**

- Compliant Installation
- Chassis Connectors and Buttons
- Connectors

## Compliant Installation



1. Connect all of the signal cables as shown in the illustration above, and secure them with a plastic tie. Dress the signal cables toward the left of the Adit 600.
2. If using the 115V Power Supply, connect the -48 VDC battery power cable.
3. Secure the ground lugs to the terminals using the nuts provided.
4. Secure the power cable and the ground cable with a plastic tie (not included). Keep these cables separate from the signal cables.
5. Terminate each signal cable to its appropriate connector.
6. Secure signal cables using the holes along the bottom of the rack and plastic ties (not included).

---

**NOTE:** It is important that the Signal Cables are secured separately from the Power Cables, for proper equipment operation.

---

---

**WARNING!** ADDITIONAL PRIMARY PROTECTION IS REQUIRED WHEN CONNECTING T1/E1 OR FXS INTERFACES TO EXPOSED OFF-PREMISE COMMUNICATION CONDUCTORS. SECONDARY OVERVOLTAGE AND OVERCURRENT PROTECTION IS PROVIDED ON THESE INTERFACES FOR LIGHTNING SURGE, AC POWER CONTACT AND INDUCTION. IT WILL BE THE RESPONSIBILITY OF THE INSTALLER TO UTILIZE LISTED PRIMARY PROTECTORS AND FOLLOW INSTALLATION REQUIREMENTS PER LOCAL OR NATIONAL REGULATIONS.

---

## **Ferrite Beads (US)**

**NOTE:** E1 is not supported in this release of the Adit 600 Controller. It will be supported in a future release.

To be compliant with Part 15A of the FCC and for NEBS compliant facilities, the following ferrite beads are required for the chassis and service cards listed below.

### **Ferrite beads for Adit 600 chassis:**

Ferrite	Part Number	Intended For
3 small	P/N 010-0095	(2) One on each T1 or E1 cable (1) Ethernet (10Base-T) cable
1 large	P/N 010-0051	(1) Alarm cable, which requires a loop through the bead (see drawing)

### **Service cards requiring ferrite beads:**

Card	Ferrite	Part Number	Intended For
ISDN BRI	1 large	P/N 010-0051	(1) 25-pair Telco cable (ISDN BRI card in slot 1-3 top telco, 4-6 bottom)
Quad DS1/E1 Quad T1 Quad E1	1 large	P/N 010-0051	Cables from front of card (1 bead can hold 1-4 cables) <b>or</b> , (1) One on 25-pair Telco cable
IP Router	1 small	P/N 010-0095	Ethernet Cable (from front of card)
CMG Router*	1 small	P/N 010-0095	Ethernet Cable (from front of card)

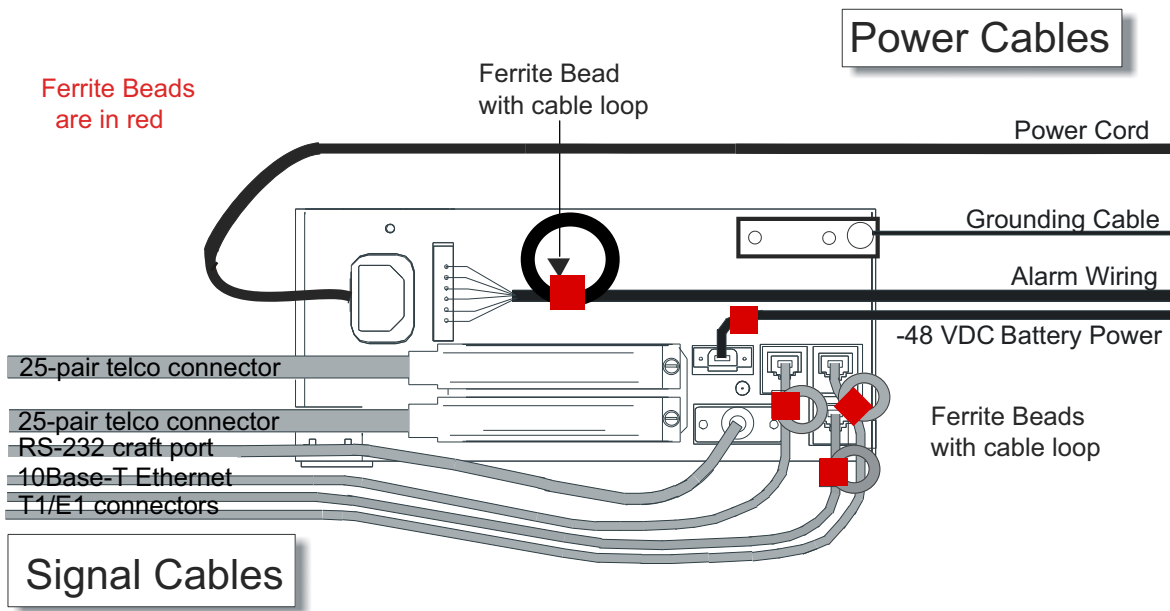
\*The CMG-01 and CMG-02 Router cards do not require a ferrite bead.

For additional information on ferrite beads and their installation on the Adit 600, please contact Force10 Networks Customer Support at 1-866-887-4638 (US) or 1-707-665-4355 (International/Direct).

Ferrite Beads (Europe, Australia and Canada)

**NOTE:** E1 is not supported in this release of the Adit 600 Controller. It will be supported in a future release.

To be compliant with EN55022 and CISPR22 Class A emissions, the following beads are required for the chassis and components listed below. Also, shielded cables are required for the V.35/54 service card and must be ordered separately.



Ferrite beads for Adit 600 chassis:

Ferrite	Part Number	Intended For
4 large	P/N 010-0051	All of these ferrites require a loop through the bead (see drawing). (1) Alarm cable (2) One on each or E1 cable (E1-1/E1-2) (1) Ethernet (10Base-T) cable

Additional components requiring ferrite beads:

Component	Ferrite	Part Number	Intended For
CMG Router*	1 small	P/N 010-0095	Ethernet Cable (from front of card)
Quad DS1/E1 Quad E1	2 large	P/N 010-0051	E1 cables from front of card (1 bead can hold 1-4 cables) <b>or</b> , (2) One on each 25-pair Telco cable
Battery Unit	1 small	P/N 010-0095	Battery Cable
DC Power Kit	1 small	P/N 010-0095	DC Input Cable

\*The CMG-01 and CMG-02 Router cards do not require a ferrite bead.



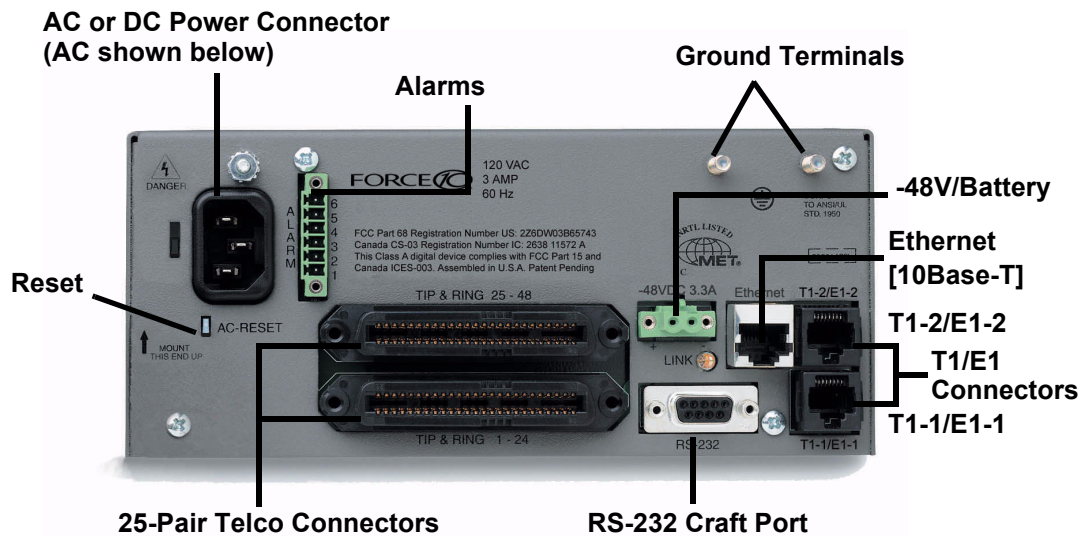
***Shielded Cable (order separately):***

<b>Card</b>	<b>Part Number</b>	<b>Intended For</b>
V.35/54 (HD)	P/N 005-0008	D-sub Male to Winchester Male, 10 ft.
	P/N 005-0009	D-sub Male to Winchester Male, 25 ft.
	P/N 005-0010	D-sub Male to Winchester Male, 50 ft.
	P/N 005-0014	D-sub Male to Winchester Female, 10 ft.
	P/N 005-0068	D-sub Male to Winchester Female, 25 ft.
	P/N 005-0069	D-sub Male to Winchester Female, 50 ft.

For additional information on Ferrite beads and their installation on the Adit 600, please contact Force10 Networks Customer Support at 1-866-887-4638 (US) or 1-707-665-4355 (International/Direct).

## Chassis Connectors and Buttons

The following illustrations show all connectors on the back of the Adit 600.



## Connectors

---

**NOTE:** E1 is not supported in this release of the Adit 600 Controller. It will be supported in a future release.

---

The following are the Adit 600 interface connectors:

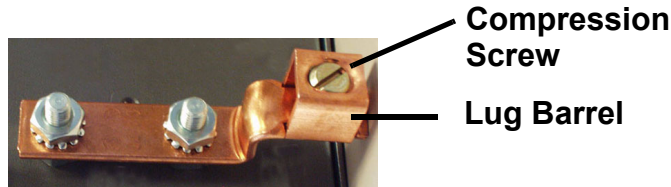
- T1-1/E1-1 and T1-2/E1-2 line connection ports each equipped with standard RJ-48C 8-pin connector jack
- RS-232 craft port connector
- Tip and Ring Analog Interfaces equipped with standard 25-pair Telco Connectors
- 10Base-T Ethernet port to be connected to a remote management tool such as Telnet or an SNMP-based Network Management System with an RJ-45 8-pin connector jack
- External Alarm Connector
- Ground Lugs

## **Chassis Ground Connector**

**WARNING!** THIS EQUIPMENT IS REQUIRED TO HAVE A PERMANENT GROUND CONNECTION. IF CONNECTED TO EXPOSED OUTDOOR COMMUNICATION CONDUCTORS, A #6 AWG COPPER WIRE MUST BE PERMANENTLY CONNECTED FROM AN APPROVED GROUNDING ELECTRODE TO THE CHASSIS GROUND LUG. OTHERWISE, A #14 AWG COPPER WIRE MAY BE UTILIZED. INSTALL THE GROUNDING CONDUCTOR IN ACCORDANCE WITH NATIONAL OR LOCAL REGULATIONS.

1. Route wire (#6 or #8 AWG copper) from building ground to lug on Adit 600.
2. Strip insulation off wire end, if necessary.

**Ground Lug**



3. Loosen compression screw until opening is large enough to accept ground wire.
4. Insert ground wire into lug barrel, beneath compression plate and tighten compression screw.
5. Attach ground lug to chassis

## **Power Reset**

This is a resettable circuit breaker. If at any time there is a short or power surge on the incoming AC/DC line, the breaker will trip to protect the Power supply from damage.



## **Power Connections**

There are four power supplies available for the Adit 600.

- 115 VAC/-48 VDC
- 230 VAC/-48 VDC
- 24/-48 VDC
- 24 VDC with -48 Output

These power supplies have different connectors as shown in the following sections. For additional information, see *Chapter 15, Power Supply*.

## **Fuse Recommendation**

When using -48 VDC input power, use a 3.5 Amp fast-acting fuse if the power connector is wired to a fuse panel.

### Power Cord AC

An AC Power cord is provided with the 115 VAC and the 230 VAC Power Supplies.

#### To connect the Power Cord:

1. Insert power cord (male-end) to AC power source.
2. Plug connector into the Adit 600.
3. A green light should appear on the DC Input LED on the front of the Power Supply.



AC Power Connector

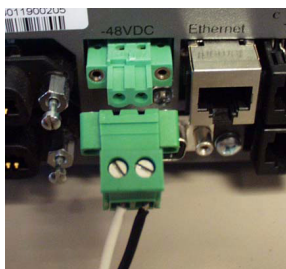
### -48V Battery

The -48 VDC input connector on the Adit 600 is used for either direct DC powering of the Adit 600 unit or for a Battery Backup connection when AC is used. There is no power cable provided for this connector, however the connector is provided.

**WARNING!** POSSIBLE SHOCK HAZARD EXISTS, PLEASE FOLLOW INSTRUCTIONS CAREFULLY.

To connect -48 VDC power:

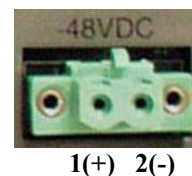
1. Ensure that no power is present on the two wires to be connected.
2. Strip the two wires (approx. 5/16 in. bare wire) from the power source. 16 or 18 AWG insulated copper wire is recommended for power connections.
3. Insert the Battery Return and DC wires into the appropriate square holes.
4. Tighten screws to clamp wires.
5. Ensure that no bare wire shows after the wires are installed.
6. Plug connector in the -48 VDC connector, as seen below and secure with set screws.
7. Apply power to connector from -48 VDC power source.
8. Verify with voltmeter that voltage is correct and polarity is correct.
9. Plug connector in the Adit 600 -48 VDC connector, as seen in the graphic and secure with set screws.



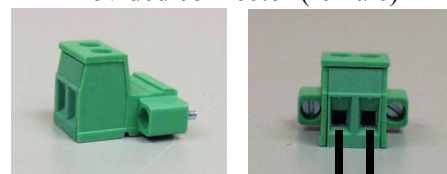
Battery -48 VDC (-)  
Return (+)



Connector  
on back  
of Adit 600  
(male)



Provided connector (female)



Battery -48 VDC  
Return 1(+) 2(-)

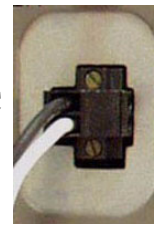
## **Power Cord DC**

There is no power cable provided with the 24 VDC Power Supply, however the connector is provided. This connector will need to be wired, the following chart provides the wire gauge recommended.

### **To connect 24 VDC power:**

1. Ensure that no power is present on the two wires to be connected.

24 VDC  
6 Amp

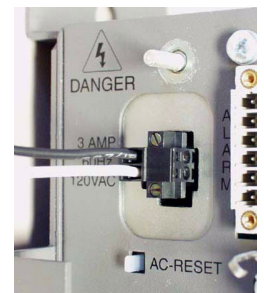


Battery  
Return (-)  
  
Battery (+)

DC Power Connector

**WARNING!** POSSIBLE SHOCK HAZARD EXISTS, PLEASE FOLLOW INSTRUCTIONS CAREFULLY.

2. Strip the two wires from the power source so that approximately 5/16 inch of bare wire is exposed. see Wire Gauge chart below for wire recommendations.
3. Insert the Battery Return (-) and Battery (+) wires into the appropriate square holes, one at a time.
4. Tighten screws to clamp wires.
5. Ensure that no bare wire shows after the wires are installed.
6. Apply power to connector.
7. Verify with voltmeter that voltage is correct and polarity is correct.
8. Plug connector(s) into the Adit 600 DC Power connector, as seen in the graphic and secure with set screws
9. A green light should appear on the DC OK LED on the front of the Power Supply.



Battery  
Return (-)

Battery (+)

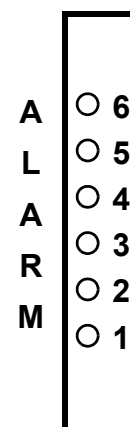
Wire Gauge	18 AWG	16 AWG	14 AWG
Maximum Distance	12 Feet	20 Feet	35 Feet

## External Alarm Connector

The external alarm 6-pin connector with one input pair (pins 5 and 6) and two output pairs (pins 1 and 2 - major alarms; pins 3 and 4 - minor alarms).

The pinouts are as follows:

Pin #	Description	Explanation
1	Major Alarm +	The major alarm output is available for power supply or major alarm failure alerting. The maximum voltage across the contacts is 350 V, and the maximum current is 150 mA.  This alarm is closed when power is off.
2	Major Alarm -	
3	Minor Alarm +	The minor alarm output is available for power supply or minor alarm failure alerting. The maximum voltage across the contacts is 350 V, and the maximum current is 150 mA.  This alarm remains open when power is off.
4	Minor Alarm -	
5	Alarm In +	The alarm inputs provide 5 VDC across the two contacts, and generate an alarm when a short circuit is detected between the contacts.  The alarm generated is a minor severity alarm.
6	Alarm In -	

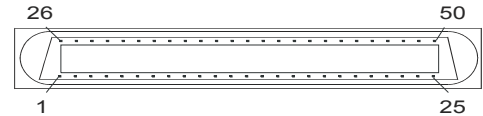


## 25-Pair Telco Connectors

Tip and Ring Analog Interfaces equipped with standard 25-pair Telco Connectors (female) for connection to key systems, fax machines, modems, and PBXs. These interfaces are also used for ISDN BRI ports and are jumper selectable on the Quad T1, Quad E1, Quad DS1/E1 and Quad ADPCM service cards.

Circuit connections are made at the 25-pair telco connectors. A standard 25-pair telephone cable with RJ-21X wiring and a male D-type connector at the Adit 600 end is required.

The pinouts are as follows:



Pair	Pin Location	Function	Color Code
1	26 1	Tip Channel 1 Ring Channel 1	White/Blue Blue/White
2	27 2	Tip Channel 2 Ring Channel 2	White/Orange Orange/White
3	28 3	Tip Channel 3 Ring Channel 3	White/Green Green/White
4	29 4	Tip Channel 4 Ring Channel 4	White/Brown Brown/White
5	30 5	Tip Channel 5 Ring Channel 5	White/Slate Slate/White
6	31 6	Tip Channel 6 Ring Channel 6	Red/Blue Blue/Red
7	32 7	Tip Channel 7 Ring Channel 7	Red/Orange Orange/Red
8	33 8	Tip Channel 8 Ring Channel 8	Red/Green Green/Red
9	34 9	Tip Channel 9 Ring Channel 9	Red/Brown Brown/Red
10	35 10	Tip Channel 10 Ring Channel 10	Red/Slate Slate/Red
11	36 11	Tip Channel 11 Ring Channel 11	Black/Blue Blue/Black
12	37 12	Tip Channel 12 Ring Channel 12	Black/Orange Orange/Black
13	38 13	Tip Channel 13 Ring Channel 13	Black/Green Green/Black
14	39 14	Tip Channel 14 Ring Channel 14	Black/Brown Brown/Black
15	40 15	Tip Channel 15 Ring Channel 15	Black/Slate Slate/Black
16	41 16	Tip Channel 16 Ring Channel 16	Yellow/Blue Blue/Yellow

## ***Electrical Installation/Cabling***

### ***Connectors***

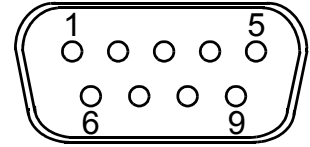
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<b>Pair</b>	<b>Pin Location</b>	<b>Function</b>	<b>Color Code</b>
17	42 17	Tip Channel 17 Ring Channel 17	Yellow/Orange Orange/Yellow
18	43 18	Tip Channel 18 Ring Channel 18	Yellow/Green Green/Yellow
19	44 19	Tip Channel 19 Ring Channel 19	Yellow/Brown Brown/Yellow
20	45 20	Tip Channel 20 Ring Channel 20	Yellow/Slate Slate/Yellow
21	46 21	Tip Channel 21 Ring Channel 21	Violet/Blue Blue/Violet
22	47 22	Tip Channel 22 Ring Channel 22	Violet/Orange Orange/Violet
23	48 23	Tip Channel 23 Ring Channel 23	Violet/Green Green/Violet
24	49 24	Tip Channel 24 Ring Channel 24	Violet/Brown Brown/Violet
25	50 25	Reserved	Violet/Slate Slate/Violet



### **RS-232 Craft Port (Female DB-9)**

The RS-232 craft port connector (female) is for connection to an external PC or Hayes-compatible modem for local or remote configuration, management, and performance monitoring using the Adit 600 Command Line Interface (CLI).



The RS-232 craft port connects via a female DB-9 connector on the Adit 600.

The pinouts are as follows:

Pin Number	Direction	Description
1	Outbound	Carrier Detect
2	Outbound	Receive Data
3	Inbound	Transmit Data
4	Inbound	Data Terminal Ready
5	N/A	Signal Ground
6	Outbound	Data Set Ready
7	Inbound	Request to Send
8	Outbound	Clear to Send
9	N/C	Not connected

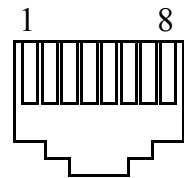
## **T1 and E1 Connection Ports**

The T1 and E1 connection ports are each equipped with a standard RJ-48C (female) on the Adit 600 unit.

The pinouts are as follows:

### **T1/E1 (RJ-48C)**

Pin	Name	Description
1	Receive Ring	Receive from DS1 network
2	Receive Tip	Receive from DS1 network
3	N/C	Not connected
4	Transmit Ring	To DS1 network
5	Transmit Tip	To DS1 network
6 - 8	N/C	Not connected



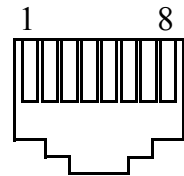
## **10Base-T Ethernet**

The 10Base-T Ethernet (female) port to connect to a remote management tool such as Telnet or an SNMP-based Network Management System. **Note:** A LINK LED on the back of the unit displays green when the system has a good Ethernet link.

The pinouts are as follows:

### **Ethernet (RJ-45)**

Pin	Name	Description
1	Receive +	Receive from network
2	Receive -	Receive from network
3	Transmit +	Transmit to network
4-5	N/C	Not connected
6	Transmit -	Transmit to network
7-8	N/C	Not connected



---

**NOTE:** This Ethernet port uses a "hub" pinout. Use a straight-through cable to connect a PC.

---

# CHAPTER 4

---

## *Configuration*

### **In this Chapter**

- Setting up a CLI Connection
- Setting up Login Security
- System Information
- Basic System Setup
  - Initial Setup
  - Basic Security Setup
  - DS1/T1 Setup
  - E1 Setup
  - DS0/Channel Setup
  - Analog Port Setup
  - 4-Wire E&M Setup
  - Establish a Static Channel Connection
  - ISDN BRI Service Setup
  - OCU-DP Card Setup
  - ADPCM Card Setup
  - V.35 Port Setup
  - Change the IP Address of the DS0 Management Channel
  - Upgrade the Adit 600 Software
  - Upgrade the Router Card Software
- Basic Router Setups
- Configuration Restrictions
- Install Country Specific Ringer Tones
- Quick Configuration Reload
- DS0 Management Channel Setup
- Basic P-Phone Configuration Setup

## Setting up a CLI Connection

---

**NOTE:** Default IP address of the Adit 600 Controller is 10.0.0.10.

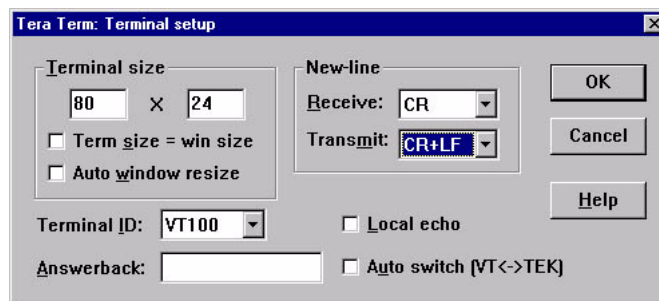
---

To connect with CLI, set up the connection:

- If connecting via the Ethernet 10Base-T connection, use a Telnet TCP/IP program to access the CLI. This requires the IP address of the Controller. Controllers are shipped with the IP address set to 10.0.0.10. If this address has been changed and is not known, use HyperTerm to access the Controller and use the CLI command *show ip*. If an IP address needs to be set, use the CLI command *set ethernet ip address*.
- If connecting via RS-232, the port settings should be set to:  
Bits per second: **9600**                      Data bits: **8**  
Parity: **None**                                  Stop bits: **1**  
Flow control: **None**
- Set your Terminal Emulation to: VT100

**Note:** If you are using Tera Term TCP/IP, CLI commands will not be recognized until the following setup is completed:

- In Tera Term go to Setup/Terminal.
- Set the New-line/Transmit value "CR+LF".



### Local vs. Remote Configuration

- For remote configuration via the CLI, use the *set local off* command.

## Setting up Login Security

The default for the system is to have no login. A login should be setup, as soon as possible, for security reasons. To set up security on the Adit 600 perform the following:

1. Open a CLI session (either through Telnet, HyperTerm, or other).
2. Set user password length requirement as necessary. See *set password length* on page 5-109.
3. Add a user. See *add user* on page 5-29.  
**Note:** The first user added should always be an administrator level (full-access). This administrator then manages subsequent users added.
4. Set user Access Level. See *set user level* on page 5-236.
5. Set user Password as necessary. See *set user password* on page 5-237.
6. User the exit command to end the session, and select [Enter] to log back in.

**The following shows this process:**

```
> add user "helen"
OK
> show users
  User           Level      Last Login           Logged In
  helen          1          00:00:00 00/00/0000      0
* indicates self

> set user "helen" password
  New Password: *****
  New Password again: *****
OK

> exit
Logging out of Force10 Networks - Adit 600

Force10 Networks - Adit 600
07:46:34 08/18/2005
  Login: helen
  Password: *****

Status Equipment:

BootCode Version: 2.00

      CardType      Status      SW Vers      CLEI
      -
SLOT A   E1x2       Present     9.4.0       SIUXSS0EAA
SLOT 1   FX0x8       Present     1.12       SIIXPV0DAA
SLOT 2   FXSx8       Present     1.09       SIC3GJ0CAA
SLOT 3   CMGx1       Present     2.70       SIIX270DAA
SLOT 4   V35x2       Present     1.05       SIC3HK0CAA
SLOT 5   BRIx8       Present     1.11       SIIXUX0DAA
SLOT 6   T1E1x4H     Present     2.01       NOT_AVAIL
```

```
.  
.   
.   
Show Autoexit:  
  
Autoexit is on; timeout is 20 minutes.  
  
>
```

## System Information

Once a management session has been initiated (Telnet or HyperTerm) the system information will be displayed similar to the following:

---

**NOTE:** CLEI codes are only displayed after system bootup or with the command **status equipment** as seen below.

---

```
Force10 Networks - Adit 600  
00:00:17 08/01/2004  
  
Status Equipment:  
BootCode Version: 2.00  
  
      CardType      Status      SW Vers      CLEI  
SLOT A    T1x2        Present      9.2.0      SIC3DH0CAA  
SLOT 1    T1E1x4H     Present      2.01      NOT_AVAIL  
SLOT 2    FXSx8        Present      1.09      SIC3GJ0CAA  
SLOT 3    RTRx1        Present      1.80      SIIASS0BAA  
SLOT 4    CMGx1        Present      2.30      SIIX270DAA  
SLOT 5    CMG-02x1     Present      2.40      SIIX270DAA  
SLOT 6    V35x2        Present      SIC3HK0CAA  
  
Alarms:  
  
      Time      Date      Severity      Description  
00:00:21    08/01/2004    Major      4:1-CMG Ethernet Link Down  
00:00:20    08/01/2004    Major      5:1-RTR Ethernet Link Down  
00:00:20    08/01/2004    Major      6:1-TSR Ethernet Link Down  
00:00:05    08/01/2004    Major      A:2-DS1 Loss Of Signal  
00:00:05    08/01/2004    Major      A:1-DS1 Loss Of Signal  
Total=5  
  
Status Sessions:  
  
      Session      User      Login Port  
* TELNET1      10.10.1.1  
* indicates current session  
  
Show Autoexit:  
Autoexit is on; timeout is 20 minutes.  
WARNING: System in LOCAL mode.  
        Use 'set local off' to turn it off.
```

## **Basic System Setup**

Following is a quick reference to some of the common tasks in configuring the Adit 600.

### **Initial Setup**

Use the following commands for your initial setup. For further information see the specific commands listed in *Chapter 5, CLI Commands*.

<b>Command</b>	<b>Description</b>
<code>set local off</code>	Disables DIP switches.
<code>set date {mm/dd/yyyy}</code>	Set the date used for event logging
<code>set time {hh:mm:ss}</code>	Set the time used for event logging
<code>set id {"id-name"}</code>	Set a system ID name
<code>set clock1 {slot:port} internal</code>	Set the primary clock source
<code>set clock2 {slot:port} internal</code>	Set the secondary clock source
<code>set ethernet ip address {ip-addr} {mask}</code>	Set the Ethernet IP address and mask.
<code>set ip gateway {ip-addr}</code>	Set the IP gateway, in the standard IP address format

### **Basic Security Setup**

Use the following commands to set up the security on the Adit 600. For further information see the specific commands listed in *Chapter 5, CLI Commands*.

<b>Command</b>	<b>Description</b>
<code>set password length {long short}</code>	Set user password length requirement.
<code>add user {"user-name"} [password {"password"}]</code>	Add user and password as necessary.
<code>set user {"user-name"} level {1-3}</code>	Specify the user's security level.
<code>set user {"user-name"} password</code>	Set/change password for the user as necessary.

## DS1/T1 Setup

Use the following commands to set up a DS1. See the *set (ds1)* command for more details.

Command	Description
<code>set {ds1-addr} up</code>	Activate the port of the DS1 (slot:port)
<code>set {ds1-addr} id {"id-string"}</code>	Set the identification string
<code>set {ds1-addr} lbo {1-9}</code>	Set the line buildout value for the DS1
<code>set {ds1-addr} linecode {ami b8zs}</code>	Set the linecode for the DS1
<code>set {ds1-addr} framing {d4 esf tr8afdl tr8anofdl tr8b}</code>	Set the framing option for the DS1
<code>set {ds1-addr} loopdetect {on off}</code>	Set the detection/reaction to CSU loopcodes

## E1 Setup

---

**NOTE:** E1 is not supported in this release of the Adit 600 Controller. It will be supported in a future release.

---

Use the following commands to set up a E1. See the *set (e1)* command for more details.

Command	Description
<code>set {e1-addr} up</code>	Activate the port of the E1 (slot:port)
<code>set {e1-addr} id {"id-string"}</code>	Set the identification string
<code>set {e1-addr} lbo {1 - 9}</code>	Set the line buildout value for the E1
<code>set {e1-addr} linecode {ami hdb3}</code>	Set the linecode for the E1
<code>set {e1-addr} framing {elfr lefrcrc}</code>	Set the framing option for the E1
<code>set {e1-addr} loopdetect {on off}</code>	Set the detection/reaction to CSU loopcodes



## **DS0/Channel Setup**

Use the following commands to set up a DS0. See the *set (ds0)* command for details.

Command	Description
<code>set {slot:port:channel} up</code>	Activate the channel
<code>set {slot:port:channel} signal {ls gs emw emdw emicpd dpt}</code>	Set the signaling option for the channel
<code>set {slot:port:channel} type {data voice}</code>	Set the channel type

## **Analog Port Setup**

Use the following commands to set up an analog port.

Command	Description
<code>set {slot:port} up</code>	Activate the port. See <i>set (ds1)</i> command for details
<code>set {slot:port} signal {dpt gs gsrb gsw gswrb ls lscpd lsrb}</code>	Set the signaling option for the port. See the <i>set (fxs)</i> or <i>set (fxo)</i> command for details
<code>set {slot:port} rxgain {n}</code>	Set the receive gain/loss in dB. See the <i>set (fxs)</i> or <i>set (fxo)</i> command for details
<code>set {slot:port} txgain {n}</code>	Set the transmit gain/loss in dB. See the <i>set (fxs)</i> or <i>set (fxo)</i> command for details

## 4-Wire E&M Setup

For this example the 4 E&M ports will be connected to the first 4 DS0s on T1-1 (a:1). This can be changed to match the customer's desired DS0 connections.

For Transmission Only mode, the DS0s on the DS1 should be set to data, as well as the E&M card channels.

Command	Description
<b>For Normal or Tandem E&amp;M:</b>	
set a:1:1-4 type voice	Set DS0s to voice.
connect a:1:1-4 1:1-4	Connect DS0s to the 4 ports of the 4-Wire E&M card.
show connect a: 1	Verify cross connects.
set a:1:1-4 signal emi	Set DS0 signal type to EMI.
set 1:1-4 signal emi	Set 4-Wire E&M ports signal type to EMI.
show connect a:1	Verify cross connects.
<b>For TO Mode:</b>	
set a:1:1-4 type data	Set DS0s to data.
set 1:1-4 type data	Set 4-Wire E&M port to data.
connect a:1:1-4 1:1-4	Connect DS0s to the 4 ports of the 4-Wire E&M card.
show connect a: 1	Verify cross connects.

## Establish a Static Channel Connection

Use the following commands to establish a static channel connection.

Command	Description
set {slot:port:channel} type {voice data}	Set the channel type for the channel you want to map. See <i>set (ds0)</i> command for details
set {slot:port:channel} signal {emdw emi emicpd emw gs ls plar r2}	Set the signaling option for the channel you want to map. See <i>set (ds0)</i> command for details
connect {slot:port} {slot:port}	Connect the channels. See the <i>connect (card-trunk) (card-trunk)</i> command for details

## ISDN BRI Service Setup

Use the following commands to set up a ISDN BRI Service. See the *set (bri)* command for details.

Command	Description
set {slot:port} up	Put the ISDN line In-Service
set {slot} mode {lt3ds0 lt4to1tdm nt3ds0}	Set the ISDN mode
set {slot:port} crv {1-768}	Set the Call Reference Value. <b>Note:</b> value must be the same as the Access Navigator
set {slot:port} threshold {day hour} {es ses}	Set the threshold for the IDSN lines
set {slot} pmsync {adit switch}	Set the source for performance monitoring synchronization
set {slot:port} autoactivate {on off}	Only used in 4-to-1 mode. Establishes the D channel when the FDL link can not be used

## OCU-DP Card Setup

The following is a basic setup for the OCU-DP card.

Command	Description
set {ocudp-addr} baud {2400 4800  9600 19200 38400 56000* 64000}	Set the OCU-DP Baud rate. Where ocudp-addr = {slot:port} of the OCU-DP card to apply the configuration settings to
set {ocudp-addr} up	Set the OCU-DP port 1 up
show {ocudp_card-addr}	Show the OCU-DP card settings. Where ocudp_card-addr = {slot} of the OCU-DP card
disconnect a	Disconnects all connections to slot a (controller)
set {ds0-addr} type data	Sets a DS0 data signaling type
connect {ds0-addr} {ocudp-addr}	Connects DS0 (in previous step) to OCU-DP port (in previous step)
show connect (ocudp_card-addr)	Displays connect information for OCU-DP card

## ADPCM Card Setup

Command	Description
Connect T1 cable to port 1 of the ADPCM service card	
set {adpcm_card-addr} {none map1 map2 map3}	Enable compressing by selecting Map type. Note: <b>none</b> disables compression.
show (adpcm_card-addr)	Displays the status of the card, and the mapping.
connect 2:1:1-12 2:4:1-12	Set ADPCM cross-connects. The example connects all 24 channels of the ADPCM to the 12 channels of the T1 (now compressed) on port 4. This example is with <b>map2</b>
show connect {2:1}	Displays the connections made above.

## V.35 Port Setup

Use the following commands to set up a V.35 port. See the *set (v35)* command for details.

Command	Description
set {slot:port} cts {cd high low rts}	Set the Clear to Send operation mode
set {slot:port} data {invert normal}	Set the data mode
set {slot:port} clock {source external}	Set the clock mode
set {slot:port} speed {56K 64K}	Set the speed
set {slot:port} txclkinv {invert normal}	Set the transmit clock inversion mode
set {slot:port} rxclkinv {invert normal}	Set the receive clock inversion mode

## Change the IP Address of the DS0 Management Channel

Use the following commands to change the IP over DS0 Management Channel for the Adit 600.

Command	Description
set ipds0 down	Set the DS0 management channel down
set ipds0 ip address {ip-addr}	Set the DS0 management channel IP address.
set ipds0 up	Set the DS0 management channel up

## **Upgrade the Adit 600 Software**

Use the following commands to determine the system software level, then upgrade the software to the latest version.

Command	Description
<code>status equipment</code>	Determine the system software level. The Slot A line (SW Vers) will display the current software level
<code>load tftp {ip-addr} {"file-name"}</code> (or <code>load xmodem</code> )	Load the new system software to the Adit 600. See the <i>load</i> command on page 5-60 for important information about Controller memory size and "large" vs. "small" upgrade files.  <b>Note:</b> You must have TFTP running in the background.

## **Upgrade the Router Card Software**

Use the following commands to determine the Router card software level, then upgrade the software to the latest version.

Command	Description
<code>status equipment</code>	Determine the Router software level. The Router Slot line (SW Vers) will display the current software level
<code>load {router-slot} tftp {ip-addr} {"file-name"}</code>	Load the new Router software to the Adit Router card. See the <i>load tftp</i> command for more information.  <b>Note:</b> You must have TFTP running in the background.

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**NOTE:** For additional information about upgrading MSR card software, see the **load scp** command on page 5-61 and the *Adit 3000 Series and Multi-Service Router (MSR) Card GUI Reference Manual* or the *Adit 3000 Series and Multi-Service Router (MSR) Card CLI Reference Manual*.

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## Basic Router Setups

The following is the basic router setup and a few examples of router configuration optimized by the Adit 600 routers (IP, CMG, and TSR):

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**NOTE:** For most router configuration changes to go into effect, the router must be reset. Best practice is to always reset the router after making configuration changes.

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- Basic Setup
- PPP Internet Connection and Public IP Address Routing
- Frame Relay Internet Connection and Public IP Address Routing
- Internet Connection using PPP, NAT/PAT and Firewall Filters
- Internet Connection using NAT and Static NAT Addresses
- Back-to-Back with PPP
- Back-to-Back with Multi-Link PPP
- Back-to-Back with Frame Relay
- Basic VoIP Setup (CMG Router)

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**NOTE:** For MSR router setup information, see Chapter 21, Multi-Service Router (MSR) Card and the *Adit 3000 Series and Multi-Service Router (MSR) Card GUI Reference Manual* or the *Adit 3000 Series and Multi-Service Router (MSR) Card CLI Reference Manual*.

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### Basic Setup

Command	Description
set {ds0-addr} type data	Confirm DS0 is set to type data. ds0-addr = {slot:port:channel} of DS0 Example: set a:1:1-24 type data
connect {slot:port:trunk} {slot:port:channel}	Cross-connect T1 to router card. Example: connect a:1:1-24 6:1:1 (router in slot 6)
set {router-addr} proxy	Disable/enable router proxy. router-addr = {slot:port} of router card. Example: set 6:1 disable.
set {slot:port} up	Set Router LAN as In-Service. Example: set 6:1 up
telnet {router_card-addr}	Telnet to Router card. router_card-addr = {slot} location of router card Example: telnet 6 (if earlier than 3.0 release {slot:port} must be used)
Local and Remote Profile Setup	
reset {slot}	To enable configuration changes, reset the card.

## **PPP Internet Connection and Public IP Address Routing**

### **Router in Slot 1**

ISP Router that provides the Internet connection.

<b>Command</b>	<b>Description</b>
<code>set clock1 a:1</code>	Set primary master transmit clock source
<code>set 1 default</code>	Set Router to default settings
<code>disconnect a:1</code>	Disconnect all T1-1 connections on the Controller
<code>disconnect 1</code>	Disconnect all connections to the router in slot 1
<code>set a:1:all type data</code>	Set the T1-1 of the Controller, Type to Data
<code>connect a:1:all 1:1:1</code>	Connect all of T1-1 to the Router in slot 1
<code>rename 1 "LocalUnit" "Boulder"</code>	Rename LAN interface to "Boulder"
<code>rename 1 "RemoteUnit" "wan1"</code>	Rename WAN interface to "wan1"
<code>set 1:1 ip address 215.168.21.14 255.255.255.0</code>	Set the ethernet IP address, in the conventional IP address format. (Router LAN)
<code>add 1 "wan1" static ip network 0.0.0.0 0.0.0.0 1</code>	Adds a static IP network (route) to the WAN interface
<code>set 1 "wan1" trunk 1</code>	Set WAN interface "wan1" to be mapped to trunk 1
<code>reset 1</code>	Reboot the router, to enable all configurations set

## **Frame Relay Internet Connection and Public IP Address Routing**

### **Router in Slot 1**

ISP Router that provides the Internet connection.

<b>Command</b>	<b>Description</b>
set clock1 a:1	Set primary master transmit clock source
set 1 default	Set Router to default settings
disconnect a:1	Disconnect all T1-1 connections on the Controller
disconnect 1	Disconnect all connections to the router in slot 1
set a:1:all type data	Set the T1-1 of the Controller, Type to Data
connect a:1:all 1:1:1	Connect all of T1-1 to the Router that is in slot 1
rename 1 "LocalUnit" "Boulder"	Rename LAN interface to "Boulder"
rename 1 "RemoteUnit" "wan1"	Rename WAN interface to "wan1"
set 1:1 ip address 215.168.21.14 255.255.255.0	Set the ethernet IP address, in the conventional IP address format. (Router LAN)
add 1 "wan1" static ip network 0.0.0.0 0.0.0.0 1	Adds a static IP network (route) to the WAN interface
set 1:1:1 encapsulation fr	Set the encapsulation on trunk 1 to Frame Relay
set 1 lmi annexd	Disable LMI to Annex D
set 1 "wan1" trunk 1	Set WAN interface "wan1" to be mapped to trunk 1
set 1 "wan1" dlci 101	Set the DLCI number
reset 1	Reboot the router, to enable all configurations set



## **Internet Connection using PPP, NAT/PAT and Firewall Filters**

### **Router in Slot 1**

ISP Router that provides the Internet connection. Router with NAT/PAT and Firewall Filters.

<b>Command</b>	<b>Description</b>
set clock1 a:1	Set primary master transmit clock source
set 1 default	Set Router to default settings
disconnect a:1	Disconnect all T1-1 connections on the Controller
disconnect 1	Disconnect all connections to the router in slot 1
set a:1:all type data	Set the T1-1 of the Controller, Type to Data
connect a:1:all 1:1:1	Connect all of T1-1 to the Router that is in slot 1
rename 1 "LocalUnit" "Boulder"	Rename the LAN to "Boulder"
rename 1 "RemoteUnit" "wan1"	Rename WAN to "wan1"
set 1:1 ip address 192.168.21.14 255.255.255.0	Set the ethernet IP address, in the conventional IP address format. (Router LAN)
set 1 "wan1" nat enable	Set WAN interface "wan1" to enable NAT mapping
set 1 "wan1" nat address 216.174.44.2 1	Set WAN interface "wan1" NAT address
add 1 "wan1" static ip network 0.0.0.0 0.0.0.0 1	Adds a static IP network (route) to the WAN interface
add 1 "wan1" firewall 1 pass incoming log telnet 192.168.21.14/32 xxx.xxx.xxx.xxx/32	Adds a Firewall rule to the WAN. Where xxx.xxx.xxx.xxx is the host's IP address at the far end that will be able to ping or telnet to the router. 0.0.0.0/0 will allow any other host at the far end to ping and/or telnet to the router.
add 1 "wan1" firewall 2 pass inout nolog ping 192.168.21.14/32 xxx.xxx.xxx.xxx/32	Adds a Firewall rule to the WAN. Where xxx.xxx.xxx.xxx is the host's IP address at the far end that will be able to ping or telnet to the router. 0.0.0.0/0 will allow any other host at the far end to ping and/or telnet to the router.
add 1 "wan1" firewall 3 pass inout nolog ping 0.0.0.0/0 0.0.0.0/0	Adds a Firewall rule to the WAN.
add 1 "wan1" firewall 4 pass inout nolog tcp 1-65535 0.0.0.0/0 0.0.0.0/0	Adds a Firewall rule to the WAN.
add 1 "wan1" firewall 5 pass inout nolog udp 1-65535 0.0.0.0/0 0.0.0.0/0	Adds a Firewall rule to the WAN.
set 1 "wan1" trunk 1	Set WAN interface "wan1" to be mapped to trunk 1
reset 1	Reboot the router, to enable all configurations set

## **Internet Connection using NAT and Static NAT Addresses**

### **Router in Slot 1**

ISP Router that provides the Internet connection. Router with NAT and Static NAT addresses.

<b>Command</b>	<b>Description</b>
set clock1 a:1	Set primary master transmit clock source
set 1 default	Set Router to default settings
disconnect a:1	Disconnect all T1-1 connections on the Controller
disconnect 1	Disconnect all connections to the router in slot 1
set a:1:all type data	Set the T1-1 of the Controller, Type to Data
connect a:1:all 1:1:1	Connect all of T1-1 to the Router that is in slot 1
rename 1 "LocalUnit" "Boulder"	Rename the LAN interface to "Boulder"
rename 1 "RemoteUnit" "wan1"	Rename WAN interface to "wan1"
set ethernet ip address 192.168.21.15 255.255.255.0	Set the Ethernet IP address and Subnet Mask, for the
set 1:1 ip address 192.168.21.14 255.255.255.0	Set the ethernet IP address, in the conventional IP address format. (Router LAN)
set 1 "wan1" nat enable	Set the WAN interface named "wan1" enable NAT mapping
set 1 "wan1" nat address 216.174.44.2 1	Set the WAN interface named "wan1" NAT address
add 1 "wan1" static ip network 0.0.0.0 0.0.0.0 1	Adds a static IP network (route) to the WAN interface
add 1 "wan1" static nat address 192.168.21.14 216.174.44.232	Add static NAT bi-directional mapping to wan1
add 1 "wan1" static nat address 192.168.21.15 216.174.44.233	Add static NAT bi-directional mapping to wan1
add 1 "wan1" static nat address 192.168.21.16 216.174.44.234	Add static NAT bi-directional mapping to wan1
add 1 "wan1" static nat address 192.168.21.17 216.174.44.235	Add static NAT bi-directional mapping to wan1
set 1:1:1 encapsulation fr	Set the encapsulation on trunk 1 to Frame Relay
set 1 lmi annexd	Disable LMI Annex D
set 1 "wan1" trunk 1	Set WAN interface "wan1" to be mapped to trunk 1
set 1 "wan1" dlci 101	Set the DLCI number
reset 1	Reboot the router, to enable all configurations set

Please note the following:

216.174.44.232 is the static NAT address assigned to the router.

216.174.44.233 is the static NAT address assigned to the controller.

216.174.44.234 is the static NAT address for a server\*.

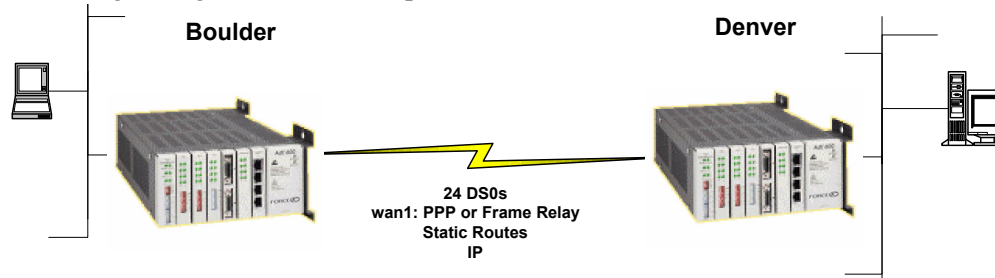
216.174.44.235 is the static NAT address for a host\*.

\*In the private network that can be reached from the outside world.

There can be up to 16 static NAT addresses, therefore the actual range can be 216.174.44.232 to 216.174.44.247. Only 4 were used in this example.

## Back-to-Back with PPP

The following configuration will set up two Adit 600 Routers back-to-back with PPP.



### Boulder Router in Slot 1

Command	Description
set 1 default	Set Router to default settings
disconnect a:1	Disconnect all T1-1 connections to the Controller
disconnect 1	Disconnect all connections to the router in slot 1
set a:1:all type data	Set the T1-1 of the Controller, Type to Data
connect a:1:all 1:1:1	Connect all of T1-1 to the Router that is in slot 1
rename 1 "LocalUnit" "Boulder"	Rename the LAN interface to "Boulder" (LAN)
rename 1 "RemoteUnit" "wan1"	Rename WAN interface to "wan1"
set 1:1 ip address 1.1.1.1 255.255.255.0	Set the Ethernet IP address. (Router LAN)
set 1:1 phy auto	Set the Physical Specifications to auto-negotiate
add 1 "wan1" static ip network 2.2.2.0 255.255.255.0 1	Adds a static IP network (route) to the WAN interface
set 1 "wan1" trunk 1	Set WAN interface "wan1" to be mapped to trunk 1
reset 1	Reboot the router, to enable all configurations set

### Denver Router in Slot 1

Command	Description
set 1 default	Set Router to default settings
disconnect a:1	Disconnect all T1-1 connections to the Controller
disconnect 1	Disconnect all connections to the router in slot 1
set clock1 a:1	Set primary master transmit clock source
set a:1:all type data	Set the T1-1 of the Controller, Type to Data
connect a:1:all 1:1:1	Connect all of T1-1 to the Router that is in slot 1
rename 1 "LocalUnit" "Denver"	Rename the from "LocalUnit" (default) to "Denver" (LAN)
rename 1 "RemoteUnit" "wan1"	Rename WAN interface to "wan1"
set 1:1 ip address 2.2.2.1 255.255.255.0	Set the ethernet IP address. (Router LAN)
set 1:1 phy auto	Set the Physical Specifications to auto-negotiate
add 1 "wan1" static ip network 1.1.1.0 255.255.255.0 1	Adds a static IP network (route) to the WAN interface
set 1 "wan1" trunk 1	Set WAN interface "wan1" to be mapped to trunk 1
reset 1	Reboot the router, to enable all configurations set

## **Back-to-Back with Multi-Link PPP**

The following configuration will set up two Adit 600 Routers back-to-back with Multi-Link PPP.

### **Boulder Router in Slot 1**

<b>Command</b>	<b>Description</b>
set 1 default	Set Router to default settings
disconnect a:1	Disconnect all T1-1 connections to the Controller
disconnect 1	Disconnect all connections to the router in slot 1
set a:1:all type data	Set the T1-1 of the Controller, Type to Data
connect a:1:all 1:1:1	Connect all of T1-1 to the Router that is in slot 1
connect a:2:all 1:1:2	Connect all of T1-2 to the Router that is in slot 1
rename 1 "LocalUnit" "Boulder"	Rename the LAN interface to "Boulder" (LAN)
set 1:1:1-2 multilink group 1	Set the multilink group 1
rename 1 "RemoteUnit" "wan1"	Rename WAN interface to "wan1"
set 1:1 ip address 1.1.1.1 255.255.255.0	Set the Ethernet IP address, in the conventional IP address format. (Router LAN)
add 1 "wan1" static ip network 2.2.2.0 255.255.255.0 1	Adds a static IP network (route) to the WAN interface
set 1 "wan1" trunk multilink group 1	Set the WAN interface named "wan1" to be mapped to trunk multilink group 1
reset 1	Reboot the router, to enable all configurations set

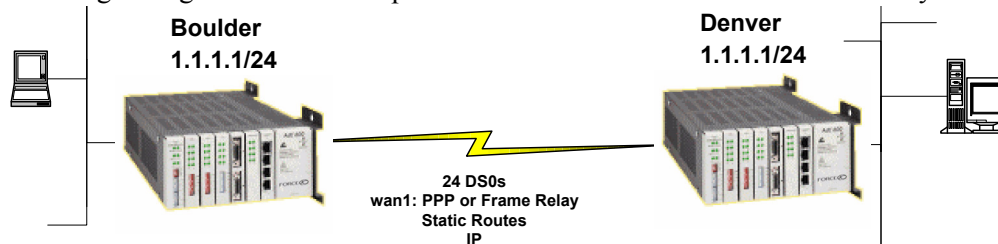
### **Denver Router in Slot 1**

<b>Command</b>	<b>Description</b>
set 1 default	Set Router to default settings
disconnect a:1	Disconnect all connections to the T1 on the Controller (slot a)
disconnect 1	Disconnect all connections to the router in slot 1
set clock1 a:1	Set primary master transmit clock source
set a:1:all type data	Set the T1-1 of the Controller, Type to Data
connect a:1:all 1:1:1	Connect all of T1-1 to the Router that is in slot 1
connect a:2:all 1:1:2	Connect all of T1-2 to the Router that is in slot 1
rename 1 "LocalUnit" "Denver"	Rename the Adit 600 from "LocalUnit" (default) to "Denver" (LAN)
set 1:1:1-2 multilink group 1	Set the multilink group 1
rename 1 "RemoteUnit" "wan1"	Rename WAN #1 from "RemoteUnit" (default) to "wan1"
set 1:1 ip address 2.2.2.1 255.255.255.0	Set the ethernet IP address, in the conventional IP address format. (Router LAN)

Command	Description
add 1 "wan1" static ip network 1.1.1.0 255.255.255.0 1	Adds a static IP network (route) to the WAN interface
set 1 "wan1" trunk multilink group 1	Set the WAN interface named "wan1" to be mapped to trunk multilink group 1
reset 1	Reboot the router, to enable all configurations set

## Back-to-Back with Frame Relay

The following configuration will set up two Routers back-to-back with Frame Relay.



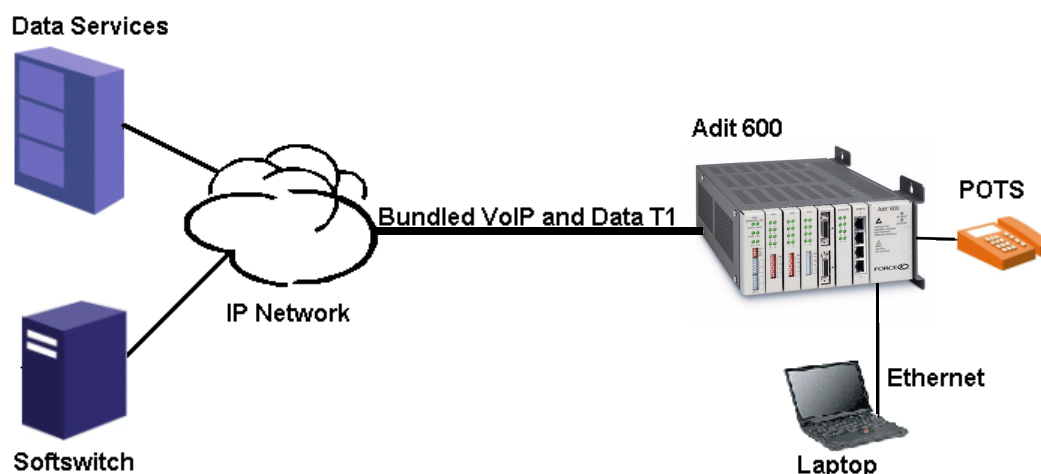
### Boulder Router in Slot 1

Command	Description
set clock1 internal	Set primary master transmit clock source
set 1 default	Set Router to default settings
disconnect a:1	Disconnect all connections to the T1 on the Controller (slot a)
disconnect 1	Disconnect all connections to the router in slot 1
set a:1:all type data	Set the T1-1 of the Controller, Type to Data
connect a:1:all 1:1:1	Connect all of T1-1 to the Router that is in slot 1
rename 1 "LocalUnit" "Boulder"	Rename the "LocalUnit" (default) to "Boulder" (LAN)
rename 1 "RemoteUnit" "wan1"	Rename WAN #1 from "RemoteUnit" (default) to "wan1"
set 1:1 ip address 1.1.1.1 255.255.255.0	Set the Ethernet IP address, in the conventional IP address format. (Router LAN)
add 1 "wan1" static ip network 2.2.2.0 255.255.255.0 1	Adds a static IP network (route) to the WAN interface
set 1:1:1 encapsulation fr	Set the encapsulation on trunk 1 to Frame Relay
set 1 lmi disable	Disable LMI (Local Management Interface)
set 1 "wan1" trunk 1	Set the WAN interface named "wan1" to be mapped to trunk 1
set 1 "wan1" dlci 101	Set the DLCI number
reset 1	Reboot the router, to enable all configurations set

***Denver Router in Slot 3***

Command	Description
set 3 default	Set Router to default settings
disconnect a:1	Disconnect all connections to the T1 on the Controller (slot a)
disconnect 3	Disconnect all connections to the router in slot 1
set clock1 a:1	Set primary master transmit clock source
set a:1:all type data	Set the T1-1 of the Controller, Type to Data
connect a:1:all 3:1:1	Connect all of T1-1 to the Router that is in slot 1
rename 3 "LocalUnit" "Denver"	Rename the "LocalUnit" (default) to "Denver" (LAN)
rename 3 "RemoteUnit" "wan1"	Rename WAN #1 from "RemoteUnit" (default) to "wan1"
set 3:1 ip address 2.2.2.1 255.255.255.0	Set the ethernet IP address, in the conventional IP address format. (Router LAN)
add 3 "wan1" static ip network 1.1.1.0 255.255.255.0 1	Adds a static IP network (route) to the WAN interface
set 3:1:1 encapsulation fr	Set the encapsulation on trunk 1 to Frame Relay
set 3 lmi disable	Disable LMI (Local Management Interface)
set 3 "wan1" trunk 1	Set the WAN interface named "wan1" to be mapped to trunk 1
set 3 "wan1" dlci 101	Set the DLCI number
reset 3	Reboot the router, to enable all configurations set

## Basic VoIP Setup (CMG Router)



### Adit 600 Implementation in VoIP Application

This example is with an Adit 600 with the following cards installed:

- Controller Card (4.0 or higher)
- CMG Router Card, 1.0 or higher (example - slot 6)
- 3 FXS Cards, 1.03 or higher (example - slots 1, 2 and 3). Cards are configured for Loop Start POTS lines.

### Overview

- Adit 600: the DS0s supporting the bundled service delivery will be cross-connected to the CMG card
- Adit 600: the CMG voice channels are connected to the FXS channels
- Adit 600 CMG: the VoIP parameters and data parameters are configured
- Adit 600 uses endpoint prefix "aaln" and endpoint suffix "1-48" i.e. channel 1 would be suffix "1", channel 5 would be suffix "5"

Command	Description
<code>set local off</code>	Set the controller to use CLI commands
<code>disconnect a:1</code>	Disconnect all connections to the T1-1 on the Controller (slot a)
<code>disconnect 1</code>	Disconnect all connections to the FXS card in slot 1
<code>disconnect 2</code>	Disconnect all connections to the FXS card in slot 2
<code>disconnect 3</code>	Disconnect all connections to the FXS card in slot 3
<code>disconnect 6</code>	Disconnect all connections to the router card in slot 6
<code>set a:1 up</code>	Set the T1 on the controller up
<code>set a:1 fdl none</code>	Disable FDL output messages on the DS1

Command	Description
set a:1 lbo 1	Sets the DS1 Line Build Out to 0-133 feet
set a:1 framing esf	Sets the DS1 to Extended Superframe (ESF) framing
set a:1 id "TN DS1# A:1"	Sets the DS1 ID to "TN DS1# A:1"
set a:1 linecode b8zs	Sets the DS1 line coding to B8ZS.
set a:1 loopdetect on	Enables the detection of CSU loop code on the DS1
set a:1:all type data	Set the T1-1 of the Controller, Type to Data
set a:2 down	Set the T1-2 as Out-of-Service
set clock1 a:1	Set primary master transmit clock source
set clock2 internal	Set secondary clock source
set a:2 up	Set the T1-2 as In-Service
connect a:1:1-24 6:1:1	Connect Data DS0s to the CMG card
connect 6:1:1:1-8 1:1-8	Connect CMG voice ports to FXS ports
connect 6:1:1:9-16 2:1-8	Connect CMG voice ports to FXS ports
connect 6:1:1:17-24 3:1-8	Connect CMG voice ports to FXS ports
set verification off	Disable verification prompts
set 6:1:1 encapsulation ppp	Set Router trunk encapsulations to Point-to-Point Protocol.
set 6:1:1 up	Set Router trunk as In-Service
set 6:1 ip address {ip-addr} {mask}	Set Router IP Address and Subnet Mask
set 6:1 up	Set Router as In-Service
add 6 "RemoteAdit" static ip network {ip-addr} {mask} {next-hop-ip-addr} 1	Set router WAN static ip network. Metric set as 1, normally indicates a direct network
set 6 "RemoteAdit" trunk 1	Set router WAN trunk to port 1
set 6 "RemoteAdit" up	Set router WAN as In-Service
set 6 log last detail	Set the router log to add new entries and display the log in detail
set 6 mgcp callagent address {ip-addr}	Set the IP Address to be used by MGCP to access the call agent
set 6 mgcp up	Set the MGCP as In-Service
set 6:1:1:1-24 log start both	Start logging events to the CMG text log, for MGCP protocol events and errors
reset 6	Reset the CMG card, to apply all configurations



## Configuration Restrictions

Please refer to the following sections for Adit 600 configuration restrictions:

- Card Combination Restrictions
- 8MB Controller Configuration Restrictions
- Restrictions on Multiple Router Cards
- MSR Card 8-DS1 Multilink PPP Restriction
- Proxy Restriction

### Card Combination Restrictions

---

**NOTE:** Starting with Adit 600 Controller release 10.1, the following restrictions apply only to the 16MB Controller. See *8MB Controller Configuration Restrictions* on page 4-24 for a table of configurations supported by the 8MB Controller.

---

The Adit 600 can have up to four DS0 data streams. The following service cards reserve one data stream for each card installed:

- Quad DS1/E1, Quad E1, or Quad T1
- Quad DS1 ADPCM
- CMG or MSR card (using WANs)

If four of any of the above service cards are installed in a chassis, the remaining two slots **MUST** be left empty. If three of the above service cards are installed in a chassis:

- Two V.35 cards can be installed, while one slot remains empty, or
- The remaining three slots can be used for any cards supported on the Adit platform that are not listed above.

Below are a few examples of card combinations for the Adit 600 in which this scenario applies.

	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6
<b>Example 1</b>	Quad T1	Quad T1	Quad T1	Quad T1	<i>Empty</i>	<i>Empty</i>
<b>Example 2</b>	Quad T1	Quad T1	Quad T1	V.35	V.35	<i>Empty</i>
<b>Example 3</b>	Quad T1	Quad T1	Quad T1	CMG	<i>Empty</i>	<i>Empty</i>
<b>Example 4</b>	Quad T1	Quad T1	ADPCM	ADPCM	<i>Empty</i>	<i>Empty</i>
<b>Example 5</b>	Quad T1	Quad T1	Quad T1	FXS	FXS	FXO

---

**NOTE:** The Adit 600 using the Controller with the expanded memory (16MB) can support more than 4 CMG cards in a chassis if they are not set up to use WANs. See *Restrictions on Multiple Router Cards* on page 4-24 for additional information.

The Adit 600 supports only one MSR card in a chassis. MSR support requires the expanded memory Controller.

For further information, please contact Force10 Networks Customer Support.

---

## Configuration

### Configuration Restrictions

#### 8MB Controller Configuration Restrictions

Current Adit 600 Controllers feature 16MB of memory to support expanded features. Older Adit 600 Controllers featured 8MB of memory. Starting with release 10.1, only the following configurations are supported by the 8MB Controller.

Application	Slot A	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6
Voice #1	8MB T1 Controller	FXS	Empty	Empty	Empty	Empty	CMG
Voice #2		FXS	FXS	Empty	Empty	Empty	CMG
Voice #3		FXS	FXS	FXS	Empty	Empty	CMG
TDM		FXS	FXS	FXS	FXS	FXS	FXS
Data #1		Empty	Empty	Empty	Empty	Empty	IP Rtr
Data #2		Empty	Empty	Empty	Empty	Quad T1	IP Rtr
Mixed		FXS	FXS	FXS	FXO	Quad T1	CMG

**NOTE:** Configurations other than those listed above may function correctly, but are not recommended or supported.

#### Restrictions on Multiple Router Cards

Starting with release 10.0, only Controllers with the expanded memory (16MB) support four or more router cards in the same chassis. Older Controllers with 8MB of memory support only the configurations listed above. If you are upgrading to release 10.x or above, you can check your Controller's memory size as described in the instructions provided for the **load** command on page 5-60.

**NOTE:** The Adit 600 using the 16MB Controller can support more than 4 CMG cards in a chassis only if they are not set up to use WANs.

The Adit 600 supports only one MSR card in a chassis. MSR support requires the expanded memory Controller (16MB).

#### MSR Card 8-DS1 Multilink PPP Restriction

If you are configuring a multilink PPP WAN with 8 Link Cross-Connects on the MSR card, the following restrictions apply:

- You must use 2 Quad T1 or Quad DS1/E1 cards.
- You can have no more than 1 FXS card in the chassis.
- The remaining chassis slots must be empty.

#### Proxy Restriction

When more than one router card is in use, multiple proxies may be established, but the Adit 600 limits Telnet sessions to just one of them at a time. See the **set (router) proxy** command on page 5-167 for information about setting up a proxy.

## ***Install Country Specific Ringer Tones***

The CMG Router card ships with a set of call progress tones that are played to a VoIP endpoint at the direction of an external MGCP call agent. By default the call progress tones are defined to match the United States standard call progress tones. The CMG Router card ships with a set of call progress tone files that allow call progress tone definitions for a number of other countries to be used.

Tones are loaded via TFTP directly to the CMG Router card. All supported country tones are provided on the software CD with the CMG Router.

Once a tone file is loaded into a CMG Router card it will remain in effect until replaced by another. It is not removed when the CMG Router card is set back to its default settings.

---

**NOTE:** Use of ringer tones requires Adit 600 Controller release 5.0 or higher and CMG Router release 1.1 or higher.

---

**Syntax:** `load {cmg_card-addr} tftp {ip-addr} {"tone_file"}`

**Example:** `load 2 tftp 192.168.43.52 "brazil.tdb"`

```
Adit E1> status equipment
BootCode Version: 1.29
```

	<u>CardType</u>	<u>Status</u>	<u>SW Vers</u>	<u>CLEI</u>
SLOT A	E1x2	Present	8.0.0	SIUXSS0EAA
SLOT 1	FXOx8	Not Present		
SLOT 2	CMGx1	Present	2.11	SIIX270DAA
SLOT 3	V35x2	Present		SIC3HK0CAA
SLOT 4	E1x4	Not Present		
SLOT 5	E1x4	Not Present		
SLOT 6	FXSx8	Not Present		

```
Adit E1> load 2 tftp 192.168.43.52 "brazil.tdb"
```

```
Filename: brazil.tdb
Source IP Address: 192.168.43.52
Target IP Address: 192.168.3.192
Target Card Slot: 2
Target Card Type: CMGx1
```

```
'load tftp' will be executed with the above parameters.
A TFTP server must be running on the host system.
```

```
Do you really want to do this? y
```

```
Card software download in progress. Please be patient...
Software transfer command completed.
```

## Quick Configuration Reload

The **print config** command can be used as a quick way to reload a configuration into an Adit unit, in the event that the configuration has been lost due to software reload problems or operator error.

The download of the file generated by the **print config** command can be done by direct connect to the RS-232 port or via Telnet, **BUT** the upload from the PC back to the Adit can only be done via direct RS-232 connection. The reason for this is that there will not be an IP address in the Adit because it is at the factory default at this time.

The procedure described below is based on using Hyperterm.

### **Download Config File:**

1. Connect to the unit using Hyperterm via the RS-232 port.
2. Type **print config** (do not hit [ENTER]).
3. Select **Transfer/Capture Text...** from the menu bar.

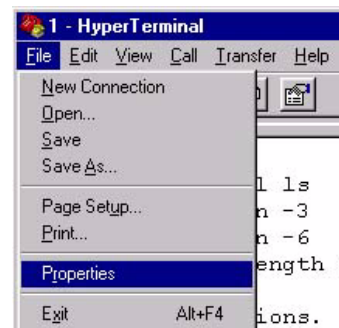


4. Name the file so that it can be accessed when needed.
5. Select the [START] button, the window will close and the operator will be returned to the Adit command line.
6. Press [ENTER] to download. Adit will generate an executable file of all configurable commands and save it to the file location defined above.
7. The download is complete when the text has finished scrolling on the screen and the Adit ID prompt displays again.

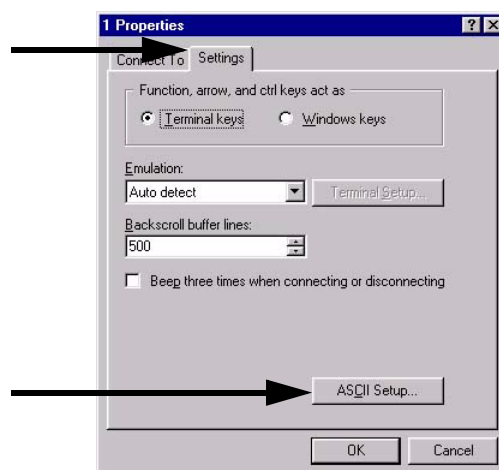


### **Load Config File Back to Unit:**

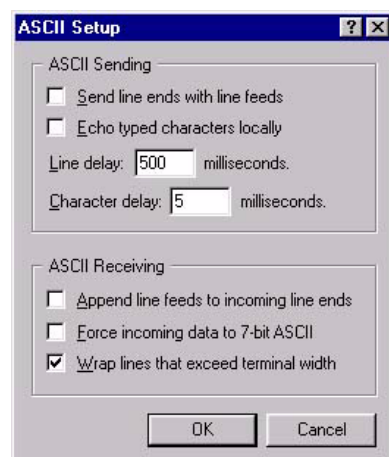
1. Select **File/Properties** from the menu bar.



2. Select the **Settings** tab.
3. Select the **ASCII Setup** button.

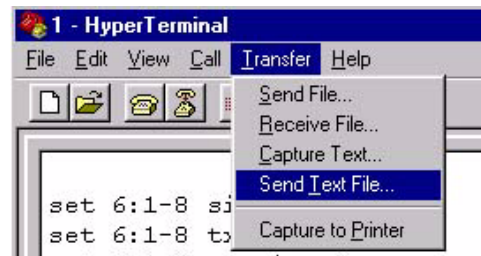


4. Set the **Line delay** to 500 milliseconds and the **Character delay** to 5 milliseconds.
5. Select the **[OK]** button back to the Main HyperTerminal screen.



6. Select **Transfer/Send Text File..** from the menu bar.

Hyperterm will now send the configuration to the Adit exactly as it was saved in the Download Config File process.

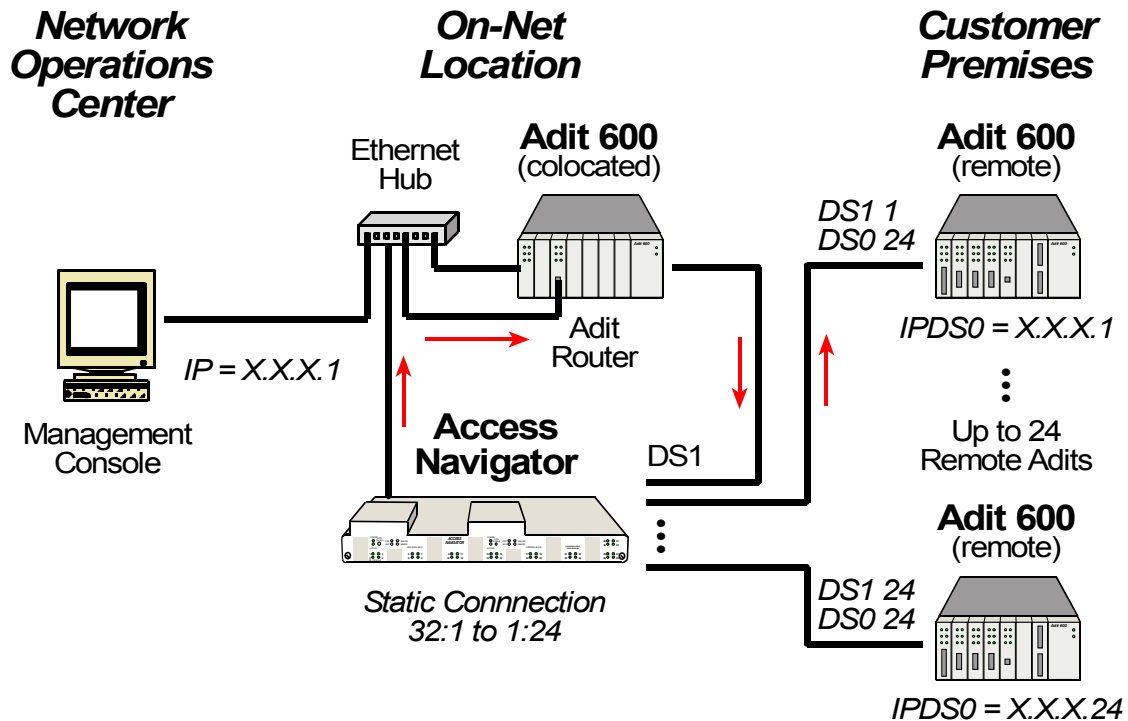


## DS0 Management Channel Setup

The DS0 Management Channel provides an alternative to the FDL link for management information where FDL is unavailable. The Access Navigator and the remote Adit 600 will use IP packets to communicate management and control information over the DS0 Management channel. This information includes support for the activation, testing, and status reporting of ISDN lines. A DS0 Channel will be used in the remote Adit 600 to send and receive the management IP packets.

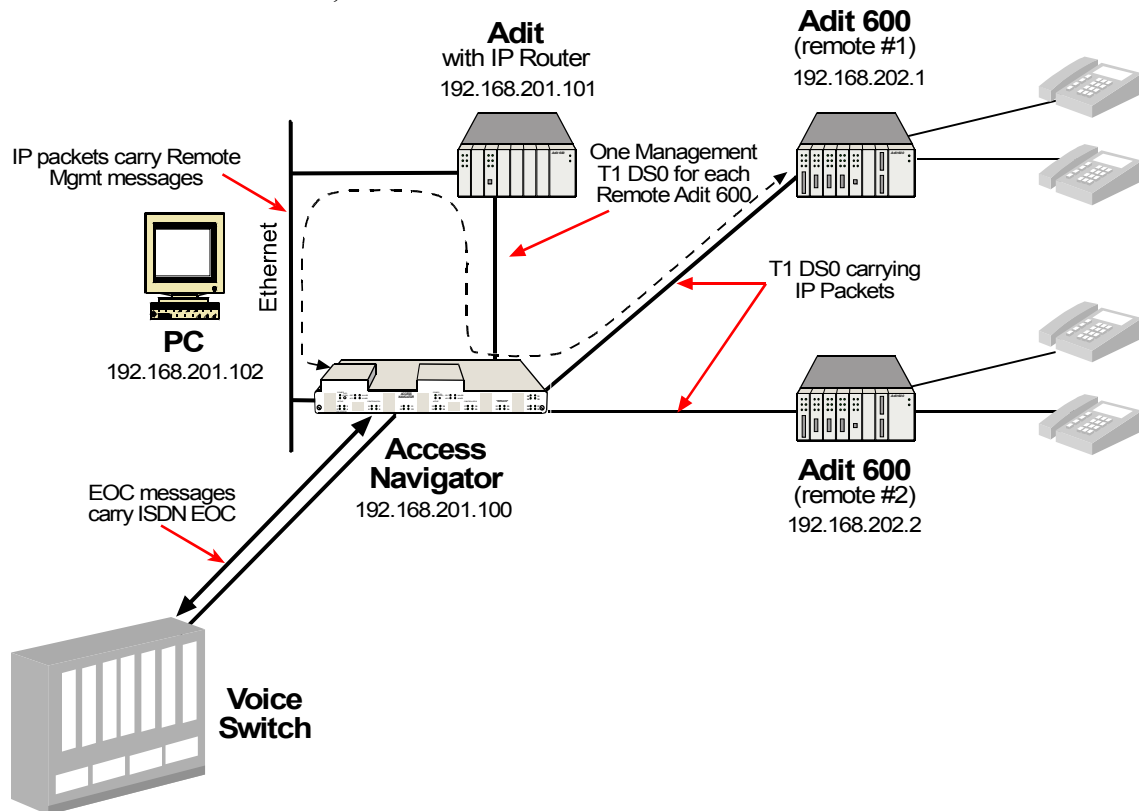
The Navigator sends and receives the IP packets over its Ethernet connection while the remote Adit sends and receives the IP packets over a DS0 channel. A channelized router takes the IP messages from the Ethernet to send them over DS0 channels (WAN) and vice versa. The DS0s coming out of the router are on a single T1. It connects to the Navigator, where the DS0s are cross-connected to the remote Adits.

The following procedure will walk you through the basic setup of a DS0 Management Channel.



## Equipment Required

- Access Navigator (version 1.7 or above)
- (1) Co-located Router  
This example uses an Adit 600 (version 10.1.1) with an IP Router card (version 2.97)
- Remote Adit:  
(1-24) Adit 600
- PC
- Cables: Ethernet, T1



## Configuration

### DS0 Management Channel Setup

---

#### Basic Setup

The following are the Address and DS1 assignments used in this example. This will configure 1 Access Navigator, 1 Router and 24 remote Adits.

	LAN addr	WAN addr	Navigator DS1	Navigator mgmt DS0 to Router Adit	Adit DS0 to Navigator
Navigator	192.168.201.100	-	-	-	-
Router	192.168.201.101	-	32	-	-
PC	192.168.201.102	-	-	-	-
Adit1	-	192.168.202.1	1	32:1	a:1:1
Adit2	-	192.168.202.2	2	32:2	a:1:2
Adit3	-	192.168.202.3	3	32:3	a:1:3
Adit4	-	192.168.202.4	4	32:4	a:1:4
Adit5	-	192.168.202.5	5	32:5	a:1:5
Adit6	-	192.168.202.6	6	32:6	a:1:6
Adit7	-	192.168.202.7	7	32:7	a:1:7
Adit8	-	192.168.202.8	8	32:8	a:1:8
Adit9	-	192.168.202.9	9	32:9	a:1:9
Adit10	-	192.168.202.10	10	32:10	a:1:10
Adit11	-	192.168.202.11	11	32:11	a:1:11
Adit12	-	192.168.202.12	12	32:12	a:1:12
Adit13	-	192.168.202.13	13	32:13	a:1:13
Adit14	-	192.168.202.14	14	32:14	a:1:14
Adit15	-	192.168.202.15	15	32:15	a:1:15
Adit16	-	192.168.202.16	16	32:16	a:1:16
Adit17	-	192.168.202.17	17	32:17	a:1:17
Adit18	-	192.168.202.18	18	32:18	a:1:18
Adit19	-	192.168.202.19	19	32:19	a:1:19
Adit20	-	192.168.202.20	20	32:20	a:1:20
Adit21	-	192.168.202.21	21	32:21	a:1:21
Adit22	-	192.168.202.22	22	32:22	a:1:22
Adit23	-	192.168.202.23	23	32:23	a:1:23
Adit24	-	192.168.202.24	24	32:24	a:1:24



## **Set IP Configuration of PC**

1. Set IP Address to 192.168.201.102
2. Set Gateway to 192.168.201.101 (Router LAN Address)

## **Configuring the Adit Router**

---

**NOTE:** The Remote Adit WAN address MUST have a different subnet than the Adit Controller Ethernet address.

---

### **WAN Connections**

The following WAN connections are made from a default condition with one (1) Adit IP Router card installed set with factory defaults.

---

**NOTE:** An Adit IP Router is capable of managing 24 virtual WAN connections through T1-1 or T1-2 of the Controller card. If support of more than 24 Adits is required, a Quad T1 and a Router(s) can be added for additional support (only on a collocated router, not on a remote Adit).

---

1. From the CLI execute the following command to connect one DS0 to each one of the 24 WANs.

Command	Description
set local off	Sets the Adit to be configured through CLI
set a:1 down	Sets the T1-1 as Out-of-Service
disconnect a	Disconnects all connections to slot a (controller)
set a:1:1-24 type data	Sets all DS0s on T1-1 to data signaling type
connect a:1:1 1:1:1	Connects first DS0 of T1-1 of the controller to port 1, WAN 1 of the Router in slot 1.
connect a:1:2 1:1:2	Connects second DS0 of T1-1 of the controller to port 1, WAN 2 of the Router in slot 1.
connect a:1:3 1:1:3	Up to 24 WAN connections (a:1:24 1:1:24)
set a:1 up	Sets the T1-1 as In-Service

#### Add and Enable all Remote Adits Needed

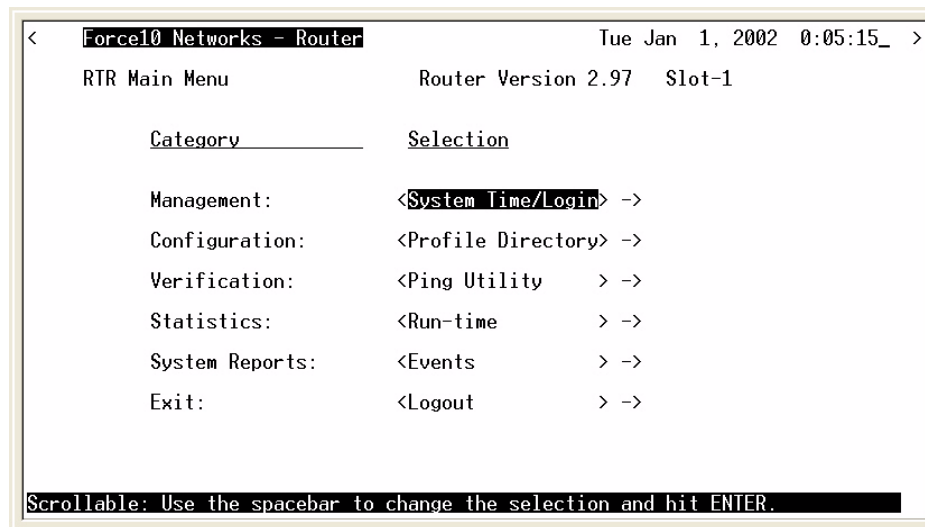
##### Telnet into Router

1. From the CLI execute a Telnet command to the Router.  
Telnet {slot}:[port]

##### Example: telnet 1

The example will Telnet into the router located in slot 1.

2. Enter password (default is "admin") and select [ENTER].
3. Select Terminal Emulation (scroll with [TAB]) and select [ENTER].



```
< Force10 Networks - Router Tue Jan 1, 2002 0:05:15_ >
RTR Main Menu Router Version 2.97 Slot-1

Category Selection

Management: <System Time/Login> ->
Configuration: <Profile Directory> ->
Verification: <Ping Utility > ->
Statistics: <Run-time > ->
System Reports: <Events > ->
Exit: <Logout > ->

Scrollable: Use the spacebar to change the selection and hit ENTER.
```

Once you are in the router, the [TAB] key will move you through the menus and the [SPACEBAR] will scroll you through selections in < >.

## Configure Trunk Connections

1. Select **Configuration < Profile Directory >** -> from the Router Main Menu and select **[ENTER]**.

```
< Force10 Networks - Router Tue Jan 1, 2002 0:07:58_ >
RTR Main Menu Router Version 2.97 Slot-1

Category Selection

Management: <System Time/Login> ->
Configuration: <Profile Directory> ->
Verification: <Ping Utility> ->
Statistics: <Run-time> ->
System Reports: <Events> ->
Exit: <Logout> ->

Scrollable: Use the spacebar to change the selection and hit ENTER.
```

2. Select **Router CARD <Setup ->** from the Profile window and **[ENTER]**.

```
< Force10 Networks - Router Tue Jan 1, 2002 0:10:21_ >
Profile Directory: 1 Configured and 2 Enabled.

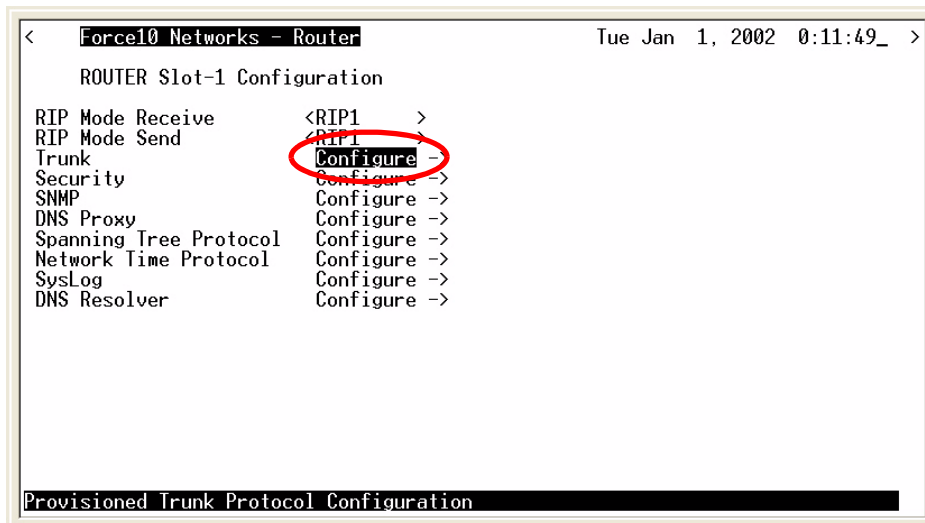
Name Profile Type Recv/Send Profile State
Router CARD <Setup ->
LocalUnit LAN NONE/NONE <Setup ->
1. RemoteUnit WAN NONE/NONE <Setup -> <Enabled >

CTRL A to add, CTRL E to erase, CTRL F to page forward, CTRL B to page back
Hit ENTER to configure the communication information for this profile.
```

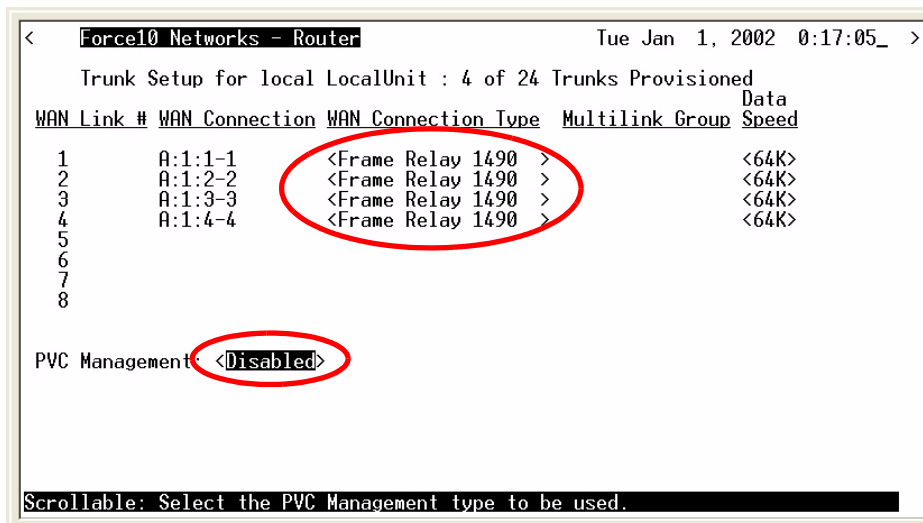
## Configuration

### DS0 Management Channel Setup

3. Select **Trunk** <Configure -> and select [ENTER].



4. For all WAN port numbers already assigned a DS0 for management, select <Frame Relay 1490> as the WAN connection type. Set the **PVC Management** as <Disabled>.



5. Select the [ESC] key to Exit and <Yes> to save changes. This will return to the **Trunk Configure** window. For these configuration changes to take effect, you must **Reinitialize** the Router.

**NOTE:** Since there are only Frame Relay links for this application there is no need to enable/disable the authentication protocols (CHAP/PAP) that are under the Router CARD/Security menu.

### Configure the Local Adit Profile

1. Select **LocalUnit LAN <Setup>** from the **Profile Directory** main window and select **[ENTER]**.

```

< Force10 Networks - Router Tue Jan 1, 2002 0:24:46_ >
Profile Directory: 1 Configured and 2 Enabled.

Name      Profile Type  Recv/Send  Profile      State
Router    CARD             NONE/NONE  <Setup ->
LocalUnit LAN             NONE/NONE  <Setup ->
1. RemoteUnit WAN         NONE/NONE  <Setup ->  <Enabled >

CTRL A to add, CTRL E to erase, CTRL F to page forward, CTRL B to page back
Hit ENTER to configure the communication information for this profile.
  
```

2. Set the following on this screen (settings that are default are noted with \*):  
 Select the **IP Protocol Eth II (X)**, all others should not be selected \*  
 Set the **LAN Networks Updates** for **IP** and **IPX** to **<Neither> \***.  
 Set the **LAN IP Address** to **192.168.201.101** (Router IP Address) along with the **Subnet Mask** to **255.255.255.0**.

```

< Force10 Networks - Router Tue Jan 1, 2002 0:30:10_ >
Profile Setup for (LocalUnit ), LOCAL

Protocol  802.2  Frame Types  LAN Network
          802.3  Eth II SNAP 802.3  Updates
IP         X
IPX        [X] [X] [X] [X]
Other      [X] [X] [X]
          [X]

LAN IP
IP Address: (192.168.201.101)
Subnet Mask: (255.255.255.0)
Default Router: (0.0.0.0)

802.2 Ext. Network: (00000000)
Eth II Ext. Network: (00000000)
SNAP Ext. Network: (00000000)
802.3 Ext. Network: (00000000)

Setup: <Static Networks > -Link Speed : <Auto Negotiate >
  
```

3. Select **[ESC]** to exit menu and **<Yes>** to save changes.

#### Create a Remote Adit Profile for all Remotes

1. Select **RemoteUnit WAN** <Setup> from the **Profile Directory** main window and select [ENTER].

```
< Force10 Networks - Router Tue Jan 1, 2002 0:32:55_ >
Profile Directory: 1 Configured and 2 Enabled.

Name      Profile Type Recv/Send Profile      State
Router    CARD          NONE/NONE <Setup ->
LocalUnit LAN          NONE/NONE <Setup ->
1. RemoteUnit WAN          NONE/NONE <Setup -> <Enabled>

CTRL A to add, CTRL E to erase, CTRL F to page forward, CTRL B to page back
Hit ENTER to configure the communication information for the remote profile.
```

2. Set the following on this screen (settings that are default are noted with \*):  
Rename **RemoteAdit** (default name) to **Adit1**.  
Set **WAN Networks Updates** for IP to <Never> \*.  
Set **WAN IP: Numbered** to <No> \*.

```
< Force10 Networks - Router Tue Jan 1, 2002 0:35:30_ >
Profile Setup for (Adit1)

WAN Network
Protocol Mode Updates GRE Tunnel
IP <Route> <Never> <Disabled>
IPX <Blocked>
Other <Blocked>

NAT Gateway: <Disabled>

WAN IP
Numbered: <NO>

FW Allow Frags <Disabled>
Setup: <Static/VPN Networks> -> Setup: <Trunk Port> ->
Scrollable: Select the item to be set up and hit ENTER.
```

3. [TAB] to **Setup: <Static/VPN Networks>** (scroll to this selection if it is not displayed) and select [ENTER].

**NOTE:** If the IP Protocol is set to <Bridge> this option will not be available.

4. Set **Setup Static:** to **<IP Networks>** (scroll to this selection if it is not displayed).
5. Select **[CTRL A]** to add a Static IP Address.

```
< Force10 Networks - Router Tue Jan 1, 2002 0:40:55_ >
Adit1 has 1 Static IP Network.
Setup Static: <IP Networks >
  Network      Subnet Mask  Metric
1. (192.168.202.1 ) (255.255.255.255) (1)

CTRL A to add, CTRL E to erase, CTRL F to page forward, CTRL B to page back
Editable: Enter the distance, in hops, to the network.
```

6. Set the **IP Address** to **192.168.202.1** (Adit1 WAN address)  
Set the **Subnet Mask** to **255.255.255.255**

---

**NOTE:** After inserting the IP address and **[TAB]**, the subnet field will automatically fill with 255.255.255.0. You must retype the entire address of 255.255.255.255.

---

7. Set the Metric to **(1)**.
8. Select **[ESC]** to exit and **<Yes>** to save changes.
9. On the Remote Profile setup window select **Setup: <Trunk Port >** and **[ENTER]**.

```
< Force10 Networks - Router Tue Jan 1, 2002 0:42:44_ >
Profile Setup for (Adit1 )

Protocol  Mode      WAN Network  GRE Tunnel
IP        <Route >  Updates    <Disabled >
IPX       <Blocked >
Other     <Blocked >

NAT Gateway: <Disabled>

WAN IP
Numbered:  <NO >

FW Allow Frags  <Disabled>

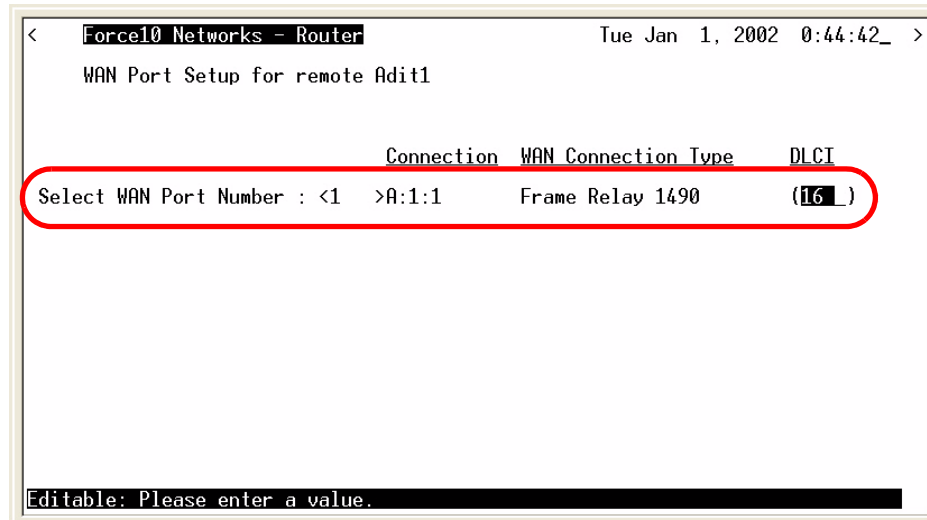
Setup: <Static/VPN Networks > ->  Setup: <Trunk Port > ->
Scrollable: Select the item to be set up and hit ENTER.
```

## Configuration

### DS0 Management Channel Setup

10. Select the following on this screen:

At the **Select WAN Port Number: <None>**, scroll from **None** to **1** (which is the remote Adit1).  
Set **DLCI** to **16**.



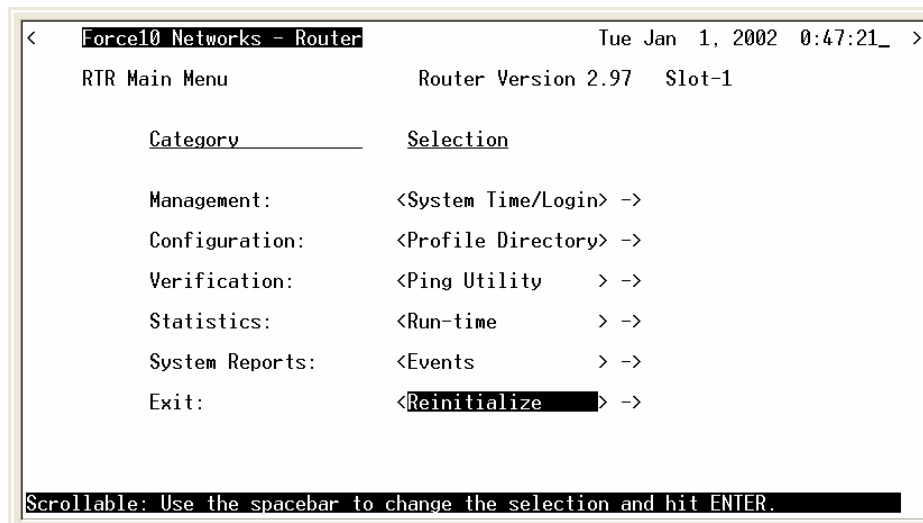
Connection	WAN Connection Type	DLCI
Select WAN Port Number : <1 >A:1:1	Frame Relay 1490	(16_)

Editable: Please enter a value.

11. Select **[ESC]** to exit the **Trunk Port** configuration window.
12. Select **[ESC]** to exit and **<Yes>** to save changes.

## Reinitialize the Router

1. Select **Exit <Reinitialize >** from the **Router** main window and select **[ENTER]**.



Category	Selection
Management:	<System Time/Login> ->
Configuration:	<Profile Directory> ->
Verification:	<Ping Utility> > ->
Statistics:	<Run-time> > ->
System Reports:	<Events> > ->
Exit:	<Reinitialize> > ->

Scrollable: Use the spacebar to change the selection and hit ENTER.

2. Select **<YES>** and select **[ENTER]** to Reinitialize the Router Card. This will save all the changes made to the Router.



### **Configuration of Remote Adits**

**Note: The Ethernet cannot be connected to the Remote Adit during the setup of the DS0.**

Use the following commands to setup the IP over DS0 Management Channel for each Remote Adit 600. Connect to the Adit1, use the following CLI commands to setup the DS0 Management Channel.

**Note: the following commands are assuming that the Remote Adits are set to factory defaults.**

Command	Description
set local off	Sets the Adit to be configured through CLI
set a:1 down	Sets the T1-1 as Out-of-Service
disconnect a	Disconnects all connections to slot A (Controller), assuming there are not any established cross-connects that need to remain.
set a:1:24 type data	Sets all DS0s on T1-1 to data signaling type
set ipds0 assign a:1:24	Assigns the DS0 as the IP management channel
set ipds0 ip address 192.168.202.1 255.255.255.0	Set the DS0 management channel IP address (the Adit1 WAN address is inserted here)
set ipds0 up	Set the DS0 management channel up
set snmp nms1 xxx.xxx.xxx.xxx	Sends alarms to server. Sends alarms to server. xxx.xxx.xxx.xxx is the IP Address of the server.
show connect a:1	Displays connections to T1-1 of the controller
show ipds0	Displays the configurations of the DS0 mgmt channel
status ipds0	Will display the operational status (up/down) of the DS0 management channel to the Navigator
set a:1 up	Sets the T1-1 as In-Service

### **Configuration of Access Navigator**

**Note: The Ethernet cannot be connected to the Remote Adit during the setup of the DS0.**

The following setup creates a path from the Adit Router to the remote Adit.

<b>Command</b>	<b>Description</b>
restore defaults	Sets the unit back to default settings
set switch type dms	Sets 1-32 Out-of-Service
set ds1 1-32 down	Sets 1-32 Out-of-Service
set ethernet ip address 192.168.201.100 255.255.255.0	Sets the ethernet ip address of the Access Navigator and it's subnet mask
set ip gateway 192.168.201.101	Sets the gateway (router address)
set ds1 32 type groom	Sets DS1 32 to groom
set ds0 32:1-24 type data	Sets DS0 32 1-24 to data signaling type
set ds1 1 remote device mgmt caip 192.168.202.1	Sets DS1 1 as the Management Channel with the Router (address listed)
set ds0 1:24 type data	Sets DS0 1-24 to data signaling type
connect 1:24 32:1	Connects DS1 1:DS0 24 to DS1 32, DS0 1
set ds1 32 up	Sets DS1 32 In-Service
set ds1 1 up	Sets DS1 1 In-Service
set snmp nms1 xxx.xxx.xxx.xxx	Sends alarms to server. xxx.xxx.xxx.xxx is the IP Address of the server.
show ds1 1	Displays DS1 1 information
show ip	Displays IP Address information
show connect 1	Displays connections on DS1 1
status remote 1	Displays the status of the Management Channel

### **Testing the DS0 Management Channel**

After the DS0 management channels have been setup with one Remote Adit, test the channel.

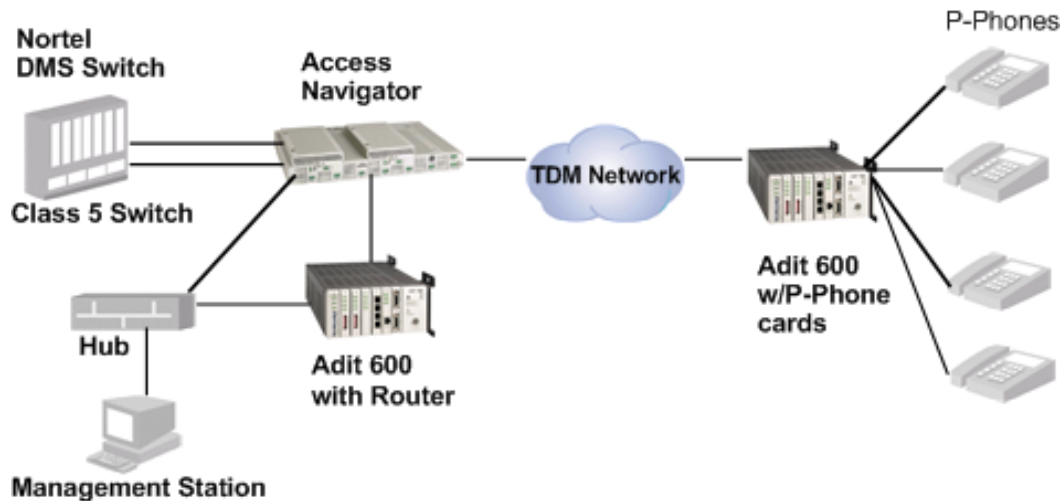
1. PING 192.168.202.1 (Adit1) from the Adit Router.
2. PING 192.168.202.1 (Adit1) from the Access Navigator.
3. PING 192.168.202.1 from the PC.
4. Telnet 192.168.202.1 from the PC to the Remote Adit.

Once the Management Channel is working properly, add additional Remote units. Test the DS0 Management Channel after each additional unit has been setup.

With the successful completion of the setup and test of the DS0 Management Channels, the Ethernet may be reattached to the network.

## **Basic P-Phone Configuration Setup**

The following is the basic P-Phone setup of the Adit 600. For more information on this service card see *Chapter 13, P-Phone Card*.



### **Equipment required for this setup**

- (1) Adit 600 with T1 Controller (Rel 6.0), (3) P-Phone Service cards
- (1) Adit 600 with T1 Controller, (1) IP Router Service card  
The collocated Adit 600 must have the following software levels:
  - T1 Controller Release 5.0 or higher
  - Router can be any one of the following:
    - IP Router Card - Release 1.5 or higher
    - Terminal Server Router Card - Release 1.0 or higher
    - CMG Router Card - Release 1.1 or higher
- (1) Access Navigator GR-303 with P-Phone (release 1.8 or higher)
- Nortel DMS Switch
- P-Phones

### **Installation**

1. Install Adit 600 at Remote site following the directions in Chapter 2 and 3 of the User Manual.
2. Install P-Phone Service cards into the Remote Adit 600 chassis.
3. Connect P-Phones to the Adit 600.
4. Install Adit 600 (w/router) and Access Navigator at the CO following the installation directions in the User Manuals.

## Configuration

### Basic P-Phone Configuration Setup

#### Configuration of Access Navigator

1. Use the Access Navigator Quick Start Guide for basic configuration of the Access Navigator connectivity to the Nortel Switch.
2. The following Access Navigator setup creates a path from the Adit Router to the Remote Adit for DS0 Management.

Command	Description
restore defaults	Sets the unit back to default settings
reset all	Reset both Controller cards
set switch type dms	Sets switch type to Nortel DMS
set ds1 1-32 down	Sets 1-32 Out-of-Service
set ds1 1 type drop	Sets DS1 to terminate at a remote terminal
set ds1 32 type drop	Sets DS1 32 to drop
set ds1 25 type switch	Sets DS1 25 to switch
set ds1 29 type switch	Sets DS1 29 to switch
set ds1 25 termid 1	Sets DS1 25 Term ID to 1
set ds1 29 termid 2	Sets DS1 28 Term ID to 2
set eoc primary 25:12	Sets primary Embedded Operations Channel to 25:12
set tmc primary 25:24	Sets primary Timeslot Management Channel to 25:24
set eoc secondary 29:12	Sets primary Embedded Operations Channel to 29:12
set tmc secondary 29:24	Sets primary Timeslot Management Channel to 29:24
set ds0 1:1-23 pphone	Sets DS0 1:1-23 to P-Phone type
set ds0 1:24 type data	Sets DS0 1:24 to data signaling type
show ds0 1:1-24	Displays DS0 1:1-24 information
set ds0 32:1-24 type data	Sets DS0 32 1-24 to data signaling type
set ds1 1 up	Sets DS1 1 In-Service
set ds1 25 up	Sets DS1 25 In-Service
set ds1 29 up	Sets DS1 29 In-Service
set ds1 32 up	Sets DS1 32 In-Service
set clock1 ds1 25	Sets primary system clock source to DS1 25
set clock2 ds1 29	Sets secondary system clock source to DS1 29
set ds1 1 remote device mgmt caip 192.168.202.1	Sets DS1 1 as the Management Channel with the Router (address listed)
set ds1 1 remote device mgmt caip 192.168.202.1 pphone	Sets DS1 1 as the DS0 Management Channel with the Router (address listed) and P-Phone Call Connection
connect 1:24 32:1	Connects DS1 1:DS0 24 to DS1 32, DS0 1

Command	Description
set ethernet ip address 192.168.201.100 255.255.255.0	Sets the ethernet ip address of the Access Navigator and it's subnet mask
set ip gateway 192.168.201.101	Sets the gateway (router address)
show ds1 1	Displays DS1 1 information
show ip	Displays IP Address information
status remote 1	Displays the status of the Management Channel
show connect 1	Displays connections on DS1 1
status tmc	Displays the status of the TMC
status eoc	Displays the status of the EOC

## **Configure Adit and Router at CO**

Direct connect to the CLI via RS-232. Follow the commands for "Initial Setup" below.

Command	Description
restore defaults	Sets the unit back to default settings
reset	Resets the system
set 1 default	Sets the Router in Slot 1 to its default settings
set local off	Disables DIP switches
set date {mm/dd/yyyy}	Set the date used for event logging
set time {hh:mm:ss}	Set the time used for event logging
set id {"id-name"}	Set a system ID name
set clock1 a:1	Set the primary clock source to a:1
set clock2 internal	Set the secondary clock source to internal
set a:2 down	Sets the T1-2 as Out-of-Service
disconnect a	Disconnect all connections to slot A (Controller)
set a:1:1-24 type data	Sets all DS0s on T1-1 to data signaling type
connect a:1:1 1:1:1	Connects first DS0 of T1-1 of the controller to port 1, WAN 1 of the Router in slot 1.
set ethernet ip address {ip-addr} {mask}	Set Ethernet IP address, in IP address format
set ip gateway {ip-addr}	Set IP gateway, in the conventional IP address format
show ip	Displays the IP information

## Configure IP Router in Adit 600

### Add and Enable all Remote Adits Needed

Telnet into Router:

1. From the CLI execute a Telnet command to the Router **telnet {slot}**  
Example: **telnet 1**
2. Enter password (default is "admin") and select **[ENTER]**.
3. Select Terminal Emulation (scroll with **[TAB]**) and select **[ENTER]**.

### Configure Trunk Connections

1. Select **Configuration <Profile Directory>** from the Router Main Menu and select **[ENTER]**.

```
< Force10 Networks - Router Tue Jan 1, 2002 0:58:37_ >
RTR Main Menu Router Version 2.97 Slot-1

Category Selection

Management: <System Time/Login> ->
Configuration: <Profile Directory> ->
Verification: <Ping Utility> ->
Statistics: <Run-time> ->
System Reports: <Events> ->
Exit: <Logout> ->

Scrollable: Use the spacebar to change the selection and hit ENTER.
```

2. Select **Router CARD <Setup ->** and select **[ENTER]**.

```
< Force10 Networks - Router Tue Jan 1, 2002 1:00:01_ >
Profile Directory: 1 Configured and 2 Enabled.

Name Profile Type Recv/Send Profile State
Router CARD <Setup ->
LocalUnit LAN NONE/NONE <Setup ->
1. RemoteUnit WAN NONE/NONE <Setup -> <Enabled >

CTRL A to add, CTRL E to erase, CTRL F to page forward, CTRL B to page back
Hit ENTER to configure the communication information for this profile.
```

3. Select **Trunk Configure** -> and select **[ENTER]**.

```
< Force10 Networks - Router Tue Jan 1, 2002 1:01:43_ >
ROUTER Slot-1 Configuration
RIP Mode Receive      <RIP1   >
RIP Mode Send         <RIP1   >
Trunk                  Configure ->
Security               Configure ->
SNMP                   Configure ->
DNS Proxy              Configure ->
Spanning Tree Protocol Configure ->
Network Time Protocol  Configure ->
SysLog                 Configure ->
DNS Resolver           Configure ->

Provisioned Trunk Protocol Configuration
```

4. Set the **WAN Connection Type** to **<Frame Relay 1490>**, and **PVC Management:** to **<Disabled>**. Scroll with the **[SPACEBAR]** to select options.

Note: settings will not take effect until the Router is Reinitialized.

```
< Force10 Networks - Router Tue Jan 1, 2002 1:16:25 >
Trunk Setup for local LocalUnit : 8 of 24 Trunks Provisioned
WAN Link #  WAN Connection  WAN Connection Type  Multilink Group  Data Speed
1           A:1:1-1         <Frame Relay 1490 >  <64K>
2           A:1:2-2         <Frame Relay 1490 >  <64K>
3           A:1:3-3         <Frame Relay 1490 >  <64K>
4           A:1:4-4         <Frame Relay 1490 >  <64K>
5           A:1:5-5         <Frame Relay 1490 >  <64K>
6           A:1:6-6         <Frame Relay 1490 >  <64K>
7           A:1:7-7         <Frame Relay 1490 >  <64K>
8           A:1:8-8         <Frame Relay 1490 >  <64K>

PVC Management: <Disabled>

Scrollable: Select the PVC Management type to be used.
```

5. Select **[ESC]** to exit and **<Yes>** to save changes.

### Configure Trunk Connections

1. Select **LocalUnit LAN** <Setup -> and select [ENTER].

```

< Force10 Networks - Router Tue Jan 1, 2002 1:18:38_ >
Profile Directory: 1 Configured and 2 Enabled.
Name      Profile Type Recv/Send Profile      State
Router    CARD          NONE/NONE <Setup ->
LocalUnit LAN          NONE/NONE <Setup ->
1. RemoteUnit WAN      NONE/NONE <Setup -> <Enabled >

CTRL A to add, CTRL E to erase, CTRL F to page forward, CTRL B to page back
Hit ENTER to configure the communication information for this profile.
  
```

2. Set the following:  
**IP Protocol Eth II** (with an X), all others should not be selected (default)  
**LAN Networks Updates** for IP and IPX to <Neither> (default)  
**LAN IP Address** to 192.168.201.101 (Router IP Address).  
**LAN IP Subnet Mask** to 255.255.255.0.

```

< Force10 Networks - Router Tue Jan 1, 2002 1:21:41_ >
Profile Setup for (LocalUnit ), LOCAL

Protocol  802.2  Eth II  SNAP  802.3  LAN Network
IP         X          <Neither >
IPX        [X] [X] [X] [X] <Neither >
Other      [X] [X] [X]

LAN IP
IP Address: (192.168.201.101)
Subnet Mask: (255.255.255.0)
Default Router: (0.0.0.0)

LAN IPX
802.2 Ext. Network: (00000000)
Eth II Ext. Network: (00000000)
SNAP Ext. Network: (00000000)
802.3 Ext. Network: (00000000)

Setup: <Static Networks > -Link Speed : <Auto Negotiate >
  
```

3. Select [ESC] to exit and <Yes> to save changes.



### Create a Remote Profile for all Adit Remotes

1. Select **LocalUnit WAN** <Setup -> and select [ENTER].

```
< Force10 Networks - Router Tue Jan 1, 2002 1:24:00_ >
Profile Directory: 1 Configured and 2 Enabled.
Name      Profile Type  Recv/Send  Profile      State
Router    CARD              NONE/NONE  <Setup ->
LocalUnit LAN              NONE/NONE  <Setup ->
1. RemoteUnit WAN          NONE/NONE  <Setup ->  <Enabled >

CTRL A to add, CTRL E to erase, CTRL F to page forward, CTRL B to page back
Hit ENTER to configure the communication information for the remote profile.
```

2. Set the following:  
**Rename** the Profile RemoteUnit (example is RemoteAdit1)  
**WAN Networks Updates** for IP to <Never> (default)  
**WAN IP Numbered** to <No> (default)

```
< Force10 Networks - Router Tue Jan 1, 2002 1:25:44_ >
Profile Setup for (RemoteAdit1)

Protocol  Mode      WAN Network  GRE Tunnel
IP        <Route >  Updates      <Disabled >
IPX       <Blocked >
Other     <Blocked >

NAT Gateway: <Disabled>

WAN IP
Numbered:  <NO >

FW Allow Frags  <Disabled>
Setup: <Static/VPN Networks > ->  Setup: <Trunk Port > ->
Scrollable: Select the item to be set up and hit ENTER.
```

3. [TAB] to **Setup: <Static/VPN Networks>** (scroll to this selection if it is not displayed, and select [ENTER].

## Configuration

### Basic P-Phone Configuration Setup

4. Select **[CTRL A]** to add a Static IP Network. Set the following:  
**Setup Static:** to **<IP Networks>**  
**Network Address** to 192.168.201.1 (RemoteAdit1 WAN Address)  
**Subnet Mask** to 255.255.255.0 (subnet mask for the above)

```
< Force10 Networks - Router Tue Jan 1, 2002 1:36:29 >
RemoteAdit1 has 1 Static IP Network.
Setup Static: <IP Networks >
  Network      Subnet Mask  Metric
1. (192.168.201.0 ) (255.255.255.0 ) (1)

CTRL A to add, CTRL E to erase, CTRL F to page forward, CTRL B to page back
Editable: Enter the distance, in hops, to the network.
```

5. Select **[ESC]** to exit and **<Yes>** to save changes.
6. Select **Setup: <Trunk Port>** and select **[ENTER]**.

```
< Force10 Networks - Router Tue Jan 1, 2002 1:38:04 >
Profile Setup for (RemoteAdit1)

Protocol  Mode      WAN Network  GRE Tunnel
Updates
IP        <Route >   <Never >    <Disabled >
IPX       <Blocked >
Other     <Blocked >

NAT Gateway: <Disabled>

WAN IP
Numbered:  <NO >

FW Allow Frags  <Disabled>

Setup: <Static/VPN Networks > ->  Setup: <Trunk Port > ->
Scrollable: Select the item to be set up and hit ENTER.
```

7. Set the following:  
Scroll **Select WAN Port Number** from <None> to <1>  
Set **DLCI** to (16)

< Force10 Networks - Router Tue Jan 1, 2002 1:39:34\_ >

WAN Port Setup for remote RemoteAdit1

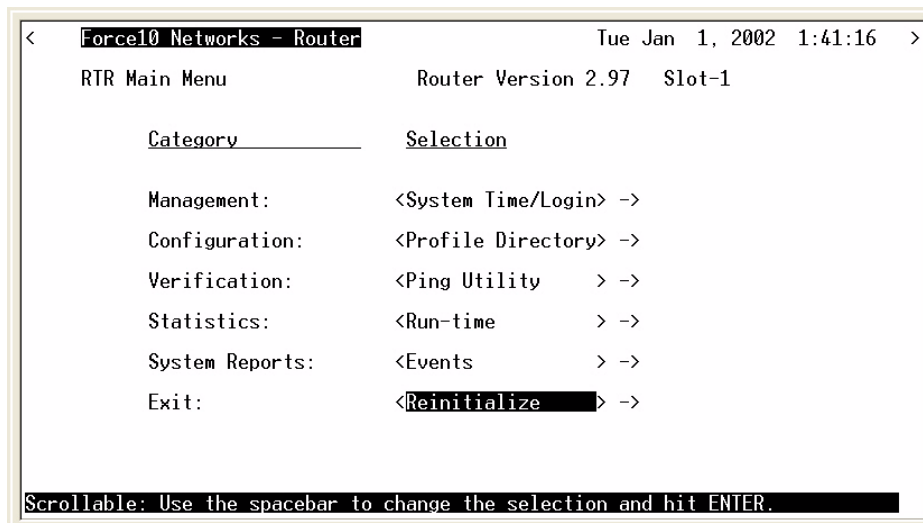
	<u>Connection</u>	<u>WAN Connection Type</u>	<u>DLCI</u>
Select WAN Port Number : <1>	>A:1:1	Frame Relay 1490	(16 ■)

Editable: Please enter a value.

8. Select [ESC] to exit the Trunk Port window.
9. Select [ESC] to exit and <Yes> to save changes.
10. Select [ESC] to exit the Profile Directory and return to the Main Router window.

#### Reinitialize the Router

1. On the Main Router window, select **Exit** <Logout> and scroll with the [SPACEBAR] to <Reinitialize> and select [ENTER].



2. Select <YES> and select [ENTER] to Reinitialize the Router Card. This will save all the changes made to the Router.

## **Configuration of the Adit 600 at Remote Site**

Direct connect to CLI via RS-232. Use the following commands for your initial setup. Note: P-Phones are installed in slots 1, 2 and 3.

Command	Description
<code>restore defaults</code>	Sets the unit back to default settings
<code>set local off</code>	Disables DIP switches
<code>set date {mm/dd/yyyy}</code>	Set the date used for event logging
<code>set time {hh:mm:ss}</code>	Set the time used for event logging
<code>set id {"id-name"}</code>	Set a system ID name
<code>set clock1 a:1</code>	Set the primary clock source to a:1
<code>set clock2 internal</code>	Set the secondary clock source to internal
<code>set a:2 down</code>	Sets the T1-2 as Out-of-Service
<code>disconnect a</code>	Disconnect all connections to slot A (Controller)
<code>set a:1:1-24 type data</code>	Sets all DS0s on T1-1 to data signaling type
<code>connect a:1:1-8 1:1-8</code>	Connects a:1:1-8 of the Controller to 1-8 of the P-Phone in slot 1.
<code>connect a:1:9-16 2:1-8</code>	Connects a:1:9-16 of the Controller to 1-8 of the P-Phone in slot 2.
<code>connect a:1:17-23 3:1-8</code>	Connects a:1:17-23 of the Controller to 1-8 of the P-Phone in slot 3.
<code>set 1:1 crv 1</code>	Set the P-Phone CRV, slot 1 port 1 to 1
<code>set 1:2 crv 2</code>	Set the P-Phone CRV, slot 1 port 1 to 2
<code>set 1:3 crv 3</code>	Set the P-Phone CRV, slot 1 port 1 to 3
<code>set 1:4 crv 4</code>	Set the P-Phone CRV, slot 1 port 1 to 4
<code>set 1:5 crv 5</code>	Set the P-Phone CRV, slot 1 port 1 to 5
<code>set 1:6 crv 6</code>	Set the P-Phone CRV, slot 1 port 1 to 6
<code>set 1:7 crv 7</code>	Set the P-Phone CRV, slot 1 port 1 to 7
<code>set 1:8 crv 8</code>	Set the P-Phone CRV, slot 1 port 1 to 8
<code>set 2:1 crv 9</code>	Set the P-Phone CRV, slot 2 port 1 to 9
<code>set 2:2 crv 10</code>	Set the P-Phone CRV, slot 2 port 1 to 10
<code>set 2:3 crv 11</code>	Set the P-Phone CRV, slot 2 port 1 to 11
<code>set 2:4 crv 12</code>	Set the P-Phone CRV, slot 2 port 1 to 12
<code>set 2:5 crv 13</code>	Set the P-Phone CRV, slot 2 port 1 to 13
<code>set 2:5 crv 13</code>	Set the P-Phone CRV, slot 2 port 1 to 13
<code>set 2:6 crv 14</code>	Set the P-Phone CRV, slot 2 port 1 to 14

## Configuration

### Basic P-Phone Configuration Setup

Command	Description
set 2:7 crv 15	Set the P-Phone CRV, slot 2 port 1 to 15
set 2:8 crv 16	Set the P-Phone CRV, slot 2 port 1 to 16
set 3:1 crv 9	Set the P-Phone CRV, slot 3 port 1 to 17
set 3:2 crv 10	Set the P-Phone CRV, slot 3 port 1 to 18
set 3:3 crv 11	Set the P-Phone CRV, slot 3 port 1 to 19
set 3:4 crv 12	Set the P-Phone CRV, slot 3 port 1 to 20
set 3:5 crv 13	Set the P-Phone CRV, slot 3 port 1 to 21
set 3:6 crv 14	Set the P-Phone CRV, slot 3 port 1 to 22
set 3:7 crv 15	Set the P-Phone CRV, slot 3 port 1 to 23
set ipds0 assign a:1:24	Assigns the DS0 as the IP mgmnt channel
set ipds0 ip address 192.168.202.1 255.255.255.0	Set the DS0 management channel IP address
set ipds0 up	Set the DS0 management channel up
show ipds0	Displays DS0 mgmnt channel information
status ipds0	Displays the current IPDS0 status
show connect a	Displays connections to the controller
set ethernet ip address {ip-addr} {mask}	Set the ethernet IP address, in the conventional IP address format
set ip gateway {ip-addr}	Set the IP gateway, in the conventional IP address format
show ip	Displays the IP information

## Testing the DS0 Management Channel

After the DS0 management channels has been setup with one Remote Adit, test the management channel.

1. PING 192.168.202.1 (RemoteAdit1) from the Adit Router.
2. PING 192.168.202.1 (RemoteAdit1) from the Access Navigator.
3. PING 192.168.202.1 from the PC.
4. Telnet 192.168.202.1 from the PC to the Remote Adit.

Once the Management Channel is working properly, add additional Remote units. Test the DS0 Management Channel after each additional unit has been setup.

# CHAPTER 5

---

## *CLI Commands*

### **In this Chapter**

- Adit 600 CLI Syntax
- Command Line Interface Help
- CLI Commands

---

**NOTE:** E1 is not supported in this release of the Adit 600 Controller. It will be supported in a future release.

---

## **Adit 600 CLI Syntax**

The Adit 600 general syntax is:

Adit 600> command [object] [setting] [modifier]

Symbols used in the Adit 600 CLI syntax are as follows:

Any items listed in brackets {} or [ ] are variables set by the user.

{ } implies mandatory parameters

[ ] implies optional parameters

| = indicates (separates) more than one option (= or)

Example: **set radius server {1|2|3} address {ip-addr} [port]**

In this example it is required to select one of the server options (1, 2 or 3) and to enter an IP address. The port number is an optional parameter.

## **Command Line Interface Help**

During a CLI session, help is available at any time.

### **? or help**

Type a ? (or "help" before a command) at any time for quick command information

> add ?

```
add ..... Create users or profiles
  {rtr_card-addr} ..... Create profile, object or service on a router
  {rtr_lan-addr} ..... Create object or service on the router LAN
  .
  .
  .
user ..... Create user with manager level access.
```

---

**NOTE:** The scrolling feature, will always scroll through the command/options in alphabetical order.

---



## ***[TAB] usage for word or command completion***

**Use [TAB] for command word completion:**

- > sh [TAB]
- > show

**Use [TAB] to view command levels:**

- > [TAB] will scroll through the base commands
- > aco [TAB]
- > add [TAB]
- > alarms [TAB]
- > clear [TAB]
- > connect [TAB]
- > delete ... etc.

**Use [TAB] to view command options, add a space after the base command with the use of the [TAB] feature, scroll through all available options for this command:**

- > set [TAB] will scroll through the set commands, with each <TAB>
- > set alarms [TAB]
- > set autoexit [TAB]
- > set clock1 ... etc.

**If another space is placed after the command and [TAB] is pressed again, the next command level will display (if any):**

- > set snmp [TAB] will scroll through all the set SNMP options
- > set snmp contact [TAB]
- > set snmp getcom [TAB]
- > set snmp location [TAB]
- > set snmp name ... etc.

## CLI Commands

For maneuverability through these commands, all command names in blue or italics are hyperlinked.

<a href="#"><i>aco (Alarm Cut Off)</i></a>	<a href="#"><i>reset</i></a>
<a href="#"><i>add</i></a>	<a href="#"><i>restore</i></a>
<a href="#"><i>alarms</i></a>	<a href="#"><i>rtrping</i></a>
<a href="#"><i>clear</i></a>	<a href="#"><i>set</i></a>
<a href="#"><i>connect</i></a>	<a href="#"><i>show</i></a>
<a href="#"><i>delete</i></a>	<a href="#"><i>ssh ip</i></a>
<a href="#"><i>disconnect</i></a>	<a href="#"><i>status</i></a>
<a href="#"><i>exit</i></a>	<a href="#"><i>store scp</i></a>
<a href="#"><i>install</i></a>	<a href="#"><i>store tftp</i></a>
<a href="#"><i>load</i></a>	<a href="#"><i>switch</i></a>
<a href="#"><i>log</i></a>	<a href="#"><i>telnet</i></a>
<a href="#"><i>ping</i></a>	<a href="#"><i>test</i></a>
<a href="#"><i>print</i></a>	<a href="#"><i>trace route</i></a>
<a href="#"><i>rename (router)</i></a>	

---

**NOTE:** For most router configuration changes to go into effect, the router must be reset. Best practice is to always reset the router after making configuration changes.

---

---

## ***aco (Alarm Cut Off)***

---

Use the **aco** command to activate the Alarm Cut Off, which opens the alarm relay contacts on the back of the unit.

**Syntax:** `aco`

**Example:** `aco`

### ***ACO LED***

LED	Definition
Off	Normal mode. No alarms are being suppressed.
Yellow	Alarm cutoff active. One or more active alarms suppressed.

To turn off ACO, all alarms must be cleared, or the operator can reset the controller, which will set the ACO back to the default (off) state.

### ***add***

---

Use the **add** command to create users, interfaces, services or profiles.

See the following sections for detailed information on the following **add** commands

***add (ds1) ais***

***add (router) dhcp server option***

***add (router) dns proxy***

***add (router) remote***

***add (router) snmp community***

***add (router) snmp trap***

***add (router) static dns host***

***add (router) uploaduser***

***add (router-lan) filter***

***add (router-lan) firewall***

***add (router-lan) secondary ip address***

***add (router-lan) static***

***add (router-wan) firewall***

***add (router-wan) gre network***

***add (router-wan) nat bypass***

***add (router-wan) static***

***add snmp group***

***add snmp view***

***add user***

---

**add (ds1) ais**

Use the **add (ds1) ais** command to add DS1s to a list for the AIS Forwarding feature. The DS1 enabled for AIS forwarding will be checked against the DS1s defined in the list.

---

**NOTE:** The conditions on cross connected DS1s that trigger sending AIS are: LOS, LOF, AIS, RAI, and loopback.

---

---

**NOTE:** If no list is defined, AIS will go to all the DS1s cross-connected to that DS1.

---

**Syntax:** add {ds1-addr} ais {all|{ds1-addr1}, [ds1-addr2], [ds1-addr3], [ds1-addr4]}

**Example:** add 1:1 ais 2:1, 3:1, 4:1, 5:1

Variable	Definition
<b>ds1-addr</b>	DS1 address in the form {slot:port}. <b>slot</b> - Slot number, A for the Controller card, or 1 - 6 for service cards. <b>port</b> - Port number, range or all.
<b>all</b>	Creates a AIS DS1 list all DS1s in the system to be configured to trigger sending AIS.
<b>{ds1-addr1}, [ds1-addr2], [ds1-addr3], [ds1-addr4]</b>	Creates a AIS DS1 list of up to 4 DS1s to be configured to trigger sending AIS.

**add (router) dhcp server option**

Use the **add (router) dhcp server option** command to add optional DHCP server attributes that will be advertised every time a DHCP client discovery is initiated. This provisioning takes effect immediately and can only be performed when the DHCP server is enabled.

**Syntax:** `add {rtr_card-addr} dhcp server option {tag} {setting}`

**Example:**

```
add 2 dhcp server option 1 255.255.0.0
add 2 dhcp server option 3 1.1.1.1
add 2 dhcp server option 19 false
add 2 dhcp server option 13 byte1 0x2
add 2 dhcp server option 160 byte2 0x3200
add 2 dhcp server option 170 byte4 0xFEDCBA98
add 2 dhcp server option 12 "www.force10networks.com"
add 2 dhcp server option 150 192.168.0.33
add 2 dhcp server option 150 192.168.0.33 10.40.1.1 20.0.0.1
100.150.3.97
```

Variable	Definition	
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.	
<b>tag</b>	Range is 1-254. Options tags are unique, duplicate numbers will be rejected. To change an option with the same tag, the old option must be deleted and then the new option re-entered. 0 = off. Reserved numbers 6, 15, 44, 46, 47, 50, 51, 53, 54, 61.	
<b>settings</b>	<b>{true/false}</b>	Boolean uses true or false
	<b>{byte1 byte2 byte4} {value}</b>	byte1 = send <b>value</b> in 1 byte byte2 = send <b>value</b> in 2 bytes byte3 = send <b>value</b> in 4 bytes value = numeric value must be entered in Hex.
	<b>{"string"}</b>	Unidentified with a maximum of 50 characters, enclosed in quotes.
	<b>{ip-addr} [ip-addr] [ip-addr] [ip-addr]</b>	IP address in the form xxx.xxx.xxx.xxx, where xxx is a number from 0 to 255.

### ***add (router) dns proxy***

Use the **add (router) dns proxy** command to enable DNS proxy and add a remote DNS server address to the specified Router card.

**Syntax:** `add {rtr_card-addr} dns proxy {"domain-name"} {ip-addr} {"profile-name"}`

**Example:** `add 2 dns proxy "Domain1" 192.168.100.245 "Texas"`  
Example will add a DNS proxy server "Domain1" with address 192.168.100.245 to the WAN named "Texas" on the Router in slot 2.

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>domain-name</b>	The domain name for the external DNS server. Name must be enclosed in quotes, with a maximum length of 42 characters.
<b>ip-addr</b>	The IP address of the external DNS server, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.
<b>profile-name</b>	The profile name for the Router interface that is used to reach this destination. Name must be enclosed in quotes, with a maximum length of 11 characters.

### ***add (router) remote***

Use the **add (router) remote** command to add a remote WAN profile to the WAN profile table on the specified Router card.

**Syntax:** `add {rtr_card-addr} remote {"profile-name"}`

**Example:** `add 6 remote "Texas"`  
The example will add a remote WAN named "Texas" to the WAN profile table for the Router in slot 6.

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>profile-name</b>	The name of the remote WAN profile to add with a maximum length of 11 characters. This name must be enclosed in quotes.

**add (router) snmp community**

Use the **add (router) snmp community** command to add a SNMP community to an interface on the specified Router card.

**Syntax:** `add {rtr_card-addr} snmp community {both|read|write} {"community-name"} {ip-addr}`

**Example:** `add 2 snmp community both "commune" 192.168.100.245`  
The example will allow the host 192.168.100.245 read/write access to the Router card SNMP agent using the community name "commune". The Router is located in slot 2.

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>both</b>	Will set the community to be read/write.
<b>read</b>	Will set the community to be read-only.
<b>write</b>	Will set the community to be write-only.
<b>community-name</b>	Community Name to add, with a maximum length of 10 characters, enclosed in quotes.
<b>ip-addr</b>	The IP address of the host that can access the SNMP agent via this community, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255. The address "0.0.0.0" allows any host.

**add (router) snmp trap**

Use the **add (router) snmp trap** command to specify a destination to send SNMP trap messages for the specified Router card.

**Syntax:** `add {rtr_card-addr} snmp trap {"community-name"} {ip-addr} {"profile-name"}`

**Example:** `add 3 snmp trap "commune" 192.168.100.245 "RemoteAdit"`  
The example will add a trap destination of 192.168.100.245 on the interface "RemoteAdit" and use the community name "commune" on the Router in slot 3.

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>community-name</b>	The community name to use in each trap message, with a maximum of 10 characters.
<b>ip-addr</b>	The IP address of the destination trap to add, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.
<b>profile-name</b>	The profile name for the Router interface that is used to reach this destination. Maximum of 11 characters and this name must be enclosed in quotes.



**add (router) static dns host**

Use the **add (router) static dns host** command to add a static DNS host record for resolving a domain name to an IP address if the DNS server cannot provide the information. The DNS resolver will first attempt to resolve the name by querying the configured DNS servers. If this does not yield the information, the DNS resolver will consult this list of static entries. This command will fail if the DNS resolver is not enabled.

**Syntax:** `add {rtr_card-addr} static dns host {ip-addr} {"domain-name"}`

**Example:** `add 2 static dns host 192.168.100.245 "myhost.some.net"`  
 Example will add a static DNS host record with address 192.168.100.245 and domain named "myhost.some.net" on the Router in slot 2.

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>ip-addr</b>	IP address of the host, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.
<b>domain-name</b>	Domain name of the host, with a maximum length of 41 characters, enclosed in quotes.

**add (router) uploaduser**

Use the **add (router) uploaduser** command to specify a host that is allowed to upload configuration or software files from the specified Router card interface.

**Syntax:** `add {rtr_card-addr} uploaduser {both|code|config} {all|ip-addr} {"profile-name"}`

**Example:** `add 3 uploaduser code all "LosAngeles"`  
 The example will allow any user to upload the code file from the Router interface named "LosAngeles". The Router is located in slot 3.

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>both</b>	Will allow user to upload both code file and configuration file from the Router.
<b>code</b>	Will allow user to upload the code file from the Router.
<b>config</b>	Will allow user to upload the configuration file from the Router.
<b>all</b>	Will allow upload from anywhere.
<b>ip-addr</b>	The IP address to allow upload from, in the form xxx.xxx.xxx.xxx, where xxx is between 0-255.
<b>profile-name</b>	Name of the remote WAN or LAN profile that can be used for upload, enclosed in quotes.

**add (router-lan) filter**

Use the **add (router-lan) filter** commands to add filters to the specified LAN interface.

**add (router-lan) filter address**

**add (router-lan) filter custom**

**add (router-lan) filter protocol**

**add (router-lan) filter address**

Use the **add (router-lan) filter address** command to add an address filter to the table of Layer 2 filters applied to the specified LAN interface.

**Syntax:** `add {rtr_lan-addr} filter address {both|destination|source} {mac-addr} {"filter-name"}`

**Example:** `add 2:1 filter address both 0x00e09700e9cd "Server1" {rtr_lan-addr}`

Variable	Definition
<b>rtr_lan-addr</b>	Router (IP, CMG or TSR) address is in the form {slot:port} or {slot "profile-name"}. <b>slot</b> - The slot number (1-6) that contains the Router card. <b>port</b> - Port number of the Router. <b>profile-name</b> - The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.
<b>both</b>	Filter by both source and destination.
<b>destination</b>	Filter by destination only.
<b>source</b>	Filter by source only.
<b>all</b>	Will allow upload from anywhere.
<b>mac-addr</b>	The MAC address to add to the learned address table for the LAN, in the form a 6-octet HEX value, 0xxxxxxxxxxx. Please note that the MAC address is preceeded by a 0x.
<b>filter-name</b>	A symbolic name given to identify a filter rule. This name must be enclosed in quotes, with a maximum of 8 characters.

**add (router-lan) filter custom**

Use the **add (router-lan) filter custom** command to add a custom filter to the table of Layer 2 filters applied to the specified LAN interface.

**Syntax:** `add {rtr_lan-addr} filter custom {pkt-offset} {mask} {match} {"filter-name"}`

**Example:** `add 2:1 filter custom 16 0xFFFF0000 0x45000000 "MyRule"`

Variable	Definition
<b>rtr_lan-addr</b>	Router (IP, CMG or TSR) address is in the form {slot:port} or {slot "profile-name"}. <b>slot</b> - The slot number (1-6) that contains the Router card. <b>port</b> - Port number of the Router. <b>profile-name</b> - The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.
<b>pkt-offset</b>	This field will designate where within a packet (past the MAC header) the system is to begin looking for a matching character string. The offset value range is 0 to 60 bytes. To create a filter for the data in the MAC header, use the address and Protocol filters. See charts below for Ethernet Frame and IP Packet formats. <b>Note: An offset of 12 will create a Source IP Address filter</b> <b>An offset of 16 will create a Destination IP Address filter</b>
<b>mask</b>	The 32-bit mask to indicate which bits to compare to the match value starting at the offset position. entered as a 32-bit hex. value (all Fs is exact match FFFFFFFF).
<b>match</b>	The 32-bit match value that is used to match the incoming packet, entered as a 32-bit hexadecimal value.
<b>filter-name</b>	A name to identify a filter rule, with a maximum of 8 characters, enclosed in quotes.

**Ethernet Frame and IP Packet Format****Ethernet 802.3 (raw) Frame - Datalink Header**

6 bytes	6 bytes	2 bytes	46 to 1500 bytes	4 bytes
Dest MAC	Source MAC	Length	"FFF" followed by the data	FCS
-----Datalink (MAC) Header-----			----Data and CRC (Frame Check Sequence)----	

**IP Packet Format**

Version (4 bits)	Header Length (4 bits)	Type-of-Service (8 bits)	Total Length (16 bits)	
Identification (16 bits)			Flags (3 bits)	Fragment Offset (13 bits)
Time-to-Live (8 bits)		Protocol (8 bits)	Header Checksum (16 bits)	
Source IP Address				
Destination IP Address				
IP Options (+ padding)				
Data portion of Datagram				

----- 32 Bits -----

**add (router-lan) filter protocol**

Use the **add (router-lan) filter protocol** command to add a protocol filter to the table of Layer 2 filters applied to the specified LAN interface. Note that you only need to identify either an Ethernet or IEEE value, but not both. The other should be entered as 0.

**Syntax:** `add {rtr_lan-addr} filter protocol {ether-type}  
{ieee-value} {"filter-name"}`

**Example:** `add 2:1 filter protocol 0x0807 0x0 "XNSrule"`

Variable	Definition
<b>rtr_lan-addr</b>	Router (IP, CMG or TSR) address is in the form {slot:port} or {slot "profile-name"}. <b>slot</b> - The slot number (1-6) that contains the Router card. <b>port</b> - Port number of the Router. <b>profile-name</b> - The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.
<b>ether-type</b>	The assigned Ethernet value for this protocol. The ether-type is entered as a 16-bit hexadecimal value. See <i>Appendix D, Ethernet Protocol Types</i> for more information.
<b>ieee-value</b>	The assigned IEEE value for this protocol. The IEEE value is the same as the SDAP & SSAP values in a SNAP packet. The match value is entered as a 8-bit hex value.
<b>filter-name</b>	A symbolic name given to identify a filter rule. This name must be enclosed in quotes, with a maximum of 8 characters.

**add (router-lan) firewall**

Use the **add (router-lan) firewall** command to add a firewall rule to a LAN.

**Syntax:** `add {rtr_card-addr} {"lan-name"} firewall  
 {rule-number} {drop|pass} {incoming|inout|outgoing}  
 {alarm|log|nolog} {service} {src-ip-addr/bits}  
 {dest-ip-addr/bits}`

**Example:** `add 3 "LocalLAN" firewall 1 pass incoming nolog http  
 203.1.21.17/32 0.0.0.0/0`

The example will add a firewall rule that allows HTTP (TCP port 80) access through the LAN to an inside web server at 203.1.21.17 to the Router card in slot 3.

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (CMG) card.
<b>lan-name</b>	The LAN interface to modify. The name must be enclosed in quotes.
<b>rule-number</b>	Firewall rules are processed in sequence until the first matching rule is found.
<b>drop</b>	Do not allow the packet to be forwarded
<b>pass</b>	Allow the packet to be forwarded
<b>incoming</b>	Matches packets for sessions originated from an outside host
<b>inout</b>	Matches packets for sessions originated from either an inside or outside host
<b>outgoing</b>	Matches packets for sessions originated from an inside host
<b>alarm</b>	Add an entry to alarm log for packets that match this rule
<b>log</b>	Add an entry to event log for packets that match this rule
<b>nolog</b>	Do not add an entry to the logs for packets that match this rule
<b>service</b>	<b>finger</b> - Display information about users <b>ftp</b> - File Transfer Protocol <b>gopher</b> - Document search and retrieval <b>http</b> - World Wide Web <b>icmp {port}</b> - Internet Control Message Protocol. Port = 0-65535 or range <b>nntp</b> - Network News Transfer <b>ping</b> - ICMP echo request/reply <b>pop3</b> - Post Office Protocol Version 3 <b>smtp</b> - Simple Mail Transfer <b>snmp</b> - Simple Network Management Protocol <b>tcp {port}</b> - Transmission Control Protocol. Port = 0-65535 or range <b>telnet</b> - User interface to remote unit <b>udp {port}</b> - User Datagram Protocol. Port = 0-65535 or range. <b>wais</b> - Wide Area Information Services <b>protocol {protocol-number}</b> - Enter a protocol number (0-255). 0=any protocol. For a list of protocols and numbers, see <i>Appendix D, Protocol Number in Firewall Filters</i> .
<b>src-ip-addr</b>	Enter the IP Address of the remote device or network that this rule will affect. If you enter the address of a remote device, this rule will affect only the session establishments of the remote device and the destination address entered in the dest-ip-addr/bits command above. The IP Address is in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255. Note: the address 0.0.0.0/0 matches any address.

Variable	Definition
<b>bits</b>	Use this field to identify the number of bits, from left to right that will be used to match the IP Address field within the data packet. Range is between 1-32.
<b>dest-ip-addr</b>	Enter the IP Address of the local device or network that this rule will affect. If you enter the address of a local device, this rule will affect only the session establishments of the local device and the destination address entered in the Remote IP Address/ Network field, below. The IP Address is in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255. Note: the address 0.0.0.0/0 matches any address.
<b>bits</b>	Use this field to identify the number of bits, from left to right that will be used to match the IP Address field within the data packet. Range is between 1-32.

### ***add (router-lan) secondary ip address***

Use the **add (router-lan) secondary ip address** command to add a secondary IP address and subnet to the specified LAN interface. The router will then be capable of routing between the various subnets on the LAN interface or between any of the LAN subnets and any WAN subnet. A maximum of 8 secondary IP addresses can be added to the LAN interface.

**Syntax:** `add {rtr_lan-addr} secondary ip address {ip-addr [mask]  
| ip-addr/bits}`

**Example:** `add 4:1 secondary ip address 192.168.1.1 255.255.255.0`

Variable	Definition
<b>rtr_lan-addr</b>	Router (IP, CMG or TSR) address is in the form {slot:port} or {slot "profile-name"}. <b>slot</b> - The slot number (1-6) that contains the Router card. <b>port</b> - Port number of the Router. <b>profile-name</b> - The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.
<b>ip-addr</b>	IP address of the Host to query, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.
<b>mask</b>	Mask of the secondary IP address, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.
<b>bits</b>	The subnet mask, specified as the number of ones bits in the mask value. Range is between 1-32.

---

**add (router-lan) static**

Use the **add (router-lan) static** commands to add static elements on the specified LAN interface.

**add (router-lan) static ip address**

**add (router-lan) static ip network**

**add (router-lan) static ipx network**

**add (router-lan) static mac address**

**add (router-lan) static ip address**

Use the **add (router-lan) static ip address** command to add a static IP address to the table of learned addresses on the specified LAN interface. This command is typically used in bridging.

**Syntax:** `add {rtr_lan-addr} static ip address {"addr-name"}  
{ip-addr}`

**Example:** `add 3:1 static ip address "JDoe" 195.168.201.140`

Variable	Definition
<b>rtr_lan-addr</b>	The Router (IP, CMG or TSR) address is in the form {slot:port} or {slot "profile-name"}. <b>slot</b> - The slot number (1-6) that contains the Router card. <b>port</b> - Port number of the Router. <b>profile-name</b> - The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.
<b>addr-name</b>	A symbolic name for this static ip address. This name must be enclosed in quotes, with a maximum of 8 characters.
<b>ip-addr</b>	The IP address of the learned address table for the LAN, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

**add (router-lan) static ip network**

Use the add (router-lan) static ip network command to add a static IP network (route) to the specified LAN interface.

**Syntax:** add {rtr\_lan-addr} static ip network {ip-addr} {mask}  
{next-hop-ip-addr} [metric]

**Example:** add 3:1 static ip network 195.168.201.0 255.255.255.0  
194.120.20.15 3

Variable	Definition
<b>rtr_lan-addr</b>	Router (IP, CMG or TSR) address is in the form {slot:port} or {slot "profile-name"}. <b>slot</b> - The slot number (1-6) that contains the Router card. <b>port</b> - Port number of the Router. <b>profile-name</b> - The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.
<b>ip-addr</b>	IP address of the static IP network to set.
<b>mask</b>	Static IP network Mask, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.
<b>next-hop-ip-addr</b>	The IP address of the next hop gateway for this route.
<b>metric</b>	Enter a numeric value indicating the distance from your local network to the destination network. This field is only used on IP networks. Valid entries range from 1 to 15. (Please note that a value of 1 usually indicates a direct network.)



**add (router-lan) static ipx network**

Use the **add (router-lan) static ipx network** command to add a static IPX network (route) to the specified LAN interface.

**Syntax:** `add {rtr_lan-addr} static ipx network {network} {hops} {ticks} {next-hop-mac-addr}`

**Example:** `add 3:1 static ipx network 0x11 2 4 0x00e09700e9cd`

Variable	Definition
<b>rtr_lan-addr</b>	Router (IP, CMG or TSR) address is in the form {slot:port} or {slot "profile-name"}. <b>slot</b> - The slot number (1-6) that contains the Router card. <b>port</b> - Port number of the Router. <b>profile-name</b> - The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.
<b>network</b>	The IPX network number in HEX (0x...). This number must be preceded by 0x.
<b>hops</b>	The number (of hops) indicating the distance from the Local (LAN) network to the destination network.
<b>ticks</b>	The distance between two networks in time increments (1/18th of a second). Like hops, ticks may be used to designate primary and secondary routes to the same network.
<b>next-hop-ip-addr</b>	The MAC address of the next hop Router, in the form a 6-octet HEX value separated by colons, xx:xx:xx:xx:xx:xx. This number must be preceded by 0x.

**add (router-lan) static mac address**

Use the **add (router-lan) static mac address** command to add a static MAC address to the table of learned addresses on the specified LAN interface. This command is typically used in bridging.

**Syntax:** `add {rtr_lan-addr} static mac address {"network-name"} {mac-addr}`

**Example:** `add 3:1 static mac address "JDoe" 0x00e09700e9cd`

The example will add a static MAC address, 00:e0:97:00:e9:cd named "JDoe", to the tables for the LAN interface on the Router card in slot 3.

Variable	Definition
<b>rtr_lan-addr</b>	The Router (IP, CMG or TSR) address is in the form {slot:port} or {slot "profile-name"}. <b>slot</b> - The slot number (1-6) that contains the Router card. <b>port</b> - Port number of the Router. <b>profile-name</b> - The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.
<b>network-name</b>	A symbolic name given to identify this static MAC address. This name must be enclosed in quotes, with a maximum of 7 characters
<b>mac-addr</b>	MAC address to add to the learned address table for the LAN, in the form a 6-octet HEX value separated by colons, xx:xx:xx:xx:xx:xx. This number must be preceded by 0x.

**add (router-wan) firewall**

Use the **add (router-wan) firewall** command to add a firewall rule to a WAN.

**Syntax:** add {rtr\_card-addr} {"wan-name"} firewall  
 {rule-number} {drop|pass} {incoming|inout|outgoing}  
 {alarm|log|nolog} {service} {dest-ip-addr/bits}  
 {src-ip-addr/bits}

**Example:** add 3 "LosAngeles" firewall 1 pass incoming nolog http  
 203.1.21.17/32 0.0.0.0/0

The example will add a firewall rule that allows HTTP (TCP port 80) access from any outside host to an inside web server at 203.1.21.17 to the Router card in slot 3.

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>wan-name</b>	The WAN interface to modify. The name must be enclosed in quotes.
<b>rule-number</b>	Firewall rules are processed in sequence until the first matching rule is found.
<b>drop</b>	Do not allow the packet to be forwarded
<b>pass</b>	Allow the packet to be forwarded
<b>incoming</b>	Matches packets for sessions originated from an outside host
<b>inout</b>	Matches packets for sessions originated from either an inside or outside host
<b>outgoing</b>	Matches packets for sessions originated from an inside host
<b>alarm</b>	Add an entry to alarm log for packets that match this rule
<b>log</b>	Add an entry to event log for packets that match this rule
<b>nolog</b>	Do not add an entry to the logs for packets that match this rule
<b>service</b>	<b>finger</b> - Display information about users <b>ftp</b> - File Transfer Protocol <b>gopher</b> - Document search and retrieval <b>http</b> - World Wide Web <b>icmp</b> - Internet Control Message Protocol <b>nnntp</b> - Network News Transfer <b>ping</b> - ICMP echo request/reply <b>pop3</b> - Post Office Protocol Version 3 <b>smtp</b> - Simple Mail Transfer <b>snmp</b> - Simple Network Management Protocol <b>tcp</b> - Transmission Control Protocol. Port number (0 - 65535) or range <b>telnet</b> - User interface to remote unit <b>udp</b> - User Datagram Protocol. Port number (0 - 65535) or range <b>wais</b> - Wide Area Information Services <b>protocol</b> - Enter a protocol number. <b>Note: for list of protocols and numbers see, Appendix D, Protocol Number in Firewall Filters.</b> {protocol-number}= number between 0-255      0= any protocol

---

Variable	Definition
<b>dest-ip-addr</b>	Enter the IP Address of the local device or network that this rule will affect. If you enter the address of a local device, this rule will affect only the session establishments of the local device and the destination address entered in the Remote IP Address/ Network field, below. The IP Address is in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255. Note: the address 0.0.0.0/0 matches any address.
<b>bits</b>	Use this field to identify the number of bits, from left to right that will be used to match the IP Address field within the data packet. Range is between 1-32.
<b>src-ip-addr</b>	Enter the IP Address of the remote device or network that this rule will affect. If you enter the address of a remote device, this rule will affect only the session establishments of the remote device and the destination address entered in the dest-ip-addr/bits command above. The IP Address is in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255. Note: the address 0.0.0.0/0 matches any address.
<b>bits</b>	Use this field to identify the number of bits, from left to right that will be used to match the IP Address field within the data packet. Range is between 1-32.

**add (router-wan) gre network**

Use the **add (router-wan) gre network** command to add a “by network” Generic Route Encapsulation (GRE) tunnel to a WAN.

**Syntax:** `add {rtr_card-addr} {"wan-name"} gre network {ip-addr mask | ip-addr/bits} {metric} {remote-ip-addr} {"tunnel-name"}`

**Example:** `add 3 "LosAngeles" gre network 10.0.0.0/8 3 2.2.2.2 "LATunnel"`

The example will set the WAN interface named “LosAngeles” in slot 3 to pass all packets destined for a host on subnet 10.0.0.0 through a GRE tunnel to 2.2.2.2.

Note: A **set 3 “LosAngeles” gre ip by network** command is required before this command.

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>wan-name</b>	The WAN interface to modify. The name must be enclosed in quotes.
<b>ip-addr mask</b>	The IP address and the subnet mask of the IP network to tunnel, each in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.
<b>ip-addr</b>	The IP Address of the IP network to tunnel, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.
<b>bits</b>	The subnet mask, specified as the number of ones bits in the mask value. Range is between 1-32.
<b>metric</b>	Enter a numeric value indicating the distance from your local network to the destination network. Valid entries range from 1 to 15.
<b>remote-ip-addr</b>	The IP address of the far end of this tunnel, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.
<b>tunnel-name</b>	A symbolic name for this tunnel. Maximum of 12 characters and must be enclosed in quotes.

**add (router-wan) nat bypass**

Use the **add (router-wan) nat bypass** command to add subnets to the list of source addresses that will not be subject to NAT translation when passing through a NAT enabled WAN interface.

**Syntax:** `add {rtr_card-addr} {"wan-name"} nat bypass  
{ip-addr mask|ip-addr/bits}`

**Example:**

The following example displays the configuration necessary to add two secondary IP subnets to the LAN that do not get NAT translation performed on them when their packets pass through the NAT on the WAN. In this example, packets leaving the "RemoteUnit" WAN whose source IP address in the 10.0.0.0 subnet will be NAT translated to 211.103.55.1 before transmission. Packets leaving the "RemoteUnit" WAN whose source IP address is in the 156.65.0.0 or 201.23.16.0 subnets will be transmitted unmodified.

```
set 1:1 ip address 10.0.0.1 255.0.0.0
add 1:1 secondary ip address 156.65.0.1 255.255.255.0
add 1:1 secondary ip address 201.23.16.1 255.255.255.0
set 1 "RemoteUnit" nat enable
set 1 "RemoteUnit" nat address 211.103.55.1 1
add 1 "RemoteUnit" nat bypass 156.65.0.0. 255.255.0.0
add 1 "RemoteUnit" nat bypass 201.23.16.0. 255.255.255.0
```

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>wan-name</b>	The WAN interface to modify. The name must be enclosed in quotes.
<b>ip-addr mask</b>	The IP address and subnet mask or host to bypass the NAT translation, each in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.
<b>ip-addr</b>	The IP address or host to bypass the NAT translation, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.
<b>bits</b>	Use this field to identify the number of bits, from left to right that will be used to match the IP Address field within the data packet. Range is between 1-32.

### ***add (router-wan) static***

Use the **add (router-wan) static** commands to add static elements on the specified WAN interface.

***add (router-wan) static ip address***

***add (router-wan) static ip network***

***add (router-wan) static ipx network***

***add (router-wan) static mac address***

***add (router-wan) static nat address***

### ***add (router-wan) static ip address***

Use the **add (router-wan) static ip address** command to add a static IP address to the table of learned addresses on the specified WAN interface. This command is typically used in bridging.

**Syntax:** `add {rtr_card-addr} {"wan-name"} static ip address {"name"}  
{ip-addr}`

**Example:** `add 3 "LosAngeles" static ip address "Pasadena"  
195.168.201.140`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>wan-name</b>	The WAN interface to modify. The name must be enclosed in quotes.
<b>name</b>	A symbolic name to help remember the purpose of this entry. Maximum of 7 characters and must be enclosed in quotes.
<b>ip-addr</b>	The IP address to add to the learned address table for the WAN, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

**add (router-wan) static ip network**

Use the **add (router-wan) static ip network** command to add a static IP network (route) to the specified WAN interface.

**Syntax:** `add {rtr_card-addr} {"wan-name"} static ip network {ip-addr} {mask} {metric}`

**Example:** `add 3 "LosAngeles" static ip network 195.168.201.0  
255.255.255.0 3`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>wan-name</b>	The WAN interface to modify. The name must be enclosed in quotes.
<b>name</b>	A symbolic name to help remember the purpose of this entry. Maximum of 7 characters and must be enclosed in quotes.
<b>ip-addr</b>	IP address of the static IP network, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.
<b>mask</b>	The mask of the static IP network, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.
<b>metric</b>	A numeric value indicating the distance from your local network to the destination network. Valid entries range from 1 to 15. (Please note that a value of 1 usually indicates a direct network).

**add (router-wan) static ipx network**

Use the **add (router-wan) static ipx network** command to add a static IPX network (route) to the specified WAN interface.

**Syntax:** `add {rtr_card-addr} {"wan-name"} static ipx network {network} {hops} {ticks}`

**Example:** `add 3 "LosAngeles" static ipx network 0x11 2 4`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>wan-name</b>	The WAN interface to modify. The name must be enclosed in quotes.
<b>network</b>	The IPX network number in HEX (0x...).
<b>hops</b>	The numeric value (of hops) indicating the distance from your Local (LAN) network to the destination network. The numeric value (of hops) indicating the distance from your Local (LAN) network to the destination network.
<b>ticks</b>	The distance between two networks as measured in time increments (1/18th of a second). Like hops, ticks may be used to designate primary and secondary routes to the same network. Although both the hops and ticks values are considered when determining routing priority, for Novell networks, the tick value is considered first.

**add (router-wan) static mac address**

Use the **add (router-wan) static mac address** command to add a static MAC address to the table of learned addresses on the specified WAN interface. This command is typically used in bridging.

**Syntax:** `add {rtr_card-addr} {"wan-name"} static mac address {"name"} {mac-addr}`

**Example:** `add 3 "LosAngeles" static mac address "JDoe" x000e09700e9cd`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>wan-name</b>	The WAN interface to modify. The name must be enclosed in quotes.
<b>name</b>	A symbolic name to help remember the purpose of this entry. This name is a maximum of 7 characters and must be enclosed in quotes.
<b>mac-addr</b>	The MAC address to add to the learned address table for the LAN, in the form a 6-octet HEX value, 0xxxxxxxxxxx. Please note that the MAC address is preceeded by a 0x.



**add (router-wan) static nat address**

Use the **add (router-wan) static nat address** command to add a static NAT bi-directional mapping to the specified WAN interface. This command will fail if NAT is not enabled, if the NAT address specified is in the NAT pool, or if the local or NAT address is not unique within the complete group of static NAT mappings.

**NOTE:** Up to 16 Static NAT addresses may be added.

**Syntax:** `add {rtr_card-addr} {"wan-name"} static nat address {local-ip-addr} {nat-ip-addr}`

**Example:** `add 3 "LosAngeles" static nat address 10.0.0.5 34.56.102.222`  
 The example will add a static NAT mapping between local IP address 10.0.0.5 to the public IP address 34.56.102.222 on the WAN interface named "LosAngeles" on the Router card in slot 3.

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>wan-name</b>	The WAN interface to modify. The name must be enclosed in quotes.
<b>local-ip-addr</b>	The IP address of the local IP host, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255
<b>nat-ip-addr</b>	The NAT public IP address, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

**add snmp group**

Use the **add snmp group** command to add a new SNMPv3 group.

**NOTE:** SNMPv3 is a keyed feature. Keys must be purchased from Force10 Networks. The Controller must be running release 9.8 or higher to support SNMPv3.

**Syntax:** `add snmp group {"group-name"}`

**Example:** `add snmp group "group1"`

Variable	Definition
<b>group-name</b>	Name for the group, up to 10 characters. Must be enclosed in quotes.

### ***add snmp view***

Use the **add snmp view** command to add a new SNMPv3 MIB view. You can add up to 10 OIDs (SNMP object identifiers) per view.

---

**NOTE:** SNMPv3 is a keyed feature. Keys must be purchased from Force10 Networks. The Controller must be running release 9.8 or higher to support SNMPv3.

---

**Syntax:** `add snmp view {"view-name"} {"OID"}`

**Example:** `add snmp view "view1" "1.3.6.1.2"`

**Example:** `add snmp view "view1" "1.3.6.1.3"`

Variable	Definition
view-name	Name for the view, up to 10 characters. Must be enclosed in quotes.
"OID"	MIB object identifier that can be accessed through this view. Must be enclosed in quotes. You can add up to 10 OIDs per view.

**add user**

Use the **add user** command to create user logins with management level access (the highest level). After adding a user, use the **set user level** command to change the user's access level as necessary.

Depending on the setting of the "password length" system variable (see **set password length**), a password may need to be assigned when the user is created:

- If password length is set to "short" (default), no password is required when a new user is added. Optionally, a 1-10 character password may be assigned to the user at creation via the password parameter, or a password may be assigned at a later time via the **set user password** command.
- If password length is set to "long," a 6-10 character password must be assigned when a new user is added to the system.

---

**NOTE:** This command is available to Manager-level users only.

---

**Syntax:** `add user {"user-name"} [password {"password"}]`

**Example:** `add user "jsmith"`

This example assumes password length is set to "short." New user "jsmith" is added without a password.

**Example:** `add user "tsmith" password "test_01"`

This example adds new user "tsmith" with the password "test\_01". (The password is optional if password length is set to "short," mandatory if password length is set to "long.")

Variable	Definition
<b>user-name</b>	<p>The user name to add to the system. The name must be enclosed in quotes and must not include blanks. The user name can include any printable character other than the following:</p> <ul style="list-style-type: none"> <li>" (quote)</li> <li>? (question mark)</li> <li>; (semi-colon)</li> </ul> <p>Maximum length is 10 characters.</p>
<b>password</b>	<p>The password to assign to the user. Optional if password length is set to "short," mandatory if password length is set to "long."</p> <p>The password must be enclosed in quotes and must not include blanks. The password can include any printable character other than the following:</p> <ul style="list-style-type: none"> <li>" (quote)</li> <li>? (question mark)</li> <li>; (semi-colon)</li> </ul>

## alarms

Use the **alarms** command to display the active alarms. The report can be filtered by address, category and/or severity (major, minor, alert). The alarms command alone, displays a full alarm report.

**Syntax:** **alarms** [**slot** | **slot:port** | **slot:port:channel**] [**category**] [**severity**]

**Example:** **alarms**

Time	Date	Severity	Description
07:35:45	01/04/2002	Major	Test Major Alarm
07:35:21	01/04/2002	Minor	Test Minor Alarm
07:34:57	01/04/2002	Critical	Test Critical Alarm
00:00:20	01/01/2002	Major	6:1-TSR Ethernet Link Down
00:00:05	01/01/2002	Major	A:2-DS1 Loss Of Signal

Total=10

Variable	Definition
<b>slot[slot:port[slot:port:channel]</b> - note this is an optional parameter.	
<b>slot</b>	A for the controller card, or 1-6 for service cards.
<b>port</b>	Port number.
<b>channel</b>	Channel number
<b>category</b> - note this is an optional parameter.	
<b>bri</b>	All BRI facility alarms.
<b>cmg</b>	All CMG Router facility alarms.
<b>ds1</b>	All DS1 facility alarms.
<b>env</b>	Environmental Alarms.
<b>equipment</b>	Equipment alarms not related to a DS1 interface.
<b>fxo</b>	All FX0 facility alarms.
<b>fxs</b>	All FXS facility alarms.
<b>rtr</b>	All Router facility alarms.
<b>tsr</b>	All Terminal Server Router facility alarms.
<b>v35</b>	All V.35 facility alarms.
<b>severity</b> - note this is an optional parameter.	
<b>alert</b>	Alert alarms (threshold crossing).
<b>critical</b>	Critical alarms.
<b>info</b>	Information alarms.
<b>major</b>	Major alarms (service effecting).
<b>minor</b>	Minor alarms (non-service affecting).

---

**clear**

---

Use the **clear** command to clear logs, performance data and tables.

***clear banner***

***clear (ds1)***

***clear (e1)***

***clear key***

***clear log***

***clear (ocudp) performance***

***clear (router) ip address table***

***clear (router) log***

***clear (router) mac address table***

***clear (router) mgcp stats***

***clear (router) performance***

**clear banner**

Use the **clear banner** command to delete SSH banner information. This command takes effect immediately.

---

**NOTE:** SSH (Secure Shell) is a keyed feature. Keys must be purchased from Force10 Networks. The Controller must be running release 9.7 or higher to support SSH.

---

**Syntax:** `clear banner`

**clear (ds1)**

Use the **clear (ds1)** command to clear specified DS1 performance data.

**Syntax:** `clear {ds1-addr} performance {setting}`

**Example:** `clear a:1 performance all`

Variable	Definition
<b>ds1-addr</b>	DS1 address in the format {slot:port}.
	<b>slot</b> A for the controller card, or 1-6 for service cards.
	<b>port</b> Port number range or all.
<b>setting</b>	<b>all</b> Clear all performance data
	<b>bes</b> Clear bes (bursty errored seconds) performance data.
	<b>css</b> Clear css (controlled slip seconds) performance data.
	<b>dm</b> Clear dm (degraded minutes) performance data.
	<b>es</b> Clear es (errored seconds) performance data.
	<b>lcv</b> Clear lcv (line code violations) performance data.
	<b>les</b> Clear les (line errored seconds) performance data.
	<b>pcv</b> Clear pcv (path code violations) performance data.
	<b>sefs</b> Clear sefs (severely errored frame seconds) performance data.
	<b>ses</b> Clear ses (severely errored seconds) performance data.
	<b>uas</b> Clear uas (unavailable seconds) performance data.

**clear (e1)**

Use the **clear (e1)** command to clear specified DS1 performance data.

**Syntax:** `clear {e1-addr} performance {setting}`

**Example:** `clear a:1 performance all`

Variable	Definition
<b>e1-addr</b>	E1 address in the format {slot:port}.
	<b>slot</b> A for the E1 controller card, or 1-6 for service cards (Quad E1).
	<b>port</b> Port number range or all.
<b>setting</b>	<b>all</b> Clear all performance data
	<b>bes</b> Clear bes (bursty errored seconds) performance data.
	<b>css</b> Clear css (controlled slip seconds) performance data.
	<b>dm</b> Clear dm (degraded minutes) performance data.
	<b>es</b> Clear es (errored seconds) performance data.
	<b>lcv</b> Clear lcv (line code violations) performance data.
	<b>les</b> Clear les (line errored seconds) performance data.
	<b>pcv</b> Clear pcv (path code violations) performance data.
	<b>sefs</b> Clear sefs (severely errored frame seconds) performance data.
	<b>ses</b> Clear ses (severely errored seconds) performance data.
	<b>uas</b> Clear uas (unavailable seconds) performance data.

**clear key**

Use the **clear key** command to remove a specific keyed feature. To acquire a feature key code, contact Force10 Networks Customer Support.

**Syntax:** `clear [rtr_card-addr] key {"key-code"}`

**Example:** `clear key "q0B8yma2IsSL+1BarY0u"`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card. This optional parameter is used for router specific keyed features.
<b>key-code</b>	The key code is entered to enable the specific feature.

### **clear log**

Use the **clear log** command to clear the event log. This will clear the log without asking for confirmation.

---

**NOTE:** This command is available to Manager-level users only.

---

**Syntax:** `clear log`

### **clear (ocudp) performance**

Use the **clear (ocudp) performance** command to clear OCU-DP status counters.

**Syntax:** `clear {ocudp-addr} performance`

**Example:** `clear 3:1 performance`

Variable	Definition
<b>ocudp-addr</b>	In the form {slot:port}.
	<b>slot</b> Slot number (1-6) that contains the OCU-DP card.
	<b>port</b> Port number, range or all.

### **clear (router) ip address table**

Use the **clear (router) ip address table** command to flush the learned entries from the IP address table for the specified interface from the specified Router card.

**Syntax:** `clear {rtr_card-addr} ip address table ["profile-name"]`

**Example:** `clear 2 ip address table`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>profile-name</b>	The name for the Router interface profile. This name must be enclosed in quotes, with a maximum of 11 characters. <b>Note: the profile-name is optional, if not specified the tables for all interfaces will be cleared.</b>



**clear (router) log**

Use the **clear (router) log** command to clear the CMG event log on the CMG card. This command applies to the CMG Router card only.

**NOTE:** This command is available to Manager-level users only.

**Syntax:** `clear {cmg_card-addr} log`

**Example:** `clear 2 log`

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG Router card.

**clear (router) mac address table**

Use the **clear (router) mac address table** command to flush the learned entries from the MAC address table for the specified interface from the specified Router card.

**Syntax:** `clear {rtr_card-addr} mac address table ["profile-name"]`

**Example:** `clear 2 mac address table "LosAngeles"`

The example will clear all the entries on the "LosAngeles" interface, MAC address table.

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>profile-name</b>	The name for the Router interface profile. This name must be enclosed in quotes, with a maximum of 11 characters. <b>Note: the profile-name is optional, if not specified the tables for all interfaces will be cleared.</b>

**clear (router) mgcp stats**

Use the **clear (router) mgcp stats** command to set all MGCP (Media Gateway Call Protocol) statistic counts to zero on the CMG card. This command applies to the CMG Router card only.

**Syntax:** `clear {cmg_card-addr} mgcp stats`

**Example:** `clear 2 mgcp stats`

The example will set all MGCP statistics counts to zero, on the CMG in slot 2.

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG Router card.

### ***clear (router) performance***

Use the **clear (router) performance** command to clear the runtime statistics that are displayed by the *status (router) performance* command. This command takes effect immediately.

**Syntax:** `clear {rtr_card-addr} performance {all | lan | wan}`

**Example:** `clear 4 performance all`

The example will clear all of the runtime statistics on the router card in slot 4.

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>all</b>	Clear both LAN and WAN statistics
<b>lan</b>	Clear the LAN statistics only.
<b>wan</b>	Clear the WAN statistics only.

---

## connect

---

Use the **connect** command to create two-way connections between any DS0 channels of the service or controller cards.

**Syntax:** **connect** {slot:port | slot:port:channel}  
{slot:port | slot:port:channel}  
Use the **disconnect** command to delete connections.

**Example:** **connect A:2:1-24 3:1**  
Connects all 24 channels on port address #2 (DS1) on the controller card (slot A) to port address #1 V.35 in slot 3.

Variable	Definition
<b>slot</b>	The slot number, A for the controller card, or 1 - 6 for service cards.
<b>port</b>	Port number or range.
<b>channel</b>	Channel number or range, for T1 ports.

Use the following variations of the **connect** command for specific applications:

**connect (bri) [4:1 mode]**

**connect (router-trunk) (t1)**

**connect (card-trunk) (card-trunk)**

**connect (router-voice) (t1|fxs)**

**connect (msr)**

### Channel Associated Signaling (CAS) Conversions

**NOTE:** E1 is not supported in this release of the Adit 600 Controller. It will be supported in a future release.

Cross-connects are done at a DS0 level. The following rules need to be kept in mind while performing cross-connects for the voice cards.

DS0	FXS Analog			E1-FXS	FXO Analog			
	LS/LSRB	GS/GSRB	GSW/GSWRB	R2	LS	GS	DPT	LSCPD
<b>E1 DS0</b>								
LS	Y	Y	N	N	Y	N	N	Y
LR2	Y	Y	N	Y	N	N	N	N
<b>VoIP Port</b>								
LS	Y	N	N	N	N	N	N	N
<b>T1 DS0</b>								
LS	Y	Y	N	N	Y	N	N	Y
GS	Y	Y	Y	N	N	Y	N	N
EMDW	Y	Y	N	N	N	N	N	N
EMI	Y	N	N	N	N	N	Y	N
EMICPD	Y	Y	N	N	N	N	N	N
EMW	Y	Y	N	N	N	N	N	N
PLAR	Y	N	N	N	N	N	N	N
TR8LSGS	Y	Y	N	N	N	N	N	N

**DPT** = Dial Pulse Termination

**EMDW** = E&M Delayed Wink start

**EMI** = E&M Immediate start

**EMICPD** = E&M Immediate Start with Calling Party Disconnect

**EMW** = E&M Wink start

**GS** = Ground Start

**GSW** = Ground Start Wink

**GSRB** = Ground Start with Reverse Battery

**GSWRB** = Ground Start Wink with Reverse Battery

**LS** = Loop Start

**LSCPD** = Loop Start Calling Party Disconnect

**LSRB** = Loop Start with Reverse Battery

**PLAR** - D4 PLAR (Private Line Automatic Ringdown)

**TR8LSGS** = TR-08 Loop Start/Ground Start

**VoIP** = Voice over IP (CMG only)

**connect (bri) [4:1 mode]**

Use the **connect (bri)** command to create two-way connections between DS0 channels of a BRI card and a controller card.

**Syntax:** `connect {slot:port:channel | slot:port}  
{slot:port:channel | slot:port}`

**Example:** `connect A:1:1 3:1 B1`  
`connect A:1:2 3:1 B2`  
`connect A:1:3 3:1 D`  
Where **B1**, **B2** or **D** indicate how the DS0 will be used.  
The **B1** and **B2** must be entered for each BRI port to be connected.

The **D** indicator applies to 4 BRI ports at a time. The groups are always ports 1-2 for a dual card, ports 1-4 for quad and octal and ports 5-8 for octal cards.

In the 3rd command in the example above, the connect command will connect BRI **D** channel for ports 1-4 (if an octal or quad card. Dual card, ports 1-2) to the DS0 specified by a A:1:3. The user will NOT need to enter the **D** channel connection for ports 2-4 on the BRI in slot 3.

In this case, `connect A:1:4 3:2 d` will fail.

Similarly `connect A:1:4 3:5 d` will connect BRI **D** channel for ports 5-8 to A:1:4.

Variable	Definition
<b>slot</b>	The slot number, A for the controller card, or 1 - 6 location of BRI card.
<b>port</b>	Port number or range.
<b>channel</b>	Channel number or range.

**connect (card-trunk) (card-trunk)**

Use the **connect (card-trunk) (card-trunk)** command for configuring card-to-card WAN cross-connects between two Router cards or between a Router card and a V.35 card.

**Syntax:** `connect {rtr_trunk-addr} {rtr_trunk-addr | v35-addr}  
{ds0-number}`

**Example:** `connect 3:1:2 4:1:3 12`  
Connects WAN trunk number 2 of a Router card in slot 3 to WAN trunk number 3 of a Router card in slot 4 using 12 DS0s.

**Example:** `connect 3:1:2 5:1 12`  
Connects WAN trunk number 2 of a Router card in slot 3 to port 1 of V.35 card in slot 5 using 12 DS0s.

Variable	Definition	
<b>rtr_trunk-addr</b>	The Router (IP, CMG or TSR) trunk address is in the form {slot:port:trunk}.	
	<b>slot</b>	The slot number (1-6) that contains the Router (CMG, IP or CMG) card.
	<b>port</b>	Port number of the TSR is 1. Note: there are 4 physical ports on the TSR, but only one logical one used for addressing.
	<b>trunk</b>	Trunk number for this port, 1-24.
<b>v35-addr</b>	The V.35 trunk address is in the form {slot:port}	
	<b>slot</b>	The slot number (1-6) that contains a V.35 card.
	<b>port</b>	Port number (1-2).
<b>ds0-number</b>	The number of DS0s to connect (1-60).	

**connect (msr)**

Use the **connect (msr)** command to assign *Link* Cross-Connects and *Line* Cross-Connects between the MSR card and the Controller or other service cards.

A Link Cross-Connect can be an all "voice" or all "data" set of DS0s. The MSR card uses Link Cross-Connects for PPP/MLPPP WANs, a PRI Trunk Group, or a CAS Trunk Group. The PPP/MLPPP Link Cross-Connects must be "data" typed. The PRI Trunk Group Link Cross-Connect must be "data" typed. The CAS Trunk Group Link Cross-Connects must be all the same type, and can only be EM Immediate, EM Delay, or EM Wink typed.

The MSR Line Cross-Connect DS0 type must be either "Loop Start" or "Ground Start" or an FXS-oriented DS0 from an FXS card or a T1/E1 device.

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**NOTE:** E1 support is scheduled for a future release of the MSR card.

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**Syntax:** `connect {msr-cc-id} {slot:port|slot:port:channel} [pri]`

**Example:** `connect 6:1:1 a:1:1-24`

Connects link 1 from the MSR card in slot 6 to 24 lines on Controller T1-1 to form a WAN.

**Example:** `connect 6:1:1:1-24 2:1:1-24`

Connects lines 1-24 from the MSR card in slot 6 to lines 1-24 of T1-1 on the Quad DS1 card in slot 2 to form a voice trunk.

Variable	Definition
<b>msr-cc-id</b>	Link or Line Cross-Connect identifier.
	Link Cross-Connect identifiers are in the form <code>{slot:1:link}</code>
	Line Cross-Connect identifiers are in the form <code>{slot:1:1:channel}</code>
	<b>slot</b> The slot number (1-6) that contains the MSR card.
	<b>link</b> Link number (1-8).
	<b>channel</b> Channel number (1-48, range, or all).
<b>slot</b>	Slot number: A for the controller card. 1 - 6 for service cards.
<b>port</b>	Port number or range.
<b>channel</b>	Channel number or range.
<b>pri</b>	Must be specified when a Link Cross-Connect is to be used for a PRI interface.

**connect (router-trunk) (t1)**

Use the **connect (router-trunk) (t1)** command to create a two-way connection (WAN) between the Router port trunk connections and any DS0 channels of the service card or Controller.

**Syntax:** **connect {slot:port|slot:port:channel} {rtr\_trunk-addr}**  
Use the **disconnect** command to delete connections.

**Example:** **connect A:2:1-12 5:1:1**  
Connects 12 channels on port address #2 (DS1) on the controller card (slot A) to trunk 1 on the Router in slot 5.

Variable	Definition	
<b>slot</b>	The slot number, A for the controller card, or 1 - 6 for service cards.	
<b>port</b>	Port number or range (port must be a T1).	
<b>channel</b>	Channel number or range, for T1 ports.	
<b>rtr_trunk-addr</b>	The Router (IP, CMG or TSR) trunk address is in the form {slot:port:trunk}.	
	<b>slot</b>	The slot number (1-6) that contains the Router (CMG, IP or TSR) card.
	<b>port</b>	Port number of the TSR is 1. <b>Note:</b> there are 4 physical ports on the TSR, but only one logical one used for addressing.
	<b>trunk</b>	Trunk number for this port, 1-24.

**connect (router-voice) (t1|fxs)**

Use the **connect (router-voice) (t1|fxs)** command to create two-way connections between the CMG voice channels and DS0 channels of an FXS or T1 service card or controller T1. The CMG only supports connections between CMG voice channels and FXS or T1 DS0s utilizing loop start signaling.

**Syntax:** **connect {cmg\_voice-addr} {slot:port|slot:port:channel}**  
Use the **disconnect** command to delete connections.

**Example:** **connect A:2:1-12 5:1:1:1-12**  
Connects 12 channels on port address #2 (DS1) on the controller card (slot A) to the first 12 voice channels on the CMG in slot 5.

Variable	Definition	
<b>cmg_voice-addr</b>	In the form {slot:voip:channel}	
	<b>slot</b>	The slot number (1-6) that contains the CMG card.
	<b>voip</b>	To designate VoIP 1:1 is used.
	<b>channel</b>	Channel number for the router is 1-48, range or all
<b>slot</b>	The slot number, A for the controller card, or 1 - 6 for service cards.	
<b>port</b>	Port number or range (port must be a T1).	
<b>channel</b>	Channel number or range, for T1 ports.	



## ***delete***

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Use the **delete** command to remove users, interfaces, services or profiles.

See the following sections for detailed information on the following **delete** commands.

***delete (ds1) ais***  
***delete (router) dhcp server option***  
***delete (router) dns proxy***  
***delete (router) remote***  
***delete (router) snmp community***  
***delete (router) snmp trap***  
***delete (router) static dns host***  
***delete (router) uploaduser***  
***delete (router-lan) filter***  
***delete (router-lan) firewall***  
***delete (router-lan) secondary ip address***  
***delete (router-lan) static***  
***delete (router-wan) firewall***  
***delete (router-wan) gre network***  
***delete (router-wan) nat bypass***  
***delete (router-wan) static***  
***delete snmp group***  
***delete snmp view***  
***delete user***

**delete (ds1) ais**

Use the **delete (ds1) ais** command to delete DS1s from the AIS DS1 list. The DS1 that is AIS enabled will be checked against the DS1s defined in the list.

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**NOTE:** If no DS1s are defined, and AIS is enabled, the default will be all the DS1s in the system. If all DS1s are removed from the list the default of all the DS1s in the system will be applied.

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**Syntax:** `delete {ds1-addr} ais {ds1-addr1}, [ds1-addr2], [ds1-addr3], [ds1-addr4]`

**Example:** `delete 1:1 ais 2:1`

Variable	Definition
<b>ds1-addr</b>	DS1 address in the form {slot:port}. <b>slot</b> - Slot number, A for the Controller card, or 1 - 6 for service cards. <b>port</b> - Port number, range or all.
<b>{ds1-addr1}, [ds1-addr2], [ds1-addr3], [ds1-addr4]</b>	Deletes a AIS DS1 list of up to 4 DS1s to be configured to trigger sending AIS.

**delete (router) dhcp server option**

Use the **delete (router) dhcp server option** command To add optional DHCP server attributes that will be advertised every time a DHCP client discovery is initiated. This provisioning takes effect immediately and can only be performed when the DHCP server is enabled.

**Syntax:** `delete {rtr_card-addr} dhcp server option {tag}`

**Example:** `add 2 dhcp server option 13`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>tag</b>	An existing tag to be removed. Use the <i>show (router) dhcp</i> command to see current options.

### ***delete (router) dns proxy***

Use the **delete (router) dns proxy** command to remove a remote DNS server address from the specified Router card. If this command is directed to delete the only a DNS proxy server address then DNS proxy is disabled.

**Syntax:** `delete {rtr_card-addr} dns proxy {ip-addr} {"profile-name"}`

**Example:** `delete 2 dns proxy 192.168.100.245 "Texas"`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>ip-addr</b>	IP address of the external DNS server, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.
<b>profile-name</b>	The profile name for the Router interface that is used to reach this destination. Name must be enclosed in quotes, with a maximum length of 11 characters.

### ***delete (router) remote***

Use the **delete (router) remote** command to delete a remote WAN profile from the WAN profile table on the specified Router card.

**Syntax:** `delete {rtr_card-addr} remote {"profile-name"}`

**Example:** `delete 6 remote "Texas"`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>profile-name</b>	The name of the remote WAN profile to delete. This name must be enclosed in quotes, with a maximum of 12 characters.

**delete (router) snmp community**

Use the **delete (router) snmp community** command to delete an SNMP community entry on the specified Router card.

**Syntax:** `delete {rtr_card-addr} snmp community {"community-name"} {ip-addr}`

**Example:** `delete 2 snmp community "commune" 192.168.100.245`  
The example will delete the previously added SNMP community named "commune" from the Router in slot 2.

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>community-name</b>	The name of an existing community, enclosed in quotes.
<b>ip-addr</b>	The IP address of the host that can access the SNMP agent via this community, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255. The address "0.0.0.0" allows any host

**delete (router) snmp trap**

Use the **delete (router) snmp trap** command to delete a trap destination from the specified Router card.

**Syntax:** `delete {rtr_card-addr} snmp trap {"community-name"} {ip-addr}`

**Example:** `delete 2 snmp trap "commune" 192.168.100.245`  
The example will delete the previously added SNMP community named "commune" from the Router in slot 2.

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>community-name</b>	The name of an existing community, enclosed in quotes.
<b>ip-addr</b>	The IP address of the destination trap to delete, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

**delete (router) static dns host**

Use the **delete (router) static dns host** command to delete a static DNS host record.

**Syntax:** `delete {rtr_card-addr} static dns host {ip-addr} {"domain-name"}`

**Example:** `delete 2 dns host 192.168.100.245 "myhost.some.net"`  
 Example will delete a DNS host entry with address 192.168.100.245 and domain named "myhost.come.net" on the Router in slot 2.

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>ip-addr</b>	The IP address of the host, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.
<b>domain-name</b>	The domain name of the host. Name must be enclosed in quotes, with a maximum length of 41 characters.

**delete (router) uploaduser**

Use the **delete (router) uploaduser** command to remove an existing host that is allowed to upload either the configuration or software files to the specified Router card.

**Syntax:** `delete {rtr_card-addr} uploaduser {all | ip-addr} {"profile-name"}`

**Example:** `delete 3 uploaduser "LosAngeles"`  
 The example will remove any user for upload of a code file from the Router interface named "LosAngeles". The Router is located in slot 3.

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>all</b>	Will delete all upload users.
<b>ip-addr</b>	Host IP address, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.
<b>profile-name</b>	The name of the remote WAN or LAN profile specified in the entry to be removed. This name must be enclosed in quotes

**delete (router-lan) filter**

Use the **delete (router-lan) filter** command to delete a single filter rule from the table of Layer 2 filters applied to the specified LAN interface.

**Syntax:** `delete {rtr_lan-addr} filter {address|custom|protocol|all} ["filter-name"]`

**Example:** `delete 2:1 filter address "Server1"`

This example will delete a previously created address filter names "Server1".

Variable	Definition
<b>rtr_lan-addr</b>	Router (IP, CMG or TSR) address is in the form {slot:port} or {slot "profile-name"}. <b>slot</b> - The slot number (1-6) that contains the Router card. <b>port</b> - Port number of the Router. <b>profile-name</b> - The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.
<b>address</b>	A previously created address filter
<b>custom</b>	A previously created custom filter
<b>protocol</b>	A previously created protocol filter
<b>all</b>	All filter rules. this options does not require a filter-name to follow
<b>filter-name</b>	A symbolic name given to identify a filter rule. This name must be enclosed in quotes, with a maximum of 8 characters.

**delete (router-lan) firewall**

Use the **delete (router-lan) firewall** command to delete a firewall rule from a LAN.

**Syntax:** `delete {rtr_card-addr} {"lan-name"} firewall {all|rule-number}`

**Example:** `delete 3 "LocalLAN" firewall all`

The example will remove all firewalls rules on the Router in slot 3, for the profile "LocalLAN".

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (CMG) card.
<b>lan-name</b>	The LAN interface to modify. The name must be enclosed in quotes.
<b>all</b>	Delete all firewall rules on this LAN
<b>rule-number</b>	The specific firewall rule to delete

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**delete (router-lan) secondary ip address**

Use the **delete (router-lan) secondary ip address** command to delete a secondary IP address and subnet to the specified LAN interface.

**Syntax:** `delete {rtr_lan-addr} secondary ip address  
{ip-addr [mask] | ip-addr/bits}`

**Example:** `delete 4:1 secondary ip address 192.168.1.1`  
The example will delete a secondary IP address of 192.168.1.1.

Variable	Definition
<b>rtr_lan-addr</b>	Router (IP, CMG or TSR) address is in the form {slot:port} or {slot "profile-name"}. <b>slot</b> - The slot number (1-6) that contains the Router card. <b>port</b> - Port number of the Router. <b>profile-name</b> - The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.
<b>ip-addr</b>	The IP address of a current secondary IP address, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.
<b>mask</b>	The mask of the secondary IP address, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255
<b>bits</b>	The subnet mask, specified as the number of ones bits in the mask value. Range is between 1-32.

***delete (router-lan) static***

Use the **delete (router-lan) static** commands to delete static elements from the LAN interface.

***delete (router-lan) static ip address***

***delete (router-lan) static ip network***

***delete (router-lan) static ipx network***

***delete (router-lan) static mac address***

***delete (router-lan) static ip address***

Use the **delete (router-lan) static ip address** command to delete a static IP address entry from the specified LAN interface.

**Syntax:** `add {rtr_lan-addr} static ip address {ip-addr}`

**Example:** `add 3:1 static ip address 195.168.201.140`

Variable	Definition
<b>rtr_lan-addr</b>	Router (IP, CMG or TSR) address is in the form {slot:port} or {slot "profile-name"}. <b>slot</b> - The slot number (1-6) that contains the Router card. <b>port</b> - Port number of the Router. <b>profile-name</b> - The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.
<b>ip-addr</b>	The IP address of the learned address table for the LAN, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255



***delete (router-lan) static ip network***

Use the **delete (router-lan) static ip network** command to delete a static IP network from the specified LAN interface.

**Syntax:** `delete {rtr_lan-addr} static ip network {ip-addr} {mask} {next-hop-ip-addr}`

**Example:** `delete 3:1 static ip network 195.168.201.0 255.255.255.0 194.120.20.15`

The example will delete the existing static IP network from the LAN interface of the Router card in slot 3.

Variable	Definition
<b>rtr_lan-addr</b>	Router (IP, CMG or TSR) address is in the form {slot:port} or {slot "profile-name"}. <b>slot</b> - The slot number (1-6) that contains the Router card. <b>port</b> - Port number of the Router. <b>profile-name</b> - The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.
<b>profile-name</b>	The IP address of the static IP network, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.
<b>ip-addr</b>	The IP address of the static IP network, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255
<b>mask</b>	The mask of the static IP network, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.
<b>next-hop-ip-addr</b>	The IP address of the next hop gateway for this route, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

**delete (router-lan) static ipx network**

Use the **delete (router-lan) static ipx network** command to delete a static IPX network (route) to the specified LAN interface.

**Syntax:** `delete {rtr_lan-addr} static ipx network {network} {next-hop-ip-addr}`

**Example:** `delete 3:1 static ipx network 0x11 0x00e09700e9cd`

The example will delete a static IPX route to network 0x11, using a next hop Router at MAC address 00:e0:97:00:e9:cd, from the LAN interface on the Router card in slot 3.

Variable	Definition
<b>rtr_lan-addr</b>	Router (IP, CMG or TSR) address is in the form {slot:port} or {slot "profile-name"}. <b>slot</b> - The slot number (1-6) that contains the Router card. <b>port</b> - Port number of the Router. <b>profile-name</b> - The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.
<b>network</b>	The IPX network number in HEX (0x...).
<b>next-hop-ip-addr</b>	The MAC address of the next hop Router, in the form a 6-octet HEX value, in the form 0xxxxxxxxxxxxx. Please note the address is preceeded by 0x

**delete (router-lan) static mac address**

Use the **delete (router-lan) static mac address** command to delete a static MAC address entry to the specified LAN interface.

**Syntax:** `delete {rtr_lan-addr} static mac address {mac-addr}`

**Example:** `delete 3:1 static mac address 0x00e09700e9cd`

The example will delete a static MAC address, 00:e0:97:00:e9:cd, from the LAN interface of the Router card in slot 5.

Variable	Definition
<b>rtr_lan-addr</b>	Router (IP, CMG or TSR) address is in the form {slot:port} or {slot "profile-name"}. <b>slot</b> - The slot number (1-6) that contains the Router card. <b>port</b> - Port number of the Router. <b>profile-name</b> - The profile name for the Router interface. Name must be enclosed in quotes, with a maximum length of 11 characters.
<b>mac-addr</b>	The MAC address to add to the learned address table for the LAN, in the form a 6-octet HEX value, xx:xx:xx:xx:xx:xx. Note: The MAC address must be preceeded by an 0x.

***delete (router-wan) firewall***

Use the **delete (router-wan) firewall** command to delete a firewall rule from a WAN.

**Syntax:** `delete {rtr_card-addr} {"wan-name"} firewall  
{all | rule-number}`

**Example:** `delete 3 "LosAngeles" firewall all`

The example will remove all firewalls rules on the Router in slot 3, for the profile "LosAngeles".

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>wan-name</b>	The WAN interface to modify. The name must be enclosed in quotes.
<b>all</b>	Delete all firewall rules on this WAN
<b>rule-number</b>	The specific firewall rule to delete

***delete (router-wan) gre network***

Use the **delete (router-wan) gre network** command to delete a "by network" GRE tunnel to a WAN.

**Syntax:** `delete {rtr_card-addr} {"wan-name"} gre network  
{ip-addr mask | ip-addr/bits}`

**Example:** `delete 3 "LosAngeles" gre network 10.0.0.0/8`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>wan-name</b>	The WAN interface to modify. The name must be enclosed in quotes.
<b>ip-addr mask</b>	The IP address and the subnet mask of the IP network to tunnel, each in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.
<b>ip-addr</b>	The IP Address of the IP network to tunnel, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.
<b>bits</b>	The subnet mask, specified as the number of ones bits in the mask value. Range is between 1-32.

***delete (router-wan) nat bypass***

Use the **delete (router-wan) nat bypass** command to delete an IP subnet or host from the list of the source addresses that will not be subject to NAT Translation when passing through a NAT enabled WAN interface.

**Syntax:** `delete {rtr_card-addr} {"wan-name"} nat bypass {ip-addr}`

**Example:** `delete 1 "RemoteUnit" nat bypass 156.65.0.0`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>wan-name</b>	The WAN interface to modify. The name must be enclosed in quotes.
<b>ip-addr</b>	The IP Address of the Host to delete, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

***delete (router-wan) static***

Use the **delete (router-wan) static** commands to delete a static element from the WAN interface.

***delete (router-wan) static ip address***

***delete (router-wan) static ip network***

***delete (router-wan) static ipx network***

***delete (router-wan) static mac address***

***delete (router-wan) static nat address***

***delete (router-wan) static ip address***

Use the **delete (router-wan) static ip address** command to delete a static IP address on the specified WAN interface.

**Syntax:** `delete {rtr_card-addr} {"wan-name"} static ip address {ip-addr}`

**Example:** `delete 3 "LosAngeles" static ip address 195.168.201.140`

The example will delete a static IP address, 192.168.201.140 from the WAN interface named "LosAngeles" on the Router card in slot 3.

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>wan-name</b>	The WAN interface to modify. The name must be enclosed in quotes.
<b>ip-addr</b>	The IP Address to delete from the WAN, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

***delete (router-wan) static ip network***

Use the **delete (router-wan) static ip network** command to delete a static IP network from the specified WAN interface.

**Syntax:** `delete {rtr_card-addr} {"wan-name"} static ip network {ip-addr} {mask}`

**Example:** `delete 3 "LosAngeles" static ip network 195.168.201.0  
255.255.255.0`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>wan-name</b>	The WAN interface to modify. The name must be enclosed in quotes.
<b>ip-addr</b>	The IP Address of the static IP network.
<b>mask</b>	Mask of the static IP network.

***delete (router-wan) static ipx network***

Use the **delete (router-wan) static ipx network** command to delete a static IPX network (route) to the specified WAN interface.

**Syntax:** `delete {rtr_card-addr} {"wan-name"} static ipx network {network}`

**Example:** `delete 3 "LosAngeles" static ipx network 0x11`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>wan-name</b>	The WAN interface to modify. The name must be enclosed in quotes.
<b>network</b>	The IPX network number in HEX (0x...).

***delete (router-wan) static mac address***

Use the **delete (router-wan) static mac address** command to delete a static MAC address entry from the specified WAN interface.

**Syntax:** `delete {rtr_card-addr} {"wan-name"} static mac address {mac-addr}`

**Example:** `delete 3 "LosAngeles" static mac address 0x00e09700e9cd`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>wan-name</b>	The WAN interface to modify. The name must be enclosed in quotes.
<b>mac-addr</b>	MAC address to add to the learned address table for the LAN, in the form a 6-octet HEX value, 0xxxxxxxxxxx. Please note that the MAC address is preceeded by a 0x

***delete (router-wan) static nat address***

Use the **delete (router-wan) static nat address** command to delete a static NAT mapping from the specified WAN interface.

**Syntax:** `delete {rtr_card-addr} {"wan-name"} static nat address {local-ip-addr} {nat-ip-addr}`

**Example:** `delete 3 "LosAngeles" static nat address 10.0.0.5  
34.56.102.222`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>wan-name</b>	The WAN interface to modify. The name must be enclosed in quotes.
<b>local-ip-addr</b>	IP address of the local IP host.
<b>nat-ip-addr</b>	The NAT public IP address.

---

### ***delete snmp group***

Use the **delete snmp group** command to delete an SNMPv3 group.

---

**NOTE:** SNMPv3 is a keyed feature. Keys must be purchased from Force10 Networks. The Controller must be running release 9.8 or higher to support SNMPv3.

---

**Syntax:** `delete snmp group {"group-name"}`

**Example:** `delete snmp group "group1"`

Variable	Definition
group-name	Name of the group to be deleted. Must be enclosed in quotes.

### ***delete snmp view***

Use the **delete snmp view** command to delete an SNMPv3 MIB view.

---

**NOTE:** SNMPv3 is a keyed feature. Keys must be purchased from Force10 Networks. The Controller must be running release 9.8 or higher to support SNMPv3.

---

**Syntax:** `delete snmp view {"view-name"}`

**Example:** `delete snmp view "view1"`

Variable	Definition
view-name	Name of the view to be deleted. Must be enclosed in quotes.

### ***delete user***

The **delete user** command removes a user created by the **add user** command.

---

**NOTE:** This command is available to Manager-level users only.

---

**Syntax:** `delete user {"user-name"}`

**Example:** `delete user "jsmith"`

Variable	Definition
user-name	The user-name is an existing user ID in the system. This name must be enclosed in quotes.

## disconnect

### disconnect

Remove a connection created using the **connect** command.

**Syntax:** `disconnect`  
`{slot|slot:port|slot:port:channel|slot:port:trunk}`

**Example:** `disconnect A:2:1-24 3:1`  
 Disconnects all 24 channels on port address #2 (DS1) on the controller card (slot A) to port address #1 V.35 in slot 3.

**NOTE:** The operator can remove connections for all of a slot {slot}, a port within a slot {slot:port}, or for specific channel {slot:port:channel}

Variable	Definition
<b>slot</b>	The slot number, A for the controller card, or 1 - 6 for service cards.
<b>port</b>	Port number or range.
<b>channel</b>	Channel number or range, for T1/E1 ports.
<b>trunk</b>	Trunk number for this port, 1-24.

### disconnect (msr)

Remove Link and Line Cross-Connects between the MSR card and the Controller or other service cards.

**Syntax:** `disconnect {msr-cc-id}`

**Example:** `disconnect 6`  
 Disconnects all Line and Link Cross-Connects on the MSR card in slot 6.

**Example:** `disconnect 6:1:1`  
 Disconnects link 1 on the MSR card in slot 6.

**Example:** `disconnect 6:1:1:1-8`  
 Disconnects lines 1-8 on the MSR card in slot 6.

Variable	Definition
<b>msr-cc-id</b>	Link or Line Cross-Connect identifier.
	Link Cross-Connect identifiers are in the form <code>{slot:1:link}</code>
	Line Cross-Connect identifiers are in the form <code>{slot:1:1:channel}</code>
	<b>slot</b> The slot number (1-6) that contains the MSR card.
	<b>link</b> Link number (1-8).
	<b>channel</b> Channel number (1-48, range, or all).



---

## exit

---

Use the **exit** command to log out of the Command Line Interface (CLI).

**Syntax:** `exit`

**Example:** `> exit`

Logging out of Force10 Networks - Adit Product Line

---

## install

---

### **install (slot) router**

The Adit 600 Controller card automatically creates a backup of the configuration of any Router cards in their respective slot. If a Router is removed and replaced with a another Router (same type) the backup of the configuration from the first occupying Router card is loaded onto the replacing Router card. This command will stop this function and the replacing Router will retain its configuration.

**Syntax:** `install {slot} {cmg|router|tsr}`

**Example:** `install 5 router`

Variable	Definition
<b>slot</b>	The slot number (1-6) location of the router.
<b>cmg</b>	Install a CMG Router card.
<b>router</b>	Install an IP Router card.
<b>tsr</b>	Install a Terminal Server Router card.

To replace a router card in slot 5 and retain its loaded configuration file:

1. Remove current router card in slot 5 of the system.
2. With the CLI command enter:  

```
> install 5 router
ok
```
3. When an “ok” is displayed the replacement router card may be inserted into slot 5.

## **load**

---

---

**WARNING!** BEFORE LOADING A DOWN-LEVEL VERSION OF ROUTER CODE TO AN ADIT, SAVE THE CONFIGURATION TO A FILE. CONFIGURATION MAY BE RESET TO THE DEFAULT SETTING AND CURRENT CONFIGURATION LOST.

---

***load scp***

***load tftp***

***load xmodem***

**IMPORTANT:** Starting with Adit 600 release 9.6, two upgrade files are provided for each Controller release: a "large" and a "small" file. The files are named:

- `tdmn_z_all.mgm` (where *n* is the release number)
- `Large_tdmn_z_all.mgm` (where *n* is the release number)

To upgrade your Controller using the "large" file, the Controller must have 16MB of memory. Early versions of the Adit 600 Controller use 8MB of memory. For these Controllers, you must upgrade using the "small" file. Be aware that the "small" file does not provide all of the features available with the "large" file. These are typically keyed features used for specific applications. If you do not require these features, the "small" file is sufficient for the upgrade.

When upgrading the Controller, please follow these guidelines:

- **Upgrading from release 9.6 or above:**

Before upgrading, check the memory size using the following command:

```
status equipment a
```

The memory size is shown as RAM=16M or RAM=8M.

If the RAM is 16M, you can load the "large" file. If the RAM is 8M, you must load the "small" file.

- **Upgrading from a release below 9.6:**

You must first load the "small" upgrade file first, regardless of memory size. After loading the "small" file, check the memory size as described above. If the RAM is 16M, you can proceed to load the "large" upgrade file, if desired. If the RAM is 8M, you will not be able to load the "large" file.

**load scp**

Use the **load scp** command to load a file (configuration or code image) via SCP (secure copy) to the Controller or MSR card. SCP requires an SSH connection. See *store scp* on page 5-341 for information about using SCP to save Controller or MSR files to a PC.

**NOTE:** SSH (Secure Shell) is a keyed feature. Keys must be purchased from Force10 Networks. The Controller must be running release 9.7 or higher to support SSH.

**Syntax:** `load [msr_card-addr] scp user {"user-name"} password {"password"} {ip-addr} {"file-name"}`

**Example:** `load 5 scp user "admin" password "1234" 192.168.43.52  
"adit_MSR_2_0_0_13.rmt"`

```
Filename:  adit_MSR_2_0_0_13.rmt
User name:  admin
Source IP Address:  192.168.43.52
Target IP Address:  192.168.3.194
Target Card Slot:   5
Target Card Type:   MSRx1
```

'load scp' will be executed with the above parameters.  
A SCP server must be running on the host system.

Do you really want to do this? y

Card software download in progress. Please be patient...

Variable	Definition
<b>msr_card-addr</b>	Slot number (1 to 6) of the MSR card. If no slot is specified, the file is loaded to the Controller.
<b>user-name</b>	User name for SCP authentication. Must be enclosed in quotation marks.
<b>password</b>	Password for SCP authentication. Must be enclosed in quotation marks.
<b>ip-addr</b>	Host IP address in the form of xxx.xxx.xxx.xxx, where xxx is a number from 1 to 255. If not supplied, the host IP address from the database will be used.
<b>file-name</b>	The software file to load, including path. Must be enclosed in quotes.  For the Controller, the file type must be: .mgm (software) .cfg (configuration) .txt (script)  For the MSR card, the file type must be: .cfg (configuration) .rmt (application image) .img (rgloader boot image)

### **load tftp**

The **load tftp** command downloads a file (software, configuration, text, country ring tone, SSH key, SSH banner) via TFTP to the Controller or a Router card. See *store tftp* on page 5-342 for information on saving a router's configuration file via TFTP.

A TFTP server must be running on the host system. You can use any TFTP server utility you wish. One example is the program "TFTPD32" which can be downloaded free-of-charge at [tftpd32.jounin.net/tftpd32.html](http://tftpd32.jounin.net/tftpd32.html).

---

**NOTE:** Country ring tones can only be loaded to a CMG Router card.

---

---

**NOTE:** SSH (Secure Shell) is a keyed feature. Keys must be purchased from Force10 Networks. The Controller must be running release 9.7 or higher to support SSH.

---

**Syntax:** `load [rtr_card-addr] tftp {ip-addr} {"file-name" | "ssh-key-file-name" | "ssh-banner-file-name"}`

**Example:** `load 5 tftp 192.168.43.52 "tdm6_1_z_all.mgm"`

Filename: tdm6\_1\_z\_all.mgm

Host IP Address: 192.168.43.52

Target IP Address: 192.168.3.194

'load tftp' will be executed with the above parameters.

Download to Active controller:

Type ACTIVE Software Release Key, or Hit 'Enter' for Non-Keyed Load:

**Example:** `load 5 tftp 192.168.43.52 "router_backup.cfg"`

The example loads the Router configuration file "router\_backup.cfg" to the Router in slot 5.

**Example:** `load 5 tftp 192.168.43.52 "brazil.tdb"`

The example loads tones for Brazil to the CMG Router card in slot 5.

**Example:** `load 5 tftp 192.168.43.52 "config.txt"`

The load tftp command is modified to add special processing when a filename ends with "txt". In this case, the .txt file is handled as an ASCII file containing CLI commands to configure the Adit 600.

**Example:** `load tftp 192.168.43.52 "BoulderManufactDSAPRIVHOST.CPK"`

The example loads a DSA private host key to the Controller.

**Example:** `load tftp 192.168.43.52 "AditBanner.ban"`

The example loads a custom banner file to the Controller.

Variable	Definition
<b>rtr_card-addr</b>	Slot number (1-6) that contains the Router card. <b>Note:</b> An optional parameter, if a slot number is not defined, the file is downloaded to the Controller.
<b>ip-addr</b>	Host IP Address. If not defined the host IP address from the database will be used.
<b>file-name</b>	The software file to load, including path. Must be enclosed in quotes.  The file type must be: .mgm (software) .tdb (country tones) .cfg (configuration) .txt (script) .rmt (MSR card - application image) .img (MSR card - rgloader boot image)
<b>ssh-key-file-name</b>	The SSH DSA, RSA, or RSA1 key file to load, including path. Must be enclosed in quotes. Key files must be named as follows: <ul style="list-style-type: none"> <li>• DSA Private Host Key: "xxxxxxdsaprivhost.cpk"</li> <li>• DSA Public Host Key: "xxxxxxdsapubhost.cpk"</li> <li>• RSA Private Host Key: "xxxxxxrsaprivhost.cpk"</li> <li>• RSA Public Host Key: "xxxxxxrsapubhost.cpk"</li> <li>• RSA1 Private Host Key: "xxxxxxrsa1privhost.cpk"</li> <li>• RSA1 Public Host Key: "xxxxxxrsa1pubhost.cpk"</li> <li>• DSA Public User Key: "xxxxxxdsapubuser.cpk"</li> <li>• RSA Public User Key: "xxxxxxrsapubuser.cpk"</li> <li>• RSA1 Public User Key: "xxxxxxrsa1pubuser.cpk"</li> </ul> <p>xxxxxx can be up to 30 characters, no spaces.</p> <p><b>Note:</b> The public and private keys should always be a matched pair set. Typically the private key is entered first, followed by the public related key.</p>
<b>ssh-banner-file-name</b>	The banner file to load, including path. Must be enclosed in quotes. The file type must be .ban. The banner file is a custom text file that can contain up to 240 characters. The banner can be used to warn against unauthorized access and use at login. The default is no banner.

### **load xmodem**

Use the **load xmodem** command to download software via Xmodem. This command is only available with RS-232 connections. If you are using Telnet, see *load tfip* command.

**Example:** `load xmodem`

Download to Active controller using xmodem.

Type ACTIVE Software Release Key, or Hit 'Enter' for Non-Keyed Load:

>>>

At the prompt enter Software Key or [Enter] to download non-keyed version.

load xmodem command will be executed  
Do you really want to do this?

Enter Y at the prompt to continue, or N to cancel the download.

Y - the system will prompt you to select the appropriate local file. With the file selected, the system will complete the download, reboot, and run the installation for flash upgrade. Screen example following.

```
**** System Boot ****
Copyright 2008 Force10 Networks Inc.
XMODEM transfer started
Validating image(fast).....SUCCEEDED!
Erasing FLASH:.....Finished Erasing FLASH!
Erasing FLASH:.....Finished Erasing FLASH!
Programming Flash.....SUCCEEDED!
In 5 seconds the system will boot from Flash
Press any key to stop boot . 5 . 4 . 3 . 2 . 1 . 0
Looking for valid application image in Flash...
Executing application image from Flash
Attached TCP/IP interface to cpm unit 0
Attaching interface lo0...done
ADIT startup
```

## log

### log

Displays the event log. Where the optional variables used to narrow down the log displayed. The log command without any options displays a full log.

**Syntax:** log [slot|slot:port|slot:port:channel] [category]  
[severity]

**Example:** log

```

Time      Date      Severity Description
00:00:15 01/01/2002 Major    4:1-CMG Ethernet Link Down
00:00:12 01/01/2002 Info     3-FX0x8 Card Detected
00:00:06 01/01/2002 Major    A:2-DS1 Loss Of Signal
00:00:05 01/01/2002 Info     4-CMGx1 Card Detected
00:00:02 01/01/2002 Info     A-T1x2 Card Detected
00:00:02 01/01/2002 Info     System Powerup
Total=6

```

Variable	Definition	
<b>slot</b>	The slot number, A for the controller card, or 1-6 for service cards.	
<b>port</b>	Port number (not a range).	
<b>channel</b>	Channel number or range.	
<b>category</b>	The slot number, A for the controller card, or 1-6 for service cards.	
	bri	All BRI facility events.
	cmg	ALL CMG Router facility events
	dsl	All DS1 facility events.
	env	Environmental events.
	equipment	Equipment events not related to a DS1 interface.
	fxo	All FXO facility events.
	fxs	All FXS facility events.
	rtr	All IP Router facility events.
	tsr	All Terminal Server Router facility events.
	v35	All V.35 facility events.
<b>severity</b>	The slot number, A for the controller card, or 1-6 for service cards.	
	alert	Alert events (threshold crossing)
	critical	Critical events
	info	Information events
	major	Major events (service effecting)
	minor	Minor events (non-service affecting)

### **ping**

---

#### **ping**

Use the **ping** command to perform a ping test from the Controller and report the result. If the host is reachable, each individual response will be displayed.

**Syntax:** `ping {ip-addr} [count] [length]`

**Example:** `ping 192.168.3.196 7 5000`

```
Pinging 192.168.3.196 with 5000 bytes of data:
```

```
Reply from 192.168.3.196: bytes=5000 time=90ms
Reply from 192.168.3.196: bytes=5000 time=144ms
Reply from 192.168.3.196: bytes=5000 time=186ms
Reply from 192.168.3.196: bytes=5000 time=90ms
Reply from 192.168.3.196: bytes=5000 time=90ms
Reply from 192.168.3.196: bytes=5000 time=90ms
Reply from 192.168.3.196: bytes=5000 time=90ms
```

```
> ping 192.168.10.196 7 5000
PING 192.168.10.196: 5000 data bytes
no answer from 192.168.10.196
```

```
> ping 192.168.10.196 1
192.168.10.196 is alive
```

Variable	Definition
<b>ip-addr</b>	The host IP address of the device to query, in the form of xxx.xxx.xxx.xxx, where xxx is a number from 0-255
<b>count</b>	This optional parameter sets the number of pings to send. Range is 1 to 32, default is 5.
<b>length</b>	This optional parameter sets the number of bytes to send in the ICMP echo request payload. Range is 0 to 8000, default is 56.



---

## **print**

---

Use the **print** command to display the help information or print the configuration file.

**Syntax:** **print {config|help}**

### **print config**

Print the configuration file for the Adit 600. The operator may then save this to a text file, which can be sent to another Adit 600 to automatically configure the system.

**Syntax:** **print config [rtr\_card-addr]**

**Example:** **print config 5**

```
-set verification off
-set 5 password view {password} is manual
-set 5 password config {password} is manual
-set 5 password admin {password} is manual
-set 5 enhanced security enable is manual
-set 5 password security {password} is manual
delete 5 remote "RemoteUnit"
rename 5 "LocalUnit" "LocalAdit"
set 5:1 ip address 192.168.3.195 255.255.255.0
set 5:1 up
add 5 remote "RemoteAdit"
reset 5
```

**Example:** **print config**

This example would produce a configuration file of the Controller.

1. While in a Telnet session to an Adit 600 select Terminal/Start Logging.
2. Name the file.
3. Type the CLI command **print config**.
4. Select Terminal/Stop Logging.

See *Load Controller Configuration on page 24-6* for instructions to reload configuration to Controller.

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router card. This is an optional parameter, if a slot is not defined, the download will be to the Controller.

### **print help**

Print the complete help file to the screen.

**Syntax:** **print help**

**Example:** **print help**

This example would print the entire help text, which can be scrolled though with Enter or Spacebar.

### **rename (router)**

---

Use the **rename (router)** command to change the name of a local LAN or remote WAN profile on the specified Router card. Profile names cannot contain spaces and must be unique on a particular Router card.

**Syntax:** `rename {rtr_card-addr} {"old-profile-name"} {"new-profile-name"}`

**Example:** `rename 6 "Chicago" "Milwaukee"`

This example will change the name of the WAN profile from "Chicago" to "Milwaukee", for the Router in slot 6.

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>old-profile-name</b>	The current LAN or WAN profile name. This name must be enclosed in quotes.
<b>new-profile-name</b>	The new profile name of a LAN or WAN profile. This name has a maximum length of 11 characters, and must be enclosed in quotes.

---

## reset

---

### reset

Use the **reset** command to reboot the system.

**Syntax:** `reset`

**Example:** `reset`

```
Do you really want to reset (y/n)? y
      **** System Boot ****
Copyright 2008 Force10 Networks Inc.
```

---

**WARNING!** THE RESET COMMAND IS A SERVICE AFFECTING COMMAND.

---

### reset (router)

Use the **reset (router)** command to reboot the router. All new configuration since the last reset will be in use.

---

**NOTE:** For most router configuration changes to go into effect, the router must be reset. Best practice is to always reset the router after making configuration changes.

---

**Syntax:** `reset {rtr_card-addr}`

**Example:** `reset 1`

```
Do you really want to do this ?    y
OK
The example will reboot the Router card in slot 1.
```

Variable	Definition
<code>rtr_card-addr</code>	The slot number (1-6) that contains the Router card.

### ***reset (router) coldboot***

Use the **reset (router) coldboot** command to reboot the Router. This will reboot including a power cycle to the Router card.

**Syntax:** `reset {rtr_card-addr} coldboot`

**Example:** `reset 2 coldboot`  
OK

The example will coldboot the Router card in slot 2.

Variable	Definition
<code>rtr_card-addr</code>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.

## ***restore***

---

Use the restore command to restore system properties.

**Note:** To restore Router defaults see *set (router) default*.

### ***restore defaults***

Use the **restore defaults** command to load factory defaults for all settings. This command will not take effect until the system is rebooted using the **reset** command.

---

**NOTE:** This command is available to Manager-level users only.

---

**Syntax:** `restore defaults`

**Example:** `restore defaults`

For the restore default changes to take effect send a **reset** command. Further configuration changes made before a **reset** will be lost.

## *rtrping*

Use the **rtrping** command to request that the Router perform a ping test and report the result.

**Syntax:** `rtrping {rtr_card-addr} {dest-ip-addr|"domain-name"}  
[count] [count length] [count length source-ip-addr]`

**Example:** `rtrping 4 192.168.100.97`

```
> rtrping 4 192.168.100.97
Pinging 192.168.100.97 with 56 bytes of data:

Reply from 192.168.100.97: bytes=56 time<10ms
Reply from 192.168.100.97: bytes=56 time<10ms
Reply from 192.168.100.97: bytes=56 time<10ms
Reply from 192.168.100.97: bytes=56 time<10ms
Reply from 192.168.100.97: bytes=56 time<10ms

> rtrping 4 192.168.103.239
Pinging 192.168.103.239 with 56 bytes of data:

no answer from 192.168.103.239
```

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>dest-ip-addr</b>	The IP Address of the IP network to tunnel, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.
<b>domain-name</b>	The domain name to use for this query. Name has a maximum of 43 characters, enclosed in quotes. Example: rtrping 3 "www.force10networks.com"
<b>count</b>	This optional parameter sets the number of pings to send. Range is 1 to 32, default is 5.
<b>length</b>	This optional parameter sets the number of bytes to send in the ICMP echo request payload. Range is 0 to 8000, default is 56
<b>source-ip-addr</b>	Override the IP address that will be used as the source IP address in the ICMP echo request, must be one of the router interface IP addresses. Default is to use the IP address of the interface from which the ping is sent. The IP address, in the form of xxx.xxx.xxx.xxx, where xxx is a number from 0-255.

## set

---

<b>set (4-wire e&amp;m)</b>	<b>set (p-phone)</b>
<b>set alarms</b>	<b>set radius</b>
<b>set autoexit</b>	<b>set (router) autologout</b>
<b>set (bri)</b>	<b>set (router) cdr</b>
<b>set clock</b>	<b>set (router) compander</b>
<b>set date</b>	<b>set (router) default</b>
<b>set (ds0)</b>	<b>set (router) dhcp</b>
<b>set (ds1)</b>	<b>set (router) dialplan timeout</b>
<b>set (ds1 card)</b>	<b>set (router) dns</b>
<b>set (e1)</b>	<b>set (router) dns server</b>
<b>set (e1 card) spantype</b>	<b>set (router) enhanced security</b>
<b>set ethernet ip address</b>	<b>set (router) hookflash</b>
<b>set (fxo)</b>	<b>set (router) lmi</b>
<b>set (fxs)</b>	<b>set (router) lmi poll</b>
<b>set (fxs8D/fxs8C/fxs8B/fxs8A/fxs5G)</b>	<b>set (router) log</b>
<b>set (fxsINTL)</b>	<b>set (router) login auth</b>
<b>set (fxsPS)</b>	<b>set (router) login prompt</b>
<b>set id</b>	<b>set (router) mgcp</b>
<b>set idle</b>	<b>set (router) network info</b>
<b>set ip gateway</b>	<b>set (router) ntp</b>
<b>set ipds0</b>	<b>set (router) password</b>
<b>set key</b>	<b>set (router) port</b>
<b>set local</b>	<b>set (router) ppp auth</b>
<b>set login auth</b>	<b>set (router) ppp security</b>
<b>set login max attempts</b>	<b>set (router) priority tos</b>
<b>set login support</b>	<b>set (router) proxy</b>
<b>set (msr-intf-id) up/down</b>	<b>set (router) reboot</b>
<b>set notes</b>	<b>set (router) rip</b>
<b>set ntp</b>	<b>set (router) snmp</b>
<b>set (ocudp)</b>	<b>set (router) stp</b>
<b>set password length</b>	<b>set (router) syslog</b>

<i>set (router) time daylight savings</i>	<i>set (router-voice) signaling</i>
<i>set (router) voip</i>	<i>set (router-voice) silence</i>
<i>set (router-lan) collision</i>	<i>set (router-voice) slash</i>
<i>set (router-lan) filter forward</i>	<i>set (router-voice) tos</i>
<i>set (router-lan) framing</i>	<i>set (router-voice) txgain</i>
<i>set (router-lan) gateway</i>	<i>set (router-voice) up</i>
<i>set (router-lan) ip address</i>	<i>set (router-wan) dlci</i>
<i>set (router-lan) ipx network</i>	<i>set (router-wan) firewall allowfrags</i>
<i>set (router-lan) phy</i>	<i>set (router-wan) gre</i>
<i>set (router-lan) rip</i>	<i>set (router-wan) ip</i>
<i>set (router-lan) stp</i>	<i>set (router-wan) ip address</i>
<i>set (router-lan) up/down</i>	<i>set (router-wan) ipx</i>
<i>set (router-trunk) encapsulation</i>	<i>set (router-wan) mlppp</i>
<i>set (router-trunk) multilink group</i>	<i>set (router-wan) nat</i>
<i>set (router-trunk) speed</i>	<i>set (router-wan) other</i>
<i>set (router-trunk) up/down</i>	<i>set (router-wan) ppp</i>
<i>set (router-trunk) voice bandwidth limit</i>	<i>set (router-wan) rip</i>
<i>set (router-voice) algorithm preference</i>	<i>set (router-wan) stp</i>
<i>set (router-voice) cpd</i>	<i>set (router-wan) trunk</i>
<i>set (router-voice) default</i>	<i>set (router-wan) up/down</i>
<i>set (router-voice) dialplan timeout</i>	<i>set (rs232)</i>
<i>set (router-voice) down</i>	<i>set screen</i>
<i>set (router-voice) dtmfrelay</i>	<i>set snmp</i>
<i>set (router-voice) echo cancellation</i>	<i>set ssh</i>
<i>set (router-voice) echo tail</i>	<i>set syslog</i>
<i>set (router-voice) endpoint prefix</i>	<i>set telnet</i>
<i>set (router-voice) endpoint suffix</i>	<i>set time</i>
<i>set (router-voice) fax</i>	<i>set time daylight savings</i>
<i>set (router-voice) log start</i>	<i>set user</i>
<i>set (router-voice) log stop</i>	<i>set (v35)</i>
<i>set (router-voice) modem</i>	<i>set (v54)</i>
<i>set (router-voice) rfc2833</i>	<i>set verification</i>
<i>set (router-voice) rxgain</i>	

**set (4-wire e&m)**

Use the **set (4-wire e&m)** command to setup channels of an 4-Wire E&M/TO service card.

**Syntax:** `set {4we&m-addr} {rxgain | signal | txgain | type}`

**Example:** `set 3:1 signal gs`  
Set the FXS port 1 on slot 3 to signaling type ground start.

**Example:** `set 3:1-8 txgain -5`  
Sets the ports 1-8 on slot 3 to transmit level range to -5 db.

Variable	Definition	
<b>4we&amp;m-addr</b>	Channels to apply setting to, in the form of {slot:port}. <b>slot</b> - Slot number 1 - 6, location of the 4Wire E&M card <b>port</b> - Port number or range.	
<b>rxgain</b>	The Receive direction is Network to Analog, with a range of -16 to +8.5 (dB), in increments of .25dB. Default is 7dB.	
<b>signal</b>	Set the DS0 signaling type	
	<b>emdw</b>	E&M delayed wink start.
	<b>emi</b>	E&M immediate start with ringback.
	<b>emicpd</b>	E&M immediate start with calling party disconnect with ringback
	<b>emw</b>	E&M wink start
<b>txgain</b>	The Transmit direction is Analog to Network, with a range of -7 to +17.5 (dB), in increments of .25dB. Default setting is 16dB.	
<b>type</b>	<b>Data</b> - Port is set to data when in TO mode. Note: The DSO also needs to be set to <b>type data</b> , and the jumpers must be set to the TO state.	
	<b>Voice</b> - Port is to carry voice traffic. Voice is the default.	

**set alarms**

Use the **set alarms** command to manually set an alarm state for testing.

**Syntax:** `set alarms {critical | major | minor} {off | on}`

**Example:** `set alarms critical on`  
The example set the alarm state of critical on.

Variable	Definition
<b>critical</b>	Sets a critical alarm
<b>major</b>	Sets a major alarm.
<b>minor</b>	Sets a minor alarm.
<b>off</b>	Disables the alarm state.
<b>on</b>	Enable the alarm state.



**set autoexit**

Use the **set autoexit** to set the autoexit feature.

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**NOTE:** This command is available to Manager-level users only.

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**Syntax:** `set autoexit {off|on}`

**Example:** `set autoexit on`

The example will enable the auto-exit feature.

Variable	Definition
<b>off</b>	Turn off the automatic logout option.
<b>on</b>	Enable the automatic exit option. Users will be automatically logged off after 20 minutes of inactivity.

**set (bri)**

Use the **set (bri)** commands to setup the ISDN BRI card.

**set (bri) autoactivate**

**set (bri) pmsync**

**set (bri) crv**

**set (bri) threshold**

**set (bri) down**

**set (bri) up**

**set (bri) mode**

**set (bri) autoactivate**

Use the **set (bri) autoactivate** command to set the auto-activate option for the card. This option can only be enabled while in 4 to 1 TDM LT Mode.

This option is used to establish the D channel when the FDL link can not be used. If Auto-activation is enabled, all commands initiated by the Switch and normally processed over the FDL will be ignored, commands to control Loop Back or Corrupt CRC tests will also be ignored. The Adit 600 will not be capable of reporting to the Switch any changes in the ISDN line status, such as Loss of Signal, on an automatically activated line. Status changes and alarms will be available through Adit 600 CLI.

**Syntax:** `set {bri_card-addr} autoactivate {off|on}`

**Example:** `set 3 autoactivate on`

To set the auto-activate on for the card in slot 3.

Variable	Definition
<b>bri_card-addr</b>	The slot number (1-6) that contains the BRI card.
<b>off</b>	Turn off the automatic-activation feature
<b>on</b>	Enable the automatic-activation feature

**set (bri) crv**

Use the **set (bri) crv** command to set the Call Reference Value when the ISDN BRI card is set to 4:1 mode (lt4to1tdm).

**Syntax:** `set {bri-addr} crv {value}`

**Example:** `set 3:4 crv 24`

Variable	Definition
<b>bri-addr</b>	The {slot:port} address of the BRI card you want to apply the changes to. <b>slot</b> - Slot number 1 - 6, location of the BRI card <b>port</b> - Port number or range.
<b>value</b>	The CRV value is between 1-768. A value of 0 deactivates the ISDN BRI line. <b>Note: The CRV value for the BRI ports MUST be set the same by both the Adit 600 and the Access Navigator.</b>

**set (bri) down**

Use the **set (bri) down** command to set the ISDN BRI line Out-of-Service.

**Syntax:** `set {bri-addr} down`

**Example:** `set 3:4 down`

Variable	Definition
<b>bri-addr</b>	The {slot:port} address of the BRI card you want to apply the changes to. <b>slot</b> - Slot number 1 - 6, location of the BRI card <b>port</b> - Port number or range.

**set (bri) mode**

Use the **set (bri) mode** command to set the mode for the ISDN BRI Service.

**Syntax:** `set {bri_card-addr} mode {lt3ds0 | lt4to1tdm | nt3ds0}`

**Example:** `set 4 mode nt3ds0`

To set the BRI card in slot 4 to use 3 DS0 LUNT

Variable	Definition
<b>bri_card-addr</b>	The slot number (1-6) that contains the BRI card.
<b>lt3ds0</b>	Set BRI to 3 DS0 LUNT, used primarily for a subscriber line.
<b>lt4to1tdm</b>	Set the BRI mode to 4 to 1 TDM LUNT.
<b>nt3ds0</b>	Set BRI mode to 3 DS0 LUNT, used primarily for a central office connection.

**set (bri) pmsync**

Use the **set (bri) pmsync** command to set the source for performance monitoring synchronization.

**Syntax:** `set {bri_card-addr} pmsync {internal|switch}`

**Example:** `set 4 pmsync internal`

To set the performance monitoring source to internal for the BRI in slot 4.

Variable	Definition
<b>bri_card-addr</b>	The slot number (1-6) that contains the BRI card.
<b>internal</b>	Set source to the internal to the system.
<b>switch</b>	Set source to the switch.

**set (bri) threshold**

Use the **set (bri) threshold** command to set default thresholds for ISDN lines.

**Syntax:** `set {bri-addr} threshold {day|hour} {es|ses} {value}`

**Example:** `set 3:4 threshold day es 240`

Variable	Definition
<b>bri-addr</b>	The {slot:port} address of the BRI card you want to apply the changes to. <b>slot</b> - Slot number 1 - 6, location of the BRI card <b>port</b> - Port number or range.
<b>up</b>	Put the ISDN line In-Service.
<b>day</b>	Set the threshold for Errored Seconds (ES)
<b>hour</b>	Set the thresholds for hourly intervals.
<b>es</b>	Set the threshold for Errored Seconds (ES)
<b>ses</b>	Set the threshold for Severely Errored Seconds (SES)
<b>value</b>	Range is 1 - 65535 seconds.

**set (bri) up**

Use the **set (bri) up** command to set the ISDN BRI line In-Service.

**Syntax:** `set {bri-addr} up`

**Example:** `set 3:4 up`

Variable	Definition
<b>bri-addr</b>	The {slot:port} address of the BRI card you want to apply the changes to. <b>slot</b> - Slot number 1 - 6, location of the BRI card <b>port</b> - Port number or range.

**set clock**

Use the **set clock** command to set the master transmit clock. The primary master clock source may be used to clock each DS1 transmitter. The clock circuit automatically switches to the secondary clock source if the primary clock fails.

**Syntax:** `set {clock1|clock2} {ds1-addr|e1-addr|internal}`

**Example:** `set clock1 a:1`  
To set the primary master clock source to A:1.

**Example:** `set clock2 1:2`  
To set the secondary master clock source to Quad T1 card in slot 1 source selected.

Variable	Definition
<b>clock1</b>	Set primary master transmit clock source.
<b>clock2</b>	Set secondary master transmit clock source.
<b>bri-addr</b>	Clock recovered from the BRI port on the BRI card (BRI card must be in LUNT and 3DS0 mode).
<b>ds1-addr</b>	Clock recovered from the DS1 receiver.
<b>e1-addr</b>	Clock recovered from the E1 receiver.
<b>internal</b>	Internal stratum 4E oscillator.

**set date**

Use the **set date** command to set the date.

**Syntax:** `set date {mm/dd/yyyy}`

**Example:** `set date 1/1/2001`  
The example will set the date to January 1, 20001.

Variable	Definition
<b>mm</b>	Represents the month. Range is 1-12, single digits can be entered.
<b>dd</b>	Represents the Day. Range is 1-31, single digits can be entered.
<b>yyyy</b>	Represents the year. Range is 1999-2106.

**set (ds0)**

Use the **set (ds0)** command to set up one or all DS0s in a DS1. The command specifies DS0 or range of DS0s, and the setting to apply.

**set (ds0) side****set (ds0) signal****set (ds0) type****set (ds0) side**

Use the **set (ds0) side** command to set the side attribute used to determine AB Bit states when connected DS0s are in a TP state.

**Syntax:** `set {ds0-addr} side {drop|network}`

**Example:** `set 3:1:1-4 side network`

Variable	Definition
<b>ds0-addr</b>	List of DS0 channels to apply setting to, in the form {slot:port:channel}. <b>slot</b> - Slot number, A for the Controller card, or 1 - 6 for service cards. <b>port</b> - Port number or range. <b>channel</b> - Channel number or range.
<b>drop</b>	DS0 connection faces the drop (FXS, RT, station, subscriber, customer user) side. Default.
<b>network</b>	DS0 connection faces the network (FXO, COT, office, exchange) side.

### set (ds0) signal

Use the **set (ds0) signal** command to set the DS0 signal type.

**Syntax:** `set {ds0-addr} signal {emdw|emi|emicpd|emw|gs|ls|plar|r2|tr8lsgs}`

**Example:** `set 3:1:1-4 signal gs`

Variable	Definition
<b>ds0-addr</b>	List of DS0 channels to apply setting to, in the form {slot:port:channel}. <b>slot</b> - Slot number, A for the Controller card, or 1 - 6 for service cards. <b>port</b> - Port number or range. <b>channel</b> - Channel number or range.
<b>emdw</b>	E&M delayed wink start. Used for ANI/DNS.
<b>emi</b>	E&M immediate start with ringback (used for D3 PLAR and DPT).
<b>emicpd</b>	E&M immediate start with calling party disconnect with ringback.
<b>emw</b>	E&M wink start.
<b>gs</b>	Ground start signaling.
<b>ls</b>	Loop start signaling.
<b>plar</b>	D4 PLAR (Private Line Automatic Ringdown) signaling.
<b>r2</b>	E1 R2 signaling.
<b>tr8lsgs</b>	Set signaling type to TR-08

### set (ds0) type

Use the **set (ds0) type** command to set the DS0 channel type.

**Syntax:** `set {ds0-addr} type {data|voice}`

**Example:** `set 3:1:1-4 type voice`

Variable	Definition
<b>ds0-addr</b>	List of DS0 channels to apply setting to, in the form {slot:port:channel}. <b>slot</b> - Slot number, A for the Controller card, or 1 - 6 for service cards. <b>port</b> - Port number or range. <b>channel</b> - Channel number or range.
<b>data</b>	Set the DS0 up to carry data (clear channel)
<b>voice</b>	Set the DS0 up to carry voice traffic (robbed-bit signaling)

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**set (ds1)**

Use the **set (ds1)** command to set up DS1 interfaces.

<b>set (ds1) ais</b>	<b>set (ds1) lbo</b>
<b>set (ds1) bpviolation</b>	<b>set (ds1) line</b>
<b>set (ds1) down</b>	<b>set (ds1) linecode</b>
<b>set (ds1) equipment</b>	<b>set (ds1) loopdetect</b>
<b>set (ds1) fdl</b>	<b>set (ds1) payload</b>
<b>set (ds1) framing</b>	<b>set (ds1) threshold</b>
<b>set (ds1) id</b>	<b>set (ds1) up</b>

**set (ds1) ais**

Use the **set (ds1) ais** command to enable/disable AIS Forwarding on the DS1. Default is Disabled.

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**NOTE:** The conditions on cross connected DS1s that trigger sending AIS are: LOS, LOF, AIS, RAI, and loopback.

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**Syntax:** `set {ds1-addr} ais {disable|enable}`

**Example:** `set a:1 ais enable`

Variable	Definition
<b>ds1-addr</b>	DS1 address in the form {slot:port}. <b>slot</b> - Slot number, A for the Controller card, or 1 - 6 for service cards. <b>port</b> - Port number, range or all.
<b>disable</b>	Disables the AIS Forwarding on the DS1. Default
<b>enable</b>	Enables the AIS Forwarding on the DS1.

**set (ds1) bpviolation**

Use the **set (ds1) bpviolation** command to set the bipolar violation (BPV) alarm threshold.

Note: this command applies only when in TR-08 mode.

**Syntax:** `set {ds1-addr} bpviolation {none | tenneg4 | tenneg5 | tenneg6}`

**Example:** `set a:1 bpviolation tenneg4`

Variable	Definition
<b>ds1-addr</b>	DS1 address in the form {slot:port}. <b>slot</b> - Slot number, A for the Controller card, or 1 - 6 for service cards. <b>port</b> - Port number, range or all.
<b>none</b>	Remove bipolar violation alarm
<b>tenneg4</b>	Set bipolar violation alarm threshold to .0001
<b>tenneg5</b>	Set bipolar violation alarm threshold to .00001
<b>tenneg6</b>	Set bipolar violation alarm threshold to .000001

**set (ds1) down**

Use the **set (ds1) down** command to set the DS1 as Out-of-Service.

**Syntax:** `set {ds1-addr} down`

**Example:** `set a:1 down`

Variable	Definition
<b>ds1-addr</b>	DS1 address in the form {slot:port}. <b>slot</b> - Slot number, A for the Controller card, or 1 - 6 for service cards. <b>port</b> - Port number, range or all.

**set (ds1) equipment**

Use the **set (ds1) equipment** command to set the equipment loopback on a DS1. Note: this feature is only available through Quad T1/E1 cards. It is not available on the Controllers.

**Syntax:** `set {ds1-addr} equipment {loopdown | loopup}`

**Example:** `set a:1 equipment loopup`

Variable	Definition
<b>ds1-addr</b>	DS1 address in the form {slot:port}. <b>slot</b> - Slot number, A for the Controller card, or 1 - 6 for service cards. <b>port</b> - Port number, range or all.
<b>loopdown</b>	Disable equipment loopback on the DS1
<b>loopup</b>	Enable equipment loopback on the DS1



**set (ds1) fdl**

Use the **set (ds1) fdl** command to set the Facilities Data Link (FDL) capabilities.

**Syntax:** `set {ds1-addr} fdl {none|alm13|alm16|t1403}`

**Example:** `set a:1 fdl alm13`

Variable	Definition
<b>ds1-addr</b>	DS1 address in the form {slot:port}. <b>slot</b> - Slot number, A for the Controller card, or 1 - 6 for service cards. <b>port</b> - Port number, range or all.
<b>none</b>	Disable FDL output messages.
<b>alm13</b>	Enable TR-08 alarm 13 FDL messages.
<b>alm16</b>	Enable TR-08 alarm 16 FDL messages.
<b>t1403</b>	Enable T1.403 FDL performance messages.

**set (ds1) framing**

Use the **set (ds1) framing** command to set the DS1 framing type.

**Syntax:** `set {ds1-addr} framing {d4|esf|tr8afdl|tr8anofdl|tr8b}`

**Example:** `set a:1 framing d4`

Variable	Definition
<b>ds1-addr</b>	DS1 address in the form {slot:port}. <b>slot</b> - Slot number, A for the Controller card, or 1 - 6 for service cards. <b>port</b> - Port number, range or all.
<b>d4</b>	To D4 Superframe (SF) framing.
<b>esf</b>	To Extended Superframe (ESF) framing.
<b>tr8afdl</b>	TR-08 A shelf framing with FDL.
<b>tr8anofdl</b>	TR-08 A shelf framing with no FDL.
<b>tr8b</b>	TR-08 B shelf framing.

### set (ds1) id

Use the **set (ds1) id** command to set the DS1 circuit identification string. This is the same as dsx1Circuit Identifier from DS1 MIB transmission vendor's identification.

**Syntax:** `set {ds1-addr} id {"id-name"}`

**Example:** `set a:1 id "Boulder"`

Variable	Definition
<b>ds1-addr</b>	DS1 address in the form {slot:port}. <b>slot</b> - Slot number, A for the Controller card, or 1 - 6 for service cards. <b>port</b> - Port number, range or all.
<b>id-name</b>	ID Name can have a maximum of 30 characters, enclosed in quotes.

### set (ds1) lbo

Use the **set (ds1) lbo** command to set the DS1 Line Build Out (LBO).

**Syntax:** `set {ds1-addr} lbo {1 | 2 | 3 | 4 | 5 | 6 | 7 | 8}`

**Example:** `set a:1 lbo 6`

Variable	Definition
<b>ds1-addr</b>	DS1 address in the form {slot:port}. <b>slot</b> - Slot number, A for the Controller card, or 1 - 6 for service cards. <b>port</b> - Port number, range or all.
<b>1</b>	DSX-1 equalization for 0-133 feet (CSU attenuation for LBO of 0dB)
<b>2</b>	DSX-1 equalization for 133-266 feet
<b>3</b>	DSX-1 equalization for 266-399 feet
<b>4</b>	DSX-1 equalization for 399-533 feet
<b>5</b>	DSX-1 equalization for 533-655 feet
<b>6</b>	CSU attenuation for LBO of -7.5dB
<b>7</b>	CSU attenuation for LBO of -15dB
<b>8</b>	CSU attenuation for LBO of -22.5dB

**set (ds1) line**

Use the **set (ds1) line** command to turn a line loopback to the DS1 interface on or off.

**Syntax:** `set {ds1-addr} line {loopdown | loopup}`

**Example:** `set a:1 line loopup`

Variable	Definition
<b>ds1-addr</b>	DS1 address in the form {slot:port}. <b>slot</b> - Slot number, A for the Controller card, or 1 - 6 for service cards. <b>port</b> - Port number, range or all.
<b>loopdown</b>	Disable the line loopback. Loopdown is the default.
<b>loopup</b>	Enable a DS1 line loopback toward the DS1 drop

**set (ds1) linecode**

Use the **set (ds1) linecode** command to set the DS1 interface line coding.

**Syntax:** `set {ds1-addr} linecode {ami | b8zs}`

**Example:** `set a:1 linecode ami`

Variable	Definition
<b>ds1-addr</b>	DS1 address in the form {slot:port}. <b>slot</b> - Slot number, A for the Controller card, or 1 - 6 for service cards. <b>port</b> - Port number, range or all.
<b>ami</b>	Alternate Mark Inversion line coding
<b>b8zs</b>	Binary 8 Zero Substitution line coding. Default is B8ZS.

### **set (ds1) loopdetect**

Use the **set (ds1) loopdetect** command to enable detection of CSU and NIU loop code (10000 for loopup; 10100 for loopdown).

**Syntax:** `set {ds1-addr} loopdetect {csu|niu|off}`

**Example:** `set a:1 loopdetect csu`

Variable	Definition
<b>ds1-addr</b>	DS1 address in the form {slot:port}. <b>slot</b> - Slot number, A for the Controller card, or 1 - 6 for service cards. <b>port</b> - Port number, range or all.
<b>csu</b>	Enable detection of CSU loop codes.
<b>niu</b>	Enable detection of NIU loop codes. <b>Note: Adit 600 (8.0) does not support NIU Loopback on DS1 cards with an earlier software version than listed below:</b> Quad DS1 ADPCM - 1.13 Quad T1 - 1.82 Hardened Quad T1 - 2.26 Note: To display card version use <i>status equipment</i> CLI command
<b>off</b>	Disable detection of loop codes.

### **set (ds1) payload**

Use the **set (ds1) payload** command to apply a payload loopback to the DS1 interface.

**Syntax:** `set {ds1-addr} payload {loopdown|loopup}`

**Example:** `set a:1 payload loopup`

Variable	Definition
<b>ds1-addr</b>	DS1 address in the form {slot:port}. <b>slot</b> - Slot number, A for the Controller card, or 1 - 6 for service cards. <b>port</b> - Port number, range or all.
<b>loopdown</b>	Disable the payload loopback.
<b>loopup</b>	Enable the payload loopback.

**set (ds1) threshold**

Use the **set (ds1) threshold** command to set default thresholds for a DS1. Note: Defaults for all are 0.

**Syntax:** `set {ds1-addr} threshold {day|hour}`  
`{bes|css|dm|es|lcv|les|pcv|sefs|ses|uas}`

**Example:** `set a:1 payload loopup`

Variable	Definition	
<b>ds1-addr</b>	DS1 address in the form {slot:port}. <b>slot</b> - Slot number, A for the Controller card, or 1 - 6 for service cards. <b>port</b> - Port number, range or all.	
<b>day</b>	Set threshold for a daily interval	
	<b>bes</b>	Bursty errored seconds range: 0 - 86400
	<b>css</b>	Controlled slip seconds range: 0 - 86400
	<b>dm</b>	Degraded minutes range: 0 - 1440
	<b>es</b>	Errored seconds range: 0 - 86400
	<b>lcv</b>	Line code violations range: 0 - 133401600
	<b>les</b>	Line errored seconds range: 0 - 86400
	<b>pcv</b>	Path code violations range: 0 - 133401600
	<b>sefs</b>	Severely errored frame seconds range: 0 - 86400
	<b>ses</b>	Severely errored seconds range: 0 - 86400
	<b>uas</b>	Unavailable seconds range: 0 - 86400
<b>hour</b>	Set threshold for a 15 minute interval	
	<b>bes</b>	Bursty errored seconds range: 0 - 900
	<b>css</b>	Controlled slip seconds range: 0 - 900
	<b>dm</b>	Degraded minutes range: 0 - 15
	<b>es</b>	Errored seconds range: 0 - 900
	<b>lcv</b>	Line code violations range: 0 - 1389600
	<b>les</b>	Line errored seconds range: 0 - 900
	<b>pcv</b>	Path code violations range: 0 - 1389600
	<b>sefs</b>	Severely errored frame seconds range: 0 - 900
	<b>ses</b>	Severely errored seconds range: 0 - 900
	<b>uas</b>	Unavailable seconds range: 0 - 900

**set (ds1) up**

Use the **set (ds1) up** command to set the DS1 as In-Service.

**Syntax:** **set {ds1-addr} up**

**Example:** **set a:1 up**

Variable	Definition
<b>ds1-addr</b>	DS1 address in the form {slot:port}. <b>slot</b> - Slot number, A for the Controller card, or 1 - 6 for service cards. <b>port</b> - Port number, range or all.

**set (ds1 card)**

Use the **set (ds1 card)** commands to configure DS1 card types. These commands apply to the Quad DS1/E1 (hardened) and Quad DS1 ADPCM (hardened) service cards.

**set (ds1 card) spantype**

Use the **set (ds1 card) spantype** command to set the span type (T1 or E1) on the DS1/E1 type card.

**Syntax:** **set {ds1\_card-addr} {elspan|t1span}**

**Example:** **set 6 elspan**

To set the Quad DS1/E1 card in slot 6 to E1 mode.

Variable	Definition
<b>ds1_card-addr</b>	The slot number (1-6) that contains a DS1 type card (Quad DS1/E1 or Quad DS1 ADPCM service card).
<b>elspan</b>	Enables E1 capability on this card.
<b>t1span</b>	Enables T1 capability on this card. (Default)

**set (ds1 card) adpcm map**

Use the **set (ds1 card) adpcm map** command to set compression map on the Quad DS1 ADPCM card.

**Syntax:** `set {adpcm_card-addr} adpcm {none|map1|map2|map3}`

**Example:** `set 5 adpcm map1`

Variable	Definition
<b>adpcm_card-addr</b>	The slot number (1-6) that contains the Quad DS1 ADPCM card
<b>none</b>	None will disable compression on the card. Default.
<b>map1, map2, map3</b>	Map setting, see chart below

	MAP 1		MAP 2		MAP 3	
DS0	X-Port	Backplane	X-Port	Backplane	X-Port	Backplane
Number	Analog	Bus	Analog	Bus	Analog	Bus
1	32n	X1/2	32n	X1/2	32n	X1/2
2	32n	X3/4	32n	X3/4	32n	X3/4
3	32n	X5/6	32n	X5/6	32n	X5/6
4	32n	X7/8	32n	X7/8	32n	X7/8
5	32n	X9/10	32n	X9/10	32n	X9/10
6	32n	X11/12	32n	X11/12	32n	X11/12
7	32n	X14/15	32n	X13/14	32n	X13/14
8	32n	X16/17	32n	X15/16	32n	X15/16
9	32n	X18/19	32n	X17/18	32n	X17/18
10	32n	X20/21	32n	X19/20	32n	X19/20
11	32n	X22/23	32n	X21/22	32n	X21/22
12	32n	X24	32n	X23/24	32n	X24
13	-	Not Avail	32n		32n	
14	32n		32n		32n	
15	32n		32n		32n	
16	32n		32n		32n	
17	32n		32n		32n	
18	32n		32n		32n	
19	32n		32n		32n	
20	32n		32n		32n	
21	32n		32n		32n	
22	32n		32n		32n	
23	32n		32n		-	Not Avail
24	64n		32n		64n	

**set (e1)**

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**NOTE:** E1 is not supported in this release of the Adit 600 Controller. It will be supported in a future release.

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<b>set (e1) down</b>	<b>set (e1) national</b>
<b>set (e1) equipment</b>	<b>set (e1) signal</b>
<b>set (e1) framing</b>	<b>set (e1) threshold</b>
<b>set (e1) line</b>	<b>set (e1) up</b>
<b>set (e1) linecode</b>	

Use the **set (e1)** command to set up E1s. The command specifies a range of interfaces/settings to apply.

**Syntax:** **set {e1-addr} {setting}**

**set (e1) down**

Use the **set (e1) down** command to set the E1 as Out-of-Service.

**Syntax:** **set {e1-addr} down**

**Example:** **set a:1 down**

Variable	Definition
<b>e1-addr</b>	E1 address in the form {slot:port}. <b>slot</b> - Slot number, A for the Controller card, or 1 - 6 for service cards (Quad E1). <b>port</b> - Port number, range or all.

**set (e1) equipment**

Use the **set (e1) equipment** command to set an equipment loopback to the E1 interface on or off.

**Syntax:** **set {e1-addr} equipment {loopdown|loopup}**

**Example:** **set a:1 equipment loopup**

Variable	Definition
<b>e1-addr</b>	E1 address in the form {slot:port}. <b>slot</b> - Slot number, A for the Controller card, or 1 - 6 for service cards (Quad E1). <b>port</b> - Port number, range or all.
<b>loopdown</b>	Disable equipment loopback. Loopdown is the default.
<b>loopup</b>	Enable equipment loopback



**set (e1) framing**

Use the **set (e1) framing** command to set the E1 framing type.

**Syntax:** `set {e1-addr} framing {elfr|elfrcrc}`

**Example:** `set a:1 framing elfr`

Variable	Definition
<b>e1-addr</b>	E1 address in the form {slot:port}. <b>slot</b> - Slot number, A for the Controller card, or 1 - 6 for service cards (Quad E1). <b>port</b> - Port number, range or all.
<b>elfr</b>	To E1 Framing with no CRC (dual frame)
<b>elfrcrc</b>	To E1 16 frame with CRC-4

**set (e1) line**

Use the **set (e1) line** command to turn a line loopback to the E1 interface on or off.

**Syntax:** `set {e1-addr} line {loopdown|loopup}`

**Example:** `set a:1 line loopup`

Variable	Definition
<b>e1-addr</b>	E1 address in the form {slot:port}. <b>slot</b> - Slot number, A for the Controller card, or 1 - 6 for service cards (Quad E1). <b>port</b> - Port number, range or all.
<b>loopdown</b>	Disable line loopback. Loopdown is the default.
<b>loopup</b>	Enable line loopback

**set (e1) linecode**

Use the **set (e1) linecode** command to set the E1 interface line coding.

**Syntax:** `set {e1-addr} linecode {ami|hdb3}`

**Example:** `set a:1 linecode ami`

Variable	Definition
<b>e1-addr</b>	E1 address in the form {slot:port}. <b>slot</b> - Slot number, A for the Controller card, or 1 - 6 for service cards (Quad E1). <b>port</b> - Port number, range or all.
<b>ami</b>	Alternate Mark Inversion line coding
<b>hdb3</b>	High Density Bipolar 3.

### **set (e1) national**

Use the **set (e1) national** command to set the E1 national bits. This setting should be left at the default (1) unless your country requires the bit to be set to 0.

**Syntax:** `set {e1-addr} national {sa4 | sa5 | sa6 | sa7 | sa8} {0 | 1}`

**Example:** `set a:1 national sa4 1`

Variable	Definition
<b>e1-addr</b>	E1 address in the form {slot:port}. <b>slot</b> - Slot number, A for the Controller card, or 1 - 6 for service cards (Quad E1). <b>port</b> - Port number, range or all.
<b>sa4</b>	Set the E1 national S <sub>a4</sub> bit
<b>sa5</b>	Set the E1 national S <sub>a5</sub> bit
<b>sa6</b>	Set the E1 national S <sub>a6</sub> bit
<b>sa7</b>	Set the E1 national S <sub>a7</sub> bit
<b>sa8</b>	Set the E1 national S <sub>a8</sub> bit
<b>{0 1}</b>	Set the bit

### **set (e1) signal**

Use the **set (e1) signal** command to set signaling on the E1.

**Syntax:** `set {e1-addr} signal {cas | none}`

**Example:** `set a:1 signal none`

Variable	Definition
<b>e1-addr</b>	E1 address in the form {slot:port}. <b>slot</b> - Slot number, A for the Controller card, or 1 - 6 for service cards (Quad E1). <b>port</b> - Port number, range or all.
<b>cas</b>	To Channel Associated Signaling
<b>none</b>	To none

**set (e1) threshold**

Use the **set (e1) threshold** command to set default thresholds for a E1. Note: Defaults for all are 0.

**Syntax:** **set {e1-addr} threshold {day|hour}**  
**{bes|css|dm|es|lcv|les|pcv|sefs|ses|uas}**

**Example:** **set a:1 threshold day uas**

Variable	Definition	
<b>e1-addr</b>	E1 address in the form {slot:port}. <b>slot</b> - Slot number, A for the Controller card, or 1 - 6 for service cards (Quad E1). <b>port</b> - Port number, range or all.	
<b>day</b>	Set threshold for a daily interval	
	<b>bes</b>	Bursty errored seconds range: 0 - 86400
	<b>css</b>	Controlled slip seconds range: 0 - 86400
	<b>dm</b>	Degraded minutes range: 0 - 1440
	<b>es</b>	Errored seconds range: 0 - 86400
	<b>lcv</b>	Line code violations range: 0 - 133401600
	<b>les</b>	Line errored seconds range: 0 - 86400
	<b>pcv</b>	Path code violations range: 0 - 133401600
	<b>sefs</b>	Severely errored frame seconds range: 0 - 86400
	<b>ses</b>	Severely errored seconds range: 0 - 86400
	<b>uas</b>	Unavailable seconds range: 0 - 86400
<b>hour</b>	Set threshold for a 15 minute interval	
	<b>bes</b>	Bursty errored seconds range: 0 - 900
	<b>css</b>	Controlled slip seconds range: 0 - 900
	<b>dm</b>	Degraded minutes range: 0 - 15
	<b>es</b>	Errored seconds range: 0 - 900
	<b>lcv</b>	Line code violations range: 0 - 1389600
	<b>les</b>	Line errored seconds range: 0 - 900
	<b>pcv</b>	Path code violations range: 0 - 1389600
	<b>sefs</b>	Severely errored frame seconds range: 0 - 900
	<b>ses</b>	Severely errored seconds range: 0 - 900
	<b>uas</b>	Unavailable seconds range: 0 - 900

**set (e1) up**

Use the **set (e1) up** command to set the E1 as In-Service.

**Syntax:** `set {e1-addr} up`

**Example:** `set a:1 up`

Variable	Definition
<b>e1-addr</b>	E1 address in the form {slot:port}. <b>slot</b> - Slot number, A for the Controller card, or 1 - 6 for service cards (Quad E1). <b>port</b> - Port number, range or all.

**set (e1 card) spantype**

Use the **set (e1 card) spantype** command to set the span type (T1 or E1) on the DS1/E1 type card. This command applies to the Quad DS1/E1 (hardened) and Quad DS1 ADPCM (hardened) service cards

**Syntax:** `set {e1_card-addr} {e1span|t1span}`

**Example:** `set 6 e1span`

To set the Quad DS1/E1 card in slot 6 to E1 mode.

Variable	Definition
<b>e1_card-addr</b>	The slot number (1-6) that contains a E1 type card (Quad DS1/E1 or Quad T1 ADPCM service card).
<b>e1span</b>	Enables E1 capability on this card.
<b>t1span</b>	Enables T1 capability on this card. (Default)

**set ethernet ip address**

Use the **set ethernet ip address** command to set the Ethernet address for the Adit 600.

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**NOTE:** This command is available to Manager-level users only.

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**Syntax:** `set ethernet ip address {ip-addr} [mask]`

**Example:** `set ethernet ip address 172.26.100.25 255.255.255.0`  
Sets the Adit IP address to 172.26.100.25, and a subnet mask of 255.255.255.0

Variable	Definition
<b>ip-addr</b>	Set the IP address for the Adit 600, using the form xxx.xxx.xxx.xxx, where xxx is a number from 0 to 255.
<b>mask</b>	Set the subnet mask, using the form xxx.xxx.xxx.xxx, where xxx is a number from 0 to 255. This is an optional setting.

**set (fxo)**

Use the **set (fxo)** command to setup one/all of the voice channels of an FXO card. The command specifies the list of voice channels within that card, and the setting to apply.

**Syntax:** `set {fxo-addr} {setting}`

**Example:** `set 2:1 signal ls`

Set the FXO on slot 2, port 1 to signaling type loop start.

Variable	Definition	
<b>fxo-addr</b>	List of voice channels to apply setting to, in the form {slot:port}. <b>slot</b> - The slot number (1-6) that contains the FXO card. <b>port</b> - Port number or range.	
<b>rxgain</b>	The Receive direction is Network to Analog, with a range is -9 to +7 (db). Available values are -9, -7, -6, -5, -4, -3, -2, 0, 2, 3, 4, 5, 6, and 7. Default is 7dB.	
<b>signal</b>	Set the DS0 signaling type	
	<b>dpt</b>	Set the DS0 to Dial Pulse Terminate
	<b>gs</b>	Set the DS0 to Ground Start signaling
	<b>ls</b>	Set the DS0 to Loop Start signaling
	<b>lscpd</b>	Set the DS0 to Loop Start Calling Party Disconnect
<b>txgain</b>	The Transmit direction is Analog to Network, with a range is -9 to +7 (db). Available values are -9, -7, -6, -5, -4, -3, -2, 0, 2, 3, 4, 5, 6, and 7. Default is 7dB.	

**set (fxs)**

Use the **set (fxs)** command to set up voice channels of an FXS card. The command specifies the list of voice channels within that FXS card and the setting to apply.

**Syntax:** **set {fxs-addr} {setting}**

**Example:** **set 3:1 signal gs**

Set the FXS port 1 on slot 3 to signaling type ground start.

**Example:** **set 3:1-8 txgain -5**

Sets the FXS ports 1-8 on slot 3 to transmit level range to -5 dB.

Variable	Definition	
<b>fxs-addr</b>	List of voice channels to apply setting to, in the form {slot:port}. <b>slot</b> - Slot number 1 - 6, location of the FXS cards <b>port</b> - Port number or range.	
<b>linelength</b>	Set the length of the line. Whenever possible, use the short loop setting, a loop set too long may overheat the unit, possibly reducing reliability	
	<b>long</b>	For longer analog loops (up to 3 miles for 26 AWG and 4.8 miles for 24 AWG). Tip/Ring voltage on a long loop is -54 VDC at all times. Using a long line length value on a shorter loop can cause overheating and reduce the reliability
	<b>short</b>	For shorter analog loops (up to 1.6 miles for 26 AWG and 2.6 miles for 24 AWG). Tip/Ring voltage on a short loop is -54 VDC while on-hook and -37 VDC while off-hook. This is the default value.
<b>rxgain</b>	The Receive direction is Network to Analog, with a range of -9 to +7 (dB). Available values are -9, -7, -6, -5, -4, -3, -2, 0, 2, 3, 4, 5, 6, and 7. Default setting is -6 dB	
<b>signal</b>	Set the DS0 signaling type	
	<b>ls</b>	Set the DS0 to Loop Start signaling
	<b>gs</b>	Set the DS0 to Ground Start signaling
<b>txgain</b>	The Transmit direction is Analog to Network, with a range of -9 to +7 (dB). Available values are -9, -7, -6, -5, -4, -3, -2, 0, 2, 3, 4, 5, 6, and 7. Default setting is -3 dB	

**set (fxs8D/fxs8C/fxs8B/fxs8A/fxs5G)**

Use the **set (fxs8D/fxs8C/fxs8B/fxs8A/fxs5G)** command to set up voice channels of an FXS 8D, FXS 8C, FXS 8B, FXS 8A or FXS 5G Voice Service card. The command specifies the list of voice channels and the setting to apply.

**Syntax:** **set {fxs-addr} {setting}**

**Example:** **set 3:1-8 impedance 19**

Sets the impedance of the FXS 8D card, in slot 3, to 900 ohms +2.16μF (μ-Law), see *show impedance* for the listing of index numbers.

Variable	Definition						
<b>fxs-addr</b>	List of voice channels to apply setting to, in the form {slot:port}. <b>slot</b> - Slot number 1 - 6, location of the FXS card. <b>port</b> - Port number or range.						
<b>cpd</b>	Sets Calling Party Disconnect parameters. <b>Syntax:</b> <b>set {fxs-addr} cpd {time topen tropen}</b> <table> <tr> <td><b>time</b></td><td>Sets the calling party disconnect (CPD) time. The range is 0-4000ms in 16ms steps (the actual time will be +/- 8ms). The default is 2000ms. <b>Note:</b> This feature is only supported on the FXS 8C and FXS 8D card.</td></tr> <tr> <td><b>topen</b></td><td>Opens tip when providing an Open Signaling Interval using the CPD feature. <b>Note:</b> This feature is only supported on the FXS 8D card.</td></tr> <tr> <td><b>tropen</b></td><td>Opens both tip and ring when providing an Open Signaling Interval using the CPD feature. <b>Note:</b> This feature is only supported on the FXS 8D card.</td></tr> </table>	<b>time</b>	Sets the calling party disconnect (CPD) time. The range is 0-4000ms in 16ms steps (the actual time will be +/- 8ms). The default is 2000ms. <b>Note:</b> This feature is only supported on the FXS 8C and FXS 8D card.	<b>topen</b>	Opens tip when providing an Open Signaling Interval using the CPD feature. <b>Note:</b> This feature is only supported on the FXS 8D card.	<b>tropen</b>	Opens both tip and ring when providing an Open Signaling Interval using the CPD feature. <b>Note:</b> This feature is only supported on the FXS 8D card.
<b>time</b>	Sets the calling party disconnect (CPD) time. The range is 0-4000ms in 16ms steps (the actual time will be +/- 8ms). The default is 2000ms. <b>Note:</b> This feature is only supported on the FXS 8C and FXS 8D card.						
<b>topen</b>	Opens tip when providing an Open Signaling Interval using the CPD feature. <b>Note:</b> This feature is only supported on the FXS 8D card.						
<b>tropen</b>	Opens both tip and ring when providing an Open Signaling Interval using the CPD feature. <b>Note:</b> This feature is only supported on the FXS 8D card.						
<b>impedance</b>	Sets the line impedance. <b>Syntax:</b> <b>set {fxs-addr} impedance {index}</b> <b>index</b> - Range is 1-19. See <i>show impedance</i> command for list of impedance settings. Default is index 19 (900 ohms +2.16μF μ-Law).						
<b>ringpower</b>	Allows selection of a "high power" ringing mode for the FXS 8D. Normal ringing (default) is a sine waveform. High-power ringing is a trapezoidal waveform. Using the high-power setting allows the FXS 8D to go to distances of 24,000 feet with optimal conditions.  <b>Note:</b> This feature is supported on the FXS 8D only.  <b>Syntax:</b> <b>set {fxs-addr} ringpower {high   normal}</b> <table> <tr> <td><b>high</b></td><td>High-power ringing.</td></tr> <tr> <td><b>normal</b></td><td>Normal-power ringing.</td></tr> </table>	<b>high</b>	High-power ringing.	<b>normal</b>	Normal-power ringing.		
<b>high</b>	High-power ringing.						
<b>normal</b>	Normal-power ringing.						
<b>rxgain</b>	The Receive direction is Network to Analog. <b>Syntax:</b> <b>set {fxs-addr} rxgain {gain}</b> gain. <b>FXS 8D, FXS 8C, FXS 8B, FXS 8A, FXS 5G, E1-FXS:</b> -12 to +6 dB, in .25 dB increments. Default -6 dB <b>FXS 4G:</b> -9 to +7 dB in 1 dB increments						

Variable	Definition
<b>signal</b>	Set the DS0 signaling type. <b>Syntax:</b> set {fxs-addr} signal {gs gsrb gsw gswrb ls lsrb}
	<b>gs</b> Set to Ground Start signaling
	<b>gsrb</b> Set to Ground Start signaling with reverse battery
	<b>gsw</b> Set to Ground Start Wink signaling
	<b>gswrb</b> Set to Ground Start Wink signaling with reverse battery
	<b>ls</b> Set to Loop Start signaling
	<b>lsrb</b> Set to Loop Start signaling with reverse battery
	<b>r2</b> Set to E1 R2 signaling <b>Note:</b> This signal option is only available on the FSX 8D, FSX 8C, FXS 8B and FXS Intl cards)
<b>txgain</b>	The Transmit direction is Analog to Network. <b>Syntax:</b> set {fxs-addr} txgain {gain} gain. <b>FXS 8D, FXS 8C, FXS 8B, FXS 8A, FXS 5G, E1-FXS:</b> -12 to +6 dB, in .25 dB increments. Default -3 dB <b>FXS 4G:</b> -9 to +7 dB in 1 dB increments
<b>winktime</b>	Set the wink time. Note: Setting the wink time for any channel sets it for all channels on this card <b>Syntax:</b> set {fxs-addr} winktime {time "default"} time - Range is 105 to 300 ms, in 3 ms increments. Default is 135 ms. default - Type "default" to set the winktime to its default setting (135 ms).

**set (fxsINTL)**

Use the **set (fxsINTL)** command to setup voice channels of an FXS card, International Version.

**Syntax:** set {fxsINTL-addr} {setting}

**Example:** set 3:1-8 impedance 18

Variable	Definition
<b>fxsINTL-addr</b>	List of voice channels to apply setting to, in the form {slot:port}. <b>slot</b> - Slot number 1 - 6, location of the FXS INTL cards <b>port</b> - Port number or range.
<b>impedance</b>	Sets the line impedance. <b>Syntax:</b> set {fxsINTL-addr} impedance {index} index - Range is 1-19. See <i>show impedance</i> command for list of impedance settings. Default is index 19 (900 ohms +2.16μF μ-Law).
<b>rxgain</b>	The Receive direction is Network to Analog. <b>Syntax:</b> set {fxsINTL-addr} rxgain {gain} gain - range is -12 to +6 dB, in .25 dB increments. Default is -6 dB
<b>signal</b>	Set the DS0 signaling type. <b>Syntax:</b> set {fxsINTL-addr} signal r2
	<b>r2</b> Set to E1 R2 signaling
<b>txgain</b>	The Transmit direction is Analog to Network. <b>Syntax:</b> set {fxsINTL-addr} txgain {gain} gain - range is -12 to +6 dB, in .25 dB increments. Default is -3 dB



**set (fxsPS)**

Use the **set (fxsPS)** command to setup voice channels of an Single Channel POTS card (FXS PS). The command specifies the list of voice channels, and the setting to apply.

**Syntax:** `set {fxsPS-addr} {setting}`

**Example:** `set 3:1 signal ls`

Variable	Definition
<b>fxsPS-addr</b>	List of voice channels to apply setting to, in the form {slot:port}. <b>slot</b> - Slot number 1 - 6, location of the FXS PS cards <b>port</b> - Port number or range.
<b>impedance</b>	Sets the line impedance. <b>Syntax:</b> <code>set {fxsPS-addr} impedance {index}</code> <b>index</b> - Range is 1-19. See <i>show impedance</i> command for list of impedance settings. Default is index 19 (900 ohms +2.16μF μ-Law).
<b>rxgain</b>	The Receive direction is Network to Analog. <b>Syntax:</b> <code>set {fxsPS-addr} rxgain {gain}</code> <b>gain</b> - range is -12 to +6 dB, in .25 dB increments. Default is -6 dB
<b>signal</b>	Set the DS0 signaling type. <b>Syntax:</b> <code>set {fxsPS-addr} signal ls</code>
	<b>ls</b> Set to Loop Start signaling
<b>txgain</b>	The Transmit direction is Analog to Network. <b>Syntax:</b> <code>set {fxsPS-addr} txgain {gain}</code> <b>gain</b> - range is -12 to +6 dB, in .25 dB increments. Default is -3 dB

**set id**

Use the **set id** command to the unit ID.

**Syntax:** `set id {"id-name"}`

**Example:** `set id "ADIT600"`  
ADIT600>

Variable	Definition
<b>id-name</b>	The name must be unique with a maximum of 20 characters, enclosed in quotes.

### **set idle**

Use the **set idle** command to set the system-wide idle code sent on DS0s.

**Syntax:** `set idle {pattern}`

**Example:** `set idle 0xff`

Variable	Definition
<b>pattern</b>	A hexadecimal number with a range from 0x00 to 0xff. This number must be preceded by 0x.

### **set ip gateway**

Use the **set ip gateway** command to set the IP gateway address (also known as the default route) for the Adit 600. The command specifies the numeric Internet Protocol (IP) address. The new gateway address takes effect immediately.

**Syntax:** `set ip gateway {ip-addr}`

**Example:** `set ip gateway 192.168.100.1`

Variable	Definition
<b>id-name</b>	The name must be unique with a maximum of 20 characters, enclosed in quotes.

**set ipds0**

Use the **set ipds0** command to setup the DS0 management channel.

Note: the DS0 selected as the DS0 management channel can only reside on the Controller T1.

**Syntax:** `set ipds0 {setting} [ds0-addr | ip-addr]`

**Example:** `set ipds0 assign a:1:24`

The example sets the DS0 management channel to slot A (Controller), port 1, channel 24.

Variable	Definition
<b>assign</b>	Assign the DS0 as the IP management channel
<b>delete</b>	Removes the IP over DS0 management channel (Default)
<b>down</b>	Set the DS0 management channel down (Default)
<b>ip address</b>	Set the DS0 management channel's IP address and optional subnet mask
<b>navalarm</b>	Set reporting of Access Navigator alarm. If IP over DS0 management is up and a Navigator is not attached, an alarm will be set. This command allows the operator to suppress the alarm in instances when the Adit is not connected to a Navigator. <b>Off</b> - Set reporting of Navigator alarm off. <b>On</b> - Set reporting of Navigator alarm on.
<b>up</b>	Set the DS0 management channel up (enables)
<b>ds0-addr</b>	In the form {slot:port:channel}. <b>slot</b> - A for the controller card. <b>port</b> -Port number or range. <b>channel</b> - Channel number or ranges.
<b>ip-addr</b>	Setup the DS0 management channel IP address and the optional subnet mask, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

**set key**

Use the **set key** command to enable a specific keyed feature. To acquire a feature key code, contact Force10 Networks Customer Support. Currently, keyed features (if available) can be enabled on a Controller or a Router.

**Syntax:** `set [rtr_card-addr] key {"key-code"}`

**Example:** `set 4 key "q0B8yma2IsSL+1BarY0u"`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router card. This optional parameter is used for router specific keyed features. If a slot is not entered, key is directed to the Controller.
<b>key-code</b>	The key code is entered to enable the specific feature.

**set local**

Use the **set local** command to enable or disable local DIP switch settings. The LOCAL LED on the Controller, will display an green light indicator if **Local** is set to **ON**.

Note: **set local** will not effect the ACO, ST, OPT or RST switches on the controller.

**Syntax:** `set local {on|off}`

**Example:** `set local off`

Variable	Definition
<b>on</b>	To configure the Adit 600 using the DIP switches.
<b>off</b>	To configure using the Command Line Interface (CLI).

**set login auth**

Use the **set login auth** command to set the authentication method for controller logins, with local database or external RADIUS servers. When set to RADIUS the controller will try the RADIUS servers first, if no servers reply to the request, the controller will use its local database of users to authenticate the login. A set login authentication to RADIUS will fail without a minimum of 1 RADIUS server configured.

**Syntax:** `set login auth {local|radius}`

**Example:** `set login auth radius`

The example will set the login authentication process to RADIUS.

Variable	Definition
<b>local</b>	Authenticate user logins via the controller database (Default).
<b>radius</b>	Authenticate user logins via the external RADIUS servers.

**set login max attempts**

Use the **set login max attempts** command to set the maximum number of login attempts for SSH logins. This command takes affect immediately.

---

**NOTE:** SSH (Secure Shell) is a keyed feature. Keys must be purchased from Force10 Networks. The Controller must be running release 9.7 or higher to support SSH.

---

**Syntax:** `set login max attempts {value}`

**Example:** `set login max attempts 4`

This example sets the maximum number of SSH login attempts to 4.

Variable	Definition
<b>value</b>	Number of login attempts. Range is 0-7 with a default of 3. 0 = unlimited.

**set login support**

Use the **set login support** command to enable/disable the internal login accounts for Force10 Networks Support personnel for the Controller and Router cards (IP, CMG, TSR).

**Syntax:** `set login support {disable|enable}`

**Example:** `set login support disable`

The example will prohibit logins via Force10 Networks Support passwords.

Variable	Definition
<b>disable</b>	Prohibit logins via Force10 Networks Support passwords.
<b>enable</b>	Allow logins via Force10 Networks Support passwords.

**set (msr-intf-id) up/down**

Use the **set (msr-intf-id) up/down** command to enable or disable alarms reported by individual Link Cross-Connects or Ethernet ports on the MSR card.

---

**NOTE:** This command is available for the MSR card only.

---

**Syntax:** `set {msr-intf-id} {down|up}`

**Example:** `set 6:1:1 down`

This example disables alarms for Link Cross-Connect 1 on the MSR card in slot 6.

**Example:** `set 6:2 down`

This example disables alarms for Ethernet port 2 on the MSR card in slot 6.

Variable	Definition
<b>msr-intf-id</b>	Interface identifier for MSR Link Cross-Connect or Ethernet port.  Link Cross-Connects are in the form {slot:1:n} where <i>n</i> is 1-8. Ethernet ports are in the form {slot:n} where <i>n</i> is 1 or 2.  <b>slot</b> - The slot number (1-6) that contains the MSR card.
<b>down</b>	Set the interface down.
<b>up</b>	Set the interface up.

### set notes

Use the **set notes** command to store configuration notes and have them displayed as comments in the *print config* command output. You can store up to three notes of 80 characters each.

---

**NOTE:** The note fields are not accessible from SNMP interfaces.

---

**Syntax:** `set notes {note-number} {"note"}`

**Example:** `set notes 1 "This is the unit serving customer A"`

Variable	Definition
<b>note-number</b>	1-3.
<b>"note"</b>	Alphanumeric text up to 80 characters in length. Must be enclosed in quotes.

### set ntp

Use the **set ntp** commands to configure the Network Time Protocol functions.

**set ntp disable**

**set ntp enable**

**set ntp poll**

**set ntp server address**

**set ntp timezone**

#### set ntp disable

Use the **set ntp disable** command to disable Network Time Protocol (NTP) processing (RFC 2030). The initial default for this processing is disabled.

**Syntax:** `set ntp disable`

**Example:** `set ntp disable`

The example will stop NTP processing on the Controller.

#### set ntp enable

Use the **set ntp enable** command to enable both Network Time Protocol (NTP) processing (RFC 2030). The initial default for this processing is disabled.

**Syntax:** `set ntp enable`

**Example:** `set ntp enable`

The example will start NTP processing on the Controller.

**set ntp poll**

Use the **set ntp poll** command to specify the polling frequency when operating in unicast polled mode. When the NTP server address is configured to a non-zero value this setting will cause the Controller NTP client to issue a unicast NTP request to the configured NTP server at this frequency.

**Syntax:** `set ntp poll {seconds}`

**Example:** `set ntp poll 120`

The example will poll the NTP server every 2 minutes.

Variable	Definition
<b>seconds</b>	The time between polls. Range is 16 - 1024 seconds, with a default of 16.

**set ntp server address**

Use the **set ntp server address** command to specify the IP address of the NTP server.

**Syntax:** `set ntp server address {ip-addr}`

**Example:** `set ntp server address 192.168.23.56`

The example will the IP address to be used to access the NTP server to 192.168.23.56.

Variable	Definition
<b>ip-addr</b>	The IP address of the NTP server for unicast polling, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255, or 0.0.0.0 for listening to broadcasts. The default is 0.0.0.0.

**set ntp timezone**

Use the **set ntp timezone** command to specify the timezone offset to GMT for this controller.

**Syntax:** `set ntp timezone {hour-offset} [minute-offset]`

**Example:** `set ntp timezone -5`

The example will set the time zone offset to be -5:00 from GMT (Greenwich Mean Time), which equates to Eastern Standard Time.

Variable	Definition
<b>hour-offset</b>	Offset from GMT in hours. Range is from -12 - 12, with a default of 0.
<b>minute-offset</b>	An optional parameter which sets the offset from GMT in minutes. Range is from 0 - 59, with a default of 0. This is used for half hour time zones.

## set (ocudp)

Use the **set (ocudp)** commands to configure the OCU-DP service cards.

<b>set (ocudp) baud</b>	<b>set (ocudp) secondary</b>
<b>set (ocudp) loopback</b>	<b>set (ocudp) selftest</b>
<b>set (ocudp) loopdetect</b>	<b>set (ocudp) up/down</b>
<b>set (ocudp) mvec</b>	

### set (ocudp) baud

Use the **set (ocudp) baud** command to configure the Baud Rate for OCU-DP ports.

**Syntax:** **set {ocudp-addr} baud {2400 | 4800 | 9600 | 19200 | 38400 | 56000 [sw56 | sw56cp] | 64000}**

**Example:** **set 3:2 baud 2400**

Set the baud rate on port 2 to 2400, on the OCU-DP card in slot 3

Variable	Definition	
<b>ocudp-addr</b>	The {slot:port} address of the OCUDP card. <b>slot</b> - Slot number (1-6) where the OCUDP card is located <b>port</b> - Port number or range.	
<b>2400</b>	Set OCU-DP baud rate to 2400	
<b>4800</b>	Set OCU-DP baud rate to 4800	
<b>9600</b>	Set OCU-DP baud rate to 9600	
<b>19200</b>	Set OCU-DP baud rate to 19200	
<b>38400</b>	Set OCU-DP baud rate to 38400	
<b>56000*</b>	Set OCU-DP baud rate to 56000 (Default)	
	<b>sw56</b>	Set to switched 56 service
	<b>sw56cp</b>	Set to switched 56 service with call progress capability. Sends special call progress CMI codes to DSU.
<b>64000</b>	Set OCU-DP baud rate to 64000	



**set (ocudp) loopback**

Use the **set (ocudp) loopback** command to manually set OCU/CSU loopback tests.

**Syntax:** `set {ocudp-addr} loopback {csu|ocu} {loopdown|loopup}`

**Example:** `set 3:2 loopback csu loopdown`

Variable	Definition
<b>ocudp-addr</b>	The {slot:port} address of the OCUDP card. <b>slot</b> - Slot number (1-6) where the OCUDP card is located <b>port</b> - Port number or range.
<b>csu</b>	Set CSU manual loopback tests
<b>ocu</b>	Set OCU manual loopback tests
<b>loopdown</b>	Stop CSU/OCU manual loopback test (Default).
<b>loopup</b>	Start CSU/OCU manual loopback test

**set (ocudp) loopdetect**

Use the **set (ocudp) loopdetect** command to configure the OCU non-latching/latching loopback code detection.

**Syntax:** `set {ocudp-addr} loopdetect {csu|dsu|ocu} {llb|nllb} {disable|enable}`

**Example:** `set 3:2 loopdetect csu llb enable`

Variable	Definition
<b>ocudp-addr</b>	The {slot:port} address of the OCUDP card. <b>slot</b> - Slot number (1-6) where the OCUDP card is located <b>port</b> - Port number or range.
<b>csu</b>	Set CSU manual loop codes detection
<b>dsu</b>	Set DSU manual loop codes detection
<b>ocu</b>	Set OCU manual loop codes detection
<b>llb</b>	Set up latching loopback detection
<b>nllb</b>	Set up non-latching loopback detection
<b>disable</b>	Disable loop detection
<b>enable</b>	Enable loop detection

**set (ocudp) mvec**

Use the **set (ocudp) mvec** command to set Majority Vote Error Correction (MVEC).

**Syntax:** **set {ocudp-addr} mvec {disable|enable}**

**Example:** **set 3:2 mvec enable**

Variable	Definition
<b>ocudp-addr</b>	The {slot:port} address of the OCUDP card. <b>slot</b> - Slot number (1-6) where the OCUDP card is located <b>port</b> - Port number or range.
<b>disable</b>	Disable the error correct (Default).
<b>enable</b>	Enable the error correct

**set (ocudp) secondary**

Use the **set (ocudp) secondary** command to configure the secondary channel service.

**Syntax:** **set {ocudp-addr} secondary {disable|enable}**

**Example:** **set 3:2 secondary enable**

Variable	Definition
<b>ocudp-addr</b>	The {slot:port} address of the OCUDP card. <b>slot</b> - Slot number (1-6) where the OCUDP card is located <b>port</b> - Port number or range.
<b>disable</b>	Disable the secondary channel service (Default).
<b>enable</b>	Enable the secondary channel service

**set (ocudp) selftest**

Use the **set (ocudp) selftest** command to initiate the OCU-DP card to perform a self test. This request will display a message to wait 8 seconds before requesting selftest status with the status command.

**Syntax:** **set {ocudp-addr} selftest**

**Example:** **set 3:2 selftest**

Variable	Definition
<b>ocudp-addr</b>	The {slot:port} address of the OCUDP card. <b>slot</b> - Slot number (1-6) where the OCUDP card is located <b>port</b> - Port number or range.

**set (ocudp) up/down**

Use the **set (ocudp) up/down** command to put the OCU-DP line In or Out-of-Service.

**Syntax:** `set {ocudp-addr} {down|up}`

**Example:** `set 3:2 up`

Set the OCU-DP card in slot 3, port 2 as In-Service.

Variable	Definition
<b>ocudp-addr</b>	The {slot:port} address of the OCUDP card. <b>slot</b> - Slot number (1-6) where the OCUDP card is located <b>port</b> - Port number or range.
<b>down</b>	Set OCU-DP port as Out-of-Service
<b>up</b>	Set OCU-DP port as In-Service

**set password length**

Use the **set password length** command to require a password consisting of 6 to 10 characters for all user logins added to the system. By default, user logins require no password.

- If password length is set to "long," a 6-10 character password must be assigned when a new user is added to the system via the **add user** command. Note that passwords for existing users are not affected by this setting. (To ensure that all users have long passwords, a Manager-level user would need to manually delete the users with the **delete user** command or issue a **restore defaults** command prior to setting password length to "long.")
- If password length is set to "short," no password is required when a new user is added. Optionally, a 1-10 character password may be assigned to the user at creation via the "password" parameter of the **add user** command, or the password may be assigned at a later time via the **set user password** command.

To view the current password length setting, use the **show password length** command.

---

**NOTE:** This command is available to Manager-level users only.

---

**Syntax:** `set password length {long|short}`

**Example:** `set password length long`

```
-Warning: Existing users may have short or no passwords
-        and are not affected by this change
OK
```

Variable	Definition
<b>long</b>	Require passwords for all subsequent users added to the system. (Existing users are not affected.) Passwords must be from 6 to 10 characters in length. For character restrictions, see the <b>set user password</b> command.
<b>short</b>	Passwords are not required to log into system. If passwords are assigned, they can contain from 1 to 10 characters. (Default.)

### **set (p-phone)**

Use the **set (p-phone)** command to configure the P-Phone card.

**Syntax:** **set {p\_phone-addr} {setting}**

**Example:** **set 2:1 crv 124**

Set the P-Phone card in slot 2, port 1 with a call reference value of 124.

Variable	Definition
<b>p_phone-addr</b>	The {slot:port} address of the P-Phone card. <b>slot</b> - Slot number (1-6) where the P-Phone card is located <b>port</b> - Port number or range.
<b>crv</b>	Set the CRV value, range is 1-768. A value of 0 deactivate the line. Default is 0.
<b>rxgain</b>	Set the receive gain. Range is 6 to -12, in .25 increments. Default is -6 dB.
<b>txgain</b>	Set the transmit gain. Range is 6 to -12, in .25 increments. Default is -3 dB.

**set radius****set radius identifier****set radius retries****set radius server address****set radius server secret****set radius timeout****set radius identifier**

Use the **set radius identifier** command to enter an optional name that is used by the RADIUS server to identify this controller, as per section 5.32 of RFC 2865. If configured, the NAS Identifier attribute is sent as part of the Access-Request.

**Syntax:** `set radius identifier {"radius-id"}`

**Example:** `set radius identifier "Adit600-1"`

Variable	Definition
<b>radius-id</b>	A RADIUS identifier with a range of 0 - 63 characters, enclosed in quotes. If entered as an empty string "", then no NAS-Identifier is sent. The default is an empty string and thus is not sent in the Access-Request

**set radius retries**

Use the **set radius retries** command to specify the maximum number of RADIUS request attempts to send to each server before trying the next RADIUS server. Note: if none of the configured RADIUS servers are able to respond the login authentication will wait a total time of (number of servers x timeout x retries) seconds before attempting to authenticate the login locally.

**Syntax:** `set radius retries {number}`

**Example:** `set radius retries 2`

Variable	Definition
<b>number</b>	The number of retries for each RADIUS servers. Range is 1-6, with a default of 3.

**set radius server address**

Use the **set radius server address** command to specify the IP address of the external RADIUS server to use for RADIUS login authentication. Up to 3 different RADIUS servers can be configured, with queries sent to each in succession until one of them sends a reply.

**Syntax:** `set radius server {1|2|3} address {ip-addr} [port]`

**Example:** `set radius server 1 address 192.168.23.56`

Variable	Definition
<b>1 2 3</b>	The RADIUS server entry to modify.
<b>ip-addr</b>	Set the IP address of the RADIUS server, in the form xxx.xxx.xxx.xxx, where xxx is a number from 0 to 255, or 0.0.0.0 to disable this entry. The default is 0.0.0.0 (unused). Note: all 3 RADIUS servers cannot be set to 0.0.0.0 if any login auth settings are set to RADIUS
<b>port</b>	This is an optional parameter. UDP port to be used to send the RADIUS queries. Default is 1812

**set radius server secret**

Use the **set radius server secret** command to specify shared secret that the controller RADIUS client and the RADIUS server use to authenticate the RADIUS requests and replies.

**Syntax:** `set radius server {1|2|3} secret {"secret"}`

**Example:** `set radius server 1 secret "secret"`

Variable	Definition
<b>1 2 3</b>	The RADIUS server entry to modify.
<b>secret</b>	An ASCII string with a range of 1 - 31 characters, enclosed in quotes. Default is an empty string "".

**set radius timeout**

Use the **set radius timeout** command to specify the maximum number of seconds to wait for a reply after each RADIUS request before sending the next attempt. Note: if none of the configured RADIUS servers are able to respond the login authentication will wait a total time of (number of servers x timeout x retries) seconds before attempting to authenticate the login locally.

**Syntax:** `set radius timeout {seconds}`

**Example:** `set radius timeout 2`

Variable	Definition
<b>seconds</b>	The number of seconds to wait for a reply after each request before the next attempt. Range is 1 - 6, with a default of 3 seconds.

**set (router) autologout**

Use the **set (router) autologout** command to set the period of time of inactivity after which the user will be automatically logged-out of a Telnet session.

**Syntax:** `set {rtr_card-addr} autologout {minutes}`

**Example:** `set 3 autologout 0`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>minutes</b>	The minutes of inactivity before auto-logout occurs. Range is 0-255. An entry of "0" will disable the auto-logout timer.

**set (router) cdr**

Use the **set (router) cdr** command to enable or disable Call Detail Recording (CDR) for the specified CMG card. Call Detail records can be viewed using the *show (router) log* command. This command applies to the CMG Router card only.

**Syntax:** `set {cmg_card-addr} cdr {disable|enable}`

**Example:** `set 1 cdr enable`

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG Router card
<b>disable</b>	Disable Call Detail Recording.
<b>enable</b>	Enable Call Detail Recording.

**set (router) compander**

Use the **set (router) compander** command to set the companding algorithm to use with the PCM (G.711) voice stream to/from the TDM side of a connection. The default companding algorithm is mu-law. The companding algorithm chosen for the CMG must match the companding used on the associated TDM-side connected interface channel, i.e. FXS ports and/or T1/E1 channels. This command applies to the CMG Router card only.

**Syntax:** `set {cmg_card-addr} compander {alaw|mulaw}`

**Example:** `set 1 compander alaw`

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG Router card
<b>alaw</b>	The companding algorithm used in Europe and elsewhere.
<b>mulaw</b>	The companding algorithm used in North America.

**set (router) default**

Use the **set (router) default** command to reset the Router card to its default configuration settings. This command will cause the Router card to perform a reboot.

**Syntax:** `set {rtr_card-addr} default`

**Example:** `set 3 default`

`Do you really want to do this ? y`

`OK`

The example will reset the Router in slot 3 to its defaults.

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router card.

**set (router) dhcp**

Use the **set (router) dhcp** commands to configure the Dynamic Host Configuration Protocol (DHCP) functions.

**Note:** To enable DHCP see *set (router) dhcp server startaddr*.

***set (router) dhcp client auto dns***

***set (router) dhcp client enable***

***set (router) dhcp client lease***

***set (router) dhcp client request***

***set (router) dhcp client transmit  
packet broadcast bit***

***set (router) dhcp disable***

***set (router) dhcp relay server***

***set (router) dhcp server dnsserver***

***set (router) dhcp server domain***

***set (router) dhcp server duration***

***set (router) dhcp server netbios  
nameserver***

***set (router) dhcp server netbios  
nodetype***

***set (router) dhcp server netbios scope***

***set (router) dhcp server startaddr***



***set (router) dhcp client auto dns***

Use the **set (router) dhcp client auto dns** command to enable or disable the LAN DHCP Client capability to automatically enable or disable the DNS Resolver. When Client is enabled, this command may cause the card to warm boot if DNS Resolver changes settings.

**Syntax:** `set {rtr_card-addr} dhcp client auto dns {disable|enable}`

**Example:** `set 3 dhcp client auto dns enable`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>disable</b>	No automatic enabling or disabling of the DNS Resolver will occur and the enable/disable setting of the DNS Resolver will be under manual configuration control.
<b>enable</b>	The DNS Resolver management will be managed automatically by the Client based on completeness of DNS configurables to operate the DNS Resolver.

***set (router) dhcp client enable***

Use the **set (router) dhcp client enable** command to enable the LAN DHCP Client capability. The default is disabled. Additionally if the target router has DHCP Server or DHCP/BOOTP relay enabled, the command will fail to enable the DHCP Client. This command requires a reset to take effect.

**Note:** To disable the DHCP Client, see the *set (router-lan) ip address*.

**Syntax:** `set {rtr_card-addr} dhcp client enable`

**Example:** `set 3 dhcp client enable`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.

### **set (router) dhcp client lease**

Use the **set (router) dhcp client lease** command to force a lease to be renewed or released.

**Note:** This command requires that DHCP Client is enabled.

**Syntax:** `set {rtr_card-addr} dhcp client lease {release|renew}`

**Example:** `set 3 dhcp client lease renew`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>release</b>	If the DHCP client is not enabled this command has no effect. If valid IP based leases exist and the DHCP Client interface is up, a release message will be sent to the server. Then the Lease Contents will be cleared and all configurable settings will be left at their last value. The DHCP Client will acquire a new lease when the user sends a renew command.
<b>renew</b>	If the DHCP client is not enabled this command has no effect. If it is enabled, the card will perform a typical lease renewal sequence based on its current DHCP configurables.

**set (router) dhcp client request**

Use the **set (router) dhcp client request** command to select the DHCP client parameters that will be requested from a DHCP server. The default will be that all of the supported negotiable parameters will be requested, except for the DNS host name. The DNS host name default is NOT to be requested. The possible negotiated parameters are: IP, gateway, DNS primary or secondary servers, DNS host name and DNS domain name. These setting will take effect immediately. Please note that selecting the IP request option will use the full DHCP Discovery, Offer, Request and ACK sequence, and will request a subnet mask. When the IP request option is disabled, the DHCP communication method will use the Inform and ACK sequence. The user must be sure that their DHCP Server supports the Inform/ACK method.

**Syntax:** `set {rtr_card-addr} dhcp client request {dns_domain_name|dns_host_name|dns_primary_server|dns_secondary_server|gateway|ip} {disable|enable}`

**Example:**

```
set 3 dhcp client request ip enable
set 3 dhcp client request gateway disable
set 3 dhcp client request dns_primary_server disable
set 3 dhcp client request dns_secondary_server enable
set 3 dhcp client request dns_host_name enable
set 3 dhcp client request dns_domain_name enable
```

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>dns_domain_name</b>	DNS Domain Name
<b>dns_host_name</b>	DNS Host Name
<b>dns_primary_server</b>	DNS Primary Server
<b>dns_secondary_server</b>	DNS Secondary Server
<b>gateway</b>	Gateway
<b>ip</b>	IP Address/Mask. The IP request option will use the full DHCP Discovery, Offer, Request and Ack sequence, plus will ask for a subnet mask. When the IP request option is disabled, the DHCP communication method will use the Inform and Ack sequence. The user must be sure that their DHCP Server supports the Inform/Ack method, which is an IP-less Forever Lease of our supported requestable options, excluding the IP/Mask options.
<b>disable</b>	Will disable the request of this parameter from the DHCP server.
<b>enable</b>	Will enable the request of this parameter from the DHCP server.

**set (router) dhcp client transmit packet broadcast bit**

Use the **set (router) dhcp client request** command to set or clear the broadcast bit in all transmit packets to DHCP Servers. This is especially important when other Servers and/or Agent in the DHCP mix need to use broadcast IP destination to get back to our Client.

**Syntax:** `set {rtr_card-addr} dhcp client transmit broadcast bit {disable|enable}`

**Example:** `set 3 dhcp client transmit packet broadcast bit disable`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>disable</b>	Will clear the broadcast bit in all transmit packets.
<b>enable</b>	Will set the broadcast bit in all transmit packets. Default is enabled.

**set (router) dhcp disable**

Use the **set (router) dhcp disable** command to disable both DHCP server and DHCP relay functionality for the specified Router card.

**Syntax:** `set {rtr_card-addr} dhcp disable`

**Example:** `set 3 dhcp disable`  
The example will set the Router in slot 3 to disable DHCP.

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.

**set (router) dhcp relay server**

Use the **set (router) dhcp relay server** command to enable a DHCP relay and assigns a DHCP server address for the specified Router card.

**Syntax:** `set {rtr_card-addr} dhcp relay server {server-number} {ip-addr} {"profile-name"}`

**Example:** `set 3 dhcp relay server 1 134.200.3.45 "remotewan"`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>server-number</b>	The server number (1 or 2) to specify.
<b>ip-addr</b>	The IP address of the server to relay to, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.
<b>profile-name</b>	The profile name for the Router interface that is used to reach this destination. This name must be enclosed in quotes, with a maximum of 11 characters.

**set (router) dhcp server dnsserver**

Use the **set (router) dhcp server dnsserver** command to set the IP address of up to 4 DNS servers that the DHCP server will inform the clients of.

**Syntax:** `set {rtr_card-addr} dhcp server dnsserver {number} {ip-addr}`

**Example:** `set 5 dhcp server dnsserver 4 122.104.33.220`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>number</b>	The DNS server entry, 1-4.
<b>ip-addr</b>	The address of the DNS server, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

**set (router) dhcp server domain**

Use the **set (router) dhcp server domain** command to select the domain name to provide to DHCP clients.

**Syntax:** `set {rtr_card-addr} dhcp server domain {"domain-name"}`

**Example:** `set 5 dhcp server domain "force10networks.com"`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>domain-name</b>	The domain name, with a maximum of 43 characters. Name must be enclosed in quotes.

**set (router) dhcp server duration**

Use the **set (router) dhcp server duration** command to set the lease duration that the DHCP server applies to client assignments.

**Syntax:** `set {rtr_card-addr} dhcp server duration {hours:minutes}`

**Example:** `set 5 dhcp server duration 3:45`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>hours:minutes</b>	The lease duration in hours and minutes. <b>hours</b> = 1-999 <b>minutes</b> = 1-59.

**set (router) dhcp server netbios nameserver**

Use the **set (router) dhcp server netbios nameserver** command to set the NetBIOS Name Server (NBNS - RFC 1001/1002) that the DHCP server provides to clients. **Note:** DHCP server must first be enabled with the “startaddr” command. See *set (router) dhcp server startaddr* on page 5-121.

**Syntax:** `set {rtr_card-addr} dhcp server netbios nameserver {1|2} {ip-addr}`

**Example:** `set 5 dhcp server netbios nameserver 1 192.168.100.80`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>1 2</b>	The NetBIOS Name Server entry.
<b>ip-addr</b>	The NBNS IP address, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

**set (router) dhcp server netbios nodetype**

Use the **set (router) dhcp server netbios nodetype** command to set the NetBIOS node type (see RFC 1001/1002) that the DHCP server provides to clients. **Note:** DHCP server must first be enabled with the “startaddr” command. See *set (router) dhcp server startaddr* on page 5-121.

**Syntax:** `set {rtr_card-addr} dhcp server netbios nodetype {type-number}`

**Example:** `set 5 dhcp server netbios nodetype 1`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>type-number</b>	The value is specified as a single octet that identifies the client type.
	1      B-node      4      M-node
	2      P-node      8      H-node

**set (router) dhcp server netbios scope**

Use the **set (router) dhcp server netbios scope** command to set the NetBIOS scope value (see RFC 1001/1002) that the DHCP server provides to clients. **Note:** DHCP server must first be enabled with the “startaddr” command. See *set (router) dhcp server startaddr* on page 5-121.

**Syntax:** `set {rtr_card-addr} dhcp server netbios scope {"scope-name"}`

**Example:** `set 5 dhcp server netbios scope "Accounting"`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>scope-name</b>	The Scope is a DHCP option that represents a grouping of computers on a subnet using the same NetBIOS name. Enter up to 41 alphanumeric characters for the scope-name, enclosed in quotes.

**set (router) dhcp server startaddr**

Use the **set (router) dhcp server startaddr** command to enable the DHCP server on the specified Router card with a defined start IP Address and number of addresses in the pool.

**Syntax:** `set {rtr_card-addr} dhcp server startaddr {ip-addr} {count}`

**Example:** `set 4 dhcp server startaddr 134.200.3.1 254`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>ip-addr</b>	The starting address of the client address pool, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255
<b>count</b>	The number of IP addresses in the client address pool (1-254).

**set (router) dialplan timeout**

Use the **set (router) dialplan timeout** commands to configure the dial plan on the CMG Router card. A CMG dial plan is responsible for user dialing timeouts and digit maps. These commands apply to the CMG Router card only.

**set (router) dialplan timeout interdigit long**

Use the **set (router) dialplan timeout interdigit long** command to set the total time allowed between dialed digits after the first, unless short timing is in effect. If the originator does not dial the next digit in this time period, the call is torn down. This command takes effect after the router card has been reset. This command applies to the CMG Router card only.

**Syntax:** `set {cmg_card-addr} dialplan timeout interdigit long {seconds}`

**Example:** `set 6 dialplan timeout interdigit long 30`

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG Router card.
<b>seconds</b>	The number of seconds (1-60). The default is 16.

**set (router) dialplan timeout interdigit short**

Use the **set (router) dialplan timeout interdigit short** command to set the time allowed between dialed digits when the T or I address template specification is in effect. For example, if the address specification is "xxxxT", and 4 digits have been dialed, this short timeout is in effect. If the timer expires, the call will be routed to the destination. If another digit is dialed before the timer expires, address processing will continue, using the long interdigit timeout. This command takes effect after the router card has been reset. This command applies to the CMG Router card only.

**Syntax:** `set {cmg_card-addr} dialplan timeout interdigit short {seconds}`

**Example:** `set 6 dialplan timeout interdigit short 1`

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG Router card.
<b>seconds</b>	The number of seconds (1-10). The default is 4.

**set (router) dns**

Use the **set (router) dns** commands to set Domain Name Server (DNS) options.

**set (router) dns domain**

**set (router) dns name**

**set (router) dns resolver**

**set (router) dns server**

**set (router) dns domain**

Use the **set (router) dns domain** command to set the default domain that the DNS resolver will add to any name queries that are not fully qualified.

**Syntax:** `set {rtr_card-addr} dns domain {"domain-name"}`

**Example:** `set 3 dns domain "mycompany.com"`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>domain-name</b>	The domain name, with a maximum of 43 characters. Name must be enclosed in quotes.



**set (router) dns name**

Use the **set (router) dns name** command to set the Router card host name.

**Syntax:** `set {rtr_card-addr} dns name {"host-name"}`

**Example:** `set 3 dns name "Adit25"`

The example will set the Router card host name to "Adit25" for the Router in slot 3.

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>host-name</b>	The host name for the Router card. This name must be enclosed in quotes, with a maximum of 15 characters.

**set (router) dns resolver**

Use the **set (router) dns resolver** command to enable/disable use of DNS resolver to convert domain names to IP addresses. Note: The DNS server address must be set before the DNS resolver can be enabled.

**Syntax:** `set {rtr_card-addr} dns resolver {disable|enable}`

**Example:** `set 3 dns resolver disable`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>disable</b>	Disables the DNS Resolver.
<b>enable</b>	Enables the DNS Resolver.

**set (router) dns server**

Use the **set (router) dns server** command to configure the IP address of DNS servers.

**Syntax:** `set {rtr_card-addr} dns server {1|2} {ip-addr}`

**Example:** `set 3 dns server 1 10.10.10.0`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>1</b>	Setup IP address of DNS server 1
<b>2</b>	Setup IP address of DNS server 2
<b>ip-addr</b>	The IP address, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

### ***set (router) enhanced security***

Use the **set (router) enhanced security** command to enable or disable enhanced login security on the Router. When enabled the user will not receive any login prompt or other output until the security password is typed. The security password is set via the *set (router) password* command.

**Note:** A **set 5 password security “password”** command must be completed before the enhanced security can be enabled. See, *set (router) password* on page 5-154

**Syntax:** `set {rtr_card-addr} enhanced security {disable|enable}`

**Example:** `set 5 enhanced security enable`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>disable</b>	Disable enhanced login security
<b>enable</b>	Enable enhanced login security

### ***set (router) hookflash***

Use the **set (router) hookflash** command to specify the flash maximum time in milliseconds. This is the time beyond which a disconnect, rather than a hookflash event, is declared. Flash event processing may be turned off by setting this parameter to zero. This command applies to the CMG Router card only.

**Syntax:** `set {cmg_card-addr} hookflash {milliseconds}`

**Example:** `set 5 hookflash 500`

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG card.
<b>milliseconds</b>	Maximum flash length, between 500 and 1500 milliseconds, or 0. Default is 1500 milliseconds

### ***set (router) lmi***

Use the **set (router) lmi** command to specify the Local Management Interface (LMI) protocol to use for the specified Router card.

**Syntax:** `set {rtr_card-addr} lmi {annexd|disable|lmi}`

**Example:** `set 5 lmi annexd`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>annexd</b>	Set LMI to Annex D.
<b>disable</b>	Disable LMI on the Router.
<b>lmi</b>	Set LMI to LMI rev1 (DLCI 1023)

### **set (router) lmi poll**

Use the **set (router) lmi poll** command to specify the Local Management Interface (LMI) polling count for the specified Router card.

**Syntax:** `set {rtr_card-addr} lmi poll {counter|interval} {value}`

**Example:** `set 5 lmi poll counter 15`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>counter</b>	Set the LMI count. <b>{value}</b> = count of how many link status enquiries can go un-responded before the link is declared down. Range is 0-255.
<b>interval</b>	Set LMI period <b>{value}</b> = LMI polling period. Range is 0-255 seconds.

### **set (router) log**

Use the **set (router) log** command to set whether the CMG text log will continuously add new log entries by over-writing the oldest entries, or will stop adding new log entries after the log is full. Entering this command will cause the log to be cleared. This command applies to the CMG Router card only.

**Syntax:** `set {cmg_card-addr} log {first|last} [detail]`

**Example:** `set 5 log last detail`

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG card.
<b>first</b>	Stop adding new entries when log is full (Default)
<b>last</b>	Always add new entries, overwrite old entries.
<b>detail</b>	Displays the log entries in greater detail, which will cause fewer entries to fit in the log.

**set (router) login auth**

Use the **set (router) login auth** command to specify how login authentication for this router should be performed. The router supports a configuration setting for each router card to determine how the router card logins are to be authenticated, as per one of the following choices: authenticate router logins from the router card local database (default), authenticate router logins by having the controller send a RADIUS access-request message to the controller's RADIUS servers, or authenticate router logins identically to controller logins. The last choice will cause the router logins to be authenticated either via RADIUS or the controller's database of users and passwords, as configured for the controller. This configuration is done with Controller CLI only (no menu support).

**Syntax:** `set {rtr_card-addr} login auth {controller|local|radius}`

**Example:** `set 5 login auth controller`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>controller</b>	Use the Controller login authentication.
<b>local</b>	Authenticate user logins via the router database (Default).
<b>radius</b>	Authenticate user logins via the Controller's RADIUS servers.

**set (router) login prompt**

Use the **set (router) login prompt** command to enable or disable the suppression of the Router login prompt for a user that telnets in from the Controller CLI. The user level of the current Controller user will be passed to the Router card at the time the telnet starts. This configuration allows a single login and authentication at the controller to apply to Router telnet sessions as well as the usual Controller CLI. This command applies to the IP Router card only.

**Syntax:** `set {rtr_card-addr} login prompt {disable|enable}`

**Example:** `set 5 login prompt disable`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>disable</b>	Do not present a login prompt.
<b>enable</b>	Present a login prompt. Default.

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**set (router) mgcp**

Use the **set (router) mgcp** command to setup Media Gateway Call Protocol (MGCP) parameters. This command applies to the CMG Router card only.

<b>set (router) mgcp addressformat</b>	<b>set (router) mgcp quarantine</b>
<b>set (router) mgcp algorithmname</b>	<b>set (router) mgcp report hookswitch</b>
<b>set (router) mgcp cac delayalert</b>	<b>set (router) mgcp retries</b>
<b>set (router) mgcp callagent address</b>	<b>set (router) mgcp rsipscheduler</b>
<b>set (router) mgcp callagent filter</b>	<b>set (router) mgcp rsipscheduler address</b>
<b>set (router) mgcp callagent port</b>	<b>set (router) mgcp rsipscheduler fallback</b>
<b>set (router) mgcp callagent secondary address</b>	<b>set (router) mgcp rsipscheduler fallback threshold</b>
<b>set (router) mgcp callagent secondary port</b>	<b>set (router) mgcp rsipscheduler normal</b>
<b>set (router) mgcp default</b>	<b>set (router) mgcp rsipscheduler port</b>
<b>set (router) mgcp dialstring format</b>	<b>set (router) mgcp rsipscheduler qtimeout</b>
<b>set (router) mgcp down</b>	<b>set (router) mgcp rsipscheduler randomize</b>
<b>set (router) mgcp gatewayid</b>	<b>set (router) mgcp rsipwildcard</b>
<b>set (router) mgcp keepalive</b>	<b>set (router) mgcp sdp codecorder</b>
<b>set (router) mgcp lco</b>	<b>set (router) mgcp sdpmode</b>
<b>set (router) mgcp package default</b>	<b>set (router) mgcp timeout</b>
<b>set (router) mgcp parsemode</b>	<b>set (router) mgcp tos</b>
<b>set (router) mgcp piggyback</b>	<b>set (router) mgcp up</b>
<b>set (router) mgcp port</b>	<b>set (router) mgcp version</b>
<b>set (router) mgcp protocolid</b>	

### **set (router) mgcp addressformat**

The **set (router) mgcp addressformat** is an interoperability command. It is used to remove or put square brackets around IP Addresses in transmitted MGCP commands. The standard convention and default setting is to have the brackets. The CMG is capable of receiving either format regardless of this setting. This command applies to the CMG Router card only.

**Syntax:** `set {cmg_card-addr} mgcp addressformat  
{brackets|nobrackets}`

**Example:** `set 1 mgcp addressformat nobrackets`

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG card.
<b>brackets</b>	MGCP will place brackets around IP addresses (Default)
<b>nobrackets</b>	MGCP will not place brackets around IP addresses

**set (router) mgcp algorithmname**

The **set (router) mgcp algorithmname** is an interoperability command to configure non-default MGCP designations for voice coding algorithms supported by the CMG. MGCP algorithm names are used in the “a:” attribute in the Local Connection Options (L:) parameter line of a CRCX or MDCX command. The CMG will ignore the case of characters in algorithm names received in MGCP commands from a call agent. Default algorithm names are taken or derived from standard encoding names registered at IANA, as specified at [www.iana.org](http://www.iana.org), the RTP section. This command takes effect immediately and applies to the CMG Router card only.

The default MGCP algorithm names are given in column 2 below.

Algorithm	CMG Algorithm ID	MGCP Algorithm Name
g711 mu-law	g711mu	PCMU
g711 A-law	g711a	PCMA
g729A	g729a	G729A
g726-16 kb/s	g726_16	g726-16
g726-24 kb/s	g726_24	g726-24
g726-32 kb/s	g726_32	g726-32
g726-40 kb/s	g726_40	g726-40

**NOTE:** The G.729 feature is protected by a software key. Until an appropriate key is entered to enable this feature it will not be usable. The command, however, will still succeed to allow for pre-configuration. For additional information on how to purchase this feature, contact Customer Support.

**Syntax:** `set {cmg_card-addr} mgcp algorithmname {algorithm}  
{“algorithm-name”}`

**Example:** `set 1 mgcp algorithmname g711mu “Gxxx”`

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG card.
<b>algorithm</b>	Enter one of the following algorithms: g711mu, g711a, g726_16, g726_24, g726_32, g726_40, g729a.
<b>algorithm-name</b>	The MGCP algorithm name for the CMG card. This name must be enclosed in quotes, with a maximum of 16 characters.

**set (router) mgcp cac delayalert**

Use the **set (router) mgcp cac delayalert** command to set the Call Admission Control (CAC) setting that allows ringing the terminating subscriber before remote SDP is received or delays ringing the terminating subscriber until remote SDP is received. This command takes effect after the router card has been reset. This command applies to the CMG Router card only.

**Syntax:** `set {cmg_card-addr} mgcp cac delayalert [disable|enable]`

**Example:** `set 1 mgcp cac delayalert enable`

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG card.
<b>disable</b>	Allows ringing the terminating subscriber before remote SDP is received. Default.
<b>enable</b>	Delays ringing the terminating subscriber until remote SDP is received.

**set (router) mgcp callagent address**

Use the **set (router) mgcp callagent address** command to initialize the address (notified entry) used by MGCP to send commands to the call agent. The address may be given in the form of an IPv4 address or as a domain name. The domain name form can only be used if DNS has been enabled. This command applies to the CMG Router card only.

**Syntax:** `set {cmg_card-addr} mgcp callagent address  
          {ip-addr|"domain-name"}`

**Example:** `set 1 mgcp callagent address "callagent.com"`

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG card.
<b>ip-addr</b>	The default IP address for MGCP to send command to call agent. In the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.
<b>domain-name</b>	The default domain name for MGCP to send commands to call agent. Name has a maximum of 43 characters, enclosed in quotes.



**set (router) mgcp callagent filter**

Use the **set (router) mgcp callagent filter** command to prevent the CMG from accepting MGCP messages from call agents except those that have been explicitly configured via the *set (router) mgcp callagent address* or *set (router) mgcp callagent secondary address* command. This command takes effect immediately.

**Syntax:** `set {cmg_card-addr} mgcp callagent filter {disable|enable}`

**Example:** `set 1 mgcp callagent filter enable`

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG card.
<b>disable</b>	Accept MGCP messages from all IP addresses.
<b>enable</b>	Ignore MGCP messages from IP addresses that are not those of the configured call agents.

**set (router) mgcp callagent port**

Use the **set (router) mgcp callagent port** command to initialize the UDP port (notified entity port) to be used by MGCP to send commands to the call agent.

**Note:** The MGCP specification suggests a port number of 2727 for the call agent. This is the default that the CMG uses to communicate with a call agent. However, many MGCP implementations use the port 2427, making it the same as the usual MGCP port of a gateway. If one is having trouble reaching the call agent, one should probably try configuring the port to 2727. This command applies to the CMG Router card only.

**Syntax:** `set {cmg_card-addr} mgcp callagent port {port-number}`

**Example:** `set 1 mgcp callagent port 2427`

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG card.
<b>port-number</b>	Port number for MGCP on the call agent. Range is from 1025 to 65535. Default 2727.

**set (router) mgcp callagent secondary address**

Use the **set (router) mgcp callagent address** command for configuring a secondary call agent address that will be tried if the primary call agent does not reply to the notifications. The secondary call agent address will function in the same fashion as would multiple IP addresses returned in a domain name query. See RFC 3435 for a detailed discussion of how multiple call agents are handled by MGCP gateways. The address may be given in the form of an IPv4 address or as a domain name. The domain name form can only be used if DNS has been enabled. This command takes effect after the card had been reset.

**Syntax:** `set {cmg_card-addr} mgcp callagent secondary address  
{ip-addr | "domain-name"}`

**Example:** `set 1 mgcp callagent secondary address  
"callagent.force10networks.com"`

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG card.
<b>ip-addr</b>	The secondary call agent IP address for MGCP to send commands to. In the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.
<b>domain-name</b>	Secondary call agent domain-name for MGCP to send command to. The name must be enclosed in quotes.

**set (router) mgcp callagent secondary port**

Use the **set (router) mgcp callagent port** command for configuring the port number for the secondary call agent that will be tried if the primary call agent does not reply to the notifications. This command takes effect after the card has been reset.

**Syntax:** `set {cmg_card-addr} mgcp callagent secondary port {port-num}`

**Example:** `set 1 mgcp callagent secondary port 5000`

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG card.
<b>port-num</b>	Default port number for MGCP on the secondary call agent. Range from 0 to 65535, with a default of 2727.

**set (router) mgcp default**

Use the **set (router) mgcp default** command to set all configurable MGCP options to their default values. This command applies to the CMG Router card only.

**Syntax:** `set {cmg_card-addr} mgcp default`

**Example:** `set 1 mgcp default`

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG card.

**set (router) mgcp dialstring format**

The **set (router) mgcp dialstring format** is an interoperability command to specify the reporting format of dialed digit strings in the Observed Events parameter of MGCP NTFY messages. Either the individual digits are separated by commas or not. The default, which is the recommended usage, is to separate digits with commas. This command applies to the CMG Router card only. Note: The *set (router) mgcp package default* command also affects the dialstring format. See description below.

**Syntax:** `set {cmg_card-addr} mgcp dialstring format {commas|nocommas}`

**Example:** `set 1 mgcp dialstring format commas`

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG card.
<b>commas</b>	Insert commas between digit events (Default)
<b>nocommas</b>	Do not insert commas between digit events

**set (router) mgcp down**

Use the **set (router) mgcp down** command to disable MGCP processing. Incoming MGCP messages from any call agent will be ignored, and endpoint activity will not cause any outgoing MGCP messages to be sent, nor any events to be accumulated. This is the default mode when the CMG is initially provisioned. If MGCP is configured as down when a reset or power cycle occurs, the call agent will NOT be notified when the reset or power cycle is complete.

The options for this command allow the invoker of the command to specify how the call agent is to treat active voice channels as they go out of service. The default (“now”) is an immediate termination of service on each provisioned (“up”) voice channel, whether active (on a call) or not. The call agent will be informed of the shutdown via an RSIP message for each voice channel with the “forced” restart method. If the “graceful” or “timeout” option is used, the call agent will be informed of the request to shut down each active voice channel via an RSIP message with “graceful” restart method, and each inactive channel with the “forced” restart method. After a call has cleared or the timeout period has expired on an active voice channel, a final RSIP will be sent, using the “forced” restart method. This command applies to the CMG Router card only.

**Syntax:** `set {cmg_card-addr} mgcp down [graceful|now|timeout] [time]`

**Example:** `set 1 mgcp down graceful`

Variable	Definition	
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG card.	
<b>graceful</b>	Wait for current calls to end before placing endpoint Out-of-Service	
<b>now</b>	Disconnect any existing calls immediately (Default)	
<b>timeout</b>	Wait a defined time (see time below) before taking endpoint out of service, disconnect any remaining calls. No new calls established during waiting period	
	<b>[time]</b>	Number of seconds to wait before taking endpoints Out-of-Service. Default time is 60 seconds.

**set (router) mgcp gatewayid**

Use the **set (router) mgcp gatewayid** command to set the gateway name or IP address to be used in MGCP command header lines and the SDP. By default, the gateway ID that will be used is the domain name of the CMG if DNS is enabled or the IP address of the LAN or WAN interface used to communicate with the call agent. The user may set an explicit name or address by entering it in the command. The domain name form can only be used if DNS has been enabled. This command applies to the CMG Router card only.

**Syntax:** `set {cmg_card-addr} mgcp gatewayid {default|ip-addr  
| "domain-name"}`

**Example:** `set 1 mgcp gatewayid "gateway1.force10networks.com"`

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG card.
<b>default</b>	Use the DNS domain name or the IP address configured for the WAN or LAN interface
<b>ip-addr</b>	Use the IP address for the gateway ID in the MGCP header. In the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.
<b>domain-name</b>	Use the name for the gateway ID in the MGCP header. Name has a maximum of 41 characters and is enclosed in quotes.

**set (router) mgcp keepalive**

Use the **set (router) mgcp keepalive** command to configure a keepalive timer that will cause the CMG to resend RSIP restart messages on expiration. When enabled, this countdown timer is reset every time an MGCP message is received from the call agent. On expiration, the CMG will react by starting periodic transmission of a wildcard RSIP restart MGCP message to each of the configured call agents until it is acknowledged. This command takes effect immediately.

**Note:** If the keepalive timer is enabled (and its value is not set to zero) and the RSIP wildcard setting is enabled (see *set (router) mgcp rsipwildcard* on page 5-147), the CMG sends wildcard RSIP messages to each endpoint. If the RSIP wildcard setting is disabled, the CMG sends individual RSIP messages without wildcards to the endpoints. Keepalive RSIP restarts are not sent during an active call.

**Syntax:** `set {cmg_card-addr} mgcp keepalive {disable|minutes}`

**Example:** `set 1 mgcp keepalive 5`

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG card.
<b>disable</b>	Disables the MGCP keep-alive timer. Default is disable.
<b>minutes</b>	The number of minutes for the countdown timer. Range is 0 - 255, where 0 will also disable the timer.

**set (router) mgcp lco**

Use the **set (router) mgcp lco** command to enable or disable the Local Connection Options (LCO) parameters which are involved in endpoint DSP negotiations. This command applies to the CMG Router card only.

**Syntax:** `set {cmg_card-addr} mgcp lco {codecs|ptime} {disable|enable}`

**Example:** `set 1 mgcp lco codecs disable`

Variable	Definition	
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG card.	
<b>codecs</b>	Determine which CODECS are used for the call	
	<b>disable</b>	The LCO CODEC list is ignored. The configured CODEC preferences in the <b>set (router-voice) algorithm preference</b> CLI command is used to determine which CODECs are used for a call, and the initial priority ordering
	<b>enable</b>	The LCO CODEC list is used to determine which CODECs may be used for the call, and determines the initial priority ordering of CODECs.
<b>ptime</b>	Determine which CODECS are used for the call	
	<b>disable</b>	The LCO ptime is ignored. The configured CODEC ptime preference, as defined in the <b>set (router) voip ptime</b> CLI command, is used instead to determine which ptime is to be used for a call, for a particular CODEC.
	<b>enable</b>	The LCO ptime is used to determine which packetization times may be used for the call.

**set (router) mgcp package default**

The **set (router) mgcp package default** is an interoperability command to set the default signal/event package to be used for the IETF version of MGCP. The default for this default is the DTMF (D) package. In the NCS version of MGCP, the default package is always the Line (L) package. This parameter does not apply to the NCS version of MGCP, whose default package is always the Line (L) package. For whichever package is made the default, the package name is not required in the softswitch-to-gateway MGCP parameter lines R, S, or T. In the gateway-to-softswitch O (observed events) parameter line, if the default package is set to DTMF(D), no package name is prepended to reported dialstring or digit events. In all other cases for observed events O, the package name is prepended (i.e. the L and G package names are always prepended in observed events). This command applies to the CMG Router card only.

**Syntax:** `set {cmg_card-addr} mgcp package default {d|g|l}`

**Example:** `set 1 mgcp package default g`

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG card.
<b>d</b>	Make the DTMF (D) package the default
<b>g</b>	Make the General (G) package the default
<b>l</b>	Make the Line (L) package the default

**set (router) mgcp parsemode**

The **set (router) mgcp parsemode** is an interoperability command to set the strictness with which incoming MGCP messages are parsed. If parsemode is set to **lenient**, then some incoming messages which may contain protocol errors for the configured protocol version, or contain requests to perform unavailable functions, may not produce an error response, if the message can be interpreted correctly, and/or if the requested unavailable function is unimportant to the desired operation. The **verbose** option behaves the same as the **lenient**, except that log entries are added to record the fact that it occurred. The **strict** option enforces all protocol requirements and function availability by means of an error return code. The default parse mode is **lenient**. This is done to account for certain softswitch implementations which do not strictly adhere to the protocol spec, or for which certain services would not work if a particular request for an unavailable benign function were to be rejected. Use of “lenient” parsemode can lead to “mysterious” problems if there is a serious protocol mismatch between the call agent and CMG. It is recommended that the parsemode be set to “strict” or “verbose” when one is attempting to determine why softswitch-CMG communications do not seem to allow CMG voice calls to be made or services to be activated. This command applies to the CMG Router card only.

**Syntax:** `set {cmg_card-addr} mgcp parsemode {lenient|strict|verbose}`

**Example:** `set 1 mgcp parsemode strict`

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG card.
<b>lenient</b>	Do not return an error response in benign situations (Default)
<b>strict</b>	Return an error response for protocol errors or requests for unavailable functions
<b>verbose</b>	Do not return an error response in benign situations, but log the event

**set (router) mgcp piggyback**

The **set (router) mgcp piggyback** is a interoperability command to set allow/disable the sending of more than one MGCP command in the same message. Some call agents support piggybacking, and some do not. The gateway will always support the processing of received piggybacked commands. The default, for greatest interoperability is to disable the sending of piggybacked commands. Enabling of piggybacking can improve MGCP throughput and provide simpler processing when an endpoint is in the quarantine state. This command applies to the CMG Router card only.

**Syntax:** `set {cmg_card-addr} mgcp piggyback {disable|enable}`

**Example:** `set 1 mgcp piggyback enable`

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG card.
<b>disable</b>	Disallow sending of piggyback commands (Default)
<b>enable</b>	Allow sending of piggybacked commands



**set (router) mgcp port**

Use the **set (router) mgcp port** command to set the gateway's UDP port for receiving MGCP commands. The default port is 2427. The port number may be set to any 16-bit number, but must not interfere with standard port numbers of other TCP or UDP applications. This command applies to the CMG Router card only.

**Syntax:** `set {cmg_card-addr} mgcp port {port-number}`

**Example:** `set 1 mgcp port 5000`

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG card.
<b>port-number</b>	The port number range is from 1025 to 65535.

**set (router) mgcp protocolid**

Use the **set (router) mgcp protocolid** command to configure a global protocol ID string which will override the default protocol ID string used in MGCP command lines. This command applies to the CMG Router card only.

**Syntax:** `set {cmg_card-addr} mgcp protocolid {default | "id-name"}`

**Example:** `set 1 mgcp protocolid "MGCP 1.0 CACS"`

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG card.
<b>default</b>	Use the default protocol ID string
<b>"id-name"</b>	Override the default protocol ID string with this string. Identifier of up to 20 characters, enclosed in quotes.

If the protocol ID setting is set to "default" or the null string (""), then the following default strings will be used depending on the configured MGCP version.

MGCP Version	Default Protocol ID
ietf10	MGCP 1.0
ietf01	MGCP 0.1
ncs	MGCP 0.1 NCS 1.0

**set (router) mgcp quarantine**

The **set (router) mgcp quarantine** is a interoperability command to specify the default quarantine handling method that the CMG will employ if the call agent has not sent an explicit quarantine handling value in the last Request Notify message. This command applies to the CMG Router card only.

**Syntax:** `set {cmg_card-addr} mgcp quarantine {loop|step}  
{discard|process}`

**Example:** `set 1 mgcp quarantine loop process`

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG card.
<b>loop</b>	Can generate multiple notifications to a request notify
<b>step</b>	Generate at most one notification to a request notify (Default)
<b>discard</b>	Discard events that are in the quarantine buffer
<b>process</b>	Process events that are in the quarantine buffer (Default)

**set (router) mgcp report hookswitch**

The **set (router) mgcp report hookswitch** is a interoperability command to specify whether the hookswitch events (offhook, onhook and flashhook) will always be reported to the call agent when they occur ("persistent event"), or whether an event request must be made by the call agent first. This command applies to the CMG Router card only.

**Syntax:** `set {cmg_card-addr} mgcp report hookswitch  
{always|onrequest}`

**Example:** `set 1 mgcp report hookswitch onrequest`

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG card.
<b>always</b>	Always report hookswitch events (Default)
<b>onrequest</b>	Wait for a request from the call agent before reporting hookswitch events

**set (router) mgcp retries**

Use the **set (router) mgcp retries** command to specify the number of times an MGCP command is retransmitted if there is no response from a call agent. After the last retry, if another message timeout occurs, the endpoint will enter a disconnected mode.

**Syntax:** `set {cmg_card-addr} mgcp retries {value}`

**Example:** `set 1 mgcp retries 4`

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG card.
<b>value</b>	The value range is 0 - 10.

**set (router) mgcp rsipscheduler**

Use the **set (router) mgcp rsipscheduler** command to enable and configure the CMG Router's RSIP scheduler. The RSIP scheduler manages the rate at which RSIP messages are sent by the CMG during periods of high RSIP volume. RSIP messages are queued by the RSIP scheduler and sent out at a configurable rate. The RSIP scheduler operates in two modes: Normal and Fallback. In Normal mode, the RSIP scheduler sends queued RSIP messages at the rate specified by the **set (router) mgcp rsipscheduler normal** command. A randomization value can be applied to the rate to decrease the chance of multiple CMGs sending RSIPs at the same time. Use the **set (router) mgcp rsipscheduler randomize** command to specify the randomization value.

If a specific number of consecutive RSIP messages are unsuccessful, indicating that the Call Agent is unavailable, the RSIP scheduler switches from Normal to Fallback mode. In Fallback mode, the RSIP scheduler sends queued RSIP messages at a reduced rate specified by the **set (router) mgcp rsipscheduler fallback** command. Use the **set (router) mgcp rsipscheduler fallback threshold** command to specify the number of unsuccessful RSIP messages required to trigger Fallback mode. Note that the randomization value specified with the **set (router) mgcp rsipscheduler randomize** command affects the fallback rate as well as the normal rate.

From Fallback mode, the RSIP scheduler reverts to Normal mode as follows:

1. After one RSIP message is successful at the fallback rate, the RSIP scheduler doubles the rate.
2. After two messages are successful at the doubled rate, the scheduler doubles the rate again.
3. After each consecutive set of messages (increased by a factor of 2) that is successful, the scheduler doubles the rate again until the normal RSIP rate is reached (or exceeded).

If at any point in this process a message is unsuccessful, the message rate is reset to the configured fallback rate and the process begins again. Note that if a system reset occurs, the RSIP scheduler defaults to Normal mode.

**Note:** To enhance Fallback mode functionality, the CMG Router can respond to input from a user-configured RSIP scheduler server. See the **set (router) mgcp rsipscheduler qtimeout** command for additional information.

**Syntax:** `set {cmg_card-addr} mgcp rsipscheduler  
{disable|local|rcvonly}`

**Example:** `set 1 mgcp rsipscheduler local`

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG card.
<b>disable</b>	Disable the RSIP scheduler. (Default)
<b>local</b>	Enable the RSIP scheduler.
<b>rcvonly</b>	Enable the RSIP scheduler and listen for commands from the RSIP scheduler server. See the <b>set (router) mgcp rsipscheduler qtimeout</b> command for information about the RSIP scheduler server.

### ***set (router) mgcp rsipscheduler address***

Use the **set (router) mgcp rsipscheduler address** command to specify the IP address or domain name of an optional RSIP scheduler server that will send RSIP limiting commands to the CMG Router. To use an RSIP scheduler server, you must specify "rcvonly" with the **set (router) mgcp rsipscheduler** command. See the **set (router) mgcp rsipscheduler qtimeout** command for additional information.

**Syntax:** `set {cmg_card-addr} mgcp rsipscheduler address  
{ip-addr|"domain-name"}`

**Example:** `set 1 mgcp rsipscheduler address 10.10.10.0`

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG card.
<b>ip-addr</b>	The IP address of the RSIP scheduler server, in the form xxx.xxx.xxx.xxx, where xxx is between 0-255.
<b>"domain-name"</b>	The domain name of the RSIP scheduler server. The name must be enclosed in quotes, with a maximum length of 41 characters.

**set (router) mgcp rsipscheduler fallback**

Use the **set (router) mgcp rsipscheduler fallback** command to set the rate at which the RSIP scheduler sends queued RSIP messages from the CMG Router during the Fallback mode of operation. See the **set (router) mgcp rsipscheduler** command for more information.

**Syntax:** `set {cmg_card-addr} mgcp rsipscheduler fallback {value} {hr|min|sec}`

**Example:** `set 1 mgcp rsipscheduler fallback 2 min`

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG card.
<b>value</b>	The rate at which RSIP messages are sent during Fallback mode. The default is 30 per minute. The range is 0 - 3600.
<b>hr min sec</b>	The units for the rate value: <b>hr</b> = per hour <b>min</b> = per minute <b>sec</b> = per second

**set (router) mgcp rsipscheduler fallback threshold**

Use the **set (router) mgcp rsipscheduler fallback threshold** command to specify the number of consecutive unsuccessful RSIP messages that must be generated by the CMG Router to trigger the Fallback mode of operation. See the **set (router) mgcp rsipscheduler** command for more information.

**Syntax:** `set {cmg_card-addr} mgcp rsipscheduler fallback threshold {value}`

**Example:** `set 1 mgcp rsipscheduler fallback threshold 2`

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG card.
<b>value</b>	The number of unsuccessful RSIP messages that must be sent to cause the transition from Normal to Fallback mode. The range is 0 - 255. The default is 3.

**set (router) mgcp rsipscheduler normal**

Use the **set (router) mgcp rsipscheduler normal** command to set the rate at which the RSIP scheduler sends queued RSIP messages from the CMG Router during the Normal mode of operation. See the **set (router) mgcp rsipscheduler** command for more information.

**Syntax:** `set {cmg_card-addr} mgcp rsipscheduler normal {value}  
{hr|min|sec}`

**Example:** `set 1 mgcp rsipscheduler normal 50 min`

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG card.
<b>value</b>	The rate at which RSIP messages are sent during Normal mode. The default is 60 per minute. The range is 0 - 3600.
<b>hr min sec</b>	The units for the rate value: <b>hr</b> = per hour <b>min</b> = per minute <b>sec</b> = per second

**set (router) mgcp rsipscheduler port**

Use the **set (router) mgcp rsipscheduler port** command to initialize the UDP port for an optional RSIP scheduler server that will send RSIP limiting commands to the CMG Router. To use an RSIP scheduler server, you must specify "rcvonly" with the **set (router) mgcp rsipscheduler** command. See the **set (router) mgcp rsipscheduler qtimeout** command for additional information.

**Syntax:** `set {cmg_card-addr} mgcp rsipscheduler port {value}`

**Example:** `set 1 mgcp rsipscheduler port 9999`

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG card.
<b>value</b>	The UDP port number for the RSIP scheduler server. The default is 2727.

**set (router) mgcp rsipscheduler qtimeout**

Use the **set (router) mgcp rsipscheduler qtimeout** command to specify the amount of time for the CMG Router to wait for an RSIP scheduler server message before moving from the Quiet state to the Start state. To use an RSIP scheduler server, you must specify "rcvonly" with the **set (router) mgcp rsipscheduler** command. To specify the location of the RSIP scheduler server, use the **set (router) mgcp rsip scheduler address** and **set (router) mgcp rsip scheduler port** commands.

To enhance the RSIP scheduler functionality described in the **set (router) mgcp rsipscheduler** command, the CMG Router can respond to input from a user-configured RSIP scheduler server located on a network device. The RSIP scheduler server can, at user request or automatically, take control of the RSIPs generated by all or selected CMGs in the network and spread them out in a deterministic way. The RSIP scheduler server can instruct the CMG to operate in two states: Quiet and Start.

When the CMG receives a Quiet state command from the RSIP scheduler server, the lines that are not in a call are put in an RSIP "quiet" mode, and the RSIP scheduler's queue is cleaned out and stopped. Lines in a call are also put in this mode after they go on-hook. No RSIPs will leave the CMG until it receives a subsequent Start state command from the RSIP scheduler server. A failsafe "quiet timeout" specified by the **set (router) mgcp rsipscheduler qtimeout** command ensures that the CMG does not stay in the quiet state forever. Note that in the Quiet state, calls that do not require RSIP (they can successfully set up and tear down calls with the Call Agent) are allowed.

When the CMG receives a Start state command from the RSIP scheduler server, the CMG moves the lines from the Quiet state to the Start state. The parameters included in the command can specify the number of lines to move into restart and the rate and the randomization number to be applied by the RSIP scheduler.

Specifications for the commands to be issued from the RSIP scheduler server are as follows:

- Must be an MGCP message with an AuditEndpoint verb (AUEP) with a custom parameter to hold the RSIP scheduler parameters. The CMG will respond to this message as a normal AUEP would, with the available endpoints information on a 200 code msg. The RSIP scheduler server can have its own retry mechanism upon failure to receive the 200 code response.
- The custom parameter is 'cac'. The following are its possible parameters:

Parameter	Definition
<b>cmd</b>	The value following this parameter defines the RSIP scheduler command. It can be 'quiet' or 'start'.
<b>endpoint</b>	Specifies the line number or the start of the range of line numbers (1 - 48) to move into restart. Must be specified for a Start command.
<b>num</b>	Specifies the number of lines to move into restart (1 - 48), starting from the line number specified by the 'endpoint' parameter. If not specified, this will default to 1 (only the channel specified in the endpoint moves to restart).
<b>rate</b>	Specifies the rate at which the RSIP scheduler will run for the specified lines. The format can be <i>n</i> /sec, <i>n</i> /min and <i>n</i> /hour where <i>n</i> is the rate number (0 - 3600). If not specified, the value set by the <b>set (router) mgcp rsipscheduler normal</b> command will be used.

Parameter	Definition
<b>random</b>	Specifies the randomization percent factor (0 - 50) for the RSIP scheduler. If not specified, the value set by the <b>set (router) mgcp rsipscheduler randomize</b> command will be used.

**Example of Quite state command from the RSIP scheduler server:**

```
AUEP 324 *@10.40.158.64 MGCP 1.0
cac: cmd quiet
```

**Examples of Start state commands from the RSIP scheduler server:**

Start RSIPs for all channels at a rate of 2 RSIPs per second with a random factor of 20%:

```
AUEP 325 *@10.40.158.64 MGCP 1.0
cac: cmd start, endpoint 1, num 48, rate 2/sec, random 20
```

Start RSIPs for channels 3 to 10 at a rate of 1 RSIP every 10 seconds with a random factor of 10%:

```
AUEP 325 *@10.40.158.64 MGCP 1.0
cac: cmd start, endpoint 3, num 8, rate 6/min, random 10
```

Start RSIPs for channel 5 and 6 using the Normal RSIP scheduler rate and randomization value:

```
AUEP 325 *@10.40.158.64 MGCP 1.0
cac: cmd start, endpoint 5, num 2
```

**Syntax:** `set {cmg_card-addr} mgcp rsipscheduler qtimeout {value}`

**Example:** `set 1 mgcp rsipscheduler qtimeout 30`

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG card.
<b>value</b>	The amount of time to wait for an RSIP scheduler server message before moving from the Quiet state to Start state. The range is 0 - 3600 minutes. The default is 60 minutes.

***set (router) mgcp rsipscheduler randomize***

Use the **set (router) mgcp rsipscheduler randomize** command to specify a randomization percentage to be applied to RSIP messages sent by the RSIP scheduler during the Normal and Fallback modes of operation. See the **set (router) mgcp rsipscheduler** command for more information.

**Syntax:** `set {cmg_card-addr} mgcp rsipscheduler randomize {value}`

**Example:** `set 1 mgcp rsipscheduler randomize 50`

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG card.
<b>value</b>	The randomization percentage to be introduced into the periodic RSIP intervals. The range is 0 - 50%. The default is 20%. A value of 0 disables randomization.



***set (router) mgcp rsipwildcard***

The **set (router) mgcp rsipwildcard** command to configure whether the CMG card should send a single wildcard RSIP or individual RSIPs for each endpoint, at those times when all endpoints are transitioning. The CMG will default to individual RSIPs. If the wildcard RSIP setting is enabled, the CMG will send an RSIP with the wildcard endpoint ID when it transitions all of the endpoints. The call agent can then use AUEPs to determine individual endpoint status. The CMG transitions all of the endpoints when it sets MGCP up or down or when it is about to reboot or has just finished booting. Individual RSIPs will always be sent when an endpoint is going to transition up or down independent from the other endpoints, such as when a CLI command sets an endpoint up or down, or when the disconnected state has occurred. This command applies to the CMG Router card only.

**Syntax:** `set {cmg_card-addr} mgcp rsipwildcard {disable|enable}`

**Example:** `set 1 mgcp rsipwildcard enable`

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG card.
<b>disable</b>	Send individual RSIPs.
<b>enable</b>	Send wildcard RSIP. (Default)

***set (router) mgcp sdp codecorder***

Use the **set (router) mgcp sdp codecorder** to determine whether the LCO CODEC order or the CODEC order of the remote descriptor shall have priority in determining the CODEC ordering in the outgoing SDP. This command applies to the CMG Router card only.

**Syntax:** `set {cmg_card-addr} mgcp sdp codecorder {lco|rdesc}`

**Example:** `set 1 mgcp sdp codecorder lco`

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG card.
<b>lco</b>	The SDP CODEC priority order that will follow the LCO settings. See <i>set (router) mgcp lco</i> .
<b>rdesc</b>	The SDP CODEC priority order will follow the Remote Descriptor.

**set (router) mgcp sdpmode**

The **set (router) mgcp sdpmode** is a interoperability command to specify the content in transmitted Session Description Protocol (SDP) message sections. This option is included to account for call agents or remote gateways that cannot handle full content (default). This command applies to the CMG Router card only.

**Syntax:** `set {cmg_card-addr} mgcp sdpmode {full|minimal}`

**Example:** `set 1 mgcp sdpmode minimal`

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG card.
<b>full</b>	SDP sections contain all mandatory lines ( <b>v, o, s, c, t, m</b> )
<b>minimal</b>	SDP sections contain only necessary lines ( <b>v, c, m</b> ) plus <b>a</b> . Which are the only lines really used for setting VoIP media stream parameters.

**set (router) mgcp timeout**

Use the **set (router) mgcp timeout** command specify the maximum bound on MGCP retransmission. The time between retries will exponentially climb from a minimum of about 200 ms up to the value entered here +200 ms. The value entered bounds the maximum number of milliseconds that MGCP should wait for a response to a command sent to the call agent, before retrying the command. This command applies to the CMG Router card only.

**Syntax:** `set {cmg_card-addr} mgcp timeout {milliseconds}`

**Example:** `set 1 mgcp timeout 5000`

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG card.
<b>milliseconds</b>	Range: 0 to 65535 milliseconds. Default is 3000 milliseconds (3 seconds).

**set (router) mgcp tos**

Use the **set (router) mgcp tos** command to configure the IP TOS byte value to be sent in each transmitted MGCP packet. This command takes effect immediately.

**Syntax:** `set {cmg_card-addr} mgcp tos {value}`

**Example:** `set 1 mgcp tos 0x28`

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG card.
<b>value</b>	IP TOS byte value, in the format of 0x (2 hex digits). Default setting is 0.

The following table contains the appropriate TOS value for various IP precedence and Diffuser Code points:

IP Precedence	TOS
IP Precedence = 0	0x00
IP Precedence = 1	0x20
IP Precedence = 2	0x40
IP Precedence = 3	0x60
IP Precedence = 4	0x80
IP Precedence = 5	0xA0
IP Precedence = 6	0xC0
IP Precedence = 7	0xE0

Diffuser Code Point	TOS
EF = 101110	0xB8
AF11 = 001010	0x28
AF12 = 001100	0x30
AF13 = 001110	0x38
AF21 = 010010	0x48
AF22 = 010100	0x50
AF23 = 010110	0x58
AF31 = 011010	0x68
AF32 = 011100	0x70
AF33 = 011110	0x78
AF41 = 100010	0x88
AF42 = 100100	0x90
AF43 = 100110	0x98

**set (router) mgcp up**

Use the **set (router) mgcp up** command to start MGCP processing of incoming messages and endpoint events. MGCP must be up for the Customer Media Gateway to properly interact with an external call agent. The CMG notifies the call agent by means of one or more Restart in Progress (RSIP) commands with the Restart Method parameter set to “restart”. An RSIP is sent for each voice channel which is configured as “up”, after an initial random delay of not more than 30 seconds. If MGCP is configured as up when a CMG board reset or power cycle occurs, RSIP commands will be sent to the call agent when the board is ready for MGCP operation. This command applies to the CMG Router card only.

**Syntax:** `set {cmg_card-addr} mgcp up`

**Example:** `set 1 mgcp up`

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG card.

**set (router) mgcp version**

The **set (router) mgcp version** is an interoperability command to specify the version of the MGCP protocol which is running on the Customer Media Gateway. This version must be compatible with the version of MGCP running on the call agent. This command applies to the CMG Router card only.

**Syntax:** `set {cmg_card-addr} mgcp version {ietf01|ietf10|ncs}`

**Example:** `set 1 mgcp version ietf01`

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG card.
<b>ietf01</b>	IETF MGCP version 0.1, as specified in an IETF MGCP Internet draft
<b>ietf10</b>	IETF MGCP version 1.0, as specified in IETF RFC 3435 (Default)
<b>ncs</b>	PacketCable MGCP version NCS 1.0

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**set (router) network info**

Use the **set (router) network info** command to allow a router card's IP address and network information to be propagated into the standard mib-2 tables for IpAddrTable (snmp OID 1.3.6.1.2.1.4.20), IpRouteTable (snmp OID 1.3.6.1.2.1.4.21), and IfTable (snmp OID 1.3.6.1.2.1.2.2). This allows the router's network information to be accessible via queries on the controller. By default, this feature is disabled.

**Syntax:** `set {rtr_card-addr} network info {enable|disable}`

**Example:** `set 5 network info enable`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG, or TSR) card.
<b>enable</b>	Enables the propagation of the network information.
<b>disable</b>	Disables the propagation of the network information. (Default)

**set (router) ntp**

Use the **set (router) ntp** command to set up Network Time Protocol (NTP) parameters.

**set (router) ntp enable/disable**

**set (router) ntp poll**

**set (router) ntp server**

**set (router) ntp timezone**

**set (router) ntp enable/disable**

Use the **set (router) ntp enable/disable** command to enable/disable NTP processing.

**Syntax:** **set {rtr\_card-addr} ntp {disable|enable}**

**Example:** **set 1 ntp enable**

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>disable</b>	Disable NTP processing
<b>enable</b>	Enable NTP processing

**set (router) ntp poll**

Use the **set (router) ntp poll** command to specify polling of the NTP server every defined number of seconds.

**Syntax:** **set {rtr\_card-addr} ntp poll {seconds}**

**Example:** **set 1 ntp poll 120**

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>seconds</b>	The number of seconds between polls. Seconds range is 16 to 1024. Default is 16.

**set (router) ntp server**

Use the **set (router) ntp server** command to specify the IP address or domain name of the NTP server.

**Syntax:** `set {rtr_card-addr} ntp server {ip-addr | "domain-name"}`

**Example:** `set 1 ntp server 10.10.10.0`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>ip-addr</b>	The IP address of the NTP server, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255. Setting the NTP server value to 0.0.0.0 will cause the router to listen to and process NTP broadcasts.
<b>domain-name</b>	Domain name of the NTP server, with a maximum length of 43 characters, enclosed in quotes.

**set (router) ntp timezone**

Use the **set (router) ntp timezone** command to specify the timezone offset relative to GMT for this Router.

**Syntax:** `set {rtr_card-addr} ntp timezone {hour-offset}  
[minute-offset]`

**Example:** `set 1 ntp timezone -5`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>hour-offset</b>	Used to calculate gateway time from GMT. The hour-offset range is -12 to 12.
<b>minute-offset</b>	Used to calculate gateway time from GMT. The minute-offset range is 0 to 60.

### ***set (router) password***

Use the **set (router) password** command to manage password access on the specified Router card.

**Syntax:** `set {rtr_card-addr} password {setting} {"password"}`

**Example:** `set 5 password view "Fred"`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>admin</b>	Set Administration level password on the Router.
<b>config</b>	Set Configuration level password on the Router.
<b>security</b>	Set Security level password on the Router.
<b>view</b>	Set View level password on the Router.
<b>password</b>	A password with a maximum of 15 characters. Password must be enclosed in quotes, and is case-sensitive.



**set (router) port**

Use the **set (router) port** command to set port characteristics on a Terminal Server Router (TSR) card. This command applies to the Terminal Server Router card only.

<b>set (router) port baudrate</b>	<b>set (router) port passive</b>
<b>set (router) port databits</b>	<b>set (router) port password</b>
<b>set (router) port dsr low reset</b>	<b>set (router) port prompt</b>
<b>set (router) port flowcontrol</b>	<b>set (router) port protocolport</b>
<b>set (router) port inactivity timer</b>	<b>set (router) port stopbits</b>
<b>set (router) port ip</b>	<b>set (router) port tbos map description</b>
<b>set (router) port name</b>	<b>set (router) port tbos map display</b>
<b>set (router) port parity</b>	<b>set (router) port type</b>

**set (router) port baudrate**

Use the **set (router) port baudrate** command to set the baud rate on a TSR port.

Note: The values listed below are the baud rates that have been tested and are selectable with the auto-completion feature. A rate that is not listed may be manually typed in the {value} field, range is 11 to 691200. Not all baud rates will resolve exactly, in this circumstance the closest possible rate will be chosen and the user informed of the rate

**Syntax:** **set {tsr\_card-addr} port {port-number} baudrate**  
**{1200 | 2400 | 4800 | 9600 | 19200 | 38400 | 57600 | 115400}**

**Example:** **set 5 port 2 baudrate 38400**

Variable	Definition
<b>tsr_card-addr</b>	The slot number (1-6) that contains the TSR card.
<b>port-number</b>	The port number (1-4) of the TSR card.
<b>1200</b>	Set baud rate to 1200
<b>2400</b>	Set baud rate to 2400
<b>4800</b>	Set baud rate to 4800
<b>9600</b>	Set baud rate to 9600
<b>19200</b>	Set baud rate to 19200
<b>38400</b>	Set baud rate to 38400
<b>57600</b>	Set baud rate to 57600
<b>115400</b>	Set baud rate to 115400

**set (router) port databits**

Use the **set (router) port databits** command to set the data bits on a TSR port.

**Syntax:** `set {tsr_card-addr} port {port-number} databits {5|6|7|8}`

**Example:** `set 5 port 2 databits 6`

Variable	Definition
<b>tsr_card-addr</b>	The slot number (1-6) that contains the TSR card.
<b>port-number</b>	The port number (1-4) of the TSR card.
<b>5 6 7 8</b>	Allowable data bits. <b>Note: If 1.5 Stop Bits is selected, the Data Bits setting MUST be 5 Data Bits, if 2 Stop Bits is selected, 5 Data Bits MUST NOT be selected. See <i>set (router) port stopbits</i> on page 5-160.</b>

**set (router) port dsr low reset**

Use the **set (router) port dsr low reset** command to cause a RE-232 session to terminate when DSR (Data Set Ready) goes low. This setting can be issued when the card is physically strapped for Ethernet, but has no effect. This setting also only goes into effect when the DSR signal is high. This setting can be done for any application type but is only active for **termserv** and **rawtcp** modes.

**Syntax:** `set {tsr_card-addr} port {port-number} dsr low reset {disable|enable}`

**Example:** `set 5 port 2 dsr low reset enable`

Variable	Definition
<b>tsr_card-addr</b>	The slot number (1-6) that contains the TSR card.
<b>port-number</b>	The port number (1-4) of the TSR card.
<b>disable</b>	Disable will not use the reset feature. Default
<b>enable</b>	Enable causes the session to teardown when DSR goes low.

**set (router) port flowcontrol**

Use the **set (router) port flowcontrol** command to set the flow control on a TSR port. This command controls the transfer of messages or characters between two points in a data network to prevent congestion, or loss of data when the receiving device's buffer begins to reach its capacity.

**Syntax:** `set {tsr_card-addr} port {port-number} flowcontrol {setting}`

**Example:** `set 5 port 2 flowcontrol none`

Variable	Definition
<b>tsr_card-addr</b>	The slot number (1-6) that contains the TSR card.
<b>port-number</b>	The port number (1-4) of the TSR card.
<b>none</b>	Set flow control to none
<b>rtscts</b>	Set flow control to hardware
<b>xonxoff</b>	Set flow control to xonxoff

**set (router) port inactivity timer**

Use the **set (router) port inactivity timer** command to set the inactivity timeout for a RS-232 session. This setting can be issued when the card is physically strapped for Ethernet, bus has no effect. When this timer is set, the socket will be reset when no data is sent or received on the port for the number of minutes the timer is set to. This timer can be set for any application type, but is only active for **termserv** and **rawtcp** modes.

**Syntax:** `set {tsr_card-addr} port {port-number} inactivity timer {disable|time}`

**Example:** `set 5 port 2 inactivity timer 30`

Variable	Definition
<b>tsr_card-addr</b>	The slot number (1-6) that contains the TSR card.
<b>port-number</b>	The port number (1-4) of the TSR card.
<b>disable</b>	Disable will not use a inactivity timer. Default.
<b>time</b>	The inactivity timer will cause the session to timeout and teardown when a value is entered. Range is 1 - 999.

**set (router) port ip**

Use the **set (router) port ip** command to set an IP address for a TSR port.

**Syntax:** `set {tsr_card-addr} port {port-number} ip {ip-addr}`

**Example:** `set 5 port 2 ip 192.100.1.1`

Variable	Definition
<b>tsr_card-addr</b>	The slot number (1-6) that contains the TSR card.
<b>port-number</b>	The port number (1-4) of the TSR card.
<b>ip-addr</b>	The IP address for the defined port, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

**set (router) port name**

Use the **set (router) port name** command to set define name for a TSR port.

**Syntax:** `set {tsr_card-addr} port {port-number} name {"name"}`

**Example:** `set 5 port 2 name "portname"`

Variable	Definition
<b>tsr_card-addr</b>	The slot number (1-6) that contains the TSR card.
<b>port-number</b>	The port number (1-4) of the TSR card.
<b>name</b>	Port identifier, with up to 15 characters, enclosed in quotes.

**set (router) port parity**

Use the **set (router) port parity** command to set the parity on a TSR port.

**Syntax:** `set {tsr_card-addr} port {port-number} parity {even|none|odd}`

**Example:** `set 5 port 2 parity none`

Variable	Definition
<b>tsr_card-addr</b>	The slot number (1-6) that contains the TSR card.
<b>port-number</b>	The port number (1-4) of the TSR card.
<b>even</b>	Set even parity to the TSR port
<b>none</b>	Set no parity to the TSR port
<b>odd</b>	Set odd parity to the TSR port

**set (router) port passive**

Use the **set (router) port passive** command to set the TSR port to be passive. This command will terminate any active telnet connection on this interface and will reinitialize its associated TCP socket

**Syntax:** `set {tsr_card-addr} port {port-number} passive`

**Example:** `set 5 port 2 passive`  
Do you wish to do this (y/n)?

Variable	Definition
<b>tsr_card-addr</b>	The slot number (1-6) that contains the TSR card.
<b>port-number</b>	The port number (1-4) of the TSR card.

**set (router) port password**

Use the **set (router) port password** command to set the password for a TSR port.

**Syntax:** `set {tsr_card-addr} port {port-number} password {"password"}`

**Example:** `set 5 port 2 password "testpassword"`

Variable	Definition
<b>tsr_card-addr</b>	The slot number (1-6) that contains the TSR card.
<b>port-number</b>	The port number (1-4) of the TSR card.
<b>password</b>	A password with up to 15 characters, enclosed in quotes.

**set (router) port prompt**

Use the **set (router) port prompt** command to set the password for a TSR port.

**Syntax:** `set {tsr_card-addr} port {port-number} prompt {disable|enable}`

**Example:** `set 5 port 2 prompt enable`

Variable	Definition
<b>tsr_card-addr</b>	The slot number (1-6) that contains the TSR card.
<b>port-number</b>	The port number (1-4) of the TSR card.
<b>disable</b>	Disable Authentication Prompt on a TSR port.
<b>enable</b>	Set the Authentication Prompt on a TSR port.

**set (router) port protocolport**

Use the **set (router) port protocolport** command to set the protocol port on a TSR port.

**Syntax:** `set {tsr_card-addr} port {port-number} protocolport {protocol-port}`

**Example:** `set 5 port 2 protocolport 0`

Variable	Definition
<b>tsr_card-addr</b>	The slot number (1-6) that contains the TSR card.
<b>port-number</b>	The port number (1-4) of the TSR card.
<b>protocol-port</b>	0-65535 of the TSR port. 0 is the wildcard, any port designator.

**set (router) port stopbits**

Use the **set (router) port stopbits** command to set the number of stop bits on a TSR port. The stop bit is an interval at the end of each Asynchronous Character that allows the receiving computer to pause before the start of the next character.

**Syntax:** `set {tsr_card-addr} port {port-number} stopbits {1|1.5|2}`

**Example:** `set 5 port 2 stopbits 1`

Variable	Definition
<b>tsr_card-addr</b>	The slot number (1-6) that contains the TSR card.
<b>port-number</b>	The port number (1-4) of the TSR card.
<b>1 1.5 2</b>	Stop bits values available. <b>Note: If 1.5 Stop Bits is selected, the Data Bits setting MUST be 5 Data Bits, if 2 Stop Bits is selected, 5 Data Bits MUST NOT be selected. See <i>set (router) port stopbits</i> on page 5-160.</b>

**set (router) port tbos map description**

Use the **set (router) port tbos map description** command to set a description attribute for one of the eight available TBOS displays. This setting can be issued when the card is physically strapped for Ethernet, but has no effect. This setting can be done for any application type but is only used when type is set to TBOS.

**Note:** This command is only available on a TSR card that has TBOS feature enabled.

**Syntax:** `set {tsr_card-addr} port {port-number} tbos map {map-addr} description {"text-string"}`

**Example:** `set 5 port 2 tbos map 4 description "Site 7, St. Louis, MO"`

Variable	Definition
<b>tsr_card-addr</b>	The slot number (1-6) that contains the TSR card.
<b>port-number</b>	The port number (1-4) of the TSR card.
<b>map-addr</b>	One of the eight TBOS displays available for monitoring equipment. Range is 1 - 8.
<b>test-string</b>	The TBOS map description command assigns a text string (0 - 19 characters) to a designated display number. Default is an empty string ("").

**set (router) port tbos map display**

Use the **set (router) port tbos map display** command to set a TBOS (Telemetry Byte Oriented Serial) display map value for one of the eight TBOS display available for monitoring equipment. This setting can be issued when the card is physically strapped for Ethernet, but has no effect. This setting can be done for any application type but is only used when type is set to TBOS.

**Note:** This command is only available on a TSR card that has TBOS feature enabled.

**Syntax:** `set {tsr_card-addr} port {port-number} tbos map {map-addr} display {device|none}`

**Example:** `set 5 port 2 tbos map 4 display lynx_ds3`

Variable	Definition	
<b>tsr_card-addr</b>	The slot number (1-6) that contains the TSR card.	
<b>port-number</b>	The port number (1-4) of the TSR card.	
<b>map-addr</b>	One of the eight TBOS displays available for monitoring equipment. Range is 1 - 8.	
<b>device-type</b>	<b>alcatel_mdr_4000</b>	Alcatel MDR-4000 radio for monitoring
	<b>lynx_1_4_port_prot_sw</b>	Proxium Lynx radio
	<b>lynx_8_port_prot_sw</b>	Proxium Lynx radio
	<b>lynx_ds3</b>	Proxium Lynx radio
	<b>lynx_hd_31145_10</b>	Proxium Lynx radio
	<b>lynx_hd_31145_1f</b>	Proxium Lynx radio
<b>none</b>	None will disable monitoring for that TBOS display.	

**set (router) port type**

Use the **set (router) port type** command to set the application being used for a RS-232 (serial) port. This setting can be issued when the card is physically strapped for Ethernet, but has no effect. This command applies to the TSR only.

**Syntax:** `set {tsr_card-addr} port {port-number} type {termserv|rawtcp|tbos}`

**Example:** `set 5 port 2 type tbos`

Variable	Definition
<b>tsr_card-addr</b>	The slot number (1-6) that contains the TSR card.
<b>port-number</b>	The port number (1-4) of the TSR card.
<b>termserv</b>	Terminal server. Default.
<b>rawtcp</b>	Raw TCP.
<b>tbos</b>	TBOS (Telemetry Byte Oriented Serial). Note: this setting requires TBOS feature to be enabled on the TSR service card. Contact Customer Support for information on purchasing this software keyed feature.

**set (router) ppp auth**

Use the **set (router) ppp auth** command to configure the PPP (Point-to-Point Protocol) authentication on the specified Router card.

**set (router) ppp auth byremote protocol**

**Syntax:** `set {rtr_card-addr} ppp auth byremote protocol {chap|none|pap}`

**Example:** `set 5 ppp auth byremote protocol none`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>chap</b>	Set to the CHAP protocol.
<b>none</b>	The remote PPP device cannot authenticate this Adit (Default).
<b>pap</b>	Set to the PAP protocol.



**set (router) ppp auth byremote secret**

**Syntax:** set {rtr\_card-addr} ppp auth byremote secret {"password"}

**Example:** set 5 ppp auth byremote secret "public"

The example will set the PPP authentication secret password for the Router in slot 5 to "public"

**Note:** A set (router) ppp auth by remote protocol command must be completed before this command can be implemented.

Variable	Definition
rtr_card-addr	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
password	A password with a maximum of 15 characters. Password must be enclosed in quotes.

**set (router) ppp auth byremote user**

**Syntax:** set {rtr\_card-addr} ppp auth byremote user {profilename|"protocol-name"}

**Example:** set 5 ppp auth byremote user profilename

The example will set the PPP authentication user name for the Router in slot 5 to equal the profile name.

**Note:** A set (router) ppp auth byremote protocol command must be completed before this command can be implemented.

Variable	Definition
rtr_card-addr	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
profilename	Use the profile name as the CHAP or PAP user name.
protocol-name	The CHAP or PAP user name. A maximum of 16 characters, enclosed in quotes.

**set (router) ppp auth ofremote protocol**

**Syntax:** `set {rtr_card-addr} ppp auth ofremote protocol {chap|none|pap}`

**Example:** `set 5 ppp auth ofremote protocol none`

The example will set the Router in slot 5 to not allow PPP authentication of this Adit by the router.

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>chap</b>	Set to the CHAP protocol.
<b>none</b>	The remote PPP device cannot authenticate this Adit (Default).
<b>pap</b>	Set to the PAP protocol.

**set (router) ppp security**

Use the **set (router) ppp security** command to set up the local external security server, that the Router will use to authenticate remote PPP devices.

**set (router) ppp security address**

**Syntax:** `set {rtr_card-addr} ppp security address {ip-addr}`

**Example:** `set 5 ppp security address 10.1.1.1`

Note: A **set (router) ppp security server** command must be completed before this command can be implemented.

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>ip-addr</b>	The IP address, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

**set (router) ppp security password**

**Syntax:** set {rtr\_card-addr} ppp security password {"password"}

**Example:** set 5 ppp security password "public"

**Note:** A set (router) ppp auth by remote protocol command must be completed before this command can be set.

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>password</b>	A password with a maximum of 15 characters. Password must be enclosed in quotes.

**set (router) ppp security server**

**Syntax:** set {rtr\_card-addr} ppp security server {none|radius|tacacs}

**Example:** set 5 ppp security server none

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>none</b>	Do not use an external security server to authenticate remote PPP devices (Default).
<b>radius</b>	Will set the server to use the RADIUS (Remote Authentication Dial-In Service) protocol. RADIUS is a client/server-based authentication software system.
<b>tacacs</b>	Will set the server to use the TACACS+ (Terminal Access Controller Access Control System) protocol. TACACS+ provides services of authentication, authorization and accounting independently.

**set (router) priority tos**

Use the **set (router) priority tos** command to configure parameters to recognize routed voice packets which will be handled with higher priority over other routed data.

For each IP datagram to be routed, the TOS byte from the IP header will be logically AND'd with the configured TOS mask and compared to the TOS match value. If they match, the datagram will be handled with a greater priority than other routed data but with lower priority than its own VoIP data. This command takes effect immediately.

**Syntax:** `set {cmg_card-addr} priority tos {disable|mask-value match-value}`

**Example:** `set 5 priority tos 0xfc 0xb8`

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG Router card.
<b>disable</b>	No priority handling of routed voice packets. Default.
<b>mask-value</b>	Mask to be applied to the TOS byte in the IP header. In the format of 0x (2 hex digits)
<b>match-value</b>	TOS byte match value. In the format of 0x (2 hex digits).

The following table contains the appropriate TOS mask and match for various IP precedence and DiffServ code points:

IP Precedence	Mask	TOS
IP Precedence = 0	0xE0	0x00
IP Precedence = 1	0xE0	0x20
IP Precedence = 2	0xE0	0x40
IP Precedence = 3	0xE0	0x60
IP Precedence = 4	0xE0	0x80
IP Precedence = 5	0xE0	0xA0
IP Precedence = 6	0xE0	0xC0
IP Precedence = 7	0xE0	0xE0

DiffServ Codepoint	Mask	TOS
EF = 101110	0xFC	0xB8
AF11 = 001010	0xFC	0x28
AF12 = 001100	0xFC	0x30
AF13 = 001110	0xFC	0x38
AF21 = 010010	0xFC	0x48
AF22 = 010100	0xFC	0x50
AF23 = 010110	0xFC	0x58
AF31 = 011010	0xFC	0x68
AF32 = 011100	0xFC	0x70
AF33 = 011110	0xFC	0x78
AF41 = 100010	0xFC	0x88
AF42 = 100100	0xFC	0x90
AF43 = 100110	0xFC	0x98

**set (router) proxy**

Use the **set (router) proxy** command to enable/disable proxy ARP mode on the Router. This command will add an IP interface between the Controller and the Router over the backplane. In this way the Controller can be accessed by IP hosts over the Router's LAN/WAN interfaces without using the Controller's physical Ethernet interface.

**Note:** When more than one router card is in use, multiple proxies may be established, but the Adit 600 limits Telnet sessions to just one of them at a time.

**Syntax:** `set {rtr_card-addr} proxy {disable|enable} [ip-addr] [mask|bits]`

**Example:** `set ethernet ip address 10.0.0.1 255.0.0.0  
set 3:1 ip address 192.168.100.1/24  
set 3 proxy enable 192.168.100.1/24  
set ip gateway 192.168.100.80`

Set a Router card port to proxy ARP for the Adit 600, where the Router card is located in slot 3. In this example the Controller is reachable at 192.168.100.80 and Router at 192.168.100.1.

**Example:** `set ethernet ip address 10.0.0.1 255.0.0.0  
set 3:1 ip address 192.168.100.1/24  
set 3 proxy enable 192.168.100.1/24  
set ip gateway 192.168.100.1`

Set a Router card port to proxy ARP for the Adit 600, where the Router card is located in slot 3. In this example the Controller and Router will share address 192.168.100.1 on the Router. Telnet and SNMP connections to 192.168.100.1 will connect to the Controller.

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router card.
<b>disable</b>	Disables Router proxy.
<b>enable</b>	When proxy ARP is enabled the Router will allow both the Router and Controller to be accessed from the Router LAN and WAN interfaces
<b>ip-addr</b>	Set the IP address for the proxy interface on the Adit 600, using the form xxx.xxx.xxx.xxx, where xxx is a number from 0 to 255.
<b>mask</b>	Set the subnet mask, using the form xxx.xxx.xxx.xxx, where xxx is a number from 0 to 255. This is an optional setting.
<b>bits</b>	Use this field to identify the number of bits, from left to right that will be used to match the IP Address field within the data packet. Range is between 1-32.

***There are numerous cases of IP address assignments for the proxy and each case causes slightly different behavior:***

**Proxy address is in the same subnet as the Controller LAN address.** If the Controller Ethernet IP address and the proxy IP address are in the same subnet, either since both addresses are the same or they fall into the same subnet based on address and mask, the Controller will attempt to use the Ethernet interface to send packets to other hosts in that subnet. Once an external host has sent a packet to the Controller that arrives on the proxy interface, the Controller will then use the proxy interface for all communication to that host.

**Proxy address is in a different subnet than the Controller LAN address.** If the Controller Ethernet IP address and the proxy IP address are in different subnets based on address and mask, then the Controller will use either the Ethernet interface or proxy interface to send packets to other hosts, based on which subnet the host is in or, which subnet the IP gateway is on.

**Proxy address is equal to one of the Router's numbered IP addresses.** If the Controller proxy IP address is equal to one of the Router's own numbered IP addresses or equal to one of the Router's static NAT addresses that maps to one of the Router's numbered IP addresses, then the Controller and Router will appear to be a single IP host to devices on any of the Router's interfaces.

This is a very useful mode that will make the Controller and Router appear to be a single IP device. When working in this mode, all management traffic directed to the Router will be forwarded internally to the Controller instead. This includes Telnet, SNMP, Adit-Navigator socket applications. When configured this way, an external host Telnet to the Router will go to the Controller login prompt and CLI.

If the proxy interface is to be the primary IP interface between the Controller and other hosts, then it is highly recommended that the IP gateway be set to the same address as the proxy address. This will make the proxy interface the default route for IP datagrams.

It is highly recommended for optimum connectability, that the Controller's proxy IP address be a unique host address in one of the Router subnets or be equal to one of the Router IP addresses if the user wishes to have both devices share a single IP address, and that the IP gateway address be set to equal the proxy address.

### **set (router) reboot**

Use the **set (router) reboot** command to set automatic reboot after an upload of code or configuration file.

**Syntax:** `set {rtr_card-addr} reboot {both|code|config}  
{disable|enable}`

**Example:** `set 5 reboot both disable`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>code</b>	Automatic reboot after code upload
<b>config</b>	Automatic reboot after configuration upload
<b>disable</b>	Will disable automatic reboot
<b>enable</b>	Will enable the automatic reboot after upload of a file

### **set (router) rip**

Use the **set (router) rip** command to specify RIP packets to transmit and receive.

**Syntax:** `set {rtr_card-addr} rip {recv|send} {v1|v1and2|v2}`

**Example:** `set 3 rip recv v1`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>recv</b>	Set RIP receive version
<b>send</b>	Set RIP send version
<b>v1</b>	Set RIP to version 1
<b>v1and2</b>	Set RIP to version 1 and version 2
<b>v2</b>	Set RIP to version 2

**set (router) snmp**

Use the **set (router) snmp** command to set the SNMP contact, location and name on the specified Router card.

**set (router) snmp contact**

Use the **set (router) snmp contact** command to set the value of sysContact on the Router card.

**Syntax:** `set {rtr_card-addr} snmp contact {"contact-name"}`

**Example:** `set 1 snmp contact "John Doe"`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>contact-name</b>	The value of sysContact, with a maximum of 64 ASCII characters. Name must be enclosed in quotes.

**set (router) snmp location**

Use the **set (router) snmp location** command to set the value of sysLocation on the Router card.

**Syntax:** `set {rtr_card-addr} snmp location {"location-name"}`

**Example:** `set 1 snmp location "Newark"`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>location-name</b>	The value of sysLocation, with a maximum of 64 ASCII characters. Name must be enclosed in quotes.

**set (router) snmp name**

Use the **set (router) snmp name** command to set the value of sysName on the Router card.

**Syntax:** `set {rtr_card-addr} snmp name {"system-name"}`

**Example:** `set 1 snmp name "AditRouters"`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>system-name</b>	The value of sysName, with a maximum of 64 ASCII characters. Name must be enclosed in quotes.



**set (router) stp**

Use the **set (router) stp** commands to configure the Spanning Tree Protocol on the Router. **Note:** Enter {slot} only. If {slot:port} is entered the command will be directed to the Router LAN and not the Router Card.

**set (router) stp bridge forwarddelay**

**set (router) stp bridge hellotime**

**set (router) stp bridge maxage**

**set (router) stp bridge priority**

**set (router) stp enable/disable**

**set (router) stp bridge forwarddelay**

Use the **set (router) stp bridge forwarddelay** command to configure Spanning Tree bridge forward delay value for the bridge. The bridge forward delay is the time spent by a Port in the Listening or Learning States before the transitioning to the Learning or Forwarding State, respectively.

**Syntax:** `set {rtr_card-addr} stp bridge forwarddelay {value}`

**Example:** `set 3 stp bridge forwarddelay 15`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>value</b>	The value can range from 4 to 30 seconds, with a default of 15.

**set (router) stp bridge hellotime**

Use the **set (router) stp bridge hellotime** command to configure Spanning Tree bridge hello time value for the bridge.

**Syntax:** `set {rtr_card-addr} stp hellotime {value}`

**Example:** `set 3 stp bridge hellotime 3`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>value</b>	The value can range from 1 to 10 seconds, with a default of 2.

**set (router) stp bridge maxage**

Use the **set (router) stp bridge maxage** command to configure Spanning Tree maximum age value for the bridge. The bridge max age value specifies the maximum age of received protocol information before it is discarded.

**Syntax:** `set {rtr_card-addr} stp bridge maxage {value}`

**Example:** `set 3 stp bridge maxage 15`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>value</b>	The value can range from 6 to 40 seconds, with a default of 20.

**set (router) stp bridge priority**

Use the **set (router) stp bridge priority** command to configure Spanning Tree priority value for the bridge.

**Syntax:** `set {rtr_card-addr} stp priority {value}`

**Example:** `set 3 stp bridge priority 32768`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>value</b>	The value can range from 0 to 65535, with a default of 32768.

**set (router) stp enable/disable**

Use the **set (router) stp enable/disable** command to enable and disable Spanning Tree Protocol on the Router.

**Syntax:** `set {rtr_card-addr} stp {disable|enable}`

**Example:** `set 3 stp enable`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card. <b>Note: Enter {slot} only. If {slot:port} is entered the command will be directed to the Router LAN and not the Router Card.</b>
<b>disable</b>	Disable Spanning Tree protocol
<b>enable</b>	Enable Spanning Tree protocol

**set (router) syslog**

Use the **set (router) syslog** commands to configure the Router to send alarm and event messages to a Syslog server.

**set (router) syslog enable/disable**

**set (router) syslog facility**

**set (router) syslog level**

**set (router) syslog server**

**set (router) syslog enable/disable**

Use the **set (router) syslog enable/disable** command to enable and disable sending alarm and event messages to an external Syslog server from the Router.

---

**NOTE:** This command is available to Manager-level users only.

---

**Syntax:** `set {rtr_card-addr} syslog {disable|enable}`

**Example:** `set 3 syslog enable`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card. <b>Note: Enter {slot} only. If {slot:port} is entered the command will be directed to the Router LAN and not the Router Card.</b>
<b>disable</b>	Disable Syslog protocol
<b>enable</b>	Enable Syslog protocol

**set (router) syslog facility**

Use the **set (router) syslog facility** command to set the Syslog facility value that the Router card will report to a Syslog server in each message.

---

**NOTE:** This command is available to Manager-level users only.

---

**Syntax:** `set {rtr_card-addr} syslog facility {value}`

**Example:** `set 3 syslog facility 16`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card. <b>Note: Enter {slot} only. If {slot:port} is entered the command will be directed to the Router LAN and not the Router Card.</b>
<b>value</b>	The range of valid facility values is from 0 to 23, with a default of 16 (local use 0).

***set (router) syslog level***

Use the **set (router) syslog level** command to set the Syslog severity level. Events of all severity levels lower in number (more severe) will be sent to the Syslog server.

---

**NOTE:** For the CMG card, setting the Syslog level to 7 causes the CMG's log to be echoed to the Syslog. To echo MGCP messages to the Syslog, make sure that the CMG's log is set for "detail" using the **set (router) log** command.

---

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**NOTE:** This command is available to Manager-level users only.

---

**Syntax:** `set {rtr_card-addr} syslog level {severity}`

**Example:** `set 3 syslog level 4`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>severity</b>	The severity threshold level can range from 0 to 7.

***set (router) syslog server***

Use the **set (router) syslog server** command to set the IP address of an external Syslog server.

---

**NOTE:** This command is available to Manager-level users only.

---

**Syntax:** `set {rtr_card-addr} syslog server {ip-addr}`

**Example:** `set 3 syslog server 10.0.0.1`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>ip-addr</b>	Set the IP address for the external Syslog server, using the form xxx.xxx.xxx.xxx, where xxx is a number from 0 to 255.

**set (router) time daylight savings**

Use the **set (router) time daylight savings** command to enable or disable automatic adjustment of the CMG router's clock for Daylight Savings Time.

**Note:** This command applies to the CMG Router card only.

**Syntax:** `set {cmg_card-addr} time daylight savings {disable|enable}`

**Example:** `set 1 time daylight savings enable`

The example enables automatic adjustment for Daylight Savings Time on the CMG card in slot 1.

Variable	Definition
<b>disable</b>	Disables automatic adjustment for Daylight Savings Time. (Default.)
<b>enable</b>	Enables automatic adjustment for Daylight Savings Time.

## set (router) voip

Use the **set (router) voip** commands to set Voice over IP (VoIP) parameters.

<b>set (router) voip alarm up/down</b>	<b>set (router) voip rtcp cname</b>
<b>set (router) voip default</b>	<b>set (router) voip rtcp interval</b>
<b>set (router) voip dtmf edge</b>	<b>set (router) voip rtp baseport</b>
<b>set (router) voip g729a</b>	<b>set (router) voip rtpmap</b>
<b>set (router) voip jitterbuffer</b>	<b>set (router) voip sdpaddress</b>
<b>set (router) voip osi</b>	<b>set (router) voip t38 ecm</b>
<b>set (router) voip packing</b>	<b>set (router) voip t38 redundancy highspeed</b>
<b>set (router) voip payload type</b>	<b>set (router) voip t38 redundancy lowspeed</b>
<b>set (router) voipptime</b>	

## set (router) voip alarm up/down

Use the **set (router) voip alarm up|down** command to enable or disable all VoIP alarms on the MSR card.

---

**NOTE:** This command applies to the MSR card only.

---

**Syntax:** set {msr\_card-addr} voip alarm {up | down}

**Example:** set 3 voip alarm down

Variable	Definition
<b>msr_card-addr</b>	The slot number (1-6) that contains the MSR card.
<b>down</b>	Disable VoIP alarms.
<b>up</b>	Enable VoIP alarms.

## set (router) voip default

Use the **set (router) voip default** command to set all VoIP options to their default values.

---

**NOTE:** This command applies to the CMG Router card only.

---

**Syntax:** set {cmg\_card-addr} voip default

**Example:** set 3 voip default

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG card.

---

**set (router) voip dtmf edge**

Use the **set (router) voip dtmf edge** command to configure the CMG to notify DTMF digits on the leading or trailing edge. Setting this configuration item to leading edge shall cause the CMG to act on DTMF digits, for collection or notification purposes, at the time the key is pressed. Setting this configuration item to trailing edge shall cause the CMG to act on DTMF digits at the time the key is released. This command takes effect immediately.

---

**NOTE:** This command applies to the CMG Router card only.

---

**Syntax:** `set {cmg_card-addr} voip dtmf edge {leading|trailing}`

**Example:** `set 3 voip dtmf edge trailing`

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG card.
<b>leading</b>	Will cause the CMG to act on DTMF digits, for collection or notification purposes, at the time the key is pressed.
<b>trailing</b>	Will cause the CMG to act on DTMF digits at the time the key is released. (Default)

**set (router) voip g729a**

Use the **set (router) voip g729a** command to enable or disable the G.729 codec in the CMG. This command takes effect after the card has been reset.

---

**NOTE:** The G.729 feature is protected by a software key. Until an appropriate key is entered to enable this feature it will not be usable. The command, however, will still succeed to allow for pre-configuration. For additional information on how to purchase this feature, contact Customer Support.

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**NOTE:** This command applies to the CMG Router card only.

---

**Syntax:** `set {cmg_card-addr} voip g729a {disable|enable}`

**Example:** `set 3 voip g729a enable`

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG card.
<b>disable</b>	Will prevent the use of the G.729 codec.
<b>enable</b>	Will allow the use of the G.729 codec. Enable is the default.

**set (router) voip jitterbuffer**

Use the **set (router) voip jitterbuffer** command to specify dynamic delay adjustment to minimize delay through the jitter buffer, or maintain a static average delay through the jitter buffer.

---

**NOTE:** This command applies to the CMG Router card only.

---

**Syntax:** `set {cmg_card-addr} voip jitterbuffer {dynamic|static}`

**Example:** `set 3 voip jitterbuffer static`

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG card.
<b>dynamic</b>	Perform dynamic delay adjustment to minimize delay
<b>static</b>	Maintain a static average delay, equal to two times the packet time (Default)

**set (router) voip osi**

Use the **set (router) voip osi** command to adjust the time of the Open Switch Interval (OSI) signal.

---

**NOTE:** This command applies to the CMG Router card only.

---

**Syntax:** `set {cmg_card-addr} voip osi {milliseconds}`

**Example:** `set 3 voip osi 1000`

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG Router card.
<b>milliseconds</b>	500-2500 milliseconds.



**set (router) voip packing**

Use the **set (router) voip packing** command to configure the packing order for g726 voice coding algorithms. The new default packing order for each voice coding algorithm is Big Endian. Note that when upgrading from CMG version 1.0 the packing order for G.726-32 will be Little Endian until changed by the user to load defaults is issued.

---

**NOTE:** This command applies to the CMG Router card only.

---

**Syntax:** `set {cmg_card-addr} voip packing {g726_40|g726_32|g726_24|g726_16} {bigendian|littleendian}`

**Example:** `set 3 voip packing g726_32 bigendian`

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG card.
<b>g726_40</b>	G.726 coding for voice channels at 40 Kbps
<b>g726_32</b>	G.726 coding for voice channels at 32 Kbps
<b>g726_24</b>	G.726 coding for voice channels at 24 Kbps
<b>g726_16</b>	G.726 coding for voice channels at 16 Kbps
<b>bigendian</b>	Use big-endian packing for this codec
<b>littleendian</b>	Use little-endian packing for this codec

**set (router) voip payload type**

Use the **set (router) voip payload type** command to configure whether or not the CMG will process RTP packets with invalid payload types in the RTP header.

---

**NOTE:** This command applies to the CMG Router card only.

---

**Syntax:** `set {cmg_card-addr} voip payload type {lenient|strict}`

**Example:** `set 3 voip payload type lenient`

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG card.
<b>lenient</b>	Process packets with invalid payload type
<b>strict</b>	Do not process packets with invalid payload type (Default)

**set (router) voip ptime**

Use the **set (router) voip ptime** command to specify the default packetization time for the specified algorithm. The packetization time determines the frequency at which RTP packets are transmitted. The MGCP call agent may override the new default set by this command on a call-by-call basis. At the end of a call, the configured default is back in force. This command takes effect immediately.

---

**NOTE:** The G.729 feature is protected by a software key. Until an appropriate key is entered to enable this feature is will not be usable. The command, however, will still succeed to allow for pre-configuration. For additional information on how to purchase this feature, contact Customer Support.

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---

**NOTE:** This command applies to the CMG Router card only.

---

**Syntax:** `set {cmg_card-addr} voip ptime {g711a|g711mu|g726_16  
|g726_24|g726_32|g726_40|g729a|all} {time}`

**Example:** `set 3 voip ptime g711mu 20`

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG card.
<b>g711a</b>	Set packetization time for G.711 A-law
<b>g711mu</b>	Set packetization time for G.711 mu-law
<b>g726_16</b>	Set packetization time for G.726 16 Kbps
<b>g726_24</b>	Set packetization time for G.726 24 Kbps
<b>g726_32</b>	Set packetization time for G.726 32 Kbps
<b>g726_40</b>	Set packetization time for G.726 40 Kbps
<b>g729a</b>	Set packetization time for G.729 8 Kbps
<b>all</b>	Set packetization time for all algorithms
<b>time</b>	Default packetization time in milliseconds. Valid values are 10, 20, 30, 40, 50, 60, 70, or 80 milliseconds. Where 40 through 80 are only valid for g729a

---

**set (router) voip rtcp cname**

Use the **set (router) voip rtcp cname** command to specify the name to be used for the CNAME field of Real Time Conferencing Protocol (RTCP) packets.

---

**NOTE:** This command applies to the CMG Router card only.

---

**Syntax:** `set {cmg_card-addr} voip rtcp cname {gatewayid|"name"}`

**Example:** `set 3 voip rtcp cname gatewayid`

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG card.
<b>gatewayid</b>	Use the gateway ID in the CNAME. Default.
<b>name</b>	Identifying the gateway, maximum 63 characters, enclosed in quotes.

**set (router) voip rtcp interval**

Use the **set (router) voip rtcp interval** command to specify the time interval between RTCP reports.

---

**NOTE:** This command applies to the CMG Router card only.

---

**Syntax:** `set {cmg_card-addr} voip rtcp interval {seconds}`

**Example:** `set 3 voip rtcp interval 0`

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG card.
<b>seconds</b>	Interval time is in seconds, range is 0 to 255. If zero, RTCP reporting is turned off. Default is 5 seconds.

**set (router) voip rtp baseport**

Use the **set (router) voip rtp baseport** command to specify the base UDP port to be used when allocating ports for transmitting or receiving RTP (Realtime Transport Protocol) packet streams in VoIP calls. All ports allocated for RTP, including the base port, must be even-numbered. Each allocated RTP port number will be equal to the base port plus some even offset. The odd port number just above each allocated RTP port will be used for sending or receiving RTCP packets, which contain reports of packet and performance statistics for the associated RTP. The CMG will reserve a block of 288 consecutive ports starting at this port for RTP and RTCP.

---

**NOTE:** This command applies to the CMG Router card only.

---

**Syntax:** `set {cmg_card-addr} voip rtp baseport {port-number}`

**Example:** `set 5 voip rtp baseport 10000`

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG card.
<b>port-number</b>	The port number range is from 0 to 65535. Default is 30000.

**set (router) voip rtpmap**

Use the **set (router) voip rtpmap** command to specify the dynamic payload type and name to be used for a specific algorithm in the Session Description Protocol (SDP) part of MGCP connection commands. This command takes effect immediately.

The defaults are:

Algorithm	Payload Type	SDP Name
G.726-16 kb/s	102	G726-16
G.726-24 kb/s	97	G726-24
G.726-40 kb/s	98	G726-40
G.729A	18	G729A

---

**NOTE:** In accordance with current IANA assignments ([www.iana.org](http://www.iana.org), RTP section), G.726-32 kb/s is assigned a (non-dynamic) payload type of 2, G.711 mu-law is assigned payload type 0, and G.711 A-law is assigned payload type 8. (a dynamic payload type to G.726-32 can be assigned by means of the above command, in case of conflict with payload type 2, formerly assigned to G.721, in RFC 1890.) Only one payload type and DSP name may be assigned per algorithm.

---

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**NOTE:** The G.729 feature is protected by a software key. Until an appropriate key is entered to enable this feature is will not be usable. The command, however, will still succeed to allow for pre-configuration. For additional information on how to purchase this feature, contact Customer Support.

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**NOTE:** This command applies to the CMG Router card only.

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**Syntax:** `set {cmg_card-addr} voip rtpmap {dtmf_relay|g711a|g711mu|g726_16|g726_24|g726_32|g726_40|g729a|nse} {type} {"name"}`

**Example:** `set 3 voip rtpmap g726_16 96 "G.726-16"`

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG card.
<b>dtmf_relay</b>	Set payload type and name for the DTMF Relay.
<b>g711a</b>	Set payload type and name for G.711 A-law.
<b>g711mu</b>	Set payload type and name for G.726 $\mu$ -law.
<b>g726_16</b>	Set payload type and name for G.726 16kbps.
<b>g726_24</b>	Set payload type and name for G.726 24kbps.
<b>g726_32</b>	Set payload type and name for G.726 32kbps.
<b>g726_40</b>	Set payload type and name for G.726 40kbps.
<b>g729a</b>	Set payload type and name for G.729 A.
<b>nse</b>	Set payload type and name for the Named Service Event (NSE). Type ranges is 98-119, with a default of 100.
<b>type</b>	RTP dynamic payload type, Range is 0 - 12, unless otherwise listed above.
<b>name</b>	Identifier up to 15 characters, enclosed in quotes.

**set (router) voip sdpaddress**

Use the **set (router) voip sdpaddress** command to set the address value to be used for the origin and connection lines in the SDP.

---

**NOTE:** This command applies to the CMG Router card only.

---

**Syntax:** `set {cmg_card-addr} voip sdpaddress {gatewayid|  
domain-name|ip|ip-addr}`

**Example:** `set 3 voip sdpaddress domainname`

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG card.
<b>domain-name</b>	Use the DNS domain name if DNS is enabled or DMG IP address if DNS is disabled.
<b>gatewayid</b>	Use the MGCP gateway ID.
<b>ip</b>	Use the CMG IP address.
<b>ip-addr</b>	Use this IP address, in the form xxx.xxx.xxx.xxx, where xxx is a number from 0 - 255.

**set (router) voip t38 ecm**

Use the **set (router) voip t38 ecm** command to enable or disable the CMG's fax T.38 Error Correction Mode (ECM) capability during fax negotiation for the entire card. This command requires a reset to take effect.

---

**NOTE:** This command applies to the CMG Router card only.

---

**Syntax:** `set {cmg_card-addr} voip t38 ecm {disable|enable}`

**Example:** `set 3 voip t38 ecm enable`

Variable	Definition
<b>disable</b>	Disable the CMG's fax T.38 error correction mode.
<b>enable</b>	This setting allows the user to accept/attempt ECM T38 negotiation. It should be noted that when ECM is enabled, the fax call might train at a lower speed, thus lengthening the overall fax call time. Enable is the default.

---

**set (router) voip t38 redundancy highspeed**

Use the **set (router) voip t38 redundancy highspeed** command to configure the number of duplicate packets to transmit during a high-speed T.38 fax call for the entire card. This command requires a reset to take effect.

---

**NOTE:** This command applies to the CMG Router card only.

---

**Syntax:** `set {cmg_card-addr} voip t38 redundancy highspeed {none|1-8}`

**Example:** `set 3 voip t38 redundancy highspeed 2`

Variable	Definition
<b>none</b>	Sets the number of duplicate packets to none. None is the default.
<b>1-3</b>	During a CMG's voice call when a voice channel is sending T.38 fax payload packets, this setting allows the user to define the number of redundant or duplicate packets sent during a high-speed T.38 fax call. Range is 1-3 packets.

**set (router) voip t38 redundancy lowspeed**

Use the **set (router) voip t38 redundancy lowspeed** command to configure the number of duplicate packets to transmit during a low speed T.38 fax call for the entire card. This command requires a reset to take effect.

---

**NOTE:** This command applies to the CMG Router card only.

---

**Syntax:** `set {cmg_card-addr} voip t38 redundancy lowspeed {none|1-8}`

**Example:** `set 3 voip t38 redundancy lowspeed 4`

Variable	Definition
<b>none</b>	Sets the number of duplicate packets to none. None is the default.
<b>1-8</b>	During a CMG's voice call when a voice channel is sending T.38 fax payload packets, this setting allows the user to define the number of redundant or duplicate packets sent during a low speed T.38 fax call. Range is 1-8 packets.

**set (router-lan) collision**

Use the **set (router-lan) collision** commands to configure collision alarms.

**set (router-lan) collision interval**

Use the **set (router-lan) collision interval** command to specify the time interval over which excessive collision alarms are calculated.

**Syntax:** `set {rtr_lan-addr} collision interval {seconds}`

**Example:** `set 3:1 collision interval 0`

Variable	Definition
<b>rtr_lan-addr</b>	Router (IP, CMG or TSR) address is in the form {slot:port} or {slot "profile-name"}. <b>slot</b> - The slot number (1-6) that contains the Router card. <b>port</b> - Port number of the Router. <b>profile-name</b> - Profile name for the Router interface used to reach this destination. Name must be enclosed in quotes, with a maximum of 11 characters.
<b>seconds</b>	Range from 0 to 65535. With a value of 0 collision alarms will be disabled.

**set (router-lan) collision threshold**

Use the **set (router-lan) collision threshold** command to specify the thresholds used to determine excessive collision alarm state.

**Syntax:** `set {rtr_lan-addr} collision threshold {high|low} {count}`

**Example:** `set 3 "Adit50" collision threshold high 500`

Variable	Definition
<b>rtr_lan-addr</b>	Router (IP, CMG or TSR) address is in the form {slot:port} or {slot "profile-name"}. <b>slot</b> - The slot number (1-6) that contains the Router card. <b>port</b> - Port number of the Router. <b>profile-name</b> - Profile name for the Router interface used to reach this destination. Name must be enclosed in quotes, with a maximum of 11 characters.
<b>high</b>	The number of collisions in the collision interval time period above which an excess collision alarm is raised.
<b>low</b>	The number of collisions in the collision interval time period below which a standing excess collision alarm is cleared.
<b>count</b>	The number of collisions in the collision interval time period. Range is 0 - 65535.



**set (router-lan) filter forward**

Use the **set (router-lan) filter forward** command to specify the forwarding mode for Layer 2 filters on the LAN interface.

**Syntax:** `set {rtr_lan-addr} filter forward {matching|nontmatching}`

**Example:** `set 3:1 filter forward notmatching`

Variable	Definition
<b>rtr_lan-addr</b>	Router (IP, CMG or TSR) address is in the form {slot:port} or {slot "profile-name"}. <b>slot</b> - The slot number (1-6) that contains the Router card. <b>port</b> - Port number of the Router. <b>profile-name</b> - Profile name for the Router interface used to reach this destination. Name must be enclosed in quotes, with a maximum of 11 characters.
<b>matching</b>	Only those frames matching a rule will be forwarded.
<b>notmatching</b>	Only those frames NOT matching a rule will be forwarded.

**set (router-lan) framing**

Use the **set (router-lan) framing** command to specify which Ethernet frame types are supported on the LAN interface.

**Syntax:** `set {rtr_lan-addr} framing {ipx|other} {ieee8022|ieee8023|ethii|snap} {disable|enable}`

**Example:** `set 3:1 framing ipx ieee8022 enable`

Variable	Definition
<b>rtr_lan-addr</b>	Router (IP, CMG or TSR) address is in the form {slot:port} or {slot "profile-name"}. <b>slot</b> - The slot number (1-6) that contains the Router card. <b>port</b> - Port number of the Router. <b>profile-name</b> - Profile name for the Router interface used to reach this destination. Name must be enclosed in quotes, with a maximum of 11 characters.
<b>ipx</b>	Enable or disable a frame type for the IPX protocol
<b>other</b>	Enable or disable a frame type for protocols other than IP and IPX
<b>ethii</b>	Ethernet II framing
<b>ieee8022</b>	IEEE 802.2 framing
<b>ieee8023</b>	IEEE 802.3 framing
<b>snap</b>	LLC/SNAP framing
<b>disable</b>	Disable the frame type
<b>enable</b>	Enable the frame type

**set (router-lan) gateway**

Use the **set (router-lan) gateway** command to specify a default IP gateway for the specified LAN interface. If there is no static network entry to 0.0.0.0, then this address is used as the default gateway for packets with no explicit route.

**Syntax:** `set {rtr_lan-addr} gateway {ip-addr}`

**Example:** `set 3:1 gateway 192.168.201.144`

Variable	Definition
<b>rtr_lan-addr</b>	Router (IP, CMG or TSR) address is in the form {slot:port} or {slot "profile-name"}. <b>slot</b> - The slot number (1-6) that contains the Router card. <b>port</b> - Port number of the Router. <b>profile-name</b> - Profile name for the Router interface used to reach this destination. Name must be enclosed in quotes, with a maximum of 11 characters.
<b>ip-addr</b>	The IP address of the gateway, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.

**set (router-lan) ip address**

Use the **set (router-lan) ip address** command to specify an IP address for the specified LAN interface. When first installed the Router card's LAN interface has a default IP address of 10.0.0.1 with subnet mask of 255.0.0.0.

**Syntax:** `set {rtr_lan-addr} ip address {ip-addr} [mask]`

**Example:** `set 3:1 ip address 192.168.202.244 255.255.255.0`

Variable	Definition
<b>rtr_lan-addr</b>	Router (IP, CMG or TSR) address is in the form {slot:port} or {slot "profile-name"}. <b>slot</b> - The slot number (1-6) that contains the Router card. <b>port</b> - Port number of the Router. <b>profile-name</b> - Profile name for the Router interface used to reach this destination. Name must be enclosed in quotes, with a maximum of 11 characters.
<b>ip-addr</b>	The Router IP address, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.
<b>mask</b>	The subnet mask, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255

**set (router-lan) ipx network**

Use the **set (router-lan) ipx network** command to specify IPX network numbers for the four IPX LAN frame types. This enables the Adit to Router IPX to Remote (WAN) networks, even if an IPX server does not exist on the local LAN.

**Syntax:** `set {rtr_lan-addr} ipx network {ieee8022|ieee8023|ethii|snap} {network}`

**Example:** `set 3:1 ipx network ieee8022 000000f1`

Variable	Definition
<b>rtr_lan-addr</b>	Router (IP, CMG or TSR) address is in the form {slot:port} or {slot "profile-name"}. <b>slot</b> - The slot number (1-6) that contains the Router card. <b>port</b> - Port number of the Router. <b>profile-name</b> - Profile name for the Router interface used to reach this destination. Name must be enclosed in quotes, with a maximum of 11 characters.
<b>ethii</b>	Ethernet II framing
<b>ieee8022</b>	IEEE 802.2 framing
<b>ieee8023</b>	IEEE 802.3 framing
<b>snap</b>	LLC/SNAP framing
<b>network</b>	External IPX network, specified as an 8-digit hexadecimal number.

**set (router-lan) phy**

Use the **set (router-lan) phy** command to specify the Ethernet Physical specifications speed and mode.

Note: It is highly recommended that this setting be left at auto-negotiation. Connecting ethernet devices with incompatible setting can lead to severe network performance degradation, increased collisions, late collisions, CRC errors, and undetected data corruption.

**Syntax:** `set {rtr_lan-addr} phy {setting}`

**Example:** `set 3:1 phy full100`

Variable	Definition
<b>rtr_lan-addr</b>	Router (IP, CMG or TSR) address is in the form {slot:port} or {slot "profile-name"}. <b>slot</b> - The slot number (1-6) that contains the Router card. <b>port</b> - Port number of the Router. <b>profile-name</b> - Profile name for the Router interface used to reach this destination. Name must be enclosed in quotes, with a maximum of 11 characters.
<b>auto</b>	Auto-negotiate (highly recommended).
<b>full10</b>	10 MHz full-duplex.
<b>full100</b>	100 MHz full-duplex.
<b>half10</b>	10 MHz half-duplex.
<b>half100</b>	100 MHz half-duplex.

**set (router-lan) rip**

Use the **set (router-lan) rip** commands to specify RIP for the specified LAN interface.

**set (router-lan) rip ip**

Use the **set (router-lan) rip ip** command to specify the IP RIP for the specified LAN interface.

**Syntax:** `set {rtr_lan-addr} rip ip {both|neither|recv|send}`

**Example:** `set 2:1 rip ip send`

Variable	Definition
<b>rtr_lan-addr</b>	Router (IP, CMG or TSR) address is in the form {slot:port} or {slot "profile-name"}. <b>slot</b> - The slot number (1-6) that contains the Router card. <b>port</b> - Port number of the Router. <b>profile-name</b> - Profile name for the Router interface used to reach this destination. Name must be enclosed in quotes, with a maximum of 11 characters.
<b>both</b>	Enable IP RIP (or IP RIP and SAP) in both directions.
<b>neither</b>	Shut IP RIP (or IP RIP and SAP) off completely.
<b>recv</b>	Enable IP RIP (or IP RIP and SAP) in the receive direction only.
<b>send</b>	Enable IP RIP (or IP RIP and SAP) in the send direction.

**set (router-lan) rip ipx**

Use the **set (router-lan) rip ipx** command to specify the IPX RIP and SAP for the specified LAN interface.

**Syntax:** `set {rtr_lan-addr} rip ipx {both|neither|recv|send}`

**Example:** `set 2:1 rip ipx send`

Variable	Definition
<b>rtr_lan-addr</b>	Router (IP, CMG or TSR) address is in the form {slot:port} or {slot "profile-name"}. <b>slot</b> - The slot number (1-6) that contains the Router card. <b>port</b> - Port number of the Router. <b>profile-name</b> - Profile name for the Router interface used to reach this destination. Name must be enclosed in quotes, with a maximum of 11 characters.
<b>both</b>	Enable IPX RIP (or IPX RIP and SAP) in both directions.
<b>neither</b>	Shut IPX RIP (or IPX RIP and SAP) off completely.
<b>recv</b>	Enable IPX RIP (or IPX RIP and SAP) in the receive direction only.
<b>send</b>	Enable IPX RIP (or IPX RIP and SAP) in the send direction.

**set (router-lan) stp**

Use the **set (router-lan) stp** commands to configure the Spanning Tree Protocol on this interface.

**set (router-lan) stp enable/disable**

Use the **set (router-lan) stp enable/disable** command to enable/disable Spanning Tree Protocol on this interface. To enable STP on an interface it must be enabled globally with the **set (router) stp enable** command.

**Syntax:** `set {rtr_lan-addr} stp {disable|enable}`

**Example:** `set 3:1 stp enable`

Variable	Definition
<b>rtr_lan-addr</b>	Router (IP, CMG or TSR) address is in the form {slot:port} or {slot "profile-name"}. <b>slot</b> - The slot number (1-6) that contains the Router card. <b>port</b> - Port number of the Router. <b>profile-name</b> - Profile name for the Router interface used to reach this destination. Name must be enclosed in quotes, with a maximum of 11 characters.
<b>disable</b>	Disable Spanning Tree on this interface.
<b>enable</b>	Enable Spanning Tree on this interface.

**set (router-lan) stp port cost**

Use the **set (router-lan) stp port cost** command to configure Spanning Tree path cost value for this bridge port.

**Syntax:** `set {rtr_lan-addr} stp port cost {port-cost-value}`

**Example:** `set 3:1 stp port cost 100`

Variable	Definition
<b>rtr_lan-addr</b>	Router (IP, CMG or TSR) address is in the form {slot:port} or {slot "profile-name"}. <b>slot</b> - The slot number (1-6) that contains the Router card. <b>port</b> - Port number of the Router. <b>profile-name</b> - Profile name for the Router interface used to reach this destination. Name must be enclosed in quotes, with a maximum of 11 characters.
<b>port-cost-value</b>	The value can range from 1 to 65535, higher values represent slower data paths. For a 100 Mb LAN a value of 19 is recommended. For a 10 Mb LAN a value of 100 is recommended

**set (router-lan) stp port priority**

Use the **set (router-lan) stp port priority** command to configure Spanning Tree priority value for this bridge port.

**Syntax:** `set {rtr_lan-addr} port priority {port-priority-value}`

**Example:** `set 3:1 stp port priority 128`

Variable	Definition
<b>rtr_lan-addr</b>	Router (IP, CMG or TSR) address is in the form {slot:port} or {slot "profile-name"}. <b>slot</b> - The slot number (1-6) that contains the Router card. <b>port</b> - Port number of the Router. <b>profile-name</b> - Profile name for the Router interface used to reach this destination. Name must be enclosed in quotes, with a maximum of 11 characters.
<b>port-priority-value</b>	Spanning Tree port priority for this bridge port. Range from 0 to 255, with a default of 128.

**set (router-lan) up/down**

Use the **set (router-lan) up/down** command to set the specified LAN interface up or down. When the Router port is set down, a link failure will not cause an alarm. This can be used to eliminate alarms from Router ports that are not in-use. When the Router port is set up, a link failure on the Ethernet port will cause an alarm to be reported to the Adit 600.

**Syntax:** `set {rtr_lan-addr} {down|up}`

**Example:** `set 2:1 down`

Variable	Definition
<b>rtr_lan-addr</b>	Router (IP, CMG or TSR) address is in the form {slot:port} or {slot "profile-name"}. <b>slot</b> - The slot number (1-6) that contains the Router card. <b>port</b> - Port number of the Router. <b>profile-name</b> - Profile name for the Router interface used to reach this destination. Name must be enclosed in quotes, with a maximum of 11 characters.
<b>down</b>	Set the Router as Out-of-Service. This command turns off the LED and disables alarm reporting for the Router specified.
<b>up</b>	Set the Router as In-Service. This command turns on the LED and enables alarm reporting for the Router specified.

**set (router-trunk) encapsulation**

Use the **set (router-trunk) encapsulation** command to specify the encapsulation to use on the Router interface.

**Syntax:** `set {rtr-trunk-addr} encapsulation {fr|ppp|pppofr}`

**Example:** `set 2:1:5 encapsulation pppofr`

Variable	Definition
<b>rtr_trunk-addr</b>	Router (IP, CMG or TSR) address is in the form {slot:port:trunk} <b>slot</b> - The slot number (1-6) that contains the Router card. <b>port</b> - Port number of the Router. <b>trunk</b> - Trunk number for this port, 1-24.
<b>fr</b>	Frame Relay as per RFC 2427
<b>ppp</b>	Point-to-Point Protocol (PPP) as per RFC 1661 and 1662
<b>pppofr</b>	PPP over Frame Relay as per RFC 1973

**set (router-trunk) multilink group**

Use the **set (router-trunk) multilink group** command to specify a router trunk to be part of a multilink PPP group. Note: It is recommended, for performance, that all of the individual links in the multilink group have approximately the same bandwidth.

**Syntax:** `set {rtr-trunk-addr} multilink group {number}`

**Example:** `set 3:1:1-2 multilink group 1`

Variable	Definition
<b>rtr_trunk-addr</b>	Router (IP, CMG or TSR) address is in the form {slot:port:trunk} <b>slot</b> - The slot number (1-6) that contains the Router card. <b>port</b> - Port number of the Router. <b>trunk</b> - Trunk number for this port, 1-24.
<b>number</b>	The multilink group number. Range is 1-24.

**set (router-trunk) speed**

Use the **set (router-trunk) speed** command to specify the data speed for each DS0 in the given trunk. This command takes effect upon transition of the trunk to active. This command applies to the TSR card only.

**Syntax:** `set {tsr-trunk-addr} speed {56|64}`

**Example:** `set 3:1:23 speed 56`

Variable	Definition
<b>tsr_trunk-addr</b>	TSR Router address is in the form {slot:port:trunk} <b>slot</b> - The slot number (1-6) that contains the Router card. <b>port</b> - Port number of the Router. <b>trunk</b> - Trunk number for this port, 1-24.
<b>56</b>	56 Kbps data speed
<b>64</b>	64 Kbps data speed. 64 is the default.

**set (router-trunk) up/down**

Use the **set (router-trunk) up/down** command to set the WAN trunk up or down. When the Router trunk is set down a link failure will not cause an alarm. This can be used to eliminate alarms from Router trunks that are not in-use. When the Router trunk is set up, a link failure on the WAN trunk will cause an alarm to be reported to the Adit.

**Syntax:** `set {rtr-trunk-addr} {down|up}`

**Example:** `set 2:1:1 down`

Variable	Definition
<b>rtr_trunk-addr</b>	Router (IP, CMG or TSR) address is in the form {slot:port:trunk} <b>slot</b> - The slot number (1-6) that contains the Router card. <b>port</b> - Port number of the Router. <b>trunk</b> - Trunk number for this port, 1-24.
<b>down</b>	Set the WAN down.
<b>up</b>	Set the WAN up.



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**set (router-trunk) voice bandwidth limit**

Use the **set (router-trunk) voice bandwidth limit** command to specify the maximum percentage of bandwidth on this trunk that voice calls are allowed to consume. The remaining percentage of the bandwidth on a CMG trunk to be reserved for routed or bridged data. Routed or bridged data is allowed to use any available bandwidth, but it is carried at a lower priority than the voice. If the bandwidth required to carry an additional VoIP call will put the total bandwidth used by VoIP calls above that allowed for voice on the trunk, then the call will be denied and the caller will hear the all-circuits-busy tone. This command applies to the CMG Router card only.

**Syntax:** `set {cmg-trunk-addr} voice bandwidth limit {percent}`

**Example:** `set 2:1:1 voice bandwidth limit 90`

Variable	Definition
<b>cmg_trunk-addr</b>	CMG Router address is in the form {slot:port:trunk} <b>slot</b> - The slot number (1-6) that contains the Router card. <b>port</b> - Port number of the Router. <b>trunk</b> - Trunk number for this port, 1-24.
<b>percent</b>	The maximum percentage of VoIP bandwidth. Range is 0 - 100.

**set (router-voice) algorithm preference**

Use the **set (router-voice) algorithm preference** command to specify the list of voice coding algorithms which will be supported for VoIP calls, on the specified voice channel(s). More than one algorithm can be listed, and they should be in order of preference. The default algorithm preference list contains all supported codecs in the order shown below. This command takes effect immediately, and applies to the CMG Router card only.

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**NOTE:** The G.729 feature is protected by a software key. Until an appropriate key is entered to enable this codec will not appear in the available codec list used in the MGCP and DSP messages and negotiation. The command, however, will still succeed to allow for pre-configuration.

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**Syntax:** `set {cmg_voice-addr} algorithm preference  
{alg-choice1} [alg-choice2] [alg-choice3]...`

**Example:** `set 2:1:1:1-24 algorithm preference g726_32 g711mu`

Variable	Definition	
<b>cmg_voice-addr</b>	In the form {slot:voip:channel} <b>slot</b> - The slot number (1-6) that contains the CMG card. <b>voip</b> - To designate VoIP 1:1 is used. <b>channel</b> - Channel number for the router is 1-48, range or all	
<b>Algorithms</b>	Algorithms are listed in order of preference. Algorithms are used from the following list and can only be listed once.	
	<b>g711a</b>	G.711 A-law PCM - 64 kb/s
	<b>g711mu</b>	G.711 mu-law PCM - 56 or 64 kb/s
	<b>g729a</b>	G.729 CS-ACELP - 8 kb/s
	<b>g726_40</b>	G.726 ADPCM - 40 kb/s
	<b>g726_32</b>	G.726 ADPCM - 32 kb/s
	<b>g726_24</b>	G.726 ADPCM - 24 kb/s
	<b>g726_16</b>	G.726 ADPCM - 16 kb/s

**set (router-voice) cpd**

Use the **set (router-voice) cpd** command for configuring how calling party disconnect should be signaled to an endpoint. Calling party disconnect is signaled to a voice endpoint by generating an Open Switch Interval (OSI) ABCD signaling bit pattern. On analog POTS lines this causes the loop to be opened for this interval. The duration of this OSI signal is configurable via the **set (router) voip osi** command. When set to “disabled” the CMG will never sent the OSI signal to the endpoint. This is appropriate for normal POTS telephones with no automated devices attached. When set to “osi” the CMG will issue the OSI signal to the endpoint only when an L/osi signal request is received from the call agent. This is appropriate when working with a call agent that requests L/osi, but only for endpoints that have automated equipment attached, such as voice mail systems, auto-answering modems, or fax machines. When set to “enabled” the CMG will issue the OSI signal to the endpoint when an L/osi signal request is received from the call agent or after the last connection on that endpoint is deleted. This is appropriate when working with a call agent that does not request L/osi, but only for endpoints that have automated equipment attached, such as voice mail systems, auto-answering modems, or fax machines. This command take effect immediately and applies to the CMG Router card only.

**Syntax:** `set {cmg_voice-addr} cpd {disable|enable|osi}`

**Example:** `set 2:1:1:1-4 cpd enable`

Variable	Definition
<b>cmg_voice-addr</b>	In the form {slot:voip:channel} <b>slot</b> - The slot number (1-6) that contains the CMG card. <b>voip</b> - To designate VoIP 1:1 is used. <b>channel</b> - Channel number for the router is 1-48, range or all
<b>disabled</b>	Do not play CPD on endpoint. Disable is the default.
<b>enable</b>	Play CPD on the OSI signal or after the last connection is deleted on endpoint.
<b>osi</b>	Play CPD on the OSI signal only.

**set (router-voice) default**

Use the **set (router-voice) default** command to reset all CLI accessible options for one or more CMG voice channels to their defaults. Defaults are set for algorithm preference, compander, echo cancellation, echo tail, endpoint prefix, endpoint suffix, silence suppression and TOS. This command applies to the CMG Router card only.

**Syntax:** `set {cmg_voice-addr} default`

**Example:** `set 2:1:1:1-4 default`

Variable	Definition
<b>cmg_voice-addr</b>	In the form {slot:voip:channel} <b>slot</b> - The slot number (1-6) that contains the CMG card. <b>voip</b> - To designate VoIP 1:1 is used. <b>channel</b> - Channel number for the router is 1-48, range or all

**set (router-voice) dialplan timeout**

Use the **set (router-voice) dialplan timeout** commands to configure user dialing timeouts on individual voice channels of the CMG Router card.

**set (router-voice) dialplan timeout interdigit long**

Use the **set (router-voice) dialplan timeout interdigit long** command to set the total time allowed between dialed digits after the first, unless short timing is in effect. If the originator does not dial the next digit in this time period, the call is torn down. This command takes effect after the router card has been reset. This command applies to the CMG Router card only.

**Syntax:** `set {cmg_voice-addr} dialplan timeout interdigit long {seconds}`

**Example:** `set 6:1:1:9 dialplan timeout interdigit long 30`

Variable	Definition
<b>cmg_voice-addr</b>	In the form {slot:voip:channel} <b>slot</b> - The slot number (1-6) that contains the CMG card. <b>voip</b> - To designate VoIP 1:1 is used. <b>channel</b> - Channel number for the router is 1-48, range or all
<b>seconds</b>	The number of seconds (1-60). The default is 16.

**set (router-voice) dialplan timeout interdigit short**

Use the **set (router-voice) dialplan timeout interdigit short** command to set the time allowed between dialed digits when the T or I address template specification is in effect. For example, if the address specification is "xxxxT", and 4 digits have been dialed, this short timeout is in effect. If the timer expires, the call will be routed to the destination. If another digit is dialed before the timer expires, address processing will continue, using the long interdigit timeout. This command takes effect after the router card has been reset. This command applies to the CMG Router card only.

**Syntax:** `set {cmg_voice-addr} dialplan timeout interdigit short {seconds}`

**Example:** `set 6:1:1:9 dialplan timeout interdigit short 1`

Variable	Definition
<b>cmg_voice-addr</b>	In the form {slot:voip:channel} <b>slot</b> - The slot number (1-6) that contains the CMG card. <b>voip</b> - To designate VoIP 1:1 is used. <b>channel</b> - Channel number for the router is 1-48, range or all
<b>seconds</b>	The number of seconds (1-10). The default is 4.

**set (router-voice) down**

Use the **set (router-voice) down** command to take a CMG voice channel out-of-service. Once out-of-service, the call agent cannot access the endpoint ID associated with this voice channel. Also, the phone, fax, or data user connected to this channel from an FXS port or T12 channel cannot make or receive calls. The options for this command allow the invoker of the command to specify how the call agent is to treat the voice channel as it goes out-of-service. The default option (“now”) causes an immediate termination of any active call, with an RSIP with “forced” restart method sent to the call agent. Use of the “graceful” or “timeout” option provides for keeping an active call up, either for its duration or for a particular timeout period, before the channel is taken out-of-service. In this case, an RSIP with “graceful” restart method is sent initially to the call agent. After the call is disconnected or the timeout period expires, the channel is taken out-of service, and a final RSIP is sent with the “forced” restart method.

**Syntax:** `set {cmg_voice-addr} down {graceful|now|timeout} [seconds]`

**Example:** `set 2:1:1:9 down now`

Variable	Definition
<b>cmg_voice-addr</b>	In the form {slot:voip:channel} <b>slot</b> - The slot number (1-6) that contains the CMG card. <b>voip</b> - To designate VoIP 1:1 is used. <b>channel</b> - Channel number for the router is 1-48, range or all
<b>graceful</b>	Wait for current calls to end before placing endpoint Out-of-Service
<b>now</b>	Disconnect any existing calls immediately (Default)
<b>timeout</b>	Wait a defined time (see time below), then disconnect calls
<b>seconds</b>	When timeout is selected, this field defines the number of seconds to wait before taking endpoints Out-of-Service. Default time is 60 seconds

**set (router-voice) dtmfrelay**

Use the **set (router-voice) dtmfrelay** command to enable or disable the relay of DTMF packets as per RFC 2833. This command applies to the CMG Router card only.

**Syntax:** `set {cmg_voice-addr} dtmfrelay {disable|enable}`

**Example:** `set 2:1:1:7 dtmfrelay enable`

Variable	Definition
<b>cmg_voice-addr</b>	In the form {slot:voip:channel} <b>slot</b> - The slot number (1-6) that contains the CMG card. <b>voip</b> - To designate VoIP 1:1 is used. <b>channel</b> - Channel number for the router is 1-48, range or all
<b>disable</b>	Disable DTMF relay as the default for voice calls (Default)
<b>enable</b>	Enable DTMF relay as the default for voice calls

**set (router-voice) echo cancellation**

Use the **set (router-voice) echo cancellation** command to enable/disable echo cancellation as the default for voice calls for one or more voice channels. The new default set by this command may be overridden on a call-by-call basis by the MGCP call agent. At the end of a call, the configured default is back in-force. This command applies to the CMG Router card only.

**Syntax:** `set {cmg_voice-addr} echo cancellation {disable|enable}`

**Example:** `set 2:1:1:7 echo cancellation disable`

Variable	Definition
<b>cmg_voice-addr</b>	In the form {slot:voip:channel} <b>slot</b> - The slot number (1-6) that contains the CMG card. <b>voip</b> - To designate VoIP 1:1 is used. <b>channel</b> - Channel number for the router is 1-48, range or all
<b>disable</b>	Disable echo cancellation as the default for voice calls
<b>enable</b>	Enable echo cancellation as the default for voice calls (Default)

**set (router-voice) echo tail**

Use the **set (router-voice) echo tail** command to set the maximum round-trip delay expected in the voice path between the CMG and the phone, including acoustical delay at the phone. This command applies to the CMG Router card only.

**Syntax:** `set {cmg_voice-addr} echo tail {milliseconds}`

**Example:** `set 2:1:1:all echo tail 8`

Variable	Definition
<b>cmg_voice-addr</b>	In the form {slot:voip:channel} <b>slot</b> - The slot number (1-6) that contains the CMG card. <b>voip</b> - To designate VoIP 1:1 is used. <b>channel</b> - Channel number for the router is 1-48, range or all
<b>milliseconds</b>	Valid values: 8, 16, 24, 32 and 64. Default is 16 milliseconds.

**set (router-voice) endpoint prefix**

Use the **set (router-voice) endpoint prefix** command to set the common part of the MGCP endpoint name for one or more voice channels. The default prefix is "aaln". Note the endpoint prefix is combined with the endpoint suffix to form a complete MGCP endpoint name in the form "prefix/suffix" (slash is added) for each voice channel. These names are used by a call agent to address the channel. The prefix part of the name is to indicate the type of voice channel. This command applies to the CMG Router card only.

**Syntax:** `set {cmg_voice-addr} endpoint prefix {"prefix"}`

**Example:** `set 2:1:1:all endpoint prefix "ds0"`

Variable	Definition
<b>cmg_voice-addr</b>	In the form {slot:voip:channel} <b>slot</b> - The slot number (1-6) that contains the CMG card. <b>voip</b> - To designate VoIP 1:1 is used. <b>channel</b> - Channel number for the router is 1-48, range or all
<b>prefix</b>	An identifier with a maximum of 16 characters, enclosed in quotes.

**set (router-voice) endpoint suffix**

Use the **set (router-voice) endpoint suffix** command to set the variable part of the MGCP endpoint name for one or more voice channels. The default suffix is the voice channel number. Note: the endpoint prefix is combined with the endpoint suffix to form a complete MGCP endpoint name for each voice channel. If the defaults are used, the endpoint names are "aaln/1", "aaln/2", "aaln/3", etc. These names are used by a call agent to address the channel. This command applies to the CMG Router card only.

**Syntax:** `set {cmg_voice-addr} endpoint suffix {"suffix"}`

**Example:** `set 2:1:1:3 endpoint suffix "bob"`

Variable	Definition
<b>cmg_voice-addr</b>	In the form {slot:voip:channel} <b>slot</b> - The slot number (1-6) that contains the CMG card. <b>voip</b> - To designate VoIP 1:1 is used. <b>channel</b> - Channel number for the router is 1-48, range or all
<b>suffix</b>	An identifier with a maximum of 16 characters, enclosed in quotes.

**set (router-voice) fax**

Use the **set (router-voice) fax** command to set the fax handling method for this endpoint. This command takes effect whenever an endpoint transitions from down to up. Note: The use of T.38 Fax Relay is dependent upon G.729 configuration.

**Syntax:** `set {cmg_voice-addr} fax {none|bypass|t38|t38reserved}`

**Example:** `set 2:1:1:3 fax bypass`

Variable	Definition
<b>cmg_voice-addr</b>	In the form {slot:voip:channel}: <b>slot</b> - The slot number (1-6) that contains the CMG card. <b>voip</b> - To designate VoIP 1:1 is used. <b>channel</b> - Channel number for the router is 1-48, range or all
<b>none</b>	A fax call is treated as a normal voice call. No special processing or codec re-negotiation is used. (Default.)
<b>bypass</b>	Will cause the line to transmit in G.711 mode, with silence suppression disabled, on detection of fax tone.
<b>t38</b>	Will use T.38 relay if no more than 5 channels are already using T.38 at the same time. Note: All 48 channels can be set to T.38, but there is a limit to the number of concurrent T.38 sessions per card type: CMG, CMG-01 - There is a maximum of 6 concurrent channels CMG-02 - There is a maximum of 12 concurrent channels
<b>t38reserved</b>	This line will always be able to use T.38 relay. Note: there is a limit of channels that can be configured for T.38 Reserved per card type. CMG, CMG-01 - 6 channels CMG-02 - 12 channels

**set (router-voice) log start**

Use the **set (router-voice) log start** command to start logging events to the CMG text log, for the particular voice channels specified. Events are currently of two types, errors and MGCP. This command does not clear the log before enabling new events. The events to be logged are defined separately for each voice channel. (ie: one may start error logging for all channels, then set error plus MGCP logging for one specific channel). This command applies to the CMG Router card only.

**Syntax:** `set {cmg_voice-addr} log start {both|errors|mgcp}`

**Example:** `set 2:1:1:8 log start both`

Variable	Definition
<b>cmg_voice-addr</b>	In the form {slot:voip:channel} <b>slot</b> - The slot number (1-6) that contains the CMG card. <b>voip</b> - To designate VoIP 1:1 is used. <b>channel</b> - Channel number for the router is 1-48, range or all
<b>both</b>	Record MGCP protocol events and errors
<b>errors</b>	Record protocol and other errors only
<b>mgcp</b>	Record MGCP protocol events only



### **set (router-voice) log stop**

Use the **set (router-voice) log stop** command to stop logging events to the CMG text log, for the particular voice channel(s) specified. This command applies to the CMG Router card only.

**Syntax:** `set {cmg_voice-addr} log stop`

**Example:** `set 2:1:1:8 log stop`

Variable	Definition
<b>cmg_voice-addr</b>	In the form {slot:voip:channel} <b>slot</b> - The slot number (1-6) that contains the CMG card. <b>voip</b> - To designate VoIP 1:1 is used. <b>channel</b> - Channel number for the router is 1-48, range or all

### **set (router-voice) modem**

Use the **set (router-voice) modem** command to set Modem handling for this endpoint. This command takes effect whenever an endpoint transitions from down to up.

**Syntax:** `set {cmg_voice-addr} modem {none|bypass}`

**Example:** `set 2:1:1:3 modem bypass`

Variable	Definition
<b>cmg_voice-addr</b>	In the form {slot:voip:channel} <b>slot</b> - The slot number (1-6) that contains the CMG card. <b>voip</b> - To designate VoIP 1:1 is used. <b>channel</b> - Channel number for the router is 1-48, range or all
<b>none</b>	A Modem call would be treated as a normal voice call. No special processing or codec re-negotiation is used. (Default.)
<b>bypass</b>	Will cause the line to transmit in G.711 mode, with echo cancellation and silence suppression disabled, on detection of Modem tone.

**set (router-voice) rfc2833****set (router-voice) rfc2833 signals****set (router-voice) rfc2833 payloadtype****set (router-voice) rfc2833 repeat count****set (router-voice) rfc2833 repeat interval****set (router-voice) rfc2833 refresh interval****set (router-voice) rfc2833 signals**

Use the **set (router-voice) rfc2833 signals** command to set the signaling method embedded in the RTP flow. This command takes effect immediately when an endpoint is idle or when the endpoint transitions from up to down. This command applies to the CMG Router card only.

**Syntax:** `set {cmg_voice-addr} rfc2833 signals {abcd|disable}`

**Example:** `set 2:1:1:10 rfc2833 signals abcd`

Variable	Definition
<b>cmg_voice-addr</b>	In the form {slot:voip:channel} <b>slot</b> - The slot number (1-6) that contains the CMG card. <b>voip</b> - To designate VoIP 1:1 is used. <b>channel</b> - Channel number for the router is 1-48, range or all
<b>abcd</b>	Use <b>abcd</b> signaling in RTP payloads
<b>disable</b>	Disable signaling in RTP payloads. Default.

**set (router-voice) rfc2833 payloadtype**

Use the **set (router-voice) rfc2833 payloadtype** command to set the signaling payload value for this endpoint. This command takes effect immediately when an endpoint is idle or when the endpoint transitions from up to down. This command applies to the CMG Router card only.

**Syntax:** `set {cmg_voice-addr} rfc2833 payloadtype {default|number}`

**Example:** `set 2:1:1:10 rfc2833 payloadtype 97`

Variable	Definition
<b>cmg_voice-addr</b>	In the form {slot:voip:channel} <b>slot</b> - The slot number (1-6) that contains the CMG card. <b>voip</b> - To designate VoIP 1:1 is used. <b>channel</b> - Channel number for the router is 1-48, range or all
<b>default</b>	Sets the payload type to the DTMF Relay payload type value (normally 97). This setting is the default.
<b>number</b>	Range between 94 - 127.

**set (router-voice) rfc2833 repeat count**

Use the **set (router-voice) rfc2833 repeat count** command to set the number of initial RTP message repeats at the time of transition. This command takes effect immediately when an endpoint is idle or when the endpoint transitions from up to down. This command applies to the CMG Router card only.

**Syntax:** `set {cmg_voice-addr} rfc2833 repeat count {value}`

**Example:** `set 2:1:1:10 rfc2833 repeat count 2`

Variable	Definition
<b>cmg_voice-addr</b>	In the form {slot:voip:channel} <b>slot</b> - The slot number (1-6) that contains the CMG card. <b>voip</b> - To designate VoIP 1:1 is used. <b>channel</b> - Channel number for the router is 1-48, range or all
<b>value</b>	Set the number of initial RTP message repeats at the time of signal transition. Range is 0 - 10 repeats. Default is 2. <b>Note: A repeat of 2 times, in essence is a message, followed by 2 repeats.</b>  To support interoperability with the Lucent iMerge trunking gateway, set this value to 0. A value of 0 invokes the proprietary iMerge RTP Multiplex mode. In this mode, the RFC2833 triple-redundancy mechanism is disabled. In the iMerge RTP Multiplex mode, the following rules apply: <ul style="list-style-type: none"> <li>• The RFC2833 repeat count, repeat interval, and refresh interval settings do not apply. These settings are only used for the RFC2833 triple-redundancy mechanism.</li> <li>• The RFC2833 trunk ABCD signaling events supported by the iMerge RTP Multiplex mode are RING-ON, RING-ON (end), ON-HOOK, ON-HOOK (end). The signaling events OFF-HOOK and RING-OFF are invalid. This is because for iMerge RTP Multiplex mode, the RTP events are terminated with the "end" bit in the second byte of the RTP message. The equivalent RTP event that represents OFF-HOOK for this mode is an ON-HOOK with the "end" bit set in the second byte (Second byte is 0x80). Similarly, the RTP event that represents the RING-OFF from the trunk gateway is a RING-ON RTP event with the "end" bit set in the second byte.</li> <li>• RTP ABCD signaling events and voice packets are mutually exclusive. That is, RTP events completely squelch the voice packets. Receiving voice packets at the trunk gateway implies the far end is OFF-HOOK, but it is not interpreted as OFF-HOOK. Ringing can proceed for between 8 and 16 seconds. Voice Packets at the CMG implies RING-OFF.</li> <li>• Events are transmitted and received at the voice packetization rate.</li> <li>• RTP ABCD signaling is not refreshed periodically.</li> <li>• After 16 seconds or less, the CMG will terminate a constant RING-ON RTP ABCD signaling event. This will prevent the ringing forever condition when Ethernet connectivity is lost.</li> </ul>

**set (router-voice) rfc2833 repeat interval**

Use the **set (router-voice) rfc2833 repeat interval** command to set the interval of RTP messages at the time of transition in resolution of milliseconds. This command takes effect immediately when an endpoint is idle or when the endpoint transitions from up to down. This command applies to the CMG Router card only.

**Syntax:** `set {cmg_voice-addr} rfc2833 repeat interval {value}`

**Example:** `set 2:1:1:10 rfc2833 repeat interval 5`

Variable	Definition
<b>cmg_voice-addr</b>	In the form {slot:voip:channel} <b>slot</b> - The slot number (1-6) that contains the CMG card. <b>voip</b> - To designate VoIP 1:1 is used. <b>channel</b> - Channel number for the router is 1-48, range or all
<b>value</b>	The interval of RTP messages at the time of transition in resolution of milliseconds. Range is 1 - 50 milliseconds. Default is 5.

**set (router-voice) rfc2833 refresh interval**

Use the **set (router-voice) rfc2833 refresh interval** command to set the periodic refresh interval of RTP signaling states. This command takes effect immediately when an endpoint is idle or when the endpoint transitions from up to down. This command applies to the CMG Router card only.

**Syntax:** `set {cmg_voice-addr} rfc2833 refresh interval {value}`

**Example:** `set 2:1:1:10 rfc2833 refresh interval 5`

Variable	Definition
<b>cmg_voice-addr</b>	In the form {slot:voip:channel} <b>slot</b> - The slot number (1-6) that contains the CMG card. <b>voip</b> - To designate VoIP 1:1 is used. <b>channel</b> - Channel number for the router is 1-48, range or all
<b>value</b>	The periodic refresh interval of RTP signaling states. Range is 500 - 4000 milliseconds. Default is 4000

### **set (router-voice) rxgain**

Use the **set (router-voice) rxgain** command to set gain on the receive side (TDM-to-packet) voice path for the specified voice channel(s). This gain setting can be overridden by the call agent on a call-by-call basis. This command applies to the CMG Router card only.

**Syntax:** `set {cmg_voice-addr} rxgain {gain}`

**Example:** `set 2:1:1:10 rxgain -3`

Variable	Definition
<b>cmg_voice-addr</b>	In the form {slot:voip:channel} <b>slot</b> - The slot number (1-6) that contains the CMG card. <b>voip</b> - To designate VoIP 1:1 is used. <b>channel</b> - Channel number for the router is 1-48, range or all
<b>gain</b>	Gain range is -14 to 14 dB. Default gain is 0 dB

### **set (router-voice) signaling**

Use the **set (router-voice) signaling** command to set the signaling protocol (FXS loop start or FXS ground start) used by a CMG Router TDM voice endpoint. This command applies to the CMG Router card only.

**Syntax:** `set {cmg_voice-addr} signaling {fxsls|fxsgs}`

**Example:** `set 2:1:1:all signaling fxsgs`

Variable	Definition
<b>cmg_voice-addr</b>	In the form {slot:voip:channel} <b>slot</b> - The slot number (1-6) that contains the CMG card. <b>voip</b> - To designate VoIP 1:1 is used. <b>channel</b> - Channel number for the router is 1-48, range or all
<b>fxsls</b>	FXS loop start signaling. (Default)
<b>fxsgs</b>	FXS ground start signaling.

**set (router-voice) silence**

Use the **set (router-voice) silence** command to enable or disable silence suppression as the default for voice calls for one or more voice channels. The new default set by this command may be overridden on a call-by-call basis by the MGCP call agent. At the end of a call, the configured default is back in-force. Silence suppression may not apply to certain voice compression algorithm types. This command applies to the CMG Router card only.

**Syntax:** `set {cmg_voice-addr} silence {disable|enable}`

**Example:** `set 2:1:1:all silence enable`

Variable	Definition
<b>cmg_voice-addr</b>	In the form {slot:voip:channel} <b>slot</b> - The slot number (1-6) that contains the CMG card. <b>voip</b> - To designate VoIP 1:1 is used. <b>channel</b> - Channel number for the router is 1-48, range or all
<b>disable</b>	Do not use silence suppression unless overridden by the call agent Default.
<b>enable</b>	Use silence suppression if possible and not overridden by the call agent

**set (router-voice) slash**

Use the **set (router-voice) slash** command to configure a CMG endpoint so that the implied slash, "/", between the endpoint prefix and suffix can be suppressed. This command applies to the CMG Router card only.

**Syntax:** `set {cmg_voice-addr} slash {disable|enable}`

**Example:** `set 2:1:1:all slash disable`

Variable	Definition
<b>cmg_voice-addr</b>	In the form {slot:voip:channel} <b>slot</b> - The slot number (1-6) that contains the CMG card. <b>voip</b> - To designate VoIP 1:1 is used. <b>channel</b> - Channel number for the router is 1-48, range or all
<b>disable</b>	Suppress the use of a slash between the endpoint prefix and suffix.
<b>enable</b>	Insert a slash between the endpoint prefix and suffix. (Default)

**set (router-voice) tos**

Use the **set (router-voice) tos** command to set the default value for the Type of Service (TOS) byte in the IP header of outgoing VoIP packets for the specified channel(s). This value may be overridden by the call agent on a call-by-call basis. This command applies to the CMG Router card only.

**Syntax:** `set {cmg_voice-addr} tos {2-hex-digits}`

**Example:** `set 2:1:1:all tos 0xA0`

Variable	Definition
<b>cmg_voice-addr</b>	In the form {slot:voip:channel} <b>slot</b> - The slot number (1-6) that contains the CMG card. <b>voip</b> - To designate VoIP 1:1 is used. <b>channel</b> - Channel number for the router is 1-48, range or all
<b>2-hex-digits</b>	Specified bits to be sent in TOS byte. The first (leftmost) 3 bits represent the “precedence” or priority. Bit 4 (from the left) indicates optimize for delay. Bit 5 indicates optimize for throughput. Bit 6 indicates optimize for reliability.

**set (router-voice) txgain**

Use the **set (router-voice) txgain** command to set the gain on the transmit side (packet-to-TDM) voice path for the specified voice channel(s). This gain setting can be overridden by the call agent on a call-by-call basis. This command applies to the CMG Router card only.

**Syntax:** `set {cmg_voice-addr} txgain {gain}`

**Example:** `set 2:1:1:9 txgain 6`

Variable	Definition
<b>cmg_voice-addr</b>	In the form {slot:voip:channel} <b>slot</b> - The slot number (1-6) that contains the CMG card. <b>voip</b> - To designate VoIP 1:1 is used. <b>channel</b> - Channel number for the router is 1-48, range or all
<b>gain</b>	Gain range is -14 to 14 dB. Default is 0 dB.

**set (router-voice) up**

Use the **set (router-voice) up** command to bring a voice channel back into service. This will cause an RSIP message to be sent to the call agent, with the “restart” value for the Restart Method parameter. It will also enable the processing of TDM-side events (eg: offhook) which are either requested by the call agent or are defined as persistent events see **set (router) mgcp report hookswitch**. This command applies to the CMG Router card only.

**Syntax:** `set {cmg_voice-addr} up`

**Example:** `set 2:1:1:2 up`

Variable	Definition
<b>cmg_voice-addr</b>	In the form {slot:voip:channel} <b>slot</b> - The slot number (1-6) that contains the CMG card. <b>voip</b> - To designate VoIP 1:1 is used. <b>channel</b> - Channel number for the router is 1-48, range or all

**set (router-wan) dlci**

Use the **set (router-wan) dlci** command to set the DLCI (Data Link Connection Identifier) for a specified WAN interface.

**Syntax:** `set {rtr_card-addr} {"wan-name"} dlci {value}`

**Example:** `set 1 "LosAngeles" dlci 16`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>wan-name</b>	The WAN interface to modify. The name must be enclosed in quotes.
<b>value</b>	DLCI value to use, 16-1022.



**set (router-wan) firewall allowfrags**

The **set (router-wan) firewall allowfrags** command allows fragmented packets to pass through the firewall to accommodate devices that send reverse-ordered or out-of-ordered packets. It is recommended that this configurable be set to disabled since this is a security risk. This command applies to the CMG Router card only.

**Syntax:** `set {cmg_card-addr} {"wan-name"} firewall allowfrags {disable|enable}`

**Example:** `set 5 "RemoteUnit" firewall allowfrags enable`

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG Router card.
<b>wan-name</b>	The WAN interface to modify. The name must be enclosed in quotes.
<b>disable</b>	Disable the passage of fragmented packets. (Default).
<b>enable</b>	Enable the passage of fragmented packets.

**set (router-wan) gre**

Use the **set (router-wan) gre** command to configure Generic Routing Encapsulation tunneling for a specified WAN interface.

**set (router-wan) gre address**

Use the **set (router-wan) gre address** command to configure the IP addresses for GRE tunneling for a specified WAN interface. Note: A **set 3 "LosAngeles" gre ip all** command is required before this command.

**Syntax:** `set {rtr_card-addr} {"wan-name"} gre address {local_ip-addr} [remote-ip-addr] ["tunnel-name"]`

**Example:** `set 3 "LosAngeles" gre address 10.0.0.0 20.0.0.0 "LATunnel"`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>wan-name</b>	The WAN interface to modify. The name must be enclosed in quotes.
<b>local-ip-addr</b>	The IP Address of the local end of the tunnel, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.
<b>remote-ip-addr</b>	The IP Address of the far end of the tunnel, required if GRE tunneling is set to All, prohibited if GRE tunneling is set to By Network. In the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.
<b>tunnel-name</b>	A symbolic name to give to this tunnel, required if GRE tunneling is set to All, prohibited if GRE tunneling is set to By Network. Up to 12 characters, enclosed in quotes.

**set (router-wan) gre ip**

Use the **set (router-wan) gre ip** command to configure the GRE tunneling of the IP protocol for a specified WAN interface.

**Syntax:** `set {rtr_card-addr} {"wan-name"} gre ip {all|bynetwork|disable}`

**Example:** `set 3 "LosAngeles" gre ip all`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>wan-name</b>	The WAN interface to modify. The name must be enclosed in quotes.
<b>all</b>	Tunnel all packets on this interface to the tunnel destination address.
<b>bynetwork</b>	Tunnel packets based on their destination address by matching GRE network entries, see <i>add (router-wan) gre network</i> command.
<b>disable</b>	Disable GRE tunneling.

**set (router-wan) gre ipx**

Use the **set (router-wan) gre ipx** command to configure the GRE tunneling of the IPX protocol for a specified WAN interface.

**Syntax:** `set {rtr_card-addr} {"wan-name"} gre ipx {all|disable}`

**Example:** `set 3 "LosAngeles" gre ipx all`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>wan-name</b>	The WAN interface to modify. The name must be enclosed in quotes.
<b>all</b>	Tunnel all packets on this interface to the tunnel destination address.
<b>disable</b>	Disable GRE tunneling.

**set (router-wan) ip**

Use the **set (router-wan) ip** command to set the IP traffic handling on the WAN interface.

**Syntax:** `set {rtr_card-addr} {"wan-name"} ip {block|bridge|route}`

**Example:** `set 1 "LosAngeles" ip route`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>wan-name</b>	The WAN interface to modify. The name must be enclosed in quotes.
<b>block</b>	Set the WAN to block IP.
<b>bridge</b>	Set the WAN to bridge IP.
<b>route</b>	Set the WAN to route IP.

**set (router-wan) ip address**

Use the **set (router-wan) ip address** command to set the IP address for a WAN interface.

**Syntax:** `set {rtr_card-addr} {"wan-name"} ip address {ip-addr} [mask] | unnumbered`

**Example:** `set 1 "LosAngeles" ip address 100.2.2.2 255.255.255.0`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>wan-name</b>	The WAN interface to modify. The name must be enclosed in quotes.
<b>ip-addr</b>	Router IP address, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.
<b>mask</b>	The subnet mask, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.
<b>unnumbered</b>	Treat this as an un-numbered interface, as per RFC 1812.

**set (router-wan) ipx**

Use the **set (router-wan) ipx** command to set the IPX traffic handling on the WAN interface.

**Syntax:** `set {rtr_card-addr} {"wan-name"} ipx {setting}`

**Example:** `set 1 "LosAngeles" ipx bridge`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>wan-name</b>	The WAN interface to modify. The name must be enclosed in quotes.
<b>block</b>	Set the WAN to <b>block</b> IPX.
<b>bridge</b>	Set the WAN to <b>bridge</b> IPX with optimized local advertising IPX servers and networks.
<b>optimize</b>	Setting to <b>optimize</b> enables the Adit to use Force10 Networks' network optimization feature, which ensures that only necessary data is transmitted over the WAN connection. The Adit will initiate IPX learning mode. Learning mode is effective for optimizing bandwidth usage for IPX RIP, SAP, serialization and watchdog (IPX and SPX) packets. If you choose this option, the Adit will initiate learning mode in order to gain knowledge of local and remote networks and services. Once it knows of remote networks and services, it can advertise the information on the local LAN on behalf of the remote networks and servers.

**set (router-wan) mlppp**

Use the **set (router) mlppp** commands to configure the WAN Multi-link PPP.

**set (router-wan) mlppp qos interleave**

Use the **set (router-wan) mlppp qos interleave** command to enable a WAN Profile that is using MLPPP trunks to additionally use Link Fragmentation and Interleaving (LFI) style QOS priority-driven interleaving on its MLPPP links. This command takes effect immediately. This command is typically combined with IP TOS priority settings to identify packet flows that need to be prioritized over non-TOS matched flows, such that the prioritized flows will be transmitted using PPP to alleviate MLPPP out of sequence issues.

**Syntax:** `set {rtr_card-addr} {"wan-name"} mlppp qos interleave {disable|enable}`

**Example:** `set 5 "LosAngeles" mlppp qos interleave disable`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>wan-name</b>	The WAN interface to modify. The name must be enclosed in quotes.
<b>disable</b>	Disables Link Fragmentation and Interleaving. Disable is the default.
<b>enable</b>	Enables the Link Fragmentation and Interleaving.

**set (router-wan) mlppp fragmentation size**

Use the **set (router-wan) mlppp fragmentation size** command to configure a WAN Profile, that is using MLPPP trunks, to a desired per-link fragmentation size. Fragmentation is typically used in conjunction with interleaving to set the maximum fragment size of low priority packets, in order to regulate the maximum time a low priority packet can delay a high priority packet. The size should be reduced only when needful, since it takes time for fragmentation and reassembly of packets at each end of the Wan. When the user sets the size to 1600 bytes, this is the same as having no fragmentation, since the MTU of each MLPPP link is 1600 bytes.

**Syntax:** `set {rtr_card-addr} {"wan-name"} mlppp fragmentation size {size}`

**Example:** `set 5 "LosAngeles" mlppp fragmentation size`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>wan-name</b>	The WAN interface to modify. The name must be enclosed in quotes.
<b>size</b>	Fragmentation size. Range is 320 to 1600 bytes, with a default of 1600.

**set (router-wan) nat**

Use the **set (router-wan) nat** commands to configure Network Address Translation (NAT) on a specified WAN interface.

**set (router-wan) nat address**

Use the **set (router-wan) nat address** command to configure Network Address Translation (NAT) public addresses for a specified WAN interface.

**Syntax:** `set {rtr_card-addr} {"wan-name"} nat address {assigned|ip-addr} [count]`

**Example:** `set 1 "LosAngeles" nat address 201.17.172.11 8`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>wan-name</b>	The WAN interface to modify. The name must be enclosed in quotes.
<b>assigned</b>	The NAT address assigned by remote.
<b>ip-addr</b>	The Router IP address, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.
<b>count</b>	An optional field defining the number of public addresses in the NAT pool. Default is 1.

**set (router-wan) nat enable/disable**

Use the **set (router-wan) nat** command to enable and disable Network Address Translation (NAT) on a specified WAN interface.

**Syntax:** `set {rtr_card-addr} {"wan-name"} nat {disable|enable}`

**Example:** `set 1 "LosAngeles" nat enable`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>wan-name</b>	The WAN interface to modify. The name must be enclosed in quotes.
<b>disable</b>	Disable NAT mapping.
<b>enable</b>	Enable NAT mapping.

**set (router-wan) nat ports**

Use the **set (router-wan) nat ports** command to configure Network Address Translation (NAT) to dynamically map ports or preserve them. This field should only be set to “preserved” if an application that you are using requires a specific port number.

**Syntax:** `set {rtr_card-addr} {"wan-name"} nat ports  
{dynamic|preserved}`

**Example:** `set 1 "LosAngeles" nat ports dynamic`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>wan-name</b>	The WAN interface to modify. The name must be enclosed in quotes.
<b>dynamic</b>	Set NAT port mapping to be dynamic.
<b>preserved</b>	Preserve original port.

**set (router-wan) other**

Use the **set (router-wan) other** command to set the traffic handling of protocols other than IP or IPX on the specified WAN interface.

**Syntax:** `set {rtr_card-addr} {"wan-name"} other {block|bridge}`

**Example:** `set 1 "LosAngeles" other bridge`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>wan-name</b>	The WAN interface to modify. The name must be enclosed in quotes.
<b>block</b>	Set the WAN to block protocols other than IP or IPX.
<b>bridge</b>	Set the WAN to bridge protocols other than IP or IPX.

**set (router-wan) ppp**

Use the **set (router) ppp** commands to configure the PPP (Point-to-Point Protocol) on the specified Router card.

**set (router-wan) ppp auth ofremote user**

Use the **set (router-wan) ppp auth ofremote user** command to set the CHAP or PAP name by which a remote PPP device is authenticated by this Adit.

**Syntax:** `set {rtr_card-addr} {"wan-name"} ppp auth ofremote user {profilename|"protocol-name"}`

**Example:** `set 5 "LosAngeles" ppp auth ofremote user profilename`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>wan-name</b>	The WAN interface to modify. The name must be enclosed in quotes.
<b>profilename</b>	Use the profile name as the CHAP or PAP user name.
<b>protocol-name</b>	CHAP or PAP user name. A maximum of 16 characters, enclosed in quotes.

**set (router-wan) ppp compression**

Use the **set (router-wan) ppp compression** command to configure the PPP compression with the remote PPP device.

**Syntax:** `set {rtr_card-addr} {"wan-name"} ppp compression {setting}`

**Example:** `set 5 "LosAngeles" ppp compression enable`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>wan-name</b>	The WAN interface to modify. The name must be enclosed in quotes.
<b>disable</b>	Disable PPP compression negotiation (Default).
<b>easy</b>	Typical data on this interface is easy to compress, such as text files (Default).
<b>enable</b>	Enable PPP compression negotiation.
<b>hard</b>	Typical data on this interface is hard to compress, such as binary files.

**set (router-wan) ppp security server**

Use the **set (router-wan) ppp security server** command to set the security server with the remote PPP device.

**Syntax:** `set {rtr_card-addr} {"wan-name"} ppp security server {external|local}`

**Example:** `set 5 "LosAngeles" ppp security server local`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>wan-name</b>	The WAN interface to modify. The name must be enclosed in quotes.
<b>external</b>	PPP External Security Server
<b>local</b>	PPP Local Security Server

**set (router-wan) rip**

Use the **set (router-wan) rip** commands to set the type of RIP updates on the specified interface.

**set (router-wan) rip ip updates**

Use the **set (router-wan) rip ip updates** command to set the type of RIP updates on the specified WAN interface.

**Syntax:** `set {rtr_card-addr} {"wan-name"} rip ip updates {never|periodic|triggered}`

**Example:** `set 1 "LosAngeles" rip ip updates never`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>wan-name</b>	The WAN interface to modify. The name must be enclosed in quotes.
<b>never</b>	Set the WAN to not send RIP updates.
<b>periodic</b>	Set the WAN to send periodic RIP updates.
<b>triggered</b>	Set the WAN to send triggered RIP updates.



**set (router-wan) rip ipx updates**

Use the **set (router-wan) rip ipx updates** command to set the type of IPX RIP updates on the specified WAN interface.

**Syntax:** `set {rtr_card-addr} {"wan-name"} rip ipx updates {never|periodic|triggered}`

**Example:** `set 1 "LosAngeles" rip ipx updates never`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>wan-name</b>	The WAN interface to modify. The name must be enclosed in quotes.
<b>never</b>	Set the WAN to not send RIP updates.
<b>periodic</b>	Set the WAN to send periodic RIP updates.
<b>triggered</b>	Set the WAN to send triggered RIP updates.

**set (router-wan) stp**

Use the **set (router-wan) stp** commands to configure Spanning Tree Protocol on the WAN interface.

**set (router-wan) stp enable/disable**

Use the **set (router-wan) stp enable/disable** command to enable and disable Spanning Tree Protocol on this interface. To enable Spanning Tree on an interface it must first be enabled globally with the **set (router) stp enable** command and the WAN must be set to bridge the IP protocol.

**Syntax:** `set {rtr_card-addr} {"wan-name"} stp {disable|enable}`

**Example:** `set 3 stp enable`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>wan-name</b>	The WAN interface to modify. The name must be enclosed in quotes.
<b>disable</b>	Disable Spanning Tree on this interface.
<b>enable</b>	Enable Spanning Tree on this interface.

**set (router-wan) stp port cost**

Use the **set (router-wan) stp port cost** command to configure Spanning Tree path cost value for this bridge port.

**Syntax:** `set {rtr_card-addr} {"wan-name"} stp port cost {port-cost-value}`

**Example:** `set 3 stp port cost 650`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>wan-name</b>	The WAN interface to modify. The name must be enclosed in quotes.
<b>port-cost-value</b>	The value can range from 1 to 65535, with higher values representing slower data paths. A value of 15625/# of DS0s is recommended.

**set (router-wan) stp port priority**

Use the **set (router-wan) stp port priority** command to configure Spanning Tree priority value for this bridge port.

**Syntax:** `set {rtr_card-addr} {"wan-name"} port priority {port-priority-value}`

**Example:** `set 3 stp port priority 128`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>wan-name</b>	The WAN interface to modify. The name must be enclosed in quotes.
<b>port-priority-value</b>	The value can range from 0 to 255 seconds, with a default of 128

**set (router-wan) trunk**

Use the **set (router-wan) trunk** command to configure the trunk port or multilink group for a specified WAN interface. If the trunk encapsulation is subsequently changed, this trunk assignment is reset to 0.

**Syntax:** `set {rtr_card-addr} {"wan-name"} trunk [multilink-group] {number}`

**Example:** `set 1 "LosAngeles" trunk 3`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>wan-name</b>	The WAN interface to modify. The name must be enclosed in quotes.
<b>multilink-group</b>	This optional parameter, indicates the number the multilink group will use, else the number is the trunk number to use.
<b>number</b>	Trunk or multilink group number to use, range is 1-24.

**set (router-wan) up/down**

Use the **set (router-wan) up/down** command to set the specified WAN interface up or down.

**Syntax:** `set {rtr_card-addr} {"wan-name"} {down|up}`

**Example:** `set 1 "LosAngeles" up`

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>wan-name</b>	The WAN interface to modify. The name must be enclosed in quotes.
<b>down</b>	Set the Router WAN to disabled.
<b>up</b>	Set the Router WAN to enabled.

**set (rs232)**

Use the **set (rs232)** command to setup RS-232 ports. The command specifies the range of channels within that card, and the setting to apply.

**Syntax:** `set {rs232-addr} {setting}`

**Example:** `set 6:1 baudrate 4800`

Variable	Definition
<b>rs232-addr</b>	In the form of {slot:port}. <b>slot</b> - slot (1-6) location of a RS-232 card. <b>port</b> - Port number or range.
<b>baudrate</b>	Set the baud rates for the RS-232 ports.
	<b>2400</b> Set baud rate to 2400 bps
	<b>4800</b> Set baud rate to 4800 bps
	<b>9600</b> Set baud rate to 9600 bps
	<b>56000</b> Set baud rate to 56000 bps
	<b>64000</b> Set baud rate to 64000 bps
<b>cts</b>	Set the Clear To Send operation mode to one of the following:
	<b>cd</b> Follow CD
	<b>high</b> Force CTS high
	<b>low</b> Force CTS low
	<b>remote</b> Follow state of remote handshake line. Not valid at 64 kbps
	<b>rts</b> Follow RTS

Variable	Definition	
<b>ded</b>	Set the Data Carrier Detect (DCD) operation mode:	
	<b>remote</b>	Follow state of remote handshake line. Not valid at 64000 bps
	<b>sw</b>	Follow software control
<b>equipment</b>	Sets the RS-232 port to equipment loopback, which loops the transmit RS-232 signal back toward the RS-232 receive (towards T1)	
	<b>loopdown</b>	disable equipment loopback
	<b>loopup</b>	enable equipment loopback
<b>line</b>	Sets the RS-232 port to line loopback, which loops the received RS-232 signal toward the RS-232 transmit (away from T1)	
	<b>loopdown</b>	disable line loopback
	<b>loopup</b>	enable line loopback
<b>rts</b>	Set the Request To Send (RTS) operation mode:	
	<b>dte</b>	Follow Data Terminal Equipment (DTE)
	<b>high</b>	Force RTS high
	<b>low</b>	Force RTS low

### **set screen**

Use the **set screen** command to set the height of the scrolling output screen, in number of lines. For example, if the screen height is set to 40 lines, the Command Line Interface (CLI) will print the maximum of 40 lines of a long output before pausing. To set the screen to scroll without pausing, set the screen height to 0.

**Syntax:** **set screen {screen-height|off}**

Where screen-height is the number of lines in the scrolling output screen.

**set snmp****set snmp****set snmp engineid (SNMPv3 only)****set snmp group (SNMPv3 only)****set snmp nms user (SNMPv3 only)****set snmp view (SNMPv3 only)****set snmp**

Use the **set snmp** command to set the Simple Network Management Protocol (SNMP) MIB-II System Group objects.

**Syntax:** **set snmp {setting} {string}**  
 Where {setting} is as below, and {string} is its value.

**Example:** **set snmp name "ADIT 1"**  
 To set the SNMP system name to "ADIT 1"

**Example:** **set snmp nms 2 192.168.3.50**

Variable	Definition
<b>contact {string}</b>	SysContact. 1 - 255 characters, enclosed in quotes
<b>getcom {string}</b>	SNMP Get-Community. 1 - 32 characters, enclosed in quotes
<b>location {string}</b>	SysLocation. 1 - 255 characters, enclosed in quotes
<b>name {string}</b>	Set the value of the SysName (name enclosed by quotes).
<b>nms {n}</b> <b>{ip-addr none}</b>	SNMP Network Management System. {n} is a number from 1 to 3, to differentiate your NMS addresses. IP-addr = IP address of the SNMP manager where the SNMP agent will send traps none = no address set.
<b>setcom {string}</b>	Set the value of the SNMP Set-Community string.
<b>trapauth</b> <b>{disable enable}</b>	Enable or disable authentication traps.
<b>trapcom {string}</b>	Set the value for the SNMP Trap-Community string. 1 - 32 characters, enclosed in quotes
<b>trapevent {setting}</b>	Set minimum severity level for (enterprise) event trap generation.
<b>all</b>	Set event trap severity limit to 'all'.
<b>critical</b>	Set event trap severity limit to 'critical'.
<b>major</b>	Set event trap severity limit to 'major'.
<b>minor</b>	Set event trap severity limit to 'minor'.
<b>warning</b>	Set event trap severity limit to 'warning'.
<b>none</b>	Set event trap severity limit to 'none'.

---

<b>version {setting}</b>	Set the supported SNMP version.	
	<b>Note:</b> SNMPv3 is a keyed feature. Keys must be purchased from Force10 Networks. The Controller must be running release 9.8 or higher to support SNMPv3.	
	<b>all</b>	SNMPv1, SNMPv2, and SNMPv3
	<b>v1</b>	SNMPv1
	<b>v2</b>	SNMPv2
	<b>v3</b>	SNMPv3
	<b>v1andv2</b>	SNMPv1 and SNMPv2

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***set snmp engineid***

Use the **set snmp engineid** command to specify the ID for the local SNMPv3 engine.

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**NOTE:** SNMPv3 is a keyed feature. Keys must be purchased from Force10 Networks. The Controller must be running release 9.8 or higher to support SNMPv3.

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**Syntax:** `set snmp engineid {"engine-id"}`

**Example:** `set snmp engineid "8020000000002558"`

Variable	Definition
<b>engine-id</b>	Engine identifier, up to 12 characters. Must be enclosed in quotes. <b>Note:</b> You do not need to enter zeros before the first non-zero number.

---

**set snmp group**

Use the **set snmp group** command to assign MIB views to an SNMPv3 group. You can assign separate read, write, and notify views.

**NOTE:** SNMPv3 is a keyed feature. Keys must be purchased from Force10 Networks. The Controller must be running release 9.8 or higher to support SNMPv3.

**Syntax:** `set snmp group {"group-name"}  
{read_view|write_view|notify_view} {"view-name"}`

**Example:** `set snmp group "group1" read_view "view1"`

Variable	Definition
<b>group-name</b>	Group name. Must be enclosed in quotes. <b>Note:</b> The group must have been previously created with the <b>add snmp group</b> command.
<b>read_view</b>	Indicates that the assigned view applies to MIB reads.
<b>write_view</b>	Indicates that the assigned view applies to MIB writes.
<b>notify_view</b>	Indicates that the assigned view applies to MIB notifies.
<b>view-name</b>	Name of the view to be assigned. Must be enclosed in quotes. <b>Note:</b> The view must have been previously created with the <b>add snmp view</b> command.

**set snmp nms user**

Use the **set snmp nms user** command to specify users to which SNMPv3 traps will be sent.

**NOTE:** SNMPv3 is a keyed feature. Keys must be purchased from Force10 Networks. The Controller must be running release 9.8 or higher to support SNMPv3.

**Syntax:** `set snmp nms {n} user {"user-name"}`

**Example:** `set snmp nms 1 user "user1"`

Variable	Definition
<b>n</b>	NMS profile number (1 - 3) corresponding to an NMS IP address specified with the <b>set snmp</b> command..
<b>user-name</b>	An existing user name (added to the system with the <b>add user</b> command). Must be enclosed in quotes.

**set snmp view**

Use the **set snmp view** command to change the OID assignment(s) for an existing SNMPv3 MIB view.

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**NOTE:** SNMPv3 is a keyed feature. Keys must be purchased from Force10 Networks. The Controller must be running release 9.8 or higher to support SNMPv3.

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**Syntax:** `set snmp view {"view-name"} {n} {"OID" | none}`

**Example:** `set snmp view "view1" 0 "1.3.6.1.2.1.3"`

**Example:** `set snmp view "view1" 1 none`

Variable	Definition
<b>view-name</b>	View name. Must be enclosed in quotes. <b>Note:</b> The view must have been previously created with the <b>add snmp view</b> command.
<b>n</b>	OID index (0 - 9). Each SNMP view can have up to 10 OIDs assigned. To determine the OID assignments and indexes for a view, issue a <b>show snmp view</b> command.
<b>"OID"</b>	MIB object identifier that can be accessed through this view. Must be enclosed in quotes.
<b>none</b>	Removes the OID associated with the specified index.



**set ssh**

Use the **set ssh** commands to specify Secure Shell (SSH) settings.

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**NOTE:** SSH (Secure Shell) is a keyed feature. Keys must be purchased from Force10 Networks. The Controller must be running release 9.7 or higher to support SSH.

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**set ssh log level****set ssh termtype****set ssh dsa host keys****set ssh user key none****set ssh rsa host keys****set ssh1****set ssh rsa1 host keys****set ssh2****set ssh log level**

Use the **set ssh log level** command to set the SSH console debug log trace level. The range is 0 (off) to 7 (all traces), with increasing traces as the numbers increase. The default is 0. This command takes effect immediately.

**Syntax:** **set ssh log level {value}**

**Example:** **set ssh log level 7**

Variable	Definition
<b>value</b>	Trace level. Range is 0 - 7, with a default of 0. <b>0</b> - Disabled (Default) <b>1</b> - Fatal <b>2</b> - Error <b>3</b> - Info <b>4</b> - Verbose <b>5</b> - Debug 1 <b>6</b> - Debug 2 <b>7</b> - Debug 3

**set ssh dsa host keys**

Use the **set ssh dsa host keys** command to set the DSA public and private host-key pair to the default (hard-coded), a newly generated random value, or none. This command takes effect after a reset and does not impact any pre-existing SSH user who used a different RSA private key to log in with.

**Syntax:** `set ssh dsa host keys {default|new|none}`

**Example:** `set ssh dsa host keys default`

Variable	Definition
<b>default</b>	Set the DSA public and private key pair to the default which is an internal hard-coded value. This setting erases any saved DSA keys.
<b>new</b>	Set the DSA public and private key pair to a newly generated random value.
<b>none</b>	Set the DSA public and private key pair to not use any default values and to clear any saved keys.

**set ssh rsa host keys**

Use the **set ssh rsa host keys** command to set the RSA public and private host-key pair to none (default) or to a newly generated random value. This command takes effect after a reset and does not impact any pre-existing SSH user who used a different RSA private key to log in with.

**Syntax:** `set ssh rsa host keys {none|new}`

**Example:** `set ssh rsa host keys new`

Variable	Definition
<b>none</b>	Set the RSA public and private key pair to none used and clear any saved keys. (Default)
<b>new</b>	Set the RSA public and private key pair to a newly generated random value.

**set ssh rsa1 host keys**

Use the **set ssh rsa1 host keys** command to set the RSA1 public and private host-key pair to none (default) or to a newly generated random value. This command takes effect after a reset and does not impact any pre-existing SSH user who used a different RSA1 private key to log in with.

**Syntax:** `set ssh rsa1 host keys {none|new}`

**Example:** `set ssh rsa1 host keys new`

Variable	Definition
<b>none</b>	Set the RSA1 public and private key pair to none used and clear any saved keys. (Default)
<b>new</b>	Set the RSA1 public and private key pair to a newly generated random value.

### **set ssh termttype**

Use the **set ssh termttype** command to allow cursor positioning in VI sessions when using SSH to log into a Linux server. This command takes effect immediately and remains in effect for the current session only. **Note:** The Controller must be running version 10.1 or higher to support this command.

**Syntax:** `set ssh termttype {dumb|xterm}`

**Example:** `set ssh termttype xterm`

Variable	Definition
<b>dumb</b>	No cursor positioning. (Default)
<b>xterm</b>	Allows cursor positioning in VI sessions.

### **set ssh user key none**

Use the **set ssh user key none** command to set the DSA, RSA, or RSA1 public user key to none. This command takes effect after a reset.

**Syntax:** `set ssh {dsa|rsa|rsa1} user key none`

**Example:** `set ssh dsa user key none`

Variable	Definition
<b>dsa</b>	Set the DSA public user key to none.
<b>rsa</b>	Set the RSA public user key to none.
<b>rsa1</b>	Set the RSA1 public user key to none.

### **set ssh1**

Use the **set ssh1** command to enable or disable SSH v1. The default for SSH v1 is enabled. This command takes effect immediately, but does not impact any pre-existing sessions.

**Syntax:** `set ssh1 {enable|disable}`

**Example:** `set ssh1 disable`

Variable	Definition
<b>enable</b>	Enables SSH v1. (Default)
<b>disable</b>	Disables SSH v1.

### **set ssh2**

Use the **set ssh2** command to enable or disable SSH v2. The default for SSH v2 is enabled. This command takes effect immediately, but does not impact any pre-existing sessions.

**Syntax:** `set ssh2 {enable|disable}`

**Example:** `set ssh2 disable`

Variable	Definition
<b>enable</b>	Enables SSH v2. (Default)
<b>disable</b>	Disables SSH v2.

## **set syslog**

Use the **set syslog** commands to configure the Syslog client features.

**set syslog disable**

**set syslog enable**

**set syslog server address**

**set syslog server facility**

**set syslog server level**

### **set syslog disable**

Use the **set syslog disable** command to disable sending alarm and event messages to external Syslog servers. The initial default setting is disabled.

---

**NOTE:** This command is available to Manager-level users only.

---

**Syntax:** `set syslog disable`

**Example:** `set syslog disable`  
The example will disable Syslog on the Controller.

### **set syslog enable**

Use the **set syslog enable** command to enable sending alarm and event messages to external Syslog servers. The command will fail if there is not at least one Syslog server configured, see **set syslog server**. The initial default setting is disabled.

---

**NOTE:** This command is available to Manager-level users only.

---

**Syntax:** `set syslog enable`

**Example:** `set syslog enable`  
The example will enable Syslog on the Controller.

**set syslog server address**

Use the **set syslog server address** command to specify the IP address of the external Syslog servers. Up to three different Syslog servers can be configured, with all messages sent to all configured servers, based on server threshold level.

---

**NOTE:** This command is available to Manager-level users only.

---

**Syntax:** `set syslog server {server-num} address {ip-addr}`

**Example:** `set syslog server 2 address 192.168.23.56`

Variable	Definition
<b>server-num</b>	External Syslog server number. Range 1 - 3.
<b>ip-addr</b>	Set the IP address of the Syslog server, in the form xxx.xxx.xxx.xxx, where xxx is a number from 0 to 255, or 0.0.0.0 for none. The default is 0.0.0.0. Note: all 3 servers cannot be set to 0.0.0.0 if the Syslog enable setting is enabled.

**set syslog server facility**

Use the **set syslog server facility** command to specify the Syslog facility value that the controller will report to the Syslog server in each message.

---

**NOTE:** This command is available to Manager-level users only.

---

**Syntax:** `set syslog server {all|server-num} facility {value}`

**Example:** `set syslog server 2 facility 18`

Variable	Definition
<b>all</b>	Sets all (1-3) external Syslog servers.
<b>server-num</b>	External Syslog server number. Range 1 - 3.
<b>value</b>	The facility value to report in the Syslog messages sent to the server. Range is 0 - 23, with a default of 16.

---

**set syslog server level**

Use the **set syslog server level** command to set the Syslog severity level threshold. Events of all severity levels will be sent to the Syslog server.

---

**NOTE:** This command is available to Manager-level users only.

---

**Syntax:** `set syslog {all|server-num} level {severity}`

**Example:** `set syslog server all level 4`

Variable	Definition
<b>all</b>	Sets all (1-3) external Syslog servers.
<b>server-num</b>	External Syslog server number. Range 1 - 3.
<b>value</b>	The facility value to report in the Syslog messages sent to the server. Range is 0 - 23, with a default of 16.
<b>severity</b>	The Syslog severity level threshold. Range 0 - 7, with a default of 3. <b>0-1</b> - <b>2</b> - Only critical alarms will be sent <b>3</b> - Only critical and major alarms will be sent <b>4</b> - Only critical, major and minor alarms will be sent <b>5</b> - Only critical, major, minor alarms and alert events will be sent <b>6</b> - Only critical, major, minor alarms, alert and informational events will be sent <b>7</b> -

### **set telnet**

Use the **set telnet** command to set the Telnet application to a disabled or enabled state when using SSH. The default behavior is for Telnet to be disabled when the SSH Feature Key is installed, the SSH daemon is active, and SSH1 or SSH2 is running. This command takes effect immediately, but does not affect any pre-existing Telnet user.

---

**NOTE:** SSH (Secure Shell) is a keyed feature. Keys must be purchased from Force10 Networks. The Controller must be running release 9.7 or higher to support SSH.

---

**Syntax:** `set telnet {disable|enable}`

**Example:** `set telnet disable`

Variable	Definition
<b>disable</b>	Disable the Telnet application. (Default.)
<b>enable</b>	Enable the Telnet application.

### **set time**

Use the **set time** command to set the time.

**Syntax:** `set time {hh:mm:ss}`

**Example:** `set time 12:00:00`  
The example will set the time to 12 noon.

Variable	Definition
<b>hh:mm:ss</b>	The time in hours, minutes, and seconds, using a 24-hour clock.

### **set time daylight savings**

Use the **set time daylight savings** command to enable or disable automatic adjustment of the system clock for Daylight Savings Time.

**Syntax:** `set time daylight savings {disable|enable}`

**Example:** `set time daylight savings enable`  
The example enables automatic adjustment for Daylight Savings Time.

Variable	Definition
<b>disable</b>	Disables automatic adjustment for Daylight Savings Time. (Default.)
<b>enable</b>	Enables automatic adjustment for Daylight Savings Time.



**set user**

Use the **set user** commands to modify attributes for a specific user that have been created with the **add user** command.

**set user auth**

**set user group**

**set user level**

**set user password**

**set user priv**

**set user auth**

Use the **set user auth** command to set the SNMPv3 authentication protocol for a user.

---

**NOTE:** SNMPv3 is a keyed feature. Keys must be purchased from Force10 Networks. The Controller must be running release 9.8 or higher to support SNMPv3.

---

**Syntax:** `set user {"user-name"} auth {md5|sha}`

**Example:** `set user "user1" auth md5`

Variable	Definition
<b>user-name</b>	An existing user name (added to the system with the <b>add user</b> command). Must be enclosed in quotes.
<b>md5</b>	Use HMAC MD5 algorithm for authentication.
<b>sha</b>	Use HMAC SHA algorithm for authentication.

### set user group

Use the **set user group** command to assign users to SNMPv3 groups.

**NOTE:** SNMPv3 is a keyed feature. Keys must be purchased from Force10 Networks. The Controller must be running release 9.8 or higher to support SNMPv3.

**Syntax:** `set user {"user-name"} group {"group-name"}`

**Example:** `set user "user1" group "group1"`

Variable	Definition
<b>user-name</b>	An existing user name (added to the system with the <b>add user</b> command). Must be enclosed in quotes.
<b>group-name</b>	SNMPv3 group name. Must be enclosed in quotes. <b>Note:</b> The group must have been previously created with the <b>add snmp group</b> command.

### set user level

Use the **set user level** command to set the user access level.

**NOTE:** This command is available to Manager-level users only.

**Syntax:** `set user {"user-name"} level {1|2|3}`

**Example:** `set user "paul" level 2`

Variable	Definition
<b>user-name</b>	An existing user name (added to the system with the <b>add user</b> command). Must be enclosed in quotes.
<b>Level 1</b>	Manager has full access to ALL commands. Typically, there is only one designated user at this level
<b>Level 2</b>	Operator has access to all commands except for the following: <b>add user</b> <b>clear log</b> <b>clear (router) log</b> <b>delete user</b> <b>restore defaults</b> <b>set autoexit</b> <b>set ethernet ip address</b> <b>set password length</b> <b>set (router) syslog</b> <b>set syslog</b> <b>set user level</b> <b>set user password</b>
<b>Level 3</b>	Monitor (read only) has access only to commands that display reports and status

**set user password**

Use the **set user password** command to set or change a password for a user.

The password must not include blanks. It can include any printable character other than the following:

- " (quote)
- ? (question mark)
- ; (semi-colon)

Depending on the setting of the "password length" system variable (see **set password length**), password length requirements are as follows:

- If password length is set to "short" (default), the password must contain from 1 to 10 characters.
- If password length is set to "long," the password must contain from 6 to 10 characters.

---

**NOTE:** This command is available to Manager-level users only.

---

**Syntax:** `set user {"user-name"} password`

**Example:** `set user "john" password`

New Password: \*\*\*\*\*

New Password again: \*\*\*\*\*

Variable	Definition
<b>user-name</b>	An existing user name (added to the system with the <b>add user</b> command). Must be enclosed in quotes.

### **set user priv**

Use the **set user priv** command to set the SNMPv3 encryption protocol and privacy password for a user.

---

**NOTE:** SNMPv3 is a keyed feature. Keys must be purchased from Force10 Networks. The Controller must be running release 9.8 or higher to support SNMPv3.

---

**Syntax:** `set user {"user-name"} priv {des|none|password}`

**Example:** `set user "user1" priv des`

**Example:** `set user "user1" priv password`

Enter password input

New Password: \*\*\*\*\*

New Password again: \*\*\*\*\*

Variable	Definition
<b>user-name</b>	An existing user name (added to the system with the <b>add user</b> command). Must be enclosed in quotes.
<b>des</b>	Use DES algorithm for encryption.
<b>none</b>	Do not use DES algorithm for encryption.
<b>password</b>	Set a privacy password for the user.

**set (v35)**

Use the **set (v35)** command to setup V.35 ports.

**Syntax:** `set {v35-addr} {setting}`

**Example:** `set 6:1 rxclk normal`

Variable	Definition	
<b>v35-addr</b>	In the form of {slot slot:port}. <b>slot</b> - slot (1-6) location of a V.35 card. <b>port</b> - Port number or range.	
<b>clock</b>	Set the clock source to one of the following:	
	<b>source</b>	to the internal Stratum 4E oscillator
	<b>external</b>	to the external source
<b>cts</b>	Set the Clear To Send operation mode to one of the following:	
	<b>cd</b>	follow CD
	<b>high</b>	force CTS high
	<b>low</b>	force CTS low
	<b>rts</b>	follow RTS
<b>data</b>	Set the data mode to one of the following:	
	<b>invert</b>	invert the receive and transmit data
	<b>normal</b>	do not invert receive and transmit data
<b>dsr</b>	Set the Data Set Ready operation mode to one of the following:	
	<b>dtr</b>	Follow DTR when port is operational
	<b>high</b>	Force DSR high when port is operational. (Default)
<b>equipment</b>	Sets the V.35 port to equipment loopback, which loops the transmit V.35 signal back toward the V.35 receive (toward the T1)	
	<b>loopdown</b>	disable equipment loopback
	<b>loopup</b>	enable equipment loopback
<b>line</b>	Sets the V.35 port to line loopback, which loops the received V.35 signal back toward the V.35 signal toward the V.35 transmit (away from T1)	
	<b>loopdown</b>	disable line loopback
	<b>loopup</b>	enable line loopback
<b>rxclkinv</b>	Set the receive clock invert mode to one of the following:	
	<b>invert</b>	invert the receive clock
	<b>normal</b>	do not invert the receive clock
<b>speed</b>	Set the data rate for each DS0 to which a V.35 is crossconnected	
	<b>56</b>	56K data rate
	<b>64</b>	64K data rate
<b>txclkinv</b>	Set the transmit clock invert mode to one of the following:	
	<b>invert</b>	invert the transmit clock
	<b>normal</b>	do not invert the transmit clock

**set (v54)**

Use the **set (v54)** command to setup V.54 Loopback Test Parameters. The command specifies the range of channels within that card, and the setting to apply.

**Syntax:** `set {v54-addr} v54 {setting} [off|on] [n] [nnn]`

**Example:** `set 6:1 v54 equipment clear`

Variable		Definition
<b>v54-addr</b>		In the form of {slot slot:port}. <b>slot</b> - slot (1-6) location of a V.35/54 card. <b>port</b> - Port number or range.
<b>equipment</b>		Set the V.54 Equipment (Tx) parameters:
	<b>address</b>	<b>Syntax:</b> <code>set {v54-addr} v54 equipment address {nnn}</code> Set V.54 loop test address {nnn}. <b>nnn</b> = must be one of the following: 0 - 255.1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 37, 39, 43, 45, 47, 51, 53, 55, 59, 61, 63, 85, 87, 91, 95, 111, 119, 127, 255 (255 disables). See chart below.
	<b>clear</b>	<b>Syntax:</b> <code>set {v54-addr} v54 equipment clear</code> Clear the bit error rate counters during BER test
	<b>ignoreack</b>	<b>Syntax:</b> <code>set {v54-addr} v54 equipment ignoreack {off on}</code> Ignore V.54 ACK check [off on] Ignore acknowledge from remote equipment. This allows potential testing with non-compliant equipment by ignoring the acknowledge phase. <b>WARNING: When choosing this option, the V.35 card will no longer be compliant with the V.54 specification. Use for debug purposes only.</b>
	<b>loopdown</b>	<b>Syntax:</b> <code>set {v54-addr} v54 equipment loopdown</code> Stop the test sequence
	<b>loopup</b>	<b>Syntax:</b> <code>set {v54-addr} v54 equipment loopup</code> Start the test sequence
	<b>pattern</b>	<b>Syntax:</b> <code>set {v54-addr} v54 equipment pattern {n}</code> Set V.54 test pattern <b>n</b> is from the following: 0 = QRSS pattern (Default) 1 = 2047 pattern 2 = $2^{15} - 1$ pattern 3 = $2^{20} - 1$ pattern (QRSS with no bit stuffing)
	<b>prepcnt</b>	<b>Syntax:</b> <code>set {v54-addr} v54 equipment prepcnt {nnn}</code> Set V.54 Rx prep-pattern count {nnn} <b>nnn</b> = number of times that the preparatory pattern must be received to be recognized.
<b>network</b>		Set the V.54 Network loop address.
	<b>address</b>	<b>Syntax:</b> <code>set {v54-addr} v54 network address {nnn}</code> Set the address of the port to {nnn}. <b>nnn</b> = must be one of the following: 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 37, 39, 43, 45, 47, 51, 53, 55, 59, 61, 63, 85, 87, 91, 95, 111, 119, 127, 255 (255 disables). See chart below.
	<b>disable</b>	<b>Syntax:</b> <code>set {v54-addr} v54 network disable.</code> Disable V.54 loop test
	<b>enable</b>	<b>Syntax:</b> <code>set {v54-addr} v54 network enable</code> Enable V.54 loop test
	<b>prepcnt</b>	<b>Syntax:</b> <code>set {v54-addr} v54 network prepcnt {nnn}</code> Sets the preparatory pattern response count. <b>nnn</b> = number of times that the preparatory pattern must be received to be recognized.

***nnn chart***

0x01 - 1	0x0F - 15	0x1D - 29	0x33 - 51	0x57 - 87
0x03 - 3	0x11 - 17	0x1F - 31	0x35 - 53	0x5B - 91
0x05 - 5	0x13 - 19	0x25 - 37	0x37 - 55	0x5F - 95
0x07 - 7	0x15 - 21	0x27 - 39	0x3B - 59	0x6F - 111
0x09 - 9	0x17 - 23	0x2B - 43	0x3D - 61	0x77 - 119
0x0B - 11	0x19 - 25	0x2D - 45	0x3F - 63	0x7F - 127
0x0D - 14	0x1B - 27	0x2F - 47	0x55 - 85	0xFF - 255*

***set verification***

Use the **set verification** command to enable or disable verification prompts.

**Syntax:** `set verification {off|on}`

**Example:** `set verification off`

The example will cause yes/no verification messages to be suppressed.

Variable	Definition
<b>off</b>	Turn yes/no verification prompts off.
<b>on</b>	Turn yes/no verification prompts on.

### **show**

---

The following show commands are linked to a detailed description of each command.

<a href="#"><b>show (4-wire e&amp;m)</b></a>	<a href="#"><b>show (p-phone)</b></a>
<a href="#"><b>show (adpcm)</b></a>	<a href="#"><b>show radius</b></a>
<a href="#"><b>show autoexit</b></a>	<a href="#"><b>show (router)</b></a>
<a href="#"><b>show banner</b></a>	<a href="#"><b>show (router) dhcp</b></a>
<a href="#"><b>show (bri)</b></a>	<a href="#"><b>show (router) dhcp client</b></a>
<a href="#"><b>show clock</b></a>	<a href="#"><b>show (router) dhcp server leases</b></a>
<a href="#"><b>show connect</b></a>	<a href="#"><b>show (router) dns</b></a>
<a href="#"><b>show connect adpcm</b></a>	<a href="#"><b>show (router) dns proxy</b></a>
<a href="#"><b>show date</b></a>	<a href="#"><b>show (router) lmi</b></a>
<a href="#"><b>show (ds0)</b></a>	<a href="#"><b>show (router) log</b></a>
<a href="#"><b>show (ds1)</b></a>	<a href="#"><b>show (router) mac</b></a>
<a href="#"><b>show (e1)</b></a>	<a href="#"><b>show (router) mgcp</b></a>
<a href="#"><b>show ethernet</b></a>	<a href="#"><b>show (router) mgcp algorithmname</b></a>
<a href="#"><b>show features</b></a>	<a href="#"><b>show (router) ntp</b></a>
<a href="#"><b>show (fxo)</b></a>	<a href="#"><b>show (router) port</b></a>
<a href="#"><b>show (fxs)</b></a>	<a href="#"><b>show (router) ppp</b></a>
<a href="#"><b>show (fxs8D/fxs8C/fxs8B/fxs8A/fxs5G)</b></a>	<a href="#"><b>show (router) rip</b></a>
<a href="#"><b>show (fxsINTL)</b></a>	<a href="#"><b>show (router) snmp</b></a>
<a href="#"><b>show (fxsPS)</b></a>	<a href="#"><b>show (router) stp</b></a>
<a href="#"><b>show id</b></a>	<a href="#"><b>show (router) syslog</b></a>
<a href="#"><b>show idle</b></a>	<a href="#"><b>show (router) uploaduser</b></a>
<a href="#"><b>show image</b></a>	<a href="#"><b>show (router) voip</b></a>
<a href="#"><b>show impedance</b></a>	<a href="#"><b>show (router-lan)</b></a>
<a href="#"><b>show ip</b></a>	<a href="#"><b>show (router-lan) collision</b></a>
<a href="#"><b>show ipds0</b></a>	<a href="#"><b>show (router-lan) filter</b></a>
<a href="#"><b>show local</b></a>	<a href="#"><b>show (router-lan) firewall</b></a>
<a href="#"><b>show login</b></a>	<a href="#"><b>show (router-lan) static</b></a>
<a href="#"><b>show ntp</b></a>	<a href="#"><b>show (router-lan) stp</b></a>
<a href="#"><b>show (ocudp)</b></a>	<a href="#"><b>show (router-trunk)</b></a>
<a href="#"><b>show password length</b></a>	<a href="#"><b>show (router-voice)</b></a>



<i>show (router-wan)</i>	<i>show screen</i>
<i>show (router-wan) firewall</i>	<i>show ssh</i>
<i>show (router-wan) nat bypass</i>	<i>show snmp</i>
<i>show (router-wan) ppp</i>	<i>show syslog</i>
<i>show (router-wan) static</i>	<i>show test (fxs8D/fxs8C/fxs8B)</i>
<i>show (router-wan) stp</i>	<i>show time</i>
<i>show (router-wan) trunk</i>	<i>show users</i>
<i>show routes</i>	<i>show (v35)</i>
<i>show (rs232)</i>	<i>show (v54)</i>

**show (4-wire e&m)**

The **show (4we&m)** command displays the settings for 4-Wire E&M card.

**Syntax:** `show {4we&m-addr}`

**Example:** `show 4:1`

```
> show 4:1
SLOT 4:
Settings for 4 Wire E&M Port 1:
  Type:          Voice
  RxGain:        7db
  TxGain:        16db
  Signaling:     EMI
```

Variable	Definition
<b>4we&amp;m-addr</b>	In the form of {slot} or {slot:port}. Note if only the slot is listed all ports will be displayed. <b>slot</b> - Slot (1-6) where the 4-Wire E&M card is located. <b>port</b> - Port number, range or "all".

**show (adpcm)**

Use the **show (adpcm)** command to display the settings for the ADPCM card.

**Syntax:** **show {adpcm-addr}**

**Example:** **show 6:1**

```

show 6:1
SLOT 6:
Settings for DS1 1:
  Circuit ID:          TN DS1# 6:1
  Up/Down:             UP
  Framing:             ESF
  Line Coding:         B8ZS
  Line Build Out:      DSX-1 EQUALIZATION FOR 0-133 ft. (CSU 0dB)
  Loop Code Detection: ON
  Loopback:            OFF
  FDL Type:            None
  ADPCM:               Enabled
  ADPCM Map:           2

Performance Threshold Settings
unavailable seconds:      15 min.    1 day
severely errored seconds: 0          0
errored seconds:         0          0
sev. errored frame seconds: 0          0
line errored seconds:    0          0
controlled slip seconds: 0          0
bursty errored seconds:  0          0
degraded minutes:        0          0
total linecode violations: 0          0
total pathcode violations: 0          0

```

Variable	Definition
<b>adpcm-addr</b>	The ADPCM address is in the form {slot:port}. Where {slot} displays information for all ports on the card, {slot:port} for only the defined port. <b>slot</b> - Slot number (1-6) where the ADPCM card is located <b>port</b> - Port number. range 1-4.

### **show autoexit**

Use the **show autoexit** command to display whether autoexit is on or off. If on, the time-out period is displayed.

**Syntax:** `show autoexit`

**Example:** `show autoexit`  
`> show autoexit`  
Autoexit is off.

### **show banner**

Use the **show banner** command to view the SSH banner information.

---

**NOTE:** SSH (Secure Shell) is a keyed feature. Keys must be purchased from Force10 Networks. The Controller must be running release 9.7 or higher to support SSH.

---

**Syntax:** `show banner`

**Example:** `show banner`

Banner is:

WARNING: Unauthorized access is prohibited!

**show (bri)**

Use the **show (bri)** command to display settings for BRIs.

**Syntax:** **show {bri-addr}**

**Example:** **show 3:1**

The example will display the settings for port 1 (BRI) on slot 3.

```
> show 3:1
SLOT 3:
Settings for BRI Port 1:
    Mode:                               LT4TO1TDM
    Up/Down:                             UP
    CRV:                                 31
    Performance Sync Source:             ADIT
    Auto Activate:                       OFF

Performance Threshold Settings          1 hour    1 day
-----
errored seconds:                        40         100
severely errored seconds:                10         25
```

Variable	Definition
<b>bri-addr</b>	The BRI address in the form of {slot port}. Where {slot} displays connections for an entire slot, {slot:port} for a port within a given slot. <b>slot</b> - The slot number (1-6) that contains the BRI card <b>port</b> - Port number, range or "all"

**show clock**

The **show clock** command displays the primary and secondary clocks.

**Syntax:** **show clock**

**Example:** **show clock**

In the following example, the primary clock source is in slot A (Controller card), DS1 2; and the secondary clock source is in slot 6 (BRI card), DS1 1.

```
> show clock
Primary Master Transmit Clock Source:    Slot A DS1  2
Secondary Master Transmit Clock Source:  Slot 6 BRI  1
```

**show connect**

The **show connect** command displays the static connections for channels and ports.

**Syntax:** **show connect** {**slot** | **slot:port** | **slot:port:channel**}

**Example:** **show connect a:1:1-4**

```
> show connect a:1:1-4
```

From	Desc	Desc	To
A:01:01	DATA DS0 <--> WAN	DATA 64K	2:01:01
A:01:02	DATA DS0 <--> WAN	DATA 64K	2:01:02
A:01:03	DATA DS0 <--> WAN	DATA 64K	2:01:03
A:01:04	DATA DS0 <--> WAN	DATA 64K	2:01:04

Variable	Definition
slot	The slot number, A for the controller card, or 1 - 6 for service cards.
port	Port number, range or all.
channel	Channel number, range or all.

**show connect adpcm**

The **show connect adpcm** command displays the connections for the ADPCM port.

**Syntax:** **show connect adpcm {adpcm-addr}**

**Example:** **show connect 1:1**

```
> show connect adpcm 1:1
```

From	Desc	Desc	To
1:01:01 (01/02)	DATA DS0 <--> DS0	DATA	1:04:01
1:01:02 (03/04)	DATA DS0 <--> DS0	DATA	1:04:02
1:01:03 (05/06)	DATA DS0 <--> DS0	DATA	1:04:03
1:01:04 (07/08)	DATA DS0 <--> DS0	DATA	1:04:04
1:01:05 (09/10)	DATA DS0 <--> DS0	DATA	1:04:05
1:01:06 (11/12)	DATA DS0 <--> DS0	DATA	1:04:06
1:01:07 (13/14)	DATA DS0 <--> DS0	DATA	1:04:07
1:01:08 (15/16)	DATA DS0 <--> DS0	DATA	1:04:08
1:01:09 (17/18)	DATA DS0 <--> DS0	DATA	1:04:09
1:01:10 (19/20)	DATA DS0 <--> DS0	DATA	1:04:10
1:01:11 (21/22)	DATA DS0 <--> DS0	DATA	1:04:11
1:01:12 (23/24)	DATA DS0 <--> DS0	DATA	1:04:12

Variable	Definition
<b>adpcm-addr</b>	The ADPCM address is in the form {slot:port}. <b>slot</b> - Slot number (1-6) where the ADPCM card is located <b>port</b> - Port number. range 1-4.

**show date**

The **show date** command displays the date in *dd/mm/yyyy* format.

**Example:** **show date**

```
> show date
date: 08/10/2002
```

### **show (ds0)**

The **show (ds0)** command displays settings for DS0s.

**Syntax:** **show {ds0-addr}**

**Example:** **show a:1:1**

In the following example, the **show (ds0)** command has queried slot A (Controller card), port 1, channel 1.

```
> show a:1:1
SLOT A:
Settings for DS1 1:  channel 1:
    Type:                VOICE
    Signaling:            LS
    Interface Side:       NETWORK
```

Variable	Definition
<b>ds0-addr</b>	DS0 address in the format {slot:port:channel}.
	<b>slot</b> A for the controller card, or 1 - 6 for service cards.
	<b>port</b> Port number or range.
	<b>channel</b> Channel number, range or all.



**show (ds1)**

The **show (ds1)** command displays settings for DS1s.

**Syntax:** **show {ds1-addr}**

**Example:** **show a:1**

In the following example, the query **show a:1** has returned the following DS1 settings for slot A (the controller card), port 1.

```
Adit 600> show 1:1
SLOT 1:
Settings for DS1 1:
  Circuit ID:          TN DS1# 1:1
  Up/Down:             UP
  Framing:             ESF
  Line Coding:         B8ZS
  Line Build Out:      DSX-1 EQUALIZATION FOR 0-133 ft. (CSU 0dB)
  Loop Code Detection: CSU
  Loopback:            OFF
  FDL Type:            None
  AIS Forwarding:      Disabled
  AIS List:            all

Performance Threshold Settings      15 min.      1 day
-----
unavailable seconds:                0              0
severely errored seconds:           0              0
errored seconds:                    0              0
sev. errored frame seconds:         0              0
line errored seconds:               0              0
controlled slip seconds:            0              0
bursty errored seconds:             0              0
degraded minutes:                   0              0
total linecode violations:          0              0
total pathcode violations:          0              0
```

Variable	Definition
<b>ds1-addr</b>	DS1 address in the format {slot} or {slot:port}.
<b>slot</b>	A for the controller, or 1 - 6 for service cards containing a Quad T1, or Quad DS1/E1 card.
<b>port</b>	Port number, range or "all". Note: if the port is not defined, all ports will be listed.

## show (e1)

**NOTE:** E1 is not supported in this release of the Adit 600 Controller. It will be supported in a future release.

The **show (e1)** command displays settings for E1s.

**Syntax:** **show {e1-addr}**

**Example:** **show 6:1**

In the following example, the query **show 6:1** has returned the following E1 settings for slot 6, port 1.

```
> show 6:1
SLOT 6:
Settings for E1 1:
  Up/Down:                UP
  Framing:                 E1FRCRC
  Signaling:               CAS
  Line Coding:              HDB3
  Loopback:                 OFF

Performance Threshold Settings      15 min.      1 day
-----
unavailable seconds:                0            0
severely errored seconds:           0            0
errored seconds:                    0            0
sev. errored frame seconds:         0            0
line errored seconds:               0            0
controlled slip seconds:            0            0
bursty errored seconds:             0            0
degraded minutes:                   0            0
total linecode violations:          0            0
total pathcode violations:          0            0
```

Variable	Definition
<b>e1-addr</b>	E1 address in the format {slot:port}.
<b>slot</b>	A for the controller (E1), or 1 - 6 for service cards containing a Quad E1 or Quad DS1/E1 card.
<b>port</b>	Port number or range.

**show ethernet**

The **show ethernet** command displays Ethernet and IP settings.

**Syntax:** **show ethernet**

**Example:** **show ethernet**

```

IP Address and Mask:          198.162.3.196  255.255.255.0
IP Address of the Gateway:    192.168.3.202
MAC Address:                  00:E0:97:00:A9:33

```

**show features**

The **show features** command displays ethernet and IP settings.

**Example:** **show [rtr\_card-addr] features**

**Example:** **show features**

```

Activated Features:
**No Active Features

```

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.

**show (fxo)**

The **show (fxo)** command displays the settings for FXOs.

**Syntax:** **show {fxo-addr}**

**Example:** **show 1:1**

```

SLOT 1:
Settings for FXO:   channel  1:
Type:              VOICE
Signaling:         LS
RxGain:            -6      dB
TxGain:            -3      dB

```

Variable	Definition
<b>fxo-addr</b>	In the form of {slot} or {slot:port}. Note if only slot is listed, all ports will be displayed <b>slot</b> - The slot number (1-6) of the Adit chassis that contains the FXO card <b>port</b> - Port number, range or “all”.

### **show (fxs)**

The **show (fxs)** command displays the settings for all FXS ports.

**Syntax:** **show {fxs-addr}**

**Example:** **show 4:1**

The example shows settings for port on slot 2.

```
> show 4:1
SLOT 4:
Settings for FXS:  channel  1:
    Type:           VOICE
    Signaling:      LS
    RxGain:         -6      dB
    TxGain:         -3      dB
    LineLength:     SHORT
```

Variable	Definition
<b>fxs-addr</b>	In the form of {slot} or {slot:port}. Note if only slot is listed, all ports will be displayed <b>slot</b> - The slot number (1-6) of the Adit chassis that contains the FXS card <b>port</b> - Port number, range or “all”.

**show (fxs8D/fxs8C/fxs8B/fxs8A/fxs5G)**

The **show (fxs8D/fxs8C/fxs8B/fxs8A/fxs5G)** command displays the settings for the FXS 8D, FXS 8C, FXS 8B, FXS 8A, and FXS 5G cards.

**Syntax:** **show {fxs-addr}**

**Example:** **show 6:1**

This command will display the settings for the FXS channel 1 for the FXS 8D card located in Slot 6.

```
> show 6:1
SLOT 6:
Settings for FXS:  channel 1:
Type:              VOICE
Signaling:         LS
RxGain:            -6      dB
TxGain:            -3      dB
Impedance:         900 Ohms + 2.16uF
```

**Example:** **show 4:1**

```
SLOT 4:
Settings for FXS:  channel 1:
Type:              VOICE
Signaling:         GSW
RxGain:            -6      dB
TxGain:            -3      dB
Impedance:         900 Ohms + 2.16uF
Wink time:         135 ms
```

**Note:** Wink time displays only when signaling is set to GSW or GSWRB.

Variable	Definition
<b>fxs-addr</b>	List of voice channels to apply setting to, in the form {slot:port}. <b>slot</b> - Slot number 1 - 6, location of the FXS card. <b>port</b> - Port number or range.

## show (fxsINTL)

**NOTE:** E1 is not supported in this release of the Adit 600 Controller. It will be supported in a future release.

The **show (fxsINTL)** command displays the settings for the E1-FXS card.

**Syntax:** **show {fxsINTL-addr}**

**Example:** **show 2:1**

Displays the settings for channel 1 for the E1-FXS card located in Slot 2.

```
SLOT 2:
Settings for FXS:  channel  1:
Type:              VOICE
Signaling:         R2
RxGain:            -6      dB
TxGain:            -3      dB
Impedance:         900 Ohms
```

Variable	Definition
<b>fxsINTL-addr</b>	In the form of {slot} or {slot:port}. Note if only slot is listed, all ports will be displayed <b>slot</b> - The slot number (1-6) of the Adit chassis that contains the E1-FXS card <b>port</b> - Port number, range or "all".

## show (fxsPS)

The **show (fxsPS)** command displays the settings for the Single Channel POTS card.

**Syntax:** **show {fxsPS-addr}**

**Example:** **show 6**

```
Settings for FXS:  channel  1:
Type:              VOICE
Signaling:         LS
RxGain:            -6      dB
TxGain:            -3      dB
```

Variable	Definition
<b>fxsPS-addr</b>	The {slot:port} address of the FXS PS card to display. <b>slot</b> - Slot number (1-6) of the FXS PS card <b>port</b> - Port number or range.

---

### **show id**

The **show id** command displays the system ID for the Adit 600.

**Syntax:** **show id**

**Example:** **show id**

The example shows the ID of a Adit 600 labeled "Adit 6001"

```
Adit 6001> show id
ID: Adit 6001
```

### **show idle**

The **show idle** command displays the system idle code for the Adit 600.

**Syntax:** **show idle**

**Example:** **show idle**

```
> show idle

IDLE Pattern: 0x2bc
```

### **show image**

The **show image** command displays the application images stored in the Controller or Router (IP, CMG or TSR).

**Syntax:** **show [rtr\_card-addr] image**

**Example:** **show image**

```
> show image

Ape. Image: Ver=7.0 Fri Aug 29 06:40:42 2003 - ACTIVE
App. Image: Ver=7.0 Thu Aug 14 13:01:18 2003 - BACKUP
```

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card. <b>Note: If no slot number is entered, the image information is retrieved from the Controller.</b>

## show impedance

The **show impedance** command displays the impedance settings for FXS 5G, FXS 8A, and E1-FXS service cards.

**Syntax:** `show impedance`

**Example:** `show impedance`

<u>Index</u>	<u>Impedance</u>	<u>CODEC</u>	<u>Country</u>
1	120 Ohms + (.110μF    820 Ohms)	A-law	Norway
2	150 Ohms + (.047μF    510 Ohms)	A-law	Malaysia
3	150 Ohms + (.072μF    830 Ohms)	A-law	Belgium
4	200 Ohms + (.100μF    680 Ohms)	A-law	China
5	215 Ohms + (.137μF    1k Ohms)	A-law	France
6	220 Ohms + (.115μF    820 Ohms)	A-law	Austria, Germany, Mexico, Switzerland
7	220 Ohms + (.120μF    820 Ohms)	A-law	Australia
8	270 Ohms + (.120μF    910 Ohms)	A-law	Finland
9	300 Ohms + (.220μF    1k Ohms)	A-law	United Kingdom
10	370 Ohms + (.310μF    620 Ohms)	A-law	New Zealand
11	400 Ohms + (.033μF    500 Ohms)	A-law	Denmark
12	400 Ohms + (.050μF    500 Ohms)	A-law	Greece
13	600 Ohms	A-law	Korea, Indonesia, Italy, Poland, Russia, Spain, Thailand, China
14	600 Ohms + 1.00μF	μ-law	Japan
15	600 Ohms + 1.50μF	A-law	Saudi Arabia
16	600 Ohms + 2.16μF	μ-law	Korea
17	800 Ohms	A-law	Netherlands
18	900 Ohms	A-law	Brazil
19	900 Ohms + 2.16μF	μ-law	USA, Taiwan

**Note:** In general, μ-Law settings are used for T1 applications, A-Law settings are used for E1 applications.

## show ip

The **show ip** command displays the IP Address information for the Adit 600.

**Syntax:** `show ip`

**Example:** `show ip`

```
> show ip
```

```

IP Address and Mask:      192.168.3.193  255.255.255.0
IP Address of the Gateway: 192.168.3.202
OK
```



### **show ipds0**

The **show ipds0** command displays the settings for the DS0 management channel.

**Syntax:** **show ipds0**

**Example:** **show ipds0**

```
> show ipds0
Administrative state:   DOWN
DS0 Selected:          a:1:1
IP Address and Mask:   192.168.210.1  255.255.255.0
```

### **show local**

The **show local** command shows whether the Adit 600 is in local mode.

**Syntax:** **show local**

**Example:** **show local**

```
> show local
LOCAL:                ON
```

### **show login**

The **show login** command displays the RADIUS login authentication configuration settings for the Controller.

**Syntax:** **show login**

**Example:** **show login**

```
Login Authentication Parameters:
Authentication Type: local
Support Logins: enabled
```

### **show ntp**

The **show ntp** command displays the configuration settings for the Controller NTP client.

**Syntax:** **show ntp**

**Example:** **show ntp**

```
NTP Settings:
NTP:                               Disabled
NTP Server Address:                 0.0.0.0
NTP Polling Interval (seconds): 16
NTP Timezone (offset from GMT): 0 hours 0 minutes
```

### **show (ocudp)**

Use the **show (ocudp)** to display baud, loopdetect, error correction, switched and enhanced switched service and secondary channel provisioning.

**Syntax:** `show {ocudp-addr}`

**Example:** `show 2:1`

```
SLOT 2:
Settings for OCUDP Port 1:
  Up/Down:                               UP
  Baudrate:                              56000
  Loopdetect Types Enabled:
    CSU Non-Latching
    DSU Non-Latching
    OCU Non-Latching
  Error Correction:                       DISABLE
  Secondary Channel:                      DISABLE
```

Variable	Definition
<b>ocudp-addr</b>	The {slot:port} address of the OCUDP card to display. <b>slot</b> - Slot number (1-6) where the OCUDP card is located <b>port</b> - Port number or range. If no port is specified, all ports will be displayed.

### **show password length**

Use the **show password length** command to display the current password length requirement (long or short). See the **set password length** command for more information.

**Syntax:** `show password length`

**Example:** `show password length`

```
password length: short
```

### **show (p-phone)**

Use the **show (p-phone)** command to display the P-Phone settings.

**Syntax:** **show {p\_phone-addr}**

**Example:** **show 2:1**

```
SLOT 2:
Settings for EBS Port 1:
  RxGain:      -6db
  TxGain:      -3db
  CRV Number:   0
```

Variable	Definition
<b>p_phone-addr</b>	The {slot:port} address of the P-Phone card to display. <b>slot</b> - Slot number (1-6) where the P-Phone card is located <b>port</b> - Port number or range. If no port is specified, all ports will be displayed.

### **show radius**

The **show radius** command displays the RADIUS configuration settings for the Controller.

**Syntax:** **show radius**

**Example:** **show radius**

```
RADIUS Configuration Parameters:

Authentication: enabled for
                  Slot 4
                  Slot 5
NAS Identifier:
Retry count:      3
Timeout (sec):    3
Server(1) :       UNUSED
Server(2) :       UNUSED
Server(3) :       UNUSED
```

### **show (router)**

The **show (router)** command displays the settings for the Router card.

**Syntax:** **show {rtr\_card-addr}**

**Example:** **show 5**

```
> show 5
```

```
SLOT 5:
```

```
Login Settings for Router:
```

```
Authentication: Local
```

```
Login Prompt: Enabled
```

```
LMI Settings for Router:
```

```
LMI: Disabled
```

```
RIP Setting for Router:
```

```
RIP Mode Receive: RIP1
```

```
RIP Mode Send: RIP1
```

```
PPP Authentication/Security Settings for Router:
```

```
Authentication by Remote:
```

```
Protocol: None
```

```
User ID: Local Profile Name
```

```
Authentication of Remote:
```

```
Protocol: None
```

```
Local Security Server:
```

```
Type: None
```

```
PPP Statistics for Slot-5:
```

		Up/Down	Rx	Rx	Tx	Tx
<u>Remote Name</u>	<u>State</u>	<u>Time</u>	<u>Packets</u>	<u>Octets</u>	<u>Packets</u>	<u>Octets</u>
RemoteAdit	DOWN	1h27m16s	0	0	0	0

```
SNMP Settings for Router:
```

```
SNMP Communities:
```

<u>Name</u>	<u>Address</u>	<u>Access</u>
public	0.0.0.0	Read

```
SNMP Trap Destinations:
```

<u>Name</u>	<u>Address</u>	<u>Location</u>
public	0.0.0.0	Local LAN

```
Name: unknown
```

```
Contact: unknown
```

```
Location: unknown
```

## DHCP Server/BOOTP Relay Agent Settings for Router:

DHCP: Disabled

## DNS Proxy Settings for Router:

Total: 0

## Spanning Tree Protocol Settings for Router:

Spanning Tree: Enabled  
 Bridge Hello Time: 2 seconds  
 Bridge Max Age: 20 seconds  
 Bridge Forward Delay: 15 seconds  
 Bridge Priority: 32768

## Syslog Settings for Router:

Syslog: Disabled

## TFTP Upload/Download User Settings for Router:

Reboot After Code is Loaded: Yes  
 Reboot After Configuration is Loaded: Yes

			Upload/Download
<u>IP Address</u>	<u>Client Site</u>	<u>Code</u>	<u>Config</u>
Total: 0			

## LAN Profile Name for Router:

LocalAdit 192.168.3.195

## WAN Profile Name(s) for Router:

RemoteAdit Unnumbered

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.

**show (router) dhcp**

The **show (router) dhcp** command displays the current DHCP settings for the Router card.

**Syntax:** **show {rtr\_card-addr} dhcp**

**Example:** **show 4 dhcp**

```
SLOT 4:
DHCP Server/BOOTP Relay Agent Settings for Router:
  DHCP Server:                Enabled
  Server Domain:
  Starting IP Address:        10.10.6.200
  Number:                     5
  Lease Duration:             3:45
  Domain Name Servers:        0.0.0.0
                              0.0.0.0
                              0.0.0.0
                              0.0.0.0

  NetBIOS over TCP/IP Settings:
    Node Type:                 0
    Scope:
    NetBIOS Name Servers:      0.0.0.0
                              0.0.0.0

  DHCP Option:
    13      0x2 Sent in 1 byte
    160     0x3200 Sent in 2 bytes
```

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.

**show (router) dhcp client**

The **show (router) dhcp client** command displays the current DHCP Client settings.

**Syntax:** `show {rtr_card-addr} dhcp client`

**Example:** `show 4 dhcp client`

```

DHCP Client          enabled
Auto DNS             enabled
Tx Broadcast Packet  enabled
Ip/Mask Request      enabled
Gateway Request      enabled
Host Name Request    disabled
Domain Name Request  enabled
DNS Primary Server Request enabled
DNS Secondary Server Request disabled

```

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.

**show (router) dhcp server leases**

The **show (router) dhcp server leases** command displays the current DHCP settings for the Router card.

**Syntax:** `show {rtr_card-addr} dhcp server leases`

**Example:** `show 4 dhcp server leases`

```

DHCP SERVER LEASES REPORT Slot-4
DHCP Server Leases: Used=0 Avail=5

# State      IP                ClientId          Expires HostName

No DHCP Leases In Use.

```

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.

**show (router) dns**

The **show (router) dns** command displays the current DNS setup for the Router card.

**Syntax:** `show {rtr_card-addr} dns`

**Example:** `show 3 dns`

```
SLOT 5:
DNS Settings:
  DNS Resolver:                Disabled
  DNS Server 1 IP Address:      0.0.0.0
  DNS Server 2 IP Address:      0.0.0.0
  DNS Host Name:
  DNS Default Domain:

DNS Static Host List:
  Total: 0
```

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.

**show (router) dns proxy**

The **show (router) dns proxy** command displays the current DNS Proxy setup for the Router card.

**Syntax:** `show {rtr_card-addr} dns proxy`

**Example:** `show 5 dns proxy`

```
SLOT 5:
DNS Proxy Settings for Router:
  Total: 0
```

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.



### **show (router) lmi**

The **show (router) lmi** command displays the current Local Management Interface (LMI) settings for the Router card.

**Syntax:** `show {rtr_card-addr} lmi`

**Example:** `show 5 lmi`

The example shows the LMI settings for the Router card in slot 5.

```
> show 5 lmi
SLOT 5:
LMI Settings for Router:
  LMI: Disabled
```

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.

### **show (router) log**

The **show (router) log** command displays the logging configuration of the CMG card. This command applies to the CMG Router card only.

**Syntax:** `show {cmg_card-addr} log`

**Example:** `show 4 log`

The example shows the logging configuration for the CMG card in slot 4.

```
> show 4 log
SLOT 4:
Log Settings for CMG:

  Logging Mode:           First
  Log Details:            No
  Call Detail Records (CDR): Disabled

  Total Ports Logging: 0
```

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG card.

### ***show (router) mac***

The **show (router) mac** command displays the MAC address for the MSR card's Ethernet ports.

**Syntax:** `show {msr_card-addr} mac [eth1|eth2]`

**Example:** `show 5 mac`

```
Eth1 MAC Address : 00e097fffffe
```

```
Eth2 MAC Address : 00e097fffffd
```

Variable	Definition
<b>msr_card-addr</b>	The slot number (1-6) that contains the MSR card.
<b>eth1</b>	Optional parameter. Shows the MAC address for Ethernet port 1 only.
<b>eth2</b>	Optional parameter. Shows the MAC address for Ethernet port 2 only.

---

**show (router) mgcp**

The **show (router) mgcp** command to display all options set through **set (router) mgcp** commands. This command applies to the CMG Router card only.

**Syntax:** **show {cmg\_card-addr} mgcp**

**Example:** **show 4 mgcp**

SLOT 4:

MGCP Settings for CMG:

Activation, Addressing, and Transactions:

MGCP State:	Up
Call Agent IP Address:	10.0.0.99
Call Agent Domain Name:	(not applicable)
Call Agent MGCP Port:	2727
Secondary Call Agent IP Address:	0.0.0.0
Secondary Call Agent Domain Name:	(not applicable)
Secondary Call Agent MGCP Port:	2727
Gateway MGCP Port:	2427
MGCP Gateway ID:	Default
Filter Call Agent by IP:	Disabled
Response Timeout (ms):	3000
Max Retries:	3

Interoperability Settings:

Version:	IETF 1.0
Hookswitch Reporting:	Always
Default IETF Event Package:	D
Piggybacking:	Disabled
Address Format:	Brackets
Dialstring Format:	Commas
SDP Mode:	Full
Parse Mode:	Lenient
Quarantine:	Step Process
RSIP Wildcard:	Disabled
RSIP Forced:	Disabled
Protocol ID:	Default
Keep-Alive Timeout:	Disabled
Type of Service:	0x0
LCO Codecs:	Enabled
LCO PTimes:	Enabled
SDP Codec Order:	RDesc Order
CAC Delay Alert:	Disabled

Voice Algorithm Names for Local Connection Options (LCO):

CMG Algorithm ID	MGCP LCO Name
-----	-----
g711mu	
g711a	
g726_16	
g726_24	
g726_32	
g726_40	

RSIP Scheduler:

State:	Disable
Normal RSIP Rate:	0       Seconds
Fallback RSIP Rate:	0       Seconds
RSIP Fallback Threshold:	0
Randomize:	0
Quiet Timeout:	0
RSIP Address:	0.0.0.0
RSIP Port:	2727

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG card.

**show (router) mgcp algorithmname**

The **show (router) mgcp algorithmname** command displays all MGCP designations for voice coding algorithms supported by the CMG. This displays the CLI defined name, if any, and the default for each algorithm. MGCP algorithm names are used in the "a:" attribute in the Local Connection Options (L:) parameter line of a CRCX or MDCX command. This command applies to the CMG Router card only.

**Syntax:** `show {cmg_card-addr} mgcp algorithmname`

**Example:** `show 4 mgcp algorithmname`

```
SLOT 4:
MGCP Voice Algorithm Names for CMG Local Connection Options (LCO):
```

<u>CMG Algorithm ID</u>	<u>MGCP LCO Name</u>
g711mu	
g711a	
g726_16	
g726_24	
g726_32	
g726_40	

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG card.

**show (router) ntp**

The **show (router) ntp** command displays settings for NTP options.

**Syntax:** `show {rtr_card-addr} ntp`

**Example:** `show 4 ntp`

```
SLOT 4:
NTP Settings for CMG:
  NTP: Disabled
  NTP Server: 0.0.0.0
  NTP Interval (seconds):120
  NTP Timezone (offset from GMT):0 hours 0 minutes
```

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.

### **show (router) port**

The **show (router) port** command displays the current TSR ports configuration. This command applies to the Terminal Server Router card only.

**Syntax:** `show {tsr_card-addr} port`

**Example:** `show 1 port`

```
SLOT 1:
Port Profiles for Terminal Server Router:

Port 1
Name: none
Type: RS-232
Asynchronous Settings
Socket: 10.10.11.1:23 TCP
    Baud Rate      9600
    Data Bits      8
    Stop Bits      1
    No Parity
    No Flowcontrol

Port 2
Name: none
Type: RS-232
Asynchronous Settings
Socket: 10.10.11.2:23 TCP
    Baud Rate      9600
    Data Bits      8
    Stop Bits      1
    No Parity
    No Flowcontrol

Port 3
Name: none
Type: Ethernet

Port 4
Name: none
Type: Ethernet
```

Variable	Definition
<b>tsr_card-addr</b>	The slot number (1-6) that contains the TSR card.

**show (router) ppp**

The **show (router) ppp** command displays the current Local PPP (Point-to-Point Protocol) authentication and security settings for the Router card.

**Syntax:** `show {rtr_card-addr} ppp`

**Example:** `show 5 ppp`

```

SLOT 5:
PPP Authentication/Security Settings for Router:
  Authentication by Remote:
    Protocol:      CHAP
    Secret:        public
    User ID:       Local Profile Name
  Authentication of Remote:
    Protocol:      CHAP
  Local Security Server:
    Type:          Radius
    IP Address:    168.0.0.100
    Password:      test
PPP Statistics for Slot-4:

```

	Up/Down	Rx	Rx	Tx	Tx
Remote Name	State Time	Packets	Octets	Packets	Octets
RemoteAdit	DOWN 26m36s	0	0	0	0

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.

**show (router) rip**

The **show (router) rip** command displays the current RIP settings for the Router card.

**Syntax:** `show {rtr_card-addr} rip`

**Example:** `show 5 rip`

```

SLOT 5:
RIP Settings for Router:
  RIP Mode Receive:  RIP2
  RIP Mode Send:     Rip2

```

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.

## show (router) snmp

The **show (router) snmp** command displays the current SNMP settings for the specified Router card.

**Syntax:** `show {rtr_card-addr} snmp`

**Example:** `show 5 snmp`

```
> show 5 snmp
SLOT 5:
SNMP Settings for Router:
  SNMP Communities:
    Name      Address      Access
    public    0.0.0.0      Read

  SNMP Trap Destinations:
    Name      Address      Location
    public    0.0.0.0      Local LAN

  Statistics Averaging Interval:  1 min.

  Name:                                unknown
  Contact:                            unknown  Location:                        unknown
```

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.

## show (router) stp

The **show (router) stp** command displays the current Spanning Tree Protocol settings for the specified Router card.

**Syntax:** `show {rtr_card-addr} stp`

**Example:** `show 5 stp`

```
> show 5 stp
SLOT 5:
Spanning Tree Protocol Settings for Router:
  Spanning Tree:      Enabled
  Bridge Hello Time:   2 seconds
  Bridge Max Age:      20 seconds
  Bridge Forward Delay: 15 seconds
  Bridge Priority:      32768
```

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.



**show (router) syslog**

The **show (router) syslog** command displays the current Syslog setup for the Router card.

**Syntax:** `show {rtr_card-addr} syslog`

**Example:** `show 5 syslog`

```
> show 5 syslog
SLOT 5:
Syslog Settings for Router:
  Syslog:           Enabled
  Facility:         20
  Level:            3
  Server IP Address: 192.168.3.3
```

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.

**show (router) uploaduser**

The **show uploaduser** command displays the current list of users allowed to upload and download configuration and code files.

**Syntax:** `show {rtr_card-addr} uploaduser`

**Example:** `show 5 uploaduser`

```
> show 5 uploaduser
SLOT 5:
TFTP Upload/Download User Settings for Router:
  Reboot After Code is Loaded:      Yes
  Reboot After Configuration is Loaded:  Yes

      Upload/Download
      IP Address      Client Site  Code    Config
      Any              Adit1         X        X
Total: 1
```

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.

## show (router) voip

The **show voip** command displays the current settings for all VoIP parameters. This command applies to the CMG Router card only.

**Syntax:** `show {cmg_card-addr} voip`

**Example:** `show 4 voip`

```
> show 4 voip
```

```
SLOT 4:
```

```
VoIP Settings for CMG:
```

```
VoIP Configuration:
```

```

RTP Baseport:           30000
RTCP CNAME:             Default Gateway ID
RTCP Interval (seconds): 5
Jitterbuffer Mode:      Static
Flash Timeout (milliseconds): 1500
Compander:              A-Law
Call Detail Records:     Disabled

```

```
Voice Algorithm SDP Identification and Ptimes:
```

CMG ID	SDP Name	RTP Payload Type	RTP Ptime
g711mu	pcmu	0	20
g711a	pcma	8	20
g726_16	g726-16	96	20
g726_24	g726-24	98	20
g726_32	g726-32	2	20
g726_40	g726-40	99	20
dtmf_relay	telephone-event	97	20

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG card.

**show (router-lan)**

The **show (router-lan)** command displays the settings for the Router card.

**Syntax:** **show {rtr\_lan-addr}**

**Example:** **show 4:1**

```

SLOT 4:
Settings for RTR LAN 1:
  Profile Name:          LocalAdit
  Up/Down:              UP
  Proxy:                Disabled
  Physical link:        Automatic
  MAC Address:          00:E0:97:01:E3:A2

  IP Settings:
    IP Address and Mask: 192.168.3.193      255.255.255.0
    Default Router:     192.168.3.202
    Enabled Frame Types: Ethernet II
    RIP Direction:      Send
    Secondary IP Addresses and Masks: 192.168.1.1      255.255.255.0

  IPX Settings:
    Enabled Frame Types: None
    RIP Direction:      Send
    802.2 Ext. Network: 00000000
    Eth II Ext. Network: 00000000
    SNAP Ext. Network:  00000000
    802.3 Ext. Network: 00000000

  Other Settings:
    Enabled Frame Types: None
LAN Collision Threshold Settings for LocalAdit:
  Sample Interval:      10
  Collision High Threshold: 500
  Collision Low Threshold: 10
LAN Spanning Tree Protocol Settings for LocalAdit:
  Spanning Tree:        Disabled
Static IP Network Settings for LocalAdit:
  Total: 0
Static IPX Network Settings for LocalAdit:
  Total: 0

Static IP Address Settings for LocalAdit:
  Total: 0
Static MAC Address Settings for LocalAdit:
  Total: 0
LAN Filters Enabled for LocalAdit:
  Forward Mode: Forward ALL Frames NOT Matching Filters

  Filter Type    Source/Dest    Filter Name
  Total: 0

LAN MAC Address Filters Defined for LocalAdit:
  Total: 0
LAN Protocol Filters Defined for LocalAdit:
  Total: 0
LAN Custom Filters Enabled Defined for LocalAdit:
  Total: 0

```

Variable	Definition
<b>rtr_lan-addr</b>	Router (IP, CMG or TSR) address is in the form {slot:port} or {slot "profile-name"}. <b>slot</b> - The slot number (1-6) that contains the Router card. <b>port</b> - Port number of the Router. <b>profile-name</b> - Profile name for the Router interface used to reach this destination. Name must be enclosed in quotes, with a maximum of 11 characters.

### **show (router-lan) collision**

The **show (router-lan) collision** command displays the current LAN collision alarm settings for the specified Router card.

**Syntax:** `show {rtr_lan-addr} collision`

**Example:** `show 5 "Adit50" collision`

```
SLOT 5:
LAN Collision Threshold Settings for Adit50:
Sample Interval:          15
Collision High Threshold: 500
Collision Low Threshold:  10
```

Variable	Definition
<b>rtr_lan-addr</b>	Router (IP, CMG or TSR) address is in the form {slot:port} or {slot "profile-name"}. <b>slot</b> - The slot number (1-6) that contains the Router card. <b>port</b> - Port number of the Router. <b>profile-name</b> - Profile name for the Router interface used to reach this destination. Name must be enclosed in quotes, with a maximum of 11 characters.

**show (router-lan) filter**

The **show (router-lan) filter** command displays the current LAN Layer 2 data filters applied to the LAN on the specified Router card.

**Syntax:** `show {rtr_lan-addr} filter [address|all|custom|protocol]`

**Example:** `show 5:1 filter`

```
SLOT 5:
LAN Filters Enabled for Adit50:
  Forward Mode: Forward ALL Frames NOT Matching Filters

  Filter Type   Source/Dest   Filter Name
  Protocol      XNSrule
  Protocol      XNSrule
Total: 2
```

**Example:** `show 5:1 filter all`

```
SLOT 5:
LAN MAC Address Filters Defined for Adit50:
  Total: 0

LAN Protocol Filters Defined for Adit50:

  Protocol Name   Ethernet Value   IEEE Value
  SPANTRE         0                42
  XNSrule         807              0
  XNSrule         807              0
Total: 3

LAN Custom Filters Enabled Defined for Adit50:
Total: 0
```

Variable	Definition
<b>rtr_lan-addr</b>	Router (IP, CMG or TSR) address is in the form {slot:port} or {slot "profile-name"}. <b>slot</b> - The slot number (1-6) that contains the Router card. <b>port</b> - Port number of the Router. <b>profile-name</b> - Profile name for the Router interface used to reach this destination. Name must be enclosed in quotes, with a maximum of 11 characters.
<b>address</b>	Display Address filters only.
<b>custom</b>	Display Custom filters only.
<b>protocol</b>	Display Protocol filters only.
<b>all</b>	Display all the defined filters.

**show (router-lan) firewall**

The **show (router-lan) firewall** command displays the current firewall filter settings for the specified LAN interface.

**Syntax:** `show {rtr_lan-addr} firewall`

**Example:** `show 5:1 firewall`

```
SLOT 5:
WAN Firewall Settings for LocalUnit:

  Service(s)      LAN Device(s)      WAN Device(s)      Log
1.   HTTP        203.1.21.17/32      <== 192.0.0.0/8
2.   ICMP 254-0   203.1.21.17/32      <== 200.0.0.0/24
3.   ICMP Type=1  203.1.21.17/32      <== 200.0.0.0/24
Last ! Any      *                  <== ==> *
```

Variable	Definition
<b>rtr_lan-addr</b>	Router (IP, CMG or TSR) address in the form {slot:port} or {slot "profile-name"}. <b>slot</b> - The slot number (1-6) that contains the Router card. <b>port</b> - Port number of the Router. <b>profile-name</b> - Profile name for the Router interface used to reach this destination. Name must be enclosed in quotes, with a maximum of 11 characters.

---

### ***show (router-lan) static***

The **show (router-lan) static** commands to display the current list of static entries for the LAN on the specified Router card.

***show (router-lan) static ip address***

***show (router-lan) static ip network***

***show (router-lan) static ipx network***

***show (router-lan) static mac address***

### ***show (router-lan) static ip address***

The **show (router-lan) static ip address** command displays the current list of static IP address entries for the LAN on the specified Router card.

**Syntax:** **show {rtr\_lan-addr} static ip address**

**Example:** **show 5:1 static ip address**

SLOT 5:

Static IP Address Settings for Adit50:

<u>Device Name</u>	<u>IP Address</u>
Adit122	120.0.0.10
Total: 1	

Variable	Definition
<b>rtr_lan-addr</b>	Router (IP, CMG or TSR) address is in the form {slot:port} or {slot "profile-name"}. <b>slot</b> - The slot number (1-6) that contains the Router card. <b>port</b> - Port number of the Router. <b>profile-name</b> - Profile name for the Router interface used to reach this destination. Name must be enclosed in quotes, with a maximum of 11 characters.

**show (router-lan) static ip network**

The **show (router-lan) static ip network** command displays the current list of static IP network entries for the LAN on the specified Router card.

**Syntax:** `show {rtr_lan-addr} static ip network`

**Example:** `show 5:1 static ip network`

SLOT 5:

Static IP Network Settings for Adit50:

<u>Network</u>	<u>Subnet Mask</u>	<u>Metric</u>	<u>Next Gateway</u>
100.0.0.0	255.0.0.0	1	192.136.43.52
Total: 1			

Variable	Definition
<b>rtr_lan-addr</b>	Router (IP, CMG or TSR) address is in the form {slot:port} or {slot "profile-name"}. <b>slot</b> - The slot number (1-6) that contains the Router card. <b>port</b> - Port number of the Router. <b>profile-name</b> - Profile name for the Router interface used to reach this destination. Name must be enclosed in quotes, with a maximum of 11 characters.

**show (router-lan) static ipx network**

The **show (router-lan) static ipx network** command displays the current list of static IPX network entries for the LAN on the specified Router card.

**Syntax:** `show {rtr_lan-addr} static ipx network`

**Example:** `show 5:1 static ipx network`

SLOT 5:

Static IPX Network Settings for Adit50:

Total: 0

Variable	Definition
<b>rtr_lan-addr</b>	Router (IP, CMG or TSR) address is in the form {slot:port} or {slot "profile-name"}. <b>slot</b> - The slot number (1-6) that contains the Router card. <b>port</b> - Port number of the Router. <b>profile-name</b> - Profile name for the Router interface used to reach this destination. Name must be enclosed in quotes, with a maximum of 11 characters.



**show (router-lan) static mac address**

The **show (router-lan) static mac address** command displays the current list of static MAC address entries for the LAN on the specified Router card.

**Syntax:** `show {rtr_lan-addr} static mac address`

**Example:** `show 5:1 static mac address`

```
SLOT 5:
Static MAC Address Settings for Adit50:
```

<u>Device Name</u>	<u>MAC Address</u>
Adit 66	00:E0:97:00:E9:CD
Total: 1	

Variable	Definition
<b>rtr_lan-addr</b>	Router (IP, CMG or TSR) address is in the form {slot:port} or {slot "profile-name"}. <b>slot</b> - The slot number (1-6) that contains the Router card. <b>port</b> - Port number of the Router. <b>profile-name</b> - Profile name for the Router interface used to reach this destination. Name must be enclosed in quotes, with a maximum of 11 characters.

**show (router-lan) stp**

The **show (router-lan) stp** command displays the current Spanning Tree Protocol settings for the specified LAN interface.

**Syntax:** `show {rtr_lan-addr} stp`

**Example:** `show 5:1 stp`

```
SLOT 5:
LAN Spanning Tree Protocol Settings for Adit1:
Spanning Tree:                Disabled
```

Variable	Definition
<b>rtr_lan-addr</b>	Router (IP, CMG or TSR) address is in the form {slot:port} or {slot "profile-name"}. <b>slot</b> - The slot number (1-6) that contains the Router card. <b>port</b> - Port number of the Router. <b>profile-name</b> - Profile name for the Router interface used to reach this destination. Name must be enclosed in quotes, with a maximum of 11 characters.

### **show (router-trunk)**

The **show (router-trunk)** command displays current settings for the specified trunk.

**Syntax:** **show {rtr\_trunk-addr}**

**Example:** **show 5:1:1**

The example displays the settings of trunk 1 for the Router card on slot 5.

```
> show 5:1:1
SLOT 5:
Settings for RTR 1 Trunk 1:
    Up/Down:      UP
    Speed:        64k
```

Variable	Definition	
<b>rtr_trunk-addr</b>	The Router (IP, CMG or TSR) trunk address is in the form {slot:port:trunk}.	
	<b>slot</b>	The slot number (1-6) that contains the Router (CMG, IP or CMG) card.
	<b>port</b>	Port number or range.
	<b>trunk</b>	Trunk number for this port, 1-24.

**show (router-voice)**

The show (**router-voice**) command displays the CMG voice line provisioning. This command applies to the CMG Router card only.

**Syntax:** show {cmg\_voice-addr}

**Example:** show 5:1:1:1

```

SLOT 5:
Settings for CMG Voice Channel 1:
  MGCP Endpoint ID:          aaln/1
  Channel Status:            Up
  Echo Cancellation:         Enabled
  Echo Tail (milliseconds):   16
  Receive Gain (dB):         0
  Transmit Gain (dB):        0
  VoIP Algorithm Pref. [ 1] : g711mu
                           [ 2] : g711a
                           [ 3] : g726_16
                           [ 4] : g726_24
                           [ 5] : g726_32
                           [ 6] : g726_40
  Silence Suppression:       Disabled
  Type of Service (TOS) Byte: 0x0
  Relay DTMF Packets:        Disabled
  Implied Slash:             Enabled
  Calling Party Disconnect:   Disabled
  Fax Handling:               None
  Modem Handling:             None
  RFC2833 Signals:           Disable
  RFC2833 Payload Type:      97
  RFC2833 Repeat Count:      2
  RFC2833 Repeat Interval:    5
  RFC2833 Refresh Interval:   4000
  Event Log:                  Disabled

```

Variable	Definition	
<b>cmg_voice-addr</b>	In the form {slot:voip:channel}	
	<b>slot</b>	The slot number (1-6) that contains the CMG card.
	<b>voip</b>	To designate VoIP 1:1 is used.
	<b>channel</b>	Channel number for the router is 1-48, range or all

**show (router-wan)**

The **show (router-wan)** command displays the current configuration for the specified WAN interface.

**Syntax:** `show {rtr_card-addr} {"wan-name"}`

**Example:** `show 5 "LosAngeles"`

```

SLOT 5:
Settings for RTR WAN LosAngeles:
  State:                               Enabled
  IP Settings:
    Mode:                               Route
    WAN Network Updates:               Never
    GRE Tunneling:                     Disabled
  IPX Settings:
    Mode:                               Blocked
  Other Settings:
    Mode:                               Blocked
  NAT Gateway:                         Enabled
    NAT Port Numbers:                  Dynamic
    NAT Address:                       Assigned by Remote
WAN PPP Authentication/Security Settings for LosAngeles:
  Authentication of Remote User:
    User ID:                           Remote Profile Name: LosAngeles
    Security Server:                    Local
  Compression:                         Disabled
    Typical Data:                       Easy to Compress
WAN Trunk Setting for LosAngeles:
  WAN Port Number:                      1
  Connection Type:                      PPP
WAN Spanning Tree Protocol Settings for LosAngeles:
  Spanning Tree:                        Disabled
WAN Static IP Network Settings for LosAngeles:
  Total: 0
WAN Static IPX Network Settings for LosAngeles:

  Network    Hops    Ticks    Next IPX Router
WAN Static IP Address Settings for LosAngeles:
  Total: 0
WAN Static MAC Address Settings for LosAngeles:
  Total: 0

WAN Static NAT Address Settings for LosAngeles:
  Total: 0
WAN Firewall Settings for LosAngeles:

```

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>wan-name</b>	The WAN interface to modify. The name must be enclosed in quotes.

**show (router-wan) firewall**

The **show (router-wan) firewall** command displays the current firewall filter settings for the specified WAN interface.

**Syntax:** `show {rtr_card-addr} {"wan-name"} firewall`

**Example:** `show 5 "LosAngeles" firewall`

```
SLOT 5:
WAN Firewall Settings for LosAngeles:

  Service(s)      LAN Device(s)      WAN Device(s)      Log
1. SMTP          192.0.0.0/8        ==> 192.0.0.0/8      Log
2. Telnet        100.0.0.0/24       ==> 200.0.0.0/24     Alm
Last ! Any      *                  <== ==> *
```

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>wan-name</b>	The WAN interface to modify. The name must be enclosed in quotes.

**show (router-wan) nat bypass**

Use the **show (router-wan) nat bypass** command to see the current list of NAT bypass entries for the WAN interface on the specified Router card.

**Syntax:** `show {rtr_card-addr} {"wan-name"} nat bypass`

**Example:** `show 2 "RemoteUnit" nat bypass`

```
SLOT 2:
WAN NAT Bypass Address Settings for RemoteAdit:

  IP Address      Netmask
156.65.0.0        255.255.255.0
201.23.16.0       255.255.255.0
Total: 2
```

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>wan-name</b>	The WAN interface to modify. The name must be enclosed in quotes.

### **show (router-wan) ppp**

The **show (router-wan) ppp** command displays the current PPP (Point-to-Point Protocol) settings for the specified WAN interface.

**Syntax:** `show {rtr_card-addr} {"wan-name"} ppp`

**Example:** `show 5 "LosAngeles" ppp`

```
> show 5 "LosAngeles" ppp
SLOT 5:
WAN PPP Authentication/Security Settings for LosAngeles:
  Authentication of Remote User:
    User ID:                Remote Profile Name: LosAngeles
    Security Server:        Local

    Compression:            Disabled
    Typical Data:            Easy to Compress
PPP Statistics for Slot-4:

      Up/Down   Rx      Rx      Tx      Tx
Remote Name  State Time   Packets  Octets  Packets  Octets
RemoteAdit   DOWN  26m36s    0         0         0         0
```

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>wan-name</b>	The WAN interface to modify. The name must be enclosed in quotes.

---

**show (router-wan) static****show (router-wan) static ip address****show (router-wan) static ip network****show (router-wan) static ipx network****show (router-wan) static mac address****show (router-wan) static nat address****show (router-wan) static ip address**

The **show (router-wan) static ip address** command displays the current list of static IP address entries for the specified WAN interface.

**Syntax:** `show {rtr_card-addr} {"wan-name"} static ip address`

**Example:** `show 5 "LosAngeles" static ip address`

```
> show 5 "LosAngeles" static ip address
SLOT 5:
WAN Static IP Address Settings for LosAngeles:
Total: 0
```

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>wan-name</b>	The WAN interface to modify. The name must be enclosed in quotes.

### **show (router-wan) static ip network**

The **show (router-wan) static ip network** command displays the current list of static IP network entries for the specified WAN interface.

**Syntax:** `show {rtr_card-addr} {"wan-name"} static ip network`

**Example:** `show 5 "LosAngeles" static ip network`

```
> show 5 "LosAngeles" static ip network
SLOT 5:
WAN Static IP Network Settings for LosAngeles:
```

<u>Network</u>	<u>Subnet Mask</u>	<u>Metric</u>	<u>Remote Tunnel Addr</u>
200.1.1.0	255.255.255.0	1	
Total: 1			

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>wan-name</b>	The WAN interface to modify. The name must be enclosed in quotes.

### **show (router-wan) static ipx network**

The **show (router-wan) static ipx network** command displays the current list of static IPX network entries for the specified WAN interface.

**Syntax:** `show {rtr_card-addr} {"wan-name"} static ipx network`

**Example:** `show 5 "LosAngeles" static ipx network`

```
SLOT 5:
WAN Static IPX Network Settings for LosAngeles:
```

<u>Network</u>	<u>Hops</u>	<u>Ticks</u>	<u>Next IPX Router</u>
00000011	2	4	00:00:00:00:00:00
Total: 1			

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>wan-name</b>	The WAN interface to modify. The name must be enclosed in quotes.



**show (router-wan) static mac address**

The **show (router-wan) static mac address** command displays the current list of static IP MAC address entries for the specified WAN interface.

**Syntax:** `show {rtr_card-addr} {"wan-name"} static mac address`

**Example:** `show 5 "LosAngeles" static mac address`

SLOT 5:

WAN Static MAC Address Settings for LosAngeles:

Device Name	MAC Address
Adit32	00:E0:97:00:E9:CD
Total: 1	

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>wan-name</b>	The WAN interface to modify. The name must be enclosed in quotes.

**show (router-wan) static nat address**

The **show (router-wan) static nat address** command displays the current static NAT address entries for the specified WAN interface.

**Syntax:** `show {rtr_card-addr} {"wan-name"} static nat address`

**Example:** `show 5 "LosAngeles" static nat address`

> `show 5 "RemoteUnit" static nat address`

SLOT 5:

WAN Static NAT Address Settings for RemoteUnit:

Total: 0

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>wan-name</b>	The WAN interface to modify. The name must be enclosed in quotes.

**show (router-wan) stp**

The **show (router-wan) stp** command displays the current Spanning Tree Protocol settings for the specified WAN interface.

**Syntax:** `show {rtr_card-addr} {"wan-name"} stp`

**Example:** `show 5 "LosAngeles" stp`

```
> show 5 "LosAngeles" stp
SLOT 5:
WAN Spanning Tree Protocol Settings for LosAngeles:
  Spanning Tree:           Enabled
  Port Cost:                651    seconds
  Port Priority:            128    seconds
```

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>wan-name</b>	The WAN interface to modify. The name must be enclosed in quotes.

**show (router-wan) trunk**

The **show (router-wan) trunk** command displays the current trunk assignment for the specified WAN interface.

**Syntax:** `show {rtr_card-addr} {"wan-name"} trunk`

**Example:** `show 5 "LosAngeles" trunk`

```
> show 5 "LosAngeles" trunk
SLOT 5:
WAN Trunk Setting for LosAngeles:
  WAN Port Number:         1
  Connection Type:         PPP
```

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>wan-name</b>	The WAN interface to modify. The name must be enclosed in quotes.

**show routes**

Use the **show routes** command to display routing information for the controller or for router cards (IP, CMG or TSR) whose network information has been propagated to the controller. **Note:** The propagation of router network information to the controller must be enabled for each router card. See the **set (router) network info** command on page 5-151.

**Syntax:** **show routes [cardslots]**

**Example:** **show routes**

```
ROUTE NET TABLE
destination      gateway      flags  Refcnt  Use      Interface
-----
10.0.0.0/24      10.0.0.2      101    0        0        cpm0
-----

ROUTE HOST TABLE
destination      gateway      flags  Refcnt  Use      Interface
-----
127.0.0.1        127.0.0.1      5      4       21638    lo0
-----
```

**Example:** **show routes cardslots**

SLOTS: 1,2,3,4,5,6 Enabled.

ROUTES:

#	Slot	Ifname	IP/Network	Gateway	Metric	Type/Proto
1	1	RTR_LAN	30.0.0.0/8	192.168.1.2	3	indirect/other
2	1	RTR_LAN	77.0.0.0/8	192.168.1.2	1	indirect/rip
3	1	RTR_LAN	99.0.0.0/8	192.168.1.2	1	indirect/rip
4	1	RTR_LAN	192.168.1.0/24	192.168.1.1	1	direct/local
5	1	rtr1	20.0.0.1/32		0	indirect/other
6	2	qtsr2	192.168.2.1/32	192.168.2.1	1	direct/local
7	3	qtsr3	192.168.3.1/32	192.168.3.1	1	direct/local
8	4	qtsr4	192.168.4.1/32	192.168.4.1	1	direct/local
9	5	qtsr5	192.168.5.1/32	192.168.5.1	1	direct/local
10	6	Qtsr6	192.168.6.1/32	192.168.6.1	1	direct/local

IP-ADDRS:

#	Slot	Ifname	IP/Network
1	1	RTR_LAN	192.168.1.1/24
2	2	qtsr2	192.168.2.1/24
3	3	qtsr3	192.168.3.1/24
4	4	qtsr4	192.168.4.1/24
5	5	qtsr5	192.168.5.1/24
6	6	Qtsr6	192.168.6.1/24

Variable	Definition
<b>cardslots</b>	Display network information for all router cards. <b>Note:</b> Information is displayed only for those router cards that have been enabled via the <b>set (router) network info</b> command.

### **show (rs232)**

Use the **show (rs232)** command to display current settings for an RS-232 card.

**Syntax:** **show {rs232-addr}**

**Example:** **show 2:1**

```
SLOT 2:
Settings for RS232 Port 1:
    CTS:                Always High
    RTS:                Always High
    DCD:                Follow Software Control
    Baud Rate:          64000 bps
    Loopback:           None
```

Variable	Definition
<b>rs232-addr</b>	In the form of {slot slot:port}. <b>slot</b> - slot (1-6) location of an RS-232 card. <b>port</b> - Port number or range.

**show screen**

The **show screen** command displays the screen settings.

**Example:** **show screen**

```
>show screen
Screen Height = 23
```

**show ssh**

Use the **show ssh** command to view the SSH overall status.

---

**NOTE:** SSH (Secure Shell) is a keyed feature. Keys must be purchased from Force10 Networks. The Controller must be running release 9.7 or higher to support SSH.

---

**Example:** **show ssh**

```
SSH is SSH-1.99-OpenSSH_3.5p1.
SSH1 is usable.
SSH RSA1 Private Host Key is Set.
SSH RSA1 Public Host Key is Set.
SSH RSA1 Public User Key is None.
SSH RSA Private Host Key is None.
SSH RSA Public Host Key is None.
SSH RSA Public User Key is None.
SSH DSA Private Host Key is Default.
SSH DSA Public Host Key is Default.
SSH DSA Public User Key is None.
SSH LogLevel is 0.
SSH Max Login Attempts is 3.
SSH1 is Enabled.
SSH2 is Disabled.
Telnet is Enabled.
```

## **show snmp**

**show snmp**  
**show snmp engineid**  
**show snmp group**  
**show snmp groups**  
**show snmp users**  
**show snmp view**  
**show snmp views**

## **show snmp**

The **show snmp** command displays the SNMP settings.

**Example:** **show snmp**

```
SNMP Settings:
  System Name:
  System Location:
  System Contact:
  GET Community:      public
  SET Community:      public
  TRAP Community:     public
  Authentication TRAP disabled
  Event TRAP          all
  Version:            all
  NMS 1:              10.70.7.51:162 user:user1

SNMP Version 3 Statistics:
  Unsupport security level: 0
  Unknown EngineID:        0
  Unknown user name:       0
  Unauthenticated:         0
```

---

**NOTE:** The SNMP Version 3 Statistics are displayed only on systems supporting SNMPv3. SNMPv3 is a keyed feature. Keys must be purchased from Force10 Networks. The Controller must be running release 9.8 or higher to support SNMPv3.

---

**show snmp engineid**

Use the **show snmp engineid** command to view the ID for the local SNMPv3 engine.

**NOTE:** SNMPv3 is a keyed feature. Keys must be purchased from Force10 Networks. The Controller must be running release 9.8 or higher to support SNMPv3.

**Syntax:** `show snmp engineid`

**Example:** `show snmp engineid`

```
SNMP engineID: 8020000000002558
```

**show snmp group**

Use the **show snmp group** command to display the attributes of an individual SNMPv3 group.

**NOTE:** SNMPv3 is a keyed feature. Keys must be purchased from Force10 Networks. The Controller must be running release 9.8 or higher to support SNMPv3.

**Syntax:** `show snmp group {"group-name"}`

**Example:** `show snmp group "group1"`

```
SNMP Access Group: group1
      Name      Object ID
-----
Notify-view  Ntfy-view1  1.3.6.1.2.1.10.33
Read-view    Read-view1   1.3.6.1.2.1.3
Write-view   Not defined
```

Variable	Definition
<b>group-name</b>	An existing SNMPv3 group name (added to the system with the <b>add snmp group</b> command). Must be enclosed in quotes.

### **show snmp groups**

Use the **show snmp groups** command to display the attributes of all SNMPv3 groups.

---

**NOTE:** SNMPv3 is a keyed feature. Keys must be purchased from Force10 Networks. The Controller must be running release 9.8 or higher to support SNMPv3.

---

**Syntax:** **show snmp groups**

**Example:** **show snmp groups**

Name	Notify-View	Read-View	Write-View
-----	-----	-----	-----
group1	Ntfy-view1	Read-view1	NONE
group2	Ntfy-view2	Read-view2	Wrt-view2
group3	Ntfy-view3	NONE	NONE

### **show snmp users**

Use the **show snmp users** command to display the SNMPv3 settings for all users.

---

**NOTE:** SNMPv3 is a keyed feature. Keys must be purchased from Force10 Networks. The Controller must be running release 9.8 or higher to support SNMPv3.

---

**Syntax:** **show snmp users**

**Example:** **show snmp users**

User	Level	Group	Auth	Priv
----	-----	-----	----	----
user1	Manager	group1	MD5	DES
user2	Manager	group2	MD5	DES
user3	Operator	Not defined	NONE	NONE



**show snmp view**

Use the **show snmp view** command to display the attributes of an individual SNMPv3 MIB view.

**NOTE:** SNMPv3 is a keyed feature. Keys must be purchased from Force10 Networks. The Controller must be running release 9.8 or higher to support SNMPv3.

**Syntax:** `show snmp view {"view-name"}`

**Example:** `show snmp view "view1"`

Name	Index	Object ID
view1	0	1.3.6.1.2
view1	1	1.3.6.1.3
view1	2	1.3.6.1.4
view1	3	1.3.6.1.5
view1	4	1.3.6.1.6

Variable	Definition
<b>view-name</b>	An existing SNMPv3 view name (added to the system with the <b>add snmp view</b> command). Must be enclosed in quotes.

**show snmp views**

Use the **show snmp views** command to display the attributes of all SNMPv3 MIB views.

**NOTE:** SNMPv3 is a keyed feature. Keys must be purchased from Force10 Networks. The Controller must be running release 9.8 or higher to support SNMPv3.

**Syntax:** `show snmp views`

**Example:** `show snmp views`

Name	Object ID
view1	1.3.6.1.2
view1	1.3.6.1.3
view1	1.3.6.1.4
view1	1.3.6.1.5
view1	1.3.6.1.6
view2	1.3.6.1.2.1.10
view3	1.3.6.1.2.1.10.33

## show syslog

The **show syslog** command displays the configuration settings for the Controller Syslog client.

**Syntax:** **show syslog**

**Example:** **show syslog**

```
Syslog Settings:
Syslog: Disabled
```

Server	IP Address	Facility	Threshold Level
1	0.0.0.0	16	3
2	0.0.0.0	16	3
3	0.0.0.0	16	3

## show test (fxs8D/fxs8C/fxs8B)

Use the **show test (fxs8D/fxs8C/fxs8B)** command to display the test results previously performed on channels of the FXS 8D, FXS 8C, or FXS 8B Service Card. To perform this test, see *test (fxs8D/fxs8C/fxs8B)* on page 5-346.

**Syntax:** **show test {fxs-addr}**

**Example:** **show test 1:1**

FXS/8D Test Results for line 1:

Results as of 00:31:24 01/01/2008

Line test shows OK.

Variable	Definition
<b>fxs-addr</b>	Channels to apply command to, in the form {slot:port}. <b>slot</b> - Slot number 1 - 6, location of the FXS card. <b>channel</b> - Channel number 1-8, or <b>all</b> will display all tests on the card.

## show time

The **show time** command displays the system time, in 24 hour hh:mm:ss format.

**Example:** **show time**

```
time: 00:22:51
```

**show users**

The **show users** command displays a list of all users and their settings, and if they are logged on at the time (0=not logged on, 1=logged on).

**Syntax:** **show users**

**Example:** **> show users**

```

      User          Level      Last Login          Logged In
      ----          -
* jack            1          00:00:13 01/01/1999          1

* indicates self

```

**show (v35)**

Use the **show (v35)** to display current settings for V.35 card.

**Syntax:** **show {v35-addr}**

**Example:** **show 2:1**

```

SLOT 2:
Settings for V35 Port 1:
  CTS:                Always High
  Timing:              Source
  Rx Clock Inversion:  Normal
  Tx Clock Inversion:  Normal
  Data Inversion:      Normal
  Data Speed:          64K
  Data Rate:
  Loopback:            None

```

Variable	Definition
<b>v35-addr</b>	In the form of {slot slot:port}. <b>slot</b> - slot (1-6) location of a V.35 card. <b>port</b> - Port number or range.

**show (v54)**

Use the **show (v54)** to display current settings for V.54 card.

**Syntax:** **show {v54-addr}**

**Example:** **show 3:1**

```
SLOT 3:
Settings for V35 Port 1:
  CTS:                Always High
  Timing:             Source
  Rx Clock Inversion: Normal
  Tx Clock Inversion: Normal
  Data Inversion:     Normal
  Data Speed:         64K
  Data Rate:
  V.54 Rx LB:         disabled
  V.54 Rx Addr:       0
  V.54 Test Addr:     0
  V.54 Tx Prep count: 15
  V.54 Rx Prep count: 15
  V.54 Test Pattern:  QRSS
  V.54 Ignore ACK:    OFF
  Loopback:           None
```

Variable	Definition
<b>v54-addr</b>	In the form of {slot slot:port}. <b>slot</b> - slot (1-6) location of a V.35/54 card. <b>port</b> - Port number or range.

---

## ssh ip

---

**NOTE:** SSH (Secure Shell) is a keyed feature. Keys must be purchased from Force10 Networks. The Controller must be running release 10.1 to support this command.

---

Use the **ssh ip** command to establish an SSH session with an SSH-capable IPv4 host that is reachable via any of the routes in the Controller's routing table. The Controller's SSH client negotiates with the host's SSH server and performs username and password authentication.

The escape sequence for the session is **Ctrl + ]** (Control key plus right-bracket key).

**Note:** Only one SSH client session is permitted per logged-in user at a time. (User can be logged into the Controller via Telnet or SSH.)

**Syntax:** `ssh ip {ip-addr}`

**Example:** `ssh ip 192.168.1.1`

Variable	Definition
ip-addr	IP address in the form xxx.xxx.xxx.xxx, where xxx is a number from 0 to 255.

## **status**

---

Use the **status** command to see the status of the system clocks, DS0s, DS1s, equipment, and the DS0 Management Channel.

<b>status (4-wire e&amp;m)</b>	<b>status (p-phone)</b>
<b>status (adpcm)</b>	<b>status (router)</b>
<b>status (adpcm) performance</b>	<b>status (router) alarms</b>
<b>status (adpcm) performance history</b>	<b>status (router) channels</b>
<b>status (bri)</b>	<b>status (router) dhcp client lease</b>
<b>status clock</b>	<b>status (router) dns</b>
<b>status (ds0)</b>	<b>status (router) events</b>
<b>status (ds1)</b>	<b>status (router) ip address table</b>
<b>status (ds1) performance</b>	<b>status (router) ip network table</b>
<b>status (ds1) performance history</b>	<b>status (router) ipx network table</b>
<b>status (e1)</b>	<b>status (router) ipx server table</b>
<b>status (e1) performance</b>	<b>status (router) log</b>
<b>status (e1) performance history</b>	<b>status (router) mac address table</b>
<b>status equipment</b>	<b>status (router) mgcp</b>
<b>status (fxo)</b>	<b>status (router) performance</b>
<b>status (fxs)</b>	<b>status (router) stp</b>
<b>status (fxs8D/fxs8C/fxs8B/fxs8A/fxs5G)</b>	<b>status (router-lan)</b>
<b>status (fxsINTL)</b>	<b>status (router-trunk)</b>
<b>status (fxsPS)</b>	<b>status (router-voice)</b>
<b>status ipds0</b>	<b>status (rs232)</b>
<b>status (ocudp)</b>	<b>status sessions</b>
<b>status (ocudp) performance</b>	<b>status (v35)</b>
<b>status (ocudp) performance history</b>	<b>status (v54)</b>

**status (4-wire e&m)**

The **status (4we&m)** command displays the settings for 4-Wire E&M card.

**Syntax:** **status {4we&m-addr}**

**Example:** **status 4**

```
> status 4
```

```

4W-E&M      Rx AB  Tx AB  Signal TP
4:1
4:2
4:3
4:4

```

Variable	Definition
<b>4we&amp;m-addr</b>	In the form of {slot} or {slot:port}. Note if only the slot is listed all ports will be displayed. <b>slot</b> - Slot (1-6) where the 4-Wire E&M card is located. <b>port</b> - Port number, range or “all”.

**status (adpcm)**

Use the **status (adpcm)** command to display the status information for the ADPCM card.

**Syntax:** **status {adpcm-addr}**

**Example:** **status 6:1**

```

> status 6:1
SLOT 6:
Status for DS1 1:
    Receive:                Loss of Signal
    Transmit:               RAI/Yellow Alarm
    Loopback:               OFF

```

Variable	Definition
<b>adpcm-addr</b>	The ADPCM address is in the form {slot slot:port}. Where {slot} displays information for all ports on the card, {slot:port} for only the defined port. <b>slot</b> - Slot number (1-6) where the ADPCM card is located <b>port</b> - Port number, range 1-4. If no port is entered all ports will be displayed.

**status (adpcm) performance**

Use the **status (adpcm) performance** command to display the performance statistics for the current (15 min) and previous (15 min, hour and day) intervals for the ADPCM card.

**Syntax:** **status {adpcm-addr} performance**

**Example:** **status 6:1 performance**

```
> status 5:1 performance
```

```
SLOT 5:
```

```
Performance Statistics for DS1 1:
```

	current 15 min.	previous 15 min.	1 hour	1 day
unavailable seconds:	127	900	3600	3600
severely errored seconds:	0	0	0	0
errored seconds:	0	0	0	0
sev. errored frame seconds:	0	0	0	0
line errored seconds:	0	0	0	0
controlled slip seconds:	0	0	0	0
bursty errored seconds:	0	0	0	0
degraded minutes:	0	0	0	0
total linecode violations:	0	0	0	0
total pathcode violations:	0	0	0	0

```
elapsed time in current 15 min. interval: 2:07
```

```
valid 15 min. intervals in hour: 4
```

```
valid 15 min. intervals in Day: 4
```

```
* - indicates threshold has been crossed.
```

Variable	Definition
<b>adpcm-addr</b>	The ADPCM address is in the form {slot:port}. <b>slot</b> - Slot number (1-6) where the ADPCM card is located <b>port</b> - Port number, range or all.



**status (adpcm) performance history**

Use the **status (adpcm) performance history** command to display performance statistics for the current 15 minute interval and all previous 15 minute intervals (up to a total of 96) for the ADPCM card.

**Syntax:** status {adpcm-addr} performance history

**Example:** status 6:1 performance history

```
> status 6:1 performance history
SLOT 6:
Performance Statistics for DS1 1:

      curr. interval:  UAS  SES  ES  SEFS  LES  CSS  BES  DM    LCV    PCV
prev. intvl  1:  900    0    0    0    0    0    0    0      0      0
prev. intvl  2:  900    0    0    0    0    0    0    0      0      0
prev. intvl  3:  900    0    0    0    0    0    0    0      0      0
prev. intvl  4:  900    0    0    0    0    0    0    0      0      0
.
.
.
prev. intvl 93:  900    0    0    0    0    0    0    0      0      0
prev. intvl 94:  900    0    0    0    0    0    0    0      0      0
prev. intvl 95:  900    0    0    0    0    0    0    0      0      0
prev. intvl 96:  900    0    0    0    0    0    0    0      0      0
totals:         21181    0    0    0    0    0    0    0      0      0

elapsed time in current 15 min. interval:  5:17
valid 15 min. intervals in data:           96
```

Variable	Definition
<b>adpcm-addr</b>	The ADPCM address is in the form {slot:port}. <b>slot</b> - Slot number (1-6) where the ADPCM card is located <b>port</b> - Port number, range or all.

**status (bri)**

Use the **status (bri)** to display the status/performance statistics for the specified BRI.

**Syntax:** **status {bri-addr} [performance] [history]**

**Example:** **status 3:1**

The example displays status of port 1 (BRI) on slot 3.

```
> status 3:1
SLOT 3:
Status for BRI Port 1:
  Loopback:                NONE
  Corrupt CRC:              NONE
```

**Example:** **status 3:1 performance**

```
SLOT 3:
Performance Statistics for BRI Port 1:

                                current  previous  current  previous
                                1 hour   1 hour   day      day
errored seconds:                0        0        0        0
severely errored seconds:       0        0        0        0
block errors:                   0        0

elapsed time in current 1-hour interval: 00:38:00
completed 1-hour intervals in data:      0
```

**Example:** **status 3:1 performance history**

```
SLOT 3:
Performance Statistics for BRI Port 1:

                                HES      HSES      BE      DES      DSES
current interval              0        0        0        0        0
totals:                       0        0        0        0        0
elapsed time in current 1-hour interval: 00:41:48
completed 1-hour intervals in data:      0
```

Variable	Definition
<b>bri-addr</b>	The BRI address in the form of {slot port}. <b>slot</b> - The slot number (1-6) that contains the BRI card <b>port</b> - Port number, range or "all"
<b>performance</b>	Displays the current performance statistics for specified BRI.
<b>history</b>	Displays historical performance statistics for specified BRI.

**status clock**

Use the **status clock** command to display the current status of both the selected primary and secondary clocks.

**Syntax:** **status clock**

**Example:** **status clock**

```
Active Clock Source: Secondary

Primary:
  Clock Source:      Slot A DS1 1
  Clock Status:      Out of Service
Secondary:
  Clock Source:      Internal
  Clock Status:      In Service
```

**status (ds0)**

Use the **status (ds0)** command to display the current status of the specified DS0.

**Syntax:** **status {ds0-addr}**

**Example:** **status a:1:1**

Displays the current status of the DS0s on port 1 on slot A (controller card), port 1, channel 1.

```
> status a:1:1
```

DS0	Rx AB	Tx AB	Signal	T1	TP
---	-----	-----	-----	-----	--
A:1:1	11	01	EMW	Traffic	N

**Display Descriptions**

**Rx AB** - AB bits received by the FXS or FXO port

**Tx AB** - AB bits transmitted by the FXS or FXO port

**Signal** - Signaling mode for which the port is configured

**T1** - T1 Status

**TP** - Trunk Processing

Variable	Definition
<b>ds0-addr</b>	In the form of {slot port:channel}. <b>slot</b> - A for the controller card, or 1 - 6 for service cards. <b>port</b> - Port number or range. <b>channel</b> - Channel number or range, for T1 ports.

**status (ds1)**

Use the **status (ds1)** command to display the current status of the specified DS1.

**Syntax:** **status {ds1-addr}**

**Example:** **status a:1**

```
SLOT A:
Status for DS1 1:
  Receive:           Traffic
  Transmit:          Traffic
  Loopback:          OFF
```

Variable	Definition
<b>ds1-addr</b>	In the form of {slot port}. <b>slot</b> - A for the controller card, or 1 - 6 for service cards. <b>port</b> - Port number or range.

**status (ds1) performance**

Use the **status (ds1) performance** command to display the performance statistics for the current (15 min) and previous (15 min, hour, and day) intervals for the specified DS1.

**Syntax:** **status {ds1-addr} performance**

**Example:** **status a:1 performance**

SLOT A:

Performance Statistics for DS1 1:

	current 15 min.	previous 15 min.	1 hour	1 day
unavailable seconds:	820	900	1800	1800
severely errored seconds:	0	0	0	0
errored seconds:	0	0	0	0
sev. errored frame seconds:	0	0	0	0
line errored seconds:	0	0	0	0
controlled slip seconds:	0	0	0	0
bursty errored seconds:	0	0	0	0
degraded minutes:	0	0	0	0
total linecode violations:	0	0	0	0
total pathcode violations:	0	0	0	0
elapsed time in current 15 min. interval: 13:40				
valid 15 min. intervals in hour:	2			
valid 15 min. intervals in Day:	2			
* - indicates threshold has been crossed.				

Variable	Definition
<b>ds1-addr</b>	In the form of {slot port}. <b>slot</b> - A for the controller card, or 1 - 6 for service cards. <b>port</b> - Port number or range.

**status (ds1) performance history**

Use the **status (ds1) performance history** command to display performance statistics for the current 15 minute interval and all previous 15 minute intervals (up to a total of 96) for the specified DS1.

**Syntax:** status {ds1-addr} performance history

**Example:** status a:1 performance history

SLOT A:

Performance Statistics for DS1 1:

	UAS	SES	ES	SEFS	LES	CSS	BES	DM	LCV	PCV
curr. interval:	182	0	0	0	0	0	0	0	0	0
prev. intvl 1:	900	0	0	0	0	0	0	0	0	0
prev. intvl 2:	900	0	0	0	0	0	0	0	0	0
prev. intvl 3:	900	0	0	0	0	0	0	0	0	0
prev. intvl 4:	900	0	0	0	0	0	0	0	0	0
prev. intvl 5:	900	0	0	0	0	0	0	0	0	0
prev. intvl 6:	900	0	0	0	0	0	0	0	0	0
prev. intvl 7:	900	0	0	0	0	0	0	0	0	0
prev. intvl 8:	900	0	0	0	0	0	0	0	0	0
prev. intvl 9:	900	0	0	0	0	0	0	0	0	0
prev. intvl 10:	900	0	0	0	0	0	0	0	0	0
.										
.										
.										
prev. intvl 96:	900	0	0	0	0	0	0	0	0	0
	====	====	====	====	====	====	====	====	=====	=====
totals:	86582	0	0	0	0	0	0	0	0	0

elapsed time in current 15 min. interval: 3:02

valid 15 min. intervals in data: 96

Variable	Definition
ds1-addr	In the form of {slot port}. <b>slot</b> - A for the controller card, or 1 - 6 for service cards. <b>port</b> - Port number or range.

---

**status (e1)**

---

**NOTE:** E1 is not supported in this release of the Adit 600 Controller. It will be supported in a future release.

---

Use the **status (e1)** command to display the current status of the specified E1.

**Syntax:** **status {e1-addr}**

**Example:** **status 6:1**

```
> status 6:1
SLOT 6:
Status for E1 1:
  Receive:          Loss of Signal
  Transmit:         RAI/Yellow Alarm
  Loopback:         OFF
```

Variable	Definition
<b>e1-addr</b>	In the form of {slot port}. <b>slot</b> - A for the controller card, or 1 - 6 for service cards. <b>port</b> - Port number or range.

**status (e1) performance**

**NOTE:** E1 is not supported in this release of the Adit 600 Controller. It will be supported in a future release.

Use the **status (e1) performance** command to display the performance statistics for the current (15 min) and previous (15 min, hour, and day) intervals for the specified E1.

**Syntax:** **status {e1-addr} performance**

**Example:** **status a:1 performance**

SLOT A:

Performance Statistics for E1 1:

	current 15 min.	previous 15 min.	1 hour	1 day
unavailable seconds:	820	900	1800	1800
severely errored seconds:	0	0	0	0
errored seconds:	0	0	0	0
sev. errored frame seconds:	0	0	0	0
line errored seconds:	0	0	0	0
controlled slip seconds:	0	0	0	0
bursty errored seconds:	0	0	0	0
degraded minutes:	0	0	0	0
total linecode violations:	0	0	0	0
total pathcode violations:	0	0	0	0

elapsed time in current 15 min. interval: 13:40

valid 15 min. intervals in hour: 2

valid 15 min. intervals in Day: 2

\* - indicates threshold has been crossed.

Variable	Definition
<b>e1-addr</b>	In the form of {slot port}. <b>slot</b> - A for the controller card, or 1 - 6 for service cards. <b>port</b> - Port number or range.



**status (e1) performance history**

**NOTE:** E1 is not supported in this release of the Adit 600 Controller. It will be supported in a future release.

Use the **status (e1) performance history** command to display performance statistics for the current 15 minute interval and all previous 15 minute intervals (up to a total of 96) for the specified E1.

**Syntax:** **status {e1-addr} performance history**

**Example:** **status a:1 performance history**

SLOT A:

Performance Statistics for E1 1:

	UAS	SES	ES	SEFS	LES	CSS	BES	DM	LCV	PCV
curr. interval:	182	0	0	0	0	0	0	0	0	0
prev. intvl 1:	900	0	0	0	0	0	0	0	0	0
prev. intvl 2:	900	0	0	0	0	0	0	0	0	0
prev. intvl 3:	900	0	0	0	0	0	0	0	0	0
prev. intvl 4:	900	0	0	0	0	0	0	0	0	0
prev. intvl 5:	900	0	0	0	0	0	0	0	0	0
prev. intvl 6:	900	0	0	0	0	0	0	0	0	0
prev. intvl 7:	900	0	0	0	0	0	0	0	0	0
prev. intvl 8:	900	0	0	0	0	0	0	0	0	0
prev. intvl 9:	900	0	0	0	0	0	0	0	0	0
prev. intvl 10:	900	0	0	0	0	0	0	0	0	0
.										
.										
.										
prev. intvl 96:	900	0	0	0	0	0	0	0	0	0
	====	====	====	====	====	====	====	====	=====	=====
totals:	86582	0	0	0	0	0	0	0	0	0

elapsed time in current 15 min. interval: 3:02

valid 15 min. intervals in data: 96

Variable	Definition
<b>e1-addr</b>	In the form of {slot port}. <b>slot</b> - A for the controller card, or 1 - 6 for service cards. <b>port</b> - Port number or range.

**status equipment**

Use the **status equipment** command to display current equipment information of the Adit 600.

**Syntax:** **status equipment** [slot]

**Example:** **status equipment**

```

BootCode Version: 2.00
      CardType  Status      SW Vers  CLEI
SLOT A    T1x2    Present      9.0    SIC3DH0CAA
SLOT 1    FX0x8    Present      1.12   SIIXPV0DAA
SLOT 2    FXSx8    Present      1.09   SIC3GJ0CAA
SLOT 3    FX0x8    Present      1.12   SIIXPV0DAA
SLOT 4    RTRx1    Present      1.80   SIIASS0BAA
SLOT 5    T1x4     Present      1.73   SIIXFWBDAA
SLOT 6    V35x2    Present      2.01   SIC3HK0CAA

```

**Example:** **status equipment a**

```

SLOT A
CardType:      T1x2           Adit 600 Controller
Status:        Present
BootCode Version: 2.00
SW Revision:    9.0.0
CLEI:          SIC3DH0CAA
LOCAL:         OFF
Switch Settings:
  Alarms Contacts Enabled
  FOR DS1 #1
    B8ZS Linecode
    Loopback Off
    ESF framing with Loop Start or Ground Start signaling
  FOR DS1 #2
    B8ZS Linecode
    Loopback Off
    ESF framing with Loop Start or Ground Start signaling

```

**Example:** **status equipment 4**

```

SLOT 4
CardType:      RTRx1
Status:        Present
SW Revision:    1.80K
BootCode Version: 2.22
FPGA Revision:  1.08
CLEI:          SIIASS0BAA
LOCAL:         OFF

```

Variable	Definition
<b>slot</b>	If a slot number is not entered, the status of the all slots will be displayed. A for the controller card, or 1 - 6 for service cards.

**status (fxo)**

Use the **status (fxo)** to display the current near-end line status of the specified FXO.

**Syntax:** **status {fxo-addr}**

**Example:** **status 5:2**

The example displays status of port 2 (FXO) on slot 5.

```
> status 5:2
```

```

FXO      Rx AB  Tx AB  Signal=>T1 sig  T1                                TP
---      -
5:2      01     10     GS=>GS                Traffic                N

```

See *Display Descriptions on page 5-309* for definitions of column headings.

Variable	Definition
<b>fxo-addr</b>	The {slot:port} address of the FXO card to display. <b>slot</b> - The slot number (1-6) that contains the FXO card <b>port</b> - Port number or range.

**status (fxs)**

Use the **status (fxs)** to display the current near-end line status of the specified FXS.

**Syntax:** **status {fxs-addr}**

**Example:** **status 4:2**

The example displays status of port 2 (FXS) on slot 4.

```
> status 4:2
```

```

FXS      Rx AB  Tx AB  Signal=>T1 sig  T1                                TP
---      -
4:2      01     00     LS=>LS                Traffic                N

```

See *Display Descriptions on page 5-309* for definitions of column headings.

Variable	Definition
<b>fxs-addr</b>	The {slot:port} address of the FXS card to display. <b>slot</b> - The slot number (1-6) that contains the FXS card <b>port</b> - Port number or range.

**status (fxs8D/fxs8C/fxs8B/fxs8A/fxs5G)**

Use the **status (fxs8D/fxs8C/fxs8B/fxs8A/fxs5G)** to display the current near-end line status of the specified FXS 8D, FXS 8C, FXS 8B, FXS 8A, or FXS 5G card.

**Syntax:** **status {fxs-addr}**

**Example:** **status 4:1**

The example displays status of port 1 (FXS 8D) on slot 4.

FXS	Rx AB	Tx AB	Signal=>T1 Sig	T1	TP
---	----	----	-----	-----	--
4:1	01	01	LS => LS	Traffic	N

Variable	Definition
fxs-addr	List of voice channels to apply setting to, in the form {slot:port}. <b>slot</b> - Slot number 1 - 6, location of the FXS card. <b>port</b> - Port number or range.

**Display Descriptions**

- DS0** - Identifies location of DS0
- Rx AB** - AB bits received by the FXS or FXO port (real-time)
- Tx AB** - AB bits transmitted by the FXS or FXO port (real-time)
- Signal** - Signaling mode for which the FXS or FXO port is configured
- |             |   |
|-------------|---|
| <b>gs</b>   | Set to Ground Start signaling                           |
| <b>gsrb</b> | Set to Ground Start signaling with reverse battery      |
| <b>gsw</b>  | Set to Ground Start Wink signaling                      |
| <b>gswb</b> | Set to Ground Start Wink signaling with reverse battery |
| <b>ls</b>   | Set to Loop Start signaling                             |
| <b>lsrb</b> | Set to Loop Start signaling with reverse battery        |
- T1** - Status of the T1 (Traffic, Loss of Signal, Loss of Framing, Loopback)
- TP** - Trunk Processing (Y = yes, N = no)

**status (fxsINTL)**

**NOTE:** E1 is not supported in this release of the Adit 600 Controller. It will be supported in a future release.

Use the **status (fxsINTL)** to display the current near-end line status of the specified E1-FXS card.

**Syntax:** **status {fxsINTL-addr}**

**Example:** **status 2:1**

<u>FXS</u>	<u>Rx AB</u>	<u>Tx AB</u>	<u>Signal=&gt;E1 Sig</u>	<u>E1</u>	<u>TP</u>
2:1	01	01	R2	Traffic	N

Variable	Definition
<b>fxsINTL-addr</b>	The {slot:port} address of the FXS INTL card to display. <b>slot</b> - The slot number (1-6) of the Adit chassis that contains the E1-FXS card <b>port</b> - Port number or range.

**Display Descriptions**

**DS0** - Identifies location of DS0

**Rx AB** - AB bits received by the FXS or FXO port (real-time)

**Tx AB** - AB bits transmitted by the FXS or FXO port (real-time)

**Signal** - Signaling mode for which the FXS or FXO port is configured

**r2** Set to E1 R2 signaling

**E1** - Status of the E1 (Traffic, Loss of Signal, Loss of Framing, Loopback)

**TP** - Trunk Processing (Y = yes, N = no)

**status (fxsPS)**

Use the **status (fxsPS)** to display the current near-end line status of the FXS PS card.

**Syntax:** **status {fxsPS-addr}**

**Example:** **status 4:1**

> status 4:1

<u>FXS</u>	<u>Rx AB</u>	<u>Tx AB</u>	<u>Signal=&gt;T1 Sig</u>	<u>T1</u>	<u>TP</u>
4:1	01	01	LS => LS	Traffic	N

Variable	Definition
<b>fxsPS-addr</b>	The {slot:port} address of the FXS PS card to display. <b>slot</b> - Slot number (1-6) of the FXS PS card <b>port</b> - Port number or range.

### **status ipds0**

Use the **status ipds0** command to display the current status of the DS0 management channel.

**Syntax:** **status ipds0**

**Example:** **status ipds0**

```
> status ipds0
Operational state:      DOWN
```

### **status (ocudp)**

Use the **status (ocudp)** command to display status for selftest and loopbacks.

**Syntax:** **status {ocudp-addr}**

**Example:** **status 2:1**

```
SLOT 2:
Status for OCUDP Port 1:
  Selftest:
Results as of 23:25:48 01/07/2001
  Datapath:                PASS
  FPGA:                    PASS
  OCU:                      PASS

  OCU Manual Loopback:     NONE
  CSU Manual Loopback:     NONE

  OCU NonLatching Loopback: NONE
  DSU NonLatching Loopback: NONE
  CSU NonLatching Loopback: NONE

  OCU Latching Loopback:   NONE
  DSU Latching Loopback:   NONE
  CSU Latching Loopback:   NONE
```

Variable	Definition
<b>ocudp-addr</b>	The {slot:port} address of the OCUDP card to display. <b>slot</b> - Slot number (1-6) where the OCUDP card is located <b>port</b> - Port number or range.

**status (ocudp) performance**

Use the **status (ocudp) performance** command to display performance statistics for the current 15 minute interval, previous 15 minute interval, previous 1 hour interval, and for the previous day.

**Syntax:** **status {ocudp-addr} performance**

**Example:** **status 2:1 performance**

SLOT 2:

Performance Statistics for OCUDP Port 1:

	current 15 min.	previous 15 min.	1 hour	1 day
out of service seconds:	775	0	0	0
loss of frame seconds:	0	0	0	0
loss of signal seconds:	784	0	0	0
bipolar violations seconds:	0	0	0	0

elapsed time in current 15 min. interval: 13:27

valid 15 min. intervals in hour: 0

valid 15 min. intervals in Day: 0

Variable	Definition
<b>ocudp-addr</b>	The {slot:port} address of the OCUDP card to display. <b>slot</b> - Slot number (1-6) where the OCUDP card is located <b>port</b> - Port number or range.

**status (ocudp) performance history**

Use the **status (ocudp) performance history** command to display performance statistics for the current 15 minute interval and all previous 15 minute intervals (up to a total of 96).

**Syntax:** **status {ocudp-addr} performance**

**Example:** **status 2:1 performance**

SLOT 2:

Performance Statistics for OCUDP Port 1:

	OOS	BPV	LOF	LOS
curr. interval:	248	0	0	248
prev. intvl 1:	899	0	0	900
prev. intvl 2:	886	0	0	896
totals:	2033	0	0	2044

elapsed time in current 15 min. interval: 4:14

valid 15 min. intervals in data: 2

Variable	Definition
<b>ocudp-addr</b>	The {slot:port} address of the OCUDP card to display. <b>slot</b> - Slot number (1-6) where the OCUDP card is located <b>port</b> - Port number or range.

**status (p-phone)**

Use the **status (p-phone)** command to display the current status of the P-Phone card.

**Syntax:** **status {p\_phone-addr}**

**Example:** **status 2:1**

```
SLOT 2:
Status for EBS Port 1:
    Selftest:
No tests have been performed on port 1.
```

Variable	Definition
<b>p_phone-addr</b>	The {slot:port} address of the P-Phone card to display. <b>slot</b> - Slot number (1-6) where the P-Phone card is located <b>port</b> - Port number or range.

**status (router)**

Use the **status (router)** command to display the current Router status information.

**Syntax:** **status {rtr-addr}**

**Example:** **status 5:1**

The example displays status of the Router card in slot 5.

```
SLOT 5:
Status for RTR Port 1:
    Run Status:                Running
    Collision Alarm:            NO
    Link Alarm:                 NO
    Alarm LED:                  Red
    10/100 LED:                 Off
    Link LED:                   Off
    Collision LED:              Off
    Transmit LED:               Off
    Receive LED:                Off
```

Variable	Definition
<b>rtr_card-addr</b>	The Router (IP, CMG or TSR) address is in the form {slot:port}. <b>slot</b> - Slot number (1-6) that contains the Router card. <b>port</b> - Port number of the Router is 1.



**status (router) alarms**

Use the **status (router) alarms** command to display the current alarm log from the specified Router card.

**Syntax:** `status {rtr_card-addr} alarms`

**Example:** `status 5 alarms`

```

ROUTER BLADE ALARM LOG REPORT Slot-5
Time                Message                Count

Jan  4 22:26:47.0 Ethernet Link 5:1 Down.
```

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.

**status (router) channels**

Use the **status (router) channels** command to display a condensed status report of all voice channel endpoints. This command applies to the CMG Router card only.

**Syntax:** `status {cmg_card-addr} channels`

**Example:** `status 3 channels`

```

CMG VoIP Channel Status - Slot 3
MGCP: Down Call Agent: 0.0.0.0/2727 Endpoint Prefix: aaln/
# STATUS SIG CONN # STATUS SIG CONN # STATUS SIG CONN
1-Down FXSL ..... 17-Down FXSL ..... 33-Down FXSL .....
2-Down FXSL ..... 18-Down FXSL ..... 34-Down FXSL .....
3-Down FXSL ..... 19-Down FXSL ..... 35-Down FXSL .....
4-Down FXSL ..... 20-Down FXSL ..... 36-Down FXSL .....
5-Down FXSL ..... 21-Down FXSL ..... 37-Down FXSL .....
6-Down FXSL ..... 22-Down FXSL ..... 38-Down FXSL .....
7-Down FXSL ..... 23-Down FXSL ..... 39-Down FXSL .....
8-Down FXSL ..... 24-Down FXSL ..... 40-Down FXSL .....
9-Down FXSL ..... 25-Down FXSL ..... 41-Down FXSL .....
10-Down FXSL ..... 26-Down FXSL ..... 42-Down FXSL .....
11-Down FXSL ..... 27-Down FXSL ..... 43-Down FXSL .....
12-Down FXSL ..... 28-Down FXSL ..... 44-Down FXSL .....
13-Down FXSL ..... 29-Down FXSL ..... 45-Down FXSL .....
14-Down FXSL ..... 30-Down FXSL ..... 46-Down FXSL .....
15-Down FXSL ..... 31-Down FXSL ..... 47-Down FXSL .....
16-Down FXSL ..... 32-Down FXSL ..... 48-Down FXSL .....
```

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG Router card.

***status (router) dhcp client lease***

Use the **status (router) dhcp client lease** command to display the current DHCP Client lease information.

**Syntax:** `status {rtr_card-addr} dhcp client lease`

**Example:** `status 6 dhcp client lease`

```
CMG DHCP CLIENT INFO Slot 6
Server-
  ID                : 1:0:E0:97:12:34:56
  IP                : 10.20.30.40
  Relay             : 0.0.0.0
Client-
  ID                : 1:0:E0:97:87:65:43
  IP/Mask            : 10.20.30.100/255.255.25.0
  Gateway            : 10.20.30.251
  DNS Primary Server : 10.10.1.1
  DNS Secondary Server: 0.0.0.0
  Host Name          : bs1
  Domain Name        : caccmg77.tst
  DnsAuto             : Enabled
  Lease (hr:min:sec) : 3:57:22 remaining time
  Lease Status        : Hunt : Discover attempts=4
  Quarantine          : None
```

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.

---

**status (router) dns**

Use the **status (router) dns** command to display the current state of DNS resolver and the entries in the DNS cache.

**Syntax:** `status {rtr_card-addr} dns`

**Example:** `status 4 dns`

```
ROUTER BLADE DNS RESOLVER REPORT Slot-4
DNS RESOLVER IS ENABLED

My DNS Ip Address  10.  0.  0.  1
My DNS Hostname    Adit25.test

Primary   DNS Server 10. 10. 10.  0
Secondary DNS Server  0.  0.  0.  0
```

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.

**status (router) events**

Use the **status (router) events** command to display the current event log from the specified Router card.

**Syntax:** **status {rtr\_card-addr} events**

**Example:** **status 5 events**

```
ROUTER BLADE EVENTS LOG REPORT Slot-5
Time      Message                                     Count
Jan 10 0:56:44.8 Download EVE.RPT by Controller
Jan 10 0:54:27.4 Download complete in 0.0 secs [17440 bps]
Jan 10 0:54:27.4 Download ALM.RPT by Controller
Jan 10 0:14:23.5 ADMIN login terminated
Jan 10 0:14:21.8 Download complete in 0.1 secs [61600 bps]
Jan 10 0:14:21.7 Download config.cfg by Controller
Jan 10 0:14:21.6 Send CFG Change Notice to Controller - PASS
Jan 10 0:14:20.7 NVRAM Flash Task Wakeup Event Sent
Jan 10 0:10:56.5 Login accepted at ADMIN level
Jan 10 0:03:29.9 ADMIN login terminated
Jan 10 0:03:28.5 Download complete in 0.1 secs [60880 bps]
Jan 10 0:03:28.4 Download config.cfg by Controller
Jan 10 0:03:28.3 Send CFG Change Notice to Controller - PASS
Jan 10 0:03:27.4 NVRAM Flash Task Wakeup Event Sent
Jan 10 0:02:48.7 Login accepted at ADMIN level
Jan  9 23:29:34.5 Download complete in 0.1 secs [60160 bps]
Jan  9 23:29:34.3 Download config.cfg by Controller
Jan  9 23:29:34.3 Send CFG Change Notice to Controller - PASS
Jan  9 23:29:33.4 NVRAM Flash Task Wakeup Event Sent
Jan  9 23:28:35.7 Download complete in 0.1 secs [60000 bps]
Jan  9 23:28:35.5 Download config.cfg by Controller
```

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.

**status (router) ip address table**

Use the **status (router) ip address table** command to display the current IP address table for the specified Router card.

**Syntax:** `status {rtr_card-addr} ip address table ["profile-name"]`

**Example:** `status 5 ip address table`

```
ROUTER BLADE IP ADDRESSES REPORT Slot-5

Adit50 has learned 2 IP Addresses from 1 Port.
Display: <IP Address >   Learned From: <All Ports   >

      Port Name          IP Address      MAC Address
1.   Local LAN      Static   120.0.0.10
2.   Local LAN      Direct   192.168.3.196   00E09701E574
```

**Example:** `status 5 ip address table "Adit50"`

```
ROUTER BLADE IP ADDRESSES REPORT Slot-5

Adit50 has learned 2 IP Addresses
Display: <IP Address >   Learned From: <Local LAN >

      IP Address      MAC Address
1.   Static   120.0.0.10
2.   Direct   192.168.3.196   00E09701E574
```

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>profile-name</b>	The profile name for the Router interface that is used to reach this destination. Name must be enclosed in quotes, with a maximum length of 11 characters.

**status (router) ip network table**

Use the **status (router) ip network table** command to display the current table of learned IP Networks for the specified interface on the Router card.

**Syntax:** `status {rtr_card-addr} ip network table ["profile-name"]`

**Example:** `status 5 ip network table`

```

ROUTER BLADE IP NETWORKS REPORT Slot-5
Total Entries-3 on 2 Ports
Display: <IP Networks >   Learned From: <All Ports   >

      Network      Subnet Mask      Metric Next Gateway      Port Name
1. Static 200.1.1.0      255.255.255.0      1
2. Static 100.0.0.0      255.0.0.0          1      192.136.43.52      Local LAN
3. Direct 192.168.3.0    255.255.255.0      1      192.168.3.196      Local LAN

```

**Example:** `status 5 ip network table "Adit50"`

```

ROUTER BLADE IP NETWORKS REPORT Slot-5
Total Entries-2 on Local LAN
Display: <IP Networks >   Learned From: <Local LAN >

      Network      Subnet Mask      Metric Next Gateway      Frame
1. Static 100.0.0.0      255.0.0.0          1      192.136.43.52      Eth II
2. Direct 192.168.3.0    255.255.255.0      1      192.168.3.196      Eth II

```

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>profile-name</b>	The profile name for the Router interface that is used to reach this destination. Name must be enclosed in quotes, with a maximum length of 11 characters.

**status (router) ipx network table**

Use the **status (router) ipx network table** command to display the current table of learned IPX Networks for the specified interface on the Router card.

**Syntax:** `status {rtr_card-addr} ipx network table ["profile-name"]`

**Example:** `status 5 ipx network table`

```

ROUTER BLADE IPX NETWORKS REPORT Slot-5
Total Entries-4 on 1 Ports
Display: <IPX Networks>   Learned From: <All Ports   >

      Network  Hops Ticks  Next IPX Router      Port Name   Frame Type
1. Static 00000011 2      4                      LosAngeles   802.3
2. Static 00000011 2      4                      LosAngeles   802.2
3. Static 00000011 2      4                      LosAngeles   SNAP
4. Static 00000011 2      4                      LosAngeles   Eth II

```

**Example:** `status 5 ipx network table "Adit50"`

```

ROUTER BLADE IPX NETWORKS REPORT Slot-5
Total Entries-0 on Local LAN
Display: <IPX Networks>   Learned From: <Local LAN >

      Network  Hops Ticks  Next IPX Router      Frame Type
No Records to Display...

```

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>profile-name</b>	The profile name for the Router interface that is used to reach this destination. Name must be enclosed in quotes, with a maximum length of 11 characters.

**status (router) ipx server table**

Use the **status (router) ipx server table** command to display the current table of learned IPX Servers for the specified interface on the Router card.

**Syntax:** `status {rtr_card-addr} ipx server table ["profile-name"]`

**Example:** `status 4 ipx server table`

```
ROUTER BLADE IPX SERVERS REPORT Slot-4

Total Entries-0 on 0 Ports
Display: <IPX Servers >  Learned From: <All Ports  >

Network    Hops Type Name          Port Name  Frame Type

No Records to Display...
```

**Example:** `status 5 ipx server table "Adit50"`

```
ROUTER BLADE IPX SERVERS REPORT Slot-5

Total Entries-0 on Local LAN
Display: <IPX Servers >  Learned From: <Local LAN >

Network    Hops Type Name          Frame Type

No Records to Display...
```

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>profile-name</b>	The profile name for the Router interface that is used to reach this destination. Name must be enclosed in quotes, with a maximum length of 11 characters.



**status (router) log**

Use the **status (router) log** command to display the log of all CMG events. This command applies to the CMG Router card only.

**Syntax:** `status {cmg_card-addr} log ["profile-name"]`

**Example:** `status 5 log`

```
CMG LOG REPORT Slot-5
Date    Time          Event Type Trans ID  Chan Event Description
Jan  1   0:00:21      Error                1   DSP Online
```

Variable	Definition
<b>cmg_card-addr</b>	The slot number (1-6) that contains the CMG card.
<b>profile-name</b>	The profile name for the Router interface that is used to reach this destination. Name must be enclosed in quotes, with a maximum length of 11 characters.

**status (router) mac address table**

Use the **status (router) mac address table** command to display the current table of learned MAC Addresses for the specified interface on the Router card.

**Syntax:** `status {rtr_card-addr} mac address table ["profile-name"]`

**Example:** `status 5 mac address table`

```
ROUTER BLADE MAC ADDRESSES REPORT Slot-5
Adit50 has learned 2 MAC Addresses from 1 Port.
Display: <MAC Address>   Learned From: <All Ports   >

Port Name          MAC Address
1.  Local LAN      Direct 00E09701E574
2.  Local LAN      Static 00E09700E9CD
```

**Example:** `status 5 mac address table "Adit50"`

```
ROUTER BLADE MAC ADDRESSES REPORT Slot-5
Adit50 has learned 2 MAC Addresses
Display: <MAC Address>   Learned From: <Local LAN >

MAC Address
1.  Direct 00E09701E574
2.  Static 00E09700E9CD
```

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card.
<b>profile-name</b>	The profile name for the Router interface that is used to reach this destination. Name must be enclosed in quotes, with a maximum length of 11 characters.

**status (router) mgcp**

Use the **status (router) mgcp** command to display counts of all MGCP sent and received return codes, internal errors and other statistics. This command applies to the CMG Router card only.

**Syntax:** **status {cmg\_card-addr} mgcp**

**Example:** **status 4 mgcp**

```
CMG MGCP REPORT Slot-4

MGCP Status and Statistics

Call Agent Communications State:      Connected

Statistics:
Item                                Count      Item                                Count
-----
MGCP:
  Tot Msgs Sent                    0          Sent Msgs not ACKed 0
  Tot Msgs Rcvd                    0          Errored Msgs Rcvd   0
  Tot ACKs Sent                    0          Prot Err ACKs Sent  0
  Tot ACKs Rcvd                    0          Negative ACKs Rcvd  0
                                      Msg Retries          0

Total Protocol Errors:      0

Return Codes Sent  Rcvd  Description
-----
None
```

Variable	Definition
<b>cmg_card-addr</b>	The CMG Router card slot number (1 - 6).

**status (router) performance**

Use the **status (router) performance** command to display the current runtime statistics from the specified Router card.

**Syntax:** **status {rtr\_card-addr} performance**

**Example:** **status 2 performance**

```

ROUTER BLADE PERFORMANCE REPORT Slot-2
Run-time Statistics for LocalUnit.

LAN Packet Totals:  Received 0          Transmitted 0          Errors 0
WAN Packet Totals:  Received 0          Transmitted 0          Errors 0

Remote's           Forwarded    Throughput    Comp. Ratio    Remote
Name              to WAN      to/from WAN   to/from WAN    conns.
RemoteUnit        0 pps      0 /0         bps            /              0

Priority Output Queue Statistics:

                                Priority 1   Priority 2   Priority 3   Priority 4
LocalUnit:
Packets Transmitted           0           0           0           0
Bytes Transmitted             0           0           0           0
Packets Queued                0           0           0           0
Bytes Queued                  0           0           0           0
Packets Dropped              0           0           0           0
Max Queue Level              0           0           0           0
RemoteUnit:
No Port/Trunk is assigned to this WAN.
```

Variable	Definition
<b>rtr_card-addr</b>	The Router (IP, CMG or TSR) card slot number (1 - 6).

**status (router) stp**

Use the **status (router) stp** command to display the current Spanning Tree state from the specified Router card.

**Syntax:** **status {rtr\_card-addr} stp**

**Example:** **status 5 stp**

```
ROUTER BLADE SPANNING TREE PROTOCOL REPORT Slot-5
STP Stats

No Enabled STP Ports Detected.

STP View

Bridge Priority: 32768 Address:00E09701E574
Root Priority: 32768 Address:00E09701E574
Root Port: 0 Path Cost 0
```

Variable	Definition
<b>rtr_card-addr</b>	The Router (IP, CMG or TSR) card slot number (1 - 6).

**status (router-lan)**

Use the **status (router-lan)** command to display the current Router status information.

**Syntax:** **status {rtr\_lan-addr}**

**Example:** **status 5:1**

```
SLOT 5:
Status for RTR Port 1:
  Run Status:           Running
  Collision Alarm:      NO
  Link Alarm:           YES
  Alarm LED:            Red
  10/100 LED:           Off
  Link LED:             Off
  Collision LED:        Off
  Transmit LED:         Off
  Receive LED:          Off
```

Variable	Definition
<b>rtr_lan-addr</b>	Router (IP, CMG or TSR) address is in the form {slot:port} or {slot "profile-name"}. <b>slot</b> - The slot number (1-6) that contains the Router card. <b>port</b> - Port number of the Router. <b>profile-name</b> - Existing WAN identifier, enclosed in quotes.

**status (router-trunk)**

Use the **status (router-trunk)** command to display the current status information for the specified Trunk on the Router card.

**Syntax:** **status {rtr\_trunk-addr}**

**Example:** **status 5:1:1-4**

```
SLOT 5:
Status for RTR 1 Trunk 1:
    Link Alarm:                NO
SLOT 5:
Status for RTR 1 Trunk 2:
    Link Alarm:                NO
SLOT 5:
Status for RTR 1 Trunk 3:
    Link Alarm:                NO
SLOT 5:
Status for RTR 1 Trunk 4:
    Link Alarm:                NO
```

Variable	Definition	
<b>rtr_trunk-addr</b>	The Router (IP, CMG or TSR) trunk address is in the form {slot:port:trunk}	
	<b>slot</b>	The slot number (1-6) that contains the Router card.
	<b>port</b>	Port number.
	<b>trunk</b>	Trunk number, a range or “all” can be used here. Port numbers are 1-24.

**status (router-voice)**

Use the **status (router-voice)** command to display the status of service, calls, signaling, connections, call agent communications and telephony statistics for a CMG Router voice channel. This command applies to the CMG Router card only.

**Syntax:** **status {cmg\_voice-addr}**

**Example:** **status 5:1:1:3**

```
CMG VoIP CHANNEL REPORT Slot-5

VoIP Channel 3:
  Endpoint ID:      aaln/3
  Admin State:      Normal
  Oper State:       Normal
  Call State:       Call In Progress
  Call Direction:   Incoming

Signaling Status:
  Hookswitch State: Off Hook
  Last Events Requested: L/hd(N)
  Current Digit Map:
    x.[#T]

Call/Connection Status for Connection ID 1:
  Leg # In Conference: 0
  Call ID:             1
  Caller ID Number:
  Caller ID Name:
  RTP Payload Type:    0
  Connection Mode:     Receive Only
  Local RTP Socket:    192.168.24.193:30000
  Remote RTP Socket:   0.0.0.0:0
  Algorithm In Use:    None
  Rx Gain              0 dB
  Tx Gain              0 dB
  Connection Statistics
    Packets Sent:      0
    Packets Rcvd:      0
    Payld Octets Sent: 0
    Payld Octets Rcvd: 0
    Dropped Packets:   0
    Jitter:            0
    Delay:             0

Call Agent Communications Status for this Endpoint:
  Notified Entity:     [192.168.24.228]:2427
  Comm State:          Up
  Last Cmd Rcvd:       CRCX
  From:                192.168.24.228:2427
  Last Cmd Sent:       NTFY
```

## Telephony Statistics

<u>Item</u>	<u>Count</u>
Offhooks	1
Onhooks	0
Seizures	2
Tone Digits	0
Pulse Digits	0

Variable	Definition	
<b>cmg_voice-addr</b>	In the form {slot:voip:channel}	
	<b>slot</b>	The slot number (1-6) that contains the CMG card.
	<b>voip</b>	To designate VoIP 1:1 is used.
	<b>channel</b>	Channel number for the router is 1-48, range or all

**Description of fields.**

Connection Parameter Name	Code	Connection Parameter Value
<b>Packets sent</b>	PS	Number of packets sent on the connection
<b>Octets sent</b>	OS	Number of octets sent on the connection
<b>Packets received</b>	PR	Number of packets received on the connection
<b>Octets received</b>	OR	Number of octets received on the connection
<b>Packets lost</b>	PL	Number of packets that were not received on the connection. calculated from gaps in the sequence number
<b>Jitter</b>	JI	Average inter-packet arrival jitter, in milliseconds
<b>Delay</b>	LA	Average latency, in milliseconds.

## status (rs232)

Use the **status (rs232)** to display the current near-end line status of the RS-232 card.

**Syntax:** **status {rs232-addr}**

**Example:** **status 2:1**

```
SLOT 2:
Status for RS232  PORT 1:
    CTS:    Low
    RTS:    Low
    DCD:    Low

SLOT 2:
Status for RS232  PORT 2:
    CTS:    Low
    RTS:    Low
    DCD:    Low
```

Variable	Definition
<b>rs232-addr</b>	The RS-232 card address is in the form {slot slot:port} <b>slot</b> - The slot number (1-6) that contains the RS-232 card <b>port</b> - Port number or range.

## status sessions

Use the **status sessions** command to display the current status of all active CLI sessions.

**Syntax:** **status sessions**

**Example:** **status sessions**

```
> status sessions
  Session      User          Login Port
  -----
* CLI          paul          RS-232
* indicates current session
```



---

**status (v35)**

Use the **status (v35)** to display the current near-end line status of the V.35 card.

**Syntax:** **status {v35-addr}**

**Example:** **status 2:1**

The example displays status of port 1 (V.35) on slot 2

```
> status 2:1
SLOT 2:
Status for V35  PORT 1:
      DCD:   Low
      CTS    Low
      DSR:   Low
      RTS:   Low
      DTR:   Low
```

Variable	Definition
<b>v35-addr</b>	The V.35 card address is in the form {slot slot:port} <b>slot</b> - The slot number (1-6) that contains the V.35 card <b>port</b> - Port number or range.

**Display Descriptions**

**DCD** - Data Carrier Detect indicates port is receiving a carrier signal

**CTS** - Clear to Send indicates port is ready to receive data

**DSR** - Data Set Ready indicates port is ready to send data

**RTS** - Request to Send

**DTR** - Data Terminal Ready

### **status (v54)**

Use the **status (v54)** to display the current near-end line status of the V.54 card.

**Syntax:** **status {v54-addr}**

**Example:** **status 3:all**

```
SLOT 3:
Status for V35  PORT 1:
    DCD:    Low
    CTS:    Low
    DSR:    Low
    RTS:    Low
    DTR:    Low
    BERT:    N/A
SLOT 3:
Status for V35  PORT 2:
    DCD:    Low
    CTS:    Low
    DSR:    Low
    RTS:    Low
    DTR:    Low
    BERT:    N/A
```

Variable	Definition
<b>v54-addr</b>	The V.54 card address is in the form {slot slot:port} <b>slot</b> - The slot number (1-6) that contains the V.54 card <b>port</b> - Port number or range.

#### **Display Descriptions**

**DCD** - Data Carrier Detect indicates port is receiving a carrier signal

**CTS** - Clear to Send indicates port is ready to receive data

**DSR** - Data Set Ready indicates port is ready to send data

**RTS** - Request to Send

**DTR** - Data Terminal Ready

**BERT** - Bit Error Rate Test

## store scp

**NOTE:** The 'store scp' command will be supported in a future release.

Use the **store scp** command to load a software file from the Controller or MSR card to a PC via SCP (secure copy). SCP requires an SSH connection. Currently, only configuration files can be uploaded. For information on how to restore a configuration via SCP, see *load scp* on page 5-61.

**NOTE:** SSH (Secure Shell) is a keyed feature. Keys must be purchased from Force10 Networks. The Controller must be running release 9.7 or higher to support SSH.

**Syntax:** store [rtr-card-addr] scp user {"user-name"} password {"password"} {ip-addr} {"file-name"}

**Example:** store 5 scp user "root" password "1234" 192.168.2.35  
"d:\MSRbackup\file.cfg"

```
Filename:  d:\MSRbackup\file.cfg
User name:  admin
Source IP Address:  198.162.3.196
Target IP Address:  192.168.2.35
Target Card Slot:  5
Target Card Type:  MSRx1
```

'store scp' will be executed with the above parameters.  
A SCP server must be running on the host system.

Do you really want to do this? y

Card software download in progress. Please be patient...

Software transfer command completed.

Variable	Definition
<b>rtr_card-addr</b>	Slot number (1 to 6) of the MSR card. If no slot is specified, the file is loaded from the Controller.
<b>user-name</b>	User name for SCP authentication. Must be enclosed in quotation marks.
<b>password</b>	Password for SCP authentication. Must be enclosed in quotation marks.
<b>ip-addr</b>	Host IP address in the form of xxx.xxx.xxx.xxx, where xxx is a number from 1 to 255. If not supplied, the host IP address from the database will be used.
<b>file-name</b>	The configuration file to load, including path. Must be enclosed in quotes. The file type must be: .cfg (configuration)

## store tftp

---

The **store tftp** command is used to upload a software file from a defined slot to a defined location on a PC, via TFTP. Currently uploads for general use are only permitted for Router card configuration files. A TFTP server must be running on the host system. You can use any TFTP server utility you wish. One example is the program "TFTPD32" which can be downloaded free-of-charge at [tftpd32.jounin.net/tftpd32.html](http://tftpd32.jounin.net/tftpd32.html).

---

**NOTE:** For information on how to restore the Router configuration you have just saved, see *load on page 5-60*.

---

**Syntax:** `store {rtr-card-addr} tftp {ip-addr} {"file-name"}`

**Example:** `store 5 tftp 192.168.2.35 "d:\RouterBackup\file.cfg"`

```
Filename:  d:\RouterBackup\file.cfg
Source IP Address:  198.162.3.196
Target IP Address:  192.168.2.35
Source Card Slot:   5
Source Card Type:   RTRx1
```

'store tftp' will be executed with the above parameters.

A TFTP server must be running on the host system.

Do you really want to do this? y

Card software download in progress. Please be patient...

Software transfer command completed.

Variable	Definition
<b>rtr_card-addr</b>	Slot number (1 to 6) of the Router card.
<b>ip-addr</b>	Host IP address in the form of xxx.xxx.xxx.xxx, where xxx is a number from 1 to 255. If not supplied, the host IP address from the database will be used.
<b>file-name</b>	This will name the configuration file that you are storing. The file must be a .cfg file and must be enclosed in quotes.

---

## switch

---

### switch activeimage

Use the **switch activeimage** command to switch the active with the backup application images stored in a Controller or Router (IP, CMG or TSR) card.

**Syntax:** **switch [rtr\_card-addr] activeimage**

**Example:** **switch activeimage**

```
> switch activeimage
Do you really want to do this? y
OK
```

Variable	Definition
<b>rtr_card-addr</b>	The Router (IP, CMG or TSR) card slot number (1 - 6) to retrieve the image information from. <b>Note: If no slot number is entered, the image information is retrieved from the Controller.</b>

**telnet**

---

**telnet (router)**  
**telnet (router) port**  
**telnet ip**

**telnet (router)**

Use the **telnet (router)** command to establish a Telnet session from the Adit 600 CLI to the Router card.

**Syntax:** **telnet {rtr-addr}**

**Example:** **telnet 3**

```
> telnet 3
Connected.
      Escape character is '^]'.
Attempting Force10 Networks Router connection...
Router [Wed Apr 24, 2002 13:00:15] (<CR> to login)
Password >*****
Select a terminal type...
(<space> or <back-space> to toggle, <CR> to accept)

Terminal: <VT100>
```

Variable	Definition
<b>rtr-addr</b>	The Router address is in the form {slot   slot:port} <b>slot</b> - Slot location (1 - 6) of the Router card. <b>port</b> - Port number of a Router is 1. <b>Note:</b> Only required on IP Router when release 1.1 or earlier.

**telnet (router) port**

Use the **telnet (router) port** command to establish a Telnet session from the Adit 600 Controller to an individual port on the Quad-Port TSR (TSR) router card. This feature can be used in conjunction with SSH to establish a secure connection to a TSR port. The user can log into the Controller using SSH, then Telnet to the TSR port within the secure SSH shell.

This command applies to the TSR router card only. The TSR port must be configured for RS-232 operation (see *TSR Card Jumpers* on page 20-16). This command is not supported when the port is configured for Ethernet operation or when the TBOS feature is enabled.

The escape sequence for the session is **Ctrl + ]** (Control key plus right-bracket key). Type **?** for a list of commands.

**Note:** Only one Telnet session is permitted at a time. This applies to all concurrent user sessions and includes Telnet to card slots and Telnet IP to a host.

**Syntax:** `telnet {tsr-slot} port {tsr-port}`

**Example:** `telnet 3 port 2`

Connected.

Escape character is '^['.

telnet>

Variable	Definition
<b>tsr-slot</b>	The slot number (1-6) that contains the TSR router card.
<b>tsr-port</b>	TSR port number (1-4).

**telnet ip**

Use the **telnet ip** command to Telnet to an IPv4 host that is reachable via any of the routes in the Controller's routing table. This function can be used in conjunction with SSH to handle cases where a host only has Telnet capability. A user can log into the Controller using SSH, then Telnet to the host within the secure SSH shell.

The escape sequence for the session is **Ctrl + ]** (Control key plus right-bracket key).

**Note:** Only one Telnet session is permitted at a time. This applies to all concurrent user sessions and includes Telnet to card slots and Telnet to a Quad TSR server port.

**Syntax:** `telnet ip {ip-addr}`

**Example:** `telnet ip 192.168.1.1`

Variable	Definition
<b>ip-addr</b>	IP address in the form xxx.xxx.xxx.xxx, where xxx is a number from 0 to 255.

## test

---

### test (fxs8D/fxs8C/fxs8B)

Use the **test (fxs8D/fxs8C/fxs8B)** command to test the channels on the FXS 8D, FXS 8C, or FXS 8B Service Card. Note: only one channel can be tested at a time. This process should take approximately 20 seconds.

The following is a list of tests that will be run on the channel. The tests cannot be selected to execute individually but must be executed as a set. If one test in the set fails all tests stop and will not continue to the next test. If all tests in the set pass only a single OK indication will be displayed. They will be executed in the following order:

1. Hazardous Potential Test
2. Foreign Electromotive Force Test
3. Resistive Faults Test
4. Receiver Off Hook Test

Note: for test results see *show test (fxs8D/fxs8C/fxs8B)* on page 5-300.

**Syntax:** test {fxs-addr}

**Example:** test 1:1

Results will be available in approximately 20 seconds.

OK

Variable	Definition
fxs-addr	List of voice channels to apply setting to, in the form {slot:port}. <b>slot</b> - Slot number 1 - 6, location of the FXS card. <b>channel</b> - Channel number 1-8.



## trace route

### tracert (router)

Use the **tracert (router)** command to invoke a Trace Route to a host device on a network of a IP, CMG or TSR Router. Trace Route responses will be returned to user screen as each hop host device response packet is received or the timeout return data is provided for a hop. The output will have DNS names only if DNS resolver is enabled and DNS server can resolve host IP. The optional parameters [ttlbeg] and [ttlmax] allow the user to define the range of hops the trace route will query. A response with a \* indicates no response from the host.

**Syntax:** `tracert {rtr_card-addr} {ip-addr|"domain-name"} [icmp|udp] [src-ip] [ttlbeg] [ttlmax] [udp-port]`

**Example:** `tracert 2 10.40.15.70 udp`

**Example:** `tracert 3 "www.google.com" ICMP 192.168.100.100 1 32`

```
Tracert 3 www.google.com 192.168.100.100 5 32 in progress...
Hops  Ave.  Host
1      <10 ms  99.90.9.254  natlxt-tw-gw.force10networks.com
2      <10 ms  65.243.6.17
3       10 ms  137.39.6.200
4       20 ms  152.63.101.134  0.so-3-1-0.XL2.DFW9.ALTER.NET
5       20 ms  152.63.102.6  0.so-0-0-0.XR2.DFW9.ALTER.NET
6       10 ms  152.63.100.221  184.ATM7-0.BR4.DFW9.ALTER.NET
7       *      *
8       10 ms  208.172.130.104  agr4-loopback.Dallas.cw.net
9       10 ms  208.172.139.9  dcr1-so-0-2-0.Dallas.cw.net
10      580 ms  216.33.153.188  csr1-ve241.SantaClarasc3.cw.net
11       60 ms  64.68.64.210  this.is.an.device.name.2.long.2show.all.of.name...
12       70 ms  216.239.47.2
13       60 ms  216.239.33.101  www.google.com
Trace Terminated: 13 Hops, Hop range 1-13
```

Variable	Definition
<b>rtr_card-addr</b>	The slot number (1-6) that contains the Router (IP, CMG or TSR) card
<b>ip-addr</b>	The IP address for trace route to use for this query, in the form of xxx.xxx.xxx.xxx, where xxx is between 0-255.
<b>domain-name</b>	The domain name for the external DNS server. Name must be enclosed in quotes, with a maximum length of 42 characters.
<b>icmp</b>	Internet Control Message Protocol (ICMP) method of trace routing is the most widely used and has the best reliability. This is the default
<b>udp</b>	User Datagram Protocol (UDP) method requires that all devices in the chain of the trace route support probes on the particular UDP port. This method is not recommended.

Variable	Definition
<b>src-ip</b>	This parameter, only applies if [type] is set to ICMP. This defines the source IP address in the ICMP echo request and must be one of the router interface IP addresses. Default is the IP address of the interface from which the ping is sent.
<b>ttlbeg</b>	Allows the user to define the beginning (or the minimum) of the range of hops the trace route will query. Range is 1 - [ttlmax] value. Default = 1.
<b>ttlmax</b>	Allows the user to define the end (or the maximum) of the range of hops the trace route will query. Range is [ttlbeg] - 255 value. Default = 30.
<b>upd-port</b>	This parameter only applies if [type] is set to UDP. Range is 1-65535. Default = 33434

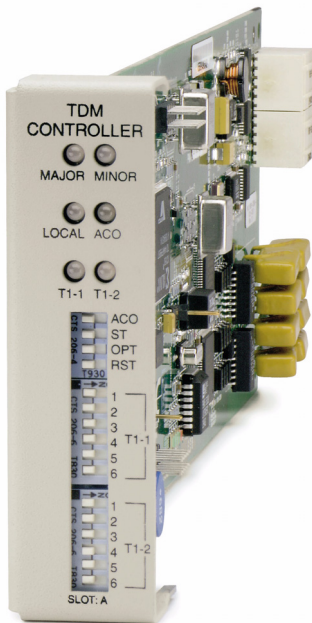
# CHAPTER 6

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## *T1 Controller Card*

### In this Chapter

- Overview
- Features
- Technical Specifications
- Configuration
  - CLI Commands
  - DIP Switch Settings
- LEDs
- DS0 Management (IP over DS0)
- TR-08 Mode 1



## **Overview**

The Adit 600 with the Dual T1 Controller Card offers a cost-effective, compact solution that delivers a wide range of services from both wireline and wireless access networks. The T1 Controller Card includes two T1 ports with integrated CSUs and a built-in 1/0 cross-connect matrix providing full, non-blocking connectivity between the T1 Controller Card and any of the six service card slots. The total T1 capacity can be increased to 18 network access trunks or drop-and-insert user connections by adding a full complement of Quad DS1/E1 Service Cards.

The Adit 600 offers a modular design that includes the T1 Controller Card (required) and an array of available service cards. This flexibility allows the Adit 600 to function in a variety of applications, including:

- 1 to 18 T1 multi-service digital cross-connect system
- GR-303/TR-08/DLC remote terminal
- 48 FXS/FXO/DPT channel bank
- 40 FXS Voice over IP (VoIP) Customer Media Gateway (CMG) Service card
- 40 ISDN BRI shelf
- 6 Ethernet IP Router/WAN nest
- 24-port RS-232 and Ethernet with TSR Service Card
- 12 V.35 or synchronous RS-232 port drop-and-insert CSU/DSU
- 24 OCU-DP digital data service (DDS) delivery device
- 47-station P-Phone (EBS) terminal
- 6 Single-Channel POTS

The modular Adit 600 platform also allows service providers to scale across service types, network architectures, and bandwidth requirements to fit a dynamic service delivery environment. Service cards provide the physical, electrical, and logical connections for either customer service demarcations or network access. Customer interface types include Routed Ethernet, IP Router, TSR Card, FXS, FXO/DPT, V.35, V.35/V.54, RS-232, OCU-DP, ISDN BRI, P-Phone (Electronic Business Set), and T1. Any service card can be placed in any of the six available slots. In addition, the CMG and MSR service cards enable the Adit 600 to provide cost-effective VoIP services.

The T1 Controller Card has several local and remote management options available. The card can be configured and managed locally using the front-panel DIP switches or the Command Line Interface (CLI). Front-panel LEDs quickly communicate alarm and T1 line status, as well as mode of operation. Remote management is accomplished directly either over an in-band DS0 management channel or via a separate SNMP Ethernet connection. Alternatively, remote management can be accomplished through the Access Navigator over the Facility Data Link (FDL) or an in-band dedicated DS0.

## **Features**

- Allows any service connection or network access line to be deployed in any slot
- Provides integrated 18 T1 port digital cross-connect for service grooming and restoration
- Supplies integrated dual T1 CSU/DSUs and SNMP management on the Controller
- Supports VoIP (MGCP) services through the Customer Media Gateway (CMG) Service Card
- Supports VoIP (SIP), VPN routing, and T.38 Fax Relay services through the Multi-Service Router (MSR) Service Card
- Supports PBX Redirection for SIP-to-PRI calls through the MSR card.
- Supports SSH and SNMPv3
- Supports Telnet and SSH sessions to IPv4 hosts that are reachable via any of the routes in the Controller's routing table
- Enables remote SNMP and Telnet provisioning, monitoring, and testing of services and network conditions
- Delivers remote management via T1, FDL, in-band IP, external Ethernet or RS-232
- Provides GR-303 remote terminal management from Access Navigator host software

## **Technical Specifications**

### **Controller Software Required**

- To support all of the features described in this manual, release 10.1 is required. If you are using an earlier controller release, check the Customer Release Notes provided with your software to determine which features are supported.

### **Product Includes**

- 18 T1 port built-in, non-blocking 1/0 Digital Cross-connect System
- Robbed-bit (voice) and clear channel (data) signaling on the same T1
- TR-08 signaling configured as either AB, BB, A or B
- Integral dual T1 ports that support drop-and-insert applications
- T1.231 performance monitoring statistics: Ninety-six 15 minute segments (24 hour period)
- Performance Report Messages
- PBX trunk signaling, E&M to loop start and ground start conversion
- Analog voice signaling, CLASS features such as Call Waiting, Call Forwarding, Calling Party Disconnect and DNIS/DID
- Front-panel LED indicators for T1 status, major and minor alarms, remote/local management mode, and Alarm Cut-Off status
- Controller support for IP router card code download through its Ethernet management port
- Configurations automatically stored in non-volatile memory

- D4 PLAR to loop start conversion
- Remote Provisioning and Management (RPM)
  - Supports RPM over FDL with Access Navigator release 1.5 or higher
- RADIUS Login Authentication
- Syslog
- NTP
- Secure Shell (SSH) and Secure Copy (SCP)
- SNMPv3

## ***Management***

- Local
  - Simple setup using front panel DIP switches for channel bank applications
  - RS-232 craft port interface drives up to 50 ft. (15.24 m) cable, and provides a Command Line Interface (CLI) using ASCII terminal or PC with terminal emulation software, modem using XMODEM or PPP sessions
- Remote
  - 10Base-T Ethernet management port provides
    - Local IP management connectivity
    - RJ-45 connector mounted on rear panel of chassis
    - 10Base-T link LED status indicator
    - IP management over a dedicated DS0 bearer channel
  - CLI management from Access Navigator (Rel. 1.7 or higher) through T1 FDL
- Integrated TFTP client for remote download of controller software upgrades
- SNMP agent, supporting MIB objects:
  - RFC 1213 (MIB-II)
  - RFC 1659 (V.35)
  - RFC 1907 (SNMPv2-MIB)
  - RFC 2011 (IP-MIB)
  - RFC 2233 (IF-MIB)
  - RFC 2493
  - RFC 2494 (DS0-MIB)
  - RFC 2495 (DS1-MIB)
  - RFC 2571 (SNMP)
- CLI offers three levels of password controlled security
- Performance Report Messages

## **Network T1 Interface**

- Selectable single or dual T1 ports operating at 1.544 Mbps  $\pm$ 50 bps
- SF (D4) and ESF framing
- AMI or B8ZS line coding
- Short or long-haul loop settings
- Integrated CSU function
- Line build out (DSX-1): 655 feet
- Receive sensitive (DS1): 0 to -22.5 dB
- Jitter and wander ITU-T B.824 (3/93)
- Channel status LEDs
- Two RJ-48C connectors on rear panel of chassis
- Solid-state (fuseless) overvoltage and overcurrent T1 line protection meets Telcordia GR-1089-CORE intra-building lightning/power cross limits
- CAS signaling options

## **Service Interfaces Supported**

- IP Router Service card
- Customer Media Gateway (CMG) Service card
- Multi-Service Router (MSR) Service card
- Terminal Server Router (TSR) Service card
- FXO/DPT 8-channel Voice Service card
- FXS 8-channel Voice Service cards
- ISDN BRI 2, 4 and 8-channel Service cards
- Dual V.35 and Dual V.35/V.54 Service cards
- Quad T1 Service card
- Quad E1 Service card
- Quad DS1/E1 Service card (T1 or E1 mode)
- Quad DS1 ADPCM Service card
- OCU-DP Single and 4 port Service cards
- Octal P-Phone Service card
- Dual RS-232 Synchronous Data Service card (limited configuration)
- Single Channel POTS Service card

## **Network Standards**

- ANSI T1-403, T1.102, T1.231

## **Clocking**

- Loop-timed from any T1
- Revertive clock switching provides automatic backup to secondary T1 should the primary T1 fail
- Operates as a Stratum 4E device

## **Alarms**

- One major and one minor alarm output
- One alarm input
- Alarm contacts accessible from external alarm connector
- All alarms are logged in an event log
- Loss of AC power triggers minor alarm
- Generates SNMP traps for alarming (MIB objects)

## **Testing and Diagnostics**

- Standard T1 line and payload loopbacks
- T1.231 performance history

## **Power Consumption**

- 4 W maximum

## **Regulatory Approvals**

See *Appendix A, Regulatory Approvals* for information on the T1 Controller card.

## **Physical**

- Dimensions: 3.5 in. (H) x 1 in. (W) x 11.25 in. (D)  
8.9 cm (H) x 2.5 cm (W) x 28.6 cm (D)
- Weight: 5.7 oz. (.16 kg)

For information on Adit 600 Environment required, see *Installation Environment* on page 2-2.



## Configuration

Options on the Controller card are set by the DIP switches, or the Command Line Interface (CLI).

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**NOTE:** The default IP address for the Adit Controller is 10.0.0.10.

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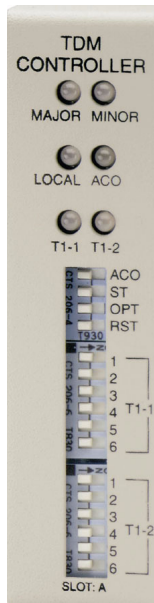
### CLI Commands

The following commands are used to configure the Controller card. For detailed information on these and other commands, see Chapter 5, CLI Commands.

- *connect*  
Creates two-way connections between channels
- *disconnect*  
Removes a connection created by the connect command
- *set clock*  
Sets the primary and secondary transmit clock
- *set date*  
Sets the date for the system
- *set (ds1)*  
Sets up the DS1 interfaces (up, down, bpviolation, fdl, framing, id string, lbo, line loopup, linecode, loopdetect, payload, threshold)
- *set ipds0*  
Sets up the DS0 management channel (assign, disable, down, IP address, up)
- *set notes*  
Allows configuration notes to be added and displayed as comments in the *print config* output.
- *show (ds1)*  
Displays current settings for DS1 (circuit ID, up, down, framing, line coding, clock source, line build out, loop code detection, loop back, fdl type)
- *show ipds0*  
Displays the settings for the DS0 management channel
- *status (ds1)*  
Displays the status of the DS1 (receive, transmit, loopback)
- *status ipds0*  
Display the status of the DS0 management channel

## DIP Switch Settings

On the front of the TDM controller card on the Adit 600 are DIP switches you can use to configure your Adit 600 locally.

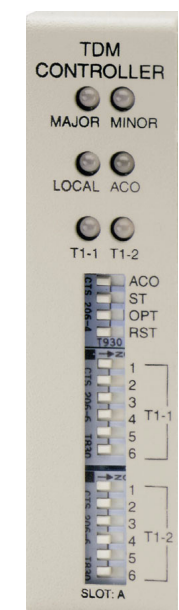


Switch	Function	Description
ACO	Alarm Cut Off	<b>0</b> = Alarm contacts enabled (close when alarm occurs). <i>Default.</i> <b>1</b> = Alarm contacts disabled (open).
ST	Self Test	<b>0</b> = Normal operation. <i>Default.</i> <b>1</b> = Perform Self Test.
OPT	Spare	
RST	Reset	<b>0</b> = User-configured operation. <i>Default.</i> <b>1</b> = Reset configuration to factory defaults, and reset CLI password.
T1-1 T2-1	Line Coding	<b>0</b> = B8ZS. <i>Default.</i> <b>1</b> = AMI
T1-2 T2-2	Line Loopback	<b>0</b> = Loopback off. <i>Default.</i> <b>1</b> = Loopback on
T1 3-4 T2 3-4	Framing	<b>0</b> = ESF (Extended Superframe). <i>Default.</i> <b>1</b> = D4
T1 5 - 6 T2 5 - 6	Signaling	

Switch 3	Switch 4	Switch 5	Switch 6	Setting
0	1	1	1	TR-08 A-Shelf with FDL, 16-bit Alarm frame
1	0	0	0	TR-08 A-Shelf with FDL, 13-bit Alarm frame
1	0	0	1	TR-08 A-Shelf with FDL disabled
1	0	1	0	TR-08 B-Shelf
0	0	0	0	Loop Start/Ground Start. <i>Default.</i>
0	0	0	1	E&M Immediate Start with ringback. (used for D3 PLAR and DPT)
0	0	1	0	E&M Immediate Start with ringback and Calling Party Disconnect (CPD)

## LEDs

The T1 Controller has a set of six LEDs you can use to troubleshoot your Adit 600. The table below describes each LED.

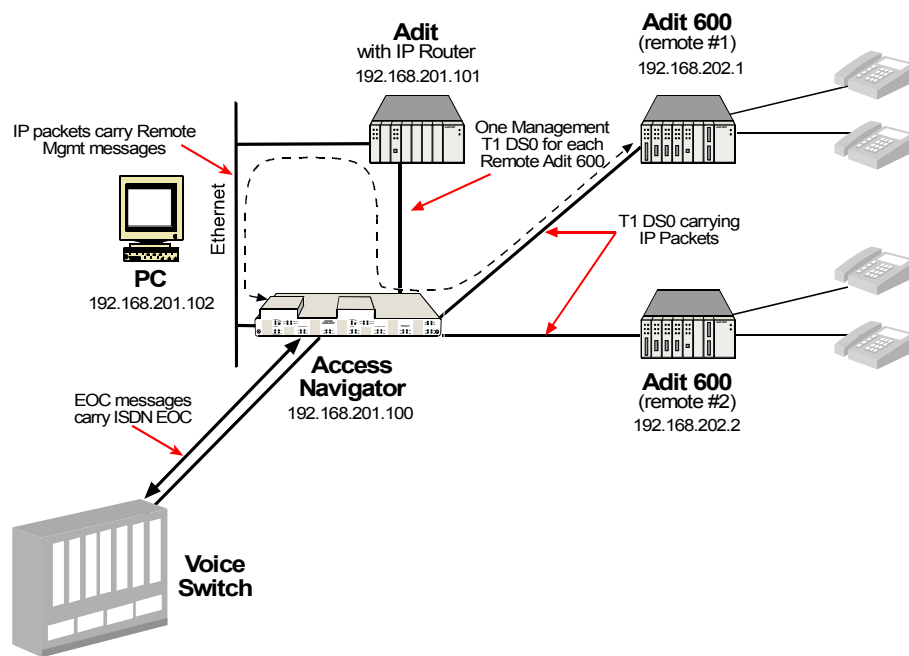


0 (Off) 1 (On)

LED	State	Description
MAJOR	Off	No major alarms present
	Red	Major alarm present
MINOR	Off	No minor alarms present
	Yellow	Minor alarms present
LOCAL	Off	Remote mode (DIP switches disabled)
	Green	Local mode (DIP switches enabled)
ACO	Off	Normal mode. No alarms are being suppressed.
	Yellow	Alarm cutoff active. One or more active alarms suppressed.
T1-1 and T1-2	Off	Off line
	Green	Normal
	Red	Loss of Signal (LOS) detected
	Yellow	Bipolar Violation (BPV) detected
	Flashing Green	Loopback active
	Flashing Red	Loss of Frame (LOF) or Alarm Indication Signal (AIS) detected
	Flashing Yellow	Yellow alarm (Remote Alarm Indication) detected.

## **DS0 Management (IP over DS0)**

The DS0 Management Channel provides an alternative to the FDL link for management information for those customer deployments where FDL is unavailable. The Access Navigator (Force10 Networks) and the remote Adit 600 will use IP packets to communicate management and control information over the DS0 Management Channel. This information includes support for the activation, testing, and status reporting for ISDN lines. A DS0 Channel will be used in the remote Adit 600 to send and receive the management IP packets. An Adit equipped with IP routing capabilities and co-located with the Navigator will be used to forward the IP packets between the remote Adit and the Navigator. The co-located Adit 600 with IP routing capabilities is required due to Navigator bandwidth limitations. In the Navigator, the Ethernet port will be used to exchange these packets.



At the remote Adit a single DS0 will be configured to exchange management information with Navigator. The DS0 will be cross-connected at the Navigator to a DS0 at the router. The Router will also be connected to the Navigator via an Ethernet connection. The Router will forward IP packets between the management DS0 and the Ethernet. The Router will support multiple Navigators through its Ethernet port and multiple Adit 600s through individual DS0 channels.

Each Navigator and each Adit 600 will be configured with a unique IP address reachable by the router. The DS0 Channel will be configured in the Adit 600. In the Navigator, the cross connects between the remote Adit 600 and the router (Adit) will be statically configured. For each remote Adit 600 supported by the Navigator a selection of an FDL or DS0 Management channel must also be made. Selection of the DS0 Management Channel will require the IP address of the remote Adit 600.

The DS0 Management Channel will be used to exchange BRI activation, deactivation, and status reporting messages between the Navigator and the remote Adit 600. All commands initiated by the Switch will be forwarded by the Navigator over the DS0 Management Channel and will be processed by the Adit 600, including commands to control Loop Back or Corrupt CRC tests. The Adit 600 will report change in status, such as Loss of Signal over the DS0 Management Channel. The Navigator will forward this information to the Switch via GR-303 EOC messages.

## TR-08 Mode 1

The Adit 600 TR-08 will provide Mode 1 non-concentrated integrated service to the Adit 600 platform. The TR-08/SLC-96 interface will allow a direct T1 physical connection to a TR-08 capable digital switch, eliminating the need for an exchange office end platform.

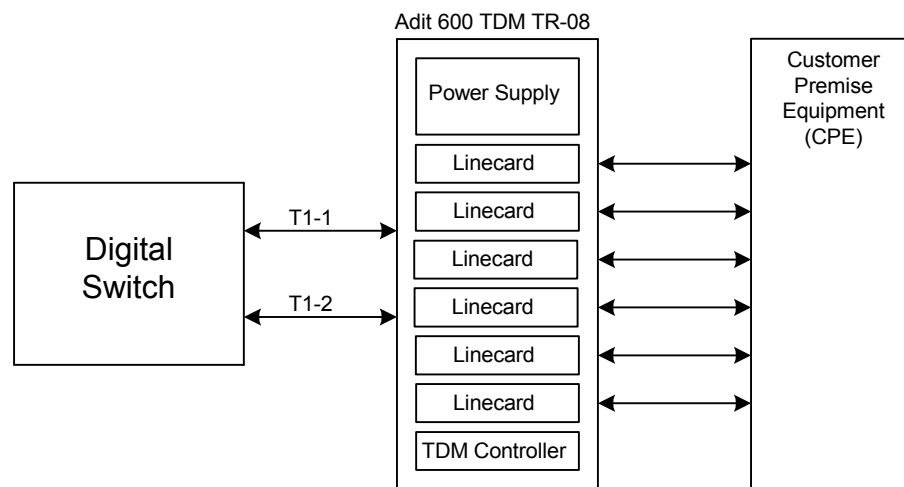
Each TR-08 provisioned T1 will handle the signaling throughput for 24 DS0 voice channels. With T1-1 provisioned as an A shelf and T1-2 provisioned as a B shelf, the Adit 600 will provide 48 DS0 voice channels with alarm reporting capability for both shelves.

The TR-08 options can be provisioned either through CLI or controller front panel DIP switches. When a T1 is provisioned to be TR-08, it's respective set of service card slots (T1-1 slots 1-3, T1-2 slots 4-6) will be nailed-up to the T1's DS0s per TR-08 Mode 1.

Each T1 can be configured to be an A shelf or B shelf. The A shelf will carry alarm information over FDL for the A and B shelf cards. The following combinations can be set up:

- Single A shelf
- Two A shelves
- A and B shelf
- TR-08 provisioned T1 and a ESF provisioned T1

The A shelf can be set for FDL or no FDL and either alarm frame format 13 or 16 can be selected. This selection can be done either by CLI (see *set (ds1)* in Chapter 5) or for DIP switch settings (see *DIP Switch Settings* on page 6-8).



**Adit 600 TR-08 Configuration**

## ***T1 Controller Card***

*TR-08 Mode 1*

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# CHAPTER 7

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## *E1 Controller Card*

### In this Chapter

- Overview
- Features
- Technical Specifications
- Configuration
  - CLI Commands
  - DIP Switch Settings
- LEDs



## **Overview**

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**NOTE:** E1 is not supported in this release. It will be supported in a future release.

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The Adit 600 with the Dual E1 Controller card offers a cost-effective, compact solution to deliver a wide range of services from both wireline and wireless access networks. The E1 Controller includes two E1 ports with integrated CSUs and a built-in 558 timeslot (DS0) 1/0 cross-connect matrix. This provides full non-blocking connectivity between the E1 Controller card and any of the six Adit 600 service card slots. The total E1 capacity can be increased to 18 network access trunks or drop-and-insert user connections by adding a full complement of four Quad DS1/E1 service cards.

The Adit 600 offers a modular design that includes the Dual E1 Controller (required) and an array of available service cards. This flexibility allows the Adit 600 to function in a variety of applications, including:

- 1 to 18 E1 port multi-service Digital Cross-connect System (DCS)
- 40 ISDN BRI shelf
- 120 WAN connection IP router
- 2 to 12 V.35 port drop-and-insert CSU/DSU

The modular Adit 600 platform also allows service providers to scale across service types and bandwidth requirements to fit a dynamic service delivery environment. Service cards provide the physical, electrical, and logical connections for either customer service demarcations or network access. Customer interface types include Routed Ethernet, FXS, FXO, E&M/TO, V.35, ISDN BRI and E1. Any service card can be placed in any of the six available slots. In addition, the CMG and MSR service cards enable the Adit 600 to provide cost-effective VoIP services.

The E1 Controller card has several local and remote management options available. The card can be configured and managed locally using the front-panel DIP switches or the Command Line Interface (CLI). Front-panel LEDs quickly communicate alarm and E1 line status, as well as mode of operation. Remote management is accomplished directly over either in-band DS0 management channel or via a separate SNMP network management facility.



## **Features**

- Supports up to 18 E1s (4 Quad E1s plus the two E1s natively on the controller)
- Any service connection or network access line in any slot
- Capacity for control of 48 analog voice lines, 40 ISDN BRIIs, 18 E1s, or 12 V.35s in an Adit 600 chassis
- Includes integration of Dual E1 functionality and Ethernet SNMP management
- Remote SNMP GUI or Telnet provisioning, monitoring, and testing of services and network
- Supports VoIP (MGCP) services through the Customer Media Gateway (CMG) Service Card
- Supports VoIP (SIP), VPN routing, and T.38 Fax Relay services through the Multi-Service Router (MSR) Service Card. **NOTE: E1 support is scheduled for a future release of the MSR card.**
- Supports PBX Redirection for SIP-to-PRI calls through the MSR card. **NOTE: E1 support is scheduled for a future release of the MSR card.**
- Supports SSH and SNMPv3
- Supports Telnet and SSH sessions to IPv4 hosts that are reachable via any of the routes in the Controller's routing table
- Supports standard E1 line loopback

## **Technical Specifications**

### **Controller Software Required**

- Release 3.2 through 9.4 to support an E1 Controller card.

### **Product Includes**

- Built-in non-blocking 512 DS0 digital cross-connect system
- Voice and Data on the same E1
- Integral dual E1 ports that support drop-and-insert applications
- RFC 2495 performance monitoring statistics
- Front-panel LED indicators for E1 status, major and minor alarms, remote/local management mode, and Alarm Cut-Off status
- Controller support for IP router card code download through its Ethernet management port
- Configurations automatically stored in non-volatile memory
- Secure Shell (SSH) and Secure Copy (SCP)
- SNMPv3

### **Management**

- Local
  - Simple setup using front panel DIP switches for channel bank applications
  - RS-232 craft port interface drives up to 50 ft. (15.24 m) cable, and provides a Command Line Interface (CLI) using ASCII terminal or PC with terminal emulation software, modem using XMODEM or PPP sessions
- Remote
  - 10Base-T Ethernet management port provides
    - Local IP management connectivity
    - RJ-45 connector mounted on rear panel of chassis
    - 10Base-T link LED status indicator
    - IP management over a dedicated DS0 bearer channel
- Integrated TFTP client for remote download of controller software upgrades
- SNMP agent, supporting MIB objects:
  - RFC 1213 (MIB-II)
  - RFC 2011 (IP-MIB)
  - RFC 2494 (DS0-MIB)
  - RFC 1659 (V.35)
  - RFC 2233 (IF-MIB)
  - RFC 2495 (DS1/E1-MIB)
  - RFC 1907 (SNMPv2-MIB)
- CLI offers three levels of password controlled security
- Performance Report Messages

## **Network E1 Interface**

- Selectable single or dual E1 ports operating at 2.048 Mbps  $\pm$ 100 bps
- Expansion to 18 E1s in a single chassis using Quad DS1/E1 Service cards
- E1 Double Framed and E1 Multi-Frame (CRC-4) framing
- AMI or HDB3 line coding
- Generic R2, no signaling and CAS signaling options
- Loop Up (on)/ Loop Down (off) line loopback settings
- 24-hour or 15-minute performance threshold
- Integrated CSU function
- Receive sensitive (DS1): 0 to -22.5 dB
- Two RJ-48C connectors on rear panel of chassis
- Solid-state (fuseless) overvoltage and overcurrent protection

## **Service Interfaces Supported**

- IP Router card
- Customer Media Gateway (CMG) Service card
- Multi-Service Router (MSR) Service card. **NOTE: E1 support is scheduled for a future release of the MSR card.**
- Terminal Server Router (TSR) Service card
- 4-Wire E&M/TO Service card
- FXO Voice Service card
- FXS 8-channel Voice Service cards
- ISDN BRI 2, 4 and 8-channel Service cards (3 DS0 mode only)
- Dual V.35 and V.35/V.54 Service cards
- Quad T1 Service card
- Quad E1 Service card
- Quad DS1/E1 Service card (T1 or E1 mode)
- Quad DS1 ADPCM Service card
- Single Channel POTS Service card

## **Network Standards**

- ITU-T G.703, G.704, G.821/G.823
- CTR 12 & 13

### **Clocking**

- E1 network loop timing
- E1 transmit circuits derive timing from 8.192 MHz backplane
- Revertive clock switching provides automatic backup to secondary E1 should the primary E1 fail
- Operates as a Stratum 4E device

### **Alarms**

- E1 alarms per ITU-T G.732
- One major and one minor alarm output
- One alarm input
- Alarm contacts accessible from external alarm connector
- All alarms are logged in an event log
- Loss of AC power triggers minor alarm
- Generates SNMP traps for alarming (MIB objects)

### **Testing and Diagnostics**

- Standard E1 line loopbacks
- Integrated FXS/GS loop testing
- RFC 2495 performance history

### **Power Consumption**

- 4 W maximum

### **Regulatory Approvals**

See *Appendix A, Regulatory Approvals* for information on the E1 Controller card.

### **Physical**

- Dimensions: 3.5 in. (H) x 1 in. (W) x 11.25 in. (D)  
8.9 cm (H) x 2.5 cm (W) x 28.6 cm (D)
- Weight: 5.7 oz. (.16 kg)

For information on Adit 600 Environment required, see *Installation Environment on page 2-2*.

## **Configuration**

Options on the E1 Controller card are set by the DIP switches or Command Line Interface (CLI).

**NOTE:** The default IP address for the Adit Controller is 10.0.0.10.

### **CLI Commands**

The following commands are used to configure the E1 Controller card. For detailed information on these commands, see *Chapter 5, CLI Commands*.

- *connect*  
Creates two-way connections between channels
- *disconnect*  
Removes a connection created by the connect command
- *set clock*  
Sets the primary and secondary transmit clock
- *set date*  
Sets the date for the system
- *set (e1)*  
Sets up the E1 interfaces (up, down, framing, line, linecode and signaling)
- *set notes*  
Allows configuration notes to be added and displayed as comments in the *print config* output.
- *show (e1)*  
Displays current settings for E1 (up, down, framing, line coding, loop back and signaling)
- *status (e1)*  
Displays the status of the E1 (receive, transmit and loopback)

## DIP Switch Settings

On the front of the E1 Controller card there are DIP switches to configure your Adit 600 locally.

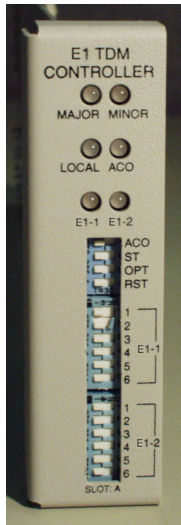


0 (Off) 1 (On)

Switch	Function	Description
ACO	Alarm Cut Off	<b>0</b> = Alarm contacts enabled (close when alarm occurs). <i>Default.</i> <b>1</b> = Alarm contacts disabled (open).
ST	Self Test	<b>0</b> = Normal operation. <i>Default.</i> <b>1</b> = Perform Self Test.
OPT	Spare	
RST	Reset	<b>0</b> = User-configured operation. <i>Default.</i> <b>1</b> = Reset configuration to defaults, and reset CLI password.
E1-1 E2-1	Line Coding	<b>0</b> = HDB3. <i>Default.</i> <b>1</b> = AMI
E1-2 E2-2	Line Loopback	<b>0</b> = Loopback off. <i>Default.</i> <b>1</b> = Loopback on
E1 3 E2 3	Framing	<b>0</b> = E1 16 frame with CRC-4. <i>Default.</i> <b>1</b> = E1 (Dual Frame)
E1 4/E2 4	Spare	
E1 5/E2 5	Spare	
E1 6/E2 6	Spare	

## LEDs

The E1 Controller has a set of six LEDs. The table below describes each LED.



LED	State	Description
MAJOR	Off	No major alarms present
	Red	Major alarm present
MINOR	Off	No minor alarms present
	Yellow	Minor alarms present
LOCAL	Off	Remote mode (DIP switches disabled)
	Green	Local mode (DIP switches enabled)
ACO	Off	Normal mode. No alarms are being suppressed.
	Yellow	Alarm Cut Off active. One or more active alarms suppressed.
E1-1 and E1-2	Off	Off line
	Green	Normal
	Red	Loss of Signal (LOS) detected
	Yellow	Bipolar Violation (BPV) detected, LCV
	Flashing Green	Loopback active
	Flashing Red (slow)	Loss of Frame (LOF) or Alarm Indication Signal (AIS) detected
	Flashing Red (fast)	Card Failure
	Flashing Yellow	Yellow alarm (Remote Alarm Indication) detected.

## ***E1 Controller Card***

*LEDs*

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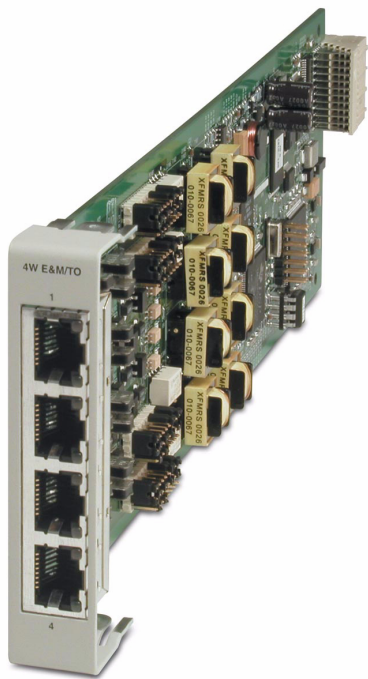
# CHAPTER 8

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## ***4-Wire E&M/TO Card***

### **In this Chapter**

- Overview
- Features
- Technical Specifications
- Card Configuration
  - CLI Commands
- LEDs
- Connector Pinouts
  - RJ-45 Connector
- Operating Modes
- Signaling Types
- Jumpers Settings
- Normal and Tandem Cables



# Overview

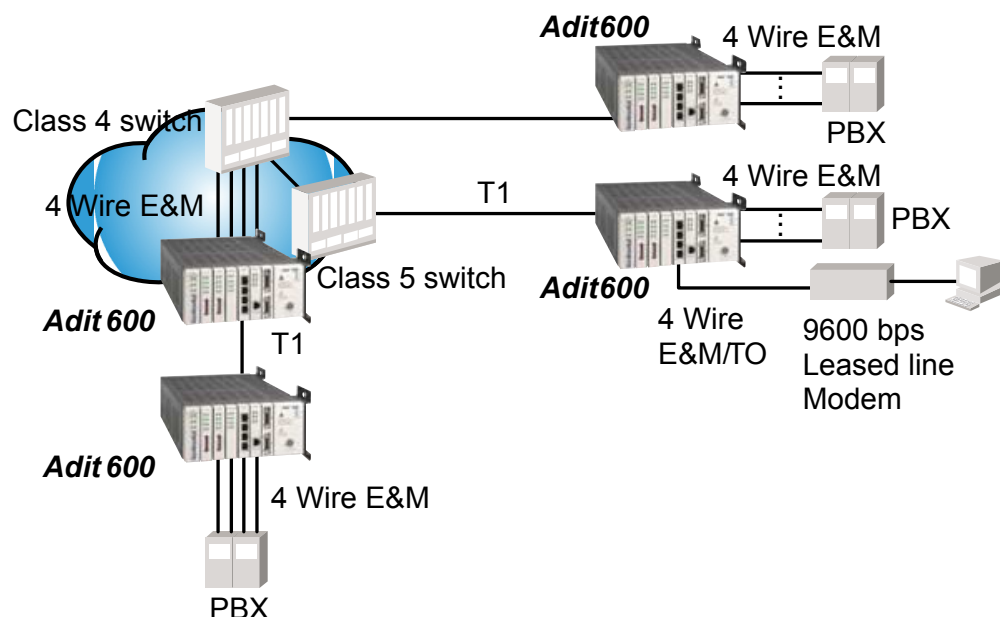
**NOTE:** E1 is not supported in this release of the Adit 600 Controller. It will be supported in a future release.

The Quad 4-Wire E&M/TO (Transmit Only) Service Card is a cost-effective way to incrementally add E&M or TO voice support to the Adit 600 Multi-Service Delivery Terminal platform. Operating in any of the Adit 600's six service card slots, the 4-Wire E&M/TO Card offers industry-leading E&M density, providing four analog voice connections for interfacing with the telephone network over a T1 or E1 access facility. Applications include: connecting off-premises telephone extensions to a main PBX; inter-toll trunk connections for analog central offices; TO connections for inter-office voice traffic; and Pulse Link Repeater circuits for trunk-to-analog connections.

The 4-Wire E&M/TO Card provides four analog voice connections with standard 8-pin (RJ-45) jacks - one for each analog port. The card maps the four analog voice ports from 4-wire radios, telephone switches, or data modems into four DS0 time slots of a T1 or E1 access link. The four analog connections can support telephone key systems, PBXs, radio systems and E&M trunk lines for providing off-premises extension, access to the PSTN, or radio dispatch applications.

The ports also provide 4-wire capability for interfacing with up to four analog leased line modems, radios, or analog mobile radios. No signaling is performed when configured as a TO interface, thereby optimizing modem performance.

The 4-Wire E&M/TO Card may be configured to provide an interface to on premises 4-wire trunk circuits employing single Type I, II, III, IV or V E&M lead signaling. Flexibility for voice applications over T1 lines is enabled utilizing Channel Associated Signaling (CAS). When the 4-Wire E&M/TO Card analog channels are configured for E&M operation, they can be used as an E&M interface between 4-wire trunk circuits employing standard E&M signaling. It is designed for use in exchange, extended area service, toll connecting, and inter-toll trunk applications. When configured for Pulse Link Repeater (PLR) operation, the channels provide the capability to interface with another carrier channel that is terminated with an E&M channel unit.



## **Features**

- Transmit and Receive gain/loss configurable per channel
- RX gain range 16/-8.5 dB, TX gain range -7/+17.5 dB per G.712 paragraph 2.1
- Mix E&M and TO services on same Service CardForward and reverse loopbacks
- Allows digital cross-connection (DCS) of all timeslots to any T1/E1 port

## **Technical Specifications**

### **Controller Software Required**

#### **T1 Controller**

- Release 8.0 or higher is required for the 4-Wire E&M/TO service card

#### **E1 Controller**

- Release 9.4 is required for the 4-Wire E&M/TO service card
  - $\mu$ -Law only

### **E&M/TO Interface**

- 4 Selectable E&M/TO ports
- System capacity: 6 Quad 4-Wire E&M/TO Service cards
- Front access RJ-45 (8-pin) connectors
- Impedance in each Tip/Ring pair 600 $\Omega$
- Maximum signaling lead resistance equipment to equipment is 150 $\Omega$
- Meets ANSI Standard T1.409.2002
- Signaling Type I, II, III, IV, and V
- Normal/Tandem/TO Modes
- Transmit and Receive gain/loss configurable per channel

### **Transmission Performance**

- Receive channel idle noise  $\leq 18$  dBmCO
- Transmit channel idle noise  $\leq 22$  dBmCO
- Terminating impedance: 600  $\Omega$
- Loop range: 150  $\Omega$  per conductor
- Receive gain: adjustable from 16 dB to -8.5 dB in .25 increments
- Transmit gain: adjustable from -7 dB to 17.5 dB in .25 increments

### **Network Standards**

- ANSI T1.409.2002
- RX gain range -16/+8.5 dB. TX gain -7/+17 dB per G.712 paragraph 2.1

### Clocking

- Loop timed from any T1/E1

### Alarms

- Card removal/Detection logged in an event log
- Generates removal/detection SNMP traps for alarming

### Power

- Less than 4.5 W per card

### Regulatory Approvals

See *Appendix A, Regulatory Approvals* for information on the 4-Wire E&M Service card.

### Physical

- Dimensions: 3.5 in. (H) x 0.75 in. (W) x 11.25 in. (D)  
8.9 cm (H) x 1.9 cm (W) x 28.6 cm (D)
- Weight: 5.1 oz. (0.14 kg)

For information on Adit 600 Environment required, see *Installation Environment on page 2-2*.

## Card Configuration

The 4-Wire E&M Service cards can be configured, using the Command Line Interface (CLI).

### CLI Commands

The following commands are used to configure the 4-Wire E&M Service card. For detailed information on these commands, see *Chapter 5, CLI Commands*.

- *connect*  
Creates two-way connections between channels.
- *disconnect*  
Removes a connection created by the connect command.
- *set (4-wire e&m)*  
Configure the E&M channels (RX gain, signal, TX gain and type).
- *show (4-wire e&m)*  
Displays the current settings for a 4-Wire E&M card (Type, RX gain, TX gain and signaling)
- *status (4-wire e&m)*  
Displays the current status of a 4-Wire E&M channel or card (port /channel, RX, TX and signal).

## LEDs

Each channel/port has two LEDs. Only the top LED is used in this application. LED definitions are listed below.

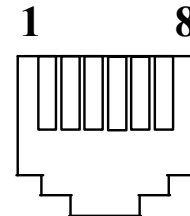


State	Description
<b>When in E&amp;M Mode</b>	
Off	Channel is idle or disabled
Green	Analog interface is off-hook
Red	Digital interface is off-hook
Yellow	Both analog and digital interfaces are off-hook, or channel is being trunk processed
<b>When in TO Mode</b>	
Off	Disconnected
Green	Connected, T1/E1 not in alarm
Yellow	Connected, T1/E1 in alarm (trunk processed)

## Connector Pinouts

### RJ-45 Connector

There are four RJ-45 (female) connectors on the front of the 4-Wire E&M Service card. The pinouts are as follows:



Normal Mode			Tandem Mode		
Pin	Name	Description	Pin	Name	Description
1	SG (Signal Ground)	Green	1	SB (Signal Battery)	Brown
2	E	White/Green	2	M	White/Brown
3	R1	Orange	3	R1	Orange
4	R	Blue	4	R	Blue
5	T	White/Blue	5	T	White/Blue
6	T1	White/Orange	6	T1	White/Orange
7	M	White/Brown	7	E	White/Green
8	SB (Signal Battery)	Brown	8	SG (Signal Ground)	Green

**NOTE:** When in TO Mode either cable can be used, as the TO mode uses only pins 3-6 and these pins have the same assignment on both cables.

## **Operating Modes**

There are 3 mode types for the 4-Wire E&M/TO card, and can be set on a per port basis.

### **Normal Mode**

In normal mode the card is operating as Channel Equipment (normal multiplexer mode). Normal mode is the default mode for this card.

### **Tandem Mode**

In Tandem Mode the card is operating as Switching Equipment for back-to-back tandem applications (sometimes referred to as Reverse E&M or Pulse Link Repeater).

### **TO (Transmit Only) Mode**

The Transmission Only (TO) mode provides dedicated 4-Wire transmit and receive signals to radio and modem equipment. Transmission Only uses the identical 4-Wire E&M physical interface, but suppresses the A/B bit-robbled signaling, maximizing the transmission performance per channel for dedicated operations.

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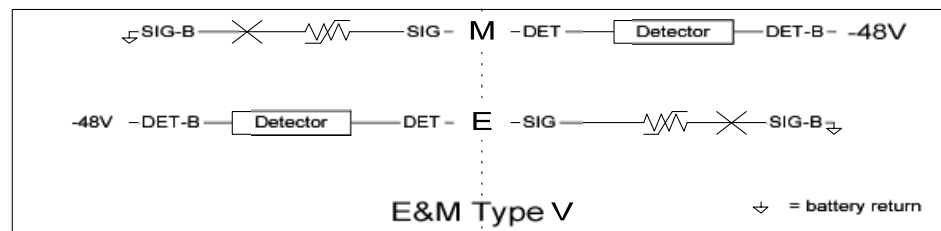
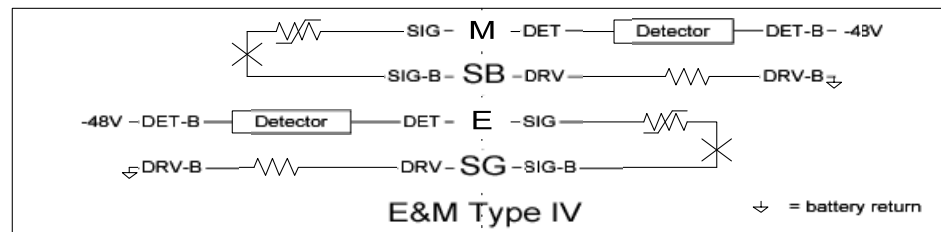
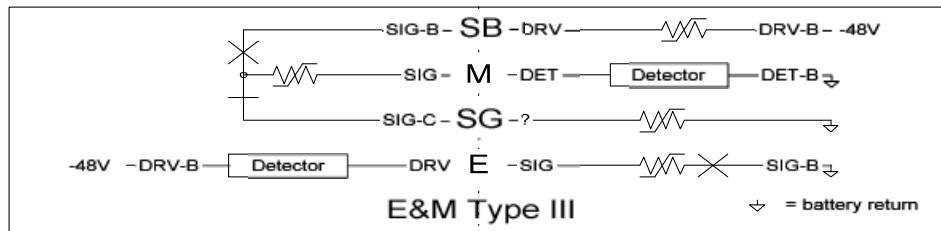
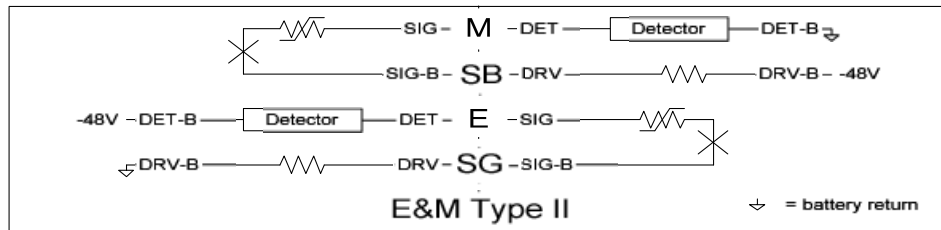
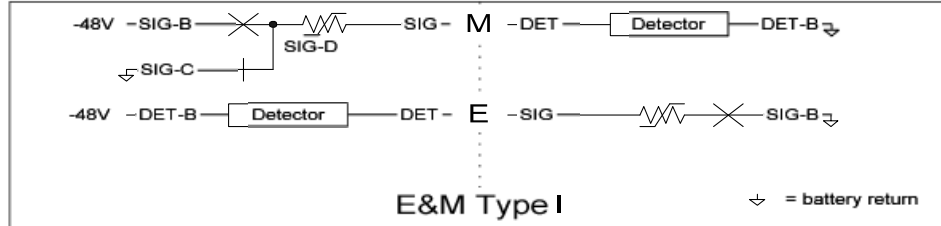
**NOTE:** For each of these mode there is a corresponding jumper setting and cable. Please see the following section for additional information.

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## Signaling Types

The 4-Wire E&M/TO card supports Signaling Types I, II, III, IV and V. The default is Type I.

Tandem Mode  
(Originating Equip)  
(Switching Equip)  
(Side A)

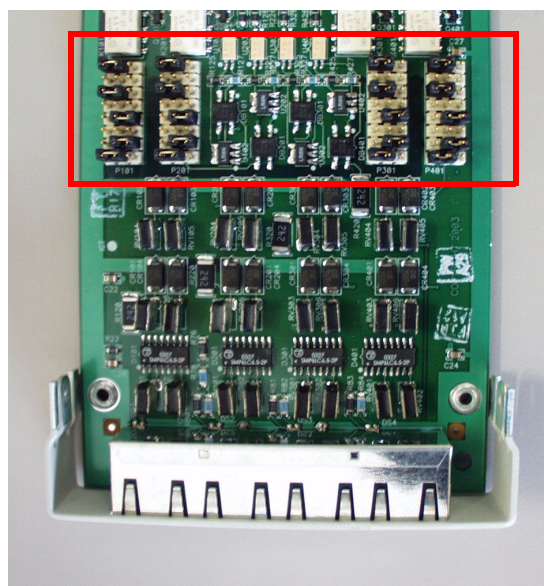


Normal Mode  
(Terminating Equip)  
(Channel Equip)  
(Side B)

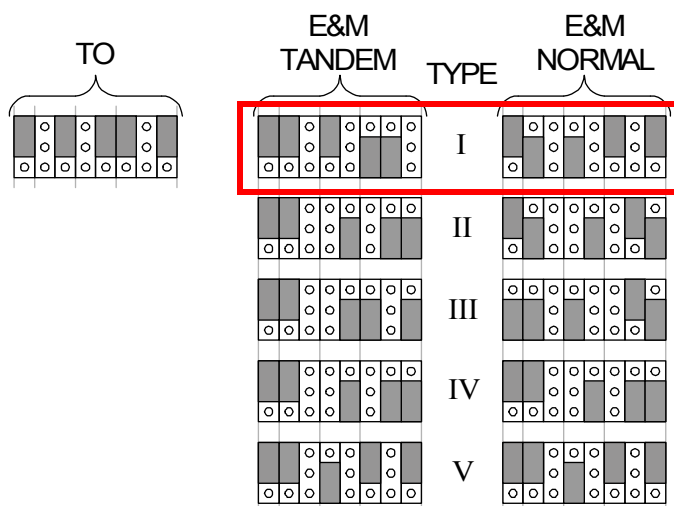
## Jumpers Settings

The 4-Wire E&M/TO service card is equipped with jumpers to set the Mode (Normal, Tandem or TO), and the Signaling Type for the Normal and Tandem modes (Signaling Types I, II, III, IV and V). The default setting is E&M Normal, Signaling Type I.

There is a set of jumpers for each port (channel). The following graphics show the location of the jumpers on the card, and the settings for all options.



Front of Service Card



## Normal and Tandem Cables

For the E&M/TO card two cables are available to meet the Normal and Tandem Modes. These cables are as follows:

4-Wire E&M/TO Service Card Cables	
P/N	Description
005-0216-0001	Normal Mode Cable. 10 Feet, RJ-45 8 position connector.
005-0217-0001	Tandem Mode Cable. 10 Feet, RJ-45 8 position connector.

**NOTE:** When in TO Mode either cable can be used.



# CHAPTER 9

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## ***FXO Voice Card***



### **In this Chapter**

- Overview
- Features
- Technical Specifications
- Card Configuration
  - CLI Commands
  - DIP Switch Settings
- LEDs
- Channel Associated Signaling (CAS) Conversions

## **Overview**

The FXO Voice Service card provides high-density provisioning of reliable Foreign Exchange Office (FXO) or Direct Inward Dialing (DID) telephone services. Eight FXO or Dial Pulse Terminate (DPT) telephone line channels can be deployed on each FXO Service card. These cards can be inserted into any slot of the Adit 600 six-slot chassis, and up to 96 lines in two side-by-side chassis occupying just two rack units of space.

The FXO function sinks battery current and detects ringing voltage originating from the central office or PBX line, enabling the transport of dial tone and calling features to remote locations. When configured as a DPT interface, the channels sink and detect forward and reverse line current, emulating the functions of a central office DID line. DID service provides the necessary dialed digits to ring a telephone extension directly through a PBX, without requiring attendant intervention. DPT and FXO functions are also used with Automatic Call Distributor (ACD), voice mail, and Computer Telephony Integration (CTI) applications.

A unique range of software-controlled signaling capabilities connects virtually any type of 2-wire battery-sink telephone line service. Supported features include caller ID, calling party disconnect, distinctive ringing, ground start, and E&M signaling conversion. Automatic impedance balancing provides echo-free service connections across a wide range of customer equipment and line conditions. V.90 transmission ensures optimal dial-up modem performance.

As a component of the Adit 600 platform, the FXO Service card has several local and remote management options available through the Adit 600 Controller. The card can be locally configured and managed using the front-panel DIP switches or the Command Line Interface (CLI). Front-panel LEDs indicate call progress and channel status. Remote management is accomplished either through the Access Navigator over the Facility Data Link (FDL) or an in-band dedicated DS0.

## Features

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**NOTE:** E1 is not supported in this release of the Adit 600 Controller. It will be supported in a future release.

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- Delivers FXO or DID telephone services from T1 or E1 access circuits
- Supports CLASS services including Caller ID, Calling Party Disconnect and Distinctive Ringing
- Provides up to 48 FXO or DPT voice lines in one chassis, or up to 96 lines in two side-by-side Adit 600s occupying two rack units of equipment space (19 in. rack)
- Complies with NEBS Level 3 standards for loop range and ringing protection for end office and customer premises
- Offers fuseless overvoltage and overcurrent protection to minimize service calls from lightning and power cross incidents

## Technical Specifications

### Controller Software Required

#### T1 Controller

- Release 1.2.2 or higher is required

#### E1 Controller

- Release 9.4 is required
  - $\mu$ -Law only

### FXO Transmission Performance

- Return Loss: ERL > 26 dB, SRL > 18 dB with respect to  $900\Omega + 2.16\mu\text{F}$
- Transhybrid Loss: ERL > 26 dB, SRL > 18 dB with respect to  $900\Omega + 2.16\mu\text{F}$
- Idle Noise: A/D < 16 dBmC0, D/A, 12 dBmC0
- Crosstalk Coupling: < 70 dB at 0 dBm0
- Signal/Distortion: > 35 dB with 1004 Hz, 0 dBm0 input
- Overload: +3.0 dBm/900 $\Omega$
- Frequency Response: +0.3 dB -1.0 dB from 300 to 3400 Hz
- Encoding:  $\mu$ -law 255 for U.S. and Canada as defined in CCITT G.711 and G.712
- Terminating Impedance:  $900\Omega + 2.16\mu\text{F}$
- Transmit Gain/Loss: +7 to -9 dB, switch selectable per card
- Receive Gain/Loss: +7 to -9 dB, switch selectable per card
- Modem Support: Full compatibility with V.90 modems

## **FXO Signaling Performance**

- DC Loop Range: > 1600 $\Omega$  loop or ground start
- Ringer Equivalency Number (REN): 0.4B (AC)
- Ringing Voltage Detection: detects Class A ringing follows distinctive ringing
- FXO DC Resistance: 100 $\Omega$
- Maximum DC: 150 mA
- Overvoltage: UL 1950, FCC Part 68 lightning protection
- Overcurrent: 600 V rms, 60 Amps
- Protection: solid-state (fuseless) overvoltage and over current protection
- Termination Type: FXO loop start or ground start, switch selectable per card or via management interface per channel
- Signaling Selection: DPT functionality enabled/disabled on all 8 channels
- Address Signaling: DTMF or dial pulse
- Calling Party Disconnect: detects and forwards current interruption to disconnect answering devices and modems

## **Regulatory Approvals**

See *Appendix A, Regulatory Approvals* for information on the FXO Service card.

## **Physical**

- Connections made on RJ21-X telco connector rear panel
- Dimensions: 3.5 in. (H) x 0.75 in. (W) x 11.25 in. (D)  
8.9 cm (H) x 1.9 cm (W) x 28.6 cm (D)
- Weight: 9.1 oz. (.26 kg)

For information on Adit 600 Environment required, see *Installation Environment on page 2-2*.

## Card Configuration

The FXO voice card can be configured, using DIP switches on the card, to support either FXO loop start or FXO ground start signaling, with various transmit and receive attenuation options.

Note that the attenuation settings you configure via DIP switches apply to all eight channels on a card. If you want different attenuation options for individual channels, use the Command Line Interface to configure your FXO channels.

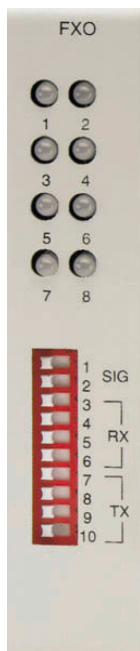
### CLI Commands

The following commands are used to configure the FXO card. For detailed information on these commands, see *Chapter 5, CLI Commands*.

- *connect*  
Creates two-way connections between channels
- *disconnect*  
Removes a connection created by the connect command
- *set (fxo)*  
To setup the voice channels parameters (rx gain, signal, tx gain)
- *show (fxo)*  
Displays the settings (type, signaling, RxGain, TxGain) for the FXO
- *status (ds0)*  
Displays the status (AB bits received, AB bits transmitted, signal, trunk processing) of the DS0s (AB Bit Monitoring)
- *status (fxo)*  
Displays the status (AB bits received, AB bits transmitted, signal, T1/E1 activity, trunk processing) of the specified FXO (AB Bit Monitoring)

## DIP Switch Settings

Each FXO card contains ten DIP switches that can be used to select signaling options for all eight channels.



Switch	Function	Description	Note
1-2	Signal Type	1 2 <b>0 0</b> = FXO Loop Start <b>1 0</b> = FXO Ground Start <b>0 1</b> = DPT (use with E&M setting on T1) <b>1 1</b> = FXO Loop Start with Calling Party Disconnect	
3-6	Receive Gain/Loss	3 4 5 6 <b>0 0 0 0</b> = 0 dB <b>0 0 0 1</b> = -9 dB <b>0 0 1 0</b> = +2 dB <b>0 1 0 0</b> = +3 dB <b>1 0 0 0</b> = +4 dB	These settings allow for receive gain and losses of -9, -7, -6, -5, -4, -3, -2, 0, 2, 3, 4, 5, 6, and 7. <b>+9 (1110) is not available.</b>
7-10	Transmit Gain/Loss	7 8 9 10 <b>0 0 0 0</b> = 0 dB <b>0 0 0 1</b> = -9 dB <b>0 0 1 0</b> = +2 dB <b>0 1 0 0</b> = +3 dB <b>1 0 0 0</b> = +4 dB	These settings allow for transmit gain and losses of -9, -7, -6, -5, -4, -3, -2, 0, 2, 3, 4, 5, 6, and 7. <b>+9 (1110) is not available.</b>

## LEDs

Each FXO port on a card has its own LED, described in the table below.

State	Loop Start Meaning	Ground Start Meaning	Dial Pulse Termination Meaning
Off	N/A	Idle (tip open)	Idle (loop open)
Green	Idle	Tip ground (incoming seizure)	Incoming seizure
Red	N/A	Ring ground (outgoing seizure)	Loop closure (outgoing seizure)
Yellow	Call in progress	Call in progress	Call in progress (reverse battery)
Flashing green	Ringling	Ringling	N/A

## Channel Associated Signaling (CAS) Conversions

**NOTE:** E1 is not supported in this release of the Adit 600 Controller. It will be supported in a future release.

Cross-connects are done at a DS0 level. The following rules need to be kept in mind while performing cross-connects for a FXO voice card.

DS0	FXO Analog			
	LS	GS	DPT	LSCPD
<b>E1 DS0</b>				
LS	Y	N	N	Y
<b>VoIP Port</b>				
CMG LS	N	N	N	N
CMG GS	N	N	N	N
<b>T1 DS0</b>				
LS	Y	N	N	Y
GS	N	Y	N	N
EMDW	N	N	N	N
EMI	N	N	Y	N
EMICPD	N	N	N	N
EMW	N	N	N	N

DPT = Dial Pulse Termination

EMDW = E&M Delayed Wink start

EMI = E&M Immediate start

EMICPD = E&M Immediate Start with Calling Party Disconnect

EMW = E&M Wink start

GS = Ground Start

GSRB = Ground Start with Reverse Battery

LS = Loop Start

LSCPD = Loop Start Calling Party Disconnect

LSRB = Loop Start with Reverse Battery

VoIP = Voice over IP

## ***FXO Voice Card***

### ***Channel Associated Signaling (CAS) Conversions***

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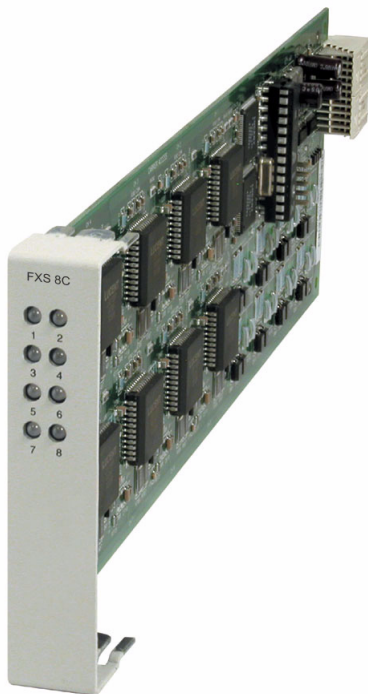
# CHAPTER 10

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## ***FXS Voice Card***

### **In this Chapter**

- Overview
- Features
- Technical Specifications (FXS 8D)
- Card Configuration
  - CLI Commands
- LEDs
- Channel Associated Signaling (CAS) Conversions
- Previous FXS Cards
  - Technical Specifications (Previous FXS Cards)
  - DIP Switch Settings
  - LEDs
  - Identifying FXS 4G and 5G Cards



## Overview

The FXS 8D 8-Channel voice Service card provides support for high-density provisioning of reliable telephone services and the ability to perform FXS remote line testing. GR-909 loop tests are supported, minimizing diagnostic and down time. The FXS 8D card includes Calling Party Disconnect (CPD) timing parameterization. CPD provisioning is provided through CLI and SNMP management functions. The FXS 8D also includes a high-power ringing mode and the ability to go to distances of 24,000 feet with optimal conditions.

An Adit 600 platform can be equipped with up to six FXS 8D cards to deliver up to 48 FXS telephone lines. The lines can be configured as FXS loop-start or ground-start interfaces, which can be used to deploy either external phone lines, or on-premises customer business line services from T1 access lines.

A unique range of software-controlled signaling capabilities designed into the FXS voice service cards connect virtually any type of 2-wire battery-feed telephone line service. Supported features include caller ID, calling party disconnect, distinctive ringing, ground start, and E&M signaling conversion. V.90 transmission is supported for optimal dial-up modem performance.

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**WARNING! THE FXS POTS INTERFACES ARE INTENDED TO BE PROTECTED FROM INCIDENTAL LIGHTNING OR AC POWER LINE CROSS WITH EXTERNAL 3MIL CARBON BLOCKS OR EQUIVALENT WHEN CONNECTING TO EXPOSED OFF-PREMISE COMMUNICATION CONDUCTORS. IT WILL BE THE RESPONSIBILITY OF THE INSTALLER TO UTILIZE THE APPROPRIATE PRIMARY PROTECTION AND INSTALLATION REQUIREMENTS PER NATIONAL ELECTRIC CODE OR THE NETWORK AUTHORITY.**

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## Features

- Provides overvoltage and overcurrent protection to minimize service calls from lightning and power cross incidents
- Minimizes power consumption for high-density service delivery with automatic battery voltage switching
- Provides up to 48 FXS voice lines in one chassis or up to 96 lines in two side-by-side Adit 600s occupying just two rack units of equipment space (19-inch rack)
- Ringing voltage/cadence generation and ring trip detection
- Loop hold and programmable impedance and termination for international compliance
- Selectable  $\mu$ -Law and A-Law encoding
- Provides integrated GR-909 line test capabilities
- Supports migration from TDM to VoIP service delivery while preserving existing capital investment

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**NOTE:** From Release 6.1.2 and higher, the FXS card will provide a fast busy indication if a subscriber is off hook and the supporting T1 DS0 is in a trunk processing state.

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## Technical Specifications (FXS 8D)

**NOTE:** E1 is not supported in this release of the Adit 600 Controller. It will be supported in a future release.

### Controller Software Required

#### T1 Controller

- Release 9.7 or higher is required for the FXS 8D Service card

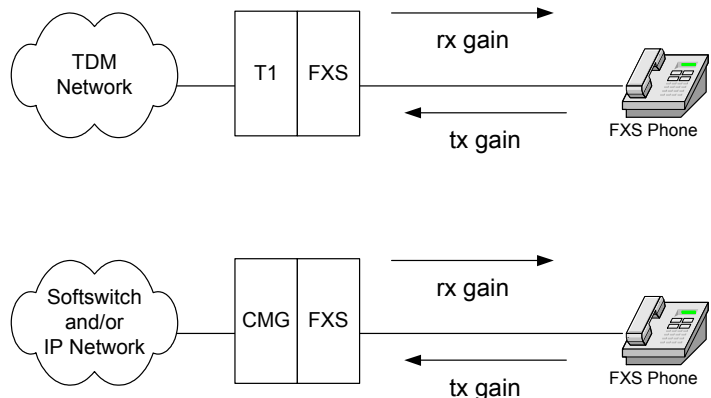
#### E1 Controller

- Release 9.7 is required for the FXS 8D Service card
  - A-Law and  $\mu$ -Law supported

**NOTE:** The following specifications are specific to the FXS 8D. For specific specifications on the other FXS cards, see *Technical Specifications (Previous FXS Cards)* on page 10-10.

### FXS Transmission Performance

- Return Loss: ERL > 19 dB, SRL > 11 dB with respect to  $900\Omega + 2.16\mu\text{F}$
- Transhybrid Loss: THL @ 1010 Hz > 23 dB, THL @ 310 Hz and 3210 Hz > 16 dB
- Idle Noise: A/D  $\leq 19$  dBmC0, D/A,  $\leq 15$  dBmC0
- Crosstalk Coupling: < 65 dBm0 at 0 dBmC0
- Signal/Distortion: >33 dB 0 to -30 dBm0  
>27 dB -30 to -40 dBm0  
>22 dB -40 to -45 dBm0
- Terminating Impedances: 19 selectable impedances
- Transmit Gain/Loss: -12 to +6 dB in .25 dB increments management selectable per channel or switch selectable per card (FXS 5G and E1-FXS only).
- Receive Gain/Loss: -12 to +6 dB in .25 dB increments management selectable per channel or switch selectable per card (FXS 5G and E1-FXS only).
- Overload:  $\leq .5$  dB loss @ +3 dB input level  
 $\leq 1.8$  dB loss @ +6 dB input level  
 $\leq 4.5$  dB loss @ +9 dB input level



## ***FXS Voice Card***

### *Technical Specifications (FXS 8D)*

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- Frequency Response: +0.25 dB -1.5 dB from 300 to 3400 Hz
- Longitudinal Balance: >58 dB per NEBS GR-57 and TIA-464-C
- Modem Support: Full compatibility with V.90 modems

## ***FXS Signaling Performance***

- DC Loop Range: 1700 $\Omega$
- Loop Feed: Nominal 27mA current limit with automatic battery switching
- Off-Hook Detection: Detects tip or ring currents > 14mA
- Ring Ground: Detects ring ground currents > 33mA
- Ringing Voltage: All-channel simultaneous ringing power, 85 V rms, 20 Hz
- Maximum Ringers: 5 REN, FCC Class B ringers
- Loop lengths:

Parameter	Value	Max. Loop Length Supported
DC Current Feed	20mA	24,000 ft.
Normal Ringing	3 REN	24,000 ft.
Normal Ringing	4 REN	18,000 ft.
Normal Ringing	5 REN	14,000 ft.
High-Power Ringing	4 REN	24,000 ft.
High-Power Ringing	5 REN	18,000 ft.

- Internal Ringing Cadence: Ringing cadence is 2 seconds on, 4 seconds off for E&M wink start conversion modes
- Control Technique: Solid-state with no mechanical relays
- Overcurrent: 600 V rms, 60 Amps
- Supports CLASS features (i.e. calling party ID, 3-way calling, distinctive ringing)
- Calling Party Disconnect: Calling party (forward) disconnect provides 2 second current interruption to disconnect answering devices and modems - requires E&M signaling service on the T1
- FXS Signaling: FXS loopstart or groundstart with LS/GS selection per channel
- FXSDN Signaling: E&M immediate or wink start to either loopstart or groundstart conversion with ringback tone for carrier services such as Megacom<sup>®</sup>, Flexpath<sup>®</sup>, DSS<sup>®</sup>, VPN<sup>®</sup>, VNET<sup>®</sup>, etc. Wink delay for advanced ANI/DNIS 800 number services

### ***GR-909 Line Tests***

- Hazardous potential (foreign DC voltage)
- Foreign electromotive force (foreign AC voltage)
- Resistive faults (resistance tip-ring, tip-GND (ground), ring-GND)
- Receiver off-hook (differentiated from a short tip-ring)

### ***Power***

- 15 W maximum

### ***Regulatory Approvals***

See *Appendix A, Regulatory Approvals* for information on the FXS Service cards.

### ***Physical***

- Dimensions: 3.5 in. (H) x 0.75 in. (W) x 11.25 in. (D)  
8.9 cm (H) x 1.9 cm (W) x 28.6 cm (D)
- Weight: 5.8 oz. (.16 kg)

For information on Adit 600 environment required, see *Installation Environment on page 2-2*.

## **Card Configuration**

### **CLI Commands**

The following commands are used to configure the FXS cards. For detailed information on these commands, see *Chapter 5, CLI Commands*.

- *connect*  
Creates two-way connections between channels
- *disconnect*  
Removes a connection created by the connect command
- *set (fxs)*  
To configure the FXS 4G voice channels (rx & tx gain, signal)
- *set (fxs8D/fxs8C/fxs8B/fxs8A/fxs5G)*  
To configure the FXS 8D/FXS 8C/FXS 8B/FXS 8A/FXS 5G voice channels (rx gain, tx gain, signal, impedance, wink time)
- *set (fxsINTL)*  
To configure the E1-FXS voice channels (rx gain, tx gain, signal, impedance).
- *show (fxs)*  
Displays the FXS 4G settings (type, signaling, rx gain, tx gain, line length).
- *show (fxs8D/fxs8C/fxs8B/fxs8A/fxs5G)*  
Displays the FXS 8D/FXS 8C/FXS 8B/FXS 8A/FXS 5G settings (type, signaling, rx gain, tx gain, impedance, wink time).
- *show (fxsINTL)*  
Displays the E1-FXS settings (type, signaling, rx & tx gain, impedance).
- *show impedance*  
Displays the impedance settings for the FXS 8D/FXS 8C/FXS 8B/FXS 8A/FXS 5G and E1-FXS cards.
- *status (fxs)*  
Displays the FXS 4G status (AB bits received & transmitted, signal, T1 activity, trunk processing).
- *status (fxs8D/fxs8C/fxs8B/fxs8A/fxs5G)*  
Displays the FXS status (AB bits received & transmitted, signal, T1 activity, trunk processing)
- *status (fxsINTL)*  
Displays the E1-FXS status (AB bits received & transmitted, signal, E1 activity, trunk processing)
- *test (fxs8D/fxs8C/fxs8B)*  
Tests the channels on the FXS 8D, FXS 8C, or FXS 8B Service Card. Note: only one channel can be tested at a time.

## **LEDs**

Each FXS port has a corresponding LED, described in the table below. This chart applies to all the FXS service cards.



State	Loop Start Meaning	Ground Start Meaning
Off	N/A	Idle (tip open)
Green	Idle	Tip ground (incoming seizure)
Red	Note: This can be seen with Forward Disconnect (tip open)	Ring ground (outgoing seizure)
Yellow	Call in progress	Call in progress
Flashing green	Ringing	Ringing

## Channel Associated Signaling (CAS) Conversions

**NOTE:** E1 is not supported in this release of the Adit 600 Controller. It will be supported in a future release.

Cross-connects are done at a DS0 level. The following rules need to be kept in mind while performing cross-connects for an FXS voice card.

DS0	FXS Analog			E1-FXS
	LS/LSRB	GS/GSRB	GSW/GSWRB*	R2
<b>E1 DS0</b>				
LS	Y	Y	N	N
R2	Y	Y	N	Y
<b>VoIP Port</b>				
CMG LS	Y	N	N	N
CMG GS	N	Y	N	N
<b>T1 DS0</b>				
LS	Y	Y	N	N
GS	Y	Y	Y	N
EMDW	Y	Y	N	N
EMI	Y	N	N	N
EMICPD	Y	Y	N	N
EMW	Y	Y	N	N
PLAR	Y	N	N	N
TR8LSGS	Y	Y	N	N

EMDW = E&M Delayed Wink start

EMI = E&M Immediate start

EMICPD = E&M Immediate Start with Calling Party Disconnect

EMW = E&M Wink start

GS = Ground Start

GSW = Ground Start Wink

GSRB = Ground Start with Reverse Battery

LS = Loop Start

LSRB = Loop Start with Reverse Battery

PLAR = D4 PLAR (Private Line Automatic Ringdown)

TR8LSGS = TR-08 Loop Start/Ground Start

VoIP = Voice over IP

R2 = E1 R2 Signaling

\* FXS 8D, FXS 8C, FXS 8B, FXS 8A, and FXS 5G Options



## **Previous FXS Cards**

The FXS 8D Service card supports all the features of the following cards. The following information is provided for older cards you may have installed in your Adit 600. For any additional information, contact Force10 Networks Customer Support.

### **FXS 8C**

Provides the same functions as the FXS 8D card except for the "Ring Power" capability.

### **FXS 8B**

Provides the same functions as the FXS 8C card except for the Calling Party Disconnect (CPD) timing parameterization capability.

### **FXS 8A**

The On-Premises FXS service card is optimized for connection to intra-building, non-exposed wiring.

### **FXS 5G**

The FXS 5G Voice card is designed for outdoor loops that meets the stringent requirements for off-premises loop termination with its industry-leading fuseless design.

### **FXS (4G Version)**

The original FXS Service card (4G) has the basic FXS features. This is a legacy product and is supported, but no longer available to purchase.

---

**NOTE:** The FXS (4G) and FXS 5G card faceplates are both labeled "FXS", therefore the FXS 5G card has a label on the card portion identifying it as the 5G card along with a warning of the required Controller software level.

---

### **E1 - FXS Voice Card**

The E1 FXS Voice card is a FXS 5G card with the following signaling only:

- R2 signaling for international applications

---

**WARNING!** THE INTERNATIONAL E1-FXS VOICE INTERFACES ARE INTENDED TO BE PROTECTED FROM INCIDENTAL LIGHTNING OR AC POWER LINE CROSS WITH EXTERNAL 3-ELEMENT GAS DISCHARGE TUBES OR EQUIVALENT WHEN CONNECTED TO EXPOSED OFF-PREMISE COMMUNICATION CONDUCTORS. IT WILL BE THE RESPONSIBILITY OF THE INSTALLER TO UTILIZE THE APPROPRIATE PRIMARY PROTECTION AND INSTALLATION REQUIREMENTS PER NATIONAL OR LOCAL REGULATIONS.

---

## ***Technical Specifications (Previous FXS Cards)***

### ***Controller Software Required***

#### **T1 Controller**

- Release 1.2.2 or higher is required for the FXS (4G) Service card
- Release 1.50 or higher is required for the FXS 5G Service card
- Release 6.1.1 or higher is required for the FXS 8A Service card
- Release 9.1 or higher is required for the FXS 8B Service card
- Release 9.4 or higher is required for the FXS 8C Service card
- The E1 - FXS Service card is not supported by the T1 Controller

#### **E1 Controller**

- Release 3.2 is required for FXS 5G and E1-FXS Service cards
- The FXS (4G) and FXS 8A service cards are not supported by the E1 Controller

### ***FXS Transmission Performance***

- Return Loss:
  - FXS 8B and FXS 8C: ERL > 19 dB, SRL > 11 dB with respect to  $900\Omega + 2.16\mu\text{F}$
  - FXS 8A, FXS 5G, FXS 4G, E1-FXS: ERL > 26 dB, SRL > 18 dB with respect to  $900\Omega + 2.16\mu\text{F}$
- Transhybrid Loss: THL @ 1010 Hz > 23 dB, THL @ 310 Hz and 3210 Hz > 16 dB
- Idle Noise:
  - FXS 8B and FXS 8C: A/D  $\leq$  19 dBmC0, D/A,  $\leq$  15 dBmC0
  - FXS 8A, FXS 5G, FXS 4G, E1-FXS: A/D  $\leq$  19 dBmC0, D/A,  $\leq$  14 dBmC0
- Crosstalk Coupling: < 65 dBm0 at 0 dBmC0
- Signal/Distortion: >33 dB 0 to -30 dBm0
  - >27 dB -30 to -40 dBm0
  - >22 dB -40 to -45 dBm0
- Terminating Impedances: 19 selectable impedances
- Transmit Gain/Loss:
  - FXS 8C, FXS 8B, FXS 8A, FXS 5G, E1-FXS: -12 to +6 dB in .25 dB increments management selectable per channel or switch selectable per card (FXS 5G and E1-FXS only).
  - FXS 4G: -9 to +7 dB in 1 dB increments management selectable per channel, or switch selectable per card.
- Receive Gain/Loss:
  - FXS 8C, FXS 8B, FXS 8A, FXS 5G, E1-FXS: -12 to +6 dB in .25 dB increments management selectable per channel or switch selectable per card (FXS 5G and E1-FXS only).
  - FXS 4G: -9 to +7 dB in 1 dB increments management selectable per channel, or switch selectable per card.

- Overload:  $\leq .5$  dB loss @ +3 dB input level  
 $\leq 1.8$  dB loss @ +6 dB input level  
 $\leq 4.5$  dB loss @ +9 dB input level
- Frequency Response:
  - FXS 8B and FXS 8C: +0.25 dB -1.5 dB from 300 to 3400 Hz
  - FXS 8A, FXS 5G, FXS 4G, E1-FXS: +0 dB -1.0 dB from 310 to 3210 Hz
- Longitudinal Balance:
  - FXS 8B and FXS 8C: >58 dB per NEBS GR-57 and TIA-464-C
  - FXS 8A, FXS 5G, FXS 4G, E1-FXS: >63 dB per IEEE 455 and NEBS GR-57
- Modem Support: Full compatibility with V.90 modems

### ***FXS Signaling Performance***

- DC Loop Range:
  - FXS 8B and FXS 8C: 1700 $\Omega$
  - FXS 8A, FXS 5G, FXS 4G, E1-FXS: 1250 $\Omega$
- Loop Feed: Nominal 27mA current limit with automatic battery switching
- Off-Hook Detection:
  - FXS 8B and FXS 8C: Detects tip or ring currents > 14mA
  - FXS 8A, FXS 5G, FXS 4G, E1-FXS: Detects tip or ring currents > 6mA
- Ring Ground:
  - FXS 8B and FXS 8C: Detects ring ground currents > 33mA
  - FXS 8A, FXS 5G, FXS 4G, E1-FXS: Detects ring ground currents > 8mA
- Ringing Voltage: All-channel simultaneous ringing power, 85 V rms, 20 Hz
- Maximum Ringers:
  - FXS 8B and FXS 8C: 5 REN, FCC Class B ringers
  - FXS 8A, FXS 5G, FXS 4G, E1-FXS: 2.5 REN, FCC Class B ringers
- Internal Ringing Cadence: Ringing cadence is 2 seconds on, 4 seconds off for E&M wink start conversion modes
- Control Technique: Solid-state with no mechanical relays
- Overcurrent: 600 V rms, 60 Amps
- Supports CLASS features (i.e. calling party ID, 3-way calling, distinctive ringing)
- Calling Party Disconnect: Calling party (forward) disconnect provides 2 second current interruption to disconnect answering devices and modems - requires E&M signaling service on the T1
- FXS Signaling: FXS loopstart or groundstart with LS/GS selection per channel
- FXSDN Signaling: E&M immediate or wink start to either loopstart or groundstart conversion with ringback tone for carrier services such as Megacom<sup>®</sup>, Flexpath<sup>®</sup>, DSS<sup>®</sup>, VPN<sup>®</sup>, VNET<sup>®</sup>, etc. Wink delay for advanced ANI/DNIS 800 number services

## Regulatory Approvals

See *Appendix A, Regulatory Approvals* for information on the FXS Service cards.

## Physical

- Dimensions: 3.5 in. (H) x 0.75 in. (W) x 11.25 in. (D)  
8.9 cm (H) x 1.9 cm (W) x 28.6 cm (D)
- Weight: FXS 4G - 9.6 oz. (.27 kg)  
FXS 8C, FXS 8B, FXS 8A, FXS 5G, and E1-FXS - 5.8 oz. (.16 kg)

For information on Adit 600 environment required, see *Installation Environment* on page 2-2.

## DIP Switch Settings

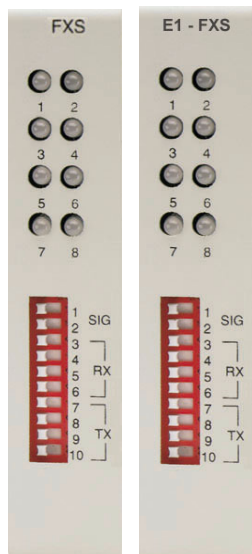
**Note:** DIP Switches are only on the following FXS Voice Service cards:

- FXS (4G)
- FXS 5G
- E1-FXS

The DIP switches on the card, to support either FXS loopstart or FXS groundstart signaling, with various transmit and receive attenuation options (the FXS 8A does not have any DIP switches).

Note: The attenuation settings configured via DIP switches apply to all eight channels. For different attenuation options for individual channels, use the CLI.

Switch	Function	Description	Note
1-2	Signal Type	1 2	
		0 0 = FXS Loop Start 1 0 = FXS Ground Start	FXS and FXS5G card Note: FXS 8A has no DIP Switches
		00 = R2	E1-FXS card
3-6	Receive Gain/Loss	3 4 5 6	These settings allow for receive gain and losses of -9, -7, -6, -5, -4, -3, -2, 0, 2, 3, 4, 5, and 6.
		0 0 0 0 = 0 dB 0 0 0 1 = -9 dB 0 0 1 0 = +2 dB 0 1 0 0 = +3 dB 1 0 0 0 = +4 dB	<b>+9 (1110) is not available.</b> Maximum setting on the 5G is +6 dB.
7-10	Transmit Gain/Loss	7 8 9 10	These settings allow for transmit gain and losses of -9, -7, -6, -5, -4, -3, -2, 0, 2, 3, 4, 5, and 6.
		0 0 0 0 = 0 dB 0 0 0 1 = -9 dB 0 0 1 0 = +2 dB 0 1 0 0 = +3 dB 1 0 0 0 = +4 dB	<b>+9 (1110) is not available.</b> Maximum setting on the 5G is +6 dB.

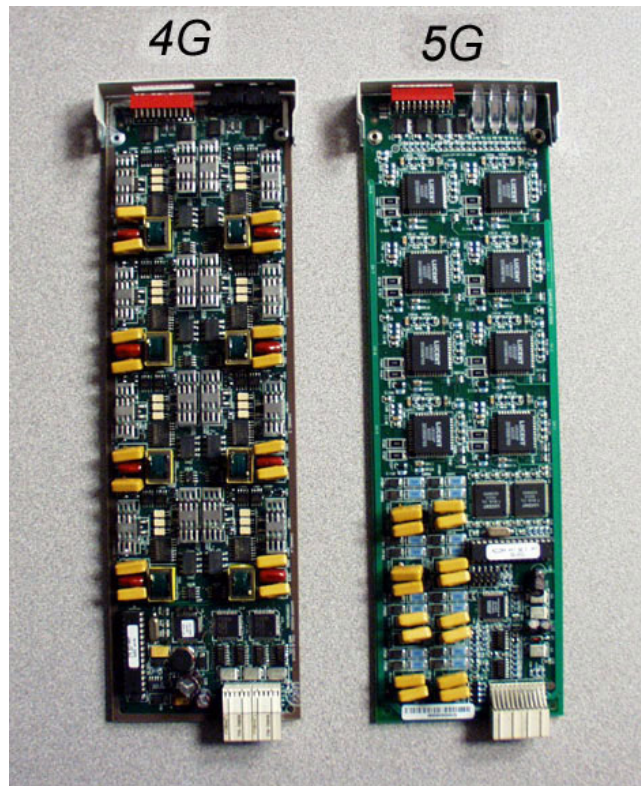


**NOTE:** The FXS channels default to a short loop setting (up to 1.6 miles for 26 AWG, and 2.6 miles for 24 AWG). To set an FXS channel to have a long loop setting, see *set (fxs)* on page 5-96.

## ***LEDs***

For LED information for these cards, see LEDs on page 10-7.

## ***Identifying FXS 4G and 5G Cards***



Identifying the original FXS (4G) card from the FXS 5G card is not easily done by looking at the faceplate, as they are both labeled FXS. The cards are easily identified by viewing the cards. Please see the above photo.



# CHAPTER 11

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## *ISDN BRI Card*

### **In this Chapter**

- Overview
- Features
- Technical Specifications
- Card Configuration
  - CLI Commands
  - LEDs
- Connector Pinouts
  - 25-Pair Telco Connectors



## Overview

**NOTE:** These cards are no longer manufactured.

The ISDN BRI Service Cards enable service providers and enterprises to deploy high-density, standards-based, ISDN Basic Rate Interface (BRI) services over one or more T1 or DSL access lines using TDM or ATM transport. ISDN voice, data, and real-time video applications may be cost effectively deployed as part of any integrated broadband service delivery.

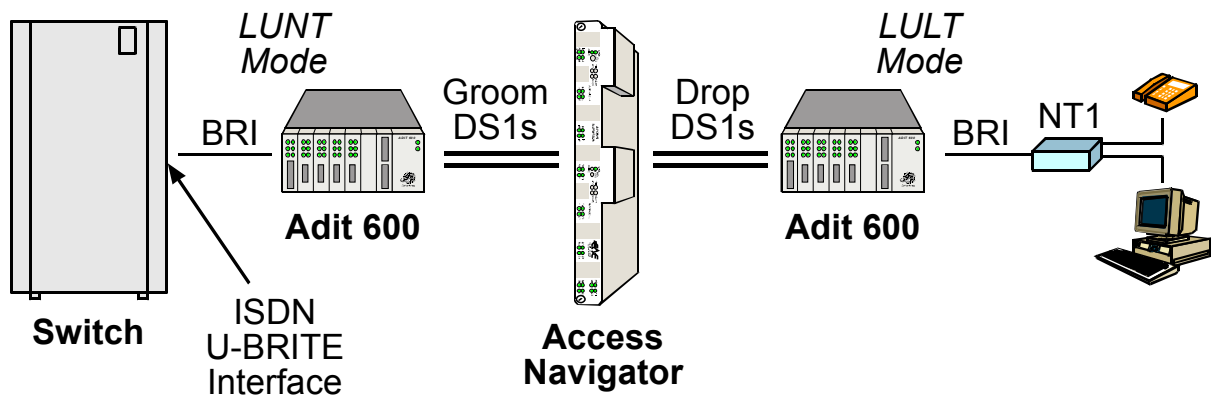
### ISDN BRI

BRI provides an end-to-end digital connection for customers with voice, data and video needs. BRI has 2 Bearer (B) channels at 64 Kbps for voice or data and 1 Data or Delta (D) channel at 16 Kbps for signal and control. With some ISDN BRI devices, the two B-channels can be aggregated together for 128 Kbps capacity.

### 3-DS0 BRITE Mode

The ISDN BRI Card supports the 3-DS0 BRITE mode of operation. In this mode, three DS0 channels support a BRI channel, providing eight BRI per T1. The BRI channel consists of two B and a D channel (2B+D) which is also transported in a full DS0. The D-channel supports the Embedded Operations Channel (EOC) and is used to pass signaling and other management information, such as loopback commands.

The following is an example of how a Adit 600 with a ISDN BRI card can function as a Line Unit Network Termination (LUNT) with central office applications, and a Line Unit Line Termination (LULT) with subscriber lines.



ISDN BRI Service Using 3DS0 Mode

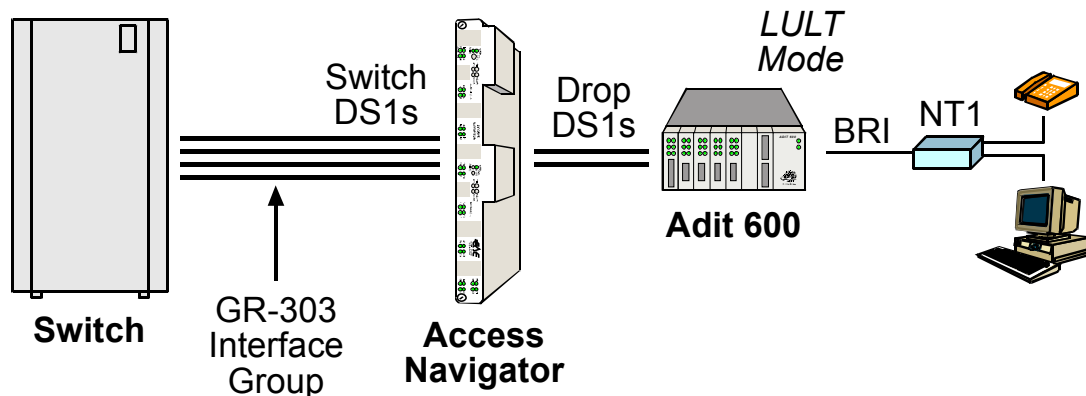


### **4:1 TDM Mode**

In the 4:1 Subrate D-Channel Mode, up to 10 BRI channels are carried over each T1 line. Four 16 Kbps D-channels are multiplexed into each DS0. The Access Navigator GR-303, in conjunction with the Adit Customer Service Terminal (CST), functions as an Integrated GR-303 Digital Loop Carrier system using this mode. Standard 4:1

D-Channel concentration is utilized from the GR-303 interface of a Class 5 switch. EOC management information from the switch is supported.

The following is an example of how a Adit 600 with a ISDN BRI card can function as with the Access Navigator in the 4:1 TDM Mode.



ISDN BRI Service Using 4:1 TDM Mode

## **Features**

- Enables carriers to economically bundle ISDN with all other services at 64 Kbps or 128 Kbps over T1 access lines
- Configurable as either Line Unit Line Terminal (LULT) for interfacing to ISDN switch interfaces at the central office, or Line Unit Network Terminal (LUNT) for customer premises deployment
- Provides direct NTU service demarcation for ISDN video conferencing, 128 Kbps dial-up Internet, point-of-sale terminals, and ISDN Centrex or telephone applications
- Enables high service density with up to 40 ISDN BRI lines from 4 T1 lines in a single Adit 600 chassis, or up to 80 ISDN BRI lines in two chassis occupying two rack units of equipment space (19-inch rack)
- Provides economic deployment of ISDN services with on-premises T1 concentration via the Access Navigator/GR-303 host to provision 40 to 240 ISDN BRI channels over 3 to 8 T1 access lines
- Offers solid-state fuseless protection for central office NEBS compliance and customer premises FCC and UL safety requirements

## **Technical Specifications**

### **Controller Software Required**

#### **T1 Controller**

- Release 1.2.2 or higher is required

#### **E1 Controller**

- Release 3.2 through 9.4 is required

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**NOTE:** E1 is not supported in this release of the Adit 600 Controller. It will be supported in a future release.

---

### **Product Includes**

- Configurable as Line Unit Line Terminal (LULT) or Line Unit Network Terminal (LUNT)
- Works with all standard Carrier Serving Area (CSA) loops - maximum 18,000 ft. range (#26 AWG copper)
- Supports standard Telcordia 3-DS0 or 4:1 TDM modes
- Line coding: 2
- Line Rate: 160 Kbps (80 kbaud)
- Front-panel multi-function LEDs provide out-of-Service, LOS/Self-test fail, ES/SES detected, Sync, Loopback, and Normal indications
- Interoperable with other standards-based ISDN BRI equipment
- B1, B2, and 2B+D payload loopbacks supported
- Maximum bridged tap length is 2.5 kft. (762 m)
- Rear-accessed U-interface connections

### **Management**

- Standard ISDN SNMP MIB supported

### **Network Interface**

- 3 DS0 mode: Uses 3 contiguous DS0 channels per ISDN BRI channel on T1
- 4:1 TDM mode: T1 to Access Navigator/GR-303

### **Network Standards**

- Telcordia TR-NWT-000397 (1993)
- Telcordia TR-TSY-000821 (1991)
- Telcordia TR-TSY-000829 (1989)
- ANSI T1.1992
- ITU-T Q.920, Q.921

## **Clocking**

- Loop timing derived from Channel 1 of ISDN BRI card or any Adit 600 T1 line

## **Testing & Diagnostics**

- Initiates 2B+D, B1, or B2 loopbacks toward the BRI at the NT1
- Performs self test at power up
- 3 DSO mode: supports external loopback testing via EOC messages from the switch
- 4:1 TDM mode: supports external loopback testing through CLI commands or as commanded by switch

## **Product Supports**

- TR-821 alarms
- TR-397/TR-829/TR-821 Generic Segmented Performance Monitoring
- TR-829 multi-EOC messages in 3 DS0 and 4:1 TDM modes
- Metallic DC test signature in Line Unit Network Terminal (LUNT) mode

## **Power**

- Maximum power input: 6 W (8 port)
- Solid-state fuseless protection

## **Regulatory Approvals**

See *Appendix A, Regulatory Approvals* for information on the ISDN BRI Service card.

## **Physical**

- Dimensions: 3.5 in. (H) x 0.75 in. (W) x 11.25 in. (D)  
8.9 cm (H) x 1.9 cm (W) x 28.6 cm (D)
- Weight: 6.9 oz. (.20 kg)

For information on Adit 600 Environment required, see *Installation Environment on page 2-2*.

## Card Configuration

BRI card options are set with the Command Line Interface (CLI). For additional information on these commands, see *Chapter 5, CLI Commands*.

### CLI Commands

- *connect*  
Creates two-way connections between channels
- *disconnect*  
Removes a connection created by the connect command
- *set (bri)*  
Setup of ISDN ports (up/down, threshold, call reference value)
- *set (bri) autoactivate*  
Set up the ISDN circuits when the FDL link cannot be used
- *set (bri) mode*  
Set up ISDN cards mode of operation (3-DS0 or 4:1)
- *set (bri) pmsync*  
Set up the BRI card source for performance monitoring synchronization
- *set (ds0)*  
For cross-connect to ISDN, must be data type
- *status (ds1)*  
Displays line status or performance statistics of a specific DS1
- *set clock*  
Set the primary and secondary (clock1/clock2) master transmit clock source
- *show (bri)*  
Displays BRI port configuration
- *show clock*  
Displays actual clock source
- *show (ds1)*  
Displays DS1 configuration
- *status (bri)*  
Displays port status or performance statistics for the specified BRI
- *status clock*  
Displays actual clock status and source

## **LEDs**

There is an LED for each ISDN BRI on a card. The function for each LED is listed below:



State	Description
Off	Line U-interface is attempting synchronization, or BRI is out of service.
Red	Line alarm (LOS or self test failure)
Yellow	ES or SES has occurred.
Flashing yellow	Line U-interface is synchronized with customer equipment, but is not passing customer data.
Flashing green	Line U-interface is in external loopback toward the switch at the unit.
Green	Normal (Line U-interface is active and transparently passing customer data.)

## Connector Pinouts

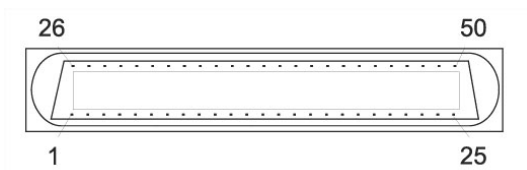
### 25-Pair Telco Connectors

Circuit connections are made at the 25-pair telco connectors. A standard 25-pair telephone cable with RJ-21X wiring and a male D-type connector at the Adit 600 end is required.

#### Slot/Pair Designation

The following designations apply whether a Dual, Quad or Octal ISDN BRI Card is placed in Slot 1 through 6. However, a Dual would only use the first 2 of the 8 pair, a Quad the first 4, and an Octal all 8. The following is the breakdown of designated pairs to each Adit 600 slot.

SLOT	25-Pair Telco Connector
#1	#1 - 8 (first 8 pairs) on J1
#2	# 9 - 16 (next 8 pairs) on J1
#3	# 17 - 24 (next 8 pairs) on J1
#4	#1 - 8 (first 8 pairs) on J2
#5	# 9 - 16 (next 8 pairs) on J2
#6	# 17 - 24 (next 8 pairs) on J2



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**NOTE:** For the location of the 25-Pair Telco Connectors, on the back of the Adit, see *25-Pair Telco Connectors on page 3-11*

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**25-Pair Telco Connector Pinouts**

	Pair	Pin Location	Function	Color Code
SLOT 1 on J1 or SLOT 4 on J2	1	26 1	Tip Channel 1 Ring Channel 1	White Blue
	2	27 2	Tip Channel 2 Ring Channel 2	White Orange
	3	28 3	Tip Channel 3 Ring Channel 3	White Green
	4	29 4	Tip Channel 4 Ring Channel 4	White Brown
	5	30 5	Tip Channel 5 Ring Channel 5	White Slate
	6	31 6	Tip Channel 6 Ring Channel 6	Red Blue
	7	32 7	Tip Channel 7 Ring Channel 7	Red Orange
	8	33 8	Tip Channel 8 Ring Channel 8	Red Green
SLOT 2 on J1 or SLOT 5 on J2	9	34 9	Tip Channel 9 Ring Channel 9	Red Brown
	10	35 10	Tip Channel 10 Ring Channel 10	Red Slate
	11	36 11	Tip Channel 11 Ring Channel 11	Black Blue
	12	37 12	Tip Channel 12 Ring Channel 12	Black Orange
	13	38 13	Tip Channel 13 Ring Channel 13	Black Green
	14	39 14	Tip Channel 14 Ring Channel 14	Black Brown
	15	40 15	Tip Channel 15 Ring Channel 15	Black Slate
	16	41 16	Tip Channel 16 Ring Channel 16	Yellow Blue
SLOT 3 on J1 or SLOT 6 on J2	17	42 17	Tip Channel 17 Ring Channel 17	Yellow Orange
	18	43 18	Tip Channel 18 Ring Channel 18	Yellow Green
	19	44 19	Tip Channel 19 Ring Channel 19	Yellow Brown
	20	45 20	Tip Channel 20 Ring Channel 20	Yellow Slate
	21	46 21	Tip Channel 21 Ring Channel 21	Violet Blue
	22	47 22	Tip Channel 22 Ring Channel 22	Violet Orange
	23	48 23	Tip Channel 23 Ring Channel 23	Violet Green
	24	49 24	Tip Channel 24 Ring Channel 24	Violet Brown
	25	50 25	Reserved	Violet Slate

## ***ISDN BRI Card***

### ***Connector Pinouts***

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# CHAPTER 12

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## ***OCU-DP Card***

### **In this Chapter**



- Overview
- Features
- Technical Specifications
- Card Configuration
  - CLI Commands
  - Basic Setup
- LEDs
- Jumper Settings
- Alarms
- Line Rates/Line Lengths
- Connector Pinouts
  - DDS RJ-48S
  - 25-Pair Telco Connector

## Overview

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**NOTE:** These cards are no longer manufactured.

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The Single Port and Quad Port all-rate OCU-DP Service Cards provide electrical and physical termination of the 4-wire Digital Data Service (DDS) that is traditionally used to interconnect lower-speed serial synchronous Data Terminal Equipment (DTE) devices such as routers, Frame Relay Access Devices (FRAD), or video conferencing equipment. Now DDS can be integrated with DS0 voice, fractional T1 data, ISDN, and IP services – over multiple T1s. This enables service providers to deliver transport for legacy enterprise data networking or Common Channel Signaling (CCS) circuits commonly used in Signaling System 7 (SS7) telephone networks using one card for all standard DDS types. Plus, it can be used as a replacement for low-density, unmanaged D4 channel banks.

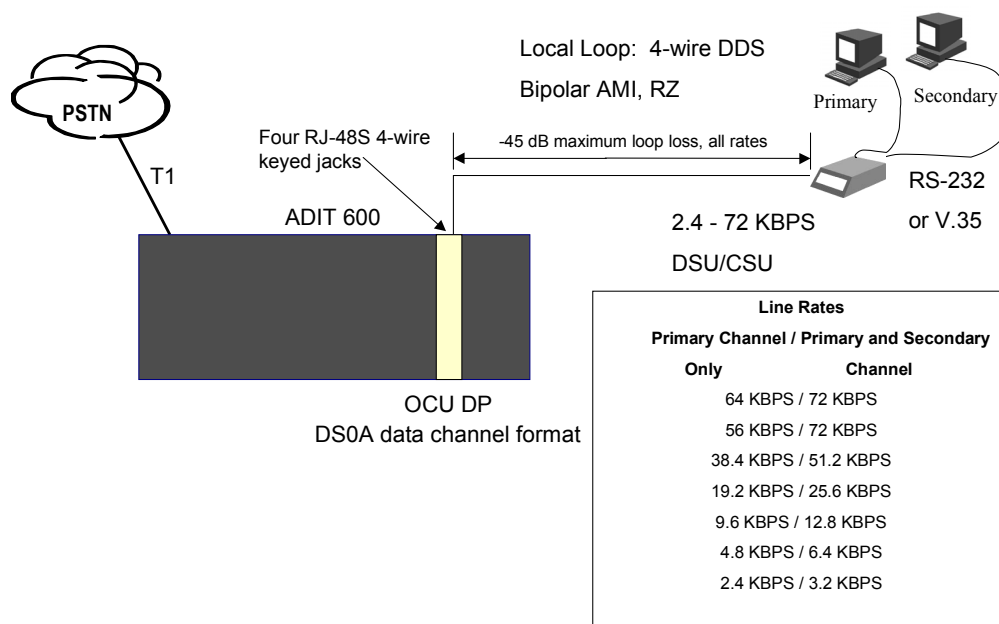
The OCU-DP Service cards provide scalable, independently configurable, synchronous data service rates from 2.4 Kbps to 64 Kbps, including Switched 56 Kbps data rates. Up to six OCU-DP cards can be inserted into any of the service card slots of the Adit 600, providing up to 24 DDS connections. These cards enable industry leading density and cost per port at Central Offices (COs) hub and collocations (COLOs) and cell sites.

For example, the Adit 600 OCU-DP ports can be groomed and mapped into any of the T1 ports of the Controller. The Adit 600's digital cross-connect functionality offers DS0 service grooming, T1 drop-and-insert, and voice access integration not available in traditional multiplexers.

The OCU-DP Service cards have several local and remote management options available through the Controllers. Cards can be locally configured and managed using the Command Line Interface (CLI). Remote management is accomplished directly over either an in-band DS0 management channel or a separate SNMP network connection, alternatively, remote management can be achieved through the Access Navigator over the Facility Data Link (FDL) or an in-band dedicated DS0.

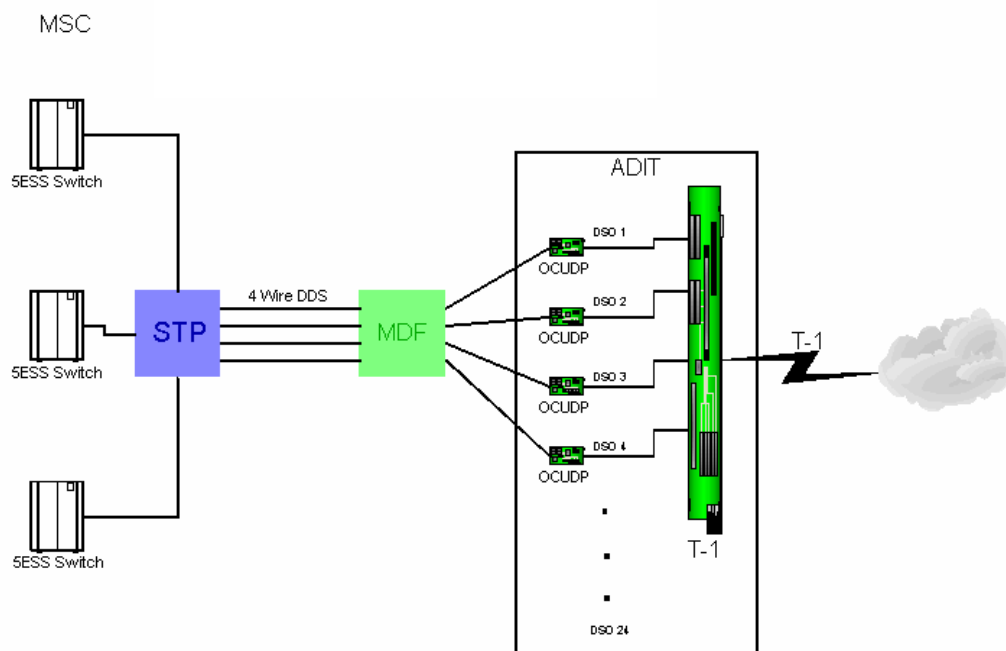
## Customer Premise Application

In this model, the carrier deploys the Adit 600 in conjunction with DDS DSU/CSUs to provide standards-based DDS access for customer data terminal needs. In essence, the the Adit 600 integrates the DDS capabilities that were traditionally served by D4 or DLC Remote Terminal equipment into a customer premise multi-service solution.



## SS7 Backhaul Application

In this application, the carrier uses the OCU to transfer signaling and call information between MSCs.



## **Features**

- Provides available baseband data rates from 2.4 to 72 Kbps
- Supports primary and secondary channel services, 64K clear channel service, and 4-wire Switched-56 service
- Complies with AT&T Pub. 62310
- Offers Bipolar Violation (BPV), Loss of Frame (LOF-DDSII), Loss of Signal (LOS) and Out-of-Service (OOS) performance counters: 15 minute, 1 hour and 24 hour intervals available
- Offers BPV, OOS, LOF and LOS selectable alarm thresholds
- Supplies built-in self-tests including data path and RAM test status and TDM and CSU failures
- Supports DDS network control codes for OCU, CSU and DSU latching and non-latching service loopbacks
- Supports system timing from any T1 line and provides it to the connected DTE
- Deploys up to 24 OCU-DP service ports in a single chassis, or a total of 48 OCU-DP service ports in two side-by-side Adit 600s occupying just two rack units of equipment space (19 inch rack)

## **Technical Specifications**

### **Controller Software Required**

#### **T1 Controller**

- Release 3.2 or higher is required

#### **E1 Controller**

- The OCU-DP service cards are not supported by the E1 Controller card

### **Service Interface**

- Single-port OCU-DP interface
  - One RJ-48S front-panel jack
  - Strap selections for rear-panel RJ-21X telco connector
- Four-port OCU-DP interface
  - Four RJ-48S front-panel jack
  - Strap selections for rear-panel RJ-21X telco connector

### **Network Interface**

- Each OCU port DS0 cross-connected to T1 port

## **Loopbacks**

OCU, CSU and DSU:

- Manual loopbacks activate via CLI
- Non-latching loopbacks activate via network code
- Latching loopbacks activate via network code

## **Clocking**

- Loop-timed from any T1 in the platform
- Sources clock to the DTE device

## **Power Consumption**

- 6 W maximum, Four Port OCU-DP card
- 3 W maximum, Single Port OCU-DP card

## **Regulatory Approvals**

See *Appendix A, Regulatory Approvals* for information on the OCU-DP Service cards.

## **Physical**

- Dimensions: 3.5 in. (H) x 0.75 in. (W) x 11.25 in. (D)  
8.9 cm (H) x 1.9 cm (W) x 28.6 cm (D)
- Weight: 5.7 oz. (.16 kg)

For information on Adit 600 Environment required, see *Installation Environment* on page 2-2.

## Card Configuration

OCU-DP card options are set with the Command Line Interface (CLI). For additional information on these commands, see *Chapter 5, CLI Commands*.

### CLI Commands

#### Configuration Commands

- *set (ocudp) baud*  
Set up OCU-DP port baud rate
- *set (ocudp) loopdetect*  
Set OCU-DP non-latching/latching loopback code detection
- *set (ocudp) mvec*  
Set Majority Vote Error Correction (MVEC)
- *set (ocudp) secondary*  
Set up the secondary channel service
- *set (ocudp) up/down*  
Set the OCU-DP line In or Out-of-Service.

#### Test Commands

- *set (ocudp) loopback*  
Set the manual loopback tests
- *set (ocudp) selftest*  
Start the OCU-DP self test

#### OCU-DP Status Commands

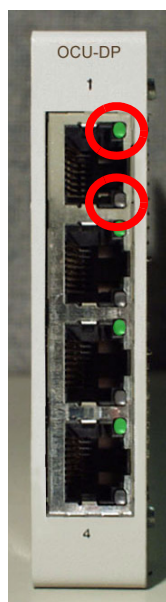
- *show (ocudp)*  
Displays OCU-DP card configuration (baud, loopdetect, error correction, switched and enhanced switched service and secondary channel provisioning)
- *status (ocudp)*  
Displays the status or performance statistics of the OCU-DP card (OOS, LOF, LOS and BPV seconds)

## Basic Setup

Command	Description
set {ocudp-addr} baud {2400 4800 9600 19200 38400 56000* 64000}	Set the OCU-DP Baud rate. ocudp-addr = {slot:port} of the OCU-DP card to apply settings to.
set {ocudp-addr} up	Set the OCU-DP port 1 up.
show {ocudp_card-addr}	Show the OCU-DP card settings. ocudp_card-addr = {slot} of the OCU-DP card.
disconnect a	Disconnects all connections to slot a (controller)
set {ds0-addr} type data	Sets a DS0 data signaling type
connect {ds0-addr} {ocudp-addr}	Connects DS0 (in previous step) to OCU-DP port (in previous step).
show connect (ocudp_card-addr)	Displays connect information for OCU-DP card.

## LEDs

There are two LEDs for each channel on the OCU-DP card. The function for each LED is listed below:



State	LEDs	Description
Yellow Flickering	ALL	Boot Software in control.
Green (walking down) Red (walking up)	ALL	Application Software in control (repeated 3.5 times).
Red, slow flash	ALL	In Boot. Application flash code checksums did not match and Boot is waiting for application download.
Red	ALL	In Application code waiting for Controller to issue SW/HW revision request. This is the first request that comes from the OCU-DP card manager in the Controller.
Green Yellow	Top Bottom	Port in Self-test. Duration is 5-8 seconds.
Off	Top Bottom	Port is set down (Out-Of-Service).
Green	Top	Port is receiving valid signals.
Red	Top	Port is receiving no signal (primary) or no frame sync (secondary or clear channel).
Red Flashing	Bottom	Port is receiving bipolar violations
Yellow	Bottom	Port is in loopback.

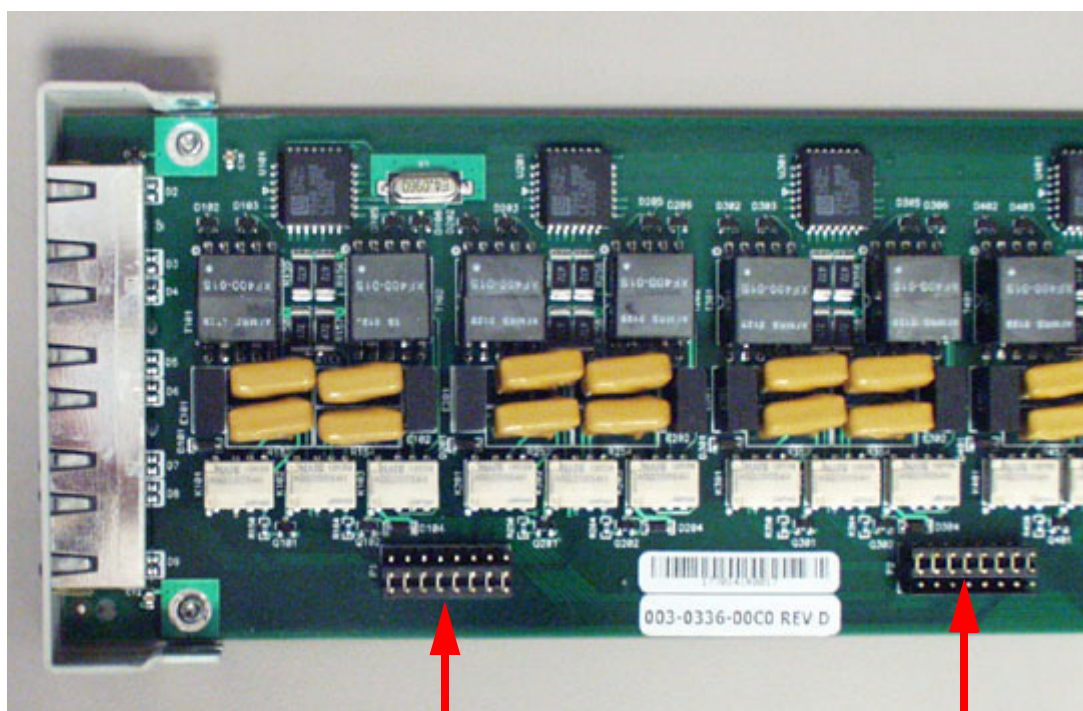
## ***Jumper Settings***

The P1 and P2 Jumpers are defaulted to RJ-48S, which are the set of pins nearest the bottom of the service card. With the jumper in this position the signals are routed to the RJ-48S connector(s) on the face of the card. To route the signals to the 25-pin Telco connector at the rear of the unit, move the jumpers to the backplane position, which is the set of pins toward the top of the service card.

P1 applies to connectors 1 and 2 (connector 2 only with the 4 port card).

P2 applies to connectors 3 and 4 (for the four port card only).

### **Top of Card**



**Front of  
Card**

**P1 is set to  
RJ-48S Position**

**P2 is set to  
25-Pin Telco  
Position**



## Alarms

The OCU-DP cards and supporting Controller Software will support the following alarms:

Alarm/Event	Severity	Category	Description	Clear Mechanism (alarms only)
Card Detect	Information	Equipment	OCU-DP card inserted	
Card Removed	Information	Equipment	OCU-DP card removed	
Out of Service (OOS)	Major	Facility	Network sending Out-of-Service code (OOS) or card has LOS.	Correct with Network or replace or deprovision the card.
Los of Signal (LOS)	Major	Facility	No signal at customer link.	Correct with Customer data path, replace the card, or reconnect the drop.
Los of Frame (LOF)	Major	Facility	Framing patter not detected at customer link.	Correct with Customer data path, replace the card, or reconnect the drop.
Bipolar Violation (BPV)	Minor	Facility	Excessive violations on customer interface.	Correct with the incoming signal, or deprovision card.

## Line Rates/Line Lengths

All lengths were measured to meet a BER of  $10^{-7}$  with up to 45 dB of cable attenuation at the Nyquist frequency for 56, 64 and 72 Kbps, and 40 dB all other rates.

Service Data Rate	Primary Channel / Secondary Channel	Max. Loop Distance (24 AWG) Primary Channel only/Primary & Secondary Channel
2.4 Kbps	2.4 Kbps/3.2 Kbps	13.8 miles/12.7 miles (22.3 km/20.4 km)
4.8 Kbps	4.8 Kbps/6.4 Kbps	11.0 miles/10.0 miles (17.7 km/16.1 km)
9.6 Kbps	9.6 Kbps/12.8 Kbps	8.0 miles/13.3 miles (13.0 km/12.2 km)
19.2 Kbps	19.2 Kbps/25.6 Kbps	6.3 miles/5.9 miles (10.1 km/9.4 km)
38.4 Kbps	38.4 Kbps/51.2 Kbps	5.5 miles/5.3 miles (8.8 km/8.5 km)
56 Kbps	56 Kbps/72 Kbps	5.1 miles/4.7 miles (8.2 km/7.6 km)
64 Kbps	64 Kbps	4.7 miles (7.6 km)

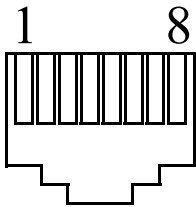
# Connector Pinouts

The OCU-DP is part of the network, and connects to customer equipment.

## DDS RJ-48S

The pinout for RJ-48S female is as follows:

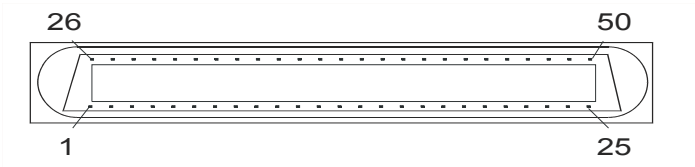
Pin	Function	Description
1	Receives Data (R-1)	From Customer to Network Interface
2	Receives Data (T-1)	From Customer to Network Interface
3-6	Not Used	
7	Transmits Data (T)	From Network Interface to Customer
8	Transmits Data (R)	From Network Interface to Customer



Note: The above listed functions are relative to this port.

## 25-Pair Telco Connector

Pinout for the Single (noted by an \*) or Quad OCU-DP card. Must setup jumpers on card to use this connector.



J1						J2					
Card Slot	Line	T1	R1	T	R	Card Slot	Line	T1	R1	T	R
1	1*	26	1	27	2	4	1*	26	1	27	2
	2	28	3	29	4		2	28	3	29	4
	3	30	5	31	6		3	30	5	31	6
	4	32	7	33	8		4	32	7	33	8
2	1*	34	9	35	10	5	1*	34	9	35	10
	2	36	11	37	12		2	36	11	37	12
	3	38	13	39	14		3	38	13	39	14
	4	40	15	41	16		4	40	15	41	16
3	1*	42	17	43	18	6	1*	42	17	43	18
	2	44	19	45	20		2	44	19	45	20
	3	46	21	47	22		3	46	21	47	22
	4	48	23	49	24		4	48	23	49	24

T1 and R1 = Receive. T and R = Transmit.

Note: The above information is relative to the connector.

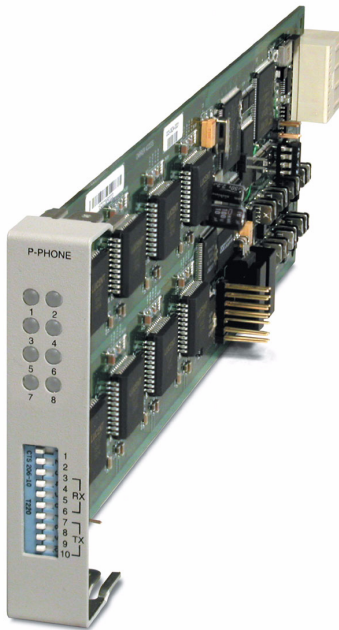
# CHAPTER 13

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## *P-Phone Card*

### In this Chapter

- Overview
- Features
- Technical Specifications
- Card Configuration
  - CLI Commands
  - DIP Switch Settings
- LEDs

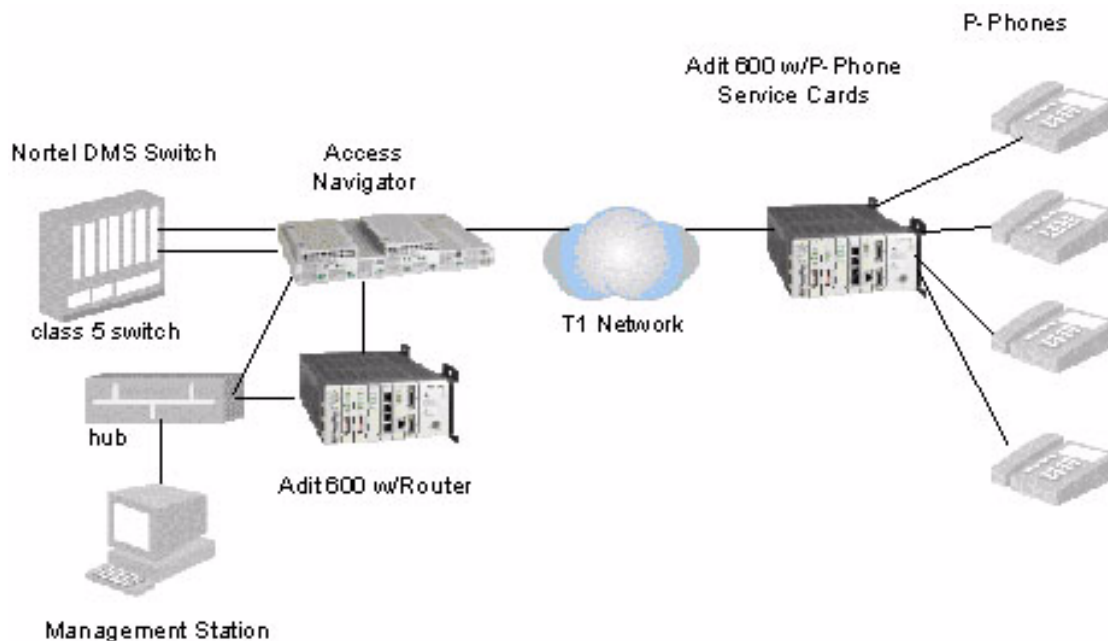


## Overview

**NOTE:** This card is no longer manufactured.

The P-Phone card enables service providers to deliver Centrex services via existing Nortel Electronic Business Set (EBS/P-Phone) telephones. This premises-based solution reduces service delivery costs for traditional Centrex providers and lowers the transition costs of moving current Centrex customers to a packet network architecture in the future. The easy-to-install, hot-swappable P-Phone card offers a flexible and cost-effective alternative to legacy EBS deployment. It requires less power and space than competing remote solutions and reduces facility needs versus CO based solutions, all while offering lower cost per DS0. Plus, the Adit 600's built in I/O DCS capabilities means no additional data grooming equipment is required to blend P-phone service delivery with other voice and data services.

The P-Phone card is hosted from a Navigator via GR-303 from a Nortel DMS Class 5 Switch. A dedicated DS0 channel in the remote Adit 600 communicates management and control data, including P-Phone signaling information, with the host Access Navigator. The Access Navigator implements the GR-303 interface, provides a highly-efficient, concentrated interface for the P-Phone traffic into the switch, and supports switch-hosted P-Phone status and control operations as well.



## Features

- Enables low-cost, premise-based delivery of high-margin Centrex services
- Integrates high-revenue Centrex services with other voice and data offerings
- Converges P-Phone & other services on efficient, cost-effective T1 facilities.
- Supports 47 P-Phone stations per 2 RU Adit 600 chassis
- Leverages customer confidence and familiarity with Centrex service delivery to expand opportunities for converged service delivery.
- Enables cost-effective service growth with incremental additions of P-Phone, analog, and data services.
- Enables cost-effective, phased migration to a softswitch-based packet network architecture with future softswitch support.

## ***Supported Base P-Phone Features***

911 Emergency Service	Consultation Hold
Automatic Line	Customer Groups
Call Forward	Direct Inward Dialing (DID)
Call Forward (All Calls, Busy, No Answer)	Direct Outward Dialing (DOD)
Call Hold	Direct Number Hunt (DNH) (First, Circular, Sequential, Distributed)
Call Pickup	Distinctive Ringing
Call Pickup Groups	Distinctive Call Waiting tones
Call Transfer Outside	End-to-End Signaling
Call Waiting, All Calls	Multicustomer Operation
Cancel Call Waiting	Off-Premises Stations
Class of Service (COS) Restrictions	Second Dial Tone
Denied Originating Services	Individual Short List
Denied Terminating Services	Individual Long List
Local Only (LOCO)	Station-to-Station Calling
Toll Restricted Services	Storing of Dialed Digits
Unrestricted Services	Three-Way Conference
Code Restrictions, Restrict Outgoing (RES1 and RES2)	3-Way Conference/Call Transfer

## ***Supported Optional P-Phone Features***

### **MDC Call Handling Package**

Call Forward, Busy Enhancements  
Call Forward, Busy - Intragroup  
Call Forward, Busy - All  
Directed Call Pickup Features, Barge-in Exempt  
Directed Call Pickup Features, Exempt

### **Call Waiting Enhancement Package**

Call Waiting - Incoming Only

Call Waiting - Intragroup

Inhibit Call Waiting

### **Business Set Services**

Group Intercom  
Message Waiting  
Multiple Appearance Directory Number (MADN)

### **Individual Features**

Call Park/Camp-on  
Call Forward, Remote Access  
Customer-Assignable Station Options Enhanced  
Message Detail Recording  
Message Detail Recording Enhancements  
Simplified Message Desk Interface  
User Programmable Call Forward, Busy - No Answer

## **Technical Specifications**

### **Controller Software Required**

#### **T1 Controller**

- Release 6.0 or higher is required

#### **E1 Controller**

- The P-Phone service card is not supported by the E1 Controller card

#### **Host Access Navigator**

- Access Navigator Release 1.8 or higher

### **Capabilities**

- 8 P-Phone channels per card
- Up to 6 P-Phone cards per Adit 600
- In-building service delivery to 5,000 ft. over 26 gauge wire
- Control and management via GR-303 with Access Navigator host with dedicated DS0 management channel
- Support for locally-powered phones (no line powering); capable of sourcing 27mA maximum

### **FXS Transmission Performance**

- Transmit Gain/Loss: -12 to +6 dB in .25 dB increments management selectable per channel or switch selectable per card.
- Receive Gain/Loss: -12 to +6 dB in .25 dB increments management selectable per channel or switch selectable per card.

### **Management**

- Controller CLI and SNMP management of all card and channel options
- Operational control via GR-303 EOC from Nortel host switch

### **Network Interfaces**

- T1 interfaces to Access Navigator host

### **Network Standards**

- Designed in accordance with NIS S106-2 Meridian Business Services Network Access Interface Specification

### **Interoperability**

- Nortel DMS GR-303 Interface designed in accordance with NIS V202-1, Issue 01 Integrated Digital Loop Carrier Interface Specification for Electronic Business Set Services

## **Clocking**

- Derived from Adit platform, typically from a network T1

## **Alarms**

- Detects and reports the loss of call control channel to host Access Navigator
- Card self-test alarm indicating card failure
- Detects and reports that power on self-test has failed

## **Testing and Diagnostics**

- Remote (P-Phone handset) loopbacks controlled via GR-303 EOC
- Excessive collision detection indicating possible handset failure

## **Power**

- 2.5 W nominal, plus 150 MW per active P-Phone channel
- Internal solid-state protection

## **Regulatory Approvals**

See *Appendix A, Regulatory Approvals* for information on the P-Phone Service card.

## **Physical**

- Dimensions: 3.5 in. (H) x 0.75 in. (W) x 11.25 in. (D)  
8.9 cm (H) x 1.9 cm (W) x 28.6 cm (D)
- Weight: 5.9 oz. (.17 kg)

For information on Adit 600 Environment required, see *Installation Environment* on page 2-2.

## Card Configuration

The P-Phone card can be configured, using DIP switches on the card or with CLI.

### CLI Commands

The following commands are used to configure a P-Phone card. For detailed information on these commands, see *Chapter 5, CLI Commands*.

- *connect*  
Creates two-way connections between channels
- *disconnect*  
Removes a connection created by the connect command
- *set (p-phone)*  
To setup the P-Phone card channels parameters (CRVs, rx gain, tx gain)
- *show (p-phone)*  
Displays the settings (CRVs, rx gain, tx gain) for the P-Phone card
- *status (p-phone)*  
Displays the test status of the P-Phone ports



## DIP Switch Settings

Each P-Phone card contains ten DIP switches that can be used to select gain options for all eight channels.



Switch	Function	Description	Note
1-2	Not in use		
3-6	Receive Gain/Loss	3 4 5 6	These settings allow for receive gain and losses of -9, -7, -6, -5, -4, -3, -2, 0, 2, 3, 4, 5, and 6. <b>+9 (1110) is not available.</b> <b>+7 (1100) is not available.</b> Maximum setting on the P-Phone is +6 dB.
		0 0 0 0 = 0 dB	
		0 0 0 1 = -9 dB	
		0 0 1 0 = +2 dB	
		0 1 0 0 = +3 dB	
7-10	Transmit Gain/Loss	1 0 0 0 = +4 dB	These settings allow for transmit gain and losses of -9, -7, -6, -5, -4, -3, -2, 0, 2, 3, 4, 5, and 6. <b>+9 (1110) is not available.</b> <b>+7 (1100) is not available.</b> Maximum setting on the P-Phone is +6 dB.
		7 8 9 10	
		0 0 0 0 = 0 dB	
		0 0 0 1 = -9 dB	
		0 0 1 0 = +2 dB	
		0 1 0 0 = +3 dB	
		1 0 0 0 = +4 dB	

## LEDs

Each P-Phone channel has a corresponding LED, described in the table below.

State	Line State
Off	No P-Phone connected
Green	No call in process
Flashing Green	Alert (Ringing)
Yellow	Call in progress
Flashing Yellow	P-Phone Loopback in Progress
Flashing Red	Self-test failed

## ***P-Phone Card***

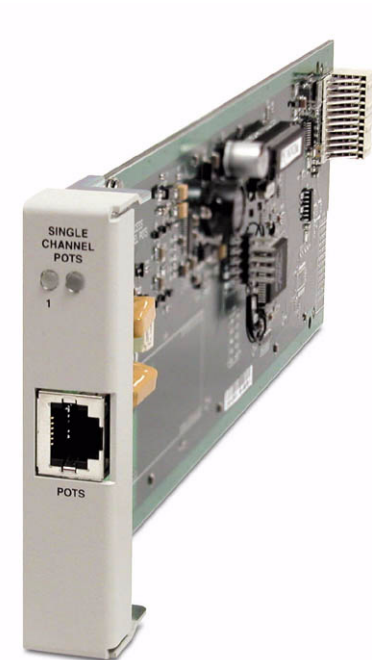
*LEDs*

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# CHAPTER 14

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## *Single Channel POTS Card*



### **In this Chapter**

- Overview
- Features
- Technical Specifications
- Card Configuration
  - CLI Commands
- Connector Pinouts
- LEDs

## Overview

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**NOTE:** This card is no longer manufactured.

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The Order Wire Single-Channel POTS Service card give service providers a standard FXS voice circuit. The cards can be used for communications with the operations support group under conditions where remote locations are being serviced or for providing a voice line without installing an additional external two-wire POTS line from a local carrier. The POTS Service Card features a single RJ-11 telecom connection. The POTS Service card can be inserted into any service card slot of the Adit 600 and is configured using CLI.

## Features

- Provides a lifeline order wire connection for communications from the remote cell sites during radio maintenance
- Offers solid-state overvoltage and fuseless overcurrent protection from lightning and power cross incidents

## Technical Specifications

### Controller Software Required

#### T1 Controller

- Release 6.1 or higher is required to support the POTS Service card

#### E1 Controller

- Release 6.1 through 9.4 is required to support the POTS Service card
  - $\mu$ -Law only

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**NOTE:** E1 is not supported in this release of the Adit 600 Controller. It will be supported in a future release.

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### FXS Transmission Performance

- Return Loss: ERL > 26 dB at 1010 Hz, with respect to  $900\Omega + 2.16\mu\text{F}$
- Idle Noise: 25 dB<sub>BrnC0</sub>
- Terminating Impedance:  $900\Omega + 2.16\mu\text{F}$
- Gain/Loss at 1010 Hz: -1 to 0 dB
- Longitudinal Balance: >50 dB

## **FXS Signaling Performance**

- DC Loop Range: < 1 Kft 25Ga
- Loop Feed: Nominal -48 VDC with 26mA current limit
- Ringing Voltage: 40 V rms, 20 Hz
- Maximum Ringers: 2 REN, FCC Class B ringers
- FXS Signaling: FXS loop start
- Ringer Equivalency Number (REN): 0.0 by definition

## **Regulatory Approvals**

See *Appendix A, Regulatory Approvals* for information on the Single Channel POTS Service card.

## **Physical**

- POTS connections are through front panel RJ-11
- Dimensions: 3.5 in. (H) x 0.75 in. (W) x 11.25 in. (D)  
8.9 cm (H) x 1.9 cm (W) x 28.6 cm (D)
- Weight: 5.1 oz. (0.14 kg)

## **Environment**

In addition to the systems environment requirements, the following applies to the Single Channel POTS card. For additional information see *Installation Environment* on page 2-2.

- Operating temperature range: -40° to 149° F (-40° to 65° C)

## Card Configuration

The Single Channel POTS card can be configured, using CLI commands.

### CLI Commands

The following commands are used to configure the POTS cards. For detailed information on these commands, see *Chapter 5, CLI Commands*.

- *connect*  
Creates two-way connections between channels
- *disconnect*  
Removes a connection created by the connect command
- *set (fxsPS)*  
To setup the voice channels parameters (rx gain, signal, tx gain).
- *show (fxsPS)*  
Displays the settings (type, signaling, rx gain, tx gain) for the FXS PS card.
- *status (fxsPS)*  
Displays the status (AB bits received, AB bits transmitted, signal, T1 activity, trunk processing) of the specified FXS PS card.

### Basic Configuration

#### Set Up the Single Channel POTS Line

Use the following commands to set up a Single Channel POTS Line.

Command	Description
<b>set a:1:1 type voice</b>	Set the DSO to voice. See <i>set (ds0)</i> for details.
<b>connect a:1:1 8:1</b>	Connect the DSO A:1:1 to port 1 of the Single Channel POTS card in slot 8. See the <i>set (fxsPS)</i> command for details.
	Assign this DS0 a phone line
	Connect phone
	Test phone for dial-tone

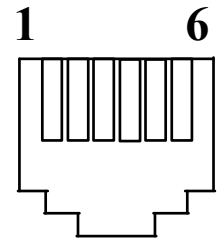
## Connector Pinouts

### RJ-11 Connector

There is one RJ-11 (female) connector on the POTS card.

The pinouts are as follows:

Pin	Name	Description
1 - 2	N/C	Not connected
3	R	Ring
4	T	Tip
5 - 6	N/C	Not connected



## LEDs



The POTS channel LED (left) status is described in the table below.

State	Loop Start Meaning
Off	Calling Party Disconnect
Green	Idle
Red	N/A
Yellow	Call in progress
Flashing green	Ringing

The second LED (right) is a status LED is not used on this card.

## ***Single Channel POTS Card***

*LEDs*

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# CHAPTER 15

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## *Power Supply*

### In this Chapter

- 115 VAC/-48 VDC Power Supply/Charger
- 230 VAC/-48 VDC Power Supply/Charger
- 24 VDC Power Supply
- Ringer Waveform Options
- Replacing a Power Supply



## **115 VAC/-48 VDC Power Supply/Charger**

The 115 VAC/-48 VDC Power Supply and Charger enables the Adit 600 to be powered from either 115 VAC or -48 VDC sources, and includes an integral battery charger and ringing generator. Integrating AC and DC power options, battery charger and ringing generator functions in the Adit chassis dramatically reduces installation time, space and cost requirements and inventory considerations in comparison to separate power conversion or Uninterruptable Power Systems (UPS) equipment.

Front-panel LEDs provide easy-to-read indications of power input, battery status and alarms. Remote notification to network operations and to monitoring centers of loss of AC input or low DC input voltage is available via SNMP. Should a loss of input voltage occur, the Adit 600 automatically switches over to the optional Battery Backup Unit without power interruption. The compact Battery Backup Unit can power the Adit 600 for up to eight hours, providing a complete solution compliant with lifeline service requirements. This eliminates the need for an expensive and bulky UPS.

The ringing generator provides 25 Ringer Equivalence Number (REN) output, supporting up to 48 FXS simultaneous ringing lines with normal cadence ringing. Three ringer waveform shapes and three selectable ringer frequencies ensure performance over a wide range of outside line or customer premises applications.

### **Features**

- Enables Adit 600 to be powered from 115 VAC or -48 VDC source
- Integral battery charger for use with optional Battery Backup Unit
- Automatic switchover to Battery Backup Unit without power interruption
- Selectable ringer frequency settings of 20, 25 and 50 Hz
- Integrated 25 REN ringing generator supports high capacity applications
- Automatic switchover to Battery Backup Unit without power interruption
- Installs quickly and easily with fully connectorized design
- Solid-state fuseless protection for Central Office NEBS and customer premises FCC and UL safety requirements

### **Technical Specifications**

#### **AC Electrical Input**

- 115 VAC (95 to 132 VAC, 57 to 63 Hz), 2.5 A rms, 130 W maximum
- Maximum inrush current: 24 A peak at 132 VAC
- Rear-panel mounted circuit breaker operates for overcurrent conditions greater than 4 A
- Front-panel AC INPUT status LED

### **DC Electrical Input**

- -48 DC (-40 to -60 V), 2.1 ADC, 90 W maximum
- Maximum cold start inrush current: 30 A peak at -60 VDC
- Solid-state input overcurrent protection trips at 2.5 A at 68° F (20° C)
- Extended mode: jumper option enables Adit 600 startup at low battery input voltage

### **Electrical Output**

- -37 VDC (short loop)/ -54 DC (long loop), talk battery, 1.45 A maximum
- -54 VDC battery charger output, 0.5 A maximum
- +5 VDC, 9 A maximum
- Automatic switchover to battery backup without power interruption

### **Battery Charger**

- Front-panel battery status LED
- Battery charging output limited to 0.5 A maximum

### **Alarms**

Generates minor alarm contact closure on External Alarm Connector when

- AC input voltage is not present or circuit breaker is open
- -48 VDC battery input voltage magnitude is low or absent

### **Ringling Generators**

- Nominal 85 V rms (108 V rms max)
- Referenced to -54 VDC (-60 VDC max) output
- Supports three jumper-selectable ringer waveform shapes
- Drives 25 REN indefinitely with minimum output voltage of 65 V rms at normal ringer cadence
- Ringer frequency is selectable, 20 25 or 50 Hz  $\pm$  15%
- Overload protected

### **Regulatory Approvals**

See *Appendix A, Regulatory Approvals* for information on the 115VAC Power Supply.

### **Interface Connectors**

- IEC-320, 15 A 3-prong AC power receptacle
- Rear PCB connector: Adit 600 backplane

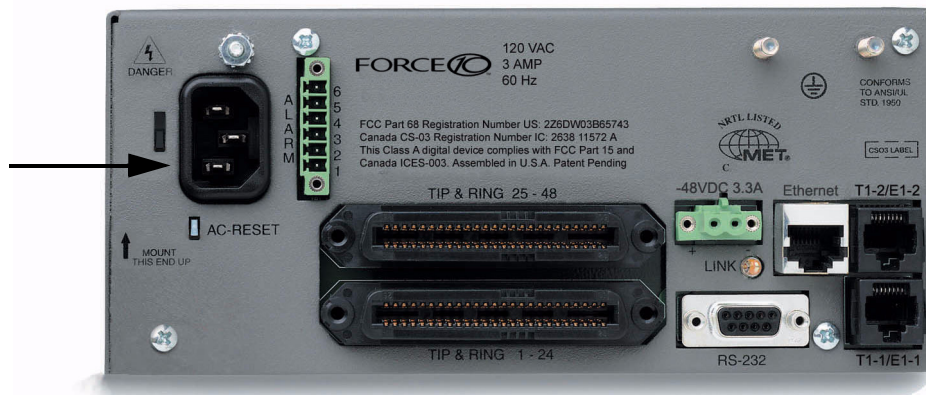
### **Physical**

- Dimensions: 3.5 in. (H) x 2 in. (W) x 12 in. (D)  
8.9 cm (H) x 5.1 cm (W) x 30.5 cm (D)
- Weight: 1 lb. 6 oz. (0.62 kg)

For information on Adit 600 Environment required, see *Installation Environment* on page 2-2.

## Input Power

The following graphic displays the back of the chassis with a 115 VAC/-48 VDC Power Supply installed.



## 115 VAC LEDs

The power supply card has two LEDs, as described in the table below.



LED	State	Description
AC Input	Off	AC input missing or failure
	Green	AC input present
Battery	Off	Battery input not used
	Green	Battery charging or operating from DC source only.
	Yellow	Battery discharging
	Red	Battery low (less than 42V), ringer disabled

## **230 VAC/-48 VDC Power Supply/Charger**

The 230 VAC Power Supply/Charger enables the Adit 600 to be powered from either 230 VAC or -48 VDC sources, and includes an integral battery charger and ring generator. Integrating AC and DC power options, battery charger, and ring generator functions in the Adit chassis dramatically reduces installation time, space and cost requirements, and inventory considerations in comparison to separate power conversion or Uninterruptable Power Systems (UPS) equipment.

Front-panel LEDs provide easy-to-read indications of power input, battery status, and alarms. Remote notification to network operations and monitoring centers of loss of AC input or low DC input voltage is available via SNMP. Should a loss of input voltage occur, the Adit 600 automatically switches over to the optional Battery Backup Unit, without power interruption. The compact Battery Backup Unit can power a fully loaded Adit 600 for up to eight hours, providing a complete solution compliant with lifeline service requirements. This eliminates the need for expensive and bulky UPS.

The ring generator provides 25 Ringer Equivalence Number (REN) output, supporting up to 48 FXS simultaneous ringing lines with normal cadence ringing. Three ringer waveform shapes and three selectable ringer frequencies ensure performance over a wide range of applications.

### **Features**

- Single unit enables Adit 600 to be powered from 230 VAC or -48 VDC source
- Integral battery charger for use with optional Battery Backup Unit
- Automatic switchover to Battery Backup Unit without power interruption
- Integrated 25 REN ringing generator supports high capacity applications
- LED status and monitoring, and remote alarming capabilities ensure service availability
- Fully connectorized design ensures quick and simple installation

### **Technical Specifications**

#### **AC Electrical Input**

- 230 VAC (190 to 254 VAC, 47 to 63 Hz), 2.5 A rms, 130 W maximum
- Maximum inrush current: 18 A peak at 254 VAC
- Rear-panel mounted circuit breaker operates for overcurrent conditions greater than 2 A
- Front-panel AC INPUT status LED

#### **DC Electrical Input**

- -48 DC (-40 to -60 V), 2.1 ADC, 90 W maximum
- Maximum cold start inrush current: 30 A peak at -60 VDC
- Solid-state input overcurrent protection trips at 2.5 A at 68° F (20° C)

**Electrical Output**

- -37 VDC (short loop)/ -54 DC (long loop), talk battery, 1.45 A maximum
- -54 VDC battery charger output, 0.5 A maximum
- +5 VDC, 9 A maximum
- Automatic switchover to battery backup without power interruption

**Battery Charger**

- Front-panel battery status LED
- Battery charging output limited to 0.5 A maximum

**Alarms**

Generates minor alarm contact closure on External Alarm Connector when

- AC input voltage is not present or circuit breaker is open
- -48 VDC battery input voltage magnitude is low or absent

**Ringling Generators**

- Nominal 85 V rms (108 V rms max)
- Referenced to -54 VDC (-60 VDC max) output
- Supports three jumper-selectable ringer waveform shapes
- Drives 25 REN indefinitely with minimum output voltage of 65 V rms at normal ringer cadence
- Ringer frequency is selectable 20, 25 or 50 Hz  $\pm$  15%
- Overload protected

**Interface Connectors**

- IEC-320, 15 A 3-prong AC power receptacle
- Rear PCB connector: Adit 600 backplane

**Regulatory Approvals**

See *Appendix A, Regulatory Approvals* for information on the 230VAC Power Supply.

**Physical**

- Dimensions: 3.5 in. (H) x 2 in. (W) x 12 in. (D)  
8.9 cm (H) x 5.1 cm (W) x 30.5 cm (D)
- Weight: 1 lb. 6 oz. (0.62 kg)

For information on Adit 600 Environment required, see *Installation Environment* on page 2-2.

**Input Power**

The following graphic displays the back of the chassis with a 230VAC Power Supply installed.



**230 VAC LEDs**

The power supply card has two LEDs, as described in the table below.



LED	State	Description
AC Input	Off	AC input missing or failure
	Green	AC input present
Battery	Off	Battery input not used
	Green	Battery charging or operating from DC source only.
	Yellow	Battery discharging
	Red	Battery low (less than 42V), ringer disabled



## **24 VDC Power Supply**

The 24 VDC Power Supply delivers +24 VDC power to the Adit 600. This power supply integrates +24 VDC power with a ringing generator in the Adit chassis to dramatically reduce installation time, space requirements and costs compared to separate +24 to -48 VDC power conversion equipment for wireless equipment bays or other +24 VDC applications.

Front panel LEDs provide easy-to-read power status and alarms. The power supply can remotely notify network operations and monitoring centers of low VDC output through the Adit SNMP.

The ringing generator provides 25 Ringer Equivalence Number (REN) output, supporting up to 48 FXS simultaneous ringing lines with normal cadence. Three waveform shapes and software selectable operation with short or long loops ensure performance across a wide range of customer premises applications.

### **Features**

- Provides the Adit 600 with a +24 VDC power source
- Integrated 25 REN ringing generator supports high capacity applications
- Ringer frequency selection of 20, 25 and 50 Hz
- The high voltage ring generator provides the ringing signal required for telecommunication networks in North America and selected foreign countries
- LED status, monitoring, and remote alarming capabilities ensure service availability
- Installs quickly and easily with fully connectorized design
- Meets Central Office NEBS and customer premises UL safety requirements with circuit breaker input protection

### **Technical Specifications**

#### **Electrical Input**

- +24 (21 to 29) VDC, +6 ADC, 90 W output maximum
- Startup at +23.5 V maximum
- Low voltage shutdown at +18 V minimum
- High voltage shutdown at +30 V minimum

#### **Electrical Output**

- -37 VDC (short loop)/ -54 VDC (long loop), software selectable, 1.45 A maximum
- +5 VDC, 9 A maximum

#### **Alarms**

Generates minor alarm contact closure on External Alarm Connector when -54 VDC output voltage magnitude is low



### **Ringling Generators**

- Nominal 80 V rms (108 V rms max)
- Supports three jumper-selectable ringer waveform shapes
- Drives 25 REN indefinitely with minimum output voltage of 65 V rms at normal ringer cadence
- Ringer frequency is selectable, 20 25 or 50 Hz  $\pm$  15%
- Overload protected

### **Interface Connectors**

- Two position +24 V input connector
- Rear PCB connector: Adit 600 backplane

### **Regulatory Approvals**

See *Appendix A, Regulatory Approvals* for information on the 24VDC Power Supply.

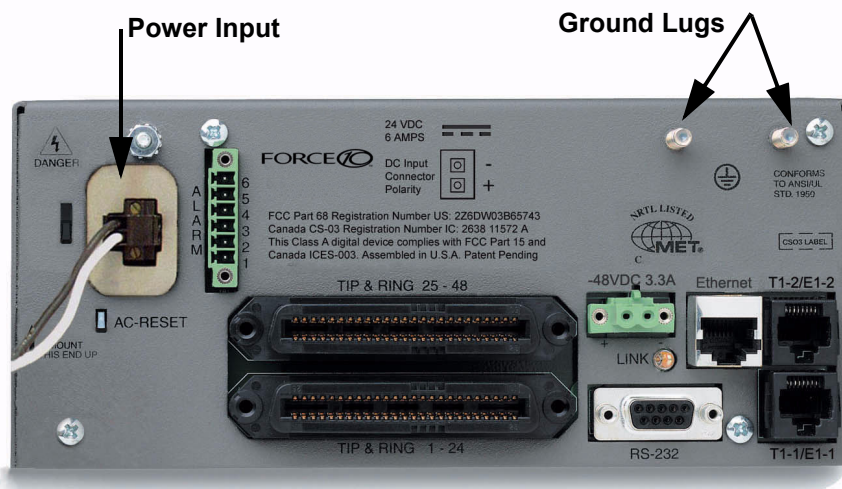
### **Physical**

- Dimensions: 3.5 in. (H) x 2 in. (W) x 12 in. (D)  
8.9 cm (H) x 5.1 cm (W) x 30.5 cm (D)
- Weight: 1 lb. 9 oz. (0.71 kg)

For information on Adit 600 Environment required, see *Installation Environment* on page 2-2.

## Input Power

The following graphic displays the back of the chassis with a 24VDC Power Supply installed. The labels have been added for additional information regarding the power input connector. There is no power cable provided with the 24VDC Power Supply, however the connector is provided. This connector will need to be wired, the following chart lists the wire gauge recommended.



Wire Gauge	Maximum Distance
18 AWG	12 Feet
16 AWG	20 Feet
14 AWG	35 Feet

## Chassis Ground

Connect Ground Lugs to permanent Earthing ground. See Chassis Ground Connector on page 3-7 for more information.

## 24 VDC LEDs

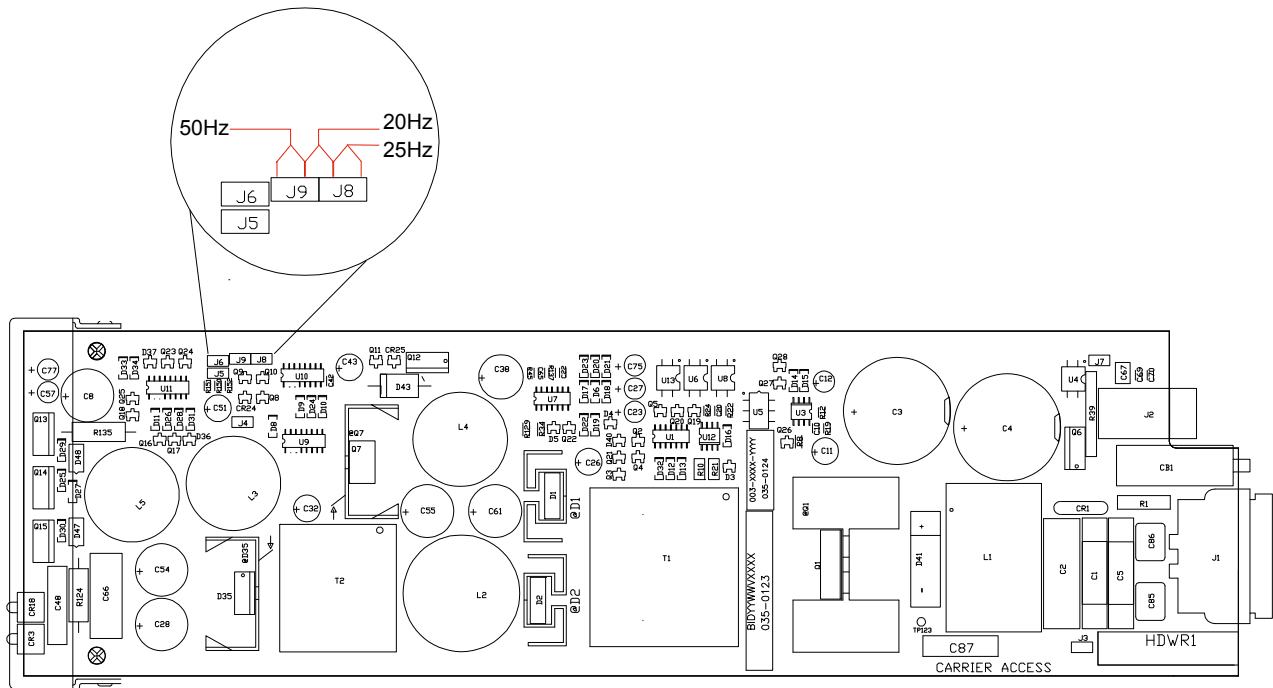
The power supply card has two LEDs, as described in the table below.



LED	State	Description
DC OK	Off	DC input missing or failure
	Green	DC input present
-48 Battery Low	Off	Normal
	Red	VDC is low (less than 42 VDC), ringer disabled

## Ringer Waveform Options

The default standard ringer waveform setting (for all three power supplies) will work well in most applications. However, if there is a ringer detection problem with the equipment, the user can alter the shape of the waveform by populating the jumpers on the power supply as described below. The Ringer Frequency can be configured using jumpers, as displayed below.



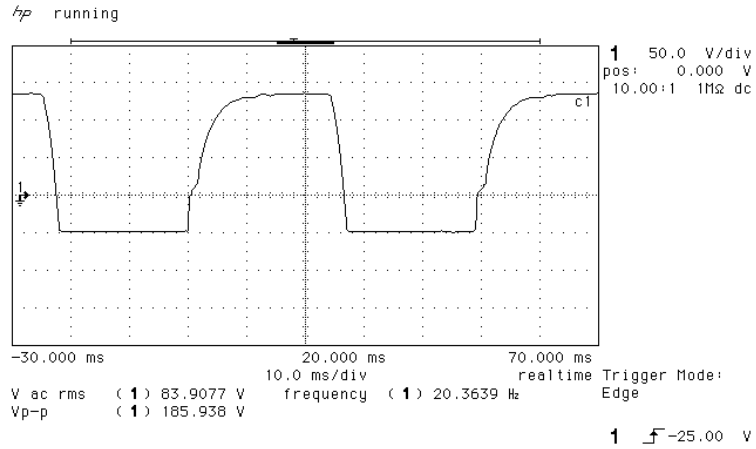
Ringer waveform of frequency options of 20, 25 and 50 Hz are available on all the power supplies. This option was not available on the previously released 115 VAC power supply, therefore when ringer jumpers are present the following applies.

Waveform Options	
Standard Waveform	J6
Square Waveform	None
Long Rise Time or Rounded Waveform	J5 and J6
Frequency Options	
Ringer Frequency of 20 Hz	J8 and J9
Ringer Frequency of 25 Hz	J8
Ringer Frequency of 50 Hz	J9

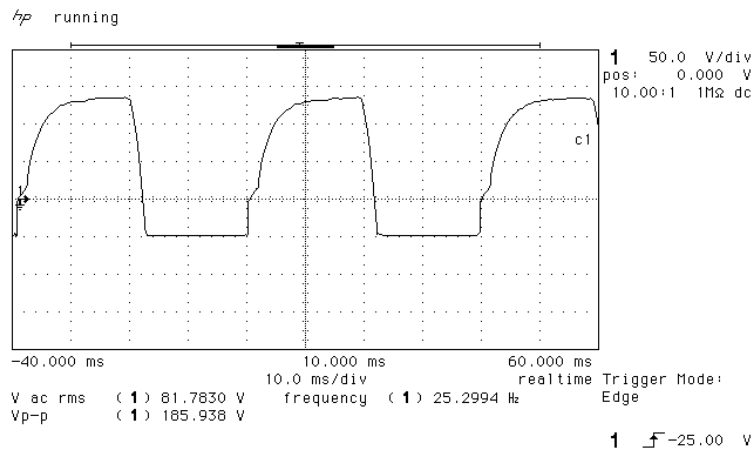
## Standard Waveform

The standard waveform (default) should work well for most applications.

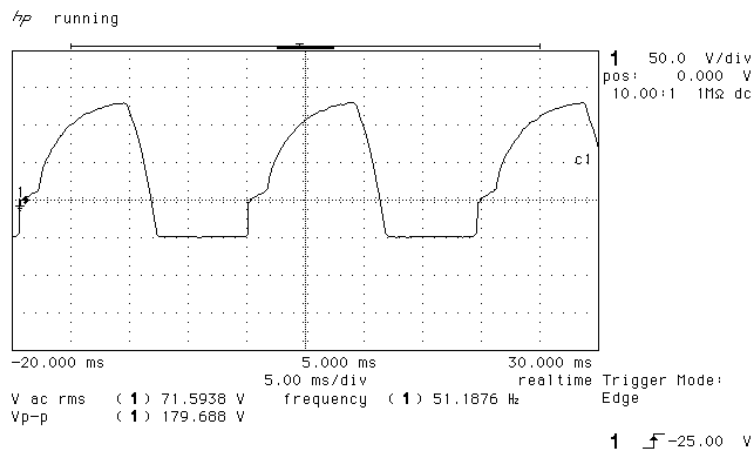
**Ringer Frequency: 20 Hz**



**Ringer Frequency: 25 Hz**

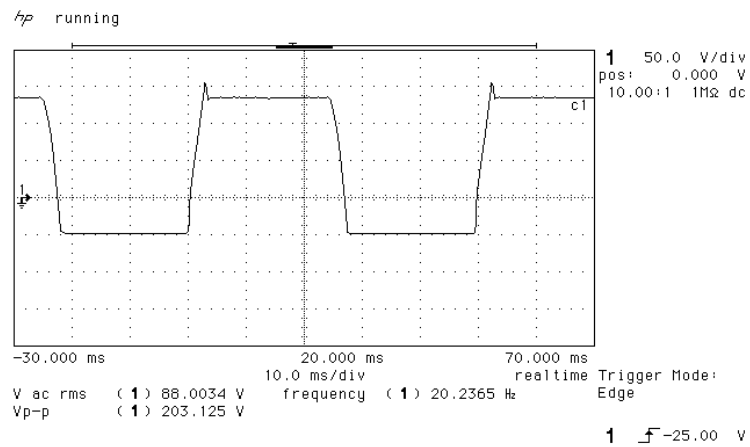


**Ringer Frequency: 50 Hz**

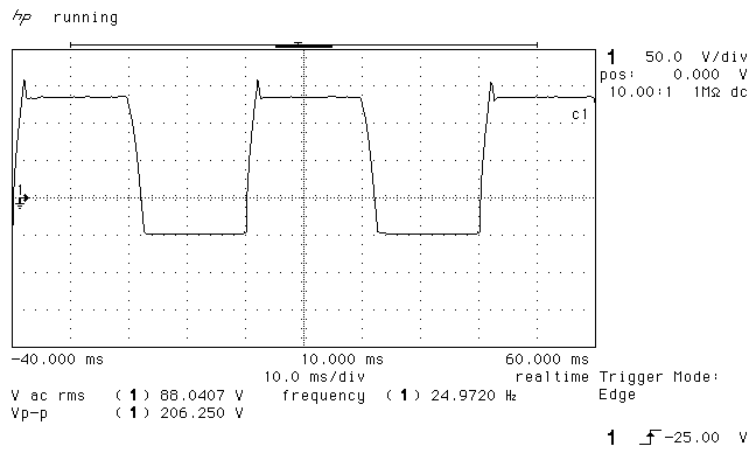


## Square Waveform

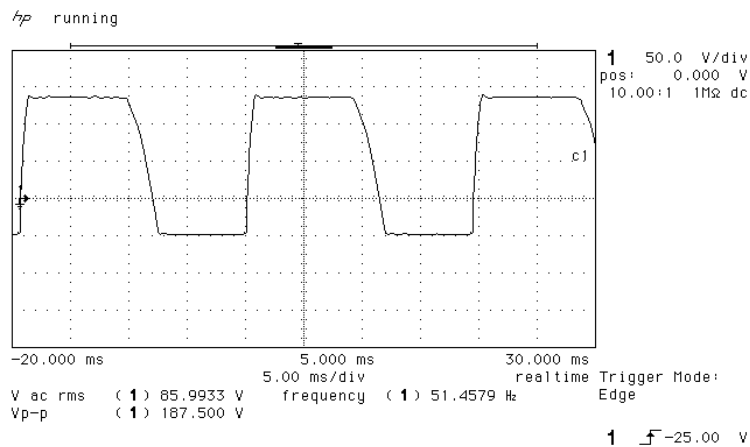
**Ringer Frequency: 20 Hz**



**Ringer Frequency: 25 Hz**

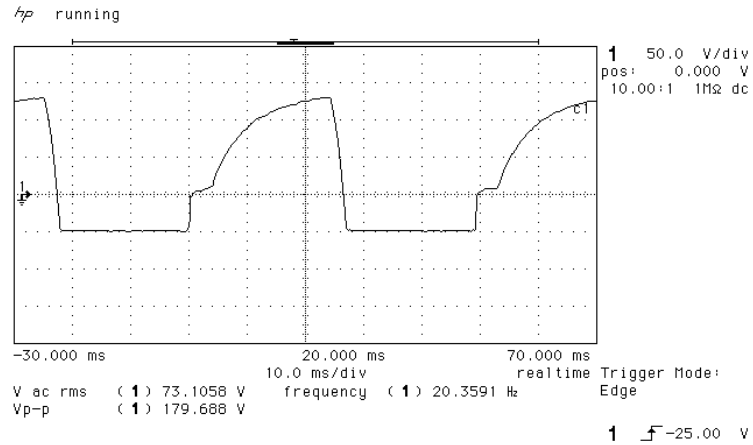


**Ringer Frequency: 50 Hz**

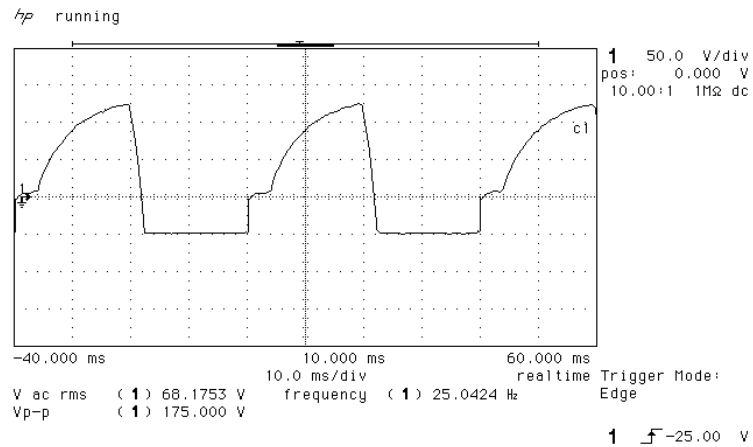


## Long Rise Time or Rounded Waveform

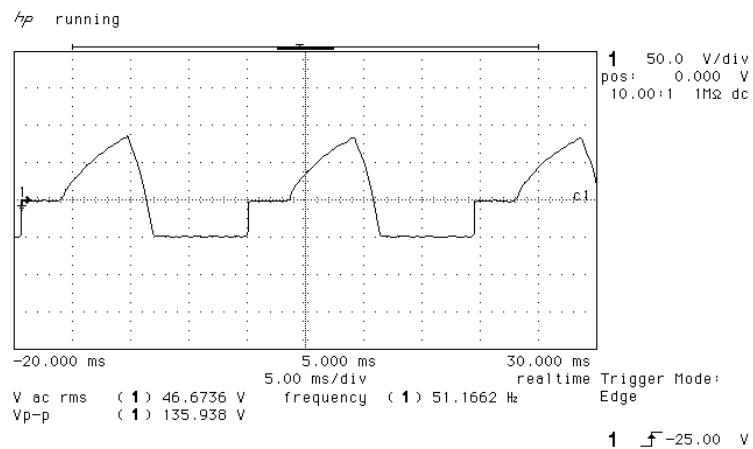
**Ringer Frequency: 20 Hz**



**Ringer Frequency: 25 Hz**



**Ringer Frequency: 50 Hz**



## Replacing a Power Supply



1. Disconnect power cord from the unit.
2. Remove nut and lock washer from power supply retention stud located directly above power cord socket.
3. Remove power supply by grasping faceplate at top and bottom and pulling power supply straight out of the case.
4. When installing the power supply, be certain to engage top and bottom edges of power supply circuit board in the card guides located 1 1/4 inches inside the front opening of the case.
5. Slowly slide the power supply into the slot while making sure that
  - the power supply retention stud aligns with and passes through its attachment hole in the rear of the case, and
  - the connector is correctly aligned to its mating connector on the backplane.
6. Press gently on the faceplate of the power supply to ensure that the connector is fully seated.
7. Replace nut and lock washer on the power supply retention stud.

---

**NOTE:** Reconnect the power cord to the unit.

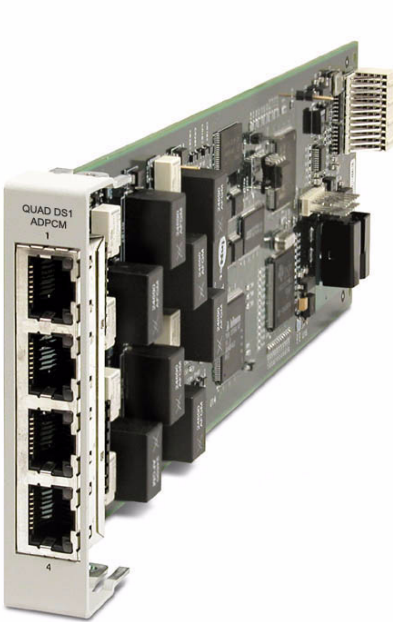
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# CHAPTER 16

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## *Quad DS1 ADPCM Card*



### **In this Chapter**

- Overview
- Features
- Technical Specifications
- Card Configuration
  - CLI Commands
  - Cross Connects
  - Basic Setup
- Jumper Settings
- Connector Pinouts
  - RJ-48 Connector
- LEDs

## Overview

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**NOTE:** This card is no longer manufactured.

---

The Quad DS1 ADPCM Service card is a component of the Adit 600, and provides an intelligent, compact device that can compress and groom traffic, which increases bandwidth utilization and reduces costs. Using Adaptive Differential Pulse Code Modulation (ADPCM), the ADPCM Service card compresses selected timeslots from one of the T1 ports. Compression maps are CLI configurable for the ADPCM port.

The ADPCM Service card is capable of packing two DS0s into a single DS0 and functions simultaneously as a digital cross-connect switch for grooming, bypassing or switching any combination of 64 kbps timeslots. It supports four T1 circuits and includes integral T1 CSU circuitry. V.35/RS-530 high-speed data ports, for integral DSU operation, can be added to the platform with the Dual V.35 Service Card and gives users the ability to drop-and-insert local data into available timeslots.

The ADPCM Service card utilizes industry-standard ADPCM compression techniques to increase the capacity of T1 links. It offers flexible timeslot assignments for mapping and configuration of compressed and non-compressed clear channels to groom data to meet network traffic requirements between remote cell sites and the Mobile Switching Center (MSC). Data and digital traffic (i.e., GSM, CDMA, and TDMA) can ride along with compressed traffic over standard T1 circuits for supporting mixed analog and digital cellular sites.

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**WARNING!** THERE IS A RESTRICTION AS TO THE NUMBER OF QUAD DS1 ADPCM CARDS THAT CAN BE INSTALLED IN AN ADIT. PLEASE SEE *CONFIGURATION RESTRICTIONS ON PAGE 4-23* FOR MORE INFORMATION.

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**NOTE:** There are 4 ports on a DS1 ADPCM Service card, only port 1 supports the ADPCM function.

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## Features

- 32 Kbps ADPCM compression
- Grooms the voice and data mix from selectable channel control options
- Supports up to 14.4 Kbps analog encoded data
- 4 DS1/T1 interfaces with integrated CSU, (DSX1 or DS1 port selections)
- Operates end-to-end with existing transcoder equipment at the MSC
- One modular integrated platform for DS1, V.35, POTS, 10/100 interfaces

## **Technical Specifications**

### **T1 Controller Software Required**

- Release 7.0 or higher is required for the Quad DS1 ADPCM service card

### **T1 Interface**

- 4 T1 ports operating at 1.544 Mbps  $\pm$ 50 bps
- T1 Port 1 provides ADPCM compression capability
- Expansion to 18 T1 ports in a single chassis using Quad T1 or Quad DS1 ADPCM Service cards
- SF (D4) or ESF framing, AMI or B8ZS line coding (DS1 operation)
- Short-haul or long-haul loop settings for T1
- 4 RJ-48C or 25-pin Telco (selectable)
- T1 Line Interface: T1-CSU or T1-DSX (field selectable)
- Line Build Out (DSX-1): 655 feet
- Receive Sensitive (DS1): 0 to -22 dB @ 772KHz ALBO
- Output Level (DS1): Selectable at 0 to -22 dB
- Jitter: meets AT&T Pub. TR-62411
- Solid-state fuseless overvoltage and overcurrent line protection
- Channel status LEDs
- Less than 3 ms signaling latency
- Less than 10 ms overall system signaling latency

### **ADPCM Signaling**

- Clear Channel Signaling passed on 64K clear channel
- 24-channel 32 Kbps ADPCM compression

### **Management**

- Managed by Adit 600 Controller Craft or SNMP Interface

### **Synchronization**

- Provides reference clock to backplane from selected T1

### **Network Standards**

- RFC 2495
- ANSI T1.403-1995, T1.231-1993
- ITU G.703, G.704

## **Clocking**

- Loop-timed from any T1
- Revertive or non-revertive clock switching provides automatic backup to secondary T1 should the primary T1 fail
- Operates as a Stratum 4E device as defined by Telcordia GR-1244-CORE and AT&T TR 62411

## **Alarms**

- Support standard T1.403 alarms
- LOS (Loss of Signal), Red, Yellow, Blue
- ESF Performance Error Count Threshold
- Timing Loss
- All alarms are logged in an event log
- Loss of power triggers minor alarm
- Generates SNMP traps for alarming

## **Testing and Diagnostics**

- T1.403 payload loopbacks (ESF only)
- T1.403 remote and local line loopbacks (ESF and SF)
- T1.231 Performance History (15 minute intervals, 24 hour totals)
- T1.403 Performance Report Messages (PRMs)

## **Power Consumption**

- Less than 4.5 W per card

## **Regulatory Approvals**

See *Appendix A, Regulatory Approvals* for information on the Quad DS1 ADPCM Service card.

## **Environment**

For systems environment requirements, see *Installation Environment* on page 2-2.

## **Physical**

- Dimensions: 3.5 in. (H) x 0.75 in. (W) x 11.25 in. (D)  
8.9 cm (H) x 1.9 cm (W) x 28.6 cm (D)
- Weight: 5.1 oz. (0.14 kg)

## Card Configuration

All options on the this Service card are set using the Command Line Interface (CLI).

### CLI Commands

The following commands are used to configure the Quad DS1 ADPCM card. For detailed information on these commands, see *Chapter 5, CLI Commands*.

- *connect*  
Creates two-way connections between channels.
- *disconnect*  
Removes a connection created by the connect command.
- *set (ds1 card) adpcm map*  
Sets the compression map on the ADPCM card (none, map 1, map 2 or map 3).
- *set (ds1)*  
Sets up the DS1 interfaces (clock, up, down, fdl, framing, id string, lbo, line, linecode, loopdetect).
- *show (adpcm)*  
Displays current settings for the ADPCM card (circuit ID, up.down, framing, line coding, line build out, loop code detection, loop back, fdl type, ADPCM, ADPCM Map).
- *show connect adpcm*  
Displays the connections for the ADPCM port.
- *show (ds1)*  
Displays current settings for DS1.
- *status (adpcm)*  
Displays the status of the ADPCM card (receive, transmit, loopback).
- *status (ds1)*  
Displays the status of the DS1 (receive, transmit, loopback).

## Basic Setup

Before configuring the DS1 ADPCM card, there are some basics that need to be considered:

- All DS0s to be compressed reside on T1 number 1 of the ADPCM card
- Compressed data and uncompressed data can be transported at the same time.
- All DS0s to be compressed must be set to *type data*.

The following is a basic setup:

Command	Description
Connect T1 cable to port 1 of the ADPCM service card	
set {adpcm_card-addr} adpcm {none map1 map2 map3}	Enable compressing by selecting Map type. Note: <b>none</b> disables compression. See the following section on Maps.
show (adpcm_card-addr)	Displays the status of the card, and the mapping.
set {2:1:1-12} type data	Set the channel (DS0) type to data on the ADPCM channels. See <i>set (ds0)</i> command for more information.
set {2:4:1-12} type data	Set the channel (DS0) type to data on the channels for cross-connect. See <i>set (ds0)</i> command for more information.
connect 2:1:1-12 2:4:1-12	Set cross-connects. The example connects all 24 channels of the ADPCM to the 12 channels of the T1 (now compressed) on port 4. Example is with <b>map2</b>
show connect adpcm {2:1}	Displays the connections made above.

## **Cross Connects**

It is important to note that all timeslots are cross-connected in pairs. The actual pairs that can be cross-connected are dependant upon which of the 3 supported mappings are set using the *set (ds1 card) adpcm map* command.

### **Map1**

- Channels 1-12 and 14-23 are compressed into 11 DS0s (2 to 1 compression)
- Channel 24 is used for 64K non-compressed data (mapped to channel 12)
- Channel 13 is idle (cannot be used)
- Channel pairing is as follows:  
1/2, 3/4, 5/6, 7/8, 9/10, 11/12, 14/15, 16/17, 18/19, 20/21, 22/23 (mapped to channels 1-11)  
Note: 13 and 24 are not included in the pairing. See above bullets.

### **Map2**

- Channels 1-24 are compressed into 12 DS0s (2 to 1 compression)
- Channel pairing is as follows:  
1/2, 3/4, 5/6, 7/8, 9/10, 11/12, 13/14, 15/16, 17/18, 19/20, 21/22, 23/24 (mapped to channels 1-12)

### **Map 3**

- Channels 1-22 are compressed into 11 DS0s (2 to 1 compression)
- Channel 24 is used for 64K non-compressed data (mapped to channel 12)
- Channel 23 is idle (cannot be used)
- Channel pairing is as follows:  
1/2, 3/4, 5/6, 7/8, 9/10, 11/12, 13/14, 15/16, 17/18, 19/20, 21/22 (mapped to channels 1-11)  
Note: 23 and 24 are not included in the pairing. See above bullets.

#### **Example:** `connect 2:1:1 2:4:1`

The above example will connect the ADPCM pair 1 (which are actually channels 1 and 2) to channel 1 (now compressed) on port 4.

#### **Example:** `connect 2:1:1-12 2:4:1-12`

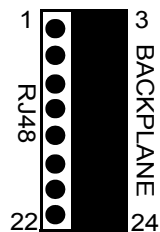
With Map 1, the example will connect the ADPCM pairs 1-11 (which is actually channels 1-23 - no 12) to channels 1-11 (now compressed) on port 4 and channel 24 (12) to channel 12 (non-compressed data).

## **Jumper Settings**

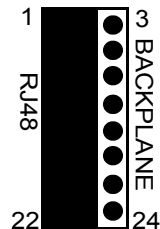
The P2 and P3 Jumpers are defaulted to RJ-48, which are the set of pins nearest the connectors. In this position the T1 signals (TX and RX) are routed to the RJ-48 connectors on the face of the card, see *RJ-48 Connector on page 16-9* for pinout information. To route the T1 signals to the 25-pin Telco connector at the rear of the unit, move all the jumpers to the "backplane" position (the two rightmost pins for each signal). See for pinout information.

### **P2 and P3 Jumpers**

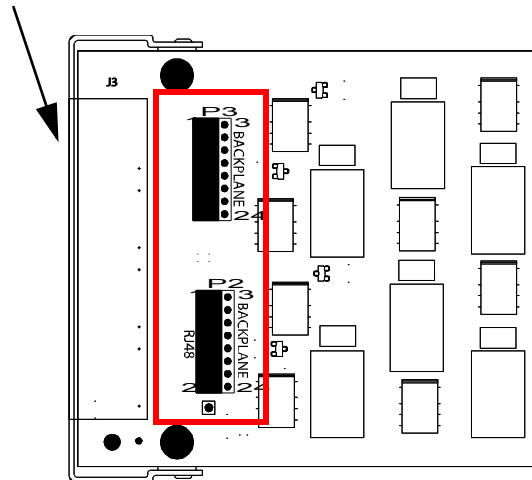
Jumper set to  
25-pin Telco  
connectors on the  
back of the chassis



Jumper set to  
RJ-48 connector  
on the front of  
the card



### **Faceplate of ADPCM card**

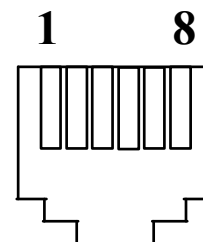




## Connector Pinouts

### RJ-48 Connector

There are four RJ-48 (female) connectors on the front of the Quad DS1 ADPCM Card.



The pinouts are as follows:

Pin	Name	Description
1	Receive Ring	Receive from DS1 network
2	Receive Tip	Receive from DS1 network
3	N/C	Not connected
4	Transmit Ring	To DS1 network
5	Transmit Tip	To DS1 network
6 - 7	N/C	Not connected
8	Chassis Ground	

## LEDs

Each channel on the Quad DS1 ADPCM card has two LEDs. The description of the top LED is shown below, the bottom LED is not used with this application.



Top LED  
(active)

Bottom LED  
(not used)

State	Description
Off	Off line
Green	Normal
Red	Loss of Signal (LOS)
Yellow	Bipolar Violation (BPV)
Flashing Green	Loopback active
Flashing Yellow	Yellow Alarm (Remote Alarm Indication)
Flashing Red (Slow)	Loss of Frame (LOF) or Alarm Indication Signal (AIS)
Flashing Red (Fast)	Self-test Failure



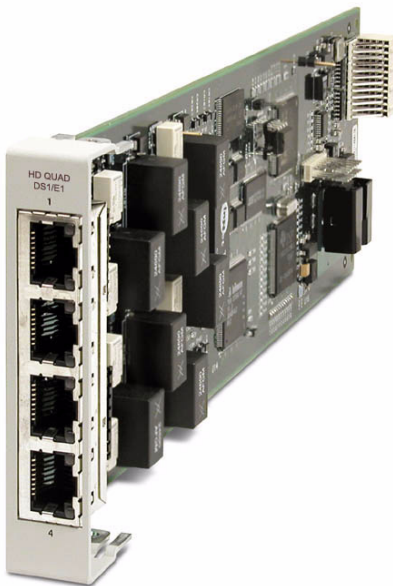
# CHAPTER 17

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## *Quad T1, Quad E1 & Quad DS1/E1 Cards*

### In this Chapter

- Overview
- Features
- Technical Specifications
- Card Configuration
  - CLI Commands
- Jumper Settings
- Connector Pinouts
  - 25-pin Telco Connector
  - RJ-48 Connector
- LEDs



## Overview

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**NOTE:** E1 is not supported in this release of the Adit 600 Controller. It will be supported in a future release.

---

The Quad DS1/E1 Service cards enable wireless service providers to cost-effectively provision and expand network bandwidth, and groom available DS0s onto other T1/E1 tributaries for optimal T1/E1 bandwidth utilization. Supported in the Adit 600 the cards can be inserted into any service card slot. They provide full 1/0 cross-connect capability, drop-and-insert functionality, and support fractional and full T1/E1 services, as well as DS0 trunking.

When fully equipped with four Quad DS1/E1 Service cards plus a Dual T1 or E1 Controller Card, an Adit 600 can support up to 18 T1 or E1 ports enabling the Adit to function as mini-DCS with DS0 voice interfaces. In wireless applications, this available bandwidth enables the Adit 600 to cost-effectively address fixed-wireless service distribution, mobile wireless backhaul and daisy-chained DS0 distribution to remote cell sites. In wireline applications, the DS1/E1 cards enable service providers and enterprise network managers to cost-effectively provision and expand network bandwidth or drop-side T1 bandwidth. This available bandwidth allows the Adit 600 to cost-effectively address small-to-medium size business requirements, multi-tenant units, as well as end-office applications.

The DS1/E1 cards can be locally or remotely managed as a component of the Adit 600 platform. The card can be configured using a Command Line Interface (CLI).

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**WARNING!** THERE IS A RESTRICTION AS TO THE NUMBER OF QUAD DS1/E1 CARDS THAT CAN BE INSTALLED IN AN ADIT. PLEASE SEE *CONFIGURATION RESTRICTIONS ON PAGE 4-20* FOR MORE INFORMATION.

---

### ***Hardened Quad DS1/E1 Service card***

The Hardened Quad DS1/E1 Service card has been specifically hardened to stand up to the extreme environmental conditions commonly associated with wireless cell site deployments. This card is configurable to DS1 or E1 with a single CLI command, regardless of Controller type. Configured as a Quad DS1 service card the following DS1/T1 Service card specifications will apply to this card. When configured as a Quad E1 service card, the following E1 Service card specifications will apply to this card.

### ***Quad T1 Service card***

The 4 port T1 service card enables cost-effective provisioning and expansion of T1 bandwidth with full non-blocking digital cross-connection of all timeslots to any Adit service card. This card requires an Adit system with an T1 Controller. **Note:** This card is no longer manufactured; it has been replaced by the Quad DS1/E1 service card.

### ***Quad E1 Service card***

The 4 port E1 service card enables cost-effective provisioning and expansion of E1 bandwidth with full non-blocking digital cross-connection of all timeslots to any Adit service card. This card requires an Adit system with an E1 Controller. **Note:** This card is no longer manufactured; it has been replaced by the Quad DS1/E1 service card.

## **Features**

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**NOTE:** E1 is not supported in this release of the Adit 600 Controller. It will be supported in a future release.

---

- Up to four DS1/E1 service cards can be installed in the Adit 600 for up to 18 DS1s/E1s, allowing the platform to act as a mini-DSC
- The DS1/E1 service cards can be mixed to combine DCS functionality with a variety of other voice and data services in a single platform
- Integrates T1 CSU functionality with FCC registration for direct connection to T1 lines
- Supports B8ZS or AMI encoding and SF (D4) or ESF framing for T1
- Local, Line and Payload loopbacks
- Performs framing and coding conversions between T1 ports
- Offers flexible system clock timing, which may be derived from or provided to any T1
- Insert up to four Quad DS1/E1 Service cards plus the two ports from the T1 or E1 Controller in a single Adit 600 for a total of 18 T1s/CSUs per chassis
- Allows full non-blocking digital cross-connection (DCS) of all timeslots to any Adit service card
- Supports ESF performance reporting
- Offers secondary solid-state fuseless protection to lightning and power cross incidents

## ***Technical Specifications***

### ***T1 Controller Software Required***

- Quad T1 service card requires release 1.3.1
- Quad E1 service card is not supported with the T1 Controller
- Quad DS1/E1 service card requires release 7.0. Supported when in T1 mode.

### ***E1 Controller Software Required***

- Quad T1 service card is not supported with the E1 Controller
- Quad E1 service card requires release 3.2
- Quad DS1/E1 service card requires release 7.0 through 9.4. Supported when in E1 mode.

---

**NOTE:** E1 is not supported in this release of the Adit 600 Controller. It will be supported in a future release.

---

### ***Card Interface***

- Short-haul or long-haul loop settings
- 24-hour or 15-minute performance threshold
- Jitter: meets AT&T Pub. TR-62411
- Solid-state fuseless overvoltage and overcurrent line protection
- Channel status LEDs
- Front or rear connections:
  - Front: uses faceplate-mounted RJ-48C connectors
  - Rear: uses rear-panel RJ-21X connectors
- Less than 3 ms signaling latency
- Less than 10 ms overall Adit system signaling latency

### ***T1 Interface (specific)***

- 4 selectable T1 ports operating at 1.544 Mbps  $\pm$ 50 bps
- Selectable B8ZS or AMI encoding
- SF (D4) or ESF framing
- T1 line interface: T1-CSU or T1-DSX (field selectable)
- Line Build Out (DSX-1): 655 feet
- Receive Sensitive: 0 to -22.5 dB @ 772 KHz ALBO
- Output Level: Selectable at 0 to -22dB

## ***E1 Interface (specific)***

---

**NOTE:** E1 is not supported in this release of the Adit 600 Controller. It will be supported in a future release.

---

- 4 selectable E1 ports operating at 2.048 Mbps  $\pm$ 100 bps
- HDB3 encoding
- E1 Double Framed and E1 Multi-Framed (CDC-4) framing
- CAS and Digital R2 signaling

## ***Network Interface***

- The Quad DS1/E1 Service card may be configured as either a network or drop-side interface.

## ***Network Standards***

### **DS1/T1**

- T1.107
- T1.102
- T1.203
- T1.231
- T1.403

### **E1**

- ITU-T G.703
- ITU-T G.704
- CTR 12 & 13

## ***Clocking***

- Loop-timed from any T1/E1
- Revertive clock switching provides automatic backup to secondary T1/E1 should the primary T1/E1 fail
- Operates as a Stratum 4E device

## ***Alarms***

- Support standard T1.403 alarms (DS1/T1)
- Supports standard G.732 alarms (E1)

## **Testing and Diagnostics**

### **DS1/T1**

- T1.403 payload loopbacks (ESF only)
- T1.403 remote and local line loopbacks (ESF and SF)
- T1.231 Performance History (15 minute intervals, 24 hour totals)
- T1.203 Performance Report Messages (PRMs)

### **E1**

- Standard E1 line loopback
- Loop Up (on)/Loop Down (Off) line loopback setting
- RFC 2495 performance history

## **Power Consumption**

- Quad DS1/E1 (hardened) card: less than 4.5 W per card
- Quad T1 card: less than 3 W per card
- Quad E1 card: less than 5 W per card

## **Regulatory Approvals**

See *Appendix A, Regulatory Approvals* for information on the Quad DS1/E1 Service cards.

## **Physical**

- Dimensions: 3.5 in. (H) x 0.75 in. (W) x 11.25 in. (D)  
8.9 cm (H) x 1.9 cm (W) x 28.6 cm (D)
- Weight: 5.1 oz. (0.14 kg)

For information on Adit 600 Environment required, see *Installation Environment* on page 2-2.



## Card Configuration

All options on the Quad DS1/E1 cards are set using either the Command Line Interface (CLI) except for setting the option of using the Telco connector, which is done with a jumper. The default for the connectors are the RJ-48s on the front of the service card, however by moving the jumpers to the backplane, the Telco connectors on the back of the unit are enabled. See *Jumper Settings on page 17-8* for more information.

### CLI Commands

The following commands are used to configure the Quad DS1/E1 cards. For detailed information on these commands, see *Chapter 5, CLI Commands*.

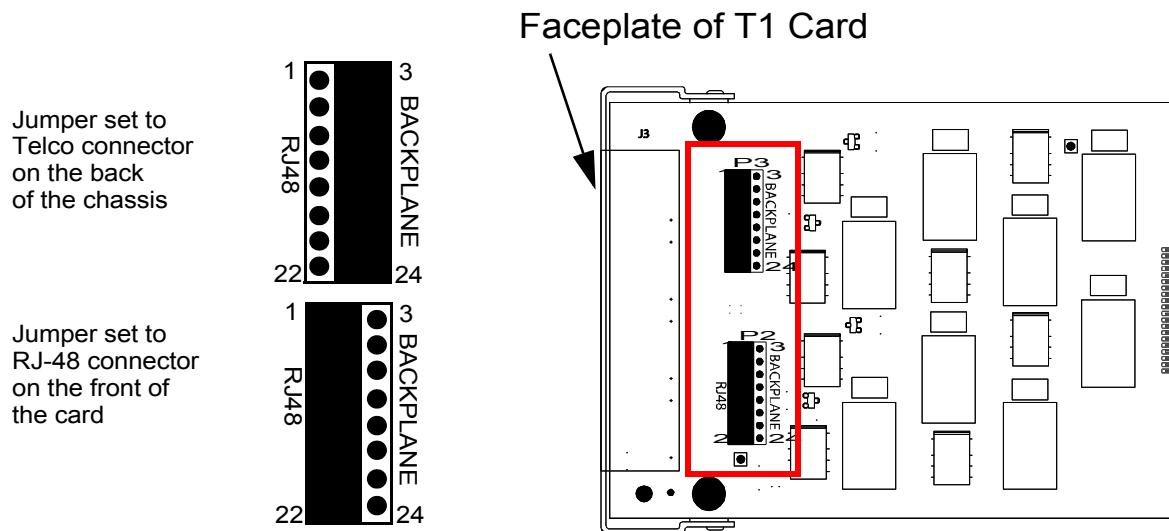
- *connect*  
Creates two-way connections between channels.
- *disconnect*  
Removes a connection created by the connect command.
- *set (ds0)*  
Set up one or all DS0s in a DS1. The command specifies DS0 or range of DS0s, and the setting to apply.
- *set (ds1)*  
Sets up the DS1 interfaces (clock, up, down, equipment loopup, fdl, framing, id string, lbo, line loopup, linecode, loopdetect, payload loopup, threshold).
- *set (e1)*  
Sets up the E1 interfaces (clock, up, down, framing, line, linecode and signaling).
- *set (ds1 card) spantype*  
To configure a Quad DS1/E1 service card for T1 or E1 mode.
- *set lsbackup*  
Defines the backup protection slot.
- *set lsprotect manual*  
Sets the manual mode control for protected ports.
- *set lsprotect nonrevertive*  
Defines the port non-revertive status and priority level.
- *set lsprotect remove*  
Removes port from protected mode.
- *set lsprotect revertive*  
Defines the port revertive status and priority level.
- *show (ds1)*  
Displays current settings for DS1 (circuit ID, up,down, framing, line coding, clock source, line build out, loop code detection, loop back, fdl type).
- *show (e1)*  
Displays current settings for E1 (up, down, framing, line coding, clock source, loop back and signaling).
- *show lsprotect*  
Displays the low speed protection settings.

- *status (ds1)*  
Displays the status of the DS1 (receive, transmit, loopback).
- *status (e1)*  
Displays the status of the E1 (receive, transmit and loopback)
- *status lsprotect*  
Displays the current status of the low speed protection cards.

## Jumper Settings

The P2 and P3 Jumpers are defaulted to RJ-48, which are the set of pins nearest the connectors. In this position the T1 signals (TX and RX) are routed to the RJ-48 connectors on the face of the card, see *RJ-48 Connector on page 17-11* for pinout information. To route the T1/E1 signals to the 25-pin Telco connector at the rear of the unit, move all the jumpers to the "backplane" position (the two rightmost pins for each signal). See *25-pin Telco Connector on page 17-9* for pinout information.

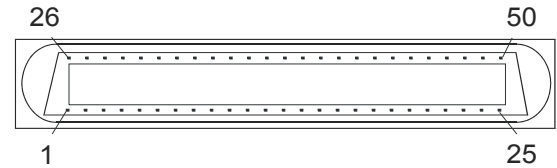
### P2 and P3 Jumpers



## Connector Pinouts

### 25-pin Telco Connector

The pinouts are as follows:



Slot	Port	Pair	Pin Location	Function	Color Code
1 and 4	1	1	26 1	Tip Receive from DS1 network Ring Receive from DS1 network	White Blue
		2	27 2	Tip Transmit to DS1 network Ring Transmit to DS1 network	White Orange
1 and 4	2	3	28 3	Tip Receive from DS1 network Ring Receive from DS1 network	White Green
		4	29 4	Tip Transmit to DS1 network Ring Transmit to DS1 network	White Brown
1 and 4	3	5	30 5	Tip Receive from DS1 network Ring Receive from DS1 network	White Slate
		6	31 6	Tip Transmit to DS1 network Ring Transmit to DS1 network	Red Blue
1 and 4	4	7	32 7	Tip Receive from DS1 network Ring Receive from DS1 network	Red Orange
		8	33 8	Tip Transmit to DS1 network Ring Transmit to DS1 network	Red Green
2 and 5	1	9	34 9	Tip Receive from DS1 network Ring Receive from DS1 network	Red Brown
		10	35 10	Tip Transmit to DS1 network Ring Transmit to DS1 network	Red Slate
2 and 5	2	11	36 11	Tip Receive from DS1 network Ring Receive from DS1 network	Black Blue
		12	37 12	Tip Transmit to DS1 network Ring Transmit to DS1 network	Black Orange
2 and 5	3	13	38 13	Tip Receive from DS1 network Ring Receive from DS1 network	Black Green
		14	39 14	Tip Transmit to DS1 network Ring Transmit to DS1 network	Black Brown

## ***Quad T1, Quad E1 & Quad DS1/E1 Cards***

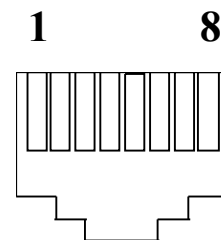
### ***Connector Pinouts***

<b>Slot</b>	<b>Port</b>	<b>Pair</b>	<b>Pin Location</b>	<b>Function</b>	<b>Color Code</b>
2 and 5	4	15	40 15	Tip Receive from DS1 network Ring Receive from DS1 network	Black Slate
		16	41 16	Tip Transmit to DS1 network Ring Transmit to DS1 network	Yellow Blue
3 and 6	1	17	42 17	Tip Receive from DS1 network Ring Receive from DS1 network	Yellow Orange
		18	43 18	Tip Transmit to DS1 network Ring Transmit to DS1 network	Yellow Green
3 and 6	2	19	44 19	Tip Receive from DS1 network Ring Receive from DS1 network	Yellow Brown
		20	45 20	Tip Transmit to DS1 network Ring Transmit to DS1 network	Yellow Slate
3 and 6	3	21	46 21	Tip Receive from DS1 network Ring Receive from DS1 network	Violet Blue
		22	47 22	Tip Transmit to DS1 network Ring Transmit to DS1 network	Violet Orange
3 and 6	4	23	48 23	Tip Receive from DS1 network Ring Receive from DS1 network	Violet Green
		24	49 24	Tip Transmit to DS1 network Ring Transmit to DS1 network	Violet Brown
NA	NA	25	50 25	Reserved	Violet Slate

## RJ-48 Connector

There are four RJ-48C (female) connectors on the front of the Card. The pinouts are as follows:

Pin	Name	Description
1	Receive Ring	Receive from DS1 network
2	Receive Tip	Receive from DS1 network
3	N/C	Not connected
4	Transmit Ring	To DS1 network
5	Transmit Tip	To DS1 network
6 - 7	N/C	Not connected
8	Chassis Ground	



## LEDs

Each channel on the card has two LEDs. Note: the bottom LED is not used with this application.



State	Description
Off	Off line
Green	Normal
Red	Loss of Signal (LOS)
Yellow	Bipolar Violation (BPV)
Flashing Green	Loopback active
Flashing Yellow	Yellow Alarm (Remote Alarm Indication)
Flashing Red (Slow)	Loss of Frame (LOF) or Alarm Indication Signal (AIS)
Flashing Red (Fast)	Self-test Failure

## ***Quad T1, Quad E1 & Quad DS1/E1 Cards***

*LEDs*

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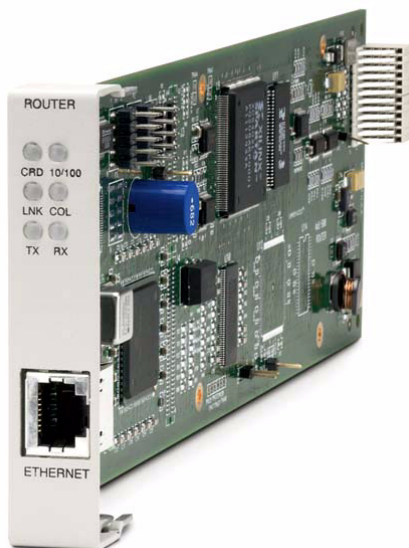
# CHAPTER 18

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## *Router (IP) Card*

### In this Chapter

- Overview
- Features
- Technical Specifications
- Card Configuration
  - CLI Commands
- Connector Pinouts
  - 10Base-T Ethernet
- LEDs



## Overview

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**NOTE:** This card is no longer manufactured.

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The fast-changing world of IP services requires products with the capability to generate new value-added revenues. The IP Router Service card offers the performance and expandability of a dedicated router in a low-cost solution with simple integrated management through the Adit platform.

Unlike other internal routing solutions that support software-based routing by adding bundles to the system software, the IP Router card employs a dedicated processor to ensure high performance and product feature expansion. It delivers high-speed Internet and Intranet connectivity to small and medium-sized businesses, as well as remote and branch office users. A powerful set of standard features includes IP and IPX routing, Layer 2 bridging, ML-PPP, networking security, and management capabilities to integrate services in the digital last mile.

The Adit 600 supports up to four or six IP Router cards in a chassis, in any combination of services, depending upon the Controller (see *Restrictions on Multiple Router Cards on page 4-24*). This flexibility enables service providers to target multi-tenant units with a single device that supports business-class voice, Internet access and data services. The addition of Multi-Link Point-to-Point Protocol (ML-PPP) to the IP Router card ensures that service providers can continue to support the growing needs of customers, beyond one or two T1s/E1s.

The IP Router card simplifies delivery of data networking solutions by leveraging the advantages of the Adit 600 battery backup and single IP management, while reducing costly cabling expense through a direct 10/100Base-TX Ethernet interface connection.

IP Router cards are easily managed through the Adit 600 user interface, identified by a single IP address. With this capability, multiple cards within a single Adit 600 can be configured, monitored and maintained through one unique IP address, speeding installation and simplifying management tasks.

The IP Router card is SNMP, CLI or menu-driven manageable. Management connectivity is provided either through the user data port connection on the IP Router card, the local RS-232 craft port, the Ethernet management port, or the dedicated management channel on the T1 Controller.

The Router Service card configuration information can be uploaded to the NOC while router code upgrades are loaded to the Router card. The uploading and downloading is accomplished through the Ethernet management port and/or the user data connection. In addition, the CLI management option enables management configuration information to be created offline and loaded into the system either via a script or TFTP.



## Features

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**NOTE:** E1 is not supported in this release of the Adit 600 Controller. It will be supported in a future release.

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- Supplies auto-sensing 10/100Base-TX Ethernet
- Supports up to 6 router cards per Adit 600 chassis, depending upon the Controller (see *Restrictions on Multiple Router Cards on page 4-24*)
  - Multi-point networking with up to 24 WAN connections per router
  - Each WAN connection can be provisioned with multiple DS0s
  - Deliver more than two T1s bandwidth per Router card; up to 60 DS0s per Router card
  - Enables multiple T1/E1 facilities to function as a single IP WAN interface using ML-PPP for bandwidth scalability beyond a single T1
- Ensures high performance and feature expansion through dedicated IP Router card processor
- Enables management via menu-driven user interface or CLI Router interface
- Supports packet filtering and Spanning Tree Protocol
- Allows Network Address Translation (NAT) and Port Address Translation (PAT)
- Supports Dynamic Host Configuration Protocol (DHCP)
- Delivers a minimum of 3,000 packets per second
- RADIUS Login Authentication

## Technical Specifications

### Controller Software Required

#### T1 Controller

- Release 3.0 or higher is required
- Adit 600 release 10.1.1 or higher is required to support all features available in IP Router release 2.97. If you are using an earlier controller or IP Router release, check the Customer Release Notes provided with your software to determine which features are supported.

#### E1 Controller

- Release 3.2 through 9.4 is required

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**NOTE:** E1 is not supported in this release of the Adit 600 Controller. It will be supported in a future release.

---

## **Management**

- Menu-driven over RS-232 and CLI
- Ping, SNMP, Telnet over IP
- Ethernet management port
- IP management connection via T1 FDL, Ethernet and DS0 bearer channel
- Code download via TFTP
- Configuration upload and download via TFTP

## **WAN Interface**

- Any T1 interface on the Adit 600 platform
- Up to 24 WAN interfaces per router
- Up to 60 DS0s bandwidth per router
- PPP, Frame Relay, PPP in Frame Relay, MLPPP and GRE tunneling

## **LAN Interface**

- A single 10/100Base-TX auto-sensing port

## **Routing**

- IPX RIP/SAP
- IP RIPv1, RIPv2, RIPv/RIPv2 compatibility mode
- Static routing
- Classless routing (CIDR)

## **Bridging**

- IEEE 802.1D MAC bridging

## **Router Performance**

- Minimum of 3,000 64-byte packets per second throughput

## **Advanced Capabilities**

- DHCP server
- Syslog
- SNTP
- Spanning Tree Protocol
- Van Jacobson message header compression
- Domain Name Server (DNS) proxy
- IP fragmentation and reassembly support
- Secondary IP Address

### ***Frame Relay***

- RFC 1490 encapsulation
- ANSI T1.617 Annex D LMI
- ITU Q.933 Annex A LMI

### ***Filtering***

- LAN/WAN Filters up to Layer 4, stateful

## **Security**

- Three user accounts
- Three levels of security
- PAP and CHAP
- Network Address Translation (NAT)
- NAT Bypass
- Port Address Translation (PAT)
- RADIUS Login Authentication

## **MIBs**

- RFC 1212 (Concise MIB)
- RFC 1213 (MIB II)
- RFC 1643 (Ethernet)
- RFC 2233 (Interface)
- RFC 2011 (IP)
- RFC 1471 (LCP/PPP)
- RFC 1473 (IP/PPP)
- RFC 2115 (Frame Relay)
- RFC 1406 (DS1/E1)
- RFC 1659 (RS-232)
- Enterprise MIB

## **Clocking**

- Loop-timed from any T1 or the internal system clock
- Simple Network Time Protocol (SNTP) support for timing from a separate network

## **Testing and Diagnostics**

- Ping, Trace Route
- WAN Monitor

## **Power**

- Less than 2 W

## **Regulatory Approvals**

See *Appendix A, Regulatory Approvals* for information on the IP Router Service card.

## **Physical**

- Dimensions: 3.5 in. (H) x 0.75 in. (W) x 11.25 in. (D)  
8.9 cm (H) x 1.9 cm (W) x 28.6 cm (D)
- Weight: 5.2 oz. (0.15 kg)

For information on Adit 600 Environment required, see *Installation Environment* on page 2-2.

## Card Configuration

The IP Router has the option of configuration through CLI or the Router menu-driven user interface, which is accessed through Telnet. The following CLI commands are all Router related. For information on the IP Router menu-driven user interface, see the IP Router User Manual.

---

**NOTE:** The default IP address for the IP Router is 10.0.0.1.

---

### CLI Commands

For detailed information on the following Router commands, see *Chapter 5, CLI Commands*.

- *add (router) dhcp server option*  
Add optional DHCP server attributes that will be advertised every time a DHCP client discovery is initiated
- *add (router) dns proxy*  
Enable DNS proxy and add a remote DNS server address to the router card
- *add (router) remote*  
Add a remote WAN profile to the WAN profile table
- *add (router) snmp community*  
Add a SNMP community to an interface on the router card
- *add (router) snmp trap*  
To specify a destination to send SNMP trap messages
- *add (router) uploaduser*  
To specify a host that is allowed to upload configuration/software files
- *add (router-lan) filter*  
Add address filters (address, custom, protocol) to the table of Layer 2 filters applied to the specified LAN interface
- *add (router-lan) static*  
Add static elements on the specific LAN interface (IP address, IP network, IPX network, MAC address).
- *add (router-wan) firewall*  
Add a firewall rule to a WAN.
- *add (router-wan) gre network*  
Add a "by network" GRE tunnel to a WAN.
- *add (router-wan) nat bypass*  
Add subnets to the list of source addresses that will not be subject to NAT translation when passing through a NAT enabled WAN interface.
- *add (router-wan) static*  
Add static elements to the specified WAN interface (IP address, IP network, IPX network, MAC address and NAT address).
- *clear (router) ip address table*  
Flush the learned entries from the IP address table for the specific interface from the specified Router card.

## Router (IP) Card

### Card Configuration

---

- *clear (router) mac address table*  
Flush the learned entries from the MAC address table for the specific interface from the specified router card.
- *connect (router-trunk) (t1)*  
Creates two-way connections between the router port trunk connections and any DS0 channels of the service card or Controller.
- *delete (router) dns proxy*  
Remove a remote DNS server address from the specified Router card.
- *delete (router) remote*  
Delete a remote WAN profile from the WAN profile table.
- *delete (router) snmp community*  
Delete an SNMP community entry.
- *delete (router) snmp trap*  
Delete a trap destination from the router card.
- *delete (router) uploaduser*  
Remove an existing authorized uploaduser.
- *delete (router-lan) filter*  
Remove a single filter rule from the table of Layer 2 filters applied to the specified LAN interface.
- *delete (router-lan) static*  
Remove a static element from the LAN interface (IP address, IP network, IPS network and MAC address).
- *delete (router-wan) firewall*  
Remove a firewall rule from a WAN.
- *delete (router-wan) gre network*  
Remove a "by network" GRE tunnel to a WAN.
- *delete (router-wan) nat bypass*  
Delete an IP subnet or host from the list of source addresses that will not be subject to NAT translation when passing through a NAT enabled WAN interface.
- *delete (router-wan) static*  
Remove a static element from the WAN interface (IP address, IP network, IP network, MAC address).
- *disconnect {slot:port:trunk}*  
Removes a connection created by the connect {trunk-addr} {t1-addr}
- *install (slot) router*  
Will prepare the controller for the insertion of a new router card that will keep its currently loaded configuration.
- *load tftp*  
Will download software via TFTP to the Controller or the Router card.

---

**WARNING!** BEFORE LOADING A DOWN-LEVEL OF ROUTER CODE TO AN ADIT, SAVE THE CONFIGURATION TO A FILE. CONFIGURATION MAY BE RESET TO THE DEFAULT SETTING AND CURRENT CONFIGURATION LOST.

---

- *rename (router) (router-wan/lan)*  
Change the name of a remote WAN or local LAN profile on the Router card.
- *reset (router)*  
Reboot the Router. All new configuration will be in-use.
- *rtrping*  
Router will perform a ping test and report the result.
- *set (router) autologout*  
Set the period of time on inactivity after which the user will be automatically logged-out of a Telnet session
- *set (router) default*  
Reset the Router card to its default configuration settings.
- *set (router) dhcp*  
Disable both DHCP server and DHCP relay functionality for the Router.
- *set (router) dns*  
Configure the Domain Name Server (DNS) options.
- *set (router) enhanced security*  
Enable/disable enhanced login security on the Router
- *set (router) lmi*  
Specify the Local Management Interface (LMI) protocol to use for the Router.
- *set (router) log*  
Set password access on the Router card (access level, password)
- *set (router) login auth*  
Sets how login authentication for this router should be performed
- *set (router) login prompt*  
Enable/disable the suppression of the Router login prompt for a user that telnets in from the Controller CLI
- *set (router) network info*  
Enable/disable the propagation of the router's IP Address and Network Information into the standard mib-2 tables for IpAddrTable, IpRouteTable, and IfTable.
- *set (router) ntp*  
Set Network Time Protocol (NTP) parameters
- *set (router) password*  
Manage password access on the specified Router card
- *set (router) ppp auth*  
Set the PPP authentication on the specified Router card
- *set (router) ppp security*  
Set up the local external security server which the Router card will use to authenticate remote PPP devices
- *set (router) proxy*  
Configures Router in-use basics (up, down and proxy).
- *set (router) reboot*  
Set automatic reboot after an upload of code or configuration file.
- *set (router) rip*  
Specify version of RIP packets to transmit and receive.

## ***Router (IP) Card***

### *Card Configuration*

---

- *set (router) snmp*  
Set the value of sysContact, sysLocation and sysName on the Router.
- *set (router) stp*  
Setup the Spanning Tree Protocol on the Router.
- *set (router) syslog*  
Configure the Router to send alarm and event messages to a Syslog server
- *set (router-lan) collision*  
Set the collision alarms (interval and threshold).
- *set (router-lan) filter forward*  
Set the forwarding mode for Layer 2 filters added to the specified LAN interface.
- *set (router-lan) framing*  
Set which ethernet frame types are supported on the Router LAN interface.
- *set (router-lan) gateway*  
Specify a default IP gateway for the specified LAN interface.
- *set (router-lan) ip address*  
Specify an IP address for the specified LAN interface.
- *set (router-lan) ipx network*  
Specify an IPX network numbers for the four IPX LAN frame types.
- *set (router-lan) phy*  
Specify the ethernet PHY (physical specifications) speed and mode.
- *set (router-lan) rip*  
Set the IP RIP for the LAN interface.
- *set (router-lan) stp*  
Setup the Spanning Tree Protocol on this interface.
- *set (router-lan) up/down*  
Set the LAN interface up or down.
- *set (router-trunk) encapsulation*  
Specify the encapsulation to use on the Router interface.
- *set (router-trunk) multilink group*  
Specify that a trunk is part of a multilink PPP group
- *set (router-trunk) up/down*  
Set the Router trunk up or down.
- *set (router-wan) dlci*  
Configure the DLCI for a specified WAN interface that will be using a frame relay encapsulated trunk.
- *set (router-wan) gre*  
Configure the GRE tunneling for a specified WAN interface.
- *set (router-wan) ip*  
Set the IP traffic handling on the WAN interface.
- *set (router-wan) ip address*  
Set the IP address for a WAN interface.
- *set (router-wan) ipx*  
Set the IPX traffic handling on the specified WAN interface.



- *set (router-wan) nat*  
Configure Network Address Translation (NAT) on a specified WAN interface.
- *set (router-wan) other*  
Set traffic handling of protocols other than IP or IPX on the specified WAN interface.
- *set (router-wan) ppp*  
Configure PPP on the specified Router card.
- *set (router-wan) rip*  
Set the type or RIP updates on the WAN interface.
- *set (router-wan) stp*  
Configure the Spanning Tree Protocol on the WAN interface.
- *set (router-wan) trunk*  
Configure the trunk port for a specified WAN interface.
- *set (router-wan) up/down*  
Set the specified WAN interface up or down.
- *show (router)*  
Displays the current Router settings (DHCP, DNS proxy, LMI, PPP, RIP, SNMP, STP, syslog and uploaduser).
- *show (router) dhcp*  
Displays the current DHCP settings for the Router
- *show (router) dns*  
Displays the current DNS setup for the router card
- *show (router) dns proxy*  
Displays the current DNS Proxy setup for the router card
- *show (router) lmi*  
Displays the current Local Management Interface (LMI) settings
- *show (router) ntp*  
Displays the settings for NTP options
- *show (router) ppp*  
Displays the current Local PPP (Point-to-Point Protocol) authentication and security settings for the router
- *show (router) rip*  
Displays the current RIP settings for the Router
- *show (router) snmp*  
Displays the current SNMP settings for the Router
- *show (router) stp*  
Displays the current Spanning Tree Protocol settings for the router
- *show (router) syslog*  
Displays the current Syslog setup for the router
- *show (router) uploaduser*  
Displays the current list of users allowed to upload and download configuration and code files
- *show (router-lan)*  
Displays the settings for the router card

## ***Router (IP) Card***

### *Card Configuration*

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- *show (router-lan) collision*  
Displays the current LAN collision alarm settings for the router
- *show (router-lan) filter*  
Displays the current LAN Layer 2 data filters applied to the LAN on the router
- *show (router-lan) static*  
Displays the current list of static entries for the LAN on the router
- *show (router-lan) stp*  
Displays the current Spanning Tree Protocol settings for the LAN interface
- *show (router-wan)*  
Displays the current Router WAN settings (firewall, PPP, static entries, STP and trunk).
- *show (router-wan) nat bypass*  
Displays the current list of NAT bypass entries for the WAN interface on the specified Router card.
- *show routes cardslots*  
Displays the routing information for the router cards. (Information must be enabled via the *set (router) network info* command.)
- *status (router)*  
Displays the current Router status information
- *status (router) channels*  
Displays a condensed status report of all voice channel endpoints
- *status (router) dns*  
Displays the current state of the DNS resolver and entries in the DNS cache
- *status (router) events*  
Displays the current event log from the router
- *status (router) ip address table*  
Displays the current IP address table for the specified Router
- *status (router) ip network table*  
Displays the current table of learned IP Networks for the specified interface on the router card
- *status (router) ipx network table*  
Displays the current table of learned IPX Networks for the specified interface on the router card
- *status (router) ipx server table*  
Displays the current table of learned IPX Servers for the specified interface
- *status (router) mac address table*  
Displays the current table of learned MAC Addresses for the specified interface on the router card
- *status (router) performance*  
Displays the current runtime statistics from the specified router
- *status (router) stp*  
Displays the current Spanning Tree state from the specified router
- *status (router-lan)*  
Displays the current Router status information
- *status (router-trunk)*  
Displays the current status for the specified trunk on the Router card.

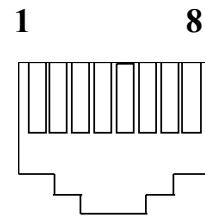
- *store scp*  
Save a software file from a defined slot to a defined location on a PC, via TFTP.
- *telnet (router)*  
Establish a Telnet session from the Adit 600 CLI to the Router port user interface.
- *trace route*  
Will invoke a Trace Route to a host device on a network of a this Router.

## Connector Pinouts

### 10Base-T Ethernet

The pinout for the RJ-45 (female) connector on the front of the card is as follows:

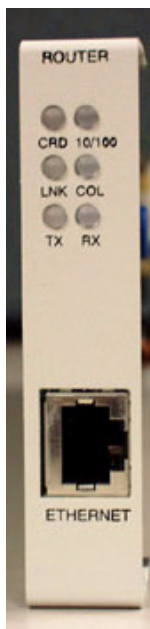
Pin	Name	Description
1	Receive +	Receive from network
2	Receive -	Receive from network
3	Transmit +	Transmit to network
4	N/C	Not connected
5	N/C	Not connected
6	Transmit -	Transmit to network
7	N/C	Not connected
8	N/C	Not connected



**NOTE:** This Ethernet port uses a "hub" pinout. Use a straight-through cable to connect a PC.

## LEDs

The following chart describes each LED, and it's state, of the Router card.



LED	State	Description
CRD	Off	Loss of power
	Green	No current alarms
	Red	Alarm state active. See alarm log for cause
	Red Flashing	Self-test or Boot in-process
	Yellow Flashing	Card is saving data to flash RAM, do not power down
10/100	Off	10 Mb ethernet
	Green	100 Mb ethernet
LNK	Off	No ethernet link
	Green	Good ethernet link
COL	Off	No current ethernet transmit collisions
	Yellow	Ethernet collisions have occurred and have not dropped to minimum level
	Yellow Flashing	Ethernet collision occurring
TX	Off	No ethernet transmit activity
	Green	Ethernet transmit activity
RX	Off	No current ethernet receive activity
	Green	Current ethernet receive activity

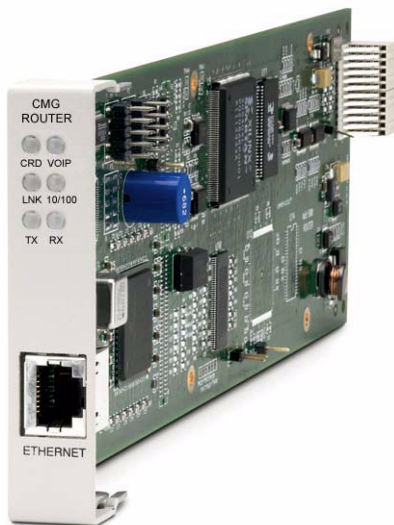
# CHAPTER 19

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## *Router (CMG) Card*

### In this Chapter

- Overview
- Features
- Technical Specifications
- Card Configuration
  - CLI Commands
- Connector Pinout
  - 10Base-T Ethernet
- LEDs



## Overview

The Customer Media Gateway Service Cards, combined with the Adit 600 Multi-service Delivery Terminal, enable high-capacity, converged IP service delivery while supporting the service provider's TDM to IP migration strategy. With the CMG the Adit 600 can be configured as an IP Services Delivery Terminal that enables carrier-class services for Small- and Medium-sized Businesses (SMBs). In addition, the Adit 600's remote management capabilities enable service providers to realize operational cost efficiencies by reducing time required for problem resolution, and by minimizing or eliminating costly truck rolls.

The Adit 600 CMG solutions provide VoIP mediation for up to 48 simultaneous calls (g.711, g.726, g.729a). Layer 3 Quality of Service (QoS) features provide the necessary traffic prioritization to ensure carrier-class voice quality over an IP network. In addition routed data services are supported.

The high-capacity, cost-effective, carrier-class features of the CMG enable a migration from traditional circuit switched services to VoIP. The CMG Service Card delivers a new generation of converged IP services for small- and medium-sized businesses while still hosting traditional TDM services. The result is a cost-effective solution for service providers seeking to migrate from traditional Class 4 or 5 architectures to next-generation IP networks.

Our standards-based call control implementation has resulted in extensive interoperability experience with industry leading softswitches and gateways.

There are three versions of the CMG Router:

**CMG Service Card** - The original CMG Router Service card.

**CMG-01 Service Card** - An enhanced version of the CMG Router card.

**CMG-02 Service Card** - The CMG-02 Router Service card, which is designed with a dual DSP configuration.

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**WARNING!** THERE IS A RESTRICTION AS TO THE NUMBER OF CMG CARDS THAT CAN BE INSTALLED IN AN ADIT. PLEASE SEE *CONFIGURATION RESTRICTIONS ON PAGE 4-23* FOR MORE INFORMATION.

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## Features

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**NOTE:** E1 is not supported in this release of the Adit 600 Controller. It will be supported in a future release.

---

- Up to 48 simultaneous voice channels (G.711, G.726, G.729a)
- Up to 8 T1s or 6 E1s in a single Adit 600 chassis
- Supports MGCP line-side applications
- Supports T.38 Fax Relay, auto-detect/fall-back
- Enables a variety of Centrex and CLASS services
- WAN capabilities include T1, E1 and 10/100Base-T (2xT1/E1 WAN capacity)
- WAN routing with QoS mechanisms for voice traffic and routed data prioritization
- LAN- and WAN-side firewall rules
- Supports voice/fax/modem calls

## Technical Specifications

### ***T1 or E1 Controller Software Required***

---

**NOTE:** E1 is not supported in this release of the Adit 600 Controller. It will be supported in a future release.

---

- Adit 600 release 4.0 or higher to support a CMG Service card
- Adit 600 release 9.4 or higher to support a CMG-01 Service card
- Adit 600 release 9.0 or higher to support a CMG-02 Service card
- Tone file loading requires Adit 600 release 5.0 and CMG release 1.10 or higher
- For E1 support, Adit 600 release 3.2 through 9.4 is required.
- Adit 600 release 9.7 or higher is required to support all features available in CMG release 2.9. If you are using an earlier controller or CMG release, check the Customer Release Notes provided with your software to determine which features are supported.
- Adit 600 release 10.1.1 or higher is required to support all features available in CMG release 2.97. If you are using an earlier controller or CMG release, check the Customer Release Notes provided with your software to determine which features are supported.

## **Management**

- CLI support through Controller via RS-232 or Telnet
- Menu-driven over RS-232 connection or Telnet
- Ping, SNMP, Telnet support
- Ethernet management port
- IP management connection via Ethernet, IP/DS0 bearer channel and in-band WAN
- Software upgradeable via TFTP
- Configuration upload and download via TFTP

## **Voice and Packet Interfaces**

- Voice/Fax/Modem - up to 48 designated FXS or DS0 channels
- LAN - 10/100Base-TX port on card
- WAN - designated Adit 600 Ethernet or T1/E1 lines and channel groups (PPP, Frame Relay, PPP over Frame Relay, MLPPP)
- Internal - backplane cross-connect interfaces to other data cards (CMG, IP Router, TSR or V.35)

## **Voice Processing and Mediation**

- Voice coding using G.711, G.726-16, G.726-24, G.726-32, G.726-40, G.729
- Capacity: G.711, G.726, G.729a
  - 48 channels with 20 msec or greater packet time
  - 24 channels with 10 msec or greater packet time
- G.168 echo cancellation (up to 64 ms)
- RTP packetization (over UDP/IP)
- TOS prioritization
- 160 ms jitter buffer, dynamic delay adjustment
- RTCP performance reporting
- Call progress tone and cadence generation via provisionable tone files
- DTMF Relay as per RFC2833



## Simultaneous Call Limits

Three factors determine the number of simultaneous calls that can be processed by the CMG Router:

- CPU limit (1600 or 2400 packets per second)
- DSP channel limit:
  - For the CMG and CMG-01 using the G.711 codec: 48 channels
  - For the CMG and CMG-01 using the G.729 codec: 24 channels
  - For the CMG-02 using the G.711 or G.729 codec: 48 channels
- LAN/WAN bandwidth limit

The following table indicates the call limits based on the packets per second (PPS) and DSP limitations:

		<b>CMG 1600 PPS (CPU) 48 - G.711 (DSP) or 24 - G.729 (DSP)</b>	<b>CMG-01 2400 PPS (CPU) 48 - G.711 (DSP) or 24 - G.729 (DSP)</b>	<b>CMG-02 2400 PPS (CPU) 48 - G.711 or G.729 (DSP)</b>
	<b>Ptime =&gt;PPS</b>	<b>Calls (Limit)</b>	<b>Calls (Limit)</b>	<b>Calls (Limit)</b>
<b>G.711</b>	<b>10ms = 100PPS</b>	16 (CPU)	24 (CPU)	24 (CPU)
<b>G.729</b>	<b>10ms = 100PPS</b>	16 (CPU)	24 (CPU)	24 (CPU)
<b>G.711</b>	<b>20ms = 50PPS</b>	32 (CPU)	48 (DSP)	48 (DSP)
<b>G.729</b>	<b>20ms = 50PPS</b>	24 (DSP)	24 (DSP)	48 (DSP)
<b>G.711</b>	<b>30ms = 33PPS</b>	48 (DSP)	48 (DSP)	48 (DSP)
<b>G.729</b>	<b>30ms = 33PPS</b>	24 (DSP)	24 (DSP)	48 (DSP)
<b>G.729</b>	<b>40ms = 25PPS</b>	24 (DSP)	24 (DSP)	48 (DSP)
<b>G.729</b>	<b>50ms = 20PPS</b>	24 (DSP)	24 (DSP)	48 (DSP)
<b>G.729</b>	<b>60ms = 17PPS</b>	24 (DSP)	24 (DSP)	48 (DSP)
<b>G.729</b>	<b>70ms = 14PPS</b>	24 (DSP)	24 (DSP)	48 (DSP)
<b>G.729</b>	<b>80ms = 13PPS</b>	24 (DSP)	24 (DSP)	48 (DSP)

**NOTE:** All G.726 codecs consume the same DSP resources as G.729.

### ***Fax and Modem Relay***

- T.38 fax relay
  - 12 concurrent calls (CMG-02)
  - 6 concurrent calls (CMG, CMG-01)
- Modem auto-detect and fallback

### ***Routing and Policy Management***

- IP RIP V1/2, IPX RIP/SAP, RIP V1/2 static routing and Classless Inter-Domain Routing (CIDR)
- PAP and CHAP
- NAT, NAT Bypass and PAT
- DNS Proxy
- Spanning Tree Protocol
- Firewall filtering
- Voice prioritization with ToS configuration
- DHCP Client/Server/Relay
- BootP Relay
- Trace Route
- Syslog
- SNTP
- Secondary IP addresses

### ***Router Performance***

- Up to 3.84 Mbps (60 DS0s) full-duplex IP WAN bandwidth
- 5,000 192-byte packets per second
- See IP Router Service card for additional information on routing features and specifications

### ***Softswitch Call Control and Signaling***

- MGCP (IETF RFC 3435 and NCS 1.0)
- MGCP IETF Version 0.1, 1.0, 1.0bis

### ***Services Enabled (under Softswitch Control)***

- Basic calling
- Caller ID, Call waiting, call forwarding, voice mail
- Hold/transfer, conference using external bridge
- Many other Centrex and CLASS services
- Distinctive ringing

### **Softswitch/Call Agent Interoperability**

- Interoperable with the leading softswitches

### **Network Standards**

- ANSI, CCITT, IEEE 802.3, IEEE 802.1D
- IETF - RFC 3435, others per router card

### **Power**

- Dissipation: approx. 6 W
- Internal solid-state (fuseless) protection
- Fan free operation

### **Regulatory Approvals**

See *Appendix A, Regulatory Approvals* for information on the CMG Router Service card.

### **Physical**

- Dimensions: 3.5 in. (H) x 0.75 in. (W) x 11.25 in. (D)  
8.9 cm (H) x 1.9 cm (W) x 28.6 cm (D)
- Weight: 5.2 oz. (0.15 kg)

For information on Adit 600 Environment required, see *Installation Environment* on page 2-2.

## Card Configuration

The CMG Service card has the option of configuration through CLI or the Router menu-driven user interface, which is accessed through Telnet. The following CLI commands are all router related. For information on the Router menu-driven user interface, see the *CMG Router User Manual*.

---

**NOTE:** The default IP address for the Adit CMG Router is 10.0.0.1.

---

### CLI Commands

Many of the router features can be configured directly with CLI commands. For detailed information on the following Router commands, see *Chapter 5, CLI Commands*.

#### Minimum Configuration Required

The CMG Service card requires an external call agent to operate as an MGCP-controlled media gateway or IAD.

The gateway must contact the call agent, on power up or reset. Therefore, the following configuration commands **MUST** be used to enter the call agent's IP address or domain name.

```
set {rtr_card-addr} mgcp callagent address {ip-addr}  
set {rtr_card-addr} mgcp up
```

All other CLI commands listed below **MAY** be used to set CMG options, but may not be necessary, since the defaults have been chosen to meet the most common expected uses. Some configuration may be necessary for proper interoperability with a given call agent.

- *add (router) dhcp server option*  
Add optional DHCP server attributes that will be advertised every time a DHCP client discovery is initiated
- *add (router) dns proxy*  
Enable DNS proxy and add a remote DNS server address to the router card
- *add (router) remote*  
Add a remote WAN profile to the WAN profile table
- *add (router) snmp community*  
Add a SNMP community to an interface on the router card
- *add (router) snmp trap*  
Specify a destination to send SNMP trap messages
- *add (router) static dns host*  
Add a static DNS host record
- *add (router) uploaduser*  
Specify a host that is allowed to upload configuration/software files
- *add (router-lan) filter*  
Add an address filter to the table of Layer 2 filter applied to the specified LAN interface
- *add (router-lan) firewall*  
Add a firewall rule to a LAN
- *add (router-lan) secondary ip address*  
Add a secondary IP address and subnet to the specified LAN interface

- *add (router-lan) static*  
Add static elements on the specified LAN interface
- *add (router-wan) firewall*  
Add a firewall rule to a WAN
- *add (router-wan) gre network*  
Add a "by network" GRE tunnel to a WAN
- *add (router-wan) nat bypass*  
Add subnets to the list of source addresses that will not be subject to NAT translation when passing through a NAT enabled WAN interface
- *add (router-wan) static*  
Add static elements on the specified WAN interface
- *clear (router) ip address table*  
Flush the learned entries from the IP address table for the specific interface from the specified router card
- *clear (router) log*  
Clear the CMG event log on the CMG Router card
- *clear (router) mac address table*  
Flush the learned entries from the MAC address table for the specific interface from the specified router card
- *clear (router) mgcp stats*  
Set all MGCP statistic counts to zero on the CMG Router card
- *clear (router) performance*  
Clear the runtime statistics that are displayed by the *status (router) performance* command.
- *connect (router-trunk) (t1)*  
Creates two-way connections between the router port trunk connections and any DS0 channels of the service card or controller
- *connect (card-trunk) (card-trunk)*  
Configure card-to-card WAN cross-connections between two Router cards or between a Router card and a V.35 card
- *connect (router-voice) (t1|fxs)*  
Creates two-way connections between the CMG voice channels and DS0 channels of and FXS or T1 service card or Controller T1
- *delete (router) dns proxy*  
Remove a remote DNS server address from the specified router card
- *delete (router) remote*  
Delete a remote WAN profile from the WAN profile table
- *delete (router) snmp community*  
Delete an SNMP community entry
- *delete (router) snmp trap*  
Delete a trap destination from the router card
- *delete (router) static dns host*  
Delete a static DNS host record
- *delete (router) uploaduser*  
Remove an existing authorized uploaduser

## Router (CMG) Card

### Card Configuration

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- *delete (router-lan) filter*  
Remove a single filter rule from the table of filters applied to the specified LAN interface
- *delete (router-lan) firewall*  
Remove a firewall rule from a LAN
- *delete (router-lan) secondary ip address*  
Delete a secondary IP address and subnet to the specified LAN interface
- *delete (router-lan) static*  
Remove a static elements from the specified LAN interface
- *delete (router-wan) firewall*  
Remove a firewall rule from a WAN
- *delete (router-wan) gre network*  
Remove a "by network" GRE tunnel to a WAN
- *delete (router-wan) nat bypass*  
Delete an IP subnet or host from the list of source addresses that will not be subject to NAT translation when passing though a NAT enabled WAN interface
- *delete (router-wan) static*  
Remove a static element from the WAN interface
- *disconnect {slot:port:trunk}*  
Removes a connection created by the connect {trunk-addr} {t1-addr}
- *install (slot) router*  
Will prepare the controller for the insertion of a new router card that will keep its currently loaded configuration
- *load tftp*  
Will download software via TFTP to the Controller or the Router card

---

**WARNING!** BEFORE LOADING A DOWN-LEVEL OF ROUTER CODE TO AN ADIT, SAVE THE CONFIGURATION TO A FILE. CONFIGURATION MAY BE RESET TO THE DEFAULT SETTING AND CURRENT CONFIGURATION LOST.

---

- *rename (router) (router-wan/lan)*  
Change the name of a remote WAN or local LAN profile on the Router card
- *reset (router)*  
Reboot the Router. All new configuration will be applied.
- *reset (router) coldboot*  
This will reboot including a power cycle to the Router card.
- *rtrping*  
Router will perform a ping test and report the result.
- *set (router) autologout*  
Set the period of time on inactivity after which the user will be automatically logged-out of a telnet session
- *set (router) cdr*  
Enable/disable Call Detail Recording (CDR) for the CMG card
- *set (router) compander*  
Set the companding algorithm to use with the PCM (G.711) voice stream to/from the TDM side of a connection

- *set (router) default*  
Reset the Router card to its default configuration settings
- *set (router) dhcp*  
Configure the DHCP functions
- *set (router) dns*  
Set the CMG Domain Name Server (DNS) options
- *set (router) enhanced security*  
Enable/disable enhanced login security on the Router
- *set (router) hookflash*  
Specify the flash maximum time
- *set (router) lmi*  
Specify the Local Management Interface (LMI) protocol to use for the Router
- *set (router) log*  
Set whether the CMG text log will continuously add new log entries by over-writing the oldest entries, or will stop adding new log entries after the log is full.
- *set (router) login auth*  
Sets how login authentication for this router should be performed
- *set (router) login prompt*  
Enable/disable the suppression of the Router login prompt for a user that telnets in from the Controller CLI
- *set (router) mgcp*  
Set Media Gateway Call Protocol (MGCP) parameters.
- *set (router) network info*  
Enable/disable the propagation of the router's IP Address and Network Information into the standard mib-2 tables for IpAddrTable, IpRouteTable, and IfTable.
- *set (router) ntp*  
Set Network Time Protocol (NTP) parameters
- *set (router) password*  
Manage password access on the specified Router card
- *set (router) ppp auth*  
Configure the PPP (Point-to-Point Protocol) authentication
- *set (router) ppp security*  
Set the local external security server that the router will use to authenticate remote PPP devices
- *set (router) priority tos*  
Configure parameters that will be used to recognize routed voice packets which will be handled with higher priority over other routed data
- *set (router) proxy*  
Enable/disable proxy ARP mode
- *set (router) reboot*  
Set automatic reboot after an upload of code or configuration file
- *set (router) rip*  
Specify version of RIP packets to transmit and receive

## ***Router (CMG) Card***

### *Card Configuration*

---

- *set (router) snmp*  
Set the SNMP contact, location, name and statistics averaging interval
- *set (router) stp*  
Configure the Spanning Tree Protocol on the router
- *set (router) syslog*  
Configure the Router to send alarm and event messages to a Syslog server
- *set (router) time daylight savings*  
Enable or disable automatic adjustment of the CMG router's clock for Daylight Savings Time.
- *set (router) voip*  
Set the Voice Over IP (VoIP) parameters
- *set (router-lan) collision*  
Configure collision alarms
- *set (router-lan) filter forward*  
Specify the forwarding mode for Layer 2 filters on the LAN interface
- *set (router-lan) framing*  
Specify which ethernet frame types are supported on the LAN interface
- *set (router-lan) gateway*  
Specify a default IP gateway for the specified LAN interface
- *set (router-lan) ip address*  
Specify an IP address for the specified LAN interface
- *set (router-lan) ipx network*  
Specify an IPX network numbers for the four IPS LAN frame types
- *set (router-lan) phy*  
Specify the ethernet PHY (physical specifications) speed and mode.
- *set (router-lan) rip*  
Specify IP RIP for the LAN interface
- *set (router-lan) stp*  
Configure the Spanning Tree Protocol on the LAN interface
- *set (router-lan) up/down*  
Set the LAN interface up or down.
- *set (router-trunk) encapsulation*  
Specify the encapsulation to use on the Router interface
- *set (router-trunk) multilink group*  
Specify that a trunk is part of a multilink PPP group
- *set (router-trunk) up/down*  
Set the Router trunk up or down
- *set (router-trunk) voice bandwidth limit*  
Set percentage of bandwidth on the trunk that is reserved for routed or bridged data
- *set (router-voice) algorithm preference*  
Specify the list of voice coding algorithms to be supported for VoIP calls
- *set (router-voice) cpd*  
Configure how calling party disconnect should be signaled to an endpoint



- *set (router-voice) default*  
Specify the list of voice coding algorithms to be supported for VoIP calls
- *set (router-voice) down*  
To take a CMG voice channel out-of-service
- *set (router-voice) dtmfrelay*  
Specify the encapsulation to use on the Router interface
- *set (router-voice) echo cancellation*  
Enable/disable echo cancellation
- *set (router-voice) echo tail*  
Set the maximum time between the signal and its echo
- *set (router-voice) endpoint prefix*  
Set the prefix of the MGCP endpoint names
- *set (router-voice) endpoint suffix*  
Set the suffix of the MGCP endpoint names
- *set (router-voice) fax*  
Set the fax call handling method
- *set (router-voice) log start*  
To start logging events to the CMG text log
- *set (router-voice) log stop*  
To stop logging events to the CMG text log
- *set (router-voice) modem*  
Set the modem call handling method
- *set (router-voice) rxgain*  
Set gain on receive side for voice channel
- *set (router-voice) silence*  
Enable/disable silence suppression
- *set (router-voice) slash*  
Suppresses the implied slash "/" between the endpoint prefix and suffix
- *set (router-voice) tos*  
Set gain on transmit side for voice channel
- *set (router-voice) txgain*  
Set the gain on the transmit side (TDM-to-packet) voice path
- *set (router-voice) up*  
Set the specified voice channel up or down
- *set (router-wan) dlci*  
Configure the DLCI for a specified WAN interface that will be using a frame relay encapsulated trunk
- *set (router-wan) firewall allowfrags*  
Allow fragmented packets to pass though the firewall to accommodate devices that send reverse-ordered or out-of-ordered packets
- *set (router-wan) gre*  
Configure the GRE tunneling for a specified WAN interface
- *set (router-wan) ip*  
Set the IP traffic handling on the WAN interface

## ***Router (CMG) Card***

### *Card Configuration*

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- *set (router-wan) ip address*  
Set the IP address for a WAN interface
- *set (router-wan) ipx*  
Set the IPX traffic handling on the specified WAN interface
- *set (router-wan) nat*  
Configure Network Address Translation (NAT) on a specified WAN interface
- *set (router-wan) other*  
Set the traffic handling of protocols other than IP or IPX on the specified WAN interface
- *set (router-wan) ppp*  
Configure the PPP (Point-to-Point Protocol) on the specified router card
- *set (router-wan) rip*  
Set the type or RIP updates on the WAN interface
- *set (router-wan) stp*  
Configure the Spanning Tree Protocol on the specified WAN
- *set (router-wan) trunk*  
Configure the trunk port for a specified WAN interface
- *set (router-wan) up/down*  
Set the specified WAN interface up or down
- *show (router)*  
Displays the current Router settings
- *show (router) dhcp*  
Displays the current DHCP settings for the Router
- *show (router) dns*  
Displays the current DNS setup for the router card
- *show (router) dns proxy*  
Displays the current DNS Proxy setup for the router card
- *show (router) lmi*  
Displays the current Local Management Interface (LMI) settings
- *show (router) log*  
Displays the logging configuration of the CMG Router card
- *show (router) mgcp*  
Displays the setting for MGCP options
- *show (router) mgcp algorithmname*  
Displays the designations for coding algorithms
- *show (router) ntp*  
Displays the settings for NTP options
- *show (router) ppp*  
Displays the current Local PPP (Point-to-Point Protocol) authentication and security settings for the router
- *show (router) rip*  
Displays the current RIP settings for the Router
- *show (router) snmp*  
Displays the current SNMP settings for the Router

- *show (router) stp*  
Displays the current Spanning Tree Protocol settings for the router
- *show (router) syslog*  
Displays the current Syslog setup for the router
- *show (router) uploaduser*  
Displays the current list of users allowed to upload and download configuration and code files
- *show (router) voip*  
Displays the current settings for all VOIP parameters
- *show (router-lan)*  
Displays the settings for the router card
- *show (router-lan) collision*  
Displays the current LAN collision alarm settings for the router
- *show (router-lan) filter*  
Displays current LAN Layer 2 data filters applied to the LAN on the router
- *show (router-lan) firewall*  
Displays the current firewall filter settings for the specified LAN interface
- *show (router-lan) static*  
Displays the current list of static entries for the LAN on the router
- *show (router-lan) stp*  
Displays the current Spanning Tree Protocol settings for the LAN interface
- *show (router-trunk)*  
Displays the current trunk settings for the Router
- *show (router-voice)*  
Displays the CMG voice line provisioning
- *show (router-wan)*  
Displays the current configuration settings for the specified WAN interface
- *show (router-wan) firewall*  
Displays the current firewall filter settings for the specified WAN interface
- *show (router-wan) nat bypass*  
Displays the current list of NAT bypass entries for the WAN interface
- *show (router-wan) ppp*  
Displays the current PPP (Point-to-Point Protocol) settings for the specified WAN interface
- *show (router-wan) static ip address*  
Displays the current list of static IP address entries for the specified WAN interface
- *show (router-wan) static ip network*  
Displays the current list of static IP network entries for the specified WAN interface
- *show (router-wan) static ipx network*  
Displays the current list of static IPX network entries for the specified WAN interface
- *show (router-wan) static mac address*  
Displays the current list of static IP MAC network entries for the specified WAN interface
- *show (router-wan) static nat address*  
Displays current static NAT address entries for the specified WAN interface

## ***Router (CMG) Card***

### *Card Configuration*

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- *show (router-wan) stp*  
Displays current Spanning Tree Protocol settings for the specified WAN interface
- *show (router-wan) trunk*  
Displays the current trunk assignment for the specified WAN interface
- *show routes cardslots*  
Displays the routing information for the router cards. (Information must be enabled via the *set (router) network info* command.)
- *status (router)*  
Displays the current Router status information
- *status (router) alarms*  
Displays the current alarm log from the router
- *status (router) channels*  
Displays a condensed status report of all voice channel endpoints
- *status (router) dns*  
Displays the current state of the DNS resolver and entries in the DNS cache
- *status (router) events*  
Displays the current event log from the router
- *status (router) ip address table*  
Displays the current IP address table for the specified Router
- *status (router) ip network table*  
Displays the current table of learned IP Networks for the specified interface on the router card
- *status (router) ipx network table*  
Displays the current table of learned IPX Networks for the interface on the router card
- *status (router) ipx server table*  
Displays the current table of learned IPX Servers for the specified interface
- *status (router) log*  
Displays the current log of all CMG events
- *status (router) mac address table*  
Displays the current table of learned MAC Addresses for the interface on the router card
- *status (router) mgcp*  
Displays the current table of counts of all MGCP sent and received return codes, internal errors and other statistics
- *status (router) performance*  
Displays the current runtime statistics from the specified router
- *status (router) stp*  
Displays the current Spanning Tree state from the specified router
- *status (router-lan)*  
Displays the current Router status information
- *status (router-trunk)*  
Displays the current status information for the specified Trunk on the router
- *status (router-voice)*  
Displays the current status of service, calls signaling, connections, call agent communications and telephony statistics for a CMG Router voice channel

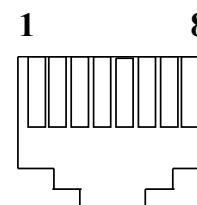
- *store scp*  
Save a software file from a defined slot to a defined location on a PC, via TFTP
- *telnet (router)*  
Establish a Telnet session from the Adit 600 CLI to the Router port user interface
- *trace route*  
Will invoke a Trace Route to a host device on a network of a this Router.

## Connector Pinout

### 10Base-T Ethernet

The pinout for the RJ-45 (female) connector on the front of the card is as follows:

Pin	Name	Description
1	Receive +	Receive from network
2	Receive -	Receive from network
3	Transmit +	Transmit to network
4-5	N/C	Not connected
6	Transmit -	Transmit to network
7-8	N/C	Not connected



**NOTE:** This Ethernet port uses a "hub" pinout. Use a straight-through cable to connect a PC.

## LEDs

The following chart describes each LED, and it's state, of the Router card.

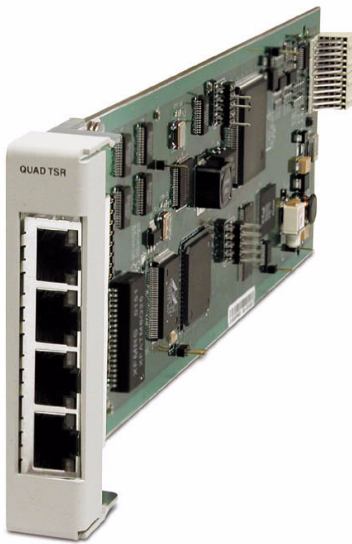


LED	State	Description
CRD	Off	Loss of power
	Green	No current alarms
	Red	Alarm state active. See alarm log for cause
	Red Flashing	Self-test or Boot in-process
VOIP	Yellow Flashing	Card is saving data to flash RAM, do not power down
	Off	No active VoIP calls or if the MGCP protocol is optioned <b>down</b>
	Green	Active VoIP calls
	Red	Call agent unreachable
LNK	Yellow	Insufficient VoIP resources to complete call or during initialization process
	Off	No ethernet link
10/100	Green	Good ethernet link
	Off	10 Mb ethernet
TX	Green	100 Mb ethernet
	Off	No ethernet transmit activity
	Green	Ethernet transmit activity
RX	Yellow	Current ethernet transmit collision
	Off	No current ethernet receive activity
	Green	Current ethernet receive activity

# CHAPTER 20

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## ***Terminal Server Router Card***



### **In this Chapter**

- Overview
- Features
- Technical Specifications
- Card Configuration
  - CLI Commands
- Connector Pinout
  - 10Base-T Ethernet
- LEDs

## **Overview**

The Quad-Port Terminal Server Router (TSR) card combines the performance and expand ability of a selectable four-port RS-232 and 10/100Base-TX Ethernet switch with dedicated routing functionality in a low-cost solution to help wireless service providers remotely manage cell site LMU and switching devices, and deliver routing capabilities needed to offer 3G applications services. The ability to remotely manage these cell site devices significantly reduces maintenance truck rolls costs, and enables the wireless service provider to focus their efforts on expanding their cell site coverage for increased revenues.

The TSR card employs a dedicated processor to ensure high performance and product feature expansion. A powerful set of standard features includes IP and IPX routing, Layer 2 bridging, ML-PPP, networking security and management capabilities to integrate services in the digital last mile. The four RJ-45 ports can be configured as either RS-232 or 10/100Base-TX Ethernet connections to support remote device management from the Network Operations Center (NOC) or 3G routed data applications services.

The TSR card is SNMP or Command Line Interface (CLI) manageable. Management connectivity is provided either by directly through the user data port connection on the TSR card, or through the Controller cards as a component of the Adit 600 platform.

### **Quad TSR with TBOS**

The Quad-Port Terminal Server Router (TSR) card with TBOS-to-SNMP conversion, offers a fully integrated solution to convert and transport TBOS alarms. The TBOS data received on the TSR card's RS-232 ports is stored and made available via SNMP GETs. Alarms from TBOS-monitored equipment are converted to SNMP traps and transported over the WAN DS0 to the Network Operation Center's SNMP Trap Manager. This eliminates the need for a separate TBOS alarm monitoring system for fixed microwave backhaul systems and reduces bandwidth expense. Up to 8 TBOS devices can be cascaded off a single TSR RS-232 port.



## **Features**

- Enables remote management of cell site resources
- Supplies 4 selectable RS-232 asynchronous or 10/100Base-T Ethernet connections per card
- Supports up to 6 Router cards per Adit 600 chassis, depending upon the Controller (see *Restrictions on Multiple Router Cards on page 4-24*)
  - Multi-point networking with up to 24 WAN connections per router
  - Each WAN connection can be provisioned with multiple DS0s
  - Deliver more than 2 T1s bandwidth per Router card; up to 60 DS0s per Router card
- Supports Telnet session from the Adit 600 Controller to an individual RS-232 port on the Router card
- Ensures high performance and feature expansion
- Enables management via menu-driven or CLI Router interface
- Supports packet filtering and Spanning Tree Protocol
- Allows network address and port translation (NAT, PAT)
- Enables multiple T1 facilities to function as a single IP WAN interface using ML-PPP for bandwidth scalability beyond a single T1
- Supports Dynamic Host Configuration Protocol (DHCP)

### ***Additional Features on a TSR Card with TBOS***

- Decodes the TBOS protocol to recover the individual alarm data points
- SNMP traps based upon changes to monitored alarm conditions
- Supports SNMP traps and GETs for the monitored alarm data
- Daisy chain up to 8 TBOS displays off 1 TSR RS-232 port

## **Technical Specifications**

### **Controller Software Required**

#### **T1 or E1 Controller**

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**NOTE:** E1 is not supported in this release of the Adit 600 Controller. It will be supported in a future release.

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- Adit 600 Release 4.1 or higher to support a TSR Service card
- Adit 600 Release 7.0 or higher to support a TSR Service card with TBOS
- For E1 support, Adit 600 Release 3.2 through 9.4 is required.
- Adit 600 release 10.1 or higher is required to support all features available in TSR release 2.9. If you are using an earlier controller or TSR release, check the Customer Release Notes provided with your software to determine which features are supported.
- Adit 600 release 10.1.1 or higher is required to support all features available in TSR release 2.97. If you are using an earlier controller or TSR release, check the Customer Release Notes provided with your software to determine which features are supported.

### **Management**

- CLI driven via RS-232 or Ethernet
- Menu-driven via RS-232 or Ethernet, see the Terminal Server Router User Manual for information on the Menu-driven software
- SNMP
- Ping, Trace Route
- Ethernet management port
- IP management DS0 bearer channel
- Code download via TFTP
- Configuration upload and download via TFTP

### **WAN Interface**

- Any T1/E1 interface on the Adit 600 platform
- Up to 24 WAN interfaces per TSR card
- Up to 60 DS0s bandwidth per TSR card
- PPP, Frame Relay, PPP in Frame Relay, ML-PPP and GRE tunneling

### **LAN Interface**

- Up to 4 10/100Base-T auto-sensing/auto-MDIX ports
- 8-pin RJ-45 modular jacks

## **RS-232 Interface**

- Up to 4 RS-232 DCE ports
- Selectable asynchronous data rates and data parameters
- 8-pin RJ-45 modular jacks
- RJ-45-to-DB9 adapter cable available

## **Routing**

- IPX RIP/SAP
- IP RIPv1, RIPv2, RIPv/RIPv2 compatibility mode
- Static routing
- Classless routing (CIDR)

## **Bridging**

- IEEE 802.1D MAC bridging, using the Spanning Tree Algorithm and Protocol

## **Performance**

- Minimum of 3,000 64-byte packets per second throughput

## **Advanced Capabilities**

- DHCP server, BOOTP Relay
- Syslog
- Domain Name Server (DNS) proxy
- DNS resolver
- Simple Network Time Protocol (SNTP) support for timing from a separate network server
- Secondary IP Address
- RS-232 terminal server
- RS-232 TBOS support: RS-422 TBOS support can be provided using an external RS-232 to RS-422 converter

## **Frame Relay**

- RFC 1490 encapsulation
- ANSI T1.617 Annex D LMI
- ITU Q.933 Annex A LMI

## **Filtering**

- LAN/WAN Filters up to Layer 4, stateful

## **Security**

- Three user accounts
- Three levels of security
- PAP and CHAP
- Network Address Translation (NAT)
- NAT Bypass
- Port Address Translation (PAT)

## **MIBs**

- RFC 1212 (Concise MIB)
- RFC 1213 (MIB II)
- RFC 1406 (DS1/E1)
- RFC 1471 (LCP/PPP)
- RFC 1473 (IP/PPP)
- RFC 1643 (Ethernet)
- RFC 1659 (RS-232)
- RFC 2011 (IP)
- RFC 2115 (Frame Relay)
- RFC 2233 (Interface)
- Enterprise MIB, including equipment-specific MIBs to support GET operation on TBOS-monitored

## **Equipment Supported for TBOS-to-SNMP Conversion**

- Proxim Lynx.sc Microwave Radio Models 31250, 31600, 31250, 31650
- Proxim Lynx.HD Microwave Radio Models 31350-10, 31850-10, 31145-10, 31145-F
- Proxim Lynx DS-3 Microwave Radio Models 27710-91, 27750-91
- Proxim Lynx Hot Standby Protection Switch Models 31455, 31420
- Alcatel MDR-4000 Microwave Digital Radio

## **Testing and Diagnostics**

- Ping, Trace Route
- WAN monitor

## **Power**

- Less than 5 W

## **Regulatory Approvals**

See *Appendix A, Regulatory Approvals* for information on the Terminal Server Router Service card.

## **Physical**

- Dimensions: 3.5 in. (H) x 0.75 in. (W) x 11.25 in. (D)  
8.9 cm (H) x 1.9 cm (W) x 28.6 cm (D)
- Weight: 5.2 oz. (0.15 kg)

For information on Adit 600 Environment required, see *Installation Environment* on page 2-2.

## Card Configuration

The Terminal Server Router card has the option of configuration through CLI or the TSR Menu-driven software, which is accessed through Telnet. The following CLI commands are all TSR related. For information on the TSR Menu-driven software, see the Terminal Server Router User Manual.

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**NOTE:** The default IP address for the IP Router is 10.0.0.1.

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**NOTE:** TBOS features are set with the TSR Menu-driven software. See the Terminal Server Router User Manual for more information.

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### CLI Commands

Many of the router features can be configured directly with CLI commands. For configuration of features not covered with CLI commands, the operator must use the TSR Menu-driven software. All commands listed are hyperlinked to *Chapter 5, CLI Commands*, for detailed information.

- *add (router) dhcp server option*  
Enable DNS proxy and add a remote DNS server address to the Router card
- *add (router) remote*  
Add a remote WAN profile to the WAN profile table
- *add (router) snmp community*  
Add a SNMP community to an interface on the Router card
- *add (router) snmp trap*  
To specify a destination to send SNMP trap messages
- *add (router) static dns host*  
Add a static DNS host record for resolving a domain name to an IP address, if the DNS server cannot provide the information
- *add (router) uploaduser*  
To specify a host that is allowed to upload configuration/software files
- *add (router-lan) filter address*  
Add an address filter to the table of Layer 2 filter applied specified LAN interface
- *add (router-lan) filter custom*  
Add a custom filter to the table of Layer 2 filter applied specified LAN interface
- *add (router-lan) filter protocol*  
Add a protocol filter to the table of Layer 2 filter applied specified LAN interface
- *add (router-lan) secondary ip address*  
Add a secondary IP address and subnet to the specified LAN interface
- *add (router-lan) static*  
Add a static elements on the specified LAN interface
- *add (router-wan) firewall*  
Add a firewall rule to a WAN
- *add (router-wan) gre network*  
Add a "by network" GRE tunnel to a WAN

- *add (router-wan) nat bypass*  
Add subnets to the list of source addresses that will not be subject to NAT translation when passing through a NAT enabled WAN interface
- *add (router-wan) static*  
Add a static IP address to the table of learned addresses on the WAN interface. This command is typically used in bridging
- *add (router-wan) static nat address*  
Add a static NAT bi-directional mapping to the WAN interface
- *clear (router) ip address table*  
Flush the learned entries from the IP address table for the specific interface from the specified Router card
- *clear (router) mac address table*  
Flush the learned entries from the MAC address table for the specific interface from the specified Router card
- *clear (router) mac address table*  
Flush the learned entries from the MAC address table for the specific interface from the specified Router card
- *clear (router) performance*  
Clear the runtime statistics that are displayed by the status (router) performance command
- *connect (router-trunk) (t1)*  
Creates two-way connections between the router port trunk connections and any DS0 channels of the service card or controller
- *connect (card-trunk) (card-trunk)*  
Configure card-to-card WAN cross-connects between two Router cards or between a Router card and a V.35 card
- *delete (router) dns proxy*  
Remove a remote DNS server address from the specified Router card
- *delete (router) remote*  
Delete a remote WAN profile from the WAN profile table
- *delete (router) snmp community*  
Delete an SNMP community entry
- *delete (router) snmp trap*  
Delete a trap destination from the Router card
- *delete (router) static dns host*  
Delete a static DNS host record
- *delete (router) uploaduser*  
Remove an existing authorized uploaduser.
- *delete (router-lan) filter*  
Remove a single filter rule from the table of Layer 2 filters applied to the specified LAN interface
- *delete (router-lan) secondary ip address*  
Delete a secondary IP address and subnet to the specified LAN interface
- *delete (router-lan) static*  
Remove a static element from the LAN interface

- *delete (router-wan) firewall*  
Remove a firewall rule from a WAN
- *delete (router-wan) gre network*  
Remove a "by network" GRE tunnel to a WAN
- *delete (router-wan) nat bypass*  
Delete an IP subnet or host from the list of source addresses that will not be subject to NAT translation when passing through a NAT enabled WAN interface
- *delete (router-wan) static*  
Remove a static element on the WAN interface
- *disconnect {slot:port:trunk}*  
Removes a connection created by the connect {trunk-addr} {t1-addr}
- *install (slot) router*  
Will prepare the controller for the insertion of a new router card that will keep its currently loaded configuration
- *load tfip*  
Will download software via TFTP to the Controller or the Router card

---

**WARNING!** BEFORE LOADING A DOWN-LEVEL OF ROUTER CODE TO AN ADIT, SAVE THE CONFIGURATION TO A FILE. CONFIGURATION MAY BE RESET TO THE DEFAULT SETTING AND CURRENT CONFIGURATION LOST.

---

- *rename (router) (router-wan/lan)*  
Change the name of a remote WAN or local LAN profile on the Router card
- *reset (router)*  
Reboot the Router. All new configuration since the last configuration will be in-use
- *rtrping*  
Router will perform a ping test and report the result
- *set (router) autologout*  
Set the period of time on inactivity after which the user will be automatically logged-out of a Telnet session
- *set (router) default*  
Reset the Router card to its default configuration settings
- *set (router) dhcp*  
Configure the DHCP functions
- *set (router) dns*  
Configure the Domain Name Server (DNS) options.
- *set (router) enhanced security*  
Enable/disable enhanced login security on the Router
- *set (router) lmi*  
Specify the Local Management Interface (LMI) protocol for the Router
- *set (router) login auth*  
Sets how login authentication for this router should be performed
- *set (router) login prompt*  
Enable/disable the suppression of the Router login prompt for a user that telnets in from the Controller CLI

## ***Terminal Server Router Card***

### *Card Configuration*

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- *set (router) network info*  
Enable/disable the propagation of the router's IP Address and Network Information into the standard mib-2 tables for IpAddrTable, IpRouteTable, and IfTable.
- *set (router) ntp*  
Set Network Time Protocol (NTP) parameters
- *set (router) password*  
Manage password access on the specified Router card
- *set (router) port*  
Set port characteristics on a TSR card
- *set (router) ppp auth*  
Configure the PPP authentication on the Router Card
- *set (router) proxy*  
Configures Router in-use basics (up, down and proxy)
- *set (router) reboot*  
Set automatic reboot after an upload of code or configuration file
- *set (router) rip*  
Specify version of RIP packets to transmit and receive
- *set (router) snmp*  
Set the SNMP contact, location and name on the specified Router card
- *set (router) stp*  
Configure the Spanning Tree Protocol on the Router
- *set (router) syslog*  
Configure the Router to send alarm and event messages to a Syslog server
- *set (router-lan) collision*  
Configure collision alarms
- *set (router-lan) filter forward*  
Specify the forwarding mode for Layer 2 filters on the LAN interface
- *set (router-lan) framing*  
Specify which ethernet frame types are supported on the LAN interface
- *set (router-lan) gateway*  
Specify a default IP gateway for the specified LAN interface
- *set (router-lan) ip address*  
Specify an IP address for the specified LAN interface
- *set (router-lan) ipx network*  
Specify an IPX network numbers for the four IPS LAN frame types
- *set (router-lan) phy*  
Specify the Ethernet PHY (physical specifications) speed and mode
- *set (router-lan) rip*  
Specify IP RIP for the LAN interface
- *set (router-lan) stp*  
Configure the Spanning Tree Protocol on the LAN interface
- *set (router-lan) up/down*  
Set the LAN interface up or down



- *set (router-trunk) encapsulation*  
Specify the encapsulation to use on the Router interface
- *set (router-trunk) multilink group*  
Specify a router trunk to be part of a multilink PPP group
- *set (router-trunk) speed*  
Specify the data speed of each DS0 (56 or 64K)
- *set (router-trunk) up/down*  
Set the TSR trunk up or down
- *set (router-wan) dlci*  
Configure the DLCI for a specified WAN interface that will be using a frame relay encapsulated trunk
- *set (router-wan) gre*  
Configure the GRE tunneling for a specified WAN interface
- *set (router-wan) ip*  
Set the IP traffic handling on the WAN interface
- *set (router-wan) ip address*  
Set the IP address for a WAN interface
- *set (router-wan) ipx*  
Set the IPX traffic handling on the specified WAN interface
- *set (router-wan) nat*  
Configure Network Address Translation (NAT) on a specified WAN interface
- *set (router-wan) other*  
Set the traffic handling of protocols other than IP or IPX on the specified WAN interface
- *set (router-wan) ppp*  
Configure the PPP (Point-to-Point Protocol) on the specified router card
- *set (router-wan) rip*  
Set the type or RIP updates on the WAN interface
- *set (router-wan) stp*  
Configure the trunk port for a specified WAN interface
- *set (router-wan) trunk*  
Configure the trunk port for a specified WAN interface
- *set (router-wan) up/down*  
Set the specified WAN interface up or down
- *show (router)*  
Displays the current Router settings
- *show (router) dhcp*  
Displays the current DHCP settings for the Router card
- *show (router) dns*  
Displays the current DNS setup for the router card
- *show (router) dns proxy*  
Displays the current DNS Proxy setup for the router card
- *show (router) lmi*  
Displays the current Local Management Interface (LMI) settings for the Router card

## ***Terminal Server Router Card***

### *Card Configuration*

---

- *show (router) ntp*  
Displays the settings for NTP options
- *show (router) port*  
Displays the current TSR port configuration
- *show (router) ppp*  
Displays the current Local PPP (Point-to-Point Protocol) authentication and security settings for the router
- *show (router) rip*  
Displays the current RIP settings for the Router card
- *show (router) snmp*  
Displays the current SNMP settings for the Router card
- *show (router) stp*  
Displays the current Spanning Tree Protocol settings for the router
- *show (router) syslog*  
Displays the current Syslog setup for the router
- *show (router) uploaduser*  
Displays the current list of users allowed to upload and download configuration and code files
- *show (router-lan)*  
Displays the settings for the router card
- *show (router-lan) collision*  
Displays the current LAN collision alarm settings for the router
- *show (router-lan) filter*  
Displays the current LAN Layer 2 data filters applied to the LAN on the router
- *show (router-lan) static*  
Displays the current list of static entries for the LAN on the router
- *show (router-lan) stp*  
Displays the current Spanning Tree Protocol settings for the LAN interface
- *show (router-wan)*  
Displays the current configuration settings for the specified WAN interface
- *show (router-wan) firewall*  
Displays the current firewall filter settings for the specified WAN interface
- *show (router-wan) nat bypass*  
Displays the current list of NAT bypass entries for the WAN interface
- *show (router-wan) ppp*  
Displays the current PPP (Point-to-Point Protocol) settings for the specified WAN interface
- *show (router-wan) static ip address*  
Displays the current list of static IP address entries for the specified WAN interface
- *show (router-wan) static ip network*  
Displays the current list of static IP network entries for the specified WAN interface
- *show (router-wan) static ipx network*  
Displays the current list of static IPX network entries for the specified WAN interface

- *show (router-wan) static mac address*  
Displays the current list of static IP MAC network entries for the specified WAN interface
- *show (router-wan) static nat address*  
Displays the current static NAT address entries for the specified WAN interface
- *show (router-wan) stp*  
Displays the current Spanning Tree Protocol settings for the specified WAN interface
- *show (router-wan) trunk*  
Displays the current trunk assignment for the specified WAN interface
- *show routes cardslots*  
Displays the routing information for the router cards. (Information must be enabled via the *set (router) network info* command.)
- *status (router)*  
Displays the current Router status information
- *status (router) alarms*  
Displays the current alarm log from the router
- *status (router) channels*  
Displays a condensed status report of all voice channel endpoints
- *status (router) dns*  
Displays the current state of the DNS resolver and entries in the DNS cache
- *status (router) events*  
Displays the current event log from the router
- *status (router) ip address table*  
Displays the current IP address table for the specified Router
- *status (router) ip network table*  
Displays the current table of learned IP Networks for the specified interface on the router card
- *status (router) ipx network table*  
Displays the current table of learned IPX Networks for the specified interface on the router card
- *status (router) ipx server table*  
Displays the current table of learned IPX Servers for the specified interface
- *status (router) mac address table*  
Displays the current table of learned MAC Addresses for the specified interface on the router card
- *status (router) performance*  
Displays the current runtime statistics from the specified router
- *status (router) stp*  
Displays the current Spanning Tree state from the specified router
- *status (router-lan)*  
Displays the current Router status information
- *status (router-trunk)*  
Displays the current status for the specified WAN
- *store scp*  
Save a software file from a defined slot to a defined location on a PC, via TFTP

## ***Terminal Server Router Card***

### *Card Configuration*

---

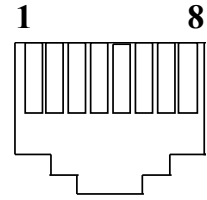
- *telnet (router)*  
Establish a Telnet session from the Adit 600 Controller to the TSR Router user interface
- *telnet (router) port*  
Establish a Telnet session from the Adit 600 Controller to an individual RS-232 port on the TSR Router card
- *trace route*  
Invoke a Trace Route to a host device on a network of this Router

## Connector Pinout

### 10Base-T Ethernet

The pinout for the RJ-45 (female) connectors on the front of the card are as follows:

Pin	Name	Description
1	Receive +	Receive from network
2	Receive -	Receive from network
3	Transmit +	Transmit to network
4 - 5	N/C	Not connected
6	Transmit -	Transmit to network
7 - 8	N/C	Not connected



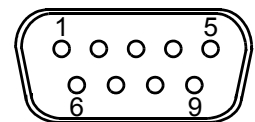
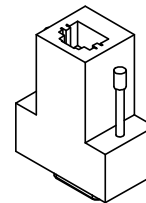
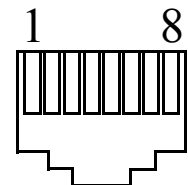
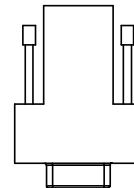
**NOTE:** These ports use a "hub" pinout. Use a straight-through cable to connect a PC.

### RS-232

If the card is set to use the RS-232 connector (with jumpers) use the following RS-232 pinouts. There is a RS-232 to DB-9 converter cable available, P/N 005-0106.

The pinout is as follows:

RJ-45	DB-9	RS-232
1	8	CTS (Input)
2	7	RTS (Output)
3	6	DSR (Input)
4	3	TXD (Output)
5	2	RXD (Input)
6	1	DCD (Input)
7	4	DTR (Output)
8	5	SG (Filtered)
N/A	9	RI (Not Used)



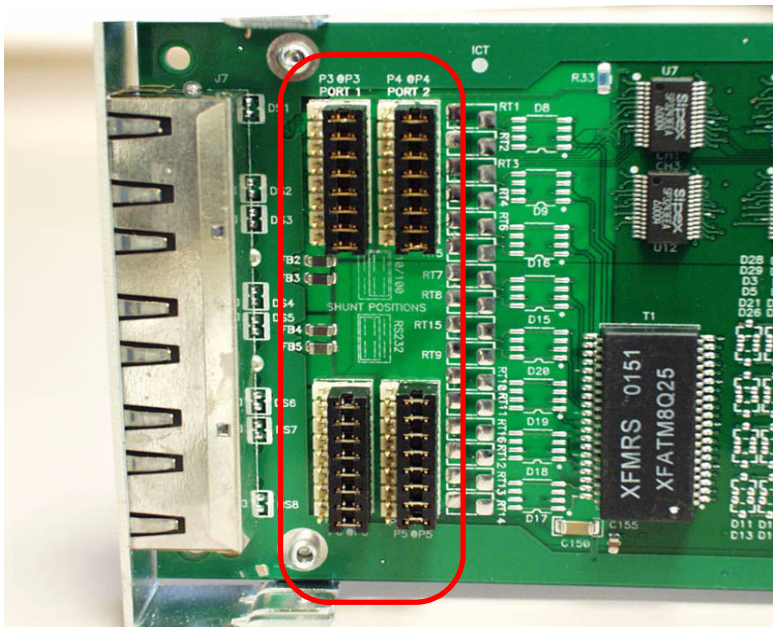
**TSR Card Jumpers**

The jumpers on the TSR card select the use of the 10/100Base-T (RJ-45) or RS-232. There is one jumper for each port on the card. Each jumper can be set to 10/100Base-T or RS-232, independent of the others.

Connector	Placement
10/100Base-T	Position is farthest away from the front of the card
RS-232	Position closest to the front of the card

In the following graphic all port jumpers are set to 10/100Base-T Ethernet.

Card Front



## LEDs

The Terminal Server Router card has 2 LEDs per port.

### At Power-up

TOP LED	Bottom LED	Description
Off	Off	At Power Up/Boot = Loss of power
Red	Red	Card is inoperative
Flashing Red	Flashing Red	Self-test or Boot in-process

### Normal Operation

TOP LED	Bottom LED	Description
Green Solid (Link)	Green Solid (Link)	Port set for Ethernet - see below
Flashing Red	Flashing Red	Self-test or Boot in-process

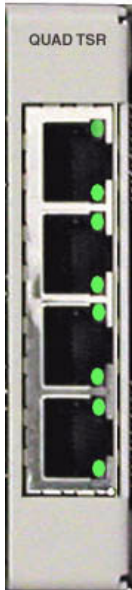
### Port Set for Ethernet

Top LED indicates 100M Link, Bottom LED indicates 10M Link

State	Description
Off	No Ethernet link
Green	Link but no activity
Red Flashing	Current Ethernet collision
Green Flashing	Current Ethernet receive
Yellow Flashing	Current Ethernet transmit

### Port Set for RS-232

TOP LED	Bottom LED	Description
Yellow	Off	No Activity
Yellow	Flashing Yellow	Current transmit
Yellow	Flashing Green	Current receive



## ***Terminal Server Router Card***

*LEDs*

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# CHAPTER 21

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## *Multi-Service Router (MSR) Card*

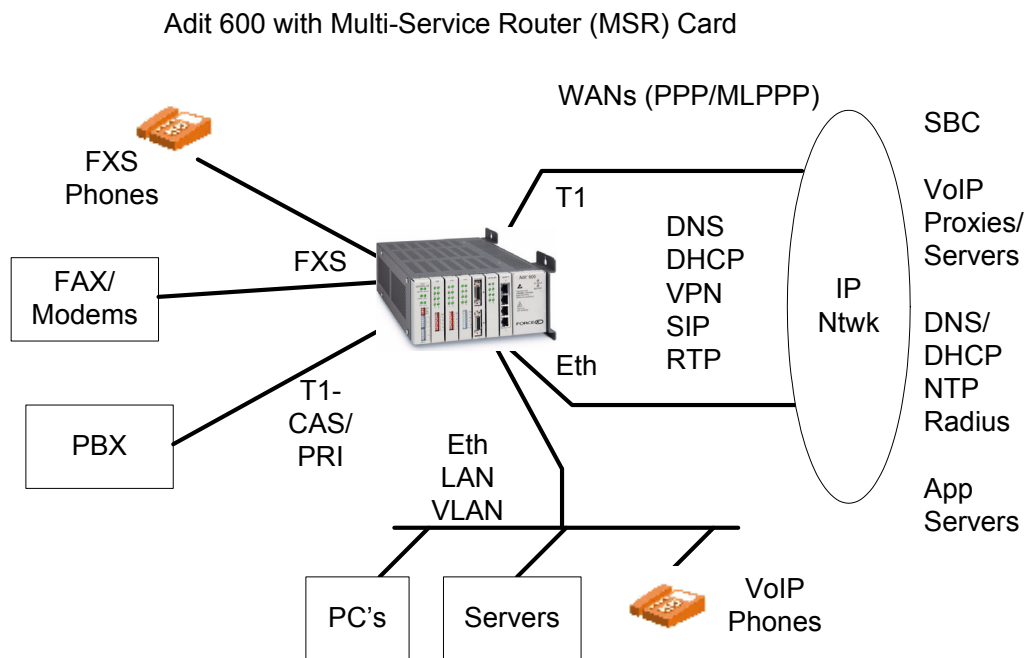
### In this Chapter

- Overview
- Features
- Technical Specifications
- CLI Commands
- Configuration
- Connector Pinouts
- LEDs



## Overview

The Multi-Service Router (MSR) card integrates the features of a trunk gateway, high-performance IPSec VPN-capable router, and stateful firewall with flexible WAN options. It replaces multiple elements at the customer premises that typically provide routing, security, and trunk gateway functions – offering a powerful blend of speed, security, data, and voice. When integrated into the Adit 600, the MSR card offers scalability and high performance for Internet and IP access, LAN-to-LAN connectivity over private and public networks, and VoIP PBX trunk service applications.



## Converged IP Services without Sacrificing Performance

The MSR card's VoIP-aware routing engine is based on advanced network processing technology and enables converged IP applications without the typical degradation in performance seen in other legacy solutions on the market. By integrating routing and security features into a single processor, the MSR cost-effectively supports Network Address Translation (NAT/NAPT), stateful packet inspection, flow classification, Application Layer Gateway (ALG), intrusion detection, and IPSec VPN tunneling. Access control lists also protect traffic flowing in and out of the network. The integrated firewall keeps the network and LAN segments secure from intrusions and attacks while allowing authorized access to network resources.

### **Carrier-Grade VoIP Service Delivery**

The MSR card offers a carrier-class solution that enables the key calling features used by today's business services. Built on top of the base routing engine, the MSR provides a scalable, integrated SIP trunk gateway that can terminate PBX traffic and route both voice and data across public and private networks. The routing engine supports the small packet-size characteristics of full-capacity voice and data plus the Quality of Service necessary to deliver carrier-grade voice. The MSR also supports Fax/Modem bypass as well as T.38 Fax Relay directly on the VoIP network.

### **Simplified Configuration and Management**

Local and remote provisioning is simplified through an easy-to-use web interface and an intuitive Command Line Interface (CLI). Remote alarms from the MSR are reported via SNMP, Syslog, e-mail alerts, or through the web interface. The platform can also be remotely configured and upgraded.

## **Features**

The MSR card offers the following key features and benefits:

- Comprehensive routing, firewall, VoIP gateway, and integrated T1
- VPN-capable routing
- T.38 Fax Relay, auto-detect/fall-back
- SIP-PRI/CAS trunk capability for PBX trunk applications
- PBX Redirection support
- Selectable trunk channel hunt schemes for incoming SIP-to-PRI/CAS calls
- LAN-to-LAN connectivity over private and public networks
- WAN routing with QoS mechanisms for voice traffic and routed data prioritization

## Technical Specifications

---

**NOTE:** The Adit 600 supports one MSR card per chassis. There are additional restrictions on the total number of service cards that can be installed in an Adit 600. See *Configuration Restrictions* on page 4-23 for more information.

---

### T1 or E1 Controller Software Required

---

**NOTE:** E1 is not supported in this release of the Adit 600 Controller. It will be supported in a future release.

---

- Adit 600 release 10.1 or higher is required to support all features available in MSR release 2.1. If you are using an earlier controller or MSR release, check the Customer Release Notes provided with your software to determine which features are supported.
- 

**NOTE:** E1 support is scheduled for a future release of the MSR card.

---

### Interfaces

- Two 10/100Base-TX Ethernet ports (RJ-45 connector), configurable for LAN/VLAN/WAN usage
- One RS-232 port for local management (DB-9 connector) on the Adit 600 Controller
- Internal IP connectivity to other Adit 600 interfaces, including T1 WANs and other Adit 600 router cards for multi-port LAN/WAN routing capability
- Internal TDM connectivity to FXS cards, T1 interfaces for VoIP applications

### Management

- Graphical User Interface (GUI) configuration through the LAN or WAN
- Command Line Interface (CLI) configuration via Telnet through the LAN or WAN, or through the Controller's RS-232 or Ethernet management port
- Minimal CLI configuration support through the Adit 600 Controller via RS-232 or Telnet
- Software upgradeable via TFTP and SCP (Secure Copy)
- Configuration upload and download via TFTP and SCP (**Note:** SCP download support is scheduled for a future release.)
- SNMP v1, v2c (10/100Base-TX or in-band network)
- Standard MIBs
- LED status indicators
- Syslog

### **VoIP SIP Gateway Functions**

- SIP-to-FXS line gateway (for analog phones, FAX/modem connectivity to VoIP)
- SIP-to-CAS/PRI trunking gateway (for PBX connectivity to VoIP)
- PBX Redirection support for SIP-to-PRI calls
- Selectable trunk channel hunt schemes for incoming SIP-to-PRI/CAS calls
- VoIP-capable phones may be placed directly on the Ethernet LAN for independent routing to external SIP/MGCP proxies and application servers

---

**NOTE:** The Adit 600 can perform MGCP VoIP operations in parallel with SIP when equipped with a CMG card in addition to the MSR card.

---

### **General Routing/Security Features**

- NAT/ALG (for private networks)
- DNS/DHCP clients (for network access and configuration)
- DHCP server/relay for devices on the LAN
- VPN (for secure remote LAN access)
- VLAN (for local virtual network operation)

### **Routing and Policy Management**

- IPv4
- Static routes
- OSPF
- RIP v1, v2
- PPP
  - ACF, VJ compression
- Spanning Tree Protocol (802.1d)
- DHCP Server/Client/Relay
- DNS Relay and Resolver
- BootP Relay
- PAP and CHAP authentication
- Ping
- IPCP, BCP
- Multi-Protocol Encapsulation

### **VPN Capabilities**

- X.509 Authentication RFC 2409 & RFC 2510
- MS-CHAP User authentication RFC 2433 & 2759
- L2TP client per RFC 2661
- PPTP Client-Server per RFC 2637
- IPSec per RFCs 2401, 2411, 2412, 2393
- IPSec network-to-network
- IPSec network-to-host
- Encryption Control Protocol per RFC 1968
- Microsoft Point-to-Point Encryption RFC 3078
- Microsoft VPN Client Interoperability
- Cisco IOS VPN Interoperability
- MD-5 (RFC 2403), SHA-1 (RFC 2404) Authentication
- Encryption: DES, 3DES, AES
- IKE Key Management per RFC 2409 (**Note:** When using X.509 certificates, the MSR interoperates only with devices that support IKE Type #9.)
- Minimum 100 VPN sessions
- NAT VPN Traversal
- Routing with NAT and min. 100 firewall rules
- 25 VPN tunnels@ 64-byte packets

### **Quality of Service**

- ToS marking and interpretation per IETF Std. 5
- VLAN Priority Queuing

### **Firewall Features**

- Stateful Firewall
- NAT/NAPT, NAT Bypass, NAT Pin-Holes
- L1-L4 Flow Classification
- Application Layer Gateways including VoIP
- Denial of Service Filtering
- Intrusion Detection

## **FXS Lines**

- Up to 48 FXS lines
- Network-side Loop Start and Ground Start protocols, configurable on a line-by-line basis
- AB signaling
- Automatic SIP registration when a proxy address is configured and enabled
- Calling Party Disconnect (CPD) for FXS calls
- Caller ID for SIP-to-FXS calls
- Call-waiting for active FXS calls
- Call-waiting caller ID (CWCID) for active FXS calls
- Simple ringing on SIP-to-FXS calls (2 seconds on and 4 seconds off)
- Call progress tones for FXS calls:
  - Normal Dial Tone
  - Stutter Dial Tone
  - MWI-Dial Tone
  - Ringback Tone
  - Busy Tone
  - Fast Busy Tone
  - ROH Tone
  - Call Waiting Tone
- Message waiting indication (MWI dialtone and VMWI) for FXS lines
- Flash detection for FXS lines
- Two modes of Flash operation for FXS lines:
  - INFO-mode flash reporting
  - Local flash operations for calling features
- Flash-based calling features for FXS lines:
  - Call Hold/Retrieve
  - Call Transfer (attended and on-ringing)
  - Call Conferencing (external media server)
  - Call Waiting
- Re-INVITE procedures for FXS lines
- T.38 calls over FXS lines
- FAX/modem fallback for FXS lines

## **Line Cross-Connects (FXS)**

- FXS "Line Cross-Connects" permitted between MSR card FXS voice channels and any other Adit 600 external DS0 FXS channels on T1/E1 lines or on FXS cards
- Up to 48 Line Cross-Connect channels
- Line Cross-Connects can be "voice" typed, with a signaling type of "loop start" or "ground start" on a per DS0 basis

## **Link Cross-Connects (LCCs)**

- Up to 8 Link Cross-Connects
- Three types of Link Cross-Connects:
  - Data** – PPP or MLPPP WAN links between MSR and any other Adit 600 WAN destination
  - Voice** – CAS links between MSR CAS trunk functionality and Adit 600 external T1/E1 lines
  - PRI** – PRI links between MSR PRI trunk functionality and Adit 600 external T1/E1 lines
- Up to 8 Link Cross-Connects in an MLPPP WAN
- Up to 8 single-link PPP WANs
- Up to 192 DS0s across all 8 Link Cross-Connects
- One trunk group (either PRI or CAS)
- Exactly 24 DS0s in a Link Cross-Connect designated for PRI use (23 DS0s for voice channels, 1 DS0 for the signaling channel)
- Up to 2 Link Cross-Connects in a PRI Trunk group
- Exactly 24 DS0s in any Link Cross-Connect designated for CAS use
- Up to 2 Link Cross-Connects in a CAS Trunk group

## **Voice Processing and Mediation**

- SIP call control
- Full T1 voice capacity
- CODEC support for G.711 a-law/G.711 $\mu$ -law/G.729a
- Echo cancellation (G.168)
- Silence Suppression
- T.38 fax support
- Voice activity detection/comfort noise generation
- RTP/RTCP
- Call progress tone and cadence generation
- 10-80 ms voice frame on PRI/CAS channels
- 10-20 ms voice frame on FXS channels
- Maximum 150 ms jitter buffer
- Gain control
- Modem support - V.90, G.711 (fallback)

## **Dial Plan Features**

- Prefix number stripping and appending
- Individual route tables for each PRI trunk
- Configurable Dial Plan



## **Network Standards**

- ANSI/TIA T1.403, T1.413 i2, T1.231
- ITU G.703, G.704
- National ISDN-1/2
- ITU-T Q.931, Q.921
- Telcordia GR-506-CORE

## **Regulatory Approvals**

See *Appendix A, Regulatory Approvals* for information about the MSR card.

## **Power**

- Dissipation: approx. 11 W maximum
- Internal solid-state (fuseless) protection
- Fan-free operation

## **Physical**

- Dimensions: 3.5 in. (H) x 0.75 in. (W) x 11.25 in. (D)  
8.9 cm (H) x 1.9 cm (W) x 28.6 cm (D)
- Weight: 6.7 oz. (190 g)

For environmental requirements, see *Installation Environment* on page 2-2.

## CLI Commands

Full configuration of the MSR card must be performed through its Graphical User Interface (GUI) or Command Line Interface (CLI). A limited number of CLI commands are available from the Adit 600 Controller for setting up cross-connects, loading code, and performing other basic functions:

- *connect (msr)*  
Assign Link and Line Cross-Connects between the MSR card and the Controller or other service cards.
- *disconnect (msr)*  
Remove Link and Line Cross-Connects between the MSR card and the Controller or other service cards.
- *load scp*  
Load software via SCP (secure copy) to the MSR card.
- *load tftp*  
Download software via TFTP to the MSR card.
- *print config*  
Print the MSR configuration, including any MSR commands supported by the Controller.
- *reset (router)*  
Reboot the MSR card. All new configuration changes since the last reset will be applied.
- *set (msr-intf-id) up/down*  
Enable or disable alarms reported by the MSR card.
- *set (router) default*  
Reset the MSR card to its default configuration settings.
- *set (router) proxy*  
Set the MSR card's proxy settings.
- *set (router) voip alarm up/down*  
Enable or disable VoIP alarms reported by the MSR card.
- *show (router) mac*  
Display the MAC address for the MSR card's Ethernet ports.
- *status equipment*  
Display the current equipment status information for cards installed in the Adit 600.
- *store scp*  
Save a software file from the MSR card to a defined location on a PC, via SCP (secure copy).  
(**Note:** The 'store scp' command is scheduled for a future release.)
- *store tftp*  
Save a software file from the MSR card to a defined location on a PC, via TFTP.
- *telnet (router)*  
Establish a Telnet session from the Adit 600 Controller to the MSR card.

## Configuration

The following sections provide instructions for connecting to the MSR card and performing basic configuration. For information about more advanced configuration tasks, refer to the *Adit 3000 Series and Multi-Service Router (MSR) Card GUI Reference Manual* and the *Adit 3000 Series and Multi-Service Router (MSR) Card CLI Reference Manual*.

- Connection Options
- PC Setup - DHCP Client Configuration
- Setting up a GUI Connection
- Setting up a CLI Connection
- Enabling Keyed Software Features
- Basic Configuration

### Connection Options

For MSR card configuration, the following connection options are available:

- RS-232 interface on the Adit 600 Controller
  - Provides access to the MSR's CLI via Telnet
  - Allows ASCII text configuration storage via text capture using the 'print config' command
- Ethernet interface on the Adit 600 Controller
  - Provides access to the MSR's CLI via Telnet
  - Allows binary and text configuration upload/download via TFTP and SCP (**Note:** SCP download support is scheduled for a future release.)
  - Allows software upload via TFTP and SCP
- Ethernet LAN or WAN interface on the MSR card
  - Provides access to the MSR's CLI
  - Provides access to the MSR's GUI
  - Allows binary and text configuration upload/download via TFTP and SCP (**Note:** SCP download support is scheduled for a future release.)
  - Allows software upload via TFTP and SCP
- Ethernet or T1 WAN interface from the Controller or other service cards to the MSR card
  - Provides access to the MSR's CLI
  - Provides access to the MSR's GUI
  - Allows binary and text configuration upload/download via TFTP and SCP (**Note:** SCP download support is scheduled for a future release.)
  - Allows software upload via TFTP and SCP

## **PC Setup - DHCP Client Configuration**

When a PC is connected to the MSR card's Ethernet LAN port, IP addresses are acquired using the MSR's DHCP server. The PC must be configured as a DHCP Client. Steps for performing DHCP client configuration on different operating systems are provided below.

### **Windows XP**

1. Access **Network Connections** from the Control Panel.
2. Right-click the Ethernet connection's icon, and select **Properties** to display the connection's properties.
3. From the **General** tab select the **Internet Protocol (TCP/IP)** component and press the **Properties** button.
4. The Internet Protocol (TCP/IP) properties will be displayed and the following must be selected.
  - Select the **Obtain an IP address automatically**.
  - Select the **Obtain DNS server address automatically**.

### **Windows 2000/98/Me**

1. Access **Network and Dialing Connections** from the Control Panel.
2. Right-click the Ethernet connection's icon, and select **Properties** to display the connection's properties.
3. Select the **Internet Protocol (TCP/IP)** component and press the **Properties** button.
4. The Internet Protocol (TCP/IP) properties will be displayed and the following must be selected.
  - Select the **Obtain an IP address automatically**.
  - Select the **Obtain DNS server address automatically**.

### **Windows NT**

1. Access **Network** from the Control Panel to display the network control panel.
2. From the **Protocol tab** select the **Internet Protocol (TCP/IP)** component and press the **Properties** button.
3. From the **IP Address** tab select **Obtain an IP address automatically**.
4. From the **DNS Address** tab verify that no DNS server is defined in the **DNS Service Search Order** field, and no suffix is defined in the **Domain Suffix Search Order** field.
5. Reboot.

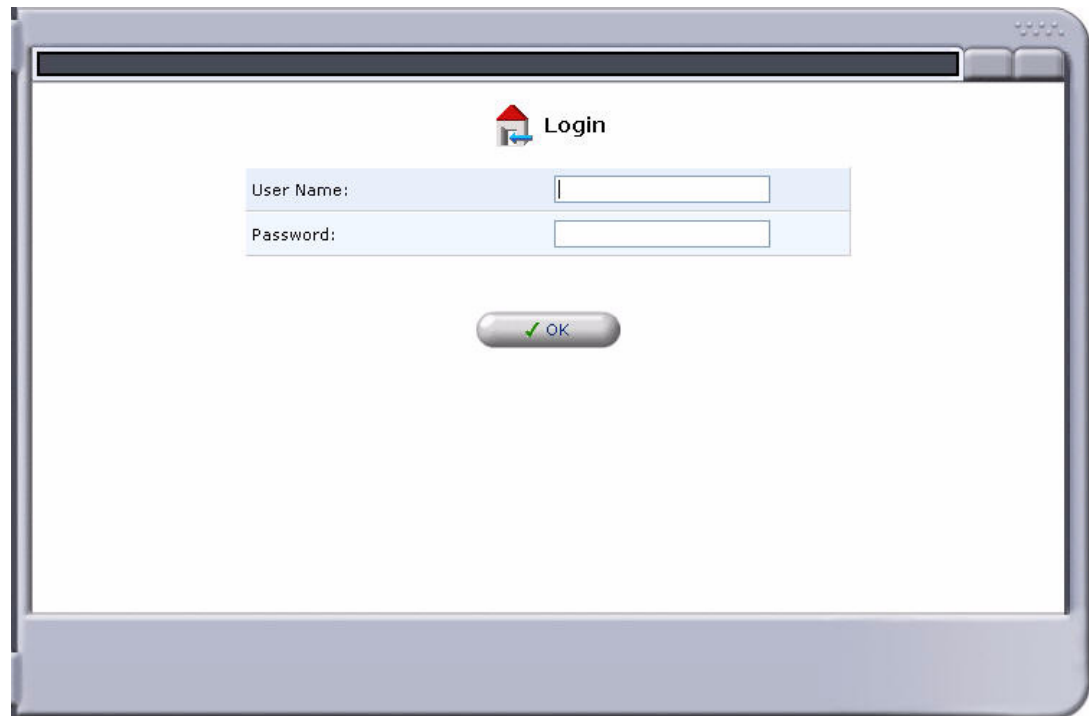
### **Linux**

1. Login into the system as a super-user, by entering **su** at the prompt.
2. Type **ifconfig** to display the network devices and allocated IPs.
3. Type **pump -i dev**, the dev is the network device name.
4. Type **ifconfig** again to view the new allocated IP address.

## **Setting up a GUI Connection**

The MSR's web-based GUI is accessed through a web browser. To access the GUI through the MSR's Ethernet LAN port:

1. Launch a web browser on your PC from the same LAN as the MSR.
2. Enter the MSR's IP address or name in the address bar.  
The default IP address is **http://192.168.1.1**. The **Login** screen appears.



3. Log in to the MSR by entering the user name and password.
  - The default user name is **admin**
  - The default password is **admin 123**

---

**NOTE:** For security purposes, the user name and password should be changed from the default settings after the initial login.

---

After you set up WAN connections on the MSR card, you can access the GUI through a WAN as well as the LAN. See *Setting up the MSR for GUI Access via WAN* on page 21-17.

## Setting up a CLI Connection

---

**NOTE:** For information about MSR CLI commands see the *Adit 3000 Series and Multi-Service Router (MSR) Card CLI Reference Manual*.

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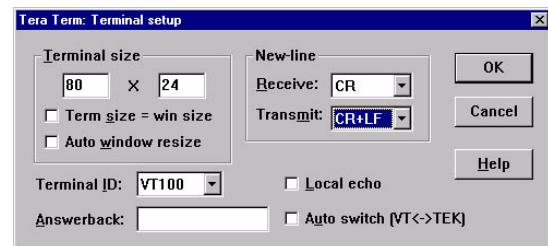
To access the MSR's CLI:

1. Set up the connection:
    - If connecting via the Ethernet 100Base-TX connection, use a Telnet TCP/IP program to access the CLI. This requires the IP address of the MSR.  
The default IP address is **http://192.168.1.1**
    - If connecting via RS-232, the port settings should be set to:  
Bits per second: **115200**                      Data bits: **8**  
Parity: **None**                                  Stop bits: **1**  
Flow control: **None**
    - Set your Terminal Emulation to: **VT100**
- 

**NOTE:** When using Tera Term (Telnet program) TCP/IP, the CLI commands will not be recognized until the following setup is completed.

---

- In Tera Term go to **Setup/Terminal**
- Set the **New-line/Transmit** value **CR**



2. After successful connection via Telnet or HyperTerm, log into the MSR. The default logins are:
    - Login: **admin**
    - Password: **admin123**
- 

**NOTE:** It is recommended that you change your password from the default.

---

After successful login, the prompt will appear as follows:

Adit MSR>

---

**NOTE:** After you set up WAN connections on the MSR card, you can access the CLI through the WAN as well as the LAN and the Controller's management connections.

---

## **Enabling Keyed Software Features**

The MSR card has additional features that are not provided on the base system. These features can be purchased with the product or added later as needed. These features are enabled via a Software Key. The number of keyed features may expand with the development of the product. To purchase a key, contact Force10 Networks Customer Service or Sales.

To enter a software key, use the following CLI command:

**Syntax:** (config)# key *key-code*

Example: (config)# key cxusdfutkj3diosn412C

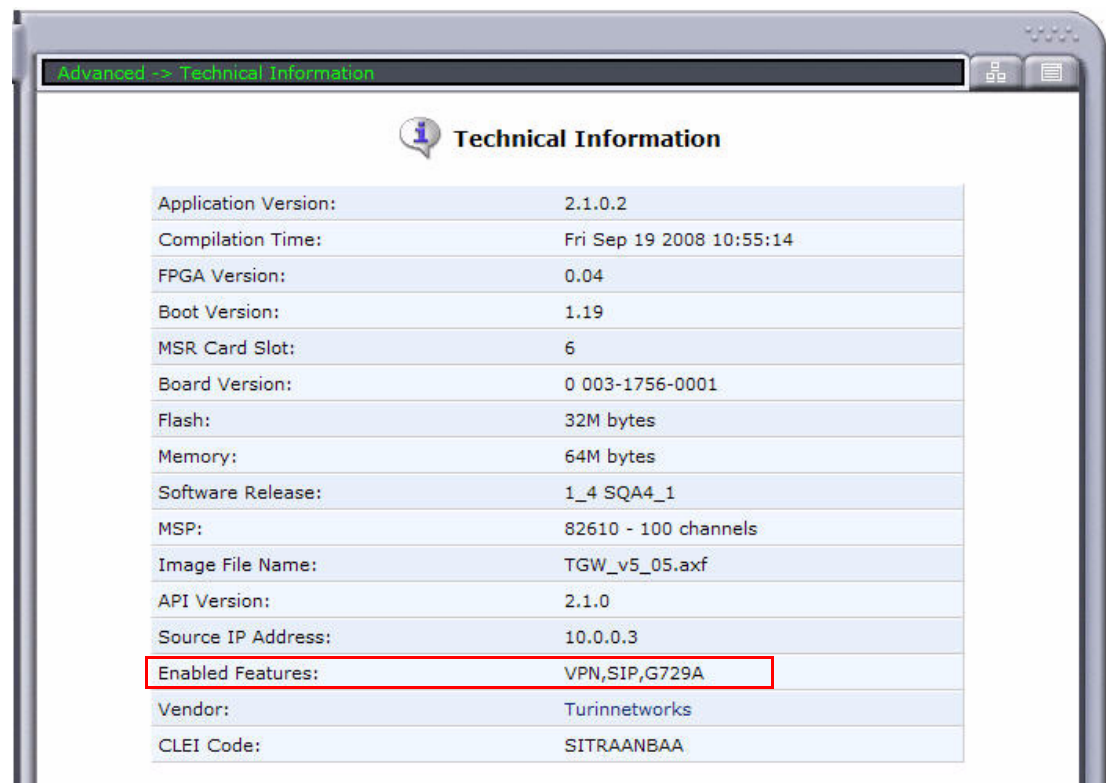
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**NOTE:** Keys may only be entered through the CLI (not through the GUI).

---

To see a list of the currently enabled keyed features:

1. Select **Advanced** from the Navigation bar.
2. Select **Technical Information**.



This information can also be displayed with the following CLI command:

```
Adit MSR> show version
Application Version: 2.1.0.4
Compilation Time: Wed Oct  8 2008 16:09:24
FPGA Version: 0.04
Boot Version: 1.19
Board Version: 0 003-1756-0001
Flash Size: 32M bytes
Memory Size: 64M bytes
IXP400 Software Release: 1_4 SQA4_1
MSP:
    82610 - 100 channels
    Image File Name: TGW_v5_05.axf
    API Version      : 2.1.0
    Source IP Addr  : 10.10.4.202
MSR Card Slot: 5
CLEI Code: SITRAANBAA
Product Features:
    VPN  enabled.
    SIP  enabled.
    G729A enabled.
```



## **Basic Configuration**

Basic configuration consists of sequential tasks, where each task configures an additional function. The first function must be configured before the second and so forth. However, you may stop at any task and not add the following feature.

---

**NOTE:** The order in which commands are entered can affect the successful provisioning of the MSR card.

---

- Setting up the MSR for GUI Access via WAN
- Restoring Factory Defaults
- Modifying the Default Admin User
- Configuring a WAN Interface for Internet Connectivity
- Configuring the MSR as a VoIP (SIP) Gateway

### **Setting up the MSR for GUI Access via WAN**

To configure WAN access to the GUI:

1. Connect to the CLI as described in *Setting up a CLI Connection on page 21-14*.
2. Enable remote admin WAN access with the following command sequence:

Command	Description
Username: admin Password: *****	Log into the system (username and password).
Adit MSR> enable	Enter the Privileged mode.
Password: *****	Enter password for the Privileged mode.
#configure terminal	Enter the Configuration mode.
(config)# remote-admin web primary-port enable	Enable remote web admin.

3. Connect to the GUI as described in *Setting up a GUI Connection on page 21-13*.

### **Restoring Factory Defaults**

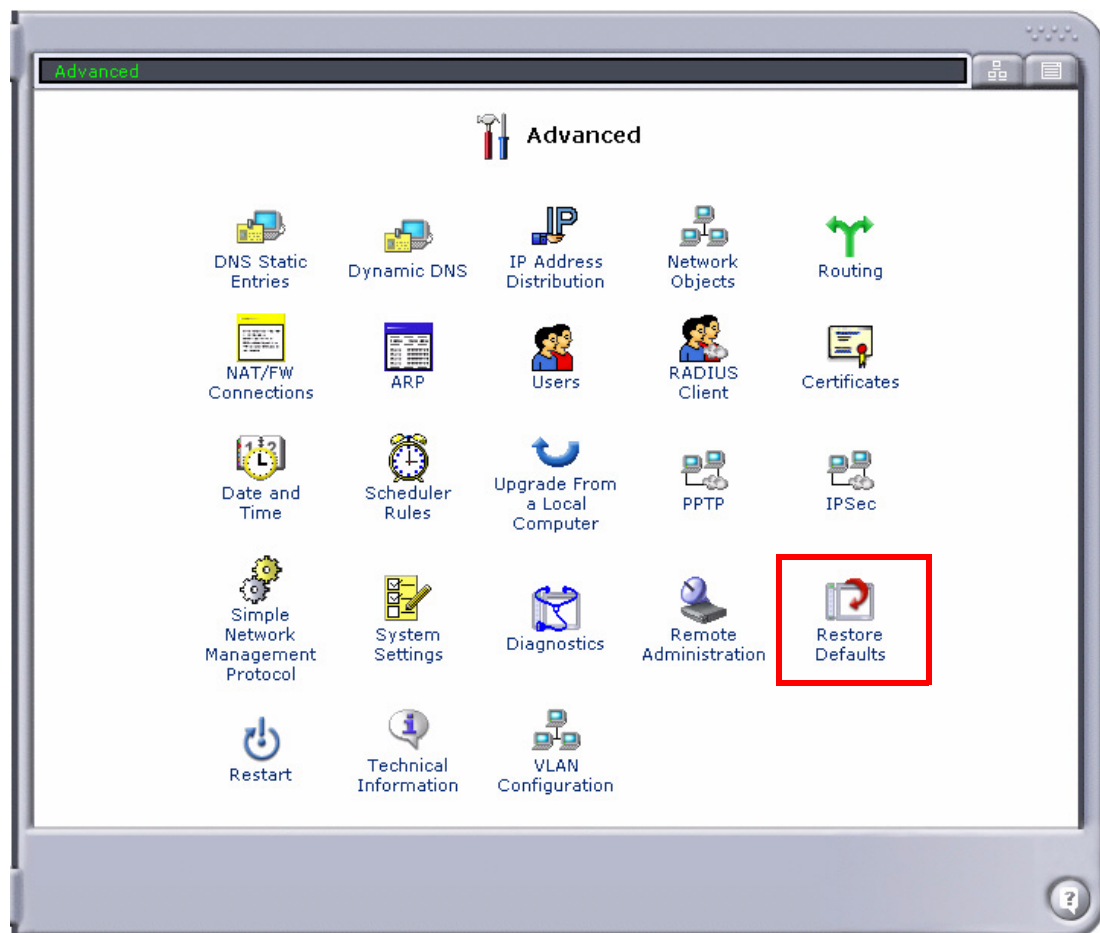
If the MSR is not "out-of-the-box," you may want to verify that it is set to defaults.

---

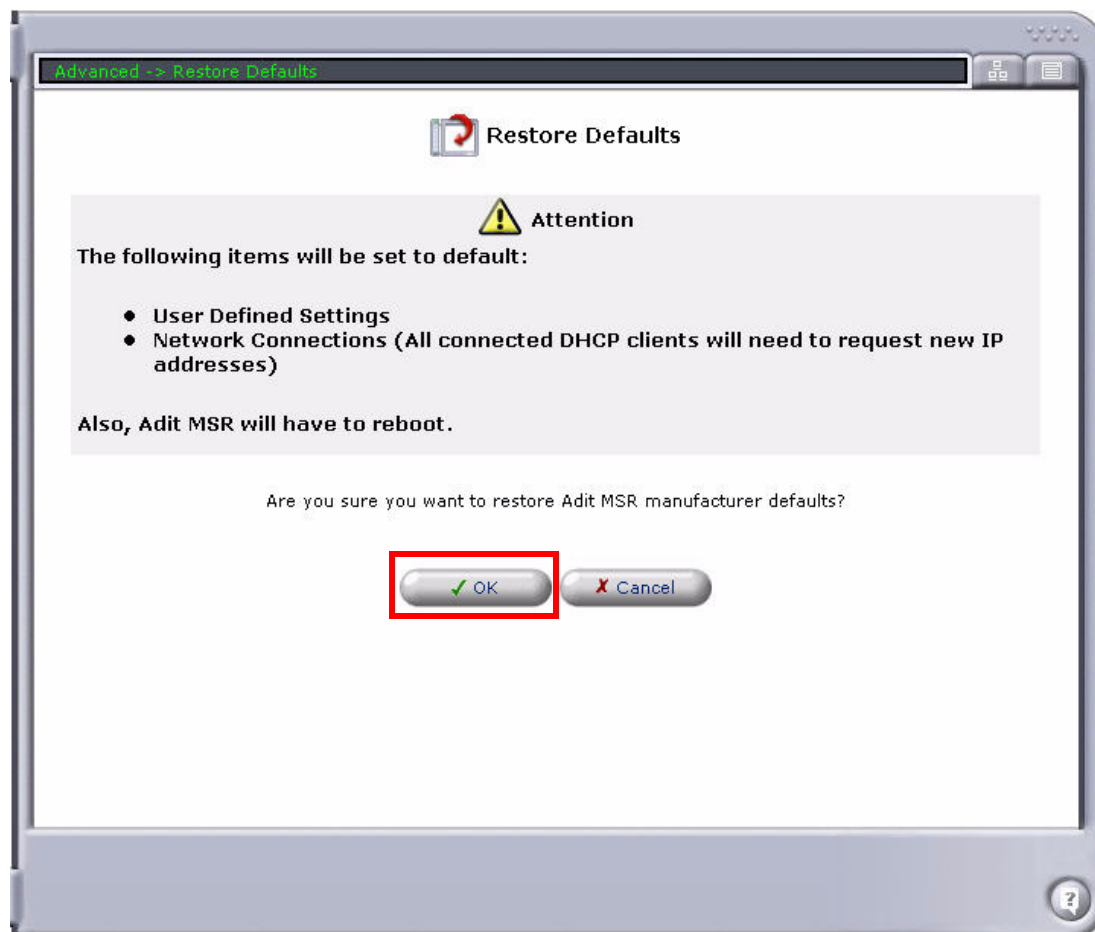
**NOTE:** This will reset the IP address back to the default setting of 192.168.1.1.

---

1. Select **Advanced** from the Navigation bar.
2. Select **Restore Defaults**.



3. Select **OK** to restore defaults.

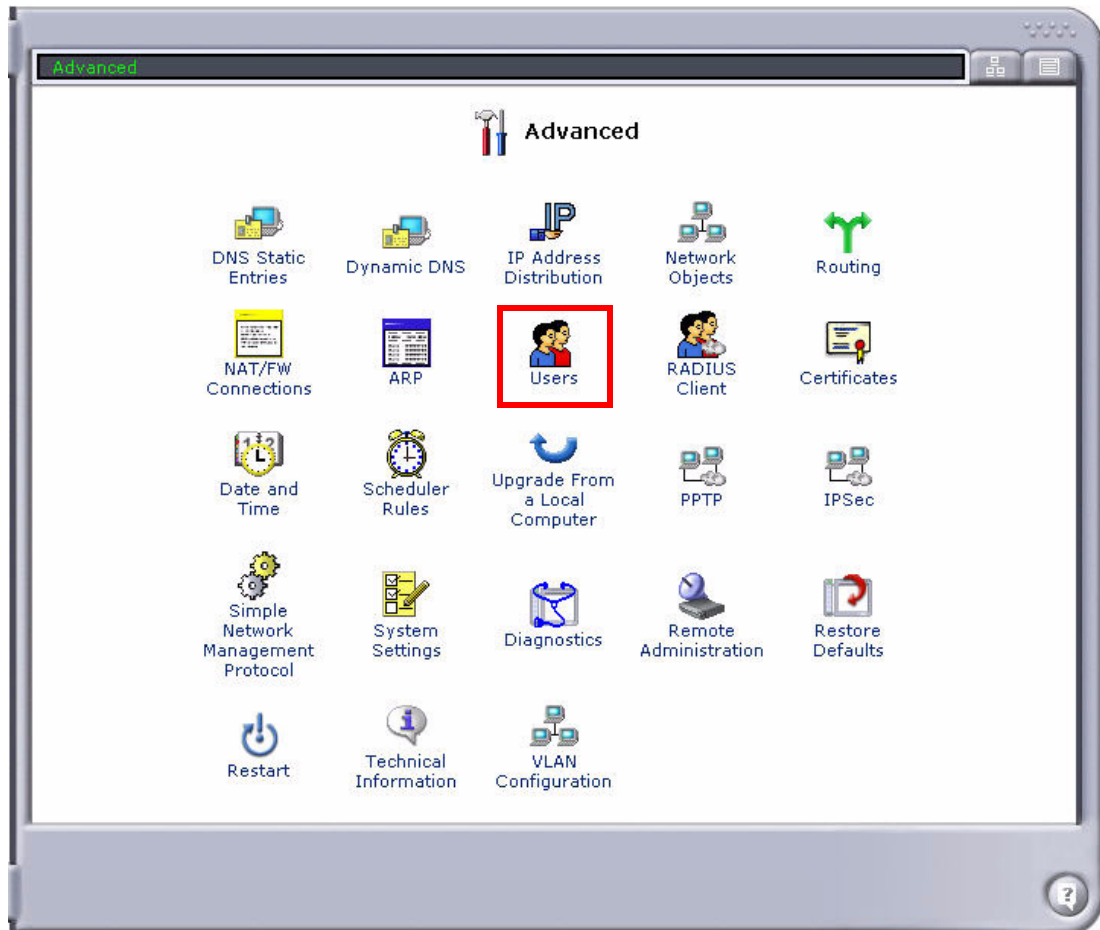


### **Modifying the Default Admin User**

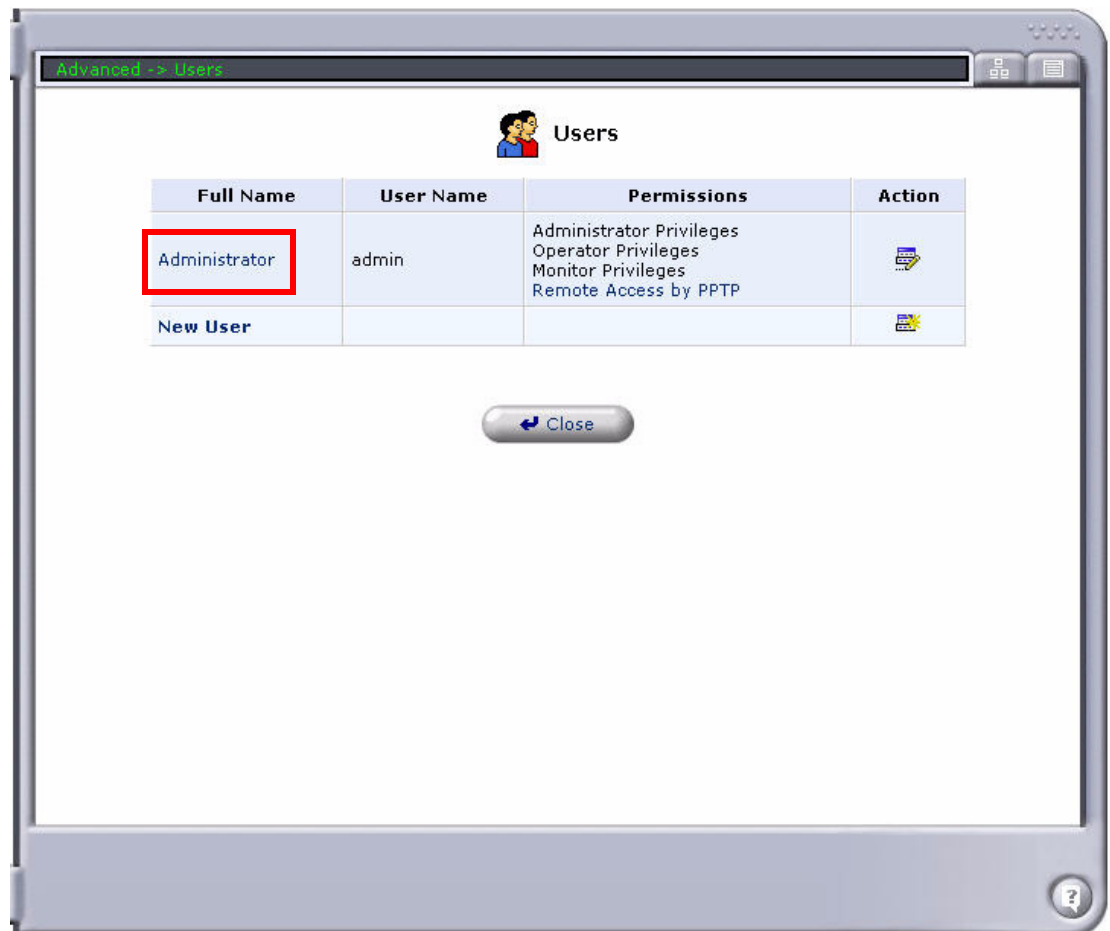
For security purposes, it is recommended that the Administrator User be changed from the default settings.

To modify the Administrator User:

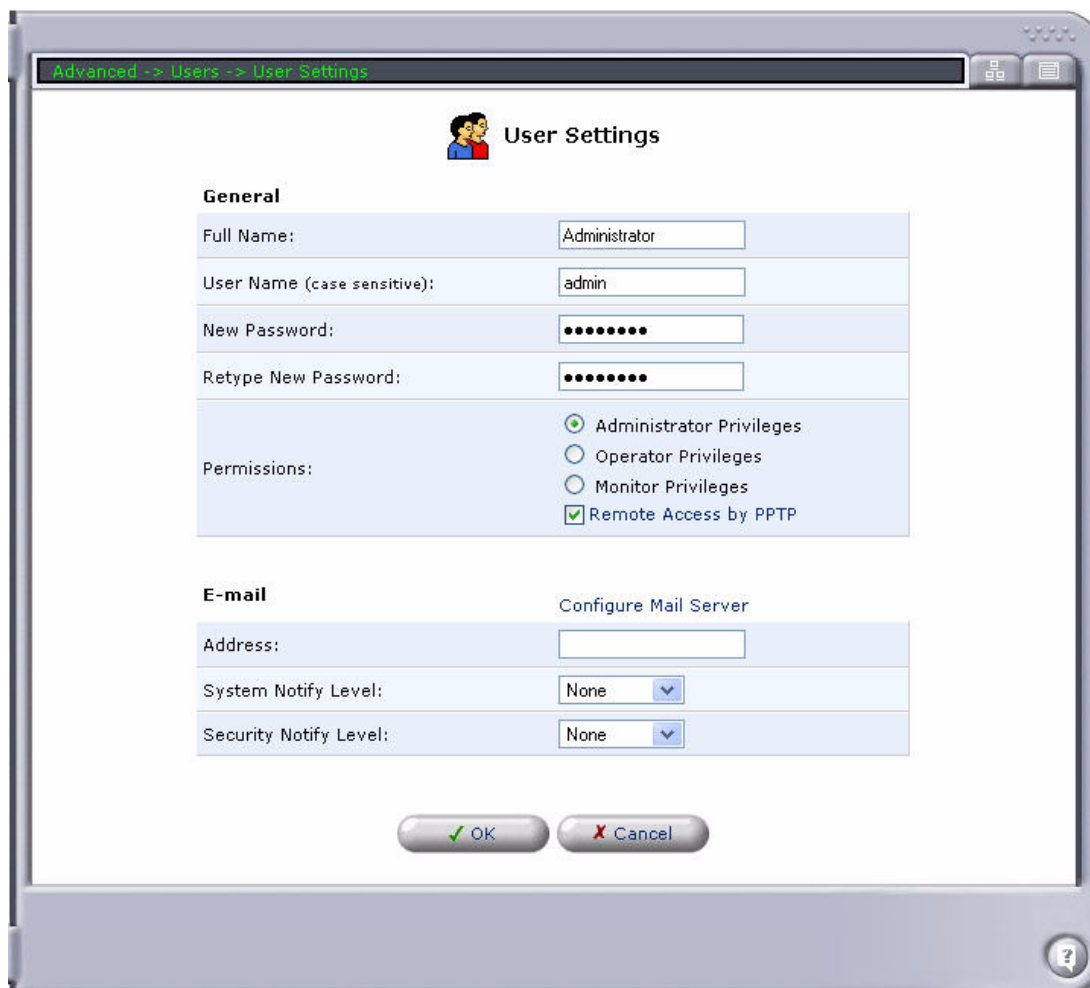
1. Select **Advanced** from the Navigation bar.
2. Select the **Users** icon.



3. Select **Administrator** to open the profile.



4. Modify the User information, and select **OK** to save. It is important to note that you need to have a minimum of one user with **Administrative Privileges**. For users with other access levels, use **New User** to add additional users on the system.  
For security purposes, the password should be changed from the default setting.



The image shows a 'User Settings' dialog box with a breadcrumb trail 'Advanced -> Users -> User Settings'. The dialog is titled 'User Settings' and contains two main sections: 'General' and 'E-mail'. In the 'General' section, there are fields for 'Full Name' (Administrator), 'User Name (case sensitive)' (admin), 'New Password' (masked with dots), and 'Retype New Password' (masked with dots). Below these is a 'Permissions' section with four radio buttons: 'Administrator Privileges' (selected), 'Operator Privileges', 'Monitor Privileges', and 'Remote Access by PPTP' (checked). The 'E-mail' section has a 'Configure Mail Server' link and fields for 'Address', 'System Notify Level' (set to 'None'), and 'Security Notify Level' (set to 'None'). At the bottom are 'OK' and 'Cancel' buttons.

Advanced -> Users -> User Settings

**User Settings**

**General**

Full Name: Administrator

User Name (case sensitive): admin

New Password: .....

Retype New Password: .....

Permissions:

- ☒ Administrator Privileges
- ☐ Operator Privileges
- ☐ Monitor Privileges
- ☒ Remote Access by PPTP

**E-mail**

Configure Mail Server

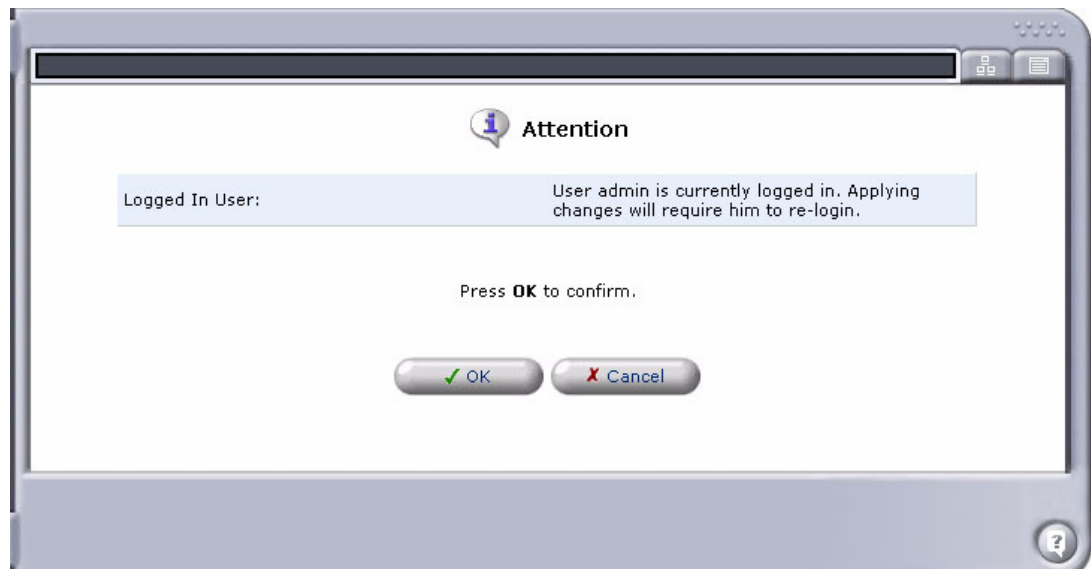
Address:

System Notify Level: None

Security Notify Level: None

OK Cancel

5. You will be required to log in again if you have modified your current User Profile.



### **Configuring a WAN Interface for Internet Connectivity**

There are several options to WAN configuration. This is the connection to the end user's internet provider. It can be the following:

- Single Link Cross-Connect WAN (PPP)
- Multiple Link Cross-Connect WAN (Multilink PPP)
- Ethernet WAN

---

**NOTE:** Refer to the *Adit 3000 Series and Multi-Service Router (MSR) Card GUI Reference Manual* for full descriptions of the settings shown in the following sections.

---

#### **Single Link Cross-Connect WAN (PPP)**

---

**NOTE:** Cross-connects from Adit 600 resources (T1 lines or WAN-capable cards) must be made before setting up the WAN link on the MSR card. All DS0s cross-connected to the WAN link must be of type "Data." Use the **connect (msr)** command to cross-connect resources to the MSR card.

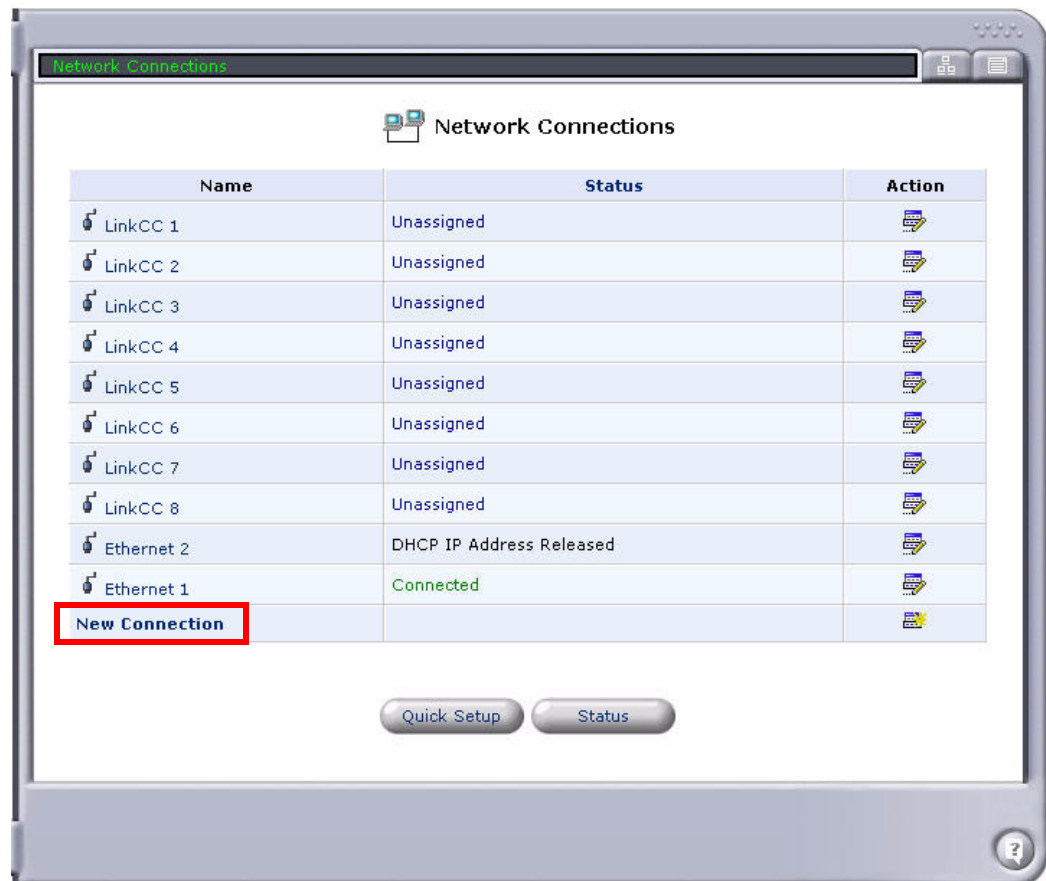
---

To configure a single Link Cross-Connect (LCC) WAN using PPP:

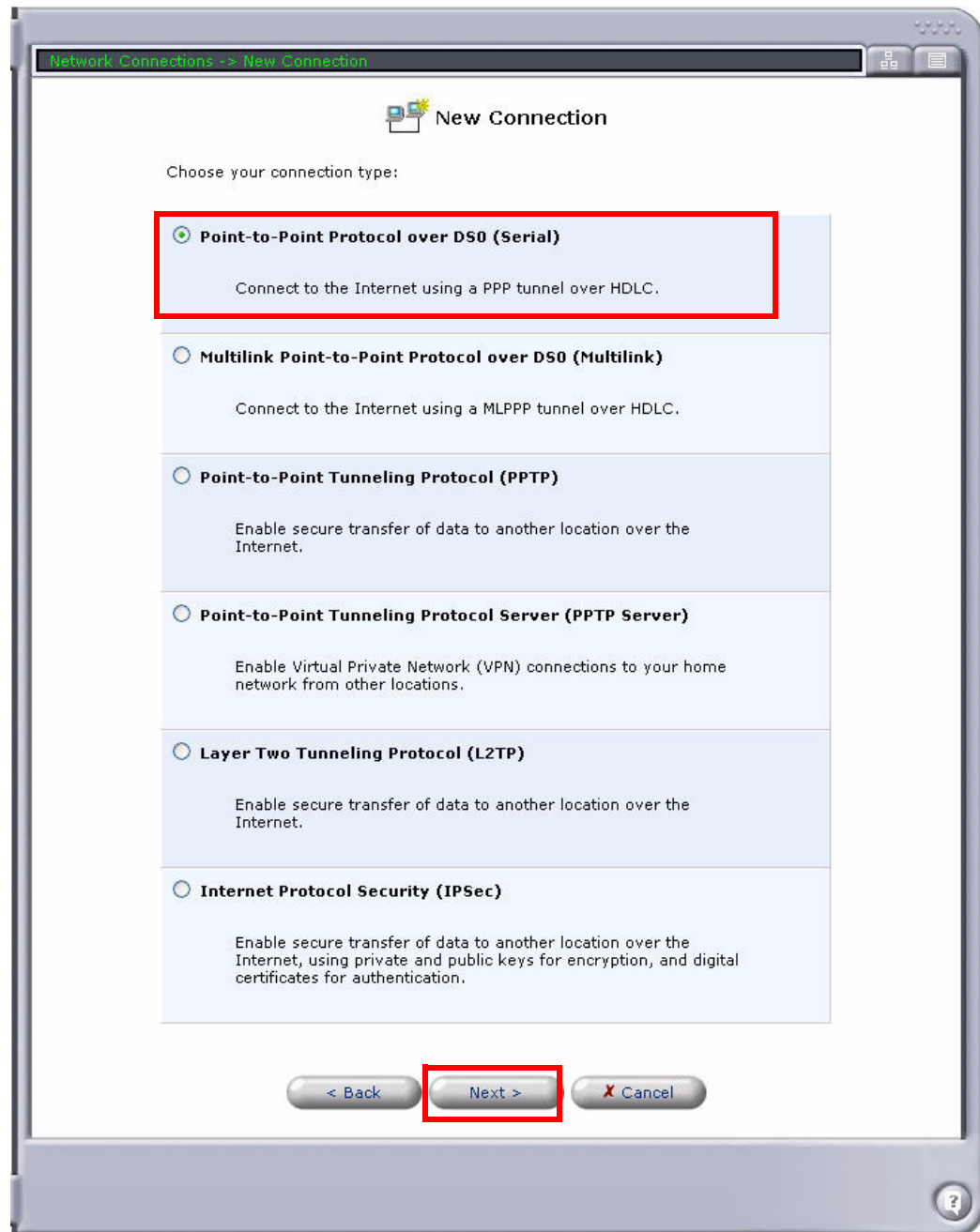
1. Select **Network Connections** from the Navigation bar.
2. Disable the **Ethernet 2** WAN port. Only one WAN interface is allowed.



3. Select **New Connection** to create the PPP Serial connection.



4. Select **Point-to-Point Protocol over DS0 (Serial)**, and select **Next**.



5. Enter the **User Name** and **Password**.
6. Select the **Connection** (LCC#1 to LCC#8) to be used for this WAN.

Network Connections -> New Connection -> Point-to-Point Protocol over DS0 (Serial)

**Point-to-Point Protocol over DS0 (Serial)**

Configure your Serial connection properties:

Login User Name (case sensitive): user1

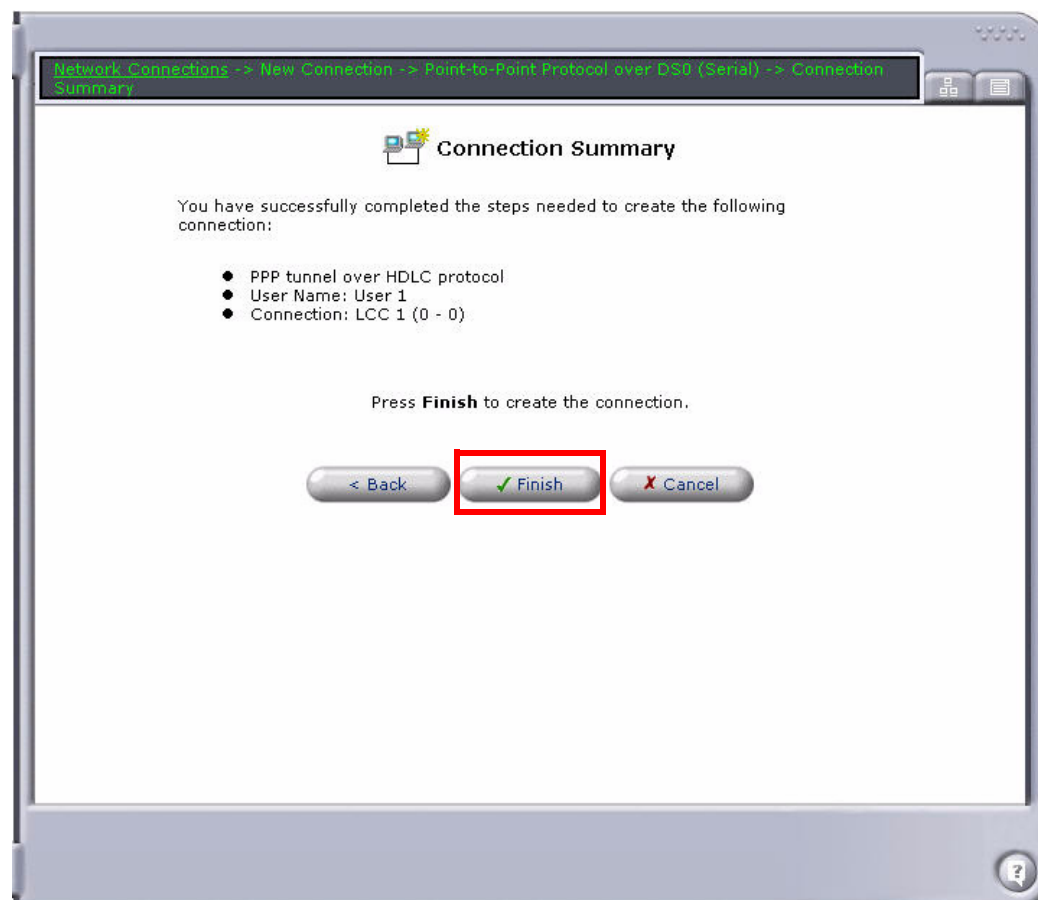
Login Password: .....

**Connection**

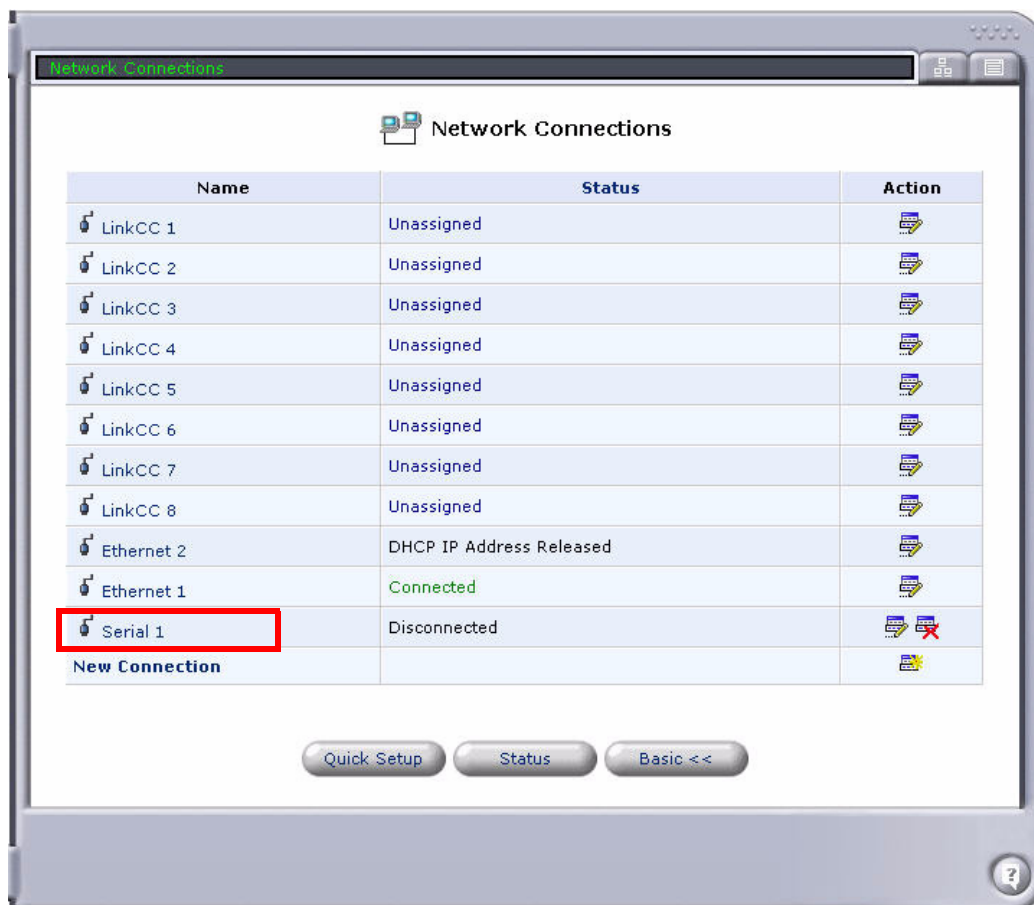
<input checked="" type="radio"/> LCC#1	unassigned
<input type="radio"/> LCC#2	unassigned
<input type="radio"/> LCC#3	unassigned
<input type="radio"/> LCC#4	unassigned
<input type="radio"/> LCC#5	unassigned
<input type="radio"/> LCC#6	unassigned
<input type="radio"/> LCC#7	unassigned
<input type="radio"/> LCC#8	unassigned

< Back   Next >   X Cancel

7. Select **Next**. A summary of the connection is displayed. If correct, select **Finish**.

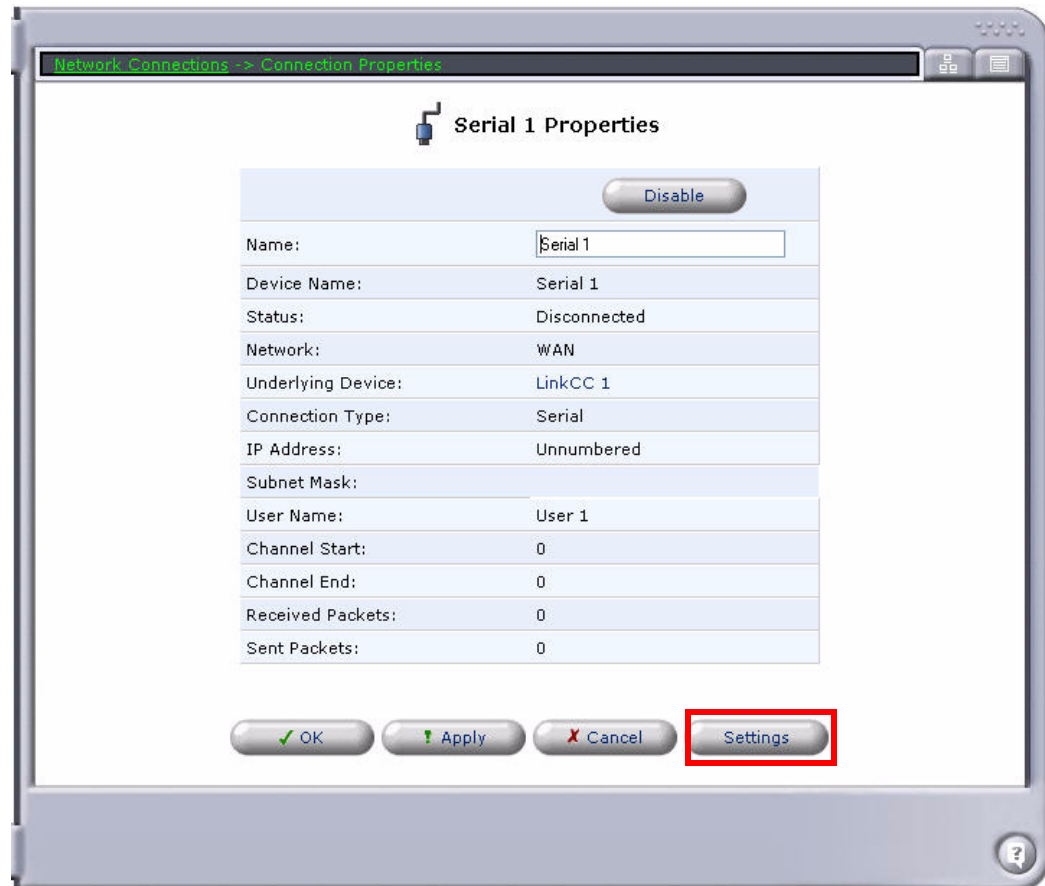


8. The new connection (Serial 1) appears on the **Network Connections** screen. Select the **Serial 1** connection.



9. At the **Serial 1 Properties** screen, select the **Settings** button.

**Note:** You can enter a new name for the interface at the **Serial 1 Properties** screen, if desired.



10. On the **Configure Serial 1** screen, specify the following:
- Make sure that **Network** is set to **WAN**.
  - Set **Internet Protocol** to **Use the Following IP Address**. Specify the **IP Address** and select the checkbox next to **Override Subnet Mask**.
  - Set **DNS Static Entries** to **Use the following DNS Server Addresses**. Specify the **Primary DNS Server** and the **Secondary DNS Server**.
  - Make sure that **Routing Mode** is set to **NAPT**.
  - Select the checkbox next to **SIP ALG**.
  - If a data T1 is being used to access the MSR, make sure that **Default Route** is checked.
  - Configure any other settings as necessary for your application.

Network Connections -> Connection Properties -> Configure Connection

### Configure Serial 1

**General**

Device Name:	Serial 1
Status:	Disconnected
Schedule Availability:	Always <span>New</span>
Network:	WAN
Connection Type:	Serial
MTU:	Automatic 1500
Underlying Device:	LinkCC 1

**PPP**

☐ On Demand (will attempt to connect only when packets are sent)

Time Between Reconnect Attempts: 30 Seconds

Restart Timer (Seconds): 3 Seconds

**PPP Authentication**

Login User Name (case sensitive):

Login Password:

☐ Support Unencrypted Password (PAP)

☐ Support Challenge Handshake Authentication (CHAP)

☐ Support Microsoft CHAP (MS-CHAP)

☐ Support Microsoft CHAP Version 2 (MS-CHAP v2)

**PPP Encryption**

☐ Require Encryption (Disconnect If Server Declines)

☐ Support Encryption (40 Bit Keys)

☐ Support Maximum Strength Encryption (128 Bit Keys)

**Internet Protocol** Use the Following IP Address

IP Address: 0.0.0.0

☒ Override Subnet Mask: 0.0.0.0

**DNS Static Entries** Use the Following DNS Server Addresses

Primary DNS Server: 0.0.0.0

Secondary DNS Server: 0.0.0.0

**Routing**

Routing Mode: NAPT

☒ SIP ALG

Device Metric: 20

☒ Default Route

Routing Protocols: None

**Internet Connection Firewall** ☒ Enabled

**Additional IP Addresses** New IP Address

## ***Multi-Service Router (MSR) Card***

### ***Configuration***

---

11. Select **OK** to apply the new settings and exit this screen.
12. Select **OK** again to return to the **Network Connections** screen.

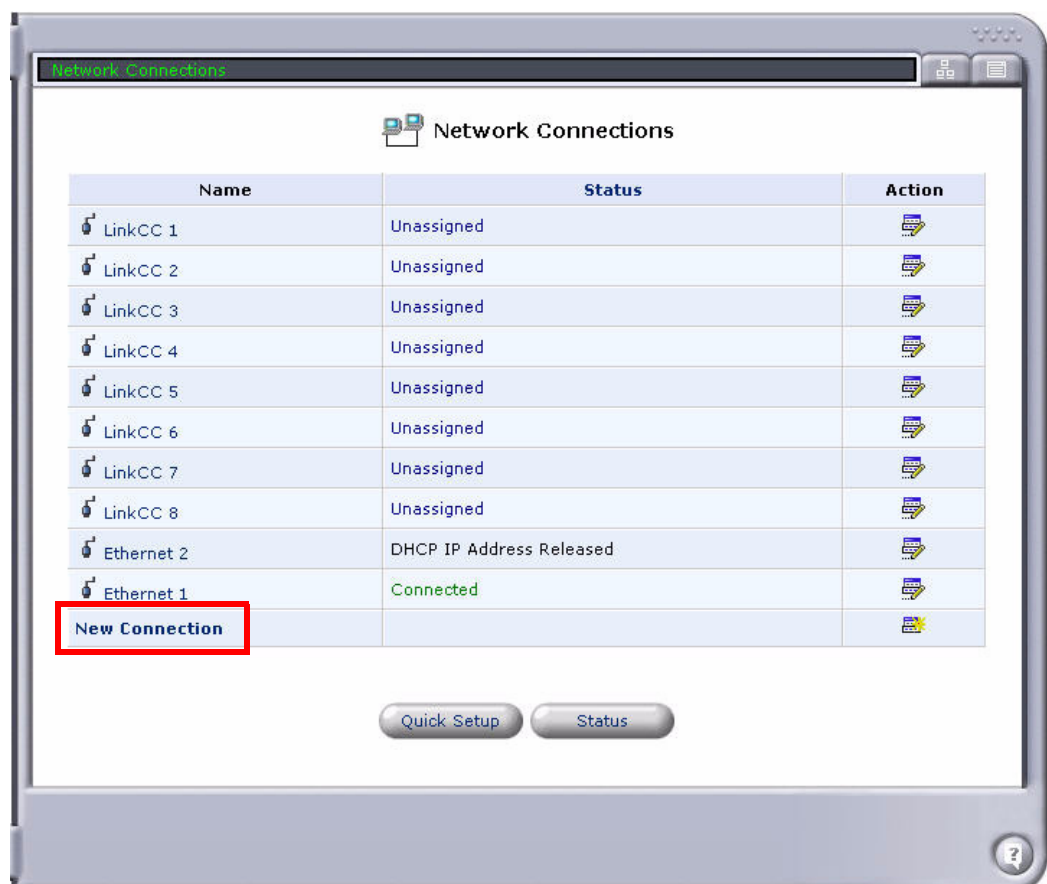


### **Multiple Link Cross-Connect WAN (Multilink PPP)**

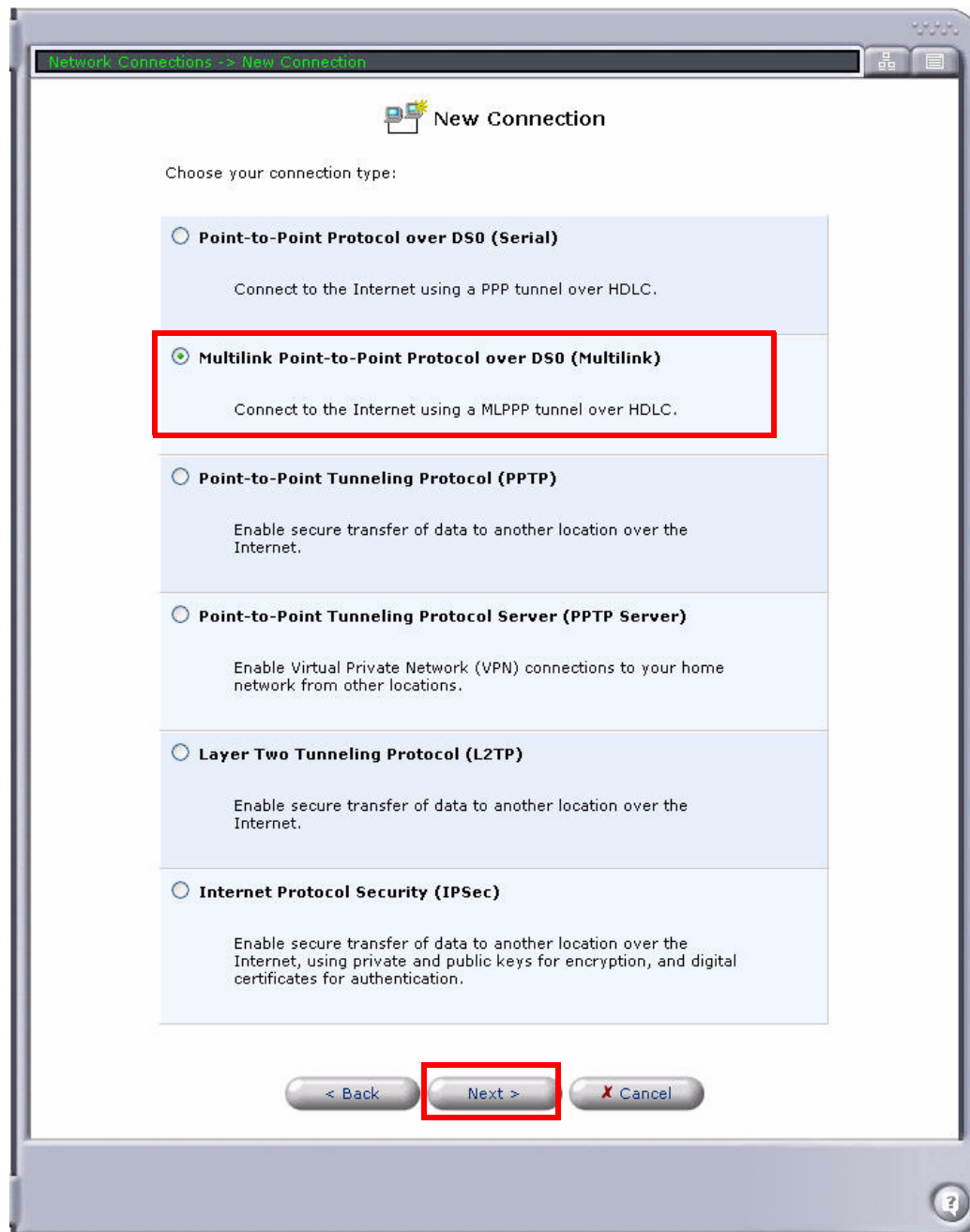
**NOTE:** Cross-connects from Adit 600 resources (T1 lines or WAN-capable cards) must be made before setting up the WAN link on the MSR card. All DS0s cross-connected to the WAN link must be of type "Data." Use the **connect (msr)** command to cross-connect resources to the MSR card.

To configure a multiple Link Cross-Connect (LCC) WAN using Multilink PPP:

1. Select **Network Connections** from the Navigation bar.
2. Disable the **Ethernet 2** WAN port. Only one WAN interface is allowed.
3. Select **New Connection** to create the ML-PPP connection.



4. Select **Multilink Point-to-Point Protocol over DS0 (Multilink)**, and select **Next**.



5. Enter **User Name** and **Password**.

6. Select the **Connections** (from LCC#1 to LCC#8) to be used for this WAN.

Network Connections -> New Connection -> Multilink Point-to-Point Protocol over DS0 (Multilink)

**Multilink Point-to-Point Protocol over DS0 (Multilink)**

Configure your Multilink connection properties:

Login User Name (case sensitive):

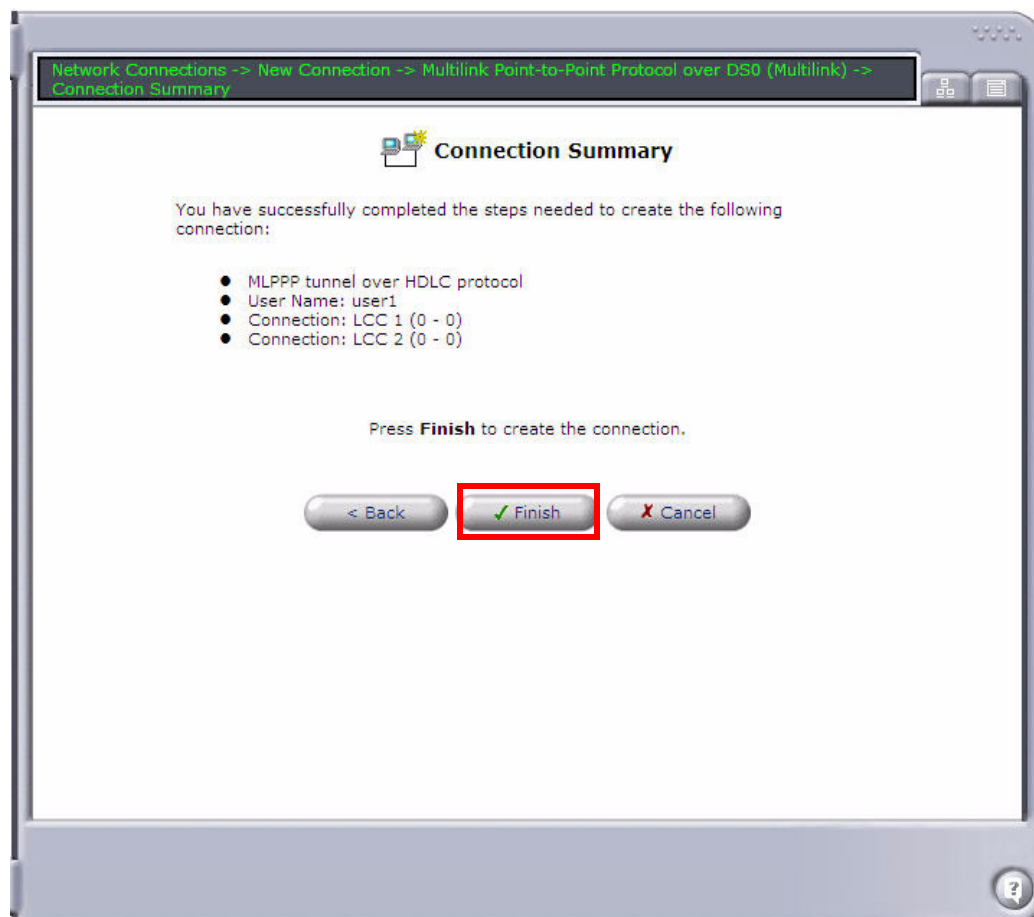
Login Password:

**Connection**

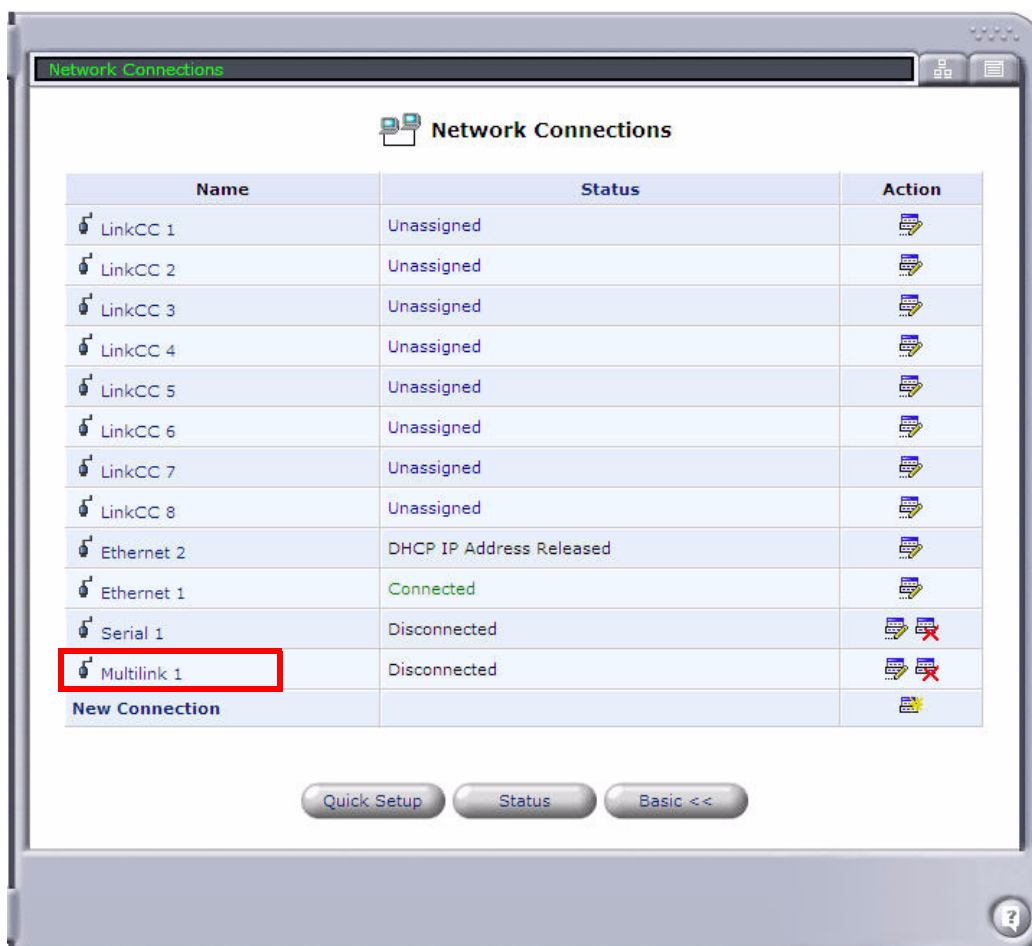
<input checked="" type="checkbox"/>	LCC#1	unassigned
<input checked="" type="checkbox"/>	LCC#2	unassigned
<input type="checkbox"/>	LCC#3	unassigned
<input type="checkbox"/>	LCC#4	unassigned
<input type="checkbox"/>	LCC#5	unassigned
<input type="checkbox"/>	LCC#6	unassigned
<input type="checkbox"/>	LCC#7	unassigned
<input type="checkbox"/>	LCC#8	unassigned

< Back   Next >   X Cancel

7. Select **Next**. A summary of the Multilink connection is displayed. If correct, select **Finish**.



8. The new connection (Multilink 1) appears on the **Network Connections** screen. Select the **Multilink 1** connection.



9. At the **Multilink 1 Properties** screen, select the **Settings** button.

**Note:** You can enter a new name for the interface at the **Multilink 1 Properties** screen, if desired.



10. On the **Configure Multilink 1** screen, specify the following:
- Make sure that **Network** is set to **WAN**.
  - Set **Internet Protocol** to **Use the Following IP Address**. Specify the **IP Address** and select the checkbox next to **Override Subnet Mask**.
  - Set **DNS Static Entries** to **Use the following DNS Server Addresses**. Specify the **Primary DNS Server** and the **Secondary DNS Server**.
  - Make sure that **Routing Mode** is set to **NAPT**.
  - Select the checkbox next to **SIP ALG**.
  - Configure any other settings as necessary for your application.

Network Connections -> Connection Properties -> Configure Connection

### Configure Multilink 1

**General**

Device Name:	Multilink 1
Status:	Disconnected
Schedule Availability:	Always <span>New</span>
Network:	WAN
Connection Type:	Multilink
MTU:	Automatic 1500
Underlying Device:	LinkCC 1 LinkCC 2

**PPP**

☐ QOS Interleaving

Link Fragmentation: 1600

☐ On Demand (will attempt to connect only when packets are sent)

Time Between Reconnect Attempts: 30 Seconds

Restart Timer (Seconds): 3 Seconds

**PPP Authentication**

Login User Name (case sensitive):

Login Password: .....

☐ Support Unencrypted Password (PAP)

☐ Support Challenge Handshake Authentication (CHAP)

☐ Support Microsoft CHAP (MS-CHAP)

☐ Support Microsoft CHAP Version 2 (MS-CHAP v2)

**PPP Encryption**

☐ Require Encryption (Disconnect If Server Declines)

☐ Support Encryption (40 Bit Keys)

☐ Support Maximum Strength Encryption (128 Bit Keys)

**Internet Protocol** Use the Following IP Address

IP Address: 0.0.0.0

☒ Override Subnet Mask: 0.0.0.0

**DNS Static Entries** Use the Following DNS Server Addresses

Primary DNS Server: 0.0.0.0

Secondary DNS Server: 0.0.0.0

**Routing**

Routing Mode: NAPT

☒ SIP ALG

Device Metric: 20

☒ Default Route

## ***Multi-Service Router (MSR) Card***

### ***Configuration***

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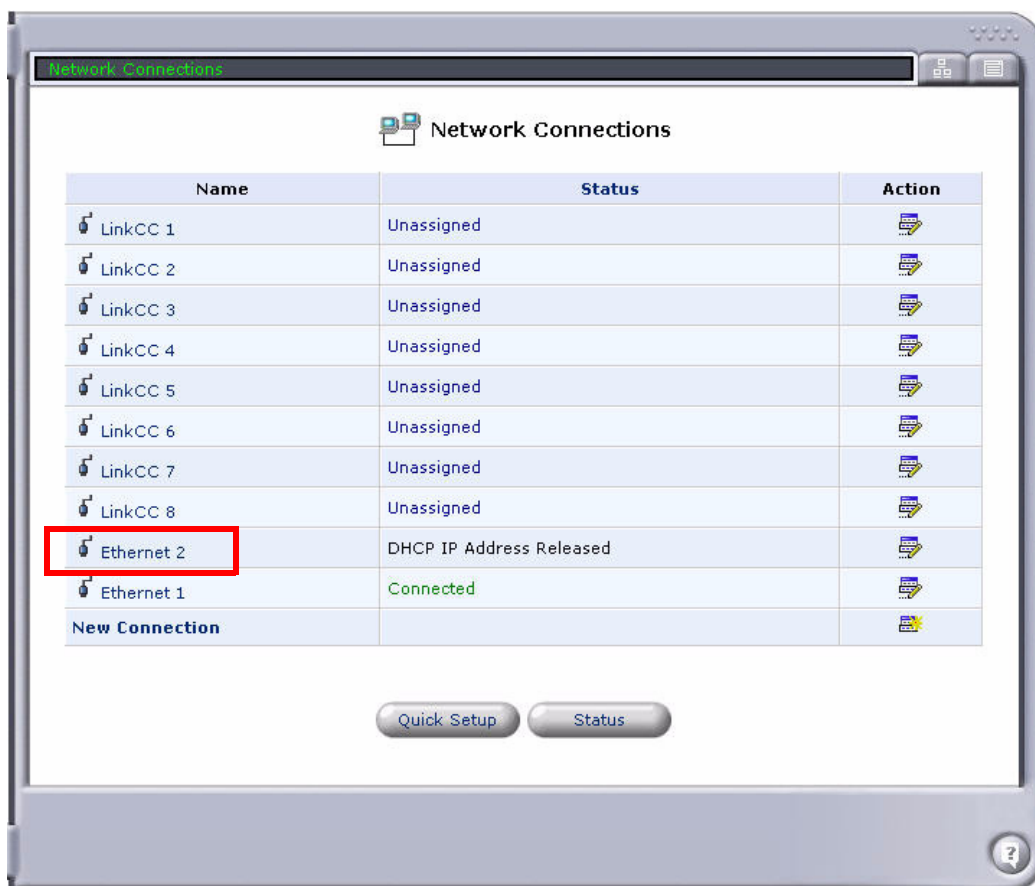
11. Select **OK** to apply the new settings and exit this screen.
12. Select **OK** again to return to the **Network Connections** screen.



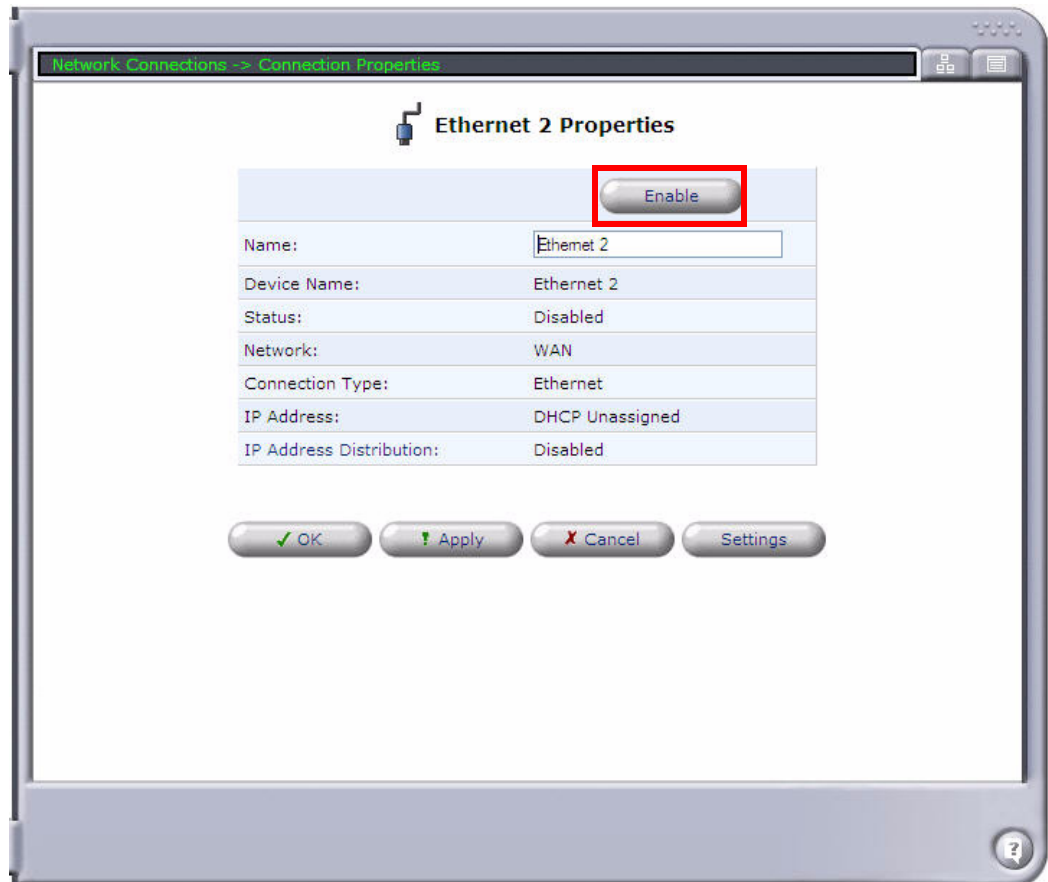
## **Ethernet WAN**

To configure an Ethernet WAN:

1. Select **Network Connections** from the Navigation bar.
2. Select the **Ethernet 2** (WAN Ethernet) connection.



3. If the Ethernet 2 interface is not already up (in service), select the **Enable** button.



4. At the **Ethernet 2 Properties** screen, select the **Settings** button.  
**Note:** You can enter a new name for the interface at the Ethernet 2 Properties screen, if desired.
5. On the **Configure Ethernet 2** screen, specify the following:
- Make sure that **Network** is set to **WAN**.
  - Set **Internet Protocol** to **Use the Following IP Address**, and specify the **IP Address**, **Subnet Mask**, and **Default Gateway**.
  - Under **DNS Static Entries**, specify the **Primary DNS Server** and the **Secondary DNS server**.
  - Make sure that **Routing Mode** is set to **NAPT**.
  - Configure any other settings as necessary for your application.

Network Connections -> Connection Properties -> Configure Connection

### Configure Ethernet 2

<b>General</b>	
Device Name:	Ethernet 2
Status:	DHCP IP Address Released; Link: Down
Schedule Availability:	Always <span>New</span>
Network:	WAN
Connection Type:	Ethernet
MTU:	Automatic 1500
Speed/Duplex:	Auto
<b>Internet Protocol</b> Use the Following IP Address	
IP Address:	0 . 0 . 0 . 0
Subnet Mask:	0 . 0 . 0 . 0
Default Gateway:	0 . 0 . 0 . 0
<b>DNS Static Entries</b>	
Primary DNS Server:	0 . 0 . 0 . 0
Secondary DNS Server:	0 . 0 . 0 . 0
IP Address Distribution	Disabled
<b>Routing</b>	
Routing Mode:	NAPT
<input checked="" type="checkbox"/> SIP ALG	
Device Metric:	40
<input checked="" type="checkbox"/> Default Route	
<input type="checkbox"/> Proxy ARP - Ethernet ARP Proxy	
Routing Protocols:	None
Internet Connection Firewall	<input checked="" type="checkbox"/> Enabled
Additional IP Addresses	<a href="#">New IP Address</a>

OK Apply Cancel

6. Select **OK** to apply the new settings and exit this screen.
7. Select **OK** again to return to the **Network Connections** screen.

### Configuring the MSR as a VoIP (SIP) Gateway

You can configure a VoIP trunk as PRI or CAS. The following example demonstrates how to configure a PRI trunk.

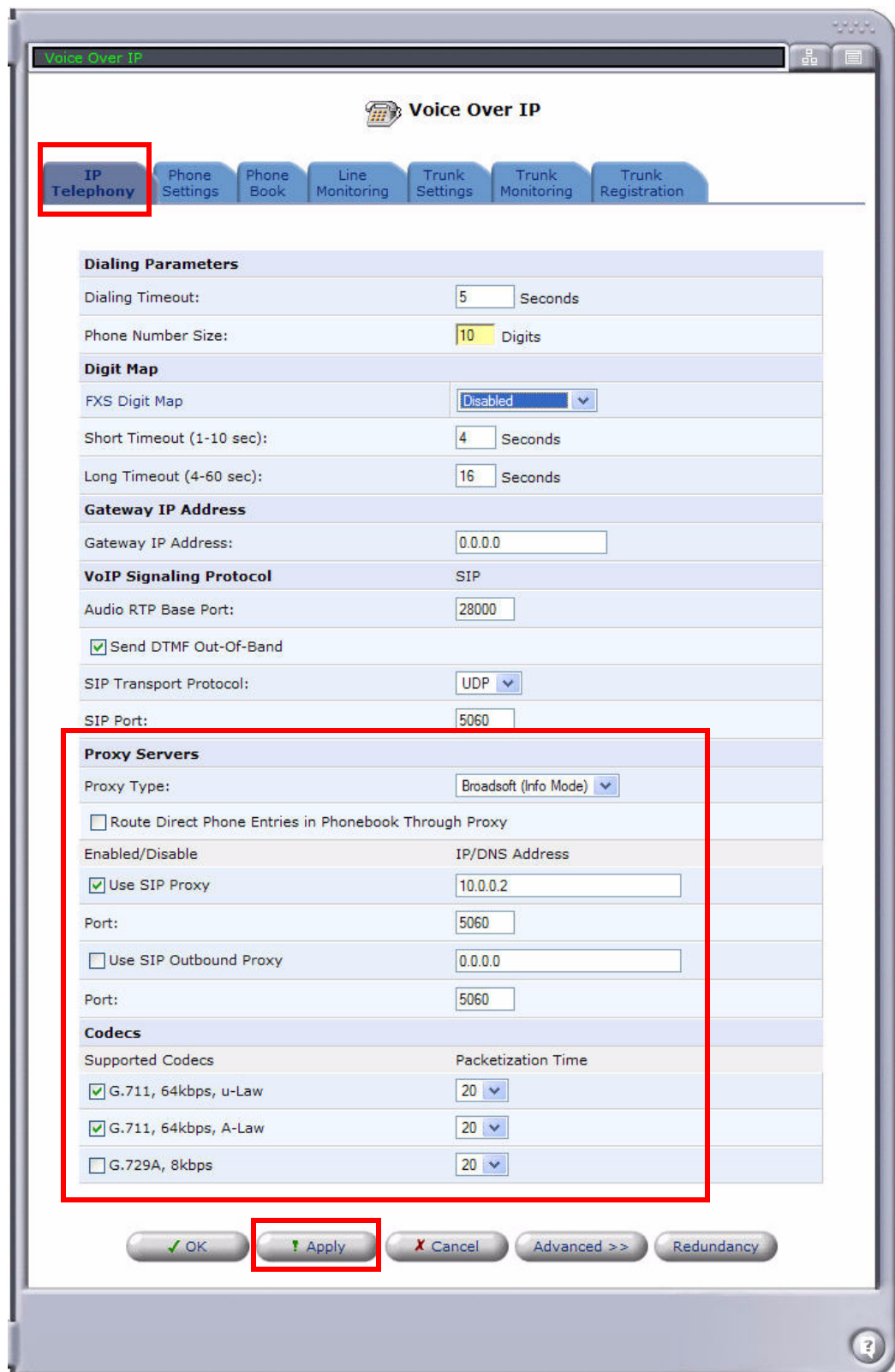
---

**NOTE:** Cross-connects from Adit 600 resources can be made before or after setting up the trunk on the MSR card. (Steps 1 and 2 can be performed at the beginning or end of the configuration process.)

---

To configure the MSR as a SIP gateway:

1. From the Adit 600 controller, use the **connect (msr)** command to configure cross-connects from the PBX-facing DS1 resource(s) on the controller or another card to the MSR's Link Cross-Connect(s). You can cross-connect either 1 or 2 full DS1s to the MSR for a trunk. You must use all 24 DS0s in each DS1, and all of the DS0s must be of type "Data." **Note:** For a PRI trunk, you must use the "pri" option with the **connect (msr)** command.
2. From the Adit 600 controller, use the **connect (msr)** command to cross-connect DS0s from network-facing DS1 resources to MSR lines. The DS0s must be "voice" typed. You can cross-connect DS0s from different DS1s.
3. At the Adit MSR GUI, select **Voice Over IP** from the Navigation bar. On the **IP Telephony** tab, specify the following:
  - Under **Proxy Servers**, select the **Proxy Type**.
  - Select **Use SIP Proxy** and enter the **SIP Proxy IP address**.
  - Under **Codecs**, select the **Supported Codecs**.
4. Select **Apply**, then select **OK** at the confirmation screen.



The image shows a 'Voice Over IP' configuration window. At the top, there is a title bar with 'Voice Over IP' and a close button. Below the title bar is a tabbed interface with the following tabs: 'IP Telephony' (highlighted with a red box), 'Phone Settings', 'Phone Book', 'Line Monitoring', 'Trunk Settings', 'Trunk Monitoring', and 'Trunk Registration'. The 'IP Telephony' tab is active, displaying various configuration sections. The sections include: 'Dialing Parameters' with fields for 'Dialing Timeout' (5 Seconds) and 'Phone Number Size' (10 Digits); 'Digit Map' with a dropdown for 'FXS Digit Map' (Disabled), and fields for 'Short Timeout (1-10 sec):' (4 Seconds) and 'Long Timeout (4-60 sec):' (16 Seconds); 'Gateway IP Address' with a field for 'Gateway IP Address' (0.0.0.0); 'VoIP Signaling Protocol' with a dropdown for 'SIP' and a field for 'Audio RTP Base Port' (28000); a checkbox for 'Send DTMF Out-Of-Band' (checked); a dropdown for 'SIP Transport Protocol' (UDP); and a field for 'SIP Port' (5060). Below these is the 'Proxy Servers' section, which is highlighted with a red box. It includes a dropdown for 'Proxy Type' (Broadsoft (Info Mode)), a checkbox for 'Route Direct Phone Entries in Phonebook Through Proxy' (unchecked), a table with columns 'Enabled/Disable' and 'IP/DNS Address', a checkbox for 'Use SIP Proxy' (checked) with a field for '10.0.0.2', a field for 'Port' (5060), a checkbox for 'Use SIP Outbound Proxy' (unchecked) with a field for '0.0.0.0', and a field for 'Port' (5060). Below the proxy servers is the 'Codecs' section, which includes a table with columns 'Supported Codecs' and 'Packetization Time'. It has three rows: 'G.711, 64kbps, u-Law' (checked) with '20', 'G.711, 64kbps, A-Law' (checked) with '20', and 'G.729A, 8kbps' (unchecked) with '20'. At the bottom of the window are five buttons: 'OK', 'Apply' (highlighted with a red box), 'Cancel', 'Advanced >>', and 'Redundancy'.

**Voice Over IP**

**IP Telephony** Phone Settings Phone Book Line Monitoring Trunk Settings Trunk Monitoring Trunk Registration

**Dialing Parameters**

Dialing Timeout: 5 Seconds

Phone Number Size: 10 Digits

**Digit Map**

FXS Digit Map: Disabled

Short Timeout (1-10 sec): 4 Seconds

Long Timeout (4-60 sec): 16 Seconds

**Gateway IP Address**

Gateway IP Address: 0.0.0.0

**VoIP Signaling Protocol** SIP

Audio RTP Base Port: 28000

☒ Send DTMF Out-Of-Band

SIP Transport Protocol: UDP

SIP Port: 5060

**Proxy Servers**

Proxy Type: Broadsoft (Info Mode)

☐ Route Direct Phone Entries in Phonebook Through Proxy

Enabled/Disable	IP/DNS Address
<input checked="" type="checkbox"/> Use SIP Proxy	10.0.0.2
Port:	5060
<input type="checkbox"/> Use SIP Outbound Proxy	0.0.0.0
Port:	5060

**Codecs**

Supported Codecs	Packetization Time
<input checked="" type="checkbox"/> G.711, 64kbps, u-Law	20
<input checked="" type="checkbox"/> G.711, 64kbps, A-Law	20
<input type="checkbox"/> G.729A, 8kbps	20

OK Apply Cancel Advanced >> Redundancy

5. Select the **Advanced** button. Modify any advanced VoIP settings as needed. Select **Apply**, then select **OK** to exit this screen.

**Advanced VoIP Configuration**

**SIP Interop**

Calling Feature Mode: Local

Privacy Mode: None

Enable PRACK: ☐ Enabled

**SIP Early Media**

Early Media: Auto

**SIP Session Timer**

Mode: Disabled

Refresher: UAC

Timeout: 1800

**IP Packet Priority**

SIP TOS: 0xdc (HEX)

RTP TOS: 0xb8 (HEX)

**FXS Signaling**

Calling Party Disconnect (CPD) Duration: 900

**Features**

Sylantro Centralized Conferencing: ☐ Enabled

**Registration**

Number of Registrations Per Minute (1-300, 0=disabled): 60

Registration Expires Timeout (30-86400 sec): 3600

Registration Window Size (1-304): 10

Retry Timeout (SIP T1) (200-5000 ms): 500

Tries Per Cycle (1-10): 2

Failed Registration Timer (30-86400 sec): 60

**T.38 Fax-Relay**

T.38 Signaling: SDP preferred

T.38 Error Correction Scheme: Redundancy

**T.38 Redundancy**

Ls Redundancy (0-4): 3

Hs Redundancy (0-3): 0

OK Apply Cancel

6. Select the **Phone Settings** tab.  
**Note:** To display all available lines, select **Display All Lines** at the bottom of the screen. To display only cross-connected lines, select **Display Cross Connect Lines**.
7. Select the **Action** icon for Line #1 to edit the line settings.

The screenshot shows the 'Voice Over IP' configuration page. At the top, there is a 'Voice Over IP' title bar. Below it, a navigation bar contains several tabs: 'IP Telephony', 'Phone Settings' (which is selected), 'Phone Book', 'Line Monitoring', 'Trunk Settings', 'Trunk Monitoring', and 'Trunk Registration'. The main content area displays a table with the following columns: 'Line', 'Cross Connect Name', 'User ID', 'Description', and 'Action'.

Line	Cross Connect Name	User ID	Description	Action
<input checked="" type="checkbox"/> 1	2:1:1	0000000001	Line 1	
<input type="checkbox"/> 2	2:1:2	0000000002	Line 2	
<input type="checkbox"/> 3	2:1:3	0000000003	Line 3	
<input type="checkbox"/> 4	2:1:4	0000000004	Line 4	
<input type="checkbox"/> 5	2:1:5	0000000005	Line 5	
<input type="checkbox"/> 6	2:1:6	0000000006	Line 6	
<input type="checkbox"/> 7	2:1:7	0000000007	Line 7	
<input type="checkbox"/> 8	2:1:8	0000000008	Line 8	
<input type="checkbox"/> 9	2:1:9	0000000009	Line 9	
<input type="checkbox"/> 10	2:1:10	0000000010	Line 10	
<input type="checkbox"/> 11	2:1:11	0000000011	Line 11	
<input type="checkbox"/> 12	2:1:12	0000000012	Line 12	
<input type="checkbox"/> 13	2:1:13	0000000013	Line 13	
<input type="checkbox"/> 14	2:1:14	0000000014	Line 14	
<input type="checkbox"/> 15	2:1:15	0000000015	Line 15	
<input type="checkbox"/> 16	2:1:16	0000000016	Line 16	
<input type="checkbox"/> 17	2:1:17	0000000017	Line 17	
<input type="checkbox"/> 18	2:1:18	0000000018	Line 18	
<input type="checkbox"/> 19	2:1:19	0000000019	Line 19	
<input type="checkbox"/> 20	2:1:20	0000000020	Line 20	
<input type="checkbox"/> 21	2:1:21	0000000021	Line 21	
<input type="checkbox"/> 22	2:1:22	0000000022	Line 22	
<input type="checkbox"/> 23	2:1:23	0000000023	Line 23	
<input type="checkbox"/> 24	2:1:24	0000000024	Line 24	



8. Enter the Phone Number in the **User ID** field. Enable the appropriate **Calling Features**, and specify the **Authentication** settings. Configure any other settings as necessary for your application. Select **OK**, then select **OK** again at the confirmation screen.

**Line Settings**

**Identification**

Begin Line Number: 1

End Line Number: 1

User ID: 0000000001

Cross Connect Name: 2:1:1

Description: Line 1

**Packet Processing**

Codec Pref1: G.711u

Codec Pref2: G.711A

Codec Pref3: G.729A

Fax Mode: None

Modem/SuperG3 Fax Mode: None

Silence Suppression: ☐ Enabled

Jitter Buffer: Static

**Voice Processing**

Transmit Gain (-12 through +6): 0

Receive Gain (-12 through +6): 0

Echo Cancellation: ☒ Enabled

**Signaling**

Protocol: LoopStart

Calling Party Disconnect (CPD): ☐ Enabled

**Calling Features**

Call Waiting: ☒ Enabled

Call Waiting Caller ID: ☒ Enabled

Block Outgoing Caller ID: ☐ Enabled

**Authentication**

Authentication: ☒ Enabled

Authentication User ID: 0000000001

Authentication Password: .....

**Logging**

Per Line Logging: ☐ Enabled

**Notes:**



9. Repeat the configuration steps for each line you are setting up.
10. Select the **Line Monitoring** tab. This screen displays the SIP status of the lines.  
**Note:** When a line is successfully registered, the Registration Status column displays "Registered" in green.

**Voice Over IP**

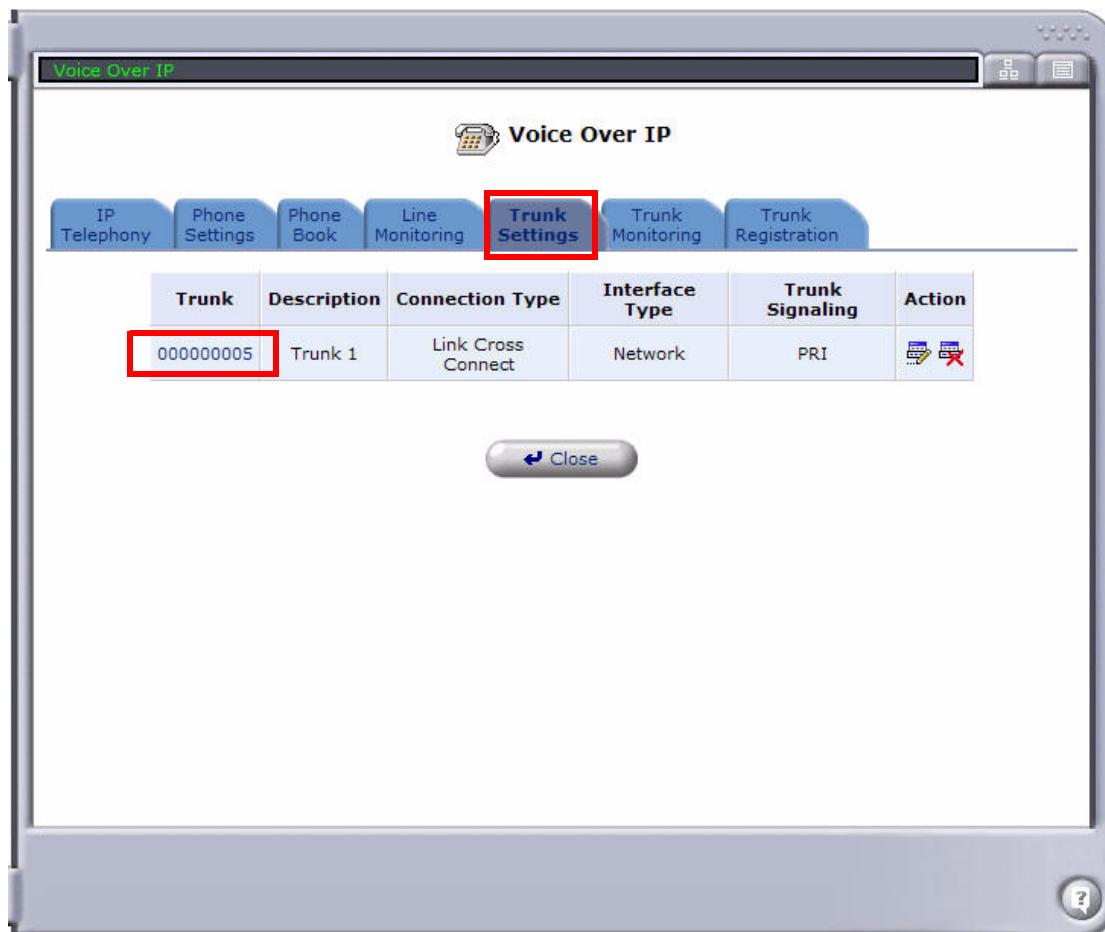
IP Telephony   Phone Settings   Phone Book   **Line Monitoring**   Trunk Settings   Trunk Monitoring   Trunk Registration

Registration Address: 10.0.0.3   SIP Proxy: 10.0.0.2

* Line	User ID	Phone Status	Registration Status	RTP RX/TX/Lost (Packets)	Jitter (ms)	Overflow
✓ 1	3035551111	Idle	Registered			
✓ 2	3035551112	Idle	Registered			
✓ 3	3035551113	Idle	Registered			
✓ 4	3035551114	Idle	Registered			
✓ 5	3035551115	Idle	Registered			
✓ 6	3035551116	Idle	Registered			
✓ 7	3035551117	Idle	Registered			
✓ 8	3035551118	Idle	Registered			
✓ 9	3035551119	Idle	Registered			
✓ 10	3035551110	Idle	Registered			
✓ 11	3035551011	Idle	Registered			
✓ 12	3035551012	Idle	Registered			
✓ 13	3035551013	Idle	Registered			
✓ 14	3035551014	Idle	Registered			
✓ 15	3035551015	Idle	Registered			
✓ 16	3035551016	Idle	Registered			
✓ 17	3035551017	Idle	Registered			
✓ 18	3035551018	Idle	Registered			
✓ 19	3035551019	Idle	Registered			
✓ 20	3035551020	Idle	Registered			
✓ 21	3035551021	Idle	Registered			
✓ 22	3035551022	Idle	Registered			
✓ 23	3035551023	Idle	Registered			
✓ 24	3035551024	Idle	Registered			

Refresh

11. Select the **Trunk Settings** tab, and select the trunk to configure.



12. At the Trunk Settings screen, specify the following:
- Select the LCC **Connections** to use for the trunk. You can select 1 or 2 LCCs from the available connections (designated by a check mark).
  - Set the **Trunk Signaling** type to PRI or CAS. (This example uses PRI.)
  - Select the **Signaling Type**.
  - Select the **Channel Hunt Mode**.
  - Configure any other settings as necessary for your application.

Voice Over IP -> Trunk Settings

### Trunk Settings

**General**

Connection: ☒ LCC 1  
☐ LCC 2  
☐ LCC 3  
☐ LCC 4  
☐ LCC 5  
☐ LCC 6  
☐ LCC 7  
☐ LCC 8

Interface Type: Network

Trunk Signaling: PRI

Signaling Type: PRI-m2

Channel hunt Mode: ascending

PCM Coding: u-law

Terminal Endpoint Identifier: 0

**Identification**

Trunk ID: 000000005

Description: Trunk 1

**Packet Processing**

Codec Pref1: G.711u

Codec Pref2: G.711A

Codec Pref3: G.729A

Fax Mode: None

Modem/SuperG3 Fax Mode: None

Silence Suppression: ☐ Enabled

Jitter Buffer: Static

**Voice Processing**

Transmit Gain (-12 through +6): 0

Receive Gain (-12 through +6): 0

Echo Cancellation: ☒ Enabled

**Calling Features**

Block Outgoing Caller ID: ☐ Enabled

**Authentication**

Authentication: ☐ Enabled

Authentication User ID:

Authentication Password:

**Digit Map**

Per Trunk Digit Map: Disabled

13. At the bottom of the Trunk Settings screen, select **New Entry** to assign dial patterns to the trunk.
- For **Line**, specify a number (1-30) for the dial pattern.
  - For **Destination**, enter the phone number pattern that must be matched for calls to be routed to the trunk. Use ? as a wildcard that can be replaced with any single digit. Use \$ as a wildcard that can be replaced with multiple digits (all digits following the \$ are ignored).
  - For **Strip**, enter the number of digits to remove from the phone number (starting from the left-most digit). Possible usages include stripping off the area code or the 3-digit office prefix.
  - For **Prefix**, enter the digits or name to be added to the phone number (starting from the left-most digit) after the stripping process has been applied.

Voice Over IP -> Trunk Settings -> Call Destination

**Call Destination**

Line:	1
Destination:	303555\$
Strip:	0
Prefix:	

Wildcard Definition:




?: Position-dependant wildcard, can be replaced with any single digit

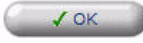


\$: General wildcard, can be replaced with multiple digits. Digits entered after \$ will be ignored.

OK Cancel

14. Select **OK** to save and exit this screen.

**Note:** The dial pattern information will appear at the bottom of the **Trunk Settings** screen.

Line	Destination	Strip	Prefix	Action
1	303555\$	0		  
<a href="#">New Entry</a>				

15. Select **New Entry** to enter additional dial patterns as necessary. You can specify up to 30 dial patterns for incoming SIP calls.
16. When finished entering dial patterns, select **OK**, then select **OK** again at the confirmation screen to return to the **Voice Over IP** screen.
17. If you have not already done so, use the **connect (msr)** command from the Adit 600 controller to configure cross-connects, as described in steps 1 and 2.

18. Select the **Trunk Monitoring** tab to view the status of any calls on the trunk.

The screenshot displays the 'Voice Over IP' configuration window. The 'Trunk Monitoring' tab is selected and highlighted with a red box. The interface includes several data tables and a list of channels.

**Voice Over IP**

Navigation tabs: IP Telephony, Phone Settings, Phone Book, Line Monitoring, Trunk Settings, **Trunk Monitoring**, Trunk Registration.

	LapdStatus	Sabme	Frmr
T1 1	Layer2Active	2	0

	TotalIncomingCalls	CompletedIncomingCalls	TotalOutgoingCalls	CompletedOutgoingCalls
LCC 1	0	0	0	0

*	Channel	Channel Status	RTP RX/TX/Lost (Packets)	Jitter (ms)	Overflow
✓	LCC 1_ 1	inactive			
✓	LCC 1_ 2	inactive			
✓	LCC 1_ 3	inactive			
✓	LCC 1_ 4	inactive			
✓	LCC 1_ 5	inactive			
✓	LCC 1_ 6	inactive			
✓	LCC 1_ 7	inactive			
✓	LCC 1_ 8	inactive			
✓	LCC 1_ 9	inactive			
✓	LCC 1_10	inactive			
✓	LCC 1_11	inactive			
✓	LCC 1_12	inactive			
✓	LCC 1_13	inactive			
✓	LCC 1_14	inactive			
✓	LCC 1_15	inactive			
✓	LCC 1_16	inactive			
✓	LCC 1_17	inactive			
✓	LCC 1_18	inactive			
✓	LCC 1_19	inactive			
✓	LCC 1_20	inactive			
✓	LCC 1_21	inactive			
✓	LCC 1_22	inactive			
✓	LCC 1_23	inactive			

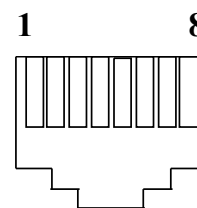
[Refresh](#)

## **Connector Pinouts**

### **10Base-T Ethernet**

The pinouts for the RJ-45 connectors on the front of the card are as follows:

Pin	Name	Description
1	Receive +	Receive from network
2	Receive -	Receive from network
3	Transmit +	Transmit to network
4-5	N/C	Not connected
6	Transmit -	Transmit to network
7-8	N/C	Not connected



---

**NOTE:** These ports use a "hub" pinout. Use a straight-through cable to connect a PC.

---

## LEDs

The following chart describes the MSR card's LEDs.



LED	State	Description
CRD	Off	Loss of power
	Green	No current alarms
	Red	Alarm state active. See alarm log for cause.
	Red Flashing	Self-test or boot in process
	Yellow Flashing	Card is saving data to flash RAM, do not power down.
VOIP	Off	No SIP proxy, or registration attempts for all lines have succeeded, but no calls are active.
	Green	Active VoIP call(s)
	Red	Inability to reach the SIP proxy, or negative response to register attempts from all lines.
	Yellow	Register attempts from some lines have succeeded, but not for all lines.
ETH1 and ETH2 Top LED	Off	10 Mbit/sec, down, or not connected
	Green	100 Mbit/sec
ETH1 and ETH2 Bottom LED	Off	Link down
	Green	Link up
	Flashing Green	Traffic on link
	Yellow	Collision status



# CHAPTER 22

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## *RS-232 Card*

### In this Chapter



- Overview
  - RS-232 Service Card (hardened)
  - Features
- Features
- Technical Specifications
- Card Configuration
  - CLI Commands
- LEDs
- Connector Pinouts
  - Connector Adapter
  - DA-26S Connector Pin Assignments

## Overview

---

**NOTE:** This card is no longer manufactured.

---

### ***RS-232 Service Card (hardened)***

The Dual RS-232 Service Card allows service providers to provision connectivity to RS-232 serial synchronous Data Terminal Equipment (DTE) devices commonly deployed in cell sites and customer locations. RS-232 service connections supporting frame relay or transparent bit streams can be configured over one or more T1 access lines to deliver 2.4, 4.8, 9.6, 56 and 64 Kbps bandwidths to frame relay access devices, controllers, computers and data routing equipment. This Service Card has been specifically hardened to stand up to the extreme environmental conditions commonly associated with cell sites, outside cabinets, and central office deployments.

The Dual RS-232 Service Card provides scalable, data service capacity to grow as bandwidth requirements increase. Up to six Dual RS-232 Service Cards can be equipped in an Adit 600 chassis, providing up to 12 RS-232 connections from any network T1 connected to the Adit 600 platform. Integrated Digital Cross-connect System (DCS) capability supports service grooming and full drop-and-insert functions not available in traditional CSU/DSU offerings.

RS-232 ports on each card can be mapped to a DS0 of a T1 network and may operate simultaneously at any supported speed (i.e., 2.4, 4.8, 9.6, 56 and 64 Kbps). Clocking is derived from the Adit 600 and the source connected to it. To allow support for a wide range of data networking applications, clocking is supplied to the connected DTE. Additionally, each RS-232 port supports loopback control via the Command Line Interface (CLI) to troubleshoot service from the network or the end device connected to the RS-232 electrical interface.

The Dual RS-232 Service Card can be locally or remotely managed as a component of the Adit 600 platform. The card can be configured using a CLI.

## Features

- Provides common RS-232 data rates up to 64 Kbps on each port
- Supports full non-blocking cross-connection of all timeslots to any T1 access line
- Enables up to 12 RS-232 ports to be equipped in a single Adit 600 platform
- Supports adaptation and transport over TDM facilities
- Integral loopback diagnostic features

## **Technical Specifications**

### **Controller Software Required**

- T1 Controller: Release 5.0 or higher is required
- E1 Controller: The RS-232 service card is not supported by the E1 Controller card

### **Service Interface**

- Two RS-232 interfaces:
  - Configured as DCE
  - Configurable for 2.4, 4.8, 9.6, 56 or 64 Kbps
  - Two sub-miniature DB-26 female connectors
  - DB-26 to RJ-45 jack (RS-232) adapter cables available

### **Network Interface**

- T1, each RS-232 port is mapped to an individual DS0
- DS0A data format

### **Clocking**

- Derived from Adit 600 clock source
- Sources clock to the DTE device

### **Testing and Diagnostics**

- CLI controlled loopbacks are supported

### **Power**

- 2 W maximum

### **Accessories**

DB-26 to RJ-45 jack adapter cables are required to interface DTE with the card.

- SCSI-26 male to RJ-45 jack adapter cable to interface DTE with the Dual RS-232 card.
- SCSI-26 to RJ-45 jack adapter cable P/N 005-0166

### **Regulatory Approvals**

See *Appendix A, Regulatory Approvals* for information on the RS-232 Service card.

### **Physical**

- Dimensions: 3.5 in. (H) x 0.75 in. (W) x 11.25 in. (D)  
8.9 cm (H) x 1.9 cm (W) x 28.6 cm (D)
- Weight: 4.6 oz. (0.13 kg)

For information on Adit 600 Environment required, see *Installation Environment* on page 2-2.

## Card Configuration

The RS-232 Service cards can be configured, using the Command Line Interface (CLI).

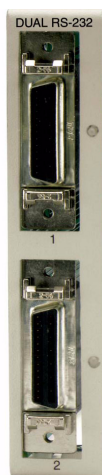
### CLI Commands

The following commands are used to configure the RS-232 Service card. For detailed information on these commands, see *Chapter 5, CLI Commands*.

- *connect*  
Creates two-way connections between channels.
- *disconnect*  
Removes a connection created by the connect command.
- *set (rs232)*  
Setup of channels of a RS-232 card (baud rate, clear to send, data carrier detect, equipment, line, request to send).
- *show (rs232)*  
Displays the current settings for RS-232 (clear to send, request to send, data carrier detect, baud rate, loopback)
- *status (rs232)*  
Displays the current status of the specified RS-232 (clear to send, request to send, data carrier detect).

## LEDs

Each RS-232 port has its own LED, as shown in the table below.



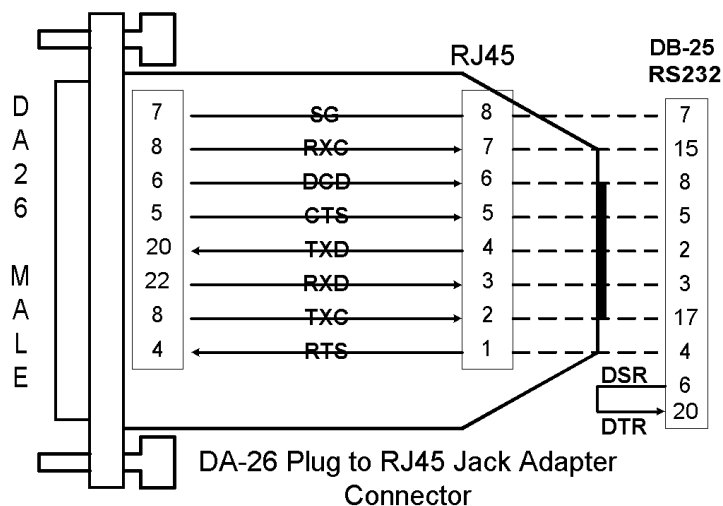
State	Description
Off	No T1 Assignment
Green	Normal (CD/RTS) Active
Red	CD inactive (T1-side failure)
Yellow	RTS inactive (equipment-side failure)
Flashing Yellow	Loopback toward T1 or equipment loop test
Flashing Green	Loopback toward equipment or network loop test

## Connector Pinouts

An adapter cable or connector is needed to provide a standard RJ-45 jack from the front panel DB-26 connector. The RJ-45 shall be pinned-out as follows (matches DTS product interface) to minimize the customer transition from DTS FlexT to Adit.

RJ-45 Pin No	Signal	Direction
1	RTS	From DTE
2	TXC	To DTE
3	RXD	To DTE
4	TXD	From DTE
5	CTS	To DTE
6	DCD	To DTE
7	RXC	To DTE
8	Signal Ground	

## Connector Adapter



## DA-26S Connector Pin Assignments

Pin No	Signal	Direction	Pin No	Signal	Direction
1	Not Used		14	Not Used	
2	Not Used		15	Not Used	
3	Not Used		16	Not Used	
4	RTS	Input	17	Not Used	
5	CTS	Output	18	Not Used	
6	DCD	Output	19	Not Used	
7	SIG GND		20	TXD	Input
8	TXC/RXC	Output	21	Not Used	
9	Not Used		22	RXD	Output
10	Not Used		23	Not Used	
11	Not Used		24	Not Used	
12	Not Used		25	Not Used	
13	Not Used		26	Not Used	

# CHAPTER 23

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## *V.35 and V.35/V.54 Cards*

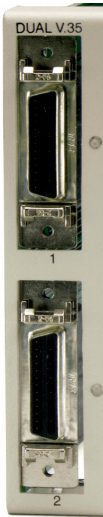
### In this Chapter



- Overview
  - V.35 Service Card
  - V.35/54 and Hardened V.35/54 Service Cards
- Features
- Technical Specifications
- Card Configuration
  - CLI Commands
- LEDs
- Cables
- Connector Pinouts
  - V.35 DCE (DB-26)

## Overview

**NOTE:** The V.35 card is no longer manufactured.



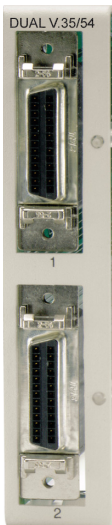
### V.35 Service Card

The V.35 Service card enables service providers and enterprise network managers to provision connectivity to high-speed serial synchronous Data Terminal Equipment (DTE) devices such as routers, Frame Relay Access Devices (FRAD) and video conferencing equipment.

The V.35 Service card provides scalable high-speed data service capacity to grow with user needs. Up to six V.35 cards can be inserted into any slot of the Adit 600 Customer Service Terminal, providing up to 12 fractional T1 V.35 connections from two T1 network connections. Two Adit Quad T1 Network Access/Drop-and-Insert cards allow eight T1s with full T1 CSU/DSU functionality to be terminated to eight V.35 ports in a single Adit 600 chassis. The Adit's digital cross-connect functionality offers service grooming, T1 drop-and-insert, and voice access integration that are not available in traditional CSU/DSU offerings.

Each V.35 port supports any n x 56/64 Kbps rate up to 1.536 Mbps. Both ports may operate simultaneously at any supported speed. Flexible clocking allows loop timing from any T1 line and provide system clocking to the connected DTE, supporting a wide range of data networking applications.

Local and remote management options for the V.35 cards are available through the Adit 600 Controller. The cards can be locally configured and managed using either the CLI. Remote management of the V.35 card is accomplished either through the Access Navigator over the Facility Data Link (FDL) or an in-band dedicated DS0.



### V.35/54 and Hardened V.35/54 Service Cards

Additionally, each V.35 port supports V.54 loopback test capabilities. This feature enables V.54 loopback pattern recognition, generation and timing control to troubleshoot service from the network or the end device to the V.35 electrical interface. Four standard Bit Error Rate Test (BERT) patterns and an error counter are provided for testing.



## **Features**

- Provides any n x 56/64 Kbps data rate up to 1.536 Mbps on each port
- Supports full non-blocking cross-connection of all timeslots to any T1 access line
- Enables up to 12 V.35 ports may be equipped in a single Adit 600 chassis
- Allows a total of 24 V.35 ports to be equipped in two Adit 600 chassis, occupying only two rack units of equipment space in a 19-inch rack
- Includes integration of T1 CSU/DSU functionality and remote management capabilities
- Supports adaptation and transport over TDM facilities
- Integrates frame relay or private line V.35 services with voice and Internet access over T1 lines

### **Additional V.54 Features**

- V.54 Loop Test capability

## **Technical Specifications**

### **Controller Software Required**

#### **T1 Controller**

- Release 1.2.2 or higher is required for the V.35 card
- Release 3.0 or higher is required for the V.35/54 and the hardened V.35/54 service cards

#### **E1 Controller**

- Release 3.2 through 9.4 is required

---

**NOTE:** E1 is not supported in this release of the Adit 600 Controller. It will be supported in a future release.

---

### **Service Interface**

- Two V.35 interfaces:
  - DCE to DTE pinout
  - Two sub-miniature DB-26 connectors
  - Adapters outlined below

### **Network Interface**

- T1 TDM

### **Clocking**

- Looped-timed from any T1 or ISDN BRI card installed
- Sources clock to the DTE device

### **Testing and Diagnostics (V.35/54 card)**

- Addressable V.54 loopup and loopdown (127-code) pattern generation/detection
- 2047,  $2^{15-1}$ ,  $2^{20-1}$  and QRSS Test Patterns with error counter

### **Power**

- 2 W maximum

### **Regulatory Approvals**

See *Appendix A, Regulatory Approvals* for information on the V.35 Service cards.

### **Physical**

- Dimensions: 3.5 in. (H) x 0.75 in. (W) x 11.25 in. (D)  
8.9 cm (H) x 1.9 cm (W) x 28.6 cm (D)
- Weight: 4.6 oz. (0.13 kg)

For information on Adit 600 Environment required, see *Installation Environment on page 2-2*.

### **Accessories**

Sub-miniature DB-26 to Winchester adapter cables are required to interface DTE with the Dual V.35 card. Gender refers to the Winchester connector. One cable per port.

- P/N 005-0008 V.35 Male 10 Ft. (3.05 m) cable
- P/N 005-0009 V.35 Male 25 Ft. (7.62 m) cable
- P/N 005-0010 V.35 Male 50 Ft. (15.24 m) cable
- P/N 005-0011 V.35 Female 10 Ft. (3.05 m) cable

## **Card Configuration**

The V.35 Service cards can be configured using the Command Line Interface (CLI).

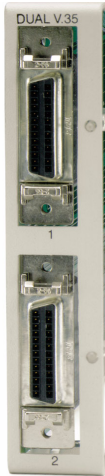
### **CLI Commands**

The following commands are used to configure the V.35 Service cards. For detailed information on these commands, see *Chapter 5, CLI Commands*.

- *connect*  
Creates two-way connections between channels.
- *disconnect*  
Removes a connection created by the connect command.
- *set (v35)*  
Setup of channels of a V.35 card (clock, clear to send, data, equipment, line, receive clock invert, speed, transmit clock invert).
- *set (v54)*  
Set the V.54 loopback test parameters.
- *show (v35)*  
Displays the current settings for V.35 (clear to send, timing, Rx clock inversion, Tx clock inversion, data inversion, data speed, data rate, loopback)
- *show (v54)*  
Displays the current settings for V.54 (CTS, timing, Rx clock inversion, Tx clock inversion, data inversion, data speed, data rate, Rx LB, Rx Addr, test address, Tx Prep count, Rx Prep count, test pattern, ignore ACK, loopback)
- *status (v35)*  
Displays the current status of the specified V.35 (data terminal ready, request to send, data carrier detect, clear to send, data set ready).
- *status (v54)*  
Displays the current near-end line status of the specified V.54 (DCD, CTS, DSR, RTS, DTR, BERT).

## LEDs

Each V.35 port has its own LED, as shown in the table below.



State	Description
Off	No T1 Assignment
Green	Normal (CD/RTS) Active
Red	CD inactive (T1-side failure)
Yellow	RTS inactive (equipment-side failure)
Flashing Yellow	Loopback toward T1 or equipment loop test
Flashing Green	Loopback toward equipment or network loop test

## Cables

Depending on your application, you will need to purchase one or more of the available Force10 Networks V.35 data cables:

Part #	Description	Notes
005-0014	V.35 Female 10-foot cable	These cables are used to provide the V.35 DCE interface on a male connector to typical DTE applications. Order one cable per V.35 port.
005-0068	V.35 Female 25-foot cable	
005-0069	V.35 Female 50-foot cable	
005-0010	V.35 Male 50-foot cable	V.35 data cables with male connector for connecting a router with a female V.35 Winchester connector or other data equipment to a Adit 600 V.35 data port (sub-miniature DB-26). Order one cable per V.35 port.
005-0009	V.35 Male 25-foot cable	
005-0008	V.35 Male 10-foot cable	
005-0189	DB-25 V.35 Female 50-foot cable	These cables are used to provide a DB-25 DCE V.35 female interface for connection to a male DB-25 DTE V.35 interface. Order one per port.
005-0188	DB-25 V.35 Female 25-foot cable	
005-0187	DB-25 V.35 Female 10-foot cable	
005-0186	DB-25 V.35 Female 6-foot cable	

These cables can be purchased at a licensed Force10 Networks distributor.

## Connector Pinouts

### V.35 DCE (DB-26)

The V.35 DCE data port connection is made at the sub-miniature DB-26 connector on the Adit 600 using the 10-foot, 25-foot, or 50-foot Force10 Networks DTE V.35 cable equipped with a sub-miniature DB-26 connector and a 34-pin Winchester connector.

This cable is used to connect the Adit 600 V.35 DCE data ports to synchronous V.35 DTE data sources up to 1.536 Mbps, all rates (1-24) Nx56 or Nx64 channel-rate progression.

The Force10 Networks V.35 data cables are built according to the pin assignments listed below:

Sub-miniature DB-26	Signal	Winchester 34-pin (female)	Paired Signals
1 (+ Shield)	← Protective Ground →	A	]
7	← Signal Ground →	B	
2	← Transmit Data A —	P	]
14	← Transmit Data B —	S	
3	— Receive Data A →	R	]
16	— Receive Data B →	T	
4	← RTS —	C	]
20	← DTR —	H	
5	— CTS →	D	]
6	— DSR →	E	
12	— Test Mode →	K	]
8	— CD (RLSD) →	F	
11	← External Clock A —	U	]
24	← External Clock B —	W	
Sub-miniature DB-26	Signal	Winchester 34-pin (female)	Paired Signals
10	— Xmit Clock A →	Y	]
23	— Xmit Clock B →	AA	
15	— Receive Clock A →	V	]
17	— Receive Clock B →	X	
22	← Local Loopback —	J	]
25	← Remote Loopback —	BB	
9, 13, 18	Open Pins/No Contact	L, N, NN	
19, 21, 26	Open Pins/No Contact		

## ***V.35 and V.35/V.54 Cards***

### ***Connector Pinouts***

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# CHAPTER 24

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## ***Maintenance***

### **In this Chapter**

- Software Upgrade
  - Minimum Version Levels
  - Determining Boot Code Software Level
  - Upgrading System and Router Software via TFTP
  - Upgrading System and Router Software via TFTP using Proxy
  - Upgrading Software Levels via X-Modem
- Backup Adit 600 Configuration
  - Save Controller Configuration
  - Load Controller Configuration
- Replace Controller Card
- Hot Swap Service Card

## Software Upgrade

### Minimum Version Levels

First confirm the Adit 600 has the minimum BootCode Version (1.04). Contact Force10 Networks for a required hardware upgrade, if below this level.

### Determining Boot Code Software Level

1. Start a CLI session on the Adit 600 using a terminal emulation program or via Telnet.
2. After login, type **status equipment** at the CLI prompt.  
A message similar to the following should appear:

```
> status equipment
BootCode Version: 1.27
```

	<u>CardType</u>	<u>Status</u>	<u>SW Vers</u>	<u>CLEI</u>
SLOT A	T1x2	Present	7.0.2	SIC3DH0CAA
SLOT 1	FXOx8	Present	1.12	SIIXPV0DAA
SLOT 2	FXSx8	Present	1.09	SIC3GJ0CAA
SLOT 3	T1E1x4H	Present	2.01	NOT_AVAIL
SLOT 4	CMGx1	Present	2.11	SIIX270DAA
SLOT 5	RTRx1	Present	1.60	SIASS0BAA
SLOT 6	V35x2	Present		SIC3HK0CAA

### Upgrading System and Router Software via TFTP

**IMPORTANT:** Before upgrading a Controller, see the **load** command on page 5-60 for important information about Controller memory size and "large" vs. "small" upgrade files.

To perform the upgrade, you must have a TFTP server utility running on your system. You can use any TFTP server utility you wish. One example is the program "TFTPD32" which can be downloaded free-of-charge at [tftpd32.jounin.net/tftpd32.html](http://tftpd32.jounin.net/tftpd32.html).

1. Start your TFTP server utility.
2. Login to the Adit 600, using a terminal emulation program or via Telnet.
3. Enter: **load [slot] tftp {ip-addr} "file-name"**  
where **[slot]** = the slot number of a router card. If no slot number is listed, the file is loaded to the Controller.  
**{ip-addr}** = the IP address of the host device holding the downloadable software  
**"file-name"** = the software file name, including path, if needed. Enclosed in quotes. Example: **"c:\tn\_sw\tdm4\_0\_z\_all.mgm"**.

This example loads **tdm4\_0\_z\_all.mgm** via tftp from the C drive and **tn\_sw** subdirectory. The path information must be provided.



4. After download, the program will be loaded from RAM into the flash memory and the system will automatically restart. Wait until the boot menu prompt is displayed before powering down the unit. If the download fails and no prompt is seen after a full minute, cycle power and repeat the process.
5. Re-establish communication with the CLI using a terminal emulation program or Telnet. Check all configurations and system operation.

## **Upgrading System and Router Software via TFTP using Proxy**

**IMPORTANT:** Before upgrading a Controller, see the **load** command on page 5-60 for important information about Controller memory size and "large" vs. "small" upgrade files.

Required:

- Router Service card (IP, CMG or TSR) release 1.32 or higher
- Controller software 3.2 or higher
- Ethernet cable connected to port on front of Router card

To perform the upgrade, you must have a TFTP server utility running on your system. You can use any TFTP server utility you wish. One example is the program "TFTPD32" which can be downloaded free-of-charge at [tftpd32.jounin.net/tftpd32.html](http://tftpd32.jounin.net/tftpd32.html).

1. Set up the Proxy with the following commands

```
set ethernet ip address {ip-addr} [mask]
set {rtr_lan-addr} ip address {ip-addr} [mask]
set {rtr_card-addr} proxy enable {ip-addr} [mask]
set ip gateway {ip-addr}
```

Example: (example with router in slot 3)

```
set ethernet ip address 10.0.0.1 255.0.0.0
set 3:1 ip address 192.168.100.1/24
set 3 proxy enable 192.168.100.80/24
set ip gateway 192.168.100.80
```

---

**NOTE:** See *Chapter 5, CLI Commands* for more information on these commands.

---

2. Start your TFTP server utility.
3. Login to the Adit 600 using the Proxy IP address, (example: 192.168.100.80) using a terminal emulation program or via Telnet.
4. Enter: **load [slot] tftp {ip-addr} "file-name"**  
where [slot] = the slot number of a router card. If no slot number is listed, the file is loaded to the Controller.  
{ip-addr} = the IP address of the host device holding the downloadable software  
"file-name" = the software file name, including path, if needed. Enclosed in quotes. Example:  
"c:\tn\_sw\tdm4\_0\_z\_all.mgm".

This example loads **tdm4\_0\_z\_all.mgm** via tftp from the C drive and **tn\_sw** subdirectory. The path information must be provided.

5. After download, the program will be loaded from RAM into the flash memory and the system will automatically restart. Wait until the boot menu prompt is displayed before powering down the unit. If the download fails and no prompt is seen after a full minute, cycle power and repeat the process.
6. Re-establish communication with the CLI using a terminal emulation program or Telnet. Check all configurations and system operation.

## **Upgrading Software Levels via X-Modem**

1. Login to the Adit 600.
2. Enter: **load xmodem** to download the application from the binary file. This will start the system looking for an xmodem download. The Adit 600 will prompt you to send the file. Use one of the following methods:

### **Using HyperTerminal**

- Pull down the **Transfer** menu
- Select **Send File** Provide the filename (and path if required), confirm that the xmodem protocol is used for the transfer, and start the download with the **Send** button
- A window will show the progress of the download.

### **Using Procomm**

- Pull down the **File** menu
- Select **Connection Directory**
- Under the **Data** tab, use the **Basic Options** button to confirm that the xmodem protocol is used for file transfers
- Pull down the **Data** menu, select **Send File**, provide the filename, and start the download

### **Using Another Terminal Emulation Program**

When using another terminal emulation program, confirm the use of xmodem protocol at 9600 baud, provide filename (and path) and initiate the download.

3. The binary file name is usually in the format: Adit.pkt. At 9600 baud, the file transfer will take approximately 20 minutes.
4. After download, the program will be loaded from RAM into the flash memory and the system will automatically restart. Wait until the boot menu prompt is displayed before powering down the unit. If the download fails and no prompt is seen after a full minute, cycle power and repeat the process.
5. Re-establish communication with the CLI using a terminal emulation program. Check all configurations and system operation.

## **Backup Adit 600 Configuration**

A text file from the current configuration can be generated to reload in the event the configuration has been lost due to card or software problems. The download of the file, generated by the **print config** command, can be done by direct connect to the RS-232 port or via Telnet. The upload of the file from the PC back to the Adit 600 can only be done via direct RS-232 connection. This is because the Adit 600 will be at factory default and an IP address is not assigned to the Adit 600.

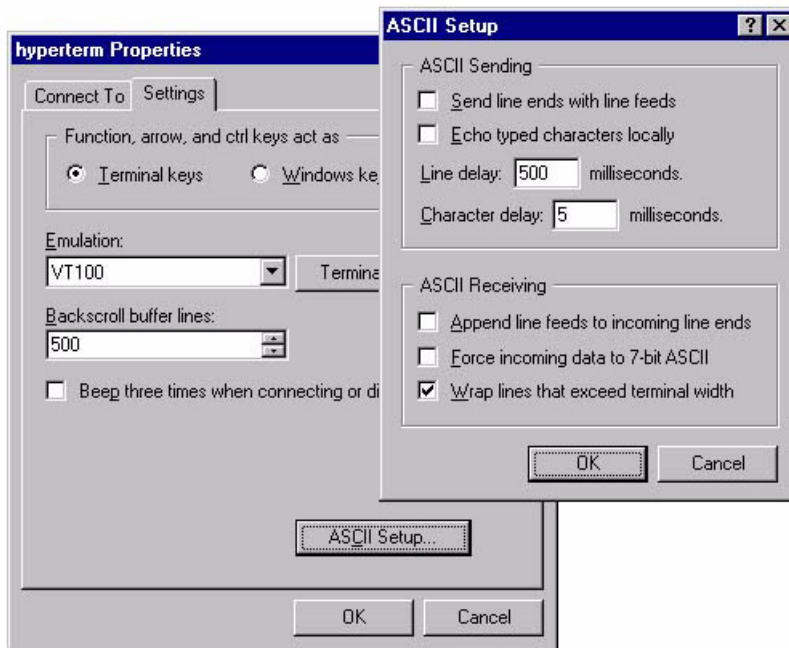
### **Save Controller Configuration**

The following example is shown with a HyperTerm session, with Telnet selections in parenthesis, other programs may be used and the process is similar, however the menu selections may be different.

1. Start a HyperTerm session to an Adit 600.
2. Type the CLI command **print config** and **do not** hit [ENTER].
3. Type select **Transfer/Capture Text** from the drop-down menu.  
(Telnet - **Terminal/Start Logging**)
4. Name the file, select **OK**.
5. Return to the CLI command **print config** and hit [ENTER].  
This process will exclude the **print config** command itself, from the configuration file you are creating.
6. (Telnet - Select **Terminal/Stop Logging**).
7. Save configuration file as a .txt file, if necessary (Telnet will create a .log file, which will need to be "saved as" a .txt file).

## **Load Controller Configuration**

1. Open HyperTerm session with the Adit 600 unit.
2. In HyperTerm, select **File/Properties/Settings/ASCII Setup**.



3. Set the **Line delay to 500 ms** and the **Character delay to 5 ms**.
4. Select **OK** to save ASCII Setup and **OK** to save HyperTerm Properties.
5. Select **Transfer/Send Text File**.
6. Select .txt file from previous steps.
7. Click **Open**.
8. Configuration will load.

## ***Replace Controller Card***

---

**WARNING!** SERVICE WILL BE INTERRUPTED WITH THE PROCESS OF CHANGING OUT A CONTROLLER CARD.

---

It is not necessary to power down a unit to replace a Controller, however if you would like to load the configuration file to the new Controller card you **must** backup the configuration file before this process.

1. Backup Controller Configuration, see *Save Controller Configuration on page 24-5*.
2. Remove Controller card, gently slide the Service card straight out of the slot.
3. Replace Controller card, gently slide the new Service card into the empty slot.
4. Ensure that the new card is seated firmly into the connector at the back of the unit.
5. Load Controller Configuration, see *Load Controller Configuration on page 24-6*

## ***Hot Swap Service Card***

To Hot-Swap (replace) a service card while the unit is powered on, follow the steps below:

1. Gently slide the Service card straight out of the slot.
2. Gently slide the new Service card into the empty slot.
3. Ensure that the new card is fastened securely into the connector at the back of the unit.



# APPENDIX **A**

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## ***Regulatory Approvals***

### **In this Appendix**

This appendix contains a chart of all the components of the Adit 600 and their Regulatory Approvals.

## Regulatory Approvals

Adit 600 Chassis	USA					Canada			European Union/CE							Australia/New Zealand				Brazil
	UL60950	FCC Part 15, Class A	FCC Part 68	NEBS Level 3 cert, type 2 & 4 equip	NEBS Level 3 cert, type 3 equip	CSA C22.2 No. 60950-00	ICES-003 Class A	CS-03	EN60950	EN61000-3-2, Harmonics	EN61000-3-3, Flicker	EN55022, Class A	EN55024, Immunity	EN 300 386 V1.3.1, CPE	CTR 12 and 13	AS/NZS 60950	AS/NZS CISPR22, Class A	C-Tick (Datacom)	A-Tick	Anatel Certification
Adit 600 Chassis	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
T1 Controller *	X	X	X			X	X	X												
E1 Controller	X	X				X	X		X	X	X	X	X	X	X	X	X	X	X	X
4-Wire E&M/TO	X	X				X	X													
FXO	X	X	X	X		X	X	X												X
E1-FXS	X	X			X	X	X		X	X	X	X	X	X		X	X	X		
FXS (4G)	X	X		X		X	X													
FXS 5G	X	X			X	X	X		X	X	X	X	X	X		X	X	X		
FXS 8A	X	X		X		X	X													
FXS 8B	X	X	X			X	X		X	X	X	X	X	X		X	X	X	X	
FXS 8C	X	X	X			X	X		X	X	X	X	X	X		X	X	X	X	
FXS 8D	X	X	X			X	X													
FXS PS	X	X				X	X													
ISDN BRI	X	X		X		X	X													
OCU-DP	X	X				X	X													
P-Phone	X	X				X	X													
Quad DS1 ADPCM	X	X	X			X	X	X												
Quad DS1/E1	X	X	X			X	X	X	X	X	X	X	X	X	X					X
Quad DS1/E1 (E1 mode)	X	X	X			X	X	X	X	X	X	X	X	X	X	X	X	X		X
Quad E1	X	X				X	X													
Quad T1	X	X	X	X		X	X	X												
RS-232	X	X				X	X													
V.35	X	X		X		X	X													
V.35/54	X	X		X		X	X													
V.35/54 (hardened)	X	X				X	X		X	X	X	X	X	X		X	X	X		
IP Router	X	X		X		X	X													
CMG Router	X	X				X	X		X	X	X	X	X	X		X	X	X		
CMG-01 Router	X	X				X	X		X	X	X	X	X	X		X	X	X		
CMG-02 Router	X	X				X	X		X	X	X	X	X	X		X	X	X		
Multi-Service Router (MSR)	X	X				X	X													
TSR	X	X				X	X													
115VAC P S	X	X		X		X	X		X	X	X	X	X							X
24VDC P S	X	X		X		X	X									X	X	X		
230VAC P S									X	X	X	X	X	X		X	X	X	X	X
	X	Meets this compliance								Designed to meet NEBs (not Certified)										
		Does not meet this compliance/non-applicable								Non-telecom network connected cards to allow use for Anatel configurations										

\* A T1 Controller purchased with Release 9.1 is designed to meet NEBs, but is not currently certified.

The T1 Controller with 9.0 or earlier is NEBs certified. For the current NEBs compliance status on any card, call Customer Support.



# APPENDIX B

---

## ***SNMP Interface***

### **In this Appendix**

- Overview
- SNMP Basics
- SNMPv3
- Enterprise MIB Support
- Router Enterprise MIB Support
- Public MIB Support
- Router Public MIB Support
- MIB Loading Order
- Adit 600 Trap Support

## Overview

The Simple Network Management Protocol (SNMP) enables network operations centers (NOCs) to monitor and manage network elements across an internetwork. The Adit 600 supports SNMP through its Ethernet port, which provides access to the carrier's TCP/IP management network.

## SNMP Basics

SNMP is a protocol used to manage network equipment over TCP/IP networks. It works by exchanging information between an SNMP Manager (NMS) and an SNMP Agent in the network equipment.

### Security

Recommended actions concerning SNMP for Force10 Networks Products residing on properly secured networks:

1. Use Proprietary SNMP Community Strings - Procedure to change Community strings outlined in the following CLI commands:
  - *set (router) snmp on page 5-170*
  - *set snmp on page 5-223*
2. Segregate/Filter Network Management traffic from public domains - Filtering must be accomplished at network access points to properly protect managed devices. Filtering should be accomplished in accordance with local policies
3. Filter of SNMP traffic at network access points - SNMP vulnerabilities exist when SNMP traffic is not filtered at network access points. Filtering should be accomplished in accordance with local policies

For a more complete treatment of SNMP vulnerabilities and security recommendations, please refer to Force10 Networks document PTN-02-003: Response to CERT Advisory CA-2002-03 Multiple Vulnerabilities in Many Implementations of the Simple Network Management Protocol (SNMP), or contact Force10 Networks Customer Support.

### MIB Structure

The SNMP Agent displays network information in a Management Information Base (MIB). MIBs are machine-to-machine interfaces that arrange and present information according to industry standards such as RFC 1213. MIBs are tree-like structures comprising nodes and leaves. Nodes are branch points used to divide information into categories. Leaves have object values that can be examined and changed. Common MIB objects include system names, performance statistics, and control values.

Control values are typically Integer types. This enables the object's value to represent a specific control selection. Selections are usually written in the "name(value)" format. For example, the selection "closed(1)" means that the "closed" state is indicated by a value of "1".

## **SNMPv3**

Starting with release 9.8, the Adit 600 supports SNMPv3. SNMPv3 provides enhanced security features not available in SNMPv1 and SNMPv2. Rather than using community strings, SNMPv3 employs user names and passwords. SNMPv3 packets are authenticated and encrypted based on how the users have been defined. In addition, SNMPv3 allows the creation of user groups and MIB views that enable an agent to control access to its MIB objects.

---

**NOTE:** SNMPv3 is a keyed feature. Keys must be purchased from Force10 Networks. The Controller must be running release 9.8 or higher to support SNMPv3.

---

### **SNMPv3 Commands**

<i>add snmp group</i>	<i>set user group</i>
<i>add snmp view</i>	<i>set user priv</i>
<i>delete snmp group</i>	<i>show snmp engineid</i>
<i>delete snmp view</i>	<i>show snmp group</i>
<i>set snmp engineid</i>	<i>show snmp groups</i>
<i>set snmp group</i>	<i>show snmp users</i>
<i>set snmp nms user</i>	<i>show snmp view</i>
<i>set snmp view</i>	<i>show snmp views</i>
<i>set user auth</i>	

### **SNMPv3 Configuration Overview**

To use SNMPv3, you configure the following:

- Views
- Groups
- Users

#### **Views**

Views specify portions of the MIB that can be accessed by users. The MIB is organized in a tree structure based on the OID (Object Identifier) of each managed object in the MIB. A view defines one or more subtrees in the MIB. For example, one view could be defined for the MIB subtree represented by the OID 1.3.6, while another could be defined for OID 1.3.6.1. Of these two views, the latter is more restrictive because it has fewer managed objects under it. Up to 10 OIDs can be assigned to a single view. A view can also be defined for a single object in the MIB.

To define MIB views, use the following command:

- **add snmp view** – Create a new view and specify the MIB OID(s) that can be accessed through the view.

To work with existing views, use the following commands:

- **delete snmp view** – Delete a view.
- **set snmp view** – Change the OID(s) associated with a view.
- **show snmp view** – Display the attributes of an individual view.
- **show snmp views** – Display the attributes of all views.

### ***Groups***

Groups are sets of MIB views. For each group, you can assign a "read" view (for GET access), a "write" view (for SET access), and a "notify" view (for receiving traps and notifications).

To create groups, use the following commands:

- **add snmp group** – Create a new group.
- **set snmp group** – Assign existing MIB views to a group and indicate whether each view is a "read" view, "write" view, or "notify" view.

To work with existing groups, use the following commands:

- **delete snmp group** – Delete a group.
- **set snmp group** – Change the views assigned to the group.
- **show snmp group** – Display the attributes of an individual group.
- **show snmp groups** – Display the attributes of all groups.

### ***Users***

After you have established views and groups, you can assign users to the groups and specify the authentication and encryption protocols for each user. You can set SNMPv3 privileges for any user in the system (created with the **add user** command).

To add existing users to groups and set user privileges:

- **set snmp nms user** – Specify a user to which SNMPv3 traps will be sent.
- **set user group** – Assign a user to an SNMPv3 group.
- **set user auth** – Set the SNMPv3 authentication protocol (HMAC MD5 or HMAC SHA) for a user.
- **set user priv** – Set the SNMPv3 encryption protocol and privacy password for a user.
- **show snmp users** – Display the SNMPv3 attributes of all users.

## Enterprise MIB Support

This release contains full SNMPv1, SNMPv2c, and SNMPv3 support. Enterprise MIBs are defined using only SMIV2 (as noted in the table).

Enterprise MIB Name	Enterprise MIB Filename
CARRIERACCESS-GENERIC- MIB	carrieraccess-generic.mib
CARRIERACCESS-TC-MIB	carrieraccess-tc.mib
CAGEN-GENERIC-MIB	cagen-generic.mib
CAGEN-SLOT-MIB	cagen-slot.mib
CAGEN-SYSTEM-MIB	cagen-system.mib
ADIT600-SYSTEM-MIB	adit600-system.mib
CAGEN-ALARM-MIB	cagen-alarm.mib
CAGEN-EVENT-MIB	cagen-event.mib
CAGEN-TRAPS-MIB	cagen-traps.mib
ADIT600-DS1-MIB	adit600-ds1.mib
ADIT600-FX-MIB	adit600-fx.mib
ADIT600-TDM-CMG-MIB	adit600-tdm-cmg.mib
ADIT600-TDM-DEPRECIATED-OIDS-MIB	adit600-tdm-depreciated-oids.mib
ADIT600-TDM-DS1-MIB	adit600-tdm-ds1.mib
ADIT600-TDM-ROUTER-MIB	adit600-tdm-router.mib
CAGEN-4WEM-MIB	cagen-4wem.mib
CAGEN-ADPCM-MIB	cagen-adpcm.mib
CAGEN-BRI-MIB	cagen-bri.mib
CAGEN-CMG-MIB	cagen-cmg.mib
CAGEN-DS0-MIB	cagen-ds0.mib
CAGEN-DS1-MIB	cagen-ds1.mib
CAGEN-FX-MIB	cagen-fx.mib
CAGEN-IF-FACTORY-MIB	cagen-if-factory.mib
CAGEN-NTP-MIB	cagen-ntp.mib
CAGEN-OCUDP-MIB	cagen-ocudp.mib
CAGEN-PPHONE-MIB	cagen-pphone.mib
CAGEN-RS232-MIB	cagen-rs232.mib
CAGEN-SYSLOG-MIB	cagen-syslog.mib
CAGEN-TSR-MIB	cagen-tsr.mib
CAGEN-V35-MIB	cagen-v35.mib
SNMPV2-CONF-MIB	snmpv2-conf.mib
SNMPV2-SMI-MIB	snmpv2-smi.mib
SNMPV2-TC-MIB	snmpv2-tc.mib

## Router Enterprise MIB Support

Enterprise MIB Name	Enterprise MIB Filename
<b>Router Specific</b>	
CAGENROUTER-MIB	caGenRouter.mib
CAGENROUTER-CARDPROFILE-MIB	caGenRouter-CardProfile.mib
CAGENROUTER-DNS-MIB	caGenRouter-DNS.mib
CAGENROUTER-FILTERS-MIB	caGenRouter-Filters.mib
CAGENROUTER-LANPROFILE-MIB	caGenRouter-LanProfile.mib
CAGENROUTER-MANAGEMENT-MIB	CAGenRouter-Mgt.mib
CAGENROUTER-NTTPPROFILE-MIB	caGenRouter-NTPProfile.mib
CAGENROUTER-REPORTS-MIB	caGenRouter-Reports.mib
CAGENROUTER-SPANTREE-MIB	caGenRouter-SpanTree.mib
CAGENROUTER-STATIC-MIB	caGenRouter-Static.mib
CAGENROUTER-TC-MIB	caGenRouter-tc.mib
CAGENROUTER-TRUNK-MIB	caGenRouter-trunk.mib
CAGENROUTER-WANPROFILE-MIB	caGenRouter-WanProfile.mib
<b>CMG Specific</b>	
CA-CMG-CARD-MIB	ca-cmg-card.mib
CAGENCMG-ALGO-MIB	caGenCmg-algo.mib
CAGENCMG-DIALPLAN-MIB	caGenCmg-dialplan.mib
CAGENCMG-MGCP-MIB	caGenCmg-mgcp.mib
CAGENCMGCARD-TC-MIB	caGenCmg-tc.mib
CAGENCMG-SIPCARD-MIB	caGenCmg-sip.mib
CAGENCMG-TRUNK-MIB	caGenCmg-trunk.mib
CAGENCMG-VCHAN-MIB	caGenCmg-vchan.mib
CAGENCMG-VOIP-MIB	caGenCmg-voip.mib
<b>TSR Specific</b>	
CAGENTSR-MIB	caGen-tsr.mib
<b>Common with Controller</b>	
CARRIERACCESS-GENERIC-MIB	carrieraccess-generic.mib
CARRIERACCESS-TC-MIB	carrieraccess-tc.mib
CAGEN-GENERIC-MIB	cagen-generic.mib
CAGEN-SYSTEM-MIB	cagen-system.mib
SNMPV2-CONF-MIB	snmpv2-conf.mib
SNMPV2-SMI-MIB	snmpv2-smi.mib
SNMPV2-TC-MIB	snmpv2-tc.mib

## Public MIB Support

MIB	Table	Comments
RFC1155 (RFC-1155-SMI-MIB)		
RFC1212 (RFC-1212-MIB)		
RFC1213 (RFC-1213-MIB)	system interfaces ip icmp	tcp udp snmp egp not supported
RFC1215 (RFC-1215-MIB)		
RFC1215-TRAP (RFC-1215-TRAP-MIB)		
RFC1659 (RFC1659-MIB)	rs232PortTable rs232SyncPortTable rs232InSigTable rs232OutSigTable	Supports V.35 Card Rs232AsnycPortTable not supported
RFC1907 (SNMPv2-MIB)	system sysORTable snmp	SMIv2 Extension of RFC1213
RFC2011 (IP-MIB)	ip ipAddrTable ipNetToMediaTable icmp	SMIv2 Extension of RFC1213
RFC2233 (IF-MIB)	ifTable ifXTable ifStackTable	IfTestTable, ifRcvAddressTable not supported
IANAifType-MIB	IANAifType	Used by RFC2233; no objects
RFC2493 (PerHist-TC-MIB)	Performance History TC	Defines textual conventions; no objects
RFC2494 (DS0-MIB, DS0BUNDLE-MIB)	dsx0ConfigTable dsx0ChanMappingTable dsx0BundleTable	Dsx0BondingTable not supported
RFC2495 (DS1-MIB)	dsx1ConfigTable dsx1CurrentTable dsx1IntervalTable dsx1TotalTable	Far End Tables and Fractional Table not supported
RFC2571 (SNMP-FRAMEWORK-MIB)	SNMP TC	Defines textual conventions; no objects
RFC2572 (SNMP-MPD-MIB)		
RFC2573 (SNMP-TARGET-MIB, SNMP-NOTIFICATION-MIB, SNMP-PROXY-MIB)		
RFC2574 (SNMP-USER-BASED-SM-MIB)		
RFC2575 (SNMP-VIEW-BASED-ACM-MIB)		

## Router Public MIB Support

MIB	Table	Comments
RFC1213 (RFC-1213-MIB)	system interfaces ip icmp tcp udp snmp	egp not supported
RFC1907 (SNMPv2-MIB)	system snmp	SMIv2 Extension of RFC1213 SysORTable not supported
RFC2011 (IP-MIB)	ip icmp	SMIv2 Extension of RFC1213. IpAddrTable not supported. Routing table and ipNetToMediaTable supported by Enterprise mibs.
RFC2233 (IF-MIB)	ifTable	IfTestTable, ifRevAddressTable, ifXTable, ifStackTable not supported
RFC3291(RFC-3291-MIB)		
IANAifType-MIB	IANAifType	Used by RFC2233; no objects
<b>MSR Specific</b>		
RFC1155 (RFC-1155-SMI-MIB)		
RFC1212 (RFC-1212-MIB)		
RFC1215 (RFC-1215-MIB)		
RFC1215-TRAP (RFC-1215-TRAP-MIB)		
RFC2012 (TCP-MIB)		
RFC2013 (UDP-MIB)		
RFC2127 (ISDN-MIB)		
RFC2272 (SNMP-MPD-MIB)		
RFC2273 (SNMP-TARGET-MIB, SNMP-NOTIFICATION-MIB, SNMP-PROXY-MIB)		
RFC2274 (SNMP-USER-BASED- SM-MIB)		
RFC2275 (SNMP-VIEW-BASED- ACM-MIB)		
RFC2465 (IPV6-MIB)		
RFC2493 (PerfHist-TC-MIB)		
RFC2495 (DS1-MIB)		
RFC2571 (SNMP-FRAMEWORK- MIB)		
RFC2573 (SNMP-TARGET-MIB, SNMP-NOTIFICATION-MIB, SNMP-PROXY-MIB)		



RFC2576 (SNMP-COMMUNITY-MIB)		
RFC2786 (SNMP-USM-DH-OBJECTS-MIB)		
RFC3413 (SNMP-TARGET-MIB, SNMP-NOTIFICATION-MIB, SNMP-PROXY-MIB)		
RFC3584 (SNMP-COMMUNITY-MIB)		

## **MIB Loading Order**

The following is the recommended order for loading MIBs into a management framework for the Adit 600. Note that many of the standard MIBs may already be loaded; it is not necessary to load them again.

- |                     |                                 |                                |
|---------------------|---------------------------------|--------------------------------|
| 1. rfc1212.mib      | 31. SNMPv2-CONF.mib             | 61. caGenRouter-Mgt.mib        |
| 2. rfc1213.mib      | 32. SNMPv2-SMI.mib              | 62. caGenRouter-NTPProfile.mib |
| 3. rfc1215.mib      | 33. SNMPv2-TC.mib               | 63. caGenRouter-Reports.mib    |
| 4. rfc1215-TRAP.mib | 34. carrieraccess-generic.mib   | 64. caGenRouter-SpanTree.mib   |
| 5. rfc1907.mib      | 35. carrieraccess-tc.mib        | 65. caGenRouter-Static.mib     |
| 6. rfc2233.mib      | 36. cagen-generic.mib           | 66. caGenRouter-tc.mib         |
| 7. rfc1659.mib      | 37. IANAIfType-MIB.mib          | 67. caGen-cmg-card.mib         |
| 8. rfc2011.mib      | 38. cagen-slot.mib              | 68. caGenCmg-algo.mib          |
| 9. rfc2012.mib      | 39. cagen-alarm.mib             | 69. caGenCmg-mgcp.mib          |
| 10. rfc2013.mib     | 40. cagen-event.mib             | 70. caGenCmg-tc.mib            |
| 11. rfc2127.mib     | 41. cagen-system.mib            | 71. caGenCmg-trunk.mib         |
| 12. rfc2272.mib     | 42. cagen-ds0.mib               | 72. caGenCmg-vchan.mib         |
| 13. rfc2273.mib     | 43. cagen-ds1.mib               | 73. caGenCmg-voip.mib          |
| 14. rfc2274.mib     | 44. cagen-bri.mib               | 74. caGenCmg-dialplan.mib      |
| 15. rfc2275.mib     | 45. cagen-fx.mib                | 75. caGenCmg-sip.mib           |
| 16. rfc2465.mib     | 46. cagen-traps.mib             | 76. cagen-v35.mib              |
| 17. rfc2493.mib     | 47. cagen-v35.mib               |                                |
| 18. rfc2494.mib     | 48. adit600-system.mib          |                                |
| 19. rfc2495.mib     | 49. adit600-ds1.mib             |                                |
| 20. rfc2571.mib     | 50. adit600-tdm-ds1.mib         |                                |
| 21. rfc2572.mib     | 51. adit600-fx.mib              |                                |
| 22. rfc2573.mib     | 52. adit600-tdm-router.mib      |                                |
| 23. rfc2574.mib     | 53. caGen-ocudp.mib             |                                |
| 24. rfc2575.mib     | 54. caGenRouter.mib             |                                |
| 25. rfc2576.mib     | 55. caGenRouter-trunk.mib       |                                |
| 26. rfc2786.mib     | 56. caGenRouter-WanProfile.mib  |                                |
| 27. rfc3291.mib     | 57. caGenRouter-CardProfile.mib |                                |
| 28. rfc3413.mib     | 58. caGenRouter-DNS.mib         |                                |
| 29. rfc3584.mib     | 59. caGenRouter-Filters.mib     |                                |
| 30. rfc1155-smi.mib | 60. caGenRouter-LanProfile.mib  |                                |

## Adit 600 Trap Support

This section highlights the standard and Enterprise SNMP trap support in the Adit 600 controller. The controller supports both standard and Enterprise specific SNMPv2 NOTIFICATION-TYPE traps.

### Standard Traps

The Adit 600 controller supports the following standard traps.

1. linkDown (RFC2233)

Variable Binding List: ifIndex, ifAdminStatus, ifOperStatus

Trap OID: 1.3.6.1.6.3.1.1.5.3

Full Path of OID:

iso(1).org(3).dod(6).internet(1).snmpV2(6).snmpModules(3).snmpMIB(1).snmpMIBObjects(1).snmpTraps(5).linkDown(3)

Trap Description:

"A linkDown trap signifies that the SNMPv2 entity, acting in an agent role, has detected that the ifOperStatus object for one of its communication links is about to enter the down state from some other state (but not from the notPresent state). This other state is indicated by the included value of ifOperStatus."

2. linkUp (RFC2233)

Variable Binding List: ifIndex, ifAdminStatus, ifOperStatus

Trap OID: 1.3.6.1.6.3.1.1.5.4

Full Path of OID:

iso(1).org(3).dod(6).internet(1).snmpV2(6).snmpModules(3).snmpMIB(1).snmpMIBObjects(1).snmpTraps(5).linkUp(4)

Trap Description:

"A linkDown trap signifies that the SNMPv2 entity, acting in an agent role, has detected that the ifOperStatus object for one of its communication links left the down state and transitioned into some other state (but not into the notPresent state). This other state is indicated by the included value of ifOperStatus."

3. coldStart (RFC1215)

Variable Binding List: None

Trap OID: V1 TRAP-TYPE trap, Enterprise snmp, trap number 0

Trap Description:

"A coldStart trap signifies that the SNMPv2 entity, acting in an agent role, is reinitializing itself and that its configuration may have been altered."

4. authenticationFailure (RFC1907)

Variable Binding List: None

Trap OID: 1.3.6.1.6.3.1.1.5.5

Full Path of OID:

iso(1).org(3).dod(6).internet(1).snmpV2(6).snmpModules(3).snmpMIB(1).snmpMIBObjects(1).snmpTraps(5).authenticationFailure(5)

Trap Description:

"An authenticationFailure trap signifies that the SNMPv2 entity, acting in an agent role, has received a protocol message that is not properly authenticated. While all implementations of the SNMPv2 must be capable of generating this trap, the snmpEnableAuthenTraps object indicates whether this trap will be generated."

## Enterprise Traps

The Adit 600 controller supports the following enterprise specific traps. All enterprise traps are defined in the CA-TRAPS-MIB (cagen-traps.mib) Most variable bindings are imported from the CA-EVENT-MIB (cagen-event.mib).

1. caGenEventLogTrap

Variable Binding List: caGenEventLogIndex, caGenEventSeverity, caGenEventCategory, caGenEventCode, caGenEventDate

Trap OID: 1.3.6.1.4.1.964.3.4.1.100.0.1

Full Path of OID:

iso(1).org(3).dod(6).internet(1).private(4).enterprises(1).carrieraccess(964).products(3).caGen(4).caGeneric(1).caGenTraps(100).caGenEventsV2(0).caGenEventLogTrap(1)

Trap Description:

"An event has been logged into the device's Event Log.

Note: caGenEventInfoParam[1|2|3] are optional variable bindings."

2. caGenMajorPortAlarmFailure

Variable Binding List: caGenEventCategory, caGenEventCode, ifIndex, caGenSlotCardType, caGenPortLoc, caGenEventAdditionalText

Trap OID: 1.3.6.1.4.1.964.3.4.1.100.0.2

Full Path of OID:

iso(1).org(3).dod(6).internet(1).private(4).enterprises(1).carrieraccess(964).products(3).caGen(4).caGeneric(1).caGenTraps(100).caGenEventsV2(0).caGenMajorPortAlarmFailure(2)

Trap Description:

"A major communication failure has been detected. The 'caGenEventCode' variable holds the particular type of failure from this set:

- |                           |                                |
|---------------------------|--------------------------------|
| ● Alarm Indication Signal | ● Loss Of Signal               |
| ● Bipolar Violation       | ● Loss Of Signal No Dying Gasp |
| ● Line Coding Violation   | ● Remote Alarm Indication      |
| ● Loss Of Frame           | ● Link Down                    |
| ● Loss Of RTS             | ● Call Connection Down         |

If the ifIndex has a name, 'caGenEventAdditionalText' reports it for all ifTypes."

3. caGenMinorPortAlarmFailure

Variable Binding List: caGenEventCategory, caGenEventCode, ifIndex, caGenSlotCardType, caGenPortLoc, caGenEventAdditionalText

Trap OID: 1.3.6.1.4.1.964.3.4.1.100.0.3

Full Path of OID:

iso(1).org(3).dod(6).internet(1).private(4).enterprises(1).carrieraccess(964).products(3).caGen(4).caGeneric(1).caGenTraps(100).caGenEventsV2(0).caGenMinorPortAlarmFailure(3)

Trap Description:

"A minor communication failure has been detected. The 'caGenEventCode' variable holds the particular type of failure from this set:

- Bipolar Violation
- Frame Slip Violation
- Collision Threshold

If the ifIndex has a name, 'caGenEventAdditionalText' reports it for all ifTypes."

4. caGenMajorPortAlarmCleared

Variable Binding List: caGenEventCategory, caGenEventCode, ifIndex, caGenSlotCardType, caGenPortLoc, caGenEventAdditionalText

Trap OID: 1.3.6.1.4.1.964.3.4.1.100.0.4

Full Path of OID:

iso(1).org(3).dod(6).internet(1).private(4).enterprises(1).carrieraccess(964).products(3).caGen(4).caGeneric(1).caGenTraps(100).caGenEventsV2(0).caGenMajorPortAlarmCleared(4)

Trap Description:

"A communication failure has been corrected. The 'caGenEventCode' variable holds the particular type of failure from this set:

- |                           |                                |
|---------------------------|--------------------------------|
| ● Alarm Indication Signal | ● Loss Of Signal               |
| ● Bipolar Violation       | ● Loss Of Signal No Dying Gasp |
| ● Line Coding Violation   | ● Remote Alarm Indication      |
| ● Loss Of Frame           | ● Link Down                    |
| ● Loss Of RTS             | ● Call Connection Down         |

If the ifIndex has a name, 'caGenEventAdditionalText' reports it for all ifTypes."

5. caGenPortAlarmThreshold

Variable Binding List: caGenEventCategory, caGenEventCode, caGenEventInfoParam1, ifIndex, caGenSlotCardType, caGenPortLoc, caGenEventAdditionalText

Trap OID: 1.3.6.1.4.1.964.3.4.1.100.0.5

Full Path of OID:

iso(1).org(3).dod(6).internet(1).private(4).enterprises(1).carrieraccess(964).products(3).caGen(4).caGeneric(1).caGenTraps(100).caGenEventsV2(0).caGenPortAlarmThreshold(5)

Trap Description:

"A performance threshold violation has occurred. The 'caGenEventCode' variable holds the particular type of threshold from this set:

- Bursty Errored Seconds Threshold
- Controlled Slip Seconds Threshold
- Degraded Minutes Threshold
- Errored Seconds Threshold
- Line Coding Violations Threshold
- Line Errored Seconds Threshold
- Path Coding Violations Threshold
- Severely Errored Framing Second Threshold
- Severely Errored Seconds Threshold
- Unavailable Seconds Threshold

If the ifIndex has a name, 'caGenEventAdditionalText' reports it for all ifTypes."

6. caGenCriticalUserAlarmInputDetected

Variable Binding List: caGenEventCategory, caGenEventInfoParam1

Trap OID: 1.3.6.1.4.1.964.3.4.1.100.0.6

Full Path of OID:

iso(1).org(3).dod(6).internet(1).private(4).enterprises(1).carrieraccess(964).products(3).caGen(4).caGeneric(1).caGenTraps(100).caGenEventsV2(0).caGenCriticalUserAlarmInputDetected(6)

Trap Description:

"A critical user alarm input has been detected. 'caGenEventInfoParam1' indicates which user alarm input has tripped."

7. caGenMajorUserAlarmInputDetected

Variable Binding List: caGenEventCategory, caGenEventInfoParam1

Trap OID: 1.3.6.1.4.1.964.3.4.1.100.0.7

Full Path of OID:

iso(1).org(3).dod(6).internet(1).private(4).enterprises(1).carrieraccess(964).products(3).caGen(4).caGeneric(1).caGenTraps(100).caGenEventsV2(0).caGenMajorUserAlarmInputDetected(7)

Trap Description:

"A major user alarm input has been detected. 'caGenEventInfoParam1' indicates which user alarm input has tripped."

8. caGenMinorUserAlarmInputDetected

Variable Binding List: caGenEventCategory, caGenEventInfoParam1

Trap OID: 1.3.6.1.4.1.964.3.4.1.100.0.8

Full Path of OID:

iso(1).org(3).dod(6).internet(1).private(4).enterprises(1).carrieraccess(964).products(3).caGen(4).caGeneric(1).caGenTraps(100).caGenEventsV2(0).caGenMinorUserAlarmInputDetected(8)

**Trap Description:**

"A minor user alarm input has been detected. 'caGenEventInfoParam1' indicates which user alarm input has tripped."

9. caGenInfoUserAlarmInputDetected

Variable Binding List: caGenEventCategory, caGenEventInfoParam1

Trap OID: 1.3.6.1.4.1.964.3.4.1.100.0.9

Full Path of OID:

iso(1).org(3).dod(6).internet(1).private(4).enterprises(1).carrieraccess(964).products(3).caGen(4).caGeneric(1).caGenTraps(100).caGenEventsV2(0).caGenInfoUserAlarmInputDetected(9)

Trap Description:

"An informative user alarm input has been detected. 'caGenEventInfoParam1' indicates which user alarm input has tripped."

10. caGenCriticalUserAlarmInputCleared

Variable Binding List: caGenEventCategory, caGenEventInfoParam1

Trap OID: 1.3.6.1.4.1.964.3.4.1.100.0.10

Full Path of OID:

iso(1).org(3).dod(6).internet(1).private(4).enterprises(1).carrieraccess(964).products(3).caGen(4).caGeneric(1).caGenTraps(100).caGenEventsV2(0).caGenCriticalUserAlarmInputCleared(10)

Trap Description:

"A user alarm input has been cleared. 'caGenEventInfoParam1' indicates which user alarm input has cleared."

11. caGenPowerSupplyFailure

Variable Binding List: caGenEventCategory, caGenEventAdditionalText

Trap OID: 1.3.6.1.4.1.964.3.4.1.100.0.12

Full Path of OID:

iso(1).org(3).dod(6).internet(1).private(4).enterprises(1).carrieraccess(964).products(3).caGen(4).caGeneric(1).caGenTraps(100).caGenEventsV2(0).caGenPowerSupplyFailure(12)

**Trap Description:**

"Power Supply Failure. 'caGenEventAdditionalText' varies for specific products."

12. caGenPowerSupplyCleared

Variable Binding List: caGenEventCategory, caGenEventAdditionalText

Trap OID: 1.3.6.1.4.1.964.3.4.1.100.0.13

Full Path of OID:

iso(1).org(3).dod(6).internet(1).private(4).enterprises(1).carrieraccess(964).products(3).caGen(4).caGeneric(1).caGenTraps(100).caGenEventsV2(0).caGenPowerSupplyCleared(13)

Trap Description:

"Power Supply recovered. 'caGenEventAdditionalText' varies for specific products."

13. caGenCardRemoved

Variable Binding List: caGenEventCategory, caGenSlot, caGenSlotCardType, caGenEventInfoParam1

Trap OID: 1.3.6.1.4.1.964.3.4.1.100.0.14

Full Path of OID:

iso(1).org(3).dod(6).internet(1).private(4).enterprises(1).carrieraccess(964).products(3).caGen(4).caGeneric(1).caGenTraps(100).caGenEventsV2(0).caGenCardRemoved(14)

Trap Description:

"Card removed. 'caGenEventInfoParam1' holds the in-service indicator;  
1=In Service, 0=Out of Service"

14. caGenCardDetected

Variable Binding List: caGenEventCategory, caGenSlot, caGenSlotCardType

Trap OID: 1.3.6.1.4.1.964.3.4.1.100.0.15

Full Path of OID:

iso(1).org(3).dod(6).internet(1).private(4).enterprises(1).carrieraccess(964).products(3).caGen(4).caGeneric(1).caGenTraps(100).caGenEventsV2(0).caGenCardDetected(15)

Trap Description:

"Card detected."

15. caGenCardResetComplete

Variable Binding List: caGenEventCategory, caGenSlot

Trap OID: 1.3.6.1.4.1.964.3.4.1.100.0.16

Full Path of OID:

iso(1).org(3).dod(6).internet(1).private(4).enterprises(1).carrieraccess(964).products(3).caGen(4).caGeneric(1).caGenTraps(100).caGenEventsV2(0).caGenCardResetComplete(16)

Trap Description:

"Card reset complete. 'caGenSlot' holds the slot number"



16. caGenCardFailure

Variable Binding List: caGenEventCategory, caGenSlot, caGenSlotCardType, caGenEventInfoParam1

Trap OID: 1.3.6.1.4.1.964.3.4.1.100.0.19

Full Path of OID:

iso(1).org(3).dod(6).internet(1).private(4).enterprises(1).carrieraccess(964).products(3).caGen(4).caGeneric(1).caGenTraps(100).caGenEventsV2(0).caGenCardFailure(19)

Trap Description:

"This would mostly be used for reporting problems during power up. 'caGenEventInfoParam1' could hold a reason code such as self test failure, insufficient bandwidth on the backplane. The category would be 'system'."

17. caGenMinorPortAlarmCleared

Variable Binding List: caGenEventCategory, caGenEventCode, ifIndex, caGenSlotCardType, caGenPortLoc, caGenEventAdditionalText

Trap OID: 1.3.6.1.4.1.964.3.4.1.100.0.22

Full Path of OID:

iso(1).org(3).dod(6).internet(1).private(4).enterprises(1).carrieraccess(964).products(3).caGen(4).caGeneric(1).caGenTraps(100).caGenEventsV2(0).caGenMinorPortAlarmCleared(22)

Trap Description:

"A communication failure has been corrected. The 'caGenEventCode' variable holds the particular type of failure from this set:

- Bipolar Violation
- Frame Slip Violation
- Collision Threshold

If the ifIndex has a name, 'caGenEventAdditionalText' reports it for all ifTypes."

18. caGenMajorUserAlarmInputCleared

Variable Binding List: caGenEventCategory, caGenEventInfoParam1

Trap OID: 1.3.6.1.4.1.964.3.4.1.100.0.23

Full Path of OID:

iso(1).org(3).dod(6).internet(1).private(4).enterprises(1).carrieraccess(964).products(3).caGen(4).caGeneric(1).caGenTraps(100).caGenEventsV2(0).caGenMajorUserAlarmInputCleared(23)

Trap Description:

"A major user alarm input has been cleared. 'caGenEventInfoParam1' indicates which user alarm input has cleared."

19. caGenMinorUserAlarmInputCleared

Variable Binding List: caGenEventCategory, caGenEventInfoParam1

Trap OID: 1.3.6.1.4.1.964.3.4.1.100.0.24

Full Path of OID:

iso(1).org(3).dod(6).internet(1).private(4).enterprises(1).carrieraccess(964).products(3).caGen(4).caGeneric(1).caGenTraps(100).caGenEventsV2(0).caGenMinorUserAlarmInputCleared(24)

Trap Description:

"A minor user alarm input has been cleared. 'caGenEventInfoParam1' indicates which user alarm input has cleared."

20. caGenInfoUserAlarmInputCleared

Variable Binding List: caGenEventCategory, caGenEventInfoParam1

Trap OID: 1.3.6.1.4.1.964.3.4.1.100.0.25

Full Path of OID:

iso(1).org(3).dod(6).internet(1).private(4).enterprises(1).carrieraccess(964).products(3).caGen(4).caGeneric(1).caGenTraps(100).caGenEventsV2(0).caGenInfoUserAlarmInputCleared(25)

Trap Description:

"A informative user alarm input has been cleared. 'caGenEventInfoParam1' indicates which user alarm input has cleared."

# APPENDIX C

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## ***Diagnostics & Troubleshooting***

### **In this Appendix**

- Alarms
- Logs
- Status and Performance
- Loopbacks Overview
  - DS1/E1 Loopbacks
  - V.35 Loopbacks
  - V.35/V.54 Loop
  - V.54 Equipment Loopback
  - OCU-DP Loopbacks
- Router Diagnostics and Performance Tools

## Alarms

### Test Alarm

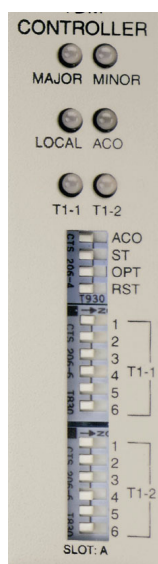
The Adit 600 alarm functions can be manually tested using the following command for setting critical, major and minor alarms. Turning alarms on or off will produce alarm messages and log entries stating the alarm event was manually set/cleared by the user.

**Syntax:** `set alarms {critical|major|minor} {off|on}`

### Identify Alarm

#### Alarm indicators

LEDs - When an Alarm is triggered, the LED will display a red/yellow indicator light, which will stay on until the Alarm is cleared. The following is the LED information for the T1 Controller card. For LED information for the specific service card see the specific chapter for that card.



LED	State	Description
MAJOR	Off	No major alarms present
	Red	Major alarm present
MINOR	Off	No minor alarms present
	Yellow	Minor alarms present
LOCAL	Off	Remote mode (DIP switches disabled)
	Green	Local mode (DIP switches enabled)
ACO	Off	Normal mode. No alarms are being suppressed.
	Yellow	Alarm cutoff active. One or more active alarms suppressed.
T1-1 and T1-2	Off	Off line
	Green	Normal
	Red	Loss of Signal (LOS) detected
	Yellow	Bipolar Violation (BPV) detected
	Flashing Green	Loopback active
	Flashing Red	Loss of Frame (LOF) or Alarm Indication Signal (AIS) detected
	Flashing Yellow	Yellow alarm (Remote Alarm Indication) detected.

The following are hyperlinks to service card LED information:

**[T1 Controller Card, LEDs](#)**

**[E1 Controller Card, LEDs](#)**

**[4-Wire E&M/TO Card, LEDs](#)**

**[FXO Voice Card, LEDs](#)**

**[FXS Voice Card, LEDs](#)**

**[ISDN BRI Card, LEDs](#)**

**[OCU-DP Card, LEDs](#)**

**[P-Phone Card, LEDs](#)**

**[Quad DS1 ADPCM Card, LEDs](#)**

**[Quad T1, Quad E1 & Quad DS1/E1 Cards, LEDs](#)**

**[Single Channel POTS Card, LEDs](#)**

**[Router \(IP\) Card, LEDs](#)**

**[Router \(CMG\) Card, LEDs](#)**

**[Terminal Server Router Card, LEDs](#)**

**[Multi-Service Router \(MSR\) Card, LEDs](#)**

**[RS-232 Card, LEDs](#)**

**[V.35 and V.35/V.54 Cards, LEDs](#)**

**[Power Supply, 115 VAC LEDs](#)**

**[Power Supply, 230 VAC LEDs](#)**

**[Power Supply, 24 VDC LEDs](#)**

### Display Alarms

Use the **alarms** command to display the active alarms. Each alarm is related to a particular address and has a severity category (major, minor, critical, alert). The report can be filtered by port address and/or severity.

**Syntax:** `alarms [slot|slot:port|slot:port:channel] [category] [severity]`

```
> alarms
```

<u>Time</u>	<u>Date</u>	<u>Severity</u>	<u>Description</u>
07:35:45	01/04/2002	Major	Test Major Alarm
07:35:21	01/04/2002	Minor	Test Minor Alarm
07:34:57	01/04/2002	Critical	Test Critical Alarm
07:30:39	01/04/2002	Major	1:1-OCUDP Out of Service
03:50:55	01/04/2002	Major	1:1-OCUDP Loss of Signal
00:00:20	01/01/2002	Major	6:1-TSR Ethernet Link Down
00:00:20	01/01/2002	Major	4:1-CMG Ethernet Link Down
00:00:20	01/01/2002	Major	5:1-RTR Ethernet Link Down
00:00:05	01/01/2002	Major	A:2-DS1 Loss Of Signal
00:00:05	01/01/2002	Major	A:1-DS1 Loss Of Signal

Total=10

Category = bri|dsl|env|equipment|fxo|fxs|rtr|v35

Severity = alert|critical|info|major|minor

### Clear Alarm

Once an alarm is identified then the process of clearing it can begin.

- Silence Alarm, if necessary (Alarm Cut Off CLI command: **aco**)
- Check Connection
- Check Cable, replace if necessary
- Check hardware and replace if necessary
- Call Customer Support

## **Logs**

Display the event log to view a log of all system events, or narrow the view to only display specific information.

**Syntax:** `log [slot|slot:port] [category] [severity]`

**Example:** `log`

<u>Time</u>	<u>Date</u>	<u>Severity</u>	<u>Description</u>
00:00:15	01/01/2002	Major	4:1-CMG Ethernet Link Down
00:00:12	01/01/2002	Info	3-FX0x8 Card Detected
00:00:12	01/01/2002	Info	2-FXS5Gx8 Card Detected
00:00:06	01/01/2002	Major	A:2-DS1 Loss Of Signal
00:00:05	01/01/2002	Info	4-CMGx1 Card Detected
00:00:02	01/01/2002	Info	A-T1x2 Card Detected
00:00:02	01/01/2002	Info	System Powerup

Total=7

Category = bri|ds1|env|equipment|fxo|fxs|rtr|v35

Severity = alert|critical|info|major|minor

## **Status and Performance**

The following status commands display vital information regarding the system that will aid in troubleshooting.

**status (4-wire e&m)**

**status (adpcm)**

**status (adpcm) performance**

**status (adpcm) performance history**

**status (bri)**

**status clock**

**status (ds0)**

**status (ds1)**

**status (e1)**

**status equipment**

**status (fxo)**

**status (fxs)**

**status (fxs8D/fxs8C/fxs8B/fxs8A/fxs5G)**

**status (fxsINTL)**

**status (fxsPS)**

**status ipds0**

**status (ocudp)**

**status (ocudp) performance**

**status (ocudp) performance history**

**status (p-phone)**

**status (router)**

**status (router) alarms**

**status (router) channels**

**status (router) dns**

**status (router) events**

**status (router) ip address table**

**status (router) ip network table**

**status (router) ipx network table**

**status (router) ipx server table**

**status (router) log**

**status (router) mac address table**

**status (router) mgcp**

**status (router) performance**

**status (router) stp**

**status (router-lan)**

**status (router-trunk)**

**status (router-voice)**

**status (rs232)**

**status (v35)**

**status (v54)**



## **Loopbacks Overview**

**NOTE:** E1 is not supported in this release of the Adit 600 Controller. It will be supported in a future release.

A loopback test is a diagnostic procedure in which a signal is transmitted and returned to the sending device after passing through all or a portion of a network or circuit. The returned signal is compared with the transmitted signal in order to evaluate the integrity of the equipment or transmission path. The following are the loopbacks available.

### **T1/E1 Loopbacks**

<b>Card</b>	<b>Line</b>	<b>Equipment</b>	<b>Payload</b>	<b>CSU</b>	<b>NIU</b>
<b>Controller T1</b>	Yes	No	Yes	Yes	Yes (if $\geq$ vers 8.0)
<b>Quad T1</b>	Yes	Yes	Yes	Yes	No
<b>Quad DS1/E1 (1.82)</b>	Yes	Yes	Yes	Yes	Yes (if $\geq$ vers 1.82)
<b>Quad DS1 ADPCM (1.13)</b>	Yes	Yes	Yes	Yes	Yes (if $\geq$ vers 1.13)
<b>Controller E1</b>	Yes	No	No	No	Yes
<b>Quad E1</b>	Yes	No	No	No	Yes
<b>V.35 T1</b>	Yes	Yes	No	No	No
<b>V.35 E1</b>	Yes	Yes	No	No	No
<b>V.54 T1</b>	Yes	Yes	No	No	No
<b>V.54 E1</b>	Yes	Yes	No	No	No

### **OCU-DP Loopbacks**

- Manual OCU Loopback
- Manual CSU Loopback
- OCU Latching Loopback
- CSU Latching Loopback
- DSU Latching Loopback
- DSU Non-Latching Loopback
- CSU Non-Latching Loopback
- OCU Non-Latching Loopback
- OCU Manual Loopback
- CSU Manual Loopback

### DS1/E1 Loopbacks

Note: T1/E1 LEDs flash green during any DS1/E1 loopback.

#### DS1 Line Loop

Loops at DS1/E1 (at framer), signal not reframed. Have DS1/E1 vendor check for framing/errors.

#### Enable Line Loopback

```
> set a:1 line loopup
OK
```

#### View Status of Loopback

##### DS1 Status

```
> status a:1
SLOT A:
Status for DS1 1:
```

Receive:	Traffic
Transmit:	Traffic
<b>Loopback:</b>	<b>LINE</b>

##### E1 Status

```
> status a:1
SLOT A:
Status for E1 1:
```

Receive:	Loss of Framing
Transmit:	RAI/Yellow Alarm
<b>Loopback:</b>	<b>LINE</b>

#### Disable Line Loopback

```
> set a:1 line loopdown
OK
```

#### View Status of Loopback

##### DS1 Status

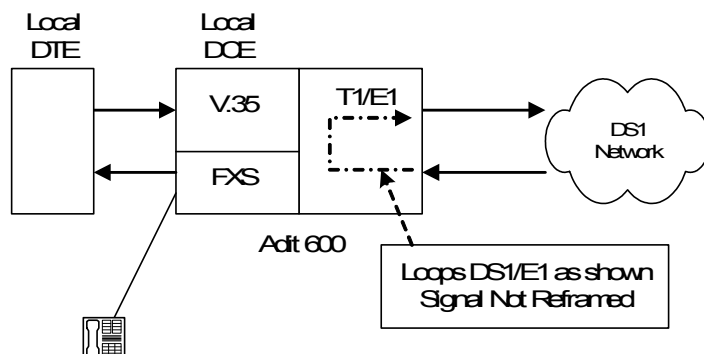
```
> status a:1
SLOT A:
Status for DS1 1:
```

Receive:	Traffic
Transmit:	Traffic
<b>Loopback:</b>	<b>OFF</b>

##### E1 Status

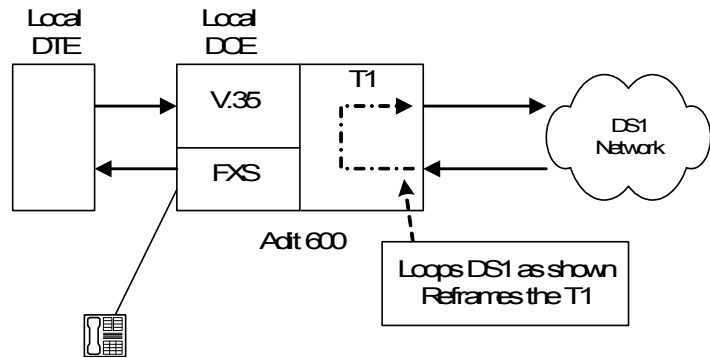
```
> status a:1
SLOT A:
Status for E1 1:
```

Receive:	Traffic
Transmit:	Traffic
<b>Loopback:</b>	<b>OFF</b>



### **DS1 Payload Loop**

Loops at DS1 (in framer) and reframes the T1. Have DS1 vendor check for framing/errors.



### **Enable Payload Loopback**

```
> set a:1 payload loopup
OK
```

### **View Status of Loopback**

```
> status a:1
SLOT A:
Status for DS1 1:
  Receive:      Traffic
  Transmit:     Traffic
  Loopback:     PAYLOAD
```

### **Disable Payload Loopback**

```
> set a:1 payload loopdown
OK
```

### **View Status of Loopback**

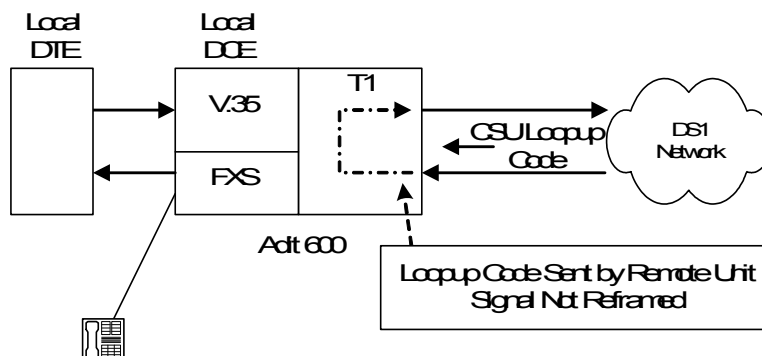
```
> status a:1
SLOT A:
Status for DS1 1:
  Receive:      Traffic
  Transmit:     Traffic
  Loopback:     OFF
```

### Receiving DS1 CSU Loop

Causes a Line Loopback.  
Loopup code sent by remote unit or network. Occurs at local DS1 CSU. Have DS1 vendor check for framing/errors.

#### Enable Detection of CSU Loopcode

Enable detection of CSU loop code (10000 for loopup; 10100 for loopdown).



```
> set a:1 loopdetect
csu
OK
```

### View Status of Loopback

```
> show a:1
SLOT A:
Settings for DS1 1:
  Circuit ID:          TN DS1# A:1
  Up/Down:             UP
  Framing:             ESF
  Line Coding:         B8ZS
  Line Build Out:      DSX-1 EQUALIZATION FOR 0-133 ft. (CSU 0dB)
  Loop Code Detection: CSU
  Loopback:            OFF
  FDL Type:            None
```

Performance Threshold Settings	15 min.	1 day
unavailable seconds:	0	0
severely errored seconds:	0	0
errored seconds:	0	0
sev. errored frame seconds:	0	0
line errored seconds:	0	0
controlled slip seconds:	0	0
bursty errored seconds:	0	0
degraded minutes:	0	0
total linecode violations:	0	0
total pathcode violations:	0	0

```
> status a:1
SLOT A:
Status for DS1 1:
  Receive:            Traffic
  Transmit:           Traffic
  Loopback:           LINE
```

## Receiving DS1 NIU Loop

Causes a Line Loopback.  
 Loopup code sent by remote unit or network. Occurs at local DS1 CSU. Have DS1 vendor check for framing/errors.

### Enable Detection of NIU Loopcode

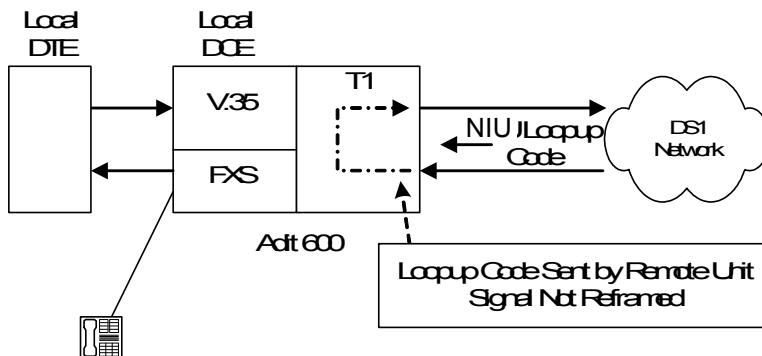
```
> set a:1 loopdetect
niu
OK
```

### View Status of Loopback

```
> show a:1
SLOT A:
Settings for DS1 1:
  Circuit ID:          TN DS1# A:1
  Up/Down:             UP
  Framing:             ESF
  Line Coding:         B8ZS
  Line Build Out:      DSX-1 EQUALIZATION FOR 0-133 ft. (CSU 0dB)
  Loop Code Detection: NIU
  Loopback:            OFF
  FDL Type:            None
```

Performance Threshold Settings	15 min.	1 day
	-----	-----
unavailable seconds:	0	0
severely errored seconds:	0	0
errored seconds:	0	0
sev. errored frame seconds:	0	0
line errored seconds:	0	0
controlled slip seconds:	0	0
bursty errored seconds:	0	0
degraded minutes:	0	0
total linecode violations:	0	0
total pathcode violations:	0	0

```
> status a:1
SLOT A:
Status for DS1 1:
  Receive:            Loss of Signal
  Transmit:           RAI/Yellow Alarm
  Loopback:           NIU
```



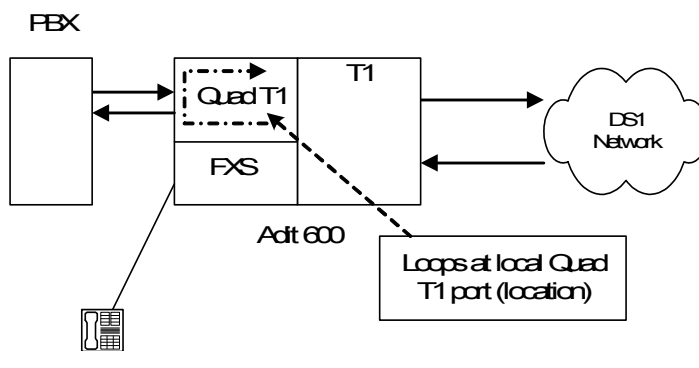
### DS1 Equipment Loop

Note: Quad T1 LED stays green during equipment loop. The DS1 Equipment Loopback is available on the Quad T1/E1 card and is not available on the Controller card.

#### Enable Equipment Loopback

Where a Quad T1 card is in slot 5.

```
> set 5:1 equipment loopup
OK
```



#### View Status of Loopback

```
> show 5:1
SLOT 5:
Settings for DS1 1:
  Circuit ID:      TN DS1# 5:1
  Up/Down:        UP
  Framing:        ESF
  Line Coding:     B8ZS
  Line Build Out:  DSX-1 EQUALIZATION FOR 0-133 ft. (CSU 0dB)
  Loop Code Detection: ON
  Loopback:       EQUIPMENT
  FDL Type:       None
```

Performance Threshold Settings	15 min.	1 day
unavailable seconds:	0	0
severely errored seconds:	0	0
errored seconds:	0	0
sev. errored frame seconds:	0	0
line errored seconds:	0	0
controlled slip seconds:	0	0
bursty errored seconds:	0	0
degraded minutes:	0	0
total linecode violations:	0	0
total pathcode violations:	0	0

#### Disable Equipment Loopback

```
> set 5:1 equipment loopdown
OK
```

**View Status of Loopback**

> show 5:1

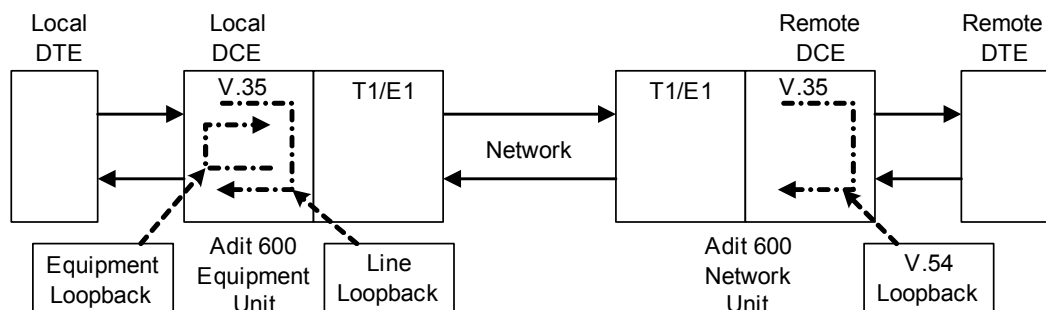
SLOT 5:

Settings for DS1 1:

Circuit ID:	TN DS1# 5:1
Up/Down:	UP
Framing:	ESF
Line Coding:	B8ZS
Line Build Out:	DSX-1 EQUALIZATION FOR 0-133 ft. (CSU 0dB)
Loop Code Detection:	ON
Loopback:	<b>OFF</b>
FDL Type:	None

Performance Threshold Settings	<u>15 min.</u>	<u>1 day</u>
unavailable seconds:	0	0
severely errored seconds:	0	0
errored seconds:	0	0
sev. errored frame seconds:	0	0
line errored seconds:	0	0
controlled slip seconds:	0	0
bursty errored seconds:	0	0
degraded minutes:	0	0
total linecode violations:	0	0
total pathcode violations:	0	0

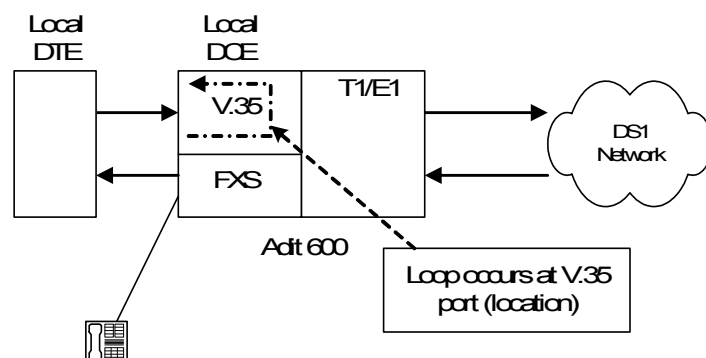
## V.35 Loopbacks



## V.35 Line Loop

Note: V.35 LED flashes green during line loop.

Loop occurs at V.35 port. Check for sync and errors at local data port.



## Enable Line Loopback

Where a V.35 card is in slot 6.

```
> set 6:1 line loopup
OK
```

## View Status of Loopback

```
> show 6:1
SLOT 6:
Settings for V35 Port 1:
  CTS:                Always High
  Timing:              Source
  Rx Clock Inversion: Normal
  Tx Clock Inversion: Normal
  Data Inversion:      Normal
  Data Speed:          64K
  Data Rate:           1536 K
  Loopback:            Line
```



***Disable Line Loopback***

```
> set 6:1 line loopdown
OK
```

***View Status of Loopback***

```
> show 6:1
SLOT 6:
Settings for V35 Port 1:
    CTS:                Always High
    Timing:              Source
    Rx Clock Inversion:  Normal
    Tx Clock Inversion:  Normal
    Data Inversion:      Normal
    Data Speed:          64K
    Data Rate:            1536 K
    Loopback:             None
```

#### V.35 Equipment Loop

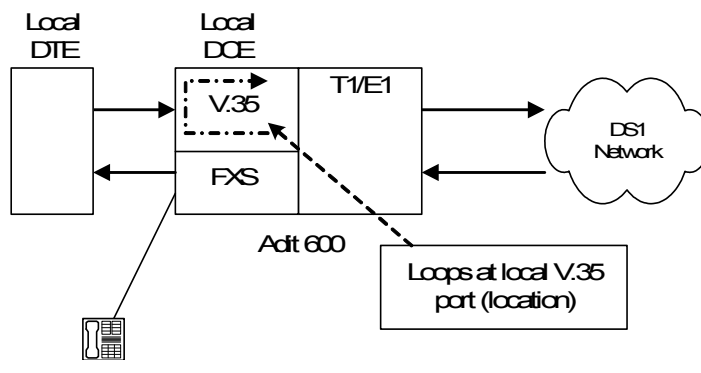
Note: V.35 LED flashes yellow during equipment loop.

Loops at local V.35 port. Check for sync and errors at remote data port, with or without BERT.

#### Enable Equipment Loopback

Where a V.35 card is in slot 6.

```
> set 6:1 equipment loopup
OK
```



#### View Status of Loopback

```
> show 6:1
SLOT 6:
Settings for V35 Port 1:
    CTS:                Always High
    Timing:              Source
    Rx Clock Inversion:  Normal
    Tx Clock Inversion:  Normal
    Data Inversion:      Normal
    Data Speed:          64K
    Data Rate:           1536 K
    Loopback:            Equipment
```

#### Disable Equipment Loopback

```
> set 6:1 equipment loopdown
OK
```

#### View Status of Loopback

```
> show 6:1
SLOT 6:
Settings for V35 Port 1:
    CTS:                Always High
    Timing:              Source
    Rx Clock Inversion:  Normal
    Tx Clock Inversion:  Normal
    Data Inversion:      Normal
    Data Speed:          64K
    Data Rate:           1536 K
    Loopback:            None
```

## **V.35/V.54 Loop**

### **V.35/V.54 Service Card Description**

The V.35 Card with V.54 Loop Test provides the capability for the V.35 card to detect network loop back initiation signals and provide a network loop back for loop testing. Each channel of the V.35 will continuously monitor the incoming data bit stream for a particular loop pattern. On detection of the pattern the channel will acknowledge the loop test request and put the channel into loop back. The channel will then continuously monitor for the loop test end pattern. On detection of the loop end pattern the channel will remove loop back and resume normal operation. Front panel LED's will indicate Loop test. Each channel can also initiate the loop test pattern causing another V.54 compatible device to loop back. The channel will then transmit a test pattern and calculate bit error rate (BER).

### **View V.35/V.54 Card Configuration**

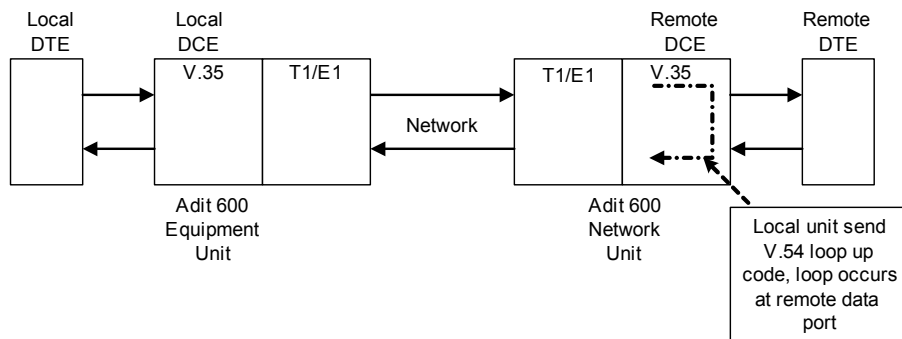
Where a V.35/V.54 card is in slot 6.

```
> show 6:1
SLOT 6:
Settings for V35 Port 1:
    CTS:                Always High
    Timing:              Source
    Rx Clock Inversion:  Normal
    Tx Clock Inversion:  Normal
    Data Inversion:      Normal
    Data Speed:          64K
    Data Rate:           768 K
    V.54 Rx LB:        disabled
    V.54 Rx Addr:        255
    V.54 Test Addr:      255
    V.54 Tx Prep count:  15
    V.54 Rx Prep count:  15
    V.54 Test Pattern:   QRSS
    V.54 Ignore ACK:     OFF
    Loopback:         None
```

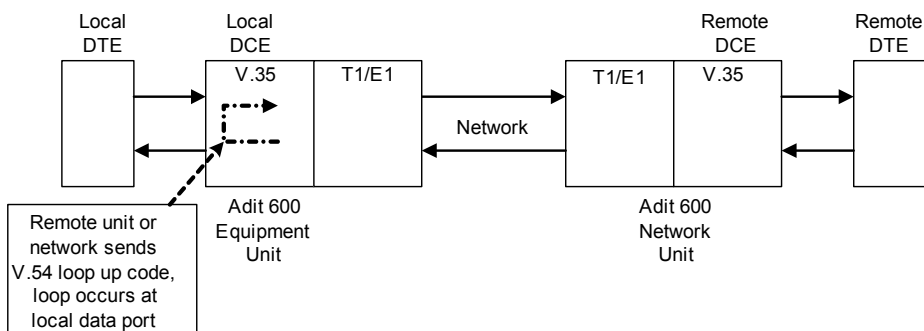
### V.54 Loop

Note: Local LED flashes yellow, remote LED flashes green.

#### Transmit V.54 Loopup



#### Receive V.54 Loopup



### Enable V.54 Loop

Where a V.35/V.54 card is in slot 6.

```
> set 6:1 v54 network enable
OK
```

### View Status of Loopback

```
> show 6:1
SLOT 6:
Settings for V35 Port 1:
CTS:                Always High
Timing:              Source
Rx Clock Inversion:  Normal
Tx Clock Inversion:  Normal
Data Inversion:      Normal
Data Speed:          64K
Data Rate:           768 K
V.54 Rx LB:       enabled
V.54 Rx Addr:        255
V.54 Test Addr:      255
V.54 Tx Prep count:  15
V.54 Rx Prep count:  15
V.54 Test Pattern:   QRSS
V.54 Ignore ACK:     OFF
Loopback:        None
```

## **V.54 Equipment Loopback**

### **Enable V.54 Equipment Loopup**

Where a V.35/V.54 card is in slot 6.

```
> set 6:1 v54 equipment loopup
OK
```

### **View Status of Loopback**

```
> show 6:1
SLOT 6:
Settings for V35 Port 1:
    CTS:                Always High
    Timing:              Source
    Rx Clock Inversion:  Normal
    Tx Clock Inversion:  Normal
    Data Inversion:      Normal
    Data Speed:          64K
    Data Rate:           768 K
V.54 Rx LB:          enabled
    V.54 Rx Addr:        255
    V.54 Test Addr:      255
    V.54 Tx Prep count:  15
    V.54 Rx Prep count:  15
    V.54 Test Pattern:   QRSS
    V.54 Ignore ACK:     OFF
Loopback:           Equipment (V.54)

> status 6:1
SLOT 6:
Status for V35 PORT 1:
    DCD:    High
    CTS:    High
    DSR:    High
    RTS:    High
    DTR:    High
BERT:     RUNNING (Syncing up)

> status 6:1
SLOT 6:
Status for V35 PORT 1:
    DCD:    High
    CTS:    High
    DSR:    High
    RTS:    High
    DTR:    High
BERT:     RUNNING
    BITS:      8386950
    ERRS:       0
    BER:       0.00000000
```

#### ***Disable V.54 Equipment Loopup***

```
> set 6:1 v54 equipment loopdown
OK
```

#### ***View Status of Loopback***

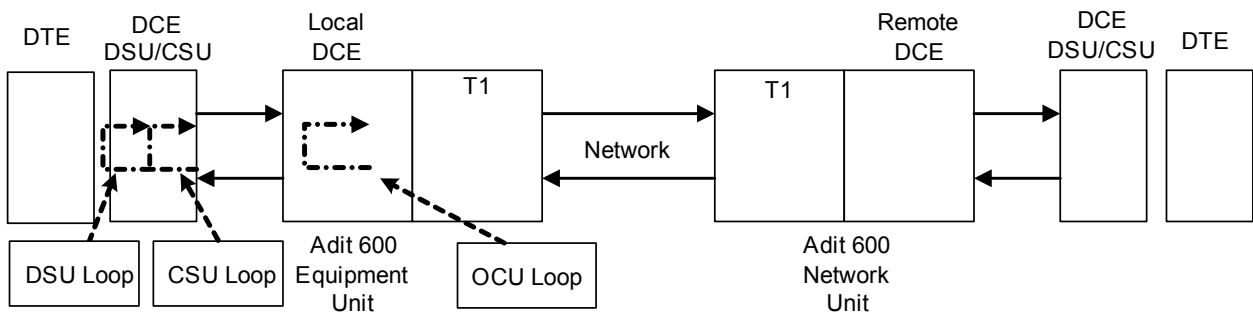
```
> status 6:1
SLOT 6:
Status for V35  PORT 1:
    DCD:    High
    CTS:    High
    DSR:    High
    RTS:    High
    DTR:    High
    BERT:    Complete
    BITS:    109030350
    ERRS:    0
    BER:    0.00000000
    BERT DATE: 1/5/2001 01:39:18
```

## OCU-DP Loopbacks

These loopbacks may be activated by the network or manually (CLI). These loopbacks are OCU, CSU, and DSU. The Network may activate each loopback by sending latching or non-latching code sequences. The OCU-DP card may be configured to allow detection of each sequence for each loopback.

**NOTE:** Latching loopback (`set {ocudp-addr} loopdetect {csu|dsu|ocu} 11b enable`) must be enabled for inband loopback functions to work. If loop detect is not enabled the loop is ignored and is not passed in any way.

Loop detection collects the inband loop signal and forwards it to the CSU/DSU on the drop side of the OCU-DP port. With a CSU Loop, we collect the signal and reverse battery (T&R) of the port TX. This will loopup the CSU.



### View OCU-DP Card Configuration

Where a OCU-DP card is in slot 3.

```
> show 3:1
SLOT 3:
Settings for OCUDP Port 1:
  Up/Down:                UP
  Baudrate:               56000
  Loopdetect Types Enabled:
                           CSU Latching
                           DSU Latching
                           OCU Latching
  Error Correction:       DISABLE
  Secondary Channel:      DISABLE
```

#### **Non-Latching Loopdetect**

##### **Enable OCU-DP Non-Latching Loopdetect**

Where a OCU-DP card is in slot 3.

```
> set 3:1 loopdetect ocu nllb enable
OK
```

```
> set 3:1 loopdetect csu nllb enable
OK
```

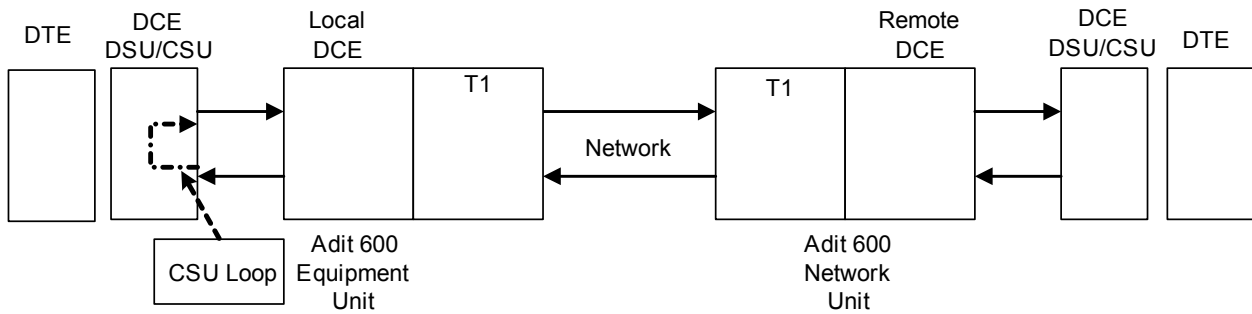
```
> set 3:1 loopdetect dsu nllb enable
OK
```

##### **View Status of Loopdetect**

```
> show 3:1
SLOT 3:
Settings for OCUDP Port 1:
  Up/Down:                               UP
  Baudrate:                              56000
  Loopdetect Types Enabled:
    CSU Latching
    CSU Non-Latching
    DSU Latching
    DSU Non-Latching
    OCU Latching
    OCU Non-Latching
  Error Correction:                       DISABLE
  Secondary Channel:                      DISABLE
```



### **CSU Manual Loopback**



### **Enable CSU Manual Loopback**

Where a OCU-DP card is in slot 3.

```
> set 3:1 loopback csu loopup
OK
```

### **View Status of Loopback**

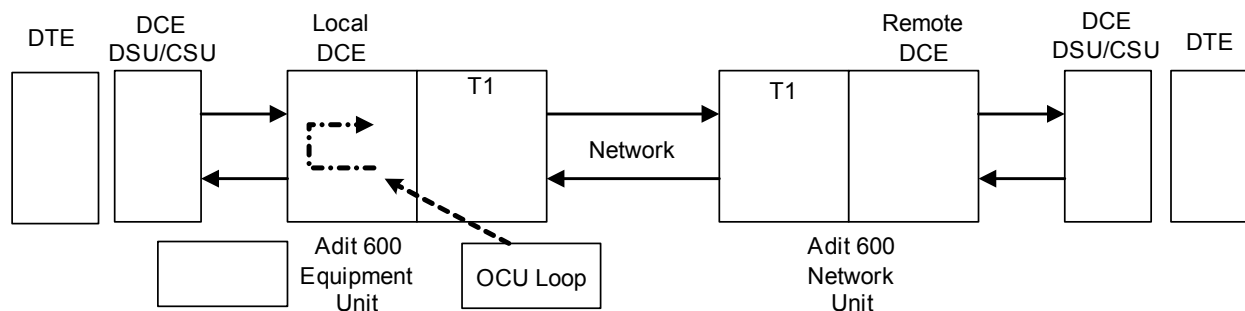
```
> status 3:1
SLOT 3:
Status for OCUDP Port 1:
  Selftest:
Results as of 00:00:24 01/01/2001
  Datapath:          PASS
  FPGA:              PASS
  OCU:               PASS

  OCU Manual Loopback:  NONE
  CSU Manual Loopback:  In Progress

  OCU NonLatching Loopback:  NONE
  DSU NonLatching Loopback:  NONE
  CSU NonLatching Loopback:  NONE

  OCU Latching Loopback:  NONE
  DSU Latching Loopback:  NONE
  CSU Latching Loopback:  NONE
```

#### Manual OCU Loopback



#### Enable Manual OCU Loopback

Where a OCU-DP card is in slot 3.

```
> set 3:1 loopback ocu loopup
OK
```

#### View Status of Loopback

```
> status 3:1
SLOT 3:
Status for OCUDP Port 1:
  Selftest:
Results as of 00:00:24 01/01/2001
  Datapath:          PASS
  FPGA:              PASS
  OCU:                PASS
```

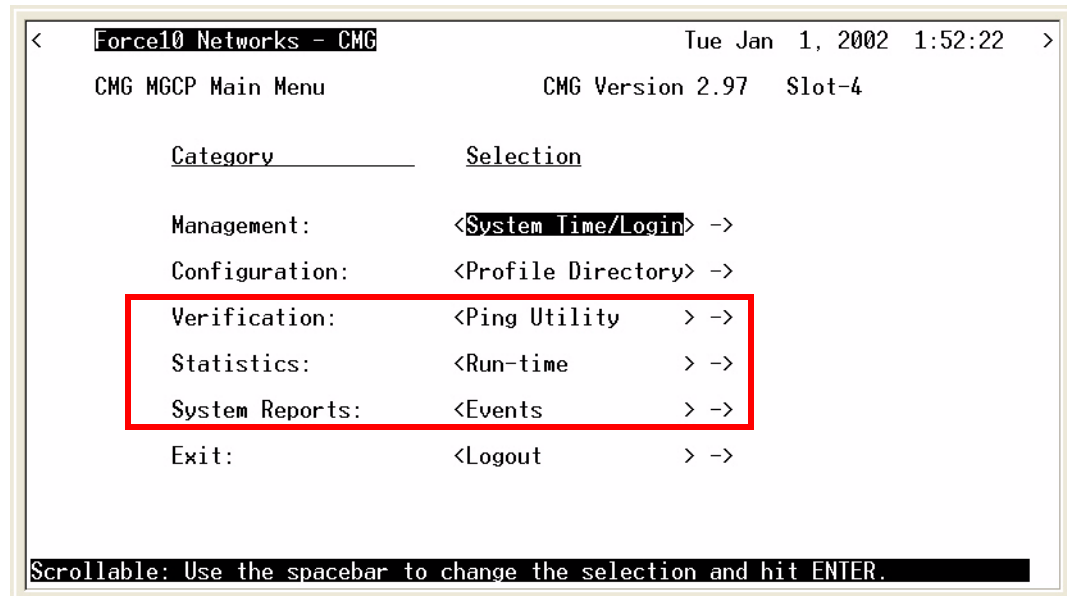
<b>OCU Manual Loopback:</b>	<b>In Progress</b>
CSU Manual Loopback:	NONE

OCU NonLatching Loopback:	NONE
DSU NonLatching Loopback:	NONE
CSU NonLatching Loopback:	NONE

OCU Latching Loopback:	NONE
DSU Latching Loopback:	NONE
CSU Latching Loopback:	NONE

## Router Diagnostics and Performance Tools

The Verification, Statistics and System Reports features are instrumental in diagnosing and troubleshooting the router card. For more information on these features, see the router User Manual.



### Verification

The Verification section may be used to identify suspected communication problems between the local and remote devices. Verification options are:

#### **Ping Utility**

Verifies the ability of the local unit to communicate by pinging remote or local devices.

#### **Port Monitor**

The Port Monitor is a diagnostic tool that is used to review the actual data being transmitted from, or received by the local Router. When the monitoring is started, a hexadecimal display of each transmission as it occurs is shown.

Note: The Port Monitor decreases the throughput of the Router. It should only be used during installation and troubleshooting procedures, not during normal operation.

#### **Trace Route**

The Trace Route option is used to verify timely and reliable connections. The Trace Route utility determines the path a packet follows from source to destination.

## **Statistics**

### **Run-Time**

The Run-Time is used to review data transmission information between the Local (LAN) unit and Remote (WAN) devices. This option allows you to review data transmission statistics to/from remote units. This data will help you to monitor the Router's connection/performance capabilities such as throughput, compression, and errors.

## **System Reports**

The System Reports menu presents data that may be useful in identifying WAN communication problems.

### **Events**

The Events listing offers on-going historical activity for the Router, while the Alarm listing indicates events that suggest further investigation.

### **Alarms**

This screen provides a listing of any Alarms that have occurred on the Router. When an Alarm is triggered, the Router LED (labeled CRD) will display a red indicator light, which will stay on until the Alarm is cleared. Each Alarm is listed separately and the Count field will display a value of 1.

### **Network/Servers**

By sending out IPX and IP RIP (Routing Information Protocol) and IPX SAP (Service Advertising Protocol) packets and monitoring RIP and SAP packets from other devices, the Router will learn about other servers and networks. The Router will constantly monitor RIP and SAP packets to ensure that the status of the network or server has changed. Should a RIP or SAP packet indicate a change in status, the Router would update the data in the table and send the information to all enabled remotes to exchange the updated data.

### **Address Tables**

The MAC Address and IP Address Tables, along with Network Tables are used to determine if and where the Router should send packets.

# APPENDIX D

---

## *Protocol Types*

### **In this Appendix**

- Protocol Number in Firewall Filters
- Ethernet Protocol Types

## Protocol Number in Firewall Filters

The Router cards can filter based on protocol numbers. See *add (router-wan) firewall* on page 5-20 and *add (router-lan) firewall* on page 5-15 for firewall instructions.

Number	Keyword	Protocol	Reference
0	HOPOPT	IPv6 Hop-by-Hop Option	[RFC1883]
1	ICMP	Internet Control Message	[RFC702]
2	IGMP	Internet Group Management	[RFC1112]
3	GGP	Gateway-to-Gateway	[RFC823]
4	IP	IP in PIP (encapsulation)	[RFC2003]
5	ST	Stream	[RFC1190, RFC1819]
6	TCP	Transmission Control	[RFC793]
7	CBT	CBT	[Ballardie]
8	EGP	Exterior Gateway Protocol	[RFC888, DLM1]
9	IGP	any private interior gateway (used by Cisco for their IGRP)	[IANA]
10	BBN-RCC-MON	BBN RCC Monitoring	[SGC]
11	NVP-II	Network Voice Protocol	[RFC741, SC3]
12	PUP	PUP	[PUP, XEROX]
13	ARGUS	ARGUS	[RWS4]
14	EMCON	EMCON	[BN7]
15	XNET	Cross Net Debugger	[IEN158, JFH2]
16	CHAOS	Chaos	[NC3]
17	UDP	User Datagram	[RFC768, JBP]
18	MUX	Multiplexing	[IEN90, JBP]
19	DCN-MEAS	DCN Measurement Subsystems	[DLM1]
20	HMP	Host Monitoring	[RFC890, RH6]
21	PRM	Packet Radio Measurement	[ZSU]
22	XNS-IDP	XEROX NS IDP	[ETHERNET, XEROX]
23	TRUNK-1	Trunk-1	[BWB6]
24	TRUNK-2	Trunk-2	[BWB6]
25	LEAF-1	Leaf-1	[BWB6]
26	LEAF-2	Leaf-2	[BWB6]
27	RDP	Reliable Data Protocol	[RFC908, RH6]
28	IRTP	Internet Reliable Transaction	[RFC938, TXM]
29	ISO-TP4	ISO Transport Protocol Class 4	[RFC905, RC77]
30	NETBLT	Bulk Data Transfer Protocol	[RFC969, DDC1]
31	MFE-NSP	NFE Network Services Protocol	[MFENET, BCH2]
32	MERIT-INP	MERIT Internodal Protocol	[HWB]
33	SEP	Sequential Exchange Protocol	[JC120]
34	3PC	Third Party Connect Protocol	[SAF3]
35	IDPR	Inter-Domain Policy Routing Protocol	[MXS1]
36	XTP	XTP	[GXC]
37	DDP	Datagram Delivery Protocol	[WXC]

Number	Keyword	Protocol	Reference
38	IDPR-CMTP	IDPR Control Message Transport Protocol	[MXS1]
39	TP++	TP++ Transport Protocol	[DXF]
40	IL	IL Transport Protocol	[Presotto]
41	IPv6	IPv6	[Deering]
42	SDRP	Source Demand Routing Protocol	[DXE1]
43	IPv6-Route	Routing Header for IPv6	[Deering]
44	IPv6-Frag	Fragment Header for IPv6	[Deering]
45	IDRP	Inter-Domain Routing Protocol	[Sue Hares]
46	RSVP	Reservation Protocol	[Bob Braden]
47	GRE	General Routing Encapsulation	[Tony Li]
48	MHRP	Mobile Host Routing Protocol	[David Johnson]
49	BNA	BNA	[Gary Salamon]
50	ESP	Encap Security Payload for IPv6	[RFC2406]
51	AH	Authentication Header for IPv6	[RFC2402]
52	I-NLSP	Integrated Net Layer Security TUBA	[GLENN]
53	SWIPE	IP with Encryption	[J16]
54	NARP	NBMA Address Resolution Protocol	[RFC1735]
55	MOBILE	IP Mobility	[Perkins]
56	TLSP	Transport Layer Security Protocol using Kryptonnet key management	[Oberg]
57	SKIP	SKIP	[Markson]
58	IPv6-ICMP	ICMP for IPv6	[RFC1883]
59	IPv6-NoNxt	No Next Header for IPv6	[RFC1883]
60	IPv6-Opts	Destination Options for IPv6	[RFC1883]
61		any host internal protocol	[IANA]
62	CFTP	CFTP	[CFTP, HCF2]
63		any local network	[IANA]
64	SAT-EXPAK	SATNET and Backroom EXPAK	[SHB]
65	KRYPTOLAN	Kryptolan	[PXL1]
66	RVD	MIT Remote Virtual Disk Protocol	[MBG]
67	IPPC	Internet Pluribus Packet Core	[SHB]
68		any distributed file system	[IANA]
69	SAT-MON	SATNET Monitoring	[SHB]
70	VISA	VISA Protocol	[GXT1]
71	IPCV	Internet Packet Core Utility	[SHB]
72	CPNX	Computer Protocol Network Executive	[DXM2]
73	CPHB	Computer Protocol Heart Beat	[DXM2]
74	WSN	Wang Span Network	[VXD]
75	PVP	Packet Video Protocol	[SC3]
76	BR-SAT-MON	Backroom SATNET Monitoring	[SHB]
77	SUN-ND	SUN ND PROTOCOL-Temporary	[WM3]
78	WB-MON	WIDEBAND Monitoring	[SHB]
79	WB-EXPAK	WIDEBAND EXPAK	[SHB]
80	ISO-IP	ISO Internet Protocol	[MTR]

## Protocol Types

### Protocol Number in Firewall Filters

Number	Keyword	Protocol	Reference
81	VMTP	VMTP	[DRC3]
82	SECURE-VMTP	SECURE-VMTP	[DRC3]
83	VINES	VINES	[BXH]
84	TTP	TTP	[JXS]
85	NSFNET-IGP	NSFNET-IGP	[HWB]
86	DGP	Dissimilar Gateway Protocol	[DGP, ML109]
87	TCF	TCF	[GAL5]
88	EIGRP	EIGRP	[CISCO, GXS]
89	OSPFIGP	OSPFIGP	[RFC1583, JTM4]
90	Sprite-RPC	Sprite RPC Protocol	[SPRITE, BXW]
91	LARP	Locus Address Resolution Protocol	[BXH]
92	MTP	Multicast Transport Protocol	[SXA]
93	AX.25	AZ.25 Frames	[BK29]
94	IPIP	IP-within-IP Encapsulation Protocol	[JI6]
95	MICP	Mobile Internetworking Control Pro	[JI6]
96	SCC-SP	Semaphore Communications Sec. Pro.	[HXH]
97	ETHERIP	Ethernet-within-IP Encapsulation	[RFC3378]
98	ENCAP	Encapsulation Header	[FRC1241, RXB3]
99		any private encryption scheme	[IANA]
100	GMTP	GMTP	[RXB5]
101	IFMP	Ipsilon Flow Management Protocol	[Hinden]
102	PNNI	PNNI over IP	[Callon]
103	PIM	Protocol Independent Multicast	[Farinacci]
104	ARIS	ARIS	[Feldman]
105	SCPS	SCPS	[Durst]
106	QNX	QNX	[Hunter]
107	A/N	Active Networks	[Braden]
108	IPComp	IP Payload Compression Protocol	[RFC2393]
109	SNP	Sitara Networks Protocol	[Sridhar]
110	Compaq-Peer	Compaq Peer Protocol	[Volpe]
111	IPX-in-IP	IPX in IP	[Lee]
112	VRRP	Virtual Router Redundancy Protocol	[Hinden]
113	PGM	PBM Reliable Transport Protocol	[Speakman]
114		any 0-hop protocol	[IANA]
115	L2TP	Layer Two Tunneling Protocol	[Aboba]
116	DDX	D-II Data Exchange (DDX)	[Worley]
117	IATP	Interactive Agent Transfer Protocol	[Murphy]
118	STP	Schedule Transfer Protocol	[JMP]
119	SRP	SpectraLink Radio Protocol	[Hamilton]
120	UTI	UTI	[Lothberg]
121	SMP	SMP	[Ekblad]
122	SM	SM	[Crowcroft]
123	PTP	Performance Transparency Protocol	[Welzl]



Number	Keyword	Protocol	Reference
124	ISIS over IPv4		[Przygienda]
125	FIRE		[Partridge]
126	CRTP	Combat Radio Transport Protocol	[Sautter]
127	CRUDP	Combat Radio User Datagram	[Sautter]
128	SSCOPMCE		[Waber]
129	IPLT		[Hollbach]
130	SPS	Secure Packet Shield	[McIntosh]
131	PIPE	Private IP Encapsulation within IP	[Petri]
132	SCTP	Stream Control Transmission Protocol	[Stewart]
133	FC	Fibre Channel	[Rajagopal]
134	RSVP-E2E-IGNORE		[RFC3175]
135-254		Unassigned	[IANA]
255		Reserved	[IANA]

## **Ethernet Protocol Types**

This table defines the protocol types that would be used by the LAN Protocol filters. The associated Hex number is entered into the Ethernet Value field. See, *add (router-lan) filter protocol on page 5-14*, under {**ether-type**} for the CLI field that this number is entered.

HEX	DESCRIPTION
0000-05DC	IEEE 802.3 Length Field (0-1500 decimal)
1010-01FF	Experimental (for development) Conflicts with 802.3 length fields
0200	Xerox PUP - Conflicts with 802.3 length fields
0201	PUP Address Translation - Conflicts with 802.3 length fields
0600	Xerox XNS IDP
0800	DOD IP
0801	X.75 Internet
0802	NBS Internet
0803	ECMA Internet
0804	CHAOSnet
0805	X.25 Level 3
0806	ARP (for IP and for CHAOS)
0807	SNX Compatibility
081C	Symbolics Private
0888-088A	Xyplex
0900	Ungermann-Bass network debugger
0A00	Xerox 802.3 PUP
0A01	PUP 802.3 Address Translation
0BAD	Banyan Systems Inc.
1000	Berkeley trailer negotiation
1001-100F	Berkeley Trailer encapsulation
1600	VALID
4242	BXS Basic Block Protocol
5208	BBN Simnet Private
6000	DEC Unassigned
6001	DEC MOP Dump/Load Assistance
6002	DEC MOP Remote Console
6003	DEC DECnet Phase IV
6004	DEC LAT

HEX	DESCRIPTION
6005	DEC DECnet Diagnostics
6006	DEC DECnet Customer Use
6007	DEC DECnet SCA
6008	DEC unassigned
6009	DEC unassigned
6010-6014	3Com Corporation
7000	Ungermann-Bass download
7001	Ungermann-Bass NIU
7002	Ungermann-Bass NIU
7007	OS/9 Microware
7020-7029	LRT (England)
7030	Proteon
7034	Cabletron
8003	Cronus VLN
8004	Cronus Direct
8005	HP Probe protocol
8006	Nestar
8008	AT&T
8010	Excelan
8013	SGI diagnostic type (obsolete)
8014	SGI network games (obsolete)
8015	SGI reserved type (obsolete)
8016	SGI "bounce server" (obsolete)
8019	Apollo
802E	Tymshare
802F	Tigan, Inc.
8035	Reverse ARP
8036	Aeonic Systems
8038	DEC LANBridge
8039	DEC Unassigned
803A	DEC Unassigned
803B	DEC Unassigned
803C	DEC Unassigned

HEX	DESCRIPTION
803D	DEC Ethernet CSMA/CD Encryption Protocol
803E	DEC Unassigned
803F	DEC LAN Traffic Monitor
8040	DEC Unassigned
8041	DEC Unassigned
8042	DEC Unassigned
8044	Planning Research Corporation
8046	AT&T
8047	AT&T
8049	ExperData (France)
805B	VMTP (Versatile Message Transaction Protocol, RFC-1045, Stanford)
805C	Stanford V Kernel production, Version 6.0
805D	Evans & Sutherland
8060	Little Machines
8062	Counterpoint Computers
8065	University of Massachusetts, Amherst
8066	University of Massachusetts, Amherst
8067	Veeco Integrated Automation
8068	General Dynamics
8069	AT&T
806A	Autophon (Switzerland)
806C	ComDesign
806D	Compugraphic Corporation
806E-8077	Landmark Graphics Corporation
807A	Matra (France)
807B	Dansk Data Elektronik A/S (Denmark)
807C	Merit Internodal
807D	VitaLink Communications
807E	VitaLink Communications
807F	VitaLink Communications
8080	VitaLink Communications bridge
8081	Counterpoint Computers
8082	Counterpoint Computers

HEX	DESCRIPTION
8083	Counterpoint Computers
8088	Xyplex
8089	Xyplex
808A	Xyplex
809B	Kinetics Ethertalk-Appletalk over Ethernet
809C	Datability
809D	Datability
809E	Datability
809F	Spider Systems, Ltd. (England)
80A3	Nixdorf Computer (West Germany)
80A4-80B3	Siemens Gammasonics Inc.
80C0	Digital Communication Associates
80C1	Digital Communication Associates
80C2	Digital Communication Associates
80C3	Digital Communication Associates
80C6	Pacer Software
80C7	Applitek Corporation
80C8-80CC	Integraph Corporation
80CD	Harris Corporation
80CE	Harris Corporation
80CF-80D2	Taylor Inst.
80D3	Rosemount Corporation
80D4	Rosemount Corporation
80D5	IBM SNA Services over Ethernet
80DD	Varian Associates
80DE	Integrated Solutions TRFS (Transparent Remote File System)
80DF	Integrated Solutions
80E0-80E3	Allen-Bradley
80E4-80F0	Datability
80F2	Retix
80F3	Kinetics, AppleTalk ARP (AARP)
80F4	Kinetics
80F5	Kinetics

HEX	DESCRIPTION
80F7	Apollo Computer
80FF-8103	Wellfleet Communications
8107	Symbolics Private
8108	Symbolics Private
8109	Symbolics Private
8130	Waterloo Microsystems
8131	VG Laboratory Systems
8137	Novell (old) NetWare IPX (ECONFIG E Option)
8138	Novell
8139-813D	KTI
9000	Loopback (Configuration Test Protocol)
9001	Bridge Communications XNS Systems Management
9002	Bridge Communications TCP/IP Systems Management
9003	Bridge Communications
FF00	BBN BITAL LANBridge cache wakeup

# APPENDIX E

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## ***Force10 Networks Adit 600 U.S. DoD Deployment Guide For Release 10.1***

### **In this Appendix**

- Overview
- Adit 600 Overview
- Installing Release 10.1
- Required Ancillary Equipment (RAE)
- Release 10.1 Security Features

## Overview

This document provides the latest information about deploying release 10.1 software on the Adit® 600 Multiservice Delivery Terminal in Department of Defense networks. Software release 10.1 includes all of the new features required to meet the U.S. Department of Defense network requirements for listing on the DSN Approved Products List (APL), as maintained by the Defense Information Service Agency (DISA) Joint Interoperability Test Command (JITC).

Release 10.1 software is available through Force10 Networks' Customer Support website at [www.force10networks.com/support](http://www.force10networks.com/support). If you have determined that you require an upgrade for your Adit 600 chassis, please contact Customer Support at 1-866-887-4638 or contact your Force Networks federal sales representative at [FederalSales@force10networks.com](mailto:FederalSales@force10networks.com).

## Adit 600 Overview

The Adit 600 defines a new class of equipment that combines multi-network access and multi-service delivery into one platform. The result is an extremely cost-effective, compact, and flexible solution that supports voice, IP, high-speed data, and legacy serial services using the most economical broadband access available over wireline and wireless networks. Its expandable architecture scales across service types, network architectures, and bandwidth requirements to fit a dynamic service delivery environment.

Hot-swappable service cards provide the physical, electrical, and logical connections for analog line terminations, PBX interfaces, LAN to WAN connectivity, serial interfaces, and network access. Customer interface types include Routed Ethernet, FXS, FXO/DPT, V.35, V.35/V.54, RS-232, OCU-DP, ISDN BRI, Terminal Server Router (TSR), P-Phone (Meridian Digital Centrex), Single-channel POTS, and T1 or E1. Any service card can be placed in any of the six available slots. New services can be added easily by installing a new card.

The Adit 600 features:

- Any service connection or network access line to be deployed in any slot
- Integrated 18 T1 or E1 port digital cross-connect for service grooming and restoration
- Flexibly provisions a broad variety of services within a single Adit 600 chassis occupying just 2 rack units of equipment space
- Supplies integrated dual T1/E1 CSU/DSUs and SNMP management on the Controller
- Supports VPN routing through the MSR card
- Supports T.38 Fax Relay through the CMG card and MSR card
- Supports SSH and SNMPv3
- Enables remote management



## **Installing Release 10.1**

*Chapter 24, Maintenance* in the *Adit 600 User Manual* provides detailed instructions on how to securely upload software to the Adit 600 Controller. Please note that a software key is necessary to enable SSH and SNMPv3 security features. This key is specific per Adit 600 Controller and cannot be shared between Controllers. Please contact Force10 Networks Customer Support at 1-866-887-4638 if you need help upgrading to Release 10.1 software or installing a security key. Please be ready to provide the Serial Number of the chassis and/or MAC address when requesting a security key.

The Adit 600 is controlled by issued instructions using a proprietary version of Command Line Interface (CLI). This CLI is very intuitive and has built-in prompt and help functions. The basic format for all CLI instructions is a command followed by the object to be modified followed by the specific setting and applicable modification. The “?”-key following a command will provide basic help instructions while the “TAB”-key following a command will provide the next level or expected completion for a command. All CLI commands are limited to specific user levels. All security commands are executed by CLI. A description of all CLI commands occurs in *Chapter 5, CLI Commands*.

## **Required Ancillary Equipment (RAE)**

DISA has determined that the Adit 600 shall be deployed with an Ethernet link to a RADIUS server and a Syslog server to adequately meet minimum security requirements when connected to a DISA network. Please be sure to implement these services if required.

## **Release 10.1 Security Features**

With over 135,000 units deployed, the Adit 600 Multiservice Delivery Terminal is one of the most flexible multiplexers available. Release 10.1 adds significant security enhancements that may be necessary for connection to select DoD networks. Most of these functions are described in *Chapter 4, Configuration*. They include the following:

### **User Security**

The default for the system is to have no login. A user login should be established as soon as possible after basic setup of the chassis has been completed (See also the *Adit 600 Quick Start Guide*). *Setting up Login Security* on page 4-3 explains user levels and functions, and *Basic System Setup* on page 4-5 explains how to establish minimum security. User levels and access privileges are described under the *set user level* CLI command. Note that the *set password length* command should be set to “long” to meet minimum password length requirements for most situations. The *set login max attempts* command establishes the number of unsuccessful SSH login attempts that can be attempted for a session (default 3, maximum 7, 0 implies unlimited). The *set autoexit* on command should be initiated to automatically log off user sessions that are inactive for at least 20 minutes.

Remote user validation is established by configuring access to one or more RADIUS servers. Basic RADIUS commands are controlled via the command *set radius*. Logins are then restricted to Radius by setting the command *set login auth* to “Radius”. These are described in *Chapter 5, CLI Commands*. The Adit 600 does not internally mandate user password complexity, initial password reset, or password reset due to aging, and appropriate manual procedures should be implemented to ensure adequate security if access to a RADIUS server is not available. The RADIUS server should also be used for PKI certificate validation as Release 10.1 is not PK-enabled.

## **Secure Access**

Secure Shell (SSH) and Secure Copy (SCP) provide encrypted methods to access the Adit 600 remotely. An appropriate PC running an appropriate secure software terminal emulator such as SecureCRT is necessary to use SSH. The *set ssh* CLI command controls SSH parameters, including key settings. Note that *set telnet* should be set to “disable” when using SSH (default value). The *ssh ip* command is used to establish the IP address for the SSH session. The *store scp* command is used to save batch files remotely after an SSH session has been established. The logon banner file may be transferred to the Adit (note it is currently limited to 240 characters in length). These commands are described more fully in *Chapter 5, CLI Commands*.

## **Security and Event Logs**

The Adit 600 logs events, alarms and security into an internal log. This log currently overwrites the oldest records first when it is full. Therefore, it is highly recommended that a Syslog server be associated to the Adit for concurrent logging of events and that a procedure be implemented to manually offload logs if a Syslog server is unavailable. The *set syslog* CLI command controls the Syslog. Note that all events are logged based on the Adit 600 internal clock which must be set using the manual *set date* and *set time* commands or automatically by enabling the *set ntp* automatic time update commands.

## **SNMP**

The Adit 600 supports a variety of SNMP commands and traps and can be configured to encrypt them using SNMPv3. *Appendix B, SNMP Interface* in the *Adit 600 User Manual* describes SNMP and SNMPv3.

# GLOSSARY

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<b>ADPCM</b>	Adaptive Differential Pulse Code Modulation
<b>AIS</b>	Alarm Indication Signal
<b>AMI</b>	Automatic Mark Inversion
<b>ARP</b>	Address Resolution Protocol
<b>ATM</b>	Asynchronous Transfer Mode
<b>B8ZS</b>	Bipolar with 8 Zero Substitution
<b>BER</b>	Bit Error Rate
<b>BERT</b>	Bit Error Rate Tester
<b>BES</b>	Burst Errored Seconds
<b>BIT</b>	Binary Digit
<b>bps</b>	Bits Per Second
<b>BPV</b>	Bipolar Violation
<b>BRI</b>	Basic Rate Interface
<b>CAS</b>	Channel Associated Signaling
<b>CCS</b>	Common Channel Signaling
<b>CHAP</b>	Challenge Handshake Authentication Protocol
<b>CIDR</b>	Classless Inter-Domain Routing
<b>CLASS</b>	Custom Local Area Signaling Service
<b>CLEI</b>	Common Language Equipment Identification
<b>CLI</b>	Command Line Interface
<b>CMG</b>	Customer Media Gateway
<b>CNG</b>	Also called Auto Fax Tone or Calling Tone
<b>CO</b>	Central Office

## ***Glossary***

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<b>CPE</b>	Customer Provided Equipment
<b>CRC</b>	Cyclic Redundancy Check
<b>CRV</b>	Call Reference Value
<b>CSU</b>	Channel Service Unit
<b>CTS</b>	Clear To Send
<b>D4</b>	The fourth generation channel bank
<b>dB</b>	decibel
<b>DCS</b>	Digital Signal Processor
<b>DDS</b>	Digital Data Service
<b>DHCP</b>	Dynamic Host Configuration Protocol
<b>DLC</b>	Digital Loop Carrier
<b>DLCI</b>	Data Link Connection Identifier
<b>DNS</b>	Domain Naming System
<b>DS0</b>	Digital Signal Level Zero (64 kbps) (1 voice channel)
<b>DS1</b>	Digital Signal Level 1 (1.544 Mbps)
<b>DSR</b>	Data Set Ready signal
<b>DSU</b>	Digital Service Unit/Data service Unit
<b>DTE</b>	Data Terminal Equipment
<b>DTMF</b>	Dual Tone Multi-Frequency
<b>DTR</b>	Data Terminal Ready signal.
<b>E1</b>	The European counterpart to T1, which transmits at 2.048 Mbits/sec
<b>E&amp;M</b>	Ear and Mouth - a 4-wire analog voice transport with supervisory signaling.
<b>ES</b>	Errored Seconds
<b>ESF</b>	Extended Superframe
<b>FDL</b>	Facilities Data Link
<b>FX</b>	Foreign Exchange

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<b>FXO</b>	Foreign Exchange Office
<b>FXS</b>	Foreign Exchange Station
<b>GS</b>	Ground Start
<b>GMT</b>	Greenwich Mean Time
<b>GRE</b>	Generic Routing Encapsulation
<b>IETF</b>	Internet Engineering Task Force
<b>IP</b>	Internet Protocol
<b>IPX</b>	Internet Packet eXchange
<b>ISDN BRI</b>	Integrated Services Digital Network.
<b>LAN</b>	Local Area Network
<b>LLC</b>	Logical Link Control
<b>LBO</b>	Line Build Out
<b>LMI</b>	Local Management Interface
<b>LS</b>	Loop Start
<b>LULT</b>	Line Unit Line Termination
<b>LUNT</b>	Line Unit Network Termination
<b>Mbps</b>	Million Bits Per Second
<b>MGCP</b>	Media Gateway Control Protocol
<b>MLPPP</b>	Multilink PPP
<b>MUX</b>	Multiplexer
<b>MVEC</b>	Majority Vote Error Correction
<b>NAT</b>	Network Address Translation
<b>NCS</b>	Network-based Call Signaling
<b>NEBS</b>	Network Equipment Building Standards
<b>NIU</b>	Network Interface Unit
<b>NTP</b>	Network Time Protocol

## ***Glossary***

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<b>OCU-DP</b>	Office Channel Unit - Data Port
<b>PAP</b>	Password Authentication Protocol
<b>PHY</b>	Physical specifications
<b>PPP</b>	Point-to-Point Protocol.
<b>PVC</b>	Permanent Virtual Circuit
<b>QoS</b>	Quality of Service
<b>RADIUS</b>	Remote Authentication Dial-In Service.
<b>RIP</b>	Routing Information Protocol.
<b>RTCP</b>	Real Time Conferencing Protocol.
<b>RTP</b>	Realtime Transport Protocol
<b>SAP</b>	Service Access Point.
<b>RTS</b>	Request To Send
<b>SDP</b>	Session Description Protocol.
<b>SNMP</b>	Simple Network Management Protocol.
<b>STP</b>	Spanning Tree Protocol.
<b>T1</b>	Trunk Level 1.
<b>TBOS</b>	Telemetry Byte Oriented Serial.
<b>TACACS+</b>	Terminal Access Controller Access Control System.
<b>TDM</b>	Time Division Multiplex.
<b>TFTP</b>	Trivial File Transfer Protocol.
<b>TOS</b>	Type of Service
<b>TSR</b>	Terminal Server Router
<b>VC MUX</b>	Virtual Channel Multiplexer
<b>VOIP</b>	Voice over IP.
<b>WAN</b>	Wide Area Network.
<b>VC</b>	Virtual Channel.

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<b>4-Wire E&amp;M</b>	A 4-wire analog voice transport with supervisory signaling.
<b>10Base-T</b>	The most widely installed Ethernet local area networks (LANs) use ordinary telephone twisted-pair wire. When used on Ethernet, this carrier medium is known as 10BASE-T. 10BASE-T supports Ethernet's 10 Mbps transmission speed.
<b>100Base-TX</b>	Also called "Fast Ethernet," it is a 100 Mbps version of Ethernet. 100Base-T transmits at 100 Mbps rather than 10 Mbps. Like regular Ethernet, Fast Ethernet is a shared media LAN. All nodes share the 100 Mbps bandwidth. 100Base-TX uses two pairs of Category 5 cabling, one pair for transmission, one pair for receiving.
<b>ADPCM</b>	Adaptive Differential Pulse Code Modulation. A speech coding method which uses fewer bits than the traditional PCM (Pulse Code Modulation). ADPCM allows encoding of voice signals in half the space PCM allows.
<b>Alarm Indication Signal (AIS)</b>	AIS, is formerly known as a Blue Alarm or Blue Signal. AIS is a signal that is transmitted downstream as an alert that an upstream failure has been detected.
<b>analog</b>	The telephone transmission of voice, video or image. Telephone transmission and/or switching that is not digital.
<b>Annex D</b>	A frame relay standard extension dealing with the communication and signaling between customer premises and equipment and frame relay network equipment for the purpose of querying network status information.
<b>Asynchronous Transfer Mode</b>	Very high speed transmission technology. ATM is a high bandwidth, low-delay, connection-oriented, packet-like switching and multiplexing technique. Usable capacity is segmented into 53-byte fixed-size cells, consisting of header and information fields, allocated to services on demand. The term "asynchronous" applies, as each cell is presented to the network on a "start-stop" basis - in other words, asynchronously.
<b>bandwidth</b>	The width of a communications channel. Analog is typically measured in Hertz (cycles per second), a voice conversation is typically measured in bits per second.
<b>Bipolar 8-Zero Substitution</b>	B8ZS. A coding scheme that maintains ones density.
<b>bipolar violation</b>	BPV. A violation is declared for AMI if two successive pulses have the same polarity.
<b>Bit</b>	Contraction of the words "binary" and "digit".
<b>Bit Error Rate</b>	The number of erred bits divided by the total number of bits.
<b>Basic Rate Interface</b>	Basic Rate Interface (2b+d) in ISDN.
<b>Channel Service Unit</b>	The interface to the T1 line that terminates the local loop.
<b>Classless Inter-Domain Routing</b>	CIDR is a new addressing scheme for the Internet which allows for more efficient allocation of IP addresses than the old Class A, B, and C address scheme.

<b>CLEI Codes</b>	Common Language Equipment Identifier codes, that are assigned by Bellcore to provide a standard method of identifying telecommunications equipment in a uniform, feature-oriented language.
<b>collision</b>	In Ethernet, the result of two nodes transmitting simultaneously. The frames from each device impact and are damaged when they meet on the physical media.
<b>command line</b>	The command line is where you enter MS-DOS commands.
<b>compander</b>	Companding is the process of compressing the amplitude range of a signal for economical transmission and then expanding them back to their original form at the receiving end.
<b>Domain Naming System</b>	DNS. A mechanism used in the Internet for translating names of host computers into addresses.
<b>DS0</b>	Digital Signal Zero, the standard bandwidth for digitized voice channels.
<b>DS1</b>	Digital Signal Level 1. A digital signal transmitted at a nominal rate of 1.544 Mbps.
<b>Dual Tone Multi-Frequency (DTMF)</b>	Dual Tone Multi-Frequency is a term describing push button or Touchtone dialing.
<b>Dynamic Host Configuration Protocol</b>	DHCP is a network configuration that allows maintenance to be performed from a central site rather than by end users.
<b>Ethernet</b>	A local area network used for connecting computers, printers, workstations, terminals, servers, etc., within the same building or campus. Ethernet operates over twisted wire and over coaxial cable at speeds up to 10 Mbps.
<b>encapsulation</b>	Carrying frames of one protocol as the data in another.
<b>echo cancellation</b>	A technique that allows for the isolation and filtering of unwanted signals caused by echoes from the main transmitted signal.
<b>end point</b>	A network element (component) at the end of the network, a transmitter or receiver, or an originating or terminating device.
<b>Facilities Data Link</b>	FDL supports the communication of various network information in the form of in-service monitoring and diagnostics.
<b>filter</b>	An operating parameter used with routers that can be set to block the transfer of packets from one LAN to another.
<b>firewall</b>	Any of a number of security schemes that prevent unauthorized users from gaining access to a computer network and/or may monitor the transfer of information to and from the network.
<b>frame</b>	A fragment of data that is packaged into a frame format, which comprises a header, payload, and trailer.



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<b>Foreign Exchange</b>	A Central Office trunk which has access to a distant central office. Dial Tone is returned from that distant Central Office, and a location can be reached in the area of the foreign Central Office by dialing a local number. This will provide easier access for customers in that area and calls may be made anywhere in the foreign exchange area for a flat rate.
<b>Foreign Exchange Service</b>	Foreign exchange (FX) service is a service that can be ordered from the telephone company that provides local telephone service from a central office which is outside (foreign to) the subscriber's exchange area. Simply, a user can pick up the phone in one city and receive a dial tone in the foreign city. This kind of connection is provided by a type of trunk called foreign exchange (FX) trunk. FX trunk signaling can be provided over analog or T-1 links. Connecting POTS telephones to a computer telephony system via T-1 links requires a channel bank configured with FX type connections.
<b>G.168</b>	Echo cancellation
<b>G.711</b>	Describes the 64-kbps PCM voice coding technique. In G.711, encoded voice is already in the correct format for digital voice delivery in the PSTN or through PBXs. Described in the ITU-T standard in its G-series recommendations.
<b>G.726</b>	Describes ADPCM coding at 40, 32, 24, and 16 kbps. ADPCM-encoded voice can be interchanged between packet voice, PSTN, and PBX networks if the PBX networks are configured to support ADPCM. Described in the ITU-T standard in its G-series recommendations.
<b>G.729</b>	Describes CELP compression where voice is coded into 8-kbps streams. There are two variations of this standard (G.729 and G.729 Annex A) that differ mainly in computational complexity; both provide speech quality similar to 32-kbps ADPCM. Described in the ITU-T standard in its G-series recommendations.
<b>gateway</b>	An entrance and exit into a communications network
<b>GRE tunneling</b>	Generic Routing Encapsulation tunneling is a Layer 2 protocol that can tunnel multi-protocol traffic over IP Networks.
<b>ground</b>	A physical connection to the earth or other reference point.
<b>ground start</b>	A method of signaling on subscriber trunks in which one side of the two wire trunk (typically the ring conductor of Tip and Ring) is momentarily grounded to get dial tone
<b>High Density Bipolar 3</b>	HDB3. A bipolar coding method that does not allow more than 3 consecutive zeros.
<b>hops</b>	Each individual short trip that packets make from router to router, as they are routed to their destination.
<b>impedance</b>	The total opposition a circuit offers to the flow of alternating current. It is measured in ohms and the lower the ohmic value, the better the quality of the conductor
<b>Integrated Services Digital Network</b>	ISDN BRI, which is 144,000 bits per second and designed for the desktop.

## ***Glossary***

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<b>Local Area Network</b>	LAN. A short distance data communications network (typically within a building or campus) used to link together computers and peripheral devices under some form of standard control.
<b>layer 2</b>	In the OSI 7 layer model, layer 2 is the Data Link layer. This layer deals with procedures and protocols from operating the communications lines. It also has a way of detecting and correcting message errors
<b>Line Build Out</b>	LBO. T1 circuits require the last span to lose 15-22.5 dB, a selectable out put attenuation is generally required of DTE equipment.
<b>Local Link Control</b>	A protocol developed by the IEEE 802.2 committee for data-link-level transmission control
<b>Local Management Interface</b>	A specification for the use of frame-relay products that define a method of exchanging status information between devices such as routers
<b>latching</b>	OCU-DP loopback
<b>loopback</b>	A diagnostic test in which a signal is transmitted across a medium while the sending device waits for its return.
<b>MAC Address</b>	The address for a device as it is identified at the Media Access Control layer in the network architecture
<b>mapping</b>	In network operations, the logical association of one set of values, such as addresses on one network, with quantities or values of another set, such as devices on another network.
<b>Media Gateway Control Protocol</b>	MGCP. A control and signal standard for the conversion of audio signals carried on telephone circuits (PSTN) to data packets carried over the Internet or other packet networks.
<b>MLPPP</b>	<b>MultiLink PPP</b> . An extension to the point-to-point protocol that enables two channels to be linked together to double the throughput. It is used for ISDN transmission and channel bonding
<b>multiplexer</b>	Electronic equipment which allows two or more signals to pass over one communications circuit. The circuit may be analog or digital
<b>MUX</b>	See multiplexer
<b>MVEC</b>	Majority Vote Error Correction
<b>nonlatching</b>	OCU-DP loopback
<b>NTP</b>	Network Time Protocol, developed to maintain a common sense of time among Internet hosts around the world. Many systems on the Internet run NTP, and have the same time (relative to Greenwich Mean Time).
<b>OCU-DP</b>	Office Channel Unit - Data Port. A channel bank unit used to interface between the channel bank and a customer's DDS CSU or DSU.

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<b>P-Phone</b>	Also known as EBS (Enhanced Business Service) is an analog Centrex offering provided by Northern Telecom. It operates over a single-pair subscriber loop, providing normal full duplex audio conversations and a secondary 8 KHz half-duplex amplitude shift-keyed signal, which is used to transmit signaling information to and from the Northern Telecom-equipped central office.
<b>packet</b>	A packet consists of the data to be transmitted and certain control information.
<b>PAP</b>	Password Authentication Protocol
<b>PAT</b>	Port Address Translation
<b>PHY</b>	PHY as in physical specifications. OSI Physical Layer, which provides for transmission of cells over a physical medium connecting two ATM devices.
<b>ping</b>	Packet InterNet Grouper. PING is a program used to test whether a particular network destination on the Internet is online (i.e. working) by repeatedly bouncing a "signal" off a specified address and seeing how long that signal takes to complete the round trip. No return signal - site is down or unreachable. Portion is returned - trouble with the connection.
<b>PLAR</b>	Private Line, Automatic Ringdown. A leased voice circuit that connects two single instruments together. When either handset is lifted, the other instrument automatically rings.
<b>PPP</b>	Point-to-Point Protocol. An 8-bit serial interconnection protocol which allows a computing device, such as a PC, to connect as a TCP/IP host to a network through an asynchronous port.
<b>protocol</b>	Procedure or set of rules.
<b>PVC</b>	Permanent Virtual Circuit. A PVC is a permanent channel connection between two ATM devices. PVC's allow network transmissions to be started without having to first establish a connection with the end point ATM device. When a PVC is constructed, the end points of the connection will agree upon a path in which data will travel, and therefore agree upon the route that data will travel to reach its destination.
<b>QoS</b>	Quality of Service.
<b>RADIUS</b>	Remote Authentication Dial-In Service. RADIUS is a client/server-based authentication software system. The software supports remote access applications, allowing an organization to maintain user profiles in a centralized database residing on an authentication server which can be shared by multiple remote access servers.
<b>RIP</b>	Routing Information Protocol. RIP is based on distance vector algorithms that measure the shortest path between two points on a network, based on the addresses of the originating and destination devices. The shortest path is determined by the number of "hops" between those points. Each router maintains a routing table, or routing database, of known addresses and routes; each router periodically broadcasts the contents of its table to neighboring routers in order that the entire network can maintain a synchronized database.
<b>robbed bit</b>	A type of analog signaling that will occasionally steal information bits used for circuit signaling coding.

## *Glossary*

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<b>RTCP</b>	Real-Time Conferencing Protocol. Supports real-time conferencing for large groups on the internet. It has source identification and support for audio and video bridges/gateways. Supports multicast-to-unicast translators.
<b>RTP</b>	Realtime Transport Protocol. An IETF standard for streaming realtime multimedia over IP in packets. Supports transport of real-time data like interactive voice and video over packet switched networks.
<b>SAP</b>	Service Access Point.
<b>silence suppression</b>	A term used in voice compression for transmission whereby silence in the voice conversation is filled with other transmissions (data, video, imaging, etc.).
<b>SNMP</b>	Simple Network Management Protocol. SNMP is the most common method by which network managements applications can query a management agent using a supported MIB (Management Information Base). SNMP operates at the OSI application layer.
<b>spanning tree</b>	Spanning Tree Protocol is a link management protocol that provides path redundancy while preventing undesirable loops in the network. For an Ethernet network to function properly, only one active path can exist between two stations.
<b>SDP</b>	Session Description Protocol.
<b>T1</b>	Trunk Level 1. A digital transmission link with a total signaling speed of 1.544 Mbps. T-1 is a standard for the digital transmission in North America.
<b>TACACS+</b>	Terminal Access Controller Access Control System.
<b>TBOS</b>	Telemetry Byte Oriented Serial. TBOS is an alarm monitoring and control prototype for telephone network equipment.
<b>telnet</b>	An Internet standard protocol that enables a computer to function as a terminal working from a remote computer
<b>TDM</b>	Time Division Multiplex. A technique for transmitting a number of separate data, voice and/or video signals simultaneously over one communications medium by quickly interleaving a piece of each signal one after another.
<b>TFTP</b>	Trivial File Transfer Protocol.
<b>ticks</b>	The distance between two networks, measured in time increments. Ticks may be used to designate primary and secondary routes to the same network.
<b>trunk</b>	A communication line between two switching systems.
<b>tunneling</b>	To provide a secure, temporary path over the Internet.
<b>VC MUX</b>	Virtual Channel Multiplexer
<b>VoIP</b>	Voice over IP.

**WAN** Wide Area Network.

**VC** Virtual Channel.



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