
SocketEthernet™ IP

*A Complete, Ready-to-Integrate Serial to Ethernet Module
Plus a Complete TCP/IP Protocol Stack*

Developer's Guide



SocketEthernet™ IP Developer's Guide
MTXCSEM
PN S000278D, Version D

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C	03/13/03	New and modified error messages. Additional commands added. New Auto-Discovery Manager section. Replaced the Main Board Filtering diagram with new diagram (see Hardware Considerations).
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D	06/26/03	Three new AT Commands sections: HTTP Server commands, SMTP Client commands, and POP3 Client commands. A new PPP configuration chapter. Two new PPP commands. All new connectivity examples.

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Chapter 1 – Product Description & Specifications

The Multi-Tech SocketEthernet IP is a complete, ready to integrate serial-to-Ethernet module for connecting legacy devices to an IP network for remote monitoring, control and configuration. The space efficient module (1" x 2.5") provides a high performance Ethernet bridge as well as a complete TCP/IP protocol stack. The SocketEthernet IP can make your existing and next generation device, machine or system, IP-ready while you focus on developing its core features.

Benefits

- High performance Ethernet bridge
- Terminal Server
- Flexible IP protocol stack
- Integration
- Space efficiency

Features

- Serial interface supports DTE speeds to 230K bps
- High performance 10/100BaseT Ethernet bridge
- Space efficient (1" x 2.5")
- High performance processor runs ARP, DHCP client, ICMP, IP, PPP, TCP, Telnet, TFTP, HTTP server, SMTP client, POP3 client, and PPP compression.
- LED driver outputs for visual monitoring speed, link, activity, collision and duplex mode
- Half duplex or full duplex support on the LAN interface
- 256 frame buffer for Ethernet bridging
- Stores 10,000 MAC addresses
- Automatically learns MAC addresses
- Command line interface
- Central site setup and control of the remote modules
- Flash memory to update firmware with the latest enhancements
- Developer's kit available for testing, programming and evaluation

Highlights

Applications. The SocketEthernet IP will IP-enable any device to provide remote monitoring, control and configuration of any system. The solution is ideal for the following applications:

- Industrial and medical remote monitoring systems
- Remote diagnostics
- Remote metering
- Point-of-sale terminals
- ATM terminals
- Credit card and check verification systems
- Appliances
- Data collection
- Ticketing machines
- Security systems
- Gas pumps
- Television set-top boxes
- Vending/gaming machines

Serial-to-Ethernet Technology. SocketEthernet IP provides the powerful ability to IP-enable legacy serial devices allowing more options for data acquisition, device management, and industrial control than would otherwise be available. This can greatly reduce the cost of system downtime and human labor costs.

Internet-Enable Any Device. SocketEthernet IP embeds Internet connectivity inside commercial, personal and industrial devices. Using the embedded Internet protocols and the connection to an IP network, it sends and receives data over the Internet.

Reduces Development Time. The SocketEthernet IP can make your existing and next generation device, machine or system IP-ready without requiring significant hardware changes to its design. The SocketEthernet IP actually provides faster time-to-market because it relieves the burden and expense of writing and maintaining Internet applications. The complete, ready-to-integrate SocketEthernet IP module allows you to enhance your product while you focus on developing its core features.

SocketEthernet IP Pin-Out. The SocketEthernet IP interfaces easily with existing products through a standard serial communication channel. The serial DTE channel is capable of transfer speeds to 230.4K bps and can be interfaced directly to a UART or microcontroller. SocketEthernet IP also provides LED driver outputs for visual monitoring of speed, link, activity, collision and duplex mode.

Management and Configuration. The SocketEthernet IP has several means of management and configuration built into the design. It supports remote configuration, which means you can have central site setup and control of the remote modules via the command line interface, telnet, and HTTP.

Firmware Upgrades. The SocketEthernet IP also features flash memory so you can update firmware with the latest enhancements Multi-Tech has to offer.

Developer's Kit

The SocketEthernet IP Developer's Kit allows you to plug in the SocketEthernet IP and use it externally connected to your PC for testing, programming and evaluation.

The kit includes one:

- One SocketEthernet IP module
- A development board
- A universal power supply
- An RS-232 cable

Product Specifications

Category	Description
Memory	8MEG
Flash Memory	2MEG
Board Dimensions	1.045" w x 2.541" h x 0.680" d; 0.6 oz. (2.65cm x 6.45cm x 1.7cm; 0.017 kg.)
Weight	0.602 lb. (0.017 kg.)
Protocols Supported	ARP, DHCP client, ICMP, IP, PPP, TCP, Telnet, TFTP, HTTP server, SMTP client, POP3 client, and PPP compression
LAN Interface	10/100BaseT Ethernet
Serial Interface	Standard DCE Serial
Data Formats	Serial, binary, asynchronous
Data Rates	300; 1200; 2400; 4800; 9600; 19200; 38400; 57600; 115200; 230400 bps
Flow Control	RTS/CTS (hardware)
Management	Serial; Telnet
Security	Username and password authentication using local database
System Software	Flash ROM standard: downloadable from a TCP/IP host (TFTP) or Xmodem via Serial
LEDs	Speed, Collision, Link, Activity, Duplex
Ethernet	IEEE 802.3
Power Usage	Power Consumption @ 3.3V Ethernet @ 10mbps Typical – 230mA Maximum – 270mA Ethernet @ 100mbps Typical – 260mA Maximum – 300mA Power Consumption @ 5V Ethernet @ 10mbps Typical – 240mA Maximum – 280mA Ethernet @ 100mbps Typical – 270mA Maximum – 310mA
Operating Temperature	0 to +70C; humidity range 20-90% (non-condensing)
Storage Temperature	-40C to +85C
Cleaning	No cleaning/washing due to the manufacturing process used to produce this product

Software Specifications

Supported Features

Internet Applications

- DHCP Client
- Telnet Server & Telnet Client
- Terminal Server
- TFTP Server
- SMTP Client
- POP3 Client
- HTTP Server
- Command line configuration/management via Serial or Ethernet
- Username and password authentication using local database

Other

- Flash Upgrade

Functional Features

DHCP Client

- Request IP address for Ethernet Interfaces

Telnet Server

- Command Line Configuration
- Auto Dialout Feature
- Command line via custom port (other than standard port 23)

Telnet Client

- Connect to remote Telnet Server
- Serial Auto Dial-in Feature

Terminal Server

- Network to Serial Connectivity
- Serial to Network Connectivity

TFTP Server

- Flash Upgrade

Command Line Configuration over Serial or Ethernet

- Serial - TTY
- Ethernet - Telnet

Username and Password Authentication Using Local Database

- The Username and Password can be created using commands.
- The User database authenticates the Users before access to command mode of the SocketEthernet IP module is enabled.

Remote Transparent Bridging

- Ethernet to Serial Bridging

Point-to-Point Protocol (PPP)

- Negotiations Bridging Control Protocol
 - 802.3 MAC Type
- CCP Compression

HTTP Server

- To host Web pages on behalf of the serial device for monitoring and configuration of the serial device.

SMTP Client

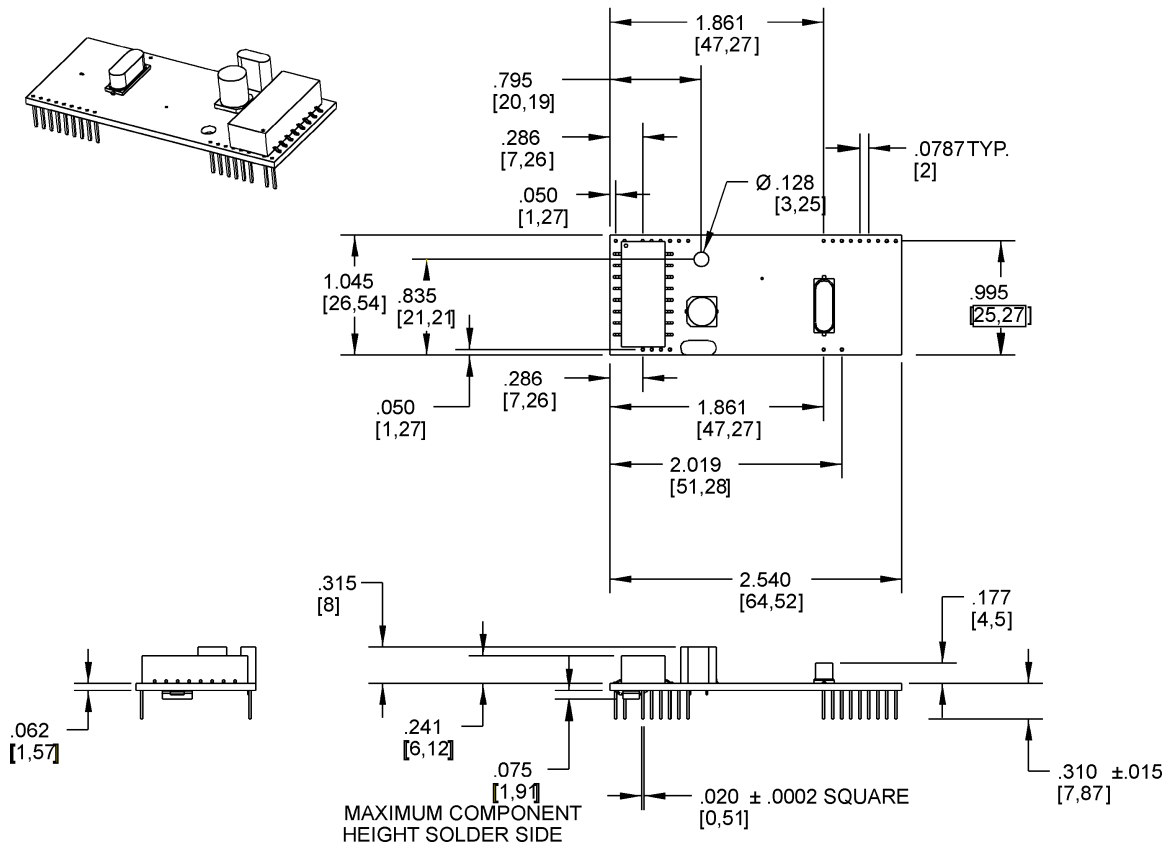
- The email client embedded in the SocketEthernet IP module sends email to the configured recipients.

POP3 Client

- The email client embedded in the SocketEthernet IP module receives email from the POP3 Server. This feature is useful for field upgrades. Firmware upgrades can be sent as attachments.

Chapter 2 – Mechanical Specifications

Physical Dimensions



Component Dimensions

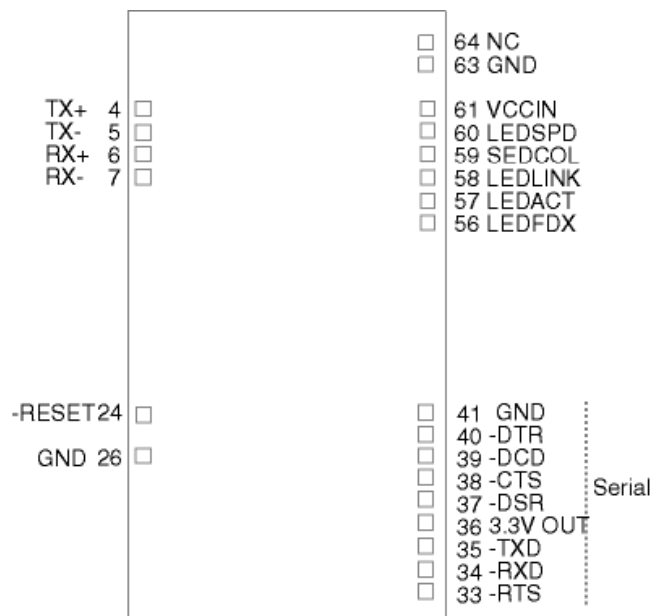
Pin Configurations

The SocketEthernet IP uses a 23-pin interface to provide an on-board Ethernet media access controller, an Ethernet physical layer (without the RJ-45 jack), an LED driver for Ethernet monitoring, and a serial interface.

5 Volt Tolerant Signal Inputs

On 3.3V builds, these signal inputs are 5V tolerant:

- DTR
- TXD
- RTS
- RESET



SocketEthernet IP Pins

Handling Precautions

All devices must be handled with certain precautions to avoid damage due to the accumulation of static charge. Although input protection circuitry has been incorporated into the devices to minimize the effect of this static buildup, proper precautions should be taken to avoid exposure to electrostatic discharge during handling and mounting.

SocketEthernet IP I/O Pin Description

Pin	Signal Name	I/O	Description
4 5	TX+ TX-	O	Twisted Pair Transmit Outputs. Differential transmit outputs for 100BaseTX or 10BaseT to magnetics.
6 7	RX+ RX-	I	Twisted Pair Receive Inputs. Differential receive input pins for 100BaseTX or 10BaseT from the magnetics.
24	-RESET	I	Module Reset (with weak pull-up). The active low -RESET input resets the SerialModule logic. -RESET is tied to VCC through a 400ms time constant circuit for “Power-on-Reset” functionality. The module is ready to accept commands with 3 seconds of power-on or reset.
26	GND	GND	Ground.
33	-RTS	I	Request to Sent (Active Low). -RTS signal is used for hardware flow control.
34	-RXD	O	Receive Data (CMOS Level, IO=10ma, Active Low). The module uses the RXD line to send data to the DTE and to send module responses to the DTE. During command mode, -RXD data presents the module responses to the DTE. Module responses take priority over incoming data when the two signals are in competition for -RXD. When no data is transmitted, the signal is held in mark condition.
35	-TXD	I	Transmitted Data (Active Low). The DTE uses the -TXD line to send data to the module for transmission or to transmit commands to the module. The DTE should hold this circuit in the mark state when no data is being transmitted or during between intervals between characters.
36	3.3V Out	O	3.3V Out. The purpose of this signal is to maintain compatibility with other Multi-Tech modules.
37	-DSR	O	Data Set Ready (IO=10ma, Active Low). -DSR indicates module status to the DTE. -DSR OFF (high) indicates that the DTE is to disregard all signals appearing on the interchange circuits. It reflects the status of the local data set and does not indicate an actual link with any remote data equipment.
38	-CTS	O	Clear to Send (IO=10ma, Active Low). -CTS is controlled by the module to indicate whether or not the module is ready to transmit data. -CTS ON indicates to the DTE that signals presented on TXD will be transmitted. -CTS OFF indicates to the DTE that it should not transfer data across the interface on TXD.
39	-DCD	O	Data Carrier Detect (IO=10ma, Active Low). -DCD output is ON (low) when the module is ready to send/receive data.
40	-DTR	I	Data Terminal Ready (Active Low). The -DTR input is turned ON (low) by the DTE when the DTE is ready to transmit or receive data.
41	GND	GND	Ground.
56	LED FDX	I/O	LED Output. During normal operation, this pin lights the FDX LED to indicate a full duplex mode. Active Low.
57	LED ACT	I/O	LED Output. During normal operation, this pin lights the Activity LED when transmitting or receiving. It will flash at a rate of 50ms high and 50ms low when active. Active Low.
58	LED LINK	I/O	LED Output. During normal operation, this pin lights the LINK LED to indicate a good link is detected. Active Low.
59	LED COL	I/O	LED Output. During normal operation, this pin lights the COL LED to indicate a collision. It flashes at 50ms high and 50ms low when active. Active Low.
60	LED SPD	I/O	LED Output. During normal operation, this pin lights the SPEED LED to indicate 100Mbps is selected. Active Low.
61	VCCIN	PWR	3.3V dc.
63	GND	GND	Ground.
64	NC		No Connect.

Chapter 3 – Electrical Specifications

Electrical characteristics for the 5V SocketEthernet IP and 3.3V SocketEthernet IP are presented in this chapter.

I/O Electrical Characteristics

5V Serial

5 Vdc Characteristics ($T_A = 0\text{ }^{\circ}\text{C}$ to $50\text{ }^{\circ}\text{C}$; $V_{DD} = 5\text{ V} \pm 0.25\text{ V}$) $V_{DDMAX} = 5.25\text{ V}$

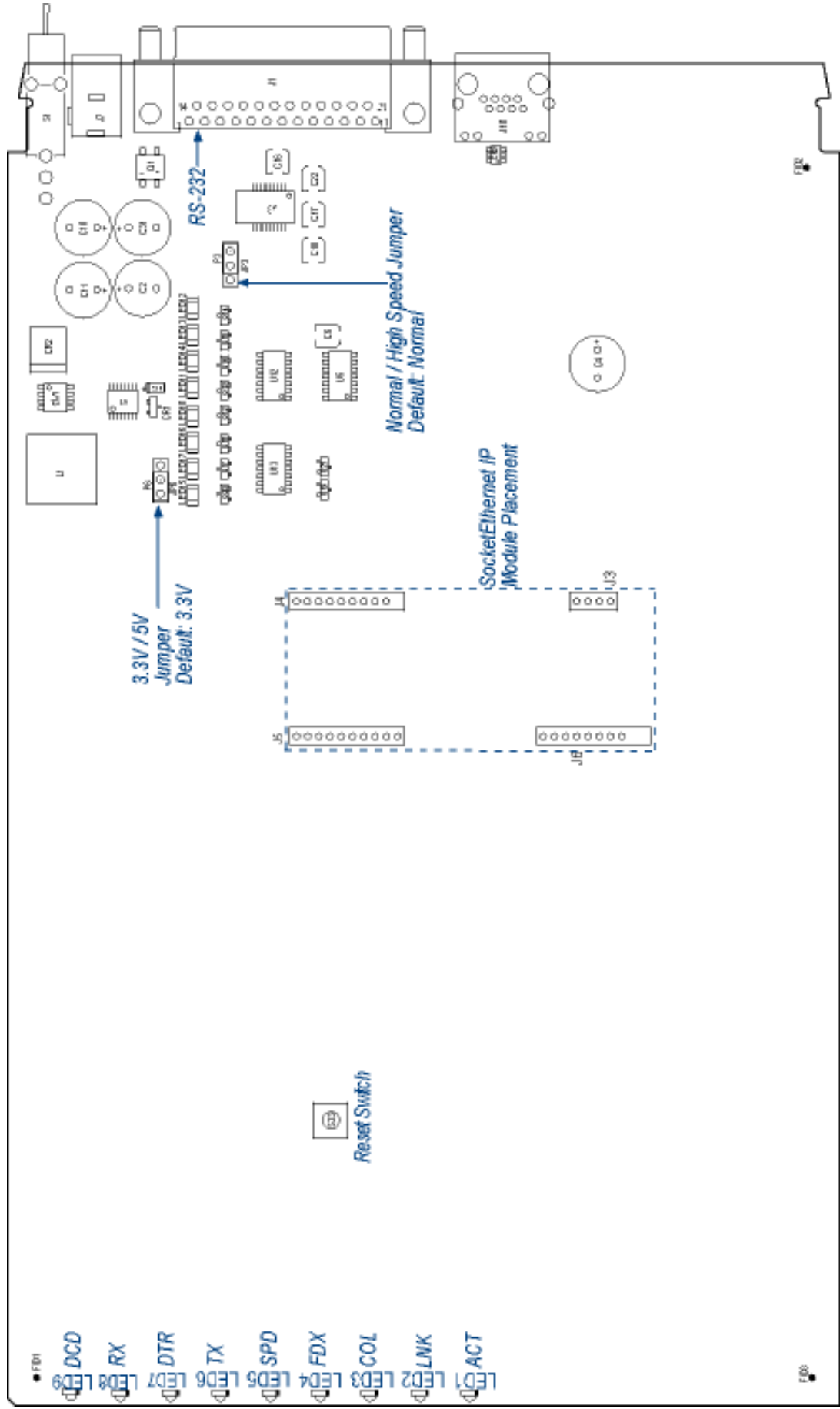
Digital Inputs –DTR (40), –TXD (35), –RTS (33), –RESET (24)	Input High Min 2.52 V	Input Low Max .09 V	
Digital Outputs –DCD (39), –CTS (38), –DSR (37), –RI (36), –RXD (34)	Output High Min. 2.3 V	Output Low Max 0.4 V	Current Drive 2 ma
Digital Input Capacitance			5 PF

3.3V Serial

3.3 Vdc Characteristics ($T_A = -40\text{ }^{\circ}\text{C}$ to $85\text{ }^{\circ}\text{C}$; $V_{DD} = 3.3\text{ V} \pm 0.3\text{ V}$) $V_{DDMAX} = 3.6\text{ V}$

Digital Inputs –DTR (40), –TXD (35), –RTS (33), –RESET (24) Note: These digital inputs are 5 volt tolerant	Input High Min 2.52 V	Input Low Max 0.9 V	
Digital Outputs –DCD (39), –CTS (38), –DSR (37), –RI (36), –RXD (34)	Output High Min. 2.3 V	Output Low Max 0.4 V	Current Drive 2 ma
Digital Input Capacitance			5 PF

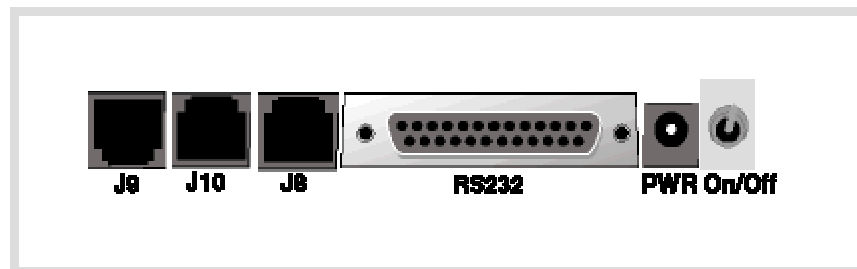
Chapter 4 – Serial Test Board



Using the Test Board

Test Board	Description
JP1	Voltage Selector 3.3V/5V
J8 Port	An Ethernet port when the SocketEthernet IP does not have the Ethernet transformer. The Ethernet transformer is populated on the test board.
J9 Port	An Ethernet port when the SocketEthernet IP does not have the Ethernet transformer. The Ethernet transformer is built into J9.
J10 Port	(Default Port) An Ethernet port when the Ethernet transformer is on the SocketEthernet IP.
LEDs in Ports	Each Ethernet port contains a built-in Activity and Link LED.
LEDs	Speed (SPD) During normal operation, this LED indicates that 100Mbps is selected. Collision (COL) During normal operation, this LED indicates a collision. Link (LNK) During normal operation, this LED indicates a good link is detected. Activity (ACT) During normal operation, this LED lights when transmitting or receiving. It will flash at a rate of 50ms high and 50ms low when active. Duplex (FDX) During normal operation, this LED indicates a full or duplex mode.
S4	(Default J10) Directs Ethernet signals to J10. Else directs Ethernet signals to J8 or J9 depended upon S3 setting.
S5	(Default J10) Directs LED signals to J8, J9, J10 (refer to silk screen on board).
S3	If S4 not set to J10 default, this directs Ethernet signals to J8 or J9.
S6	Internal Multi-Tech use. Directs Ethernet signals to RS232 connector for test purposes.

Connections



Test Board Connectors

Chapter 5 – Managing and Configuring the SocketEthernet IP

Login Using Telnet Client

- Use Telnet Client to configure the SocketEthernet IP module for the first time. Type the default IP address of the module: **192.168.2.1**.
Note: The workstation must be on the same subnet.
- At the Login prompt, type `admin`.
At the Password prompt, type `admin`.
Important: The User Name and Password are case-sensitive. They must be typed in lowercase letters.

Login Using TTY

- Use TTY to configure your module for the first time. Configure the workstation's serial port to the defaults listed below:
Baud: 115.2K
Data: 8
Parity: N
Stop: 1
Flow-Control: None
- Press the Enter key three times to get to the Login prompt.
- At the Login prompt, type `admin`.
At the Password prompt, type `admin`.
Important: The User Name and Password are case-sensitive. They must be typed in lowercase letters.

About Data Mode and Command Mode

- In **Command Mode**, a # sign designates the prompt. **Help**, at the command prompt, accesses a complete list of commands supported.
- **Usage**, at the command prompt, provides the semantics of the commands.
- In **Data Mode**, the # sign is not displayed.
- To end Command Mode, exit your terminal or Telnet session; or invoke **Exit** at the command prompt.
- See the **Restore** command and **IP Escape String** command.

Chapter 6 – SocketEthernet IP Command Line Interface

The commands of SocketEthernet IP are grouped based on the functionality.

- **General Setup Commands**
- **IP Setup Commands**
- **Serial Setup Commands**
- **Bridging Setup Commands**
- **PPP Setup Commands**
- **HTTP Setup Commands**
- **SMTP Setup Commands**
- **POP3 Setup Commands**

General Notes

- Required command parameters are indicated between < >.
- Optional command parameters are indicated between [].
- Parameter choices are delineated by /.
- On successful execution of a command, "OK" string is echoed to the client.
- On an unsuccessful command execution, an appropriate error message is displayed followed by "ERROR" string.
- If bridging is enabled, PPP should also be enabled. .
- If you enable bridging and PPP, you cannot use serial-to-Ethernet or Ethernet-to-serial applications.
- All the commands described in the next chapter are case sensitive (lower case).

General Setup Commands

The general setup is port (physical eth0, S0, etc.) independent. The following command set is used to set the global configuration of SocketEthernet IP.

General Setup Commands – Basic Commands

Command Syntax	dialout serial s0
Description	Manual telnet dialout (ethernet-to-serial connectivity) Invoked from the command shell
Default Value	NA
Success	OK
Error	<ol style="list-style-type: none"> Too few arguments “Usage: dialout serial <serial port> Type ‘dialout ?’ for more information” Invalid argument Possible argument(s) are: Serial <ol style="list-style-type: none"> When invoked from Serial Shell This command is not supported through serial dial-in

Command Syntax	exit
Description	Exits the command parser, unlocks the configurations, terminates session
Default Value	NA
Success	OK

Command Syntax	help
Description	Provides the first level of commands in IPModule
Default Value	NA
Success	OK

Command Syntax	restore default-config
Description	Restores the factory defaults. Note: All the previous configurations will be lost on invoking this command. The changes are made permanent only if “save config” command is invoked.
Default Value	NA
Success	OK
Error	<ol style="list-style-type: none"> Too few arguments “Possible arguments are: default-config session Invalid argument Invalid argument “invalid string” Valid arguments are default-config session

General Setup Commands – Basic Commands

Command Syntax	restore session
Description	On telnet dialout, the control is transferred to the command parser passing the escape sequence “+++ inet”. Invoking “restore session” would resume the telnet dialout exiting the command parser.
Default Value	NA
Success	OK
Error	<ol style="list-style-type: none"> Too few arguments Possible arguments are default-config session ERROR: Session not opened

Command Syntax	save
Description	Command to Save the configuration to the flash and reboot
Default Value	NA
Success	OK

Command Syntax	telnet <dial-ip-addr> [<port>]
Description	Manual serial dial-in (serial-to-ethernet connectivity) Invoked from the command shell
Default Value	NA
Success	OK
Error	<ol style="list-style-type: none"> Too few arguments Invalid IP address/Port “(Error: hostp = “configured host”. Error: hostp=“configured IP address“ When invoked from Command shell connected through TELNET This command is not supported through TELNET

Command Syntax	usage
Description	Provides the command semantics for all the commands
Default Value	NA
Success	OK

Command Syntax	user add <user-name> [<passwd>]
Description	Command to add the username and the password to the group Notes: Default Groups: admin, users Default Users: admin, ipmodule Only Admin can configure the SocketEthernet IP
Default Value	NA
Success	OK
Error	<ol style="list-style-type: none"> Too few arguments “Too few arguments. Possible value(s) are username followed by password“ Unable to add the user name “user ‘username’ exists“

General Setup Commands – Basic Commands

Command Syntax	user delete <user-name>
Description	Command to delete the username from the group
Default Value	NA
Success	OK
Error	<ol style="list-style-type: none"> Too few arguments “Too few arguments. Possible value(s) are username followed by password” Unable to delete the user name “user ‘username’ does not exist”

Command Syntax	user password <username> <new password>
Description	Command to change the password for a user
Default Value	NA
Success	OK
Error	<ol style="list-style-type: none"> Too few arguments “Too few arguments. Possible value(s) are username followed by password” Unable to change the password “Password does not match Unable to change user <username> password”

General Setup Commands – Set Commands

Command Syntax	set auto-discovery <enable/disable>
Description	Enables the auto-discovery application to broadcast (MAC Level), the MAC-address, IP address and DHCP information to server port configured. The default server port to send is '1020'. The server port is configurable.
Default Value	Enable
Success	OK
Error	1. Too few arguments "Usage: set auto-discovery <enable/disable> Type 'set auto-discovery ?' for more information" 2. Invalid string "error: set auto-discovery <enable/disable>"

Command Syntax	set auto-discovery broadcast-timer <timer-value>
Description	Granularity of periodic Broadcast
Default Value	10 Seconds
Success	OK
Error	1. Too few arguments "Usage: set auto-discovery broadcast-timer <timer-value> Type 'set auto-discovery broadcast-timer ?' for more information" 2. Range check "error: Broadcast-timer range supported : [0 - 300] sec"

Command Syntax	set auto-discovery server-port <portnum>
Description	Server port to contact to
Default Value	1020
Success	OK
Error	1. Too few arguments "Usage: set auto-discovery server-port <portnum> Type 'set auto-discovery server-port ?' for more information" 2. Invalid port number "error: portnum range supported : [1020 - 65535]"

Command Syntax	set boot-messages <enable/disable>
Description	enable - Print the boot-messages during module boot-up disable - Suppress the boot-messages during module boot-up
Default Value	enable
Success	OK
Error	1. Too few arguments "Too few arguments. Possible argument(s) are disable enable" 2. Invalid string "Invalid argument "string" Valid argument(s) are disable enable"

General Setup Commands – Set Commands

Command Syntax	set serial <s0> host-interaction-mode <enable/disable>
Description	This parameter is set by the host to enable the host-interactive-mode. When this mode is set, the host/serial device can use SMTP client, POP3 client, and HTTP server. Note: Telnet Auto-Dialout and PPP cannot be enabled when this mode is enabled.
Default Value	disable
Success	OK
Error	<ol style="list-style-type: none"> Too few arguments "Usage: set serial <s0> host-interaction-mode <enable/disable> Type set serial S0 host-interaction-mode ?" Invalid string Type set serial S0 host-interaction-mode ?" Port used by Auto-dialout "ERROR: Port used by Auto-dialout"

Command Syntax	set date <DD/MM/YYYY>
Description	Sets the systems date
Default Value	Jan 1 1970
Success	OK
Error	<ol style="list-style-type: none"> Too few arguments Usage: set date DD/MM/YYYY Type 'set date ?' for more information Error: Date in DD/MM/YYYY format Too few arguments. Possible argument(s) are <div style="display: flex; justify-content: space-around;"> <div>ip</div> <div>login</div> </div> <div style="display: flex; justify-content: space-around;"> <div>serial</div> <div>bridge</div> </div> <div style="display: flex; justify-content: space-around;"> <div>date</div> <div>ppp</div> </div> <div style="display: flex; justify-content: space-around;"> <div>time</div> <div></div> </div>

Command Syntax	set login
Description	This command prompts the Login for the command shell when enabled, and doesn't when disabled
Default Value	Enable
Success	OK
Error	<ol style="list-style-type: none"> Too few arguments "Usage: set login <enable/disable> Type 'set login ?' for more information" Invalid string "error: set login <enable/disable>"

Command Syntax	set login auto-dialout-login <enable/disable>
Description	Enable/Disable authentication for Telnet auto-dialout
Default Value	Disable
Success	OK
Error	<ol style="list-style-type: none"> Too few arguments "Usage: set login auto-dialout-login <enable/disable> Type 'set login auto-dialout-login ?' for more information" Invalid string "error: set login auto-dialout-login <enable/disable>"

General Setup Commands – Set Commands

Command Syntax	set time <HH:MM:SS>
Description	Sets the systems time
Default Value	00:00:00
Success	OK
Error	1. Too few arguments Usage: set date HH:MM:SS Type 'set date ?' for more information Error: Time in HH:MM:SS format Too few arguments. Possible argument(s) are ip login serial bridge date ppp time

Command Syntax	set watchdog <enable/disable>
Description	Enables/Disables the watchdog timer. The timer value is set to 6.5 seconds. This is the upper threshold value. Note: Watchdog timer comes into effect only after reboot. Hence invoking this command calls for a reboot on save.
Default Value	Enable
Success	OK
Error	1. Too few arguments "Usage: set watchdog <enable/disable> Type 'set watchdog <enable/disable> ?' for more information" 2. Invalid string "error: set watchdog <enable/disable>"

General Setup Commands – Show Commands

Command Syntax	show buildrun
Description	Command Line Configuration - History. On invoking any command, either through Telnet or Serial TTY, the command is added to the buildrun file. This is very useful in case of version updates.
Default Value	NA
Success	OK
Error	1. Too few arguments "Too few arguments. Possible argument(s) are bridge serial buildrun statistics configuration sys-info date time ip users ppp 2. Invalid argument Invalid argument "string". Valid arguments are bridge serial buildrun statistics configuration sys-info date time ip users ppp

Command Syntax	show configuration
Description	Display SocketEthernet IP configuration
Default Value	NA
Success	OK
Error	1. Too few arguments "Too few arguments. Possible argument(s) are: bridge serial configuration statistics date sys-info ip time ppp users 2. Invalid argument Valid arguments are: bridge serial configuration statistics date sys-info ip time ppp users

General Setup Commands – Show Commands

Command Syntax	show date
Description	Show system date
Default Value	NA
Success	OK
Error	1. Too few arguments Too few arguments. Possible argument(s) are: bridge ip statistics users configuration ppp sys-info date serial time 2. Invalid argument Invalid argument " <i>Invalid string</i> ". Valid arguments are: bridge ip statistics users configuration ppp sys-info date serial time

Command Syntax	show statistics
Description	Display SocketEthernet IP statistics
Default Value	NA
Success	OK
Error	1. Too few arguments "Too few arguments. Possible argument(s) are: bridge ip statistics users configuration ppp sys-info date serial time 2. Invalid argument Valid arguments are: bridge ip statistics users configuration ppp sys-info date serial time

Command Syntax	show sys-info
Description	Display the system related information. <ul style="list-style-type: none"> • Hardware information • System Uptime • Memory Utilization • Flash Memory Map
Default Value	NA
Success	OK
Error	1. Too few arguments Too few arguments. Possible argument(s) are: bridge ip statistics users configuration ppp sys-info date serial time 2. Invalid argument Invalid argument " <i>Invalid string</i> ". Valid arguments are: bridge ip statistics users configuration ppp sys-info date serial time

General Setup Commands – Show Commands

Command Syntax	show time																				
Description	Display the system time																				
Default Value	NA																				
Success	OK																				
Error	<p>1. Too few arguments Too few arguments. Possible argument(s) are</p> <table> <tr><td>bridge</td><td>serial</td></tr> <tr><td>configuration</td><td>statistics</td></tr> <tr><td>date</td><td>sys-info</td></tr> <tr><td>ip</td><td>time</td></tr> <tr><td>ppp</td><td>users</td></tr> </table> <p>2. Invalid argument Invalid argument "<i>Invalid string</i>" Valid arguments are:</p> <table> <tr><td>bridge</td><td>serial</td></tr> <tr><td>configuration</td><td>statistics</td></tr> <tr><td>date</td><td>sys-info</td></tr> <tr><td>ip</td><td>time</td></tr> <tr><td>ppp</td><td>users</td></tr> </table>	bridge	serial	configuration	statistics	date	sys-info	ip	time	ppp	users	bridge	serial	configuration	statistics	date	sys-info	ip	time	ppp	users
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Command Syntax	show users																				
Description	Display the configured users																				
Default Value	NA																				
Success	OK																				
Error	<p>1. Too few arguments "Too few arguments. Possible argument(s) are:</p> <table> <tr><td>bridge</td><td>serial</td></tr> <tr><td>configuration</td><td>statistics</td></tr> <tr><td>date</td><td>sys-info</td></tr> <tr><td>ip</td><td>time</td></tr> <tr><td>ppp</td><td>users</td></tr> </table> <p>2. Invalid argument Valid arguments are:</p> <table> <tr><td>bridge</td><td>serial</td></tr> <tr><td>configuration</td><td>statistics</td></tr> <tr><td>date</td><td>sys-info</td></tr> <tr><td>ip</td><td>time</td></tr> <tr><td>ppp</td><td>users</td></tr> </table>	bridge	serial	configuration	statistics	date	sys-info	ip	time	ppp	users	bridge	serial	configuration	statistics	date	sys-info	ip	time	ppp	users
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IP Setup Commands

Command Syntax	set ip dns <enable/disable>
Description	Set dns client enabled/disabled
Default Value	Enabled
Success	OK
Error	1. Too few arguments “Usage: set ip dns <enable/disable> Type ‘set ip dns ?’ for more information” 2. Invalid string Type ‘set ip dns ?’ for more information”

Command Syntax	set ip def-gway <gway-addr>
Description	Set the IP default gateway address
Default Value	0.0.0.0
Success	OK
Error	1. Too few arguments “Usage: set ip def-gway <gway-addr> Type ‘set ip def-gway ?’ for more Information” 2. Invalid IP address “error: Invalid IP address Type ‘set ip def-gway ?’ for more Information”

Command Syntax	set ip eth0 dhcp-client <enable/disable>
Description	By default DHCP Client is enabled. If DHCP Client fails to contact the DHCP Server, after a finite number of retries, initializes the eth0 with static ip address configured as below. Note: The DHCP Client checks periodically retries to obtain an IP address from a DHCP server if there is any error.
Default Value	Enable
Success	OK
Error	1. Too few arguments “Usage: set ip eth0 dhcp-client <enable/disable> Type ‘set ip eth0 dhcp-client ?’ for more information” 2. Invalid string Type ‘set ip eth0 dhcp-client ?’ for more information

Command Syntax	set ip eth0 ip-address <ip-addr> mask <mask>
Description	Set the IP address and the mask of eth0.
Default Value	192.168.2.1 255.255.255.0
Success	OK
Error	1. Too few arguments “Usage: set ip eth0 ip-address <ip-address> mask <mask> Type ‘set ip eth0 ip-address ? for more Information” 2. Invalid IP address/Mask “error: Invalid IP address/Mask Type ‘set ip eth0 ip-address ?’ for more information”

IP Setup Commands – Set Commands

Command Syntax	set ip hostname <hostname>
Description	Hostname of the IP Module
Default Value	"SocketEthernet IP"
Success	OK
Error	1. Too few arguments "Usage: set ip hostname <hostname> Type 'set ip hostname ?' for more information"

Command Syntax	set ip pri-dns <ip addr>
Description	Set primary DNS IP address to 0.0.0.0
Default Value	0.0.0.0
Success	OK
Error	1. Too few arguments "Usage: set ip pri-dns <ip addr> Type 'set ip pri-dns ?' for more information" 2. Invalid IP Address "error: Invalid IP address Type 'set ip pri-dns ?' for more information"

Command Syntax	set ip sec-dns <ip addr>
Description	Set secondary DNS IP address to 0.0.0.0
Default Value	0.0.0.0
Success	OK
Error	1. Too few arguments "Usage: set ip sec-dns <ip addr> Type 'set ip sec-dns ?' for more information" 2. Invalid IP Address "error: Invalid IP address Type 'set ip sec-dns ?' for more information"

Command Syntax	set ip syslogd <enable/disable>
Description	Enable/Disable syslogd
Default Value	disable
Success	OK
Error	1. Too few arguments "Usage: set ip syslogd <enable/disable> Type 'set ip syslogd ?' for more information"

Command Syntax	set ip syslogd-server <ip addr>
Description	Set the remote syslog server's IP address
Default Value	0.0.0.0
Success	OK
Error	1. Too few arguments "Usage: set ip syslogd-server <ip_addr> Type 'set ip syslogd-server ?' for more information" 2. Invalid IP address "error: Invalid IP address Type 'set ip syslogd-server ?' for more information"

IP Setup Commands – Set Commands

Command Syntax	set ip telnet <enable/disable>
Description	Telnet Server enable/disable. This is a global setting, which will enable/disable the Telnet Server in the SocketEthernet IP. Note: On disabling Telnet server, the administrator cannot configure the IP Module over Ethernet. The only option is to connect through a terminal application over the Serial port
Default Value	Enabled
Success	OK
Error	<ol style="list-style-type: none"> Too few arguments Too few arguments. Possible argument(s) are set ip telnet<enable/disable> Type : set ip telnet ? for more information) Multiple matches telnet telnet-port Invalid String Invalid argument "<i>invalid string</i>" Valid arguments are auto-dialout inactivity escape-monitor inactivity-timeout escape-string raw-mode Possible value(s) are enable or disable

Command Syntax	set ip telnet auto-dialout <enable/disable>
Description	Enable ethernet-to-serial connectivity through Telnet Auto Dialout. This is a global setting. This flag would enable/disable the Telnet Auto dialout globally
Default Value	Enabled
Success	OK
Error	<ol style="list-style-type: none"> Too few arguments "Usage: set ip telnet auto-dialout <enable/disable> Type 'set ip telnet auto-dialout ?' for more information" Invalid String Type 'set ip telnet auto-dialout ?' for more information"

Command Syntax	set ip telnet escape-string <string>
Description	The Telnet Server scans for this escape sequence and transfers the control to the command parser. By default, the Telnet Server scans for "+++inet".
Default Value	+++ inet
Success	OK
Error	<ol style="list-style-type: none"> Too few arguments "Usage: set ip telnet escape-string <string> Type 'set ip telnet escape-string ?' for more information" Multiple matches escape-monitor escape-string

IP Setup Commands – Set Commands

Command Syntax	set ip telnet escape-monitor <enable/disable>
Description	A “monitor” flag which enables/disables the scanning of escape sequence.
Default Value	Enabled
Success	OK
Error	<ol style="list-style-type: none"> Too few arguments “Usage: set ip telnet escape-monitor <enable/disable> Type ‘set ip telnet escape-monitor ?’ for more information” Multiple matches escape-monitor escape-string Invalid String Type ‘set ip telnet escape-monitor ?’ for more information”

Command Syntax	set ip telnet inactivity <enable/disable>
Description	The inactivity functionality is enabled/disabled.
Default Value	Disable
Success	OK
Error	<ol style="list-style-type: none"> Too few arguments “Usage: set ip telnet inactivity <enable/disable> Type ‘set ip telnet inactivity ?’ for more information” Multiple matches inactivity inactivity-timeout Invalid String Type ‘set ip telnet inactivity ?’ for more information”

Command Syntax	set ip telnet inactivity-timeout <t secs>
Description	If the Telnet session is inactive for ‘t’ secs, the connection is terminated. This functionality is applicable only if “set telnet inactivity” is enabled. (Refer ‘set ip telnet inactivity’ command)
Default Value	5 min
Success	OK
Error	<ol style="list-style-type: none"> Too few arguments “Usage: set ip telnet inactivity-timeout <t secs> Type ‘set ip telnet inactivity-timeout ?’ for more information” Multiple matches inactivity inactivity-timeout Invalid timeout value “error: ‘t secs range : 0 – 300 Type ‘set ip telnet inactivity-timeout ?’ for more information”

IP Setup Commands – Set Commands

Command Syntax	set ip telnet-port <port_num >
Description	<p>This Telnet-port corresponds to the port number “IP Module” would wait on for configuring the box.</p> <p>By default the port number is TCP 23. The user is given an option to change this port number.</p> <p>Notes:</p> <p>Telnet application is associated with "inetd" application.</p> <p>Modification to the telnet-port calls for a re-initialization of "inetd". This in-turn closes all the current session that are associated with "inetd".</p> <p>The other application(s) that are associated with "inetd" are</p> <ul style="list-style-type: none"> • TFTP Server <p>Hence, invoking this command would terminate the telnet session.</p>
Default Value	23
Success	OK
Error	<p>1. Too few arguments</p> <p>“Usage: set ip telnet-port <port-num></p> <p>Type ‘set ip telnet-port ?’ for more information”</p> <p>2. Invalid port-num</p> <p>“error: Invalid port number</p> <p>Type ‘set ip telnet-port ?’ for more information”</p>

Command Syntax	set ip telnet raw-mode <enable/disable>
Description	<p>This is a global setting of raw-mode for the Telnet application. This setting is applicable for both Telnet auto-dialout, serial auto-dial-in.</p>
Default Value	Disabled
Success	OK
Error	<p>1. Too few arguments</p> <p>“Usage: set ip telnet raw-mode <enable/disable></p> <p>Type ‘set ip telnet raw-mode ?’ for more information”</p> <p>2. Invalid String</p> <p>ERROR</p>

Command Syntax	set ip tftp <enable/disable >
Description	<p>TFTP Server enable/disable. On enabling the TFTP Server, the network administrator can upload the firmware to the flash.</p> <p>Notes:</p> <p>TFTP application is associated with "inetd" application.</p> <p>Enabling/Disabling the TFTP service calls for a re-initialization of "inetd", eventually closes all the current session that are associated with "inetd".</p> <p>The other application(s) that are associated with "inetd" are</p> <ul style="list-style-type: none"> • Telnet Server <p>Hence when enabling/disabling TFTP through a Telnet configuration, would terminate the telnet session.</p>
Default Value	Enabled
Success	OK
Error	<p>1. Too few arguments</p> <p>“Usage: set ip tftp <enable/disable></p> <p>Type ‘set ip tftp ?’ for more information”</p> <p>2. Invalid string</p> <p>error: Invalid string</p> <p>Type ‘set ip tftp ?’ for more information”</p>

IP Setup Commands – Show Commands

Command Syntax	show ip eth0 configuration
Description	Display eth0 configuration
Default Value	-
Success	OK
Error	1. Too few arguments Possible value(s) are statistics or configuration 2. invalid argument Invalid argument <i>"Invalid string"</i> Valid arguments are configuration statistics

Command Syntax	show ip eth0 statistics
Description	Function not implemented
Default Value	-
Success	OK
Error	1. Too few arguments Possible value(s) are statistics or configuration 2. invalid argument invalid argument <i>"Invalid string"</i> Valid arguments are configuration statistics

Serial Setup Commands

Command Syntax	set serial auto-telnet <enable/disable>
Description	This command globally enables serial auto-dial-in support. Note: This feature provides a serial-to-ethernet connectivity.
Default Value	Disabled
Success	OK
Error	1. Too few arguments “Usage: set serial auto-telnet <enable/disable> Type ‘set serial auto-telnet ?’ for more information” 2. Invalid string error: Invalid string Type ‘set serial auto-telnet ?’ for more information

Command Syntax	set serial escape-monitor <enable/disable>
Description	Set a “monitor” flag which enables/disables the scanning of escape sequence.
Default Value	Enable
Success	OK
Error	1. Too few arguments “Usage: set serial escape-monitor <enable/disable> Type ‘set serial escape-monitor ?’ for more information” 2. Multiple matches escape-monitor escape-string 3. Invalid string error: Invalid string Type ‘set serial escape-monitor ?’ for more information”

Command Syntax	set serial escape-string <string>
Description	The Telnet Server scans for this escape sequence and transfers the control to the command parser. By default, the Telnet Server scans for “+++inet”.
Default Value	+++ inet
Success	OK
Error	1. Too few arguments “Usage: set serial escape-string <string> Type ‘set serial escape-string ?’ for more information” 2. Multiple matches escape-monitor escape-string

Serial Setup Commands – Set Commands

Command Syntax	set serial s0 auto-dialin <enable/disable>
Description	Enable/disable the serial-to-ethernet connectivity for the serial port S0
Default Value	Disabled
Success	OK
Error	1. Too few arguments “Usage: set serial s0 auto-dialin <enable/disable> Type ‘set serial s0 auto-dialin ? for more information” 2. Multiple matches auto-dialin auto-dialout auto-dialin-ipaddress auto-dialout-port auto-dialin-port auto-dialout-protocol auto-dialin-protocol 3. Invalid string “error: Invalid string Type ‘set serial s0 auto-dial-in ? for more information”

Command Syntax	set serial s0 auto-dialin-ipaddress <ipaddr>
Description	Command to specify the auto dial-in IP address. Note: On connection establishment from serial, a session is established to the IP address mentioned above.
Default Value	NULL
Success	OK
Error	1. Too few arguments “Usage: set serial s0 auto-dialin-ipaddress <ipaddr> Type ‘set serial s0 auto-dialin-ipaddress ? for more information” 2. Multiple matches auto-dialin auto-dialout auto-dialin-ipaddress auto-dialout-port auto-dialin-port auto-dialout-protocol auto-dialin-protocol 3. Invalid IP Address “error: Invalid IP address Type ‘show serial s0 auto-dialin-ipaddress ? for more information”

Command Syntax	set serial s0 auto-dialin-port [port_num]
Description	Command to specify the auto dial-in port number. Note: [port_num] is optional here. If port_num is not specified, the standard port 23 of the telnet protocol shall be used.
Default Value	23
Success	OK
Error	1. Too few arguments “Usage: set serial s0 auto-dialin-port [port_num] Type ‘set serial s0 auto-dialin-port ? for more information” 2. Multiple matches auto-dialin auto-dialout auto-dialin-ipaddress auto-dialout-port auto-dialin-port auto-dialout-protocol auto-dialin-protocol 3. Invalid port “error: Invalid port number Type ‘set serial s0 auto-dialin-port ? for more information”

Serial Setup Commands – Set Commands

Command Syntax	set serial s0 auto-dialin-protocol <telnet/>
Description	By default, telnet is the protocol used to establish the serial-to-ethernet connectivity. Note: This syntax provides for future extensibility (SSH Client, etc.)
Default Value	telnet
Success	OK
Error	1. Too few arguments “Usage: set serial s0 auto-dialin-protocol telnet/> Type ‘set serial s0 auto-dialin-protocol ? for more information” 2. Multiple matches auto-dialin auto-dialout auto-dialin-ipaddress auto-dialout-port auto-dialin-port auto-dialout-protocol auto-dialin-protocol 3. Invalid protocol selected “error: Selected protocol not supported Type ‘set serial s0 auto-dialin-protocol ? for more information”

Command Syntax	set serial s0 auto-dialin trig-mode <char/ dtr/ dtr-char/ none>
Description	This mode is applicable only when auto dial-in is enabled on the serial port s0. Parameter Description char Initiate a session (Telnet) to the auto-dialin-ipaddress, only on a reception of a character on the serial port s0. dtr Initiate a session (Telnet) to the auto-dialin-ipaddress, only on seeing a DTR signal on the serial port s0 dtr-char Initiate a session (Telnet) to the auto-dialin-ipaddress, either on reception of a character (OR) seeing the DTR signal on the serial port s0. none Initiate a Telnet session to the auto-dialin-ipaddress on module boot-up.
Default Value	dtr-char
Success	OK
Error	1. Too few arguments Too few arguments. Possible argument(s) are char dtr dtr-char none 2. Invalid string “Invalid string “string” Valid arguments are char dtr dtr-char none

Serial Setup Commands – Set Commands

Command Syntax	set serial s0 auto-dialout <enable/disable>
Description	Enable/disable the ethernet-to-serial connectivity for the serial port S0.
Default Value	Enabled
Success	OK
Error	1. Too few arguments “Usage: set serial s0 auto-dialout <enable/disable> Type ‘set serial s0 auto-dialout ?’ for more information” 2. Multiple matches auto-dialin auto-dialout auto-dialin-ipaddress auto-dialout-port auto-dialin-port auto-dialout-protocol auto-dialin-protocol 3. Invalid string error: Invalid string Type ‘set serial s0 auto-dialout ?’ for more information”

Command Syntax	set serial s0 auto-dialout-port <port_num>
Description	If auto-dialout is enabled, specify the auto-dialout-port on which the client can connect. By default it is 5000. Note: The port number should be other than standard TCP ports.
Default Value	5000
Success	OK
Error	1. Too few arguments “Usage: set serial s0 auto-dialout-port <port_num> Type ‘set serial s0 auto-dialout-port ?’ for more information” 2. Multiple matches auto-dialin auto-dialout auto-dialin-ipaddress auto-dialout-port auto-dialin-port auto-dialout-protocol auto-dialin-protocol 3. Invalid Port Number “error: Invalid port number Type ‘set serial s0 auto-dialout-port ?’ for more information”

Command Syntax	set serial s0 auto-dialout-protocol <telnet/>
Description	Note: This syntax gives a provision for future extensibility. <SSH Server, etc>.
Default Value	telnet
Success	OK
Error	1. Too few arguments “Usage: set serial s0 auto-dialout-protocol <telnet/> Type ‘set serial s0 auto-dialout-protocol ?’ for more information” 2. Multiple matches auto-dialin auto-dialout auto-dialin-ipaddress auto-dialout-port auto-dialin-port auto-dialout-protocol auto-dialin-protocol 3. Invalid string error: Invalid parameter Type ‘set serial s0 auto-dialout-protocol ?’ for more information”

Serial Setup Commands – Set Commands

Command Syntax	set serial s0 baud-rate <baud>
Description	Command to set the serial baud
Default Value	115200
Success	OK
Error	1. Too few arguments “Usage: set serial s0 baud-rate <baud> Type ‘set serial s0 baud-rate ?’ for more information” 2. Invalid baud-rate “error: baud-rate range : [300,.....] Type ‘set serial s0 baud-rate ?’ for more information”

Command Syntax	set serial s0 buffer-datasize <0/d bytes>
Description	This command primarily buffers the data sent from serial-to-ethernet.
Default Value	0 – No buffering.
Success	OK
Error	1. Too few arguments “Usage: set serial s0 buffer-datasize <0/d bytes> Type ‘set serial s0 buffer-datasize ?’ for more information” 2. Multiple matches buffer-datasize buffer-time 3. Datasize range “error: Buffer data-size range : [1 - 1500] bytes Type ‘set serial s0 buffer-datasize ?’ for more information”

Serial Setup Commands – Set Commands

Command Syntax	set serial s0 buffer-time <0/t secs>
Description	<p>This command is related to the 'set serial s0 buffer-datasize' command. The buffering of data shall either wait for the datasize configured (in the previous command) or the time t secs.</p> <p>Example:</p> <pre> SI Buffer-datasize Buffer-time (secs) Descriptions 1 0 - Default 0 - Default No buffering. Pass the data to the serial application on the receptions of a character on the serial. 2 10 0 Buffer till it reaches buffer-datasize (10); then pass it to the serial application. 3 0 10 No buffering. Pass the data to the serial application on the reception of a character on the serial. 4 10 10 Buffer the characters till it reaches the buffer-datasize (10) (OR) wait for the buffer-time (10Secs). The data is passed on to the serial application depending on which condition is satisfied first. </pre>
Default Value	0 – No buffering
Success	OK
Error	<p>1. Too few arguments "Usage: set serial s0 buffer-time <0/t secs> Type 'set serial s0 buffer-time ?' for more information"</p> <p>2. Multiple matches buffer-datasize buffer-time</p> <p>3. Time limit "error: Time limit supported : <1 – 60 secs> Type 'set serial s0 buffer-time ?' for more information"</p>

Command Syntax	set serial s0 chat-script <line-num> <expect-string> <send-string>
Description	<p>Sets <i>expect</i> and <i>send</i> strings for the chat script to act on the modem. Triggers for a reboot upon save.</p> <p>Important Note: Use double quotes if more than one word is used in the <expect-string>/<send-string>.</p>
Default Value	NA
Success	OK
Error	<p>1. Too few arguments "Usage: set serial s0 chat-script <line-num> <expect-string> <send-string> Type 'set serial s0 chat-script ?' for more information"</p>

Serial Setup Commands – Set Commands

Command Syntax	set serial s0 connect-state <dialing/answering>
Description	Sets the connect state of the serial port to dialing/answering. Triggers a reboot upon save
Default Value	Dialing
Success	OK
Error	1. Too few arguments "Usage: set serial s0 connect-state <dialing/answering> Type 'set serial s0 connect-state ?' for more information" 2. Invalid string "error: Invalid string Type 'set serial s0 connect-state ?' for more information"

Command Syntax	set serial s0 connect-type <direct/modem>
Description	Sets the connect type of the serial port to direct/modem connect Triggers a reboot upon save
Default Value	Direct
Success	OK
Error	1. Too few arguments "Usage: set serial s0 connect-type <direct/modem> Type 'set serial s0 connect-type ?' for more information" 2. Invalid string "error: Invalid string Type 'set serial s0 connect-type ?' for more information"

Command Syntax	set serial s0 data-bits <7/8>
Description	Command to set the data-bits
Default Value	8
Success	OK
Error	1. Too few arguments "Usage: set serial s0 data-bits <7/8> Type 'set serial s0 data-bits ?' for more information" 2. Invalid data-bit setting "error: Data-bits range supported: [7/8] Type 'set serial s0 data-bits ?' for more information"

Command Syntax	set serial s0 flow-control <none/rts-cts>
Description	Command to set the flow-control of the serial port. By default flow-control is disabled on the serial port.
Default Value	rts-cts
Success	OK
Error	1. Too few arguments "Usage: set serial s0 flow-control <none/rts-cts> Type 'set serial s0 flow-control ?' for more information" 2. Invalid flow-control setting "error: flow-control supported: [none/rts-cts] Type 'set serial s0 flow-control ?' for more information"

Serial Setup Commands – Set Commands

Command Syntax	set serial s0 modem connect-string <connect-str>
Description	Sets the Modem Connect string. Triggers for a reboot upon save.
Default Value	CONNECT
Success	OK
Error	1. Too few arguments "Usage: set serial s0 modem connect-string <connect-str> Type 'set serial s0 modem connect-string ?' for more information"

Command Syntax	set serial s0 modem dial-number <phone-num>
Description	Sets the dial-number to be dialed.
Default Value	NA
Success	OK
Error	1. Too few arguments "Usage: set serial s0 modem dial-number <phone-num> Type 'set serial s0 modem dial-number ?' for more information"

Command Syntax	set serial s0 modem dial-prefix <dialprefix>
Description	Sets the Modem Dial-Prefix. Triggers for a reboot upon save.
Default Value	ATDT
Success	OK
Error	1. Too few arguments "Usage: set serial s0 modem dial-prefix <dialprefix> Type 'set serial s0 modem dial-prefix ?' for more information"

Command Syntax	set serial s0 modem dial-suffix <dialsuffix>
Description	Sets the Modem Dial-suffix. Triggers for a reboot upon save.
Default Value	^M
Success	OK
Error	1. Too few arguments "Usage: set serial s0 modem dial-suffix <dialsuffix> Type 'set serial s0 modem dial-suffix ?' for more information"

Command Syntax	set serial s0 modem dialing-method <configuration/chat-script>
Description	Set the modem dialing method. 1. Configuration method: The user shall provide only the dial-number to reach. 2. Choosing the 'chat' as the dialing-method, the user can write his/her own script by providing an "Expect" and a "Send" sequence Refer to: 'set serial s0 chat-script ?' for providing an "Expect" and a "Send" sequence. Triggers for a reboot upon save
Default Value	Configuration
Success	OK
Error	1. Too few arguments "Usage: set serial s0 modem dialing-method <configuration/chat-script> Type 'set serial s0 modem dialing-method ?' for more information"

Serial Setup Commands – Set Commands

Command Syntax	set serial s0 modem hangup-string <hangup-str>
Description	Sets the Modem hang-up string. Triggers for a reboot upon save.
Default Value	+++ATH0
Success	OK
Error	1. Too few arguments "Usage: set serial s0 modem hangup-string <hangup-str> Type 'set serial s0 modem hangup-string ?' for more information"

Command Syntax	set serial s0 modem init-string <init-num> <init-str>
Description	Configure the Modem init strings. Init-num can range from 1-5. Triggers for a reboot upon save. Example: Set serial s0 modem init-string 1 ATZ Set serial s0 modem init-string 1 "ATZ AT&F" Important Note: Use double quotes if more than one word is used in the <init-str>. Refer example 2 above. This holds true for all the following commands that need a string as a parameter.
Default Value	Init-string 1 is set to 'ATZ' Init-string 2 is set to '' Init-string 3 is set to '' Init-string 4 is set to '' Init-string 5 is set to ''
Success	OK
Error	1. Too few arguments "Usage: set serial s0 modem init-string <init-num> <init-str> Type 'set serial s0 modem init-string ?' for more information" Invalid init-num "ERROR: init-num range supported : [1-5]"

Command Syntax	set serial s0 modem ok-string <ok-str>
Description	Sets the Modem OK string. Triggers for a reboot upon save.
Default Value	OK
Success	OK
Error	1. Too few arguments "Usage: set serial s0 modem ok-string <ok-str> Type 'set serial s0 modem ok-string ?' for more information"

Command Syntax	set serial s0 modem ring-string <ring-str>
Description	Sets the Modem Ring string. Triggers for a reboot upon save.
Default Value	RING
Success	OK
Error	1. Too few arguments "Usage: set serial s0 modem ring-string <ring-str> Type 'set serial s0 modem ring-string ?' for more information"

Serial Setup Commands – Set Commands

Command Syntax	set serial s0 parity <even/odd/none>
Description	Command to set the parity.
Default Value	None
Success	OK
Error	1. Too few arguments “Usage: set serial s0 parity <even/odd/none> Type ‘set serial s0 parity ?’ for more information” 2. Invalid parity setting “error: parity supported: [even/odd/none] Type ‘set serial s0 parity ?’ for more information”

Command Syntax	set serial s0 raw-dialin <enable/disable>
Description	Enable/disable raw mode support for serial auto dial-in on the serial port s0.
Default Value	Disabled
Success	OK
Error	1. Too few arguments “Usage: set serial s0 raw-dialin <enable/disable> Type ‘set serial s0 raw-dialin ?’ for more information” 2. Multiple matches raw-dialin raw-dialout 3. Invalid string “ERROR: Invalid string Type ‘set serial s0 raw-dialin ?’ for more information”

Command Syntax	set serial s0 raw-dialout <enable/disable>
Description	Enable/disable the raw mode support for auto-dialout on the serial port s0.
Default Value	Disabled
Success	OK
Error	1. Too few arguments “Usage: set serial s0 raw-dialout <enable/disable> Type ‘set serial s0 raw-dialout ?’ for more information” 2. Multiple matches raw-dialin raw-dialout 3. Invalid string “error: Invalid string Type ‘set serial s0 raw-dialout ?’ for more information”

Command Syntax	set serial s0 stop-bits <1/1.5/2>
Description	Command to set the stop bits.
Default Value	1
Success	OK
Error	1. Too few arguments “Usage: set serial s0 stop-bits <1/1.5/2> Type ‘set serial s0 stop-bits ?’ for more information” 2. Invalid stop-bit setting “ERROR: Stop-bit supported : [1, 1.5, 2] Type ‘set serial s0 stop-bits ?’ for more information”

Serial Setup Commands – Show Commands

Command Syntax	show serial s0 chat-script
Description	Displays the "Expect" and "Send" sequence for the serial port 's0'.
Default Value	NA
Success	OK
Error	1. Too few arguments Possible value(s) are statistics modem-configuration configuration chat-script

Command Syntax	show serial s0 configuration
Description	Display Serial s0 Configuration.
Default Value	-
Success	OK
Error	1. Too few arguments Possible value(s) are statistics configuration modem-configuration chat-script

Command Syntax	show serial s0 modem-configuration
Description	Displays the modem related configuration for the serial port 's0'.
Default Value	NA
Success	OK
Error	1. Too few arguments Possible value(s) are statistics modem-configuration configuration chat-script

Command Syntax	show serial s0 statistics
Description	Displays Serial Statistics. <ul style="list-style-type: none"> • Status (If serial is used by any application) • Rx Bytes • Rx Errors • Tx Bytes • Tx Errors • Status of EIA signals (CTS, DSR, DCD, RTS, DTR). <p>Important Note: Serial statistics are only for the current session. Rx Bytes, Tx Bytes will be reset for every session opened on the serial.</p>
Default Value	-
Success	OK
Error	1. Too few arguments Possible value(s) are statistics configuration modem-configuration chat-script

Bridging Setup Commands

Command Syntax	set bridge <enable/disable>
Description	Enable remote transparent bridging between ethernet and serial interface.
Default Value	Disabled Bridge Name - 'ipmodule' Interfaces attached to the bridge - 'eth0' and 'ppp0'
Success	OK
Error	1. Too few arguments "Usage: set bridge <enable/disable/ipmodule> Type 'set bridge ?' for more information" 2. Invalid string "error: Invalid string Type 'set bridge ?' for more information"

Command Syntax	set bridge [bridge name] ip-address <ip-addr> mask <ip-mask>
Description	Configure IP address for bridge.
Default Value	Default BridgeName: 'ipmodule' 192.168.2.1 255.255.255.0 Example: set bridge ipmodule ip-address 192.168.2.1
Success	OK
Error	1. Too few arguments Possible argument(s) are ip-address 2. Invalid IP address/Mask Invalid argument Valid arguments are: ip-address 3. The IP address/Mask is wrong Invalid IP address/Mask Type set bridge ipmodule ip ? for more information

Bridging Setup Commands – Show Commands

Command Syntax	show bridge configuration
Description	Display Bridging Status (enable/disable), Bridge IP Address, etc.
Default Value	NA
Success	OK
Error	1. Too few arguments Possible argument(s) are: configuration statistics 2. Invalid argument Valid argument(s) are: configuration statistics

Bridging Setup Commands – Show Commands

Command Syntax	show bridge statistics
Description	Display Bridge Statistics. <ul style="list-style-type: none">• Bridge Information• MACS learned by the bridge
Default Value	NA
Success	OK
Error	1. Too few arguments Possible argument(s) are: configuration statistics 2. Invalid argument Valid argument(s) are: configuration statistics

PPP Setup Commands

Command Syntax	set ppp <interface> <enable/disable>
Description	Enable/Disable PPP for the interface. Note: PPP can be enabled only if bridging is enabled. Example: set ppp ppp0 enable
Default Value	Disabled
Success	OK
Error	1. Too few arguments Too few argument(s). Possible argument(s) are: authentication enable auth-type password compression username disable 2. Invalid interface Possible values are ppp interface (ppp0) 3. Invalid String "Invalid argument ' <i>string</i> ' " Valid argument(s) are authentication enable auth-type password compression username disable
Note	When Bridge is disabled, PPP is also disabled.

Command Syntax	set ppp <interface> authentication <enable/disable>
Description	Enable/Disable PPP Authentication
Default Value	Disabled
Success	OK
Error	1. Too few arguments Possible argument(s) are : disable enable 2. Invalid string Invalid argument. Valid argument(s) are: disable enable 3. Multiple matches auth-type authentication

PPP Setup Commands – Set Commands

Command Syntax	set ppp <interface> auth-type <pap/chap/pap-chap>
Description	Protocols to authenticate the remote peer – PAP/CHAP/PAP-CHAP
Default Value	PAP
Success	OK
Error	1. Too few arguments Too few argument(s). Possible argument(s) are: chap pap pap-chap 2. Invalid authentication type Invalid argument. Valid argument(s) are chap pap pap-chap 3. Multiple matches auth-type authentication

Command Syntax	set ppp <interface> compression <enable/disable>
Description	Enable/Disable CCP compression
Default Value	Disabled
Success	OK
Error	1. Too few arguments Possible argument(s) are; disable enable 2. Invalid string Invalid argument. Valid argument(s) are: disable enable

Command Syntax	set ppp <interface> comp-type <both/bsd/deflate>
Description	Set the compression type to BSD, DEFLATE or BOTH. In case of NON-RAWMODE: When " both " is configured as the compression type, the module tries to negotiate DEFLATE first. In the event of failure, the BSD is negotiated. In case of RAW-MODE: Compress-type " both " is not supported in RAW-MODE, since there is no negotiations between SocketEthernet IP Modules.
Default Value	Deflate
Success	OK
Error	1. Too few arguments Too few argument(s). Possible argument(s) are; both bsd deflate 2. Invalid string Invalid argument " string " Valid argument(s) are: both bsd deflate

PPP Setup Commands – Set Commands

Command Syntax	set ppp <interface> password <password >
Description	Password – with which remote peer will authenticate us.
Default Value	ipmodule
Success	OK
Error	1. Password Length Password should have minimum of 8 characters

Command Syntax	set ppp <interface> raw-mode <enable/disable>
Description	Enable simple AHDLC framing on the Serial side. Notes: NO PPP negotiations done on the serial. The ethernet data is encapsulated with 7E delimiters. FCS is part of the AHDLC frame header.
Default Value	Disable
Success	OK
Error	1. Too few arguments Too few argument(s). Possible argument(s) are; disable enable 2. Invalid string Invalid argument " <i>string</i> " Valid argument(s) are: disable enable

Command Syntax	set ppp <interface> username <username>
Description	Username – with which remote peer will authenticate us.
Default Value	ipmodule
Success	OK
Error	1. Too few arguments Possible value(s) are valid user name

PPP Setup Commands – Show Commands

Command Syntax	show ppp configuration
Description	Displays: PPP Status (enabled/disabled) Authentication status Authentication type Username and password for authentication
Default Value	NA
Success	OK
Error	1. Too few arguments Possible argument(s) are configuration statistics 2. Invalid argument Invalid argument Valid argument(s) are: configuration statistics

Command Syntax	show ppp statistics
Description	Displays PPP Statistics.
Default Value	-
Success	OK
Error	1. Too few arguments Possible argument(s) are configuration statistics 2. Invalid argument Invalid argument Valid argument(s) are: configuration statistics

HTTP Server Commands

The commands in this section are listed in the order in which they might be used.

Command Syntax	set ip http-page <default/serial>
Description	This parameter is used by the http server to host the default index.HTML or host-defined http-serial-s0.HTML page.
Default Value	Default
Success	OK
Error	1. Too few arguments "Usage: set ip http-page <default/serial> Type set ip http-page ?" 2. Invalid string Type set ip http-page ?"

Command Syntax	set ip http <enable/disable>
Description	This enables the http server on the IP Module to listen on Port 80.
Default Value	Disable
Success	OK
Error	1. Too few arguments "Usage: set ip http <enable/disable> Type set ip http ?" for more information" 2. Invalid string "ERROR: Invalid string Type set ip http ?" for more information"

Command Syntax	set ip http-port <port>
Description	Sets the HTTP server to listen on the specified port.
Default Value	80
Success	OK
Error	1. Too few arguments "Usage: set ip http-port <port> Type set ip http-port ? for more information" 2. Invalid port number "ERROR: Invalid port number Type set ip http-port ? for more information"

Command Syntax	set device-parameter P<n> <value> where n = 0 to 99.
Description	This command sets the value of the parameter from the host/serial device.
Default Value	Value in the Default parameter list file uploaded through TFTP.
Success	OK
Error	1. Too few arguments "Usage: set device P<n> <value> Type set device P<n> ? for more information" 2. Invalid string "ERROR: Invalid string Type set device P<n> ? for more information"

HTTP Server Commands – Set and Save Commands

Command Syntax	save param
Description	Invoking this command will save the host parameters into the flash. The “/var/apps” directory is gun zipped to apps.tar.gz and written into flash. (APPS_SECTOR)
Default Value	-
Success	OK
Error	1. Too few arguments “ERROR: Too few arguments Type save ? for more information”

HTTP Server Commands – Show Commands

Command Syntax	show http configuration
Description	Displays the HTTP related configurations
Default Value	-
Success	OK
Error	1. Too few arguments “ERROR: Too few arguments Type show http configuration ? for more information”

Command Syntax	show device-parameter P<n> where n = 0 to 99.
Description	Displays the value of the requested parameter from IP Module.
Default Value	-
Success	OK
Error	1. Too few arguments “ERROR: Too few arguments Type show device-parameter ? for more information”

Command Syntax	show device-parameter modified
Description	Displays the status of the host parameters i.e., whether they are changed by the browser. Returns “Device parameters changed” when values are changed by the remote browser. Returns “Device parameters not changed” when values are not changed.
Default Value	-
Success	OK
Error	1. Too few arguments “ERROR: Too few arguments Type show device-parameter ? for more information”

SMTP Client Commands

The commands in this section are listed in the order in which they might be used.

Command Syntax	set send-mail smtp-server-name <name/ip-address>
Description	Sets the SMTP Server name or IP address. Server names are to be resolvable by the DNS.
Default Value	NULL
Success	OK
Error	1. Too few arguments “Usage: set send-mail smtp-server-name <name/ip-address> Type set send-mail smtp-server-name ? for more information” 2. Invalid name/IP address “ERROR: Invalid SMTP Server Name/IP Address”

Command Syntax	set send-mail smtp-server-port <port>
Description	Sets the SMTP Server port.
Default Value	25
Success	OK
Error	1. Too few arguments “Usage: set send-mail smtp-server-port <port> Type set send-mail smtp-server-port ? for more information”

Command Syntax	set send-mail host-name <host name>
Description	Sets the SMTP Client host name.
Default Value	NULL
Success	OK
Error	1. Too few arguments “Usage: set send-mail host-name <host name> Type set send-mail host-name ? for more information”

Command Syntax	set send-mail from-address-identity <name>
Description	Sets the ‘From:’ description in the email header as <name>.
Default Value	NULL
Success	OK
Error	1. Too few arguments “Usage: set send-mail from-address-identity <name> Type set send-mail from-address-identity ? for more information”

Command Syntax	set send-mail from-address <email-address>
Description	Sets the email-address as the Default From address information.
Default Value	NULL
Success	OK
Error	1. Too few arguments “Usage: set send-mail from-address <email-address> Type set send-mail from-address ? for more information”

SMTP Client Commands – Set Commands

Command Syntax	set send-mail to-address <n> <email-address> where n = 1 to 5.
Description	Sets the email-address as one of the primary addressee. This is the default email address to which email messages are sent.
Default Value	NULL
Success	OK
Error	1. Too few arguments “Usage: set send-mail to-address <n> <email-address> Type set send-mail to-address <n> ? for more information” 2. Invalid to-address number “ERROR: to-address numbers supported: [1 to 5] Type set send-mail to-address <n> ? for more information”

Command Syntax	set send-mail cc-address <n> <email-address> where n = 1 to 5.
Description	Sets the email-address as the alternate addressee (carbon copy). This is the default Email address to which Email messages sent to primary addressee are copied.
Default Value	NULL
Success	OK
Error	1. Too few arguments “Usage: set send-mail cc-address <n> <email-address> Type set send-mail cc-address <n> ? for more information” 2. Invalid to-address number “ERROR: cc-address numbers supported: [1 to 5] Type set send-mail cc-address <n> ? for more information”

Command Syntax	set send-mail reply-to-address <email-address>
Description	Sets the email-address to be used when the recipient uses the reply-to button.
Default Value	NULL
Success	OK
Error	1. Too few arguments “Usage: set send-mail reply-to-address <email-address> Type set send-mail reply-to-address ? for more information”

Command Syntax	set send-mail subject <data>
Description	Sets the email header subject field to the given data.
Default Value	NULL
Success	OK
Error	1. Too few arguments “Usage: set send-mail subject <data> Type set send-mail subject ? for more information”

SMTP Client Commands – Set Commands

Command Syntax	send-mail [-b] [-t <email-address1, email-address2, ...>] [-c <email-address1, email-address2, ...>] [-s <data>] [-d <msg body>]
Description	Triggers the SMTP Client application. The application enters into interactive mode or send the mail according to the command arguments. Notes: All the arguments are optional. This implies that a mail can be sent by specifying the parameter(s) in the command line (or) entering them in the order prompted by SocketEthernet IP Module. Usage: -b : binary mode {default is text mode} -t : To addresses -c : CC addresses -s : Subject Data -d : Message Body
Default Value	-
Success	Email Sent Successfully OK
Error	1. Too few arguments Usage: send-mail [-b] [-t <email-address, ...>] [-c <email-address, >] [-s <data>] [-d <msg body>] ... Type send-mail ? for more information"

SMTP Client Commands – Show Commands

Command Syntax	show send-mail configuration
Description	Displays the SMTP configuration.
Default Value	-
Success	OK
Error	1. Too few arguments "Usage: show send-mail configuration Type show send-mail ? for more information"

POP3 Client - Commands

Command Syntax	set recv-mail server-name <server-name>
Description	This parameter is set by the host to establish the POP3 connection for receiving the email from the remote server. This also needs DNS to be enabled on IP Module.
Default Value	None
Success	OK
Error	1. Too few arguments Usage: set recv-mail server-name <server-name> Type 'set recv-mail server-name ?' for more information 2. Invalid string Type 'set recv-mail server-name ?' for more information

Command Syntax	set recv-mail server-port <server-port>
Description	This parameter is set by the host to establish the POP3 connection for receiving the email from the remote server.
Default Value	110
Success	OK
Error	1. Too few arguments Usage: set recv-mail server-port <server-port> Type 'set recv-mail server-port ?' for more information 2. Invalid string Type 'set recv-mail server-port ?' for more information

Command Syntax	set recv-mail mailbox-name <mailbox-name>
Description	Sets the mail box user name for POP3 server authentication.
Default Value	None
Success	OK
Error	1. Too few arguments Usage: set recv-mail mailbox-name <mailbox-name> Type 'set recv-mail mailbox-name ?' for more information 2. Invalid string Type 'set recv-mail mailbox-name ?' for more information

Command Syntax	set recv-mail mailbox-password <mailbox-password>
Description	Sets the mail box password for POP3 server authentication.
Default Value	None
Success	OK
Error	1. Too few arguments Usage: set recv-mail mailbox-password <mailbox-password> Type 'set recv-mail mailbox-password ?' for more information 2. Invalid string Type 'set recv-mail mailbox-password ?' for more information

POP3 Client Commands – Set Commands

Command Syntax	set recv-mail leave-on-server <enable/disable>
Description	This parameter is used to set the variable “leave a copy of message on server” flag, which tells the POP3 server not to delete the mails from it once the mails are received.
Default Value	Disable
Success	OK
Error	1. Too few arguments

Command Syntax	recv-mail list [index]
Description	This command retrieves list of emails from the mailbox. Displays the list of emails in the order below: <index of the mail> <size in bytes> or Mailbox is empty
Default Value	-
Success	OK
Error	1. Too few arguments Usage: recv-mail list [index] Type 'recv-mail ?' for more information

Command Syntax	recv-mail header [index]
Description	This command receives the header information of all the mails present in the mailbox if index is not issued. If index is issued, the mail header corresponding to the index is retrieved.
Default Value	-
Success	OK
Error	1. Too few arguments Usage: recv-mail header [index] Type 'recv-mail ?' for more information

Command Syntax	recv-mail mail [index]
Description	This command retrieves all the pending mails present in the mailbox if index is not given. If index is issued, the mail corresponding to the index is retrieved.
Default Value	-
Success	OK
Error	1. Too few arguments Usage: recv-mail mail [index] Type 'recv-mail ?' for more information

Command Syntax	recv-mail delete <index>
Description	Deletes the mail corresponding to the index. The emails will not be deleted until the “ recv-mail quit ” command is executed.
Default Value	-
Success	OK
Error	1. Too few arguments Usage: recv-mail delete <index> Type 'recv-mail ?' for more information

POP3 Client Commands – Set Commands

Command Syntax	recv-mail top <index> <n>
Description	Displays the first <n> lines of the mail corresponding to index. If n is greater the mail size then the whole message is displayed.
Default Value	-
Success	OK
Error	1. Too few arguments Usage: recv-mail top [index] Type 'recv-mail top' for more information

POP3 Client Commands – Show Commands

Command Syntax	recv-mail unique-id-listing [index]
Description	Displays the unique id listing from the server in the order below: <index of the mail> <unique id>. If index is specified, only the corresponding unique id is displayed. If index is not specified, all unique ids in the mail box are displayed.
Default Value	-
Success	OK
Error	1. Too few arguments Usage: recv-mail unique-id-listing [index] Type 'recv-mail ?' for more information

Command Syntax	recv-mail stat [index]
Description	Displays the statistics of an email or emails for a given index.
Default Value	-
Success	OK
Error	1. Too few arguments Usage: recv-mail stat [index] Type 'recv-mail ?' for more information

Command Syntax	show recv-mail configuration
Description	Displays the recv-mail related configuration
Default Value	-
Success	OK
Error	1. Too few arguments Possible value(s) are configuration

Chapter 7 – Flash Upgrade

Introduction

The SocketEthernet IP Module contains a 2 MB flash wherein the boot image, the firmware and configuration files are stored in a compressed format. The flash can easily be upgraded both locally as well as remotely.

- **Local Upgrade**

The flash of the SocketEthernet IP can be upgraded locally through serial port using the upload feature of serial applications.

- **Remote Upgrade**

The flash can be upgraded remotely through the Ethernet using TFTP.

The SocketEthernet IP Module flash contains two main files, which are required for an upgrade.

- **Binary File**

- The binary file contains the firmware of the Module
The name of this binary file would be in the following format
MTXCSEM-TFTP-v<version>w-<date in ddMmmmyyyy format>

- **Gun-zipped .tar File**

- This contains the HTML pages of the serial device and other files related to it, such as **http-host-param (http page configuration file)**
- The name of this tar file would always be **http.tar.gz**

Prerequisites

Prerequisite 1 – Required Tool (TFTP Client)

A Trivial File Transfer Protocol (TFTP) client must be installed on your PC in order to execute the flash upload procedure.

TFTP for Windows

Though Windows 98 and ME do not come with a TFTP client, the file can be copied from a PC operating Windows NT or 2000 (not XP):

- On a PC operating Windows NT or Windows 2000, locate the TFTP file at C:\WINNT\SYSTEM32\tftp.exe.
- Copy the this file to C:\WINDOWS on your Windows 98 or ME PC.

Downloading TFTP from the Internet

If your operating system does not include a TFTP client program, a TFTP client program is available for Windows users from the Internet. Walusoft's TFTP Suite Pro is recommended. The URL is:

<http://www.walusoft.co.uk/download.htm>

Prerequisite 2 – Serial Port Configuration

The default serial port parameters should be:

Data length – 8 bits

Parity – None

Stop bits – 1

Baud-rate of the serial port to which the SocketEthernet IP Module is connected should be set to 115200 bps for proper operation.

Prerequisite 3 – Enabling TFTP Server

Enable TFTP server on SocketEthernet IP Module by issuing the following command:

```
# set ip tftp enable  
OK
```

Scenarios

Scenario 1 – Serial Flash Upgrade

Following steps explain the procedure to upgrade a flash using the serial COM port (serial flash upgrade).

Connect the SocketEthernet IP Module to a PC COM Port.

- Open an application through which we can access the serial device(e.g., Metterm, zoc, hyperterm).
- Reboot the SocketEthernet IP Module.
- Wait for the boot message and prompt “press d to download” to appear.
- Press **d** when prompted.
- Select the **XMODEM** Protocol from the Terminal application.
- Choose a file (MTXCSEM-TFTP-...) file to be uploaded.
- Perform a file upload.



The SocketEthernet IP Module reboots and will be up after a few seconds (10-15 secs).

Scenario 2 – Ethernet Flash Upgrade

The IP module can be remotely upgraded over a network. Make sure a TFTP client is already installed on the machine. The following steps explain the method to perform flash upgrade from Ethernet.

- Make sure the SocketEthernet IP Module is reachable on the LAN.
- Perform a TFTP to the SocketEthernet IP Module from a TFTP client.
 - Set binary mode on (**Note:** This step is very important)
 - Binary
- Put the binary file.
 - put <binary filename>
- Exit the tftp session.
 - quit

The SocketEthernet IP Module reboots after it has been successfully upgraded.

Appendix A – HTTP Server

Introduction

The HTTP Server on the SocketEthernet IP module supports hosting of embedded Web pages on behalf of the host. The host-defined embedded pages support live host parameter monitoring and configuration update through a remote browser.

In addition to serving HTML Web pages, the HTTP Server also features:

- Dual configuration modes
 - Host Device Configuration
 - Remote configuration of the Host Device using a Web browser
 - Monitoring of the Host Device remotely
 - Supports live parameter updates on the Web browser.
 - IP Module Configuration
 - SocketEthernet IP Module configuration
- Flexibility to design embedded home pages by the OEMs using normal ASCII text HTML code.
- Supports downloading of a home page using TFTP.
- Access Authentication
- Support for configuring either Default or Serial Page display.

The SocketEthernet IP Module acts as a proxy between the Host-Serial Device and the Web Browser.

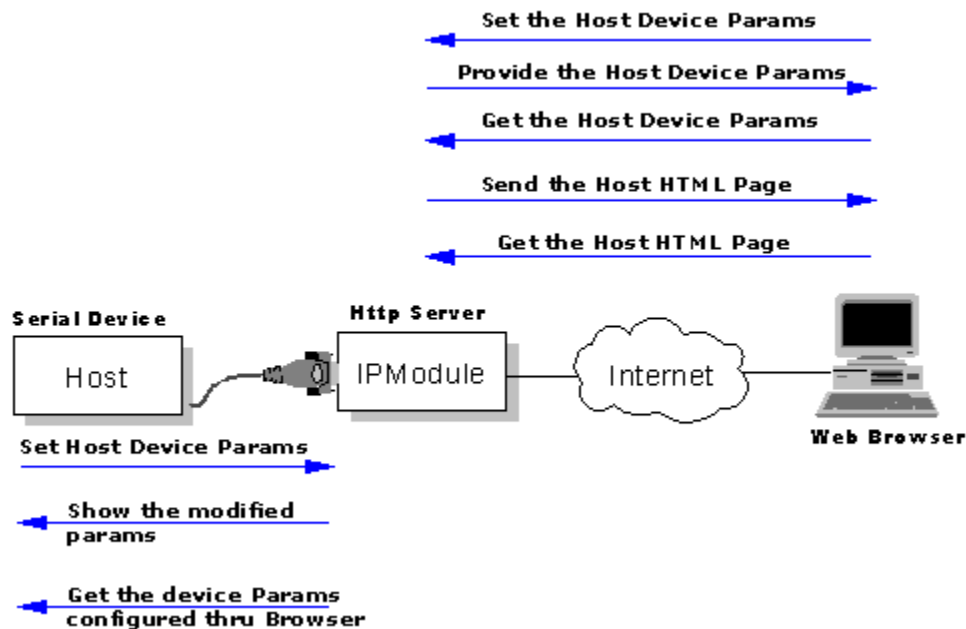


Figure 1: Typical Functions Supported by the HTTP Server

Setup and Configuration

Prerequisite – Enabling the HTTP Server

Before being able to access the SocketEthernet IP Module or the serial host through the Web browser, the HTTP support on the SocketEthernet IP Module needs to be enabled and configured.

The following configuration is mandatory and can be configured using CLI either through serial or through telnet.

Mandatory Setup for HTTP Server

set ip http enable

Successful execution of this command starts the HTTP daemon thus enabling the HTTP server.

set ip http port <port-number>

By default the HTTP server listens on port 80. However, the default port number can be changed.

set ip http-page <default/serial>

This command basically decides the Web page that will be displayed when the module is accessed through the browser.

Note: The default Index.htm is displayed when

- The http-page is set to **default** and
- The SocketEthernet IP module is accessed through the Web.

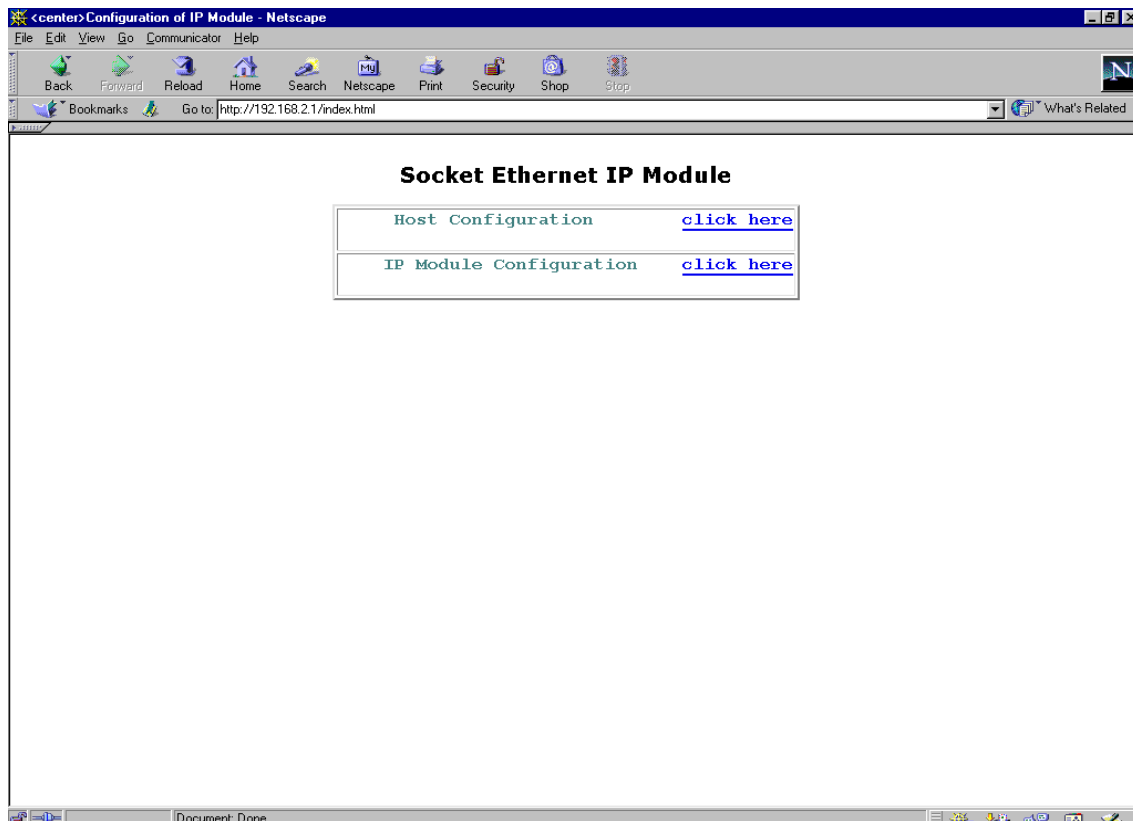


Figure 2: Index.htm (Default Index Page)

The default HTML page contains two links, one for the host configuration and another for the IP module configuration. Both these modes are described in subsequent sections.

In the event that the http-page is set to **serial**, the **http-s0.HTML** Web page will be displayed upon accessing the SocketEthernet IP module through the browser. (The Index.htm will not be accessible).

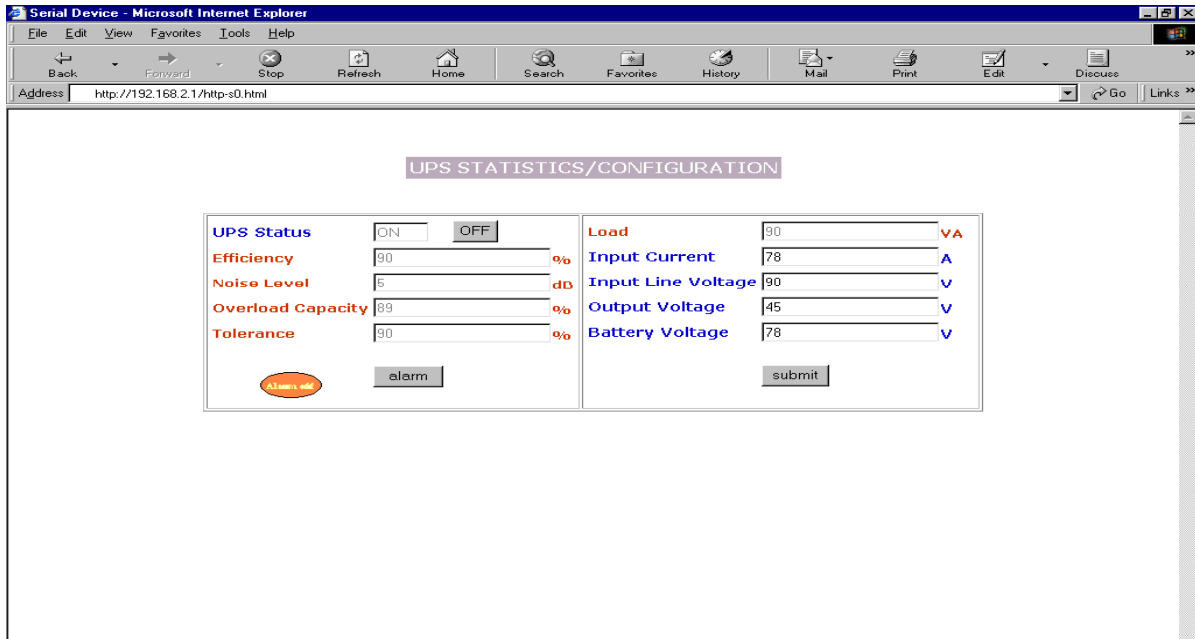


Figure 3: http-s0.HTML (Demo Page)

This page can be replaced by the OEMs home page specific to the product. More details regarding design conventions, procedure for uploading, and hosting this page are explained later in this chapter.

Configuration Modes

The embedded HTTP Server on the SocketEthernet IP module supports two modes for configuration. This option is available when the http-page is set to **serial** (see **Mandatory Setup** instructions).

- **Host Configuration Mode**
- **IP Module Configuration Mode** (not supported at this point in time)

In the **Host Configuration Mode**, the OEM's embedded home page is sent to the remote browser. The page serves as a means of monitoring the host parameters live remotely. Further, the host parameters can be updated or configured through the browser.

The **IP Module Configuration Mode** enables the configuration of the SocketEthernet IP module remotely through any standard Web browser. All parameters can be configured or their status can be viewed remotely through the interactive GUI provided. Further, vital statistics of the SocketEthernet IP Module can be viewed remotely.

Host Configuration Mode

The **Host Configuration Mode** provides the OEM flexibility to design and implement a product-specific embedded Web page, which is stored, managed, and hosted by the SocketEthernet IP module's HTTP server on behalf of the host device.

The OEM can design the Web page to contain the host parameters that will display live values for monitoring and for providing options for setting and configuring the host parameters remotely.

The three essential components of host configuration are the:

- **Parameter List**
- **HTML Page**
- **CGI Scripts**

Note: Certain **File naming and size** conventions are to be strictly adhered to and followed by the Web developer. See details later in this chapter.

The Parameter List

The OEM's customized host HTML page, which is uploaded, may contain parameters (for Configuration or for Monitoring). All these parameters must be available in the **Serial Device Parameter List**, which must be loaded onto the SocketEthernet IP Module.

The format of the Serial device parameter list is shown here:

P<n>:Description:Type:Minimum:Maximum:<Data>

n ranges from **0** to **99**

Description = Name of the parameter

Type = **I**: Integer

S: String

Minimum = If the **Type** is integer corresponds to Minimum value

If the **Type** is String, corresponds to Minimum no of characters.

Maximum = If the **Type** is integer corresponds to Maximum value

If the **Type** is String, corresponds to Maximum no of characters.

Data = The parameter value to be contained

Example:**P0:temperature:I:1:65535:100****P1:username:S:8:50:SocketEthernet IP**

Here, **P0** and **P1** are two **parameters**, which correspond to the names like **Temperature** & **username** specified in the HTML page.

I/S represents **Integer** and **String** respectively.

1 is the **minimum value** for the parameter P0

65535 is the **maximum value** for the parameter P0.

8 is the **minimum** number of **characters** for the parameter P1.

50 is the **maximum** number of **characters** for the parameter P1.

100: in P0 is an **integer Data**

SocketEthernet IP: in P1 is a **string Data**.

The serial device parameter list file (http-host-param) for the demo Web page, which is included with the default setup, (see Figure 3) uses the following parameters and values:

P0:UPSstatus:S:0:5:ON

P1:Efficiency:I:0:100:90

P2:NoiseLevel:I:0:100:5

P3:OverloadCapacity:I:0:100:89

P4:Tolerance:I:0:100:90

P5:InputCurrent:I:0:100:78

P6:InputLineVoltage:I:0:100:90

P7:OutputVoltage:I:0:100:45

P8:BatteryVoltage:I:0:100:78

P9:Load:S:0:100:90

P10:Alarm:S:0:10:silence

The Embedded HTML Page

The **embedded Web page** stored on the SocketEthernet IP module consists of normal ASCII text HTML code, which can be generated using any HTML editing tool. The page can include scripts, links to remote Web sites, graphic images, text files, etc.

A maximum 30 KB (uncompressed) of flash space for the OEM's Home Page and an additional 10 KB maximum memory is reserved for the device parameter list.

The OEM Web page must contain the **Parameter Tags**, which are the placeholders in HTML files. These tags are replaced on the fly with real-time values when the page is sent to the browser. The value of the parameter tags also can be changed through the browser in order to configure the host through the SocketEthernet IP module.

The developer should ensure that the parameter values, which are to be replaced, are qualified with **%P<n>%**.

Example:

```
<HTML>
--
--
--
--
Efficiency <input type="text" name = "P1" value = "%P1%">
--
--
</HTML>
```

In the above sample code segment, when the browser requests a page, the **%P1%** is replaced with Parameter P1's value. This value is extracted from the serial device parameter file.

CGI Scripts

- **Post-Query** is a built-in CGI script which will parse the new values set by the browser and replace them in the **http-host-param** file. See the section entitled Parameters Manipulation from the Browser for more technical information about the **Post-Query** CGI script.
- The SocketEthernet IP Module supports a user-defined CGI script, which performs host-specific processing to the parameters configured by the remote Web browser.

Important: The user-defined CGI-script **MUST** be a shell script.

File Naming and File Size Conventions

The following file naming conventions and file size constraints must be followed by the OEM Web page developer.

File Name(s)	Description
http-s0.HTML	Serial Device Main Page
http-host-param	Default Serial Device Parameter List
http-*.HTML	Any HTML file, should have the filename prefixed with "http-"
cgi-*	Any cgi script should have the filename prefixed with "cgi-"
Constraints	
The HTML file size cannot exceed 30KB Max.	
The Parameter list file cannot exceed 10KB Max.	
The Parameter tags <P1, P2, ...> should be contained in the parameter list.	
The URL for Host Configuration is http-s0.HTML . Therefore, the main page must have the filename http-s0.HTML when the host device's HTML page is uploaded to the SocketEthernet IP Module.	

Uploading the Web Page and Parameter List

The Host Device Files (.HTML, default parameter List....) can be uploaded to the SocketEthernet IP Module using TFTP CLIENT.

It is possible to upload these files in two different ways.

- **Compressed** and **Zipped** formats (tar.gz) or
- **Uncompressed** individual files.

In either case, the file naming and file size conventions described previously must be followed.

Uploading Compressed and Zipped Files (http.tar.gz)

In order to load files in the compressed (http.tar.gz) format, the following directory structure has to be strictly followed.

```
http/
  HTML/
    http-s0.HTML
    http-host-param
    http-*.HTML
  cgi-bin/
    cgi-* (Supports only Shell scripts)
```

- Place the HTML files and the default serial device parameter list in the **/http/HTML** directory. All the HTML file-names should be prefixed with **http-**.
- Place the CGI scripts in the **/http/cgi-bin** directory. All the CGI scripts should be prefixed with **cgi-**.
- Create an **http.tar.gz** from the source directory (http/). This file should be in the GZIP format only.
- Upload **http.tar.gz** using any TFTP Client with binary mode set.
- Use the following commands to upload **http.tar.gz** to the SocketEthernet IP Module.


```
[root@admin /root]# tftp 192.168.2.1 (Address of the IPModule)
tftp>trace
tftp>binary
tftp>verbose
tftp>put http.tar.gz
tftp>quit
```

Upload Uncompressed Files Individually

- Use TFTP client with binary mode set.
- Upload HTML files, the default serial device parameter list, and the CGI bin files individually using the following commands:


```
tftp 192.168.2.92 (IP-Address of the IP-Module)
tftp>verbose
tftp>binary
tftp>trace
tftp>put http-host-param
tftp>put http-s0.HTML.
```
- Upload all the files using the similar command.

Host Device Monitoring and Configuration through a Browser

If you have successfully completed the preceding configuration sections and completed the uploading, you are now ready to View, Monitor, and Configure the Host through the Web browser.

In order to view the device home page, enter the IP Address of the SocketEthernet IP module in the URL Address bar.

Example: <http://192.168.2.1>

The IP address 192.168.2.1 corresponds to the IP address of SocketEthernet IP Module.

Depending upon the configuration selected under **set ip http-page <default/serial>**, the appropriate page is displayed.

- If the http-page is set to **default**, the **index.HTML** page displays (see Figure 2) or
- If the http-page is set to **serial**, the OEM's customized Web page **http-s0.HTML** displays (see Figure 3).

Technical Information

This section describes additional details and implementation suggestions related to the SocketEthernet IP Module.

Parameter Value Display on the Fly

The HTML file can be any valid HTML file. However, it should be ensured that the parameter values, which are to be replaced, are qualified with **%P<n>%**.

Example:

```
<HTML>
-----
-----
Efficiency <input type="text" name = "P1" value = "%P1%">
-----
</HTML>
```

In the above code segment, when the browser requests a page, the **%P1%** is replaced with Parameter P1's value. This value is extracted from the serial device parameter file (**http-host-param**).

Parameter Value Manipulation from the Browser

To update a parameter from the browser, key in the new values and click the **Submit** button. The **Submit** button in turn invokes the **POST** command as shown below.

```
<form method = "POST" name= "formUPS" ACTION="/cgi-bin/post-query">
```

Post-Query is a built-in CGI script, which will parse the new values set by the browser and replace them in the **http-host-param** file.

Should you need to update the newly set parameters in the **http-host-param** file, include the **/cgi-bin/post-query** path in the **ACTION** field of your HTML file. The rest is set by the Post-Query script.

Serial Device Parameter Updating Process

The serial device probes/polls the SocketEthernet IP Module for newly configured parameter values from the browser.

Appendix B – SMTP Client

Introduction

SMTP Client is used to establish a TCP session on an SMTP server running on port 25.

SMTP Client supports sending ASCII text or MIME-encoded binary attachment emails with different media types and subtypes from the host/serial device through commands to the IP Module.

SMTP Client supports the following methods for sending emails:

- To the hosts/email addresses specified in the **command prompt**.
- To the hosts/email addresses **pre-configured**.
- To the hosts/email addresses entered in **interactive mode**.

Commands for sending emails:

send-mail [-b]

[-t "<Email-Id#1, Email-Id#2..>"]

[-c "<Email-Id#3, Email-Id#4..>"]

[-s "<subject>"]

[-d "<message-body>"]

Note: All of these commands are optional. The **send-mail** command prompts for the details required if they are neither given as options nor pre-configured. Various scenarios are covered later in this chapter.

Setup and Configuration Prerequisites

The following details are **mandatory** for configuration and have to be validated before sending an email:

- Host Interaction Mode enabled to restrict Telnet-Dialout and PPP.
Command: **set serial <s0> host-interaction-mode enable**
- Set SMTP server name or IP address of maximum length 64 characters.
Command: **set send-mail smtp-server-name <ipaddress/servername>**
- Set SMTP server port.
Command: **set send-mail smtp-server-port <25>**
- Set Host name of maximum length 64 characters.
Command: **set send-mail host-name <hostname>**
- Set From address identity of maximum length 64 characters.
Command: **set send-mail from-address-identity <hostnameidentity>**
- Set From address of maximum length 64 characters.
Command: **set send-mail from-address <email-id>**

Notes: 1. The **send-mail** command prompts for the ERROR message if any of the above details are not configured or not valid.

2. The following configuration suggestions are **optional**:

- Set reply-to address of maximum length 64 characters. By default the server takes the **from address** as the reply-to-address.
- If this is configured, this address is taken as the reply to address.
set send-mail reply-to-address <email-ID>

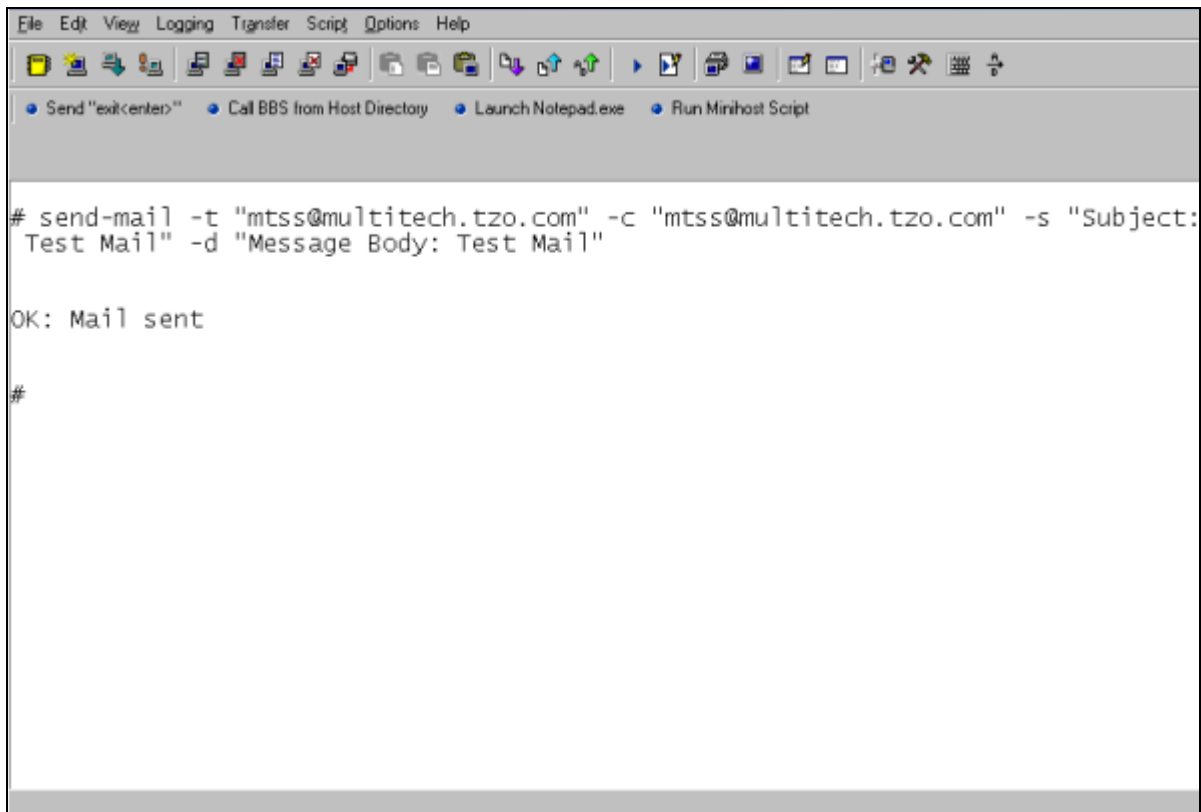
Configuration Scenario 1

Scenario 1 – Sending a Text Email from the Command Prompt

Issue the following command:

```
send-mail
-t "<email #1>, <email #2>"
-c "<email #3>, <email #4>"
-s "subject data"
-d "Messagebody"
```

A message is then given as shown in the figure below and the email is sent only to the **to-addresses** (if any) and the **cc-addresses** (if any) entered from the command prompt. The **subject** and **message body** are also taken from the command prompt.

A screenshot of a command prompt window with a menu bar (File, Edit, View, Logging, Transfer, Script, Options, Help) and a toolbar. Below the toolbar is a status bar with four items: Send "exit:center">, Call BBS from Host Directory, Launch Notepad.exe, and Run Minihost Script. The main text area shows the following text:

```
# send-mail -t "mtss@multitech.tzo.com" -c "mtss@multitech.tzo.com" -s "Subject:
Test Mail" -d "Message Body: Test Mail"

OK: Mail sent

#
```

Notes:

1. The email is **not** sent to addresses pre-configured using set commands.
2. At least one address, either the **to-address** or the **cc-address**, should be given as an alternative for sending email directly from command prompt.
3. If the **subject** option is not specified and is not pre-configured using set commands, SMNP enters into interactive mode and requests a subject to be entered.
4. Type **Ctrl+C** to quit the email at any given time.

Configuration Scenario 2

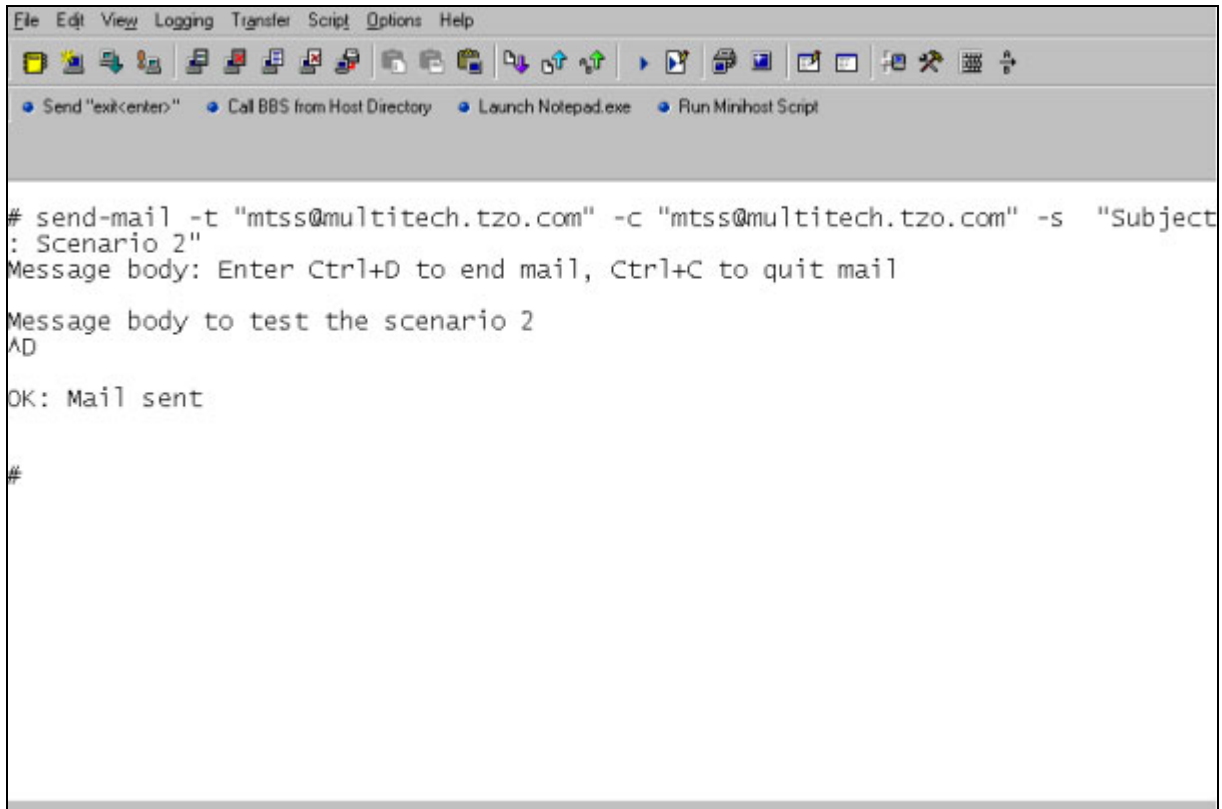
Scenario 2 – Sending a Text Email with the Message Body Entered in Interactive Mode

Issue the following command:

```
send-mail
  -t "<email #1>, <email #2>"
  -c "<email #3>, <email #4>"
  -s "subject data"
```

The SMTP session then enters into interactive mode and requests that the **message body** be entered (see the figure below). After typing the message, type **Ctrl+D** to end the message.

The email is sent only to the **to-addresses** (if any) and the **cc-addresses** (if any) entered from the command prompt. The **subject** is taken from the command prompt.



```
File Edit View Logging Transfer Script Options Help
Send "exit<enter>" Call BBS from Host Directory Launch Notepad.exe Run Minihost Script

# send-mail -t "mtss@multitech.tzo.com" -c "mtss@multitech.tzo.com" -s "Subject
: Scenario 2"
Message body: Enter Ctrl+D to end mail, Ctrl+C to quit mail

Message body to test the scenario 2
^D
OK: Mail sent

#
```

Notes:

1. The email is **not** sent to addresses pre-configured using set commands.
2. At least one address, either the **to-address** or the **cc-address**, should be given as an alternative to sending email directly from the command prompt.
3. If the **subject** option is not specified and is not pre-configured using set command, SNMP enters into interactive mode and requests a subject to be entered.
4. Type **Ctrl+C** to quit the email at any given time.

Configuration Scenario 3

Scenario 3 – Sending a Text Email with:

- The to-addresses, cc-addresses, and subject taken from the configuration and
- The message body is entered in interactive mode.

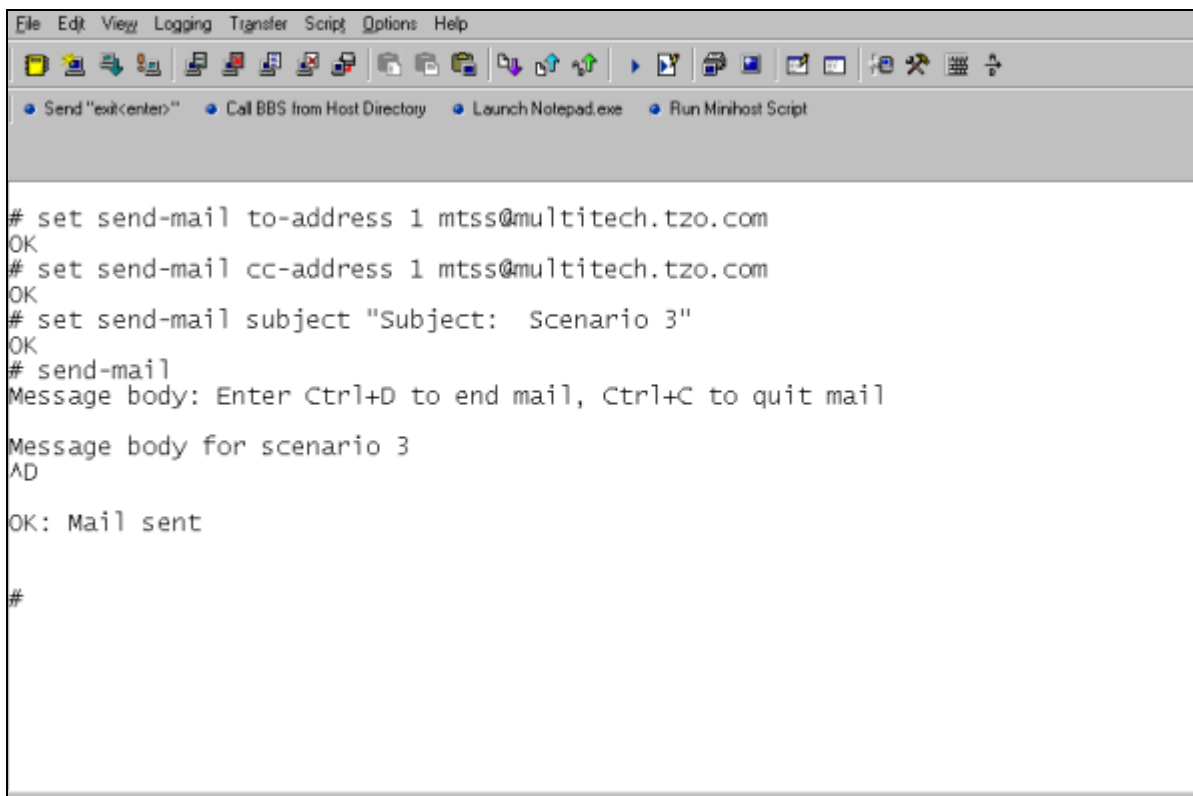
To support this scenario, the you must configure the following details apart from the mandatory configuration:

- Set subject data of maximum length 255 characters.
Command: **set send-mail subject subject data**
- Set to-addresses of maximum length 64 characters.
Command: **set send-mail to-address 1 <email-id #1>**
set send-mail to-address 2 <email-Id#2>
- Set cc-addresses of maximum length 64 characters.
Command: **set send-mail cc-address 1 <email-ID#3>**
set send-mail cc-address 2 <email-ID#4>

Issue the following command at the serial command prompt:

#send-mail

The SMTP session then enters into interactive mode and requests that the **message body** be entered as shown in the figure below. After completing the message, type **Ctrl+D** to end the message.



```

File Edit View Logging Transfer Script Options Help
[Icons]
• Send "exit:center>" • Call BBS from Host Directory • Launch Notepad.exe • Run Minihost Script

# set send-mail to-address 1 mtss@multitech.tzo.com
OK
# set send-mail cc-address 1 mtss@multitech.tzo.com
OK
# set send-mail subject "Subject: Scenario 3"
OK
# send-mail
Message body: Enter Ctrl+D to end mail, Ctrl+C to quit mail
Message body for scenario 3
^D
OK: Mail sent
#
  
```

The email is sent only to the recipients who are pre-configured. The subject is also taken from the configuration.

Notes:

1. The email is sent to addresses pre-configured using set commands.
2. At least one address, either the **to-address** or the **cc-address**, should be configured using set commands; otherwise, the SMTP session enters into interactive mode prompting you to enter the required details.
3. If the **subject** option is not specified or is not pre-configured using set commands, SNMP enters into interactive mode and requests a subject to be entered.
4. Type **Ctrl+C** to quit the email at any given time.

Configuration Scenario 4

Scenario 4 – Sending a Text Email in Interactive Mode

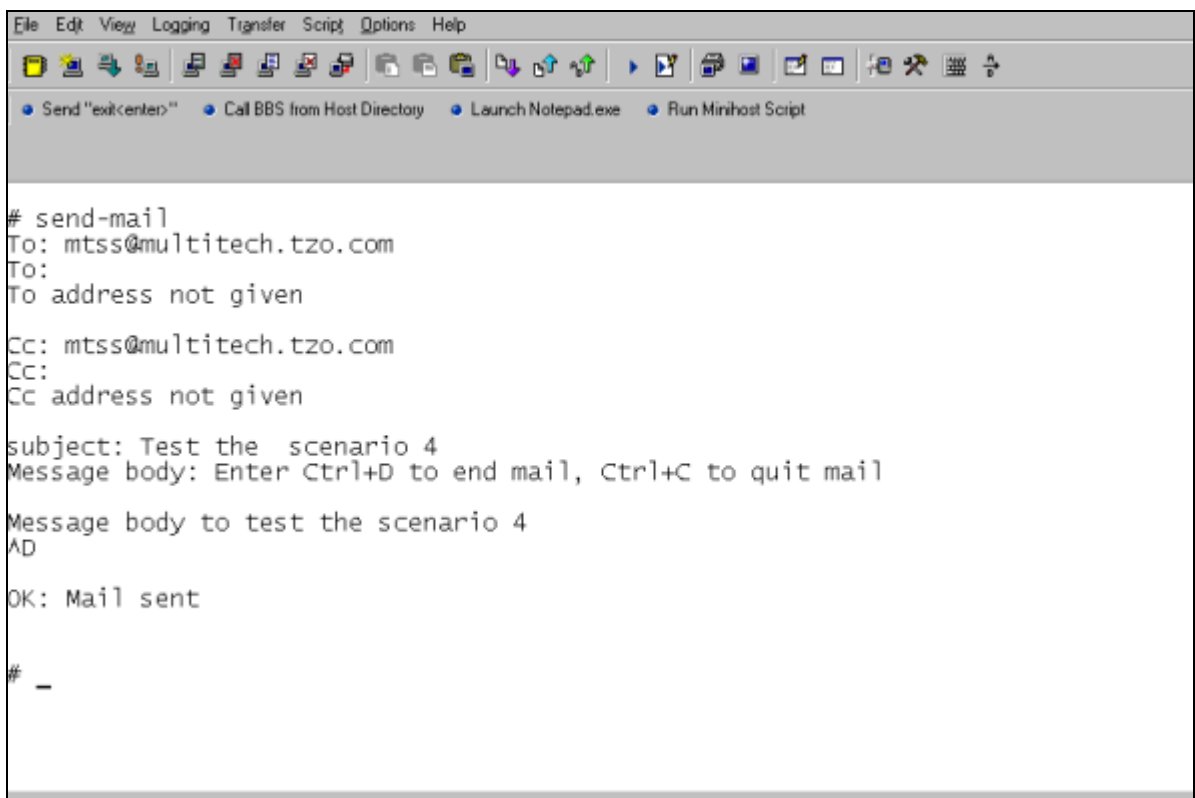
The **to-address**, **cc-address**, and **subject** are NOT configured in this example.

Issue the following command:

send-mail

The SMTP session then enters into interactive mode requesting the **to-address**, **cc-address**, **subject** and the **message body** to be entered. After entering a message, type **Ctrl+D** to end the message.

The email is sent only to the entered **to-addresses** (if any) and **cc-addresses** (if any). The **subject** and **message body** are taken as given in the interactive mode.



```

File Edit View Logging Transfer Script Options Help
Send "exit:center)" Call BBS from Host Directory Launch Notepad.exe Run Minihost Script

# send-mail
To: mtss@multitech.tzo.com
To:
To address not given
Cc: mtss@multitech.tzo.com
Cc:
Cc address not given
subject: Test the scenario 4
Message body: Enter Ctrl+D to end mail, Ctrl+C to quit mail
Message body to test the scenario 4
^D
OK: Mail sent

# _

```

Notes:

1. The email is sent only to addresses entered in interactive mode.
2. If the **subject** is already configured using set command, it will be taken as the subject for the email.
3. Type **Ctrl+C** to quit the email at any given time.

Configuration Scenario 5

Scenario 5 – Sending a Mime Encoded Binary Attachment with:

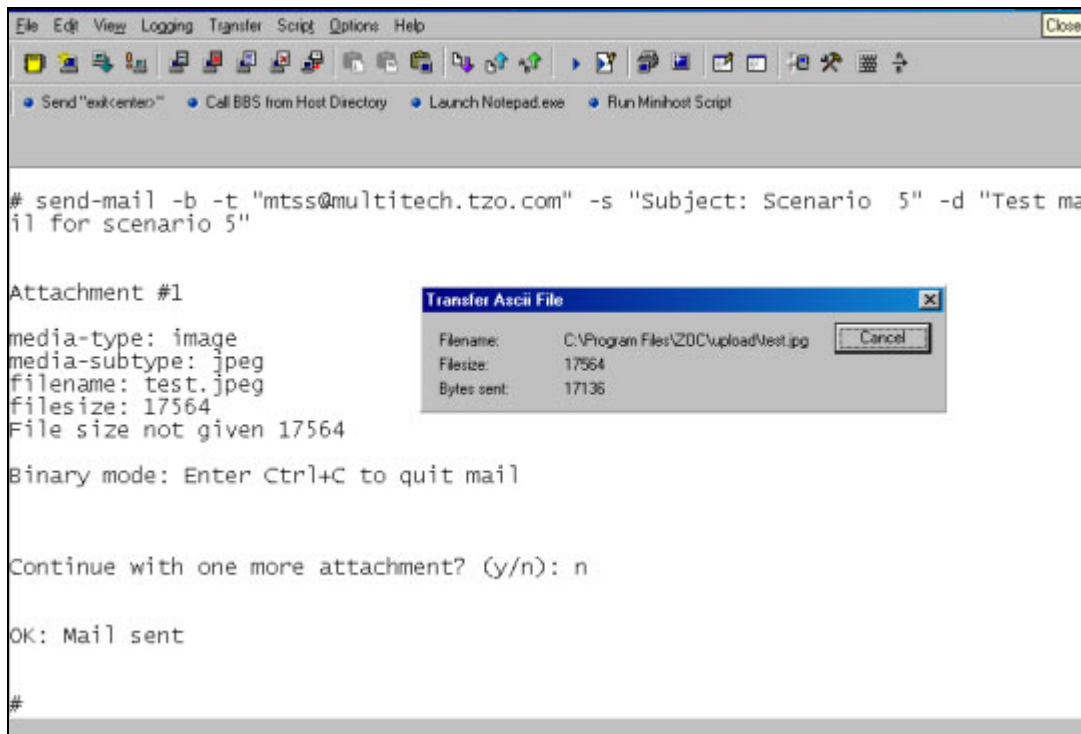
The email addresses, subject, and message body are taken from the command prompt.

Issue the following command: **Error! Bookmark not defined.**

send-mail

```
-b
-t "<email-id #1>, <email-id #2>"
-c "<email-id #3>, <email-id #4>"
-s "subject data"
-d "Message body"
```

The SMTP session then enters into interactive mode requesting media-type, media-subtype, filename, filesize, and the attachment body as shown in this figure.



When the attachment body reaches the filesize, another message is displayed asking whether to continue with one more attachment as shown in figure. Type **n** for **No**. The email with its attachment is sent only to the **to-addresses** (if any) and **cc-addresses** (if any) entered from the command prompt. The **subject** and **message body** are also taken from the command prompt.

Notes:

1. The email is not sent to addresses pre-configured using set commands.
2. At least one address, either the **to-address** or the **cc-address**, should be given as an alternative to sending email directly from command prompt.
3. If the **subject** option is not specified and is not configured using set commands, SMTP enters into interactive mode requesting the **subject** to be entered.
4. Type **Ctrl+C** to quit the email at any given time.
5. If the host wants to quit the email while sending the binary attachment body, type **Ctrl+C** and wait for 3 seconds without entering any character to quit the email.

Configuration Scenario 6

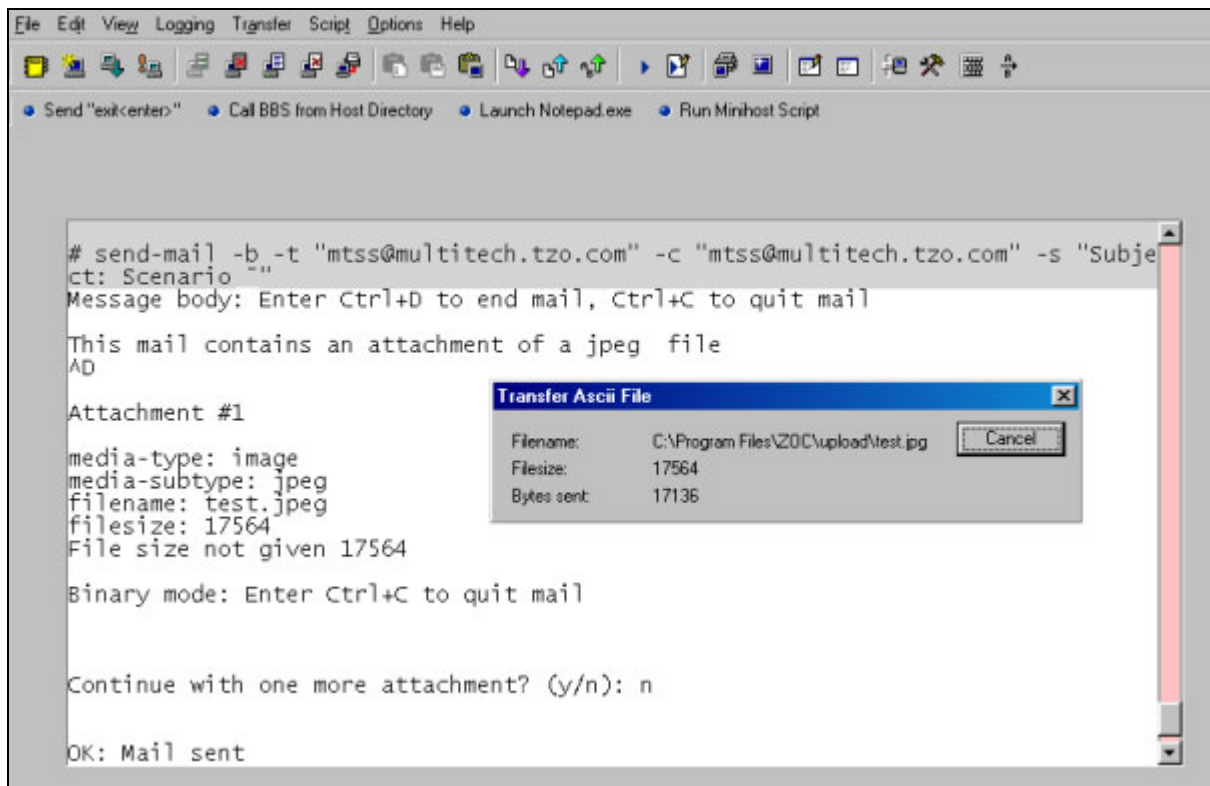
Scenario 6 – Sending a Mime Encoded Binary Attachment With:

- The to-address, cc-address, and subject are entered through the command prompt
- The message body entered in the Interactive Mode

Issue the following command:

```
send-mail
-b
-t "<email-id#1>, <email-id#2>"
-c "<email-id#3>, <email-id#4>"
-s "subject data"
```

The SMTP session then enters into interactive mode requesting the **message body** as shown in the figure to be entered. After entering the message, type **Ctrl+D** to end the message.



The SMTP session then enters into interactive mode requesting media-type, media-subtype, filename, filesize, and the attachment body as shown in the figure.

When the attachment body reaches the filesize, another message displays asking whether to continue with one more attachment as shown in the figure. Type **n** for **No**. The email with its attachment is sent only to the **to-addresses** (if any) and **cc-addresses** (if any) entered from the command prompt. The **subject** is taken from the command prompt.

Notes:

1. The email is **not** sent to addresses pre-configured using set commands.
2. At least one address, either the **to-address** or the **cc-address**, should be given as an option from the command prompt.
3. If the **subject** option is not specified and is not configured using set commands, SMTP enters into interactive mode and requests the subject to be entered.
4. Type **Ctrl+C** to quit the email at any given time.
5. If the host wants to quit the email while sending the binary attachment body, type **Ctrl+C** and wait for 3 seconds without entering any character to quit the email.

Configuration Scenario 7

Scenario 7 – Sending a Mime Encoded Binary Attachment With:

- The to-address, cc-address, and subject are pre-configured.
- The message body is entered in the Interactive Mode.

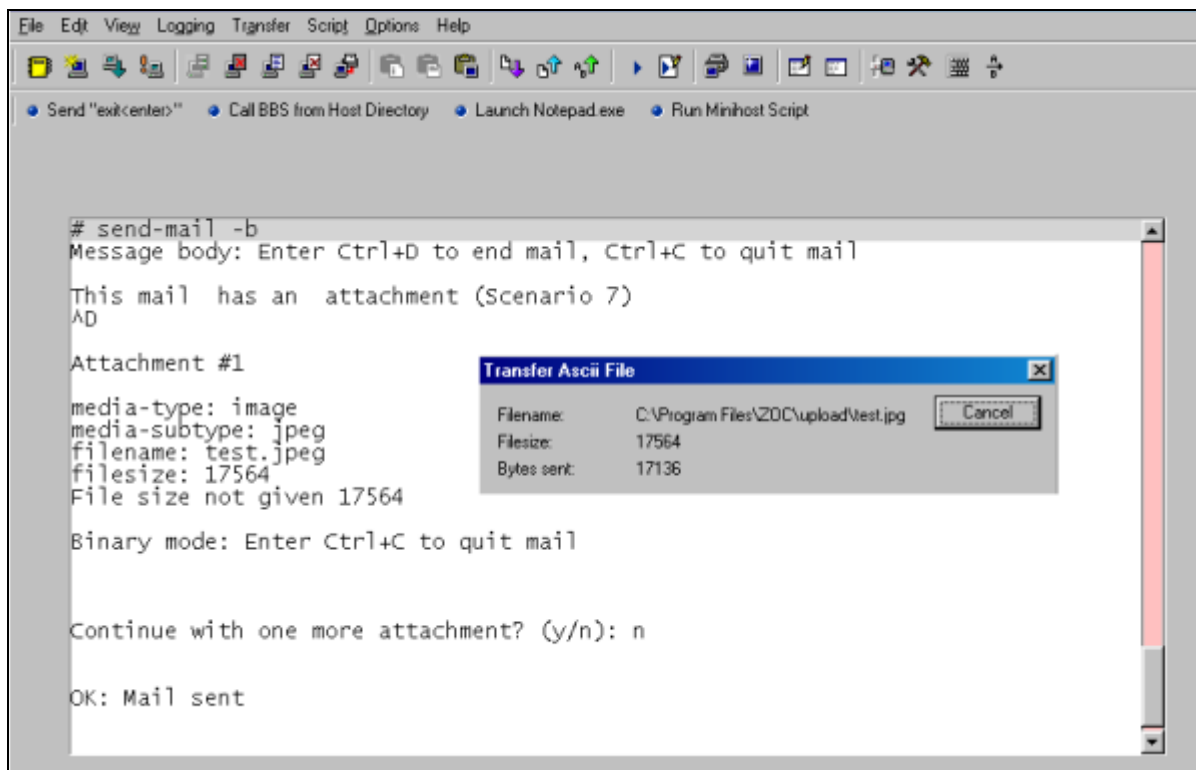
Configure the following details apart from the mandatory configuration:

- Set subject data of maximum length 255 characters.
Command: **set send-mail subject "subject data"**
- Set to-addresses of maximum length 64 characters.
Command: **set send-mail to-address 1 email-id#1**
set send-mail to-address 2 email-id#2
- Set cc-addresses of maximum length 64 characters.
Command: **set send-mail cc-address 1 email-id#3**
set send-mail cc-address 2 email-id#4

Issue the following command:

send-mail -b

The SMTP session then enters into interactive mode requesting the message body to be entered as shown in this figure. After entering the message, type **Ctrl+D** to end the message.



The SMTP session enters into interactive mode requesting media-type, media-subtype, filename, filesize, and the attachment body to be entered as shown in the figure above.

When the attachment body reaches the filesize, another message is displayed asking whether to continue with one more attachment. Type **n** for **No**. The email with its attachment is sent only to the pre-configured **to-addresses** (if any) and **cc-addresses** (if any). The **subject** is also taken from the configuration.

Notes:

1. The email is sent to addresses pre-configured using set commands.
2. At least one address, either the **to-address** or the **cc-address**, should be configured using set commands; otherwise, the SMTP session will enter into interactive mode prompting for the required details to be entered.
3. If the **subject** is not configured using set commands, SMTP will request the subject to be entered.
4. Type **Ctrl+C** to quit the email at any given time.
5. If the host wants to quit the email while sending the binary attachment body, type **Ctrl+C** and wait for 3 seconds without entering any character to quit the email.

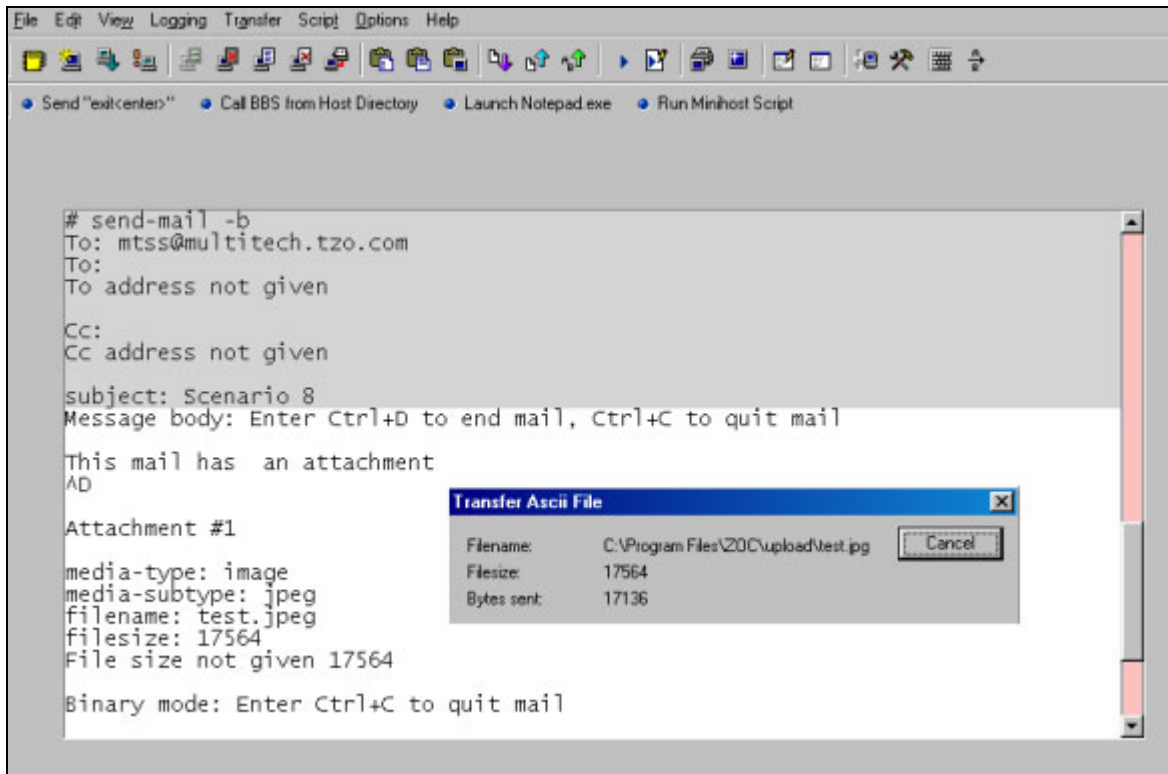
Configuration Scenario 8

Scenario 8 – Sending a Mime Encoded Binary Email with Attachment Using Interactive Mode

Issue the following command:

send-mail -b

The SMTP session then enters into interactive mode requesting the **to-address**, the **cc-address**, **subject**, and **message body** to be entered. After completion of the message, type **Ctrl+D** to end the message.



The SMTP session enters into interactive mode requesting media-type, media-subtype, filename, filesize, and the attachment body as shown in the figure.

When the attachment body reaches the filesize, another message is displayed asking whether to continue with one more attachment. Type **n** for **No**. The email with its attachment is sent only to the entered **to-addresses** (if any) and **cc-addresses** (if any). The **subject** and **message body** are used as entered in the interactive mode.

Notes:

1. The email is sent only to addresses entered in interactive mode.
2. If the **subject** is pre-configured using set commands, it will be used as the subject for the email.
3. Type **Ctrl+C** to quit the email at any given time.
4. If the host wants to quit the email while sending the binary attachment body, type **Ctrl+C** and wait for 3 seconds without entering any character to quit the email.

Appendix C – POP3 Client

Introduction

The SocketEthernet IP Module can be configured as a POP3 client to retrieve emails from a POP3 server. The POP3 client, available in SocketEthernet IP Module, can do the following:

- List the number of messages and message sizes
- Retrieve the header information of messages
- Retrieve the complete email
- Retrieve the top 'n' lines of a message
- Delete an email on the server
- Retrieve the unique email ID listing

Setup and Configuration Prerequisites

To fulfill the prerequisites for receiving/retrieving emails from the email server, configure the following parameters:

- pop3 server name/ip address
Command: **set rcv-mail server-name <server-name>**
- pop3 port number
Command: **set rcv-mail server-port <port-number>**
- pop3 account/user name
Command: **set rcv-mail mailbox-name <account/user name>**
- pop3 account/user password
Command: **set rcv-mail mailbox-password <account/user password>**

These commands need to be executed only to set the initial configuration. However, they must be executed whenever a parameter is changed.

Example

Assuming that the POP3 server is **192.168.2.10**, POP3 port is **110**, account/user name is **mtss**, and the account/user password is **mtsspass**, the following commands need to be executed to configure the SocketEthernet IP Module to retrieve emails.

```
set rcv-mail server-name 192.168.2.10
OK
set rcv-mail server-port 110
OK
set rcv-mail mailbox-name mtss
OK
set rcv-mail mailbox-password mtsspass
OK
```


Example of the *show rcv-mail* configuration

Use the **show rcv-mail** configuration to check the configuration.

```
+-----+
|           pop3 configuration           |
+-----+
| server-name           : 192.168.2.10 |
| server-port          : 110           |
| mailbox-name         : mtss          |
| mailbox-password     : mtsspass      |
+-----+
```

If any of the above fields are missing, then the email cannot be retrieved.

Optional Configuration for Deleting Emails from the Server

An optional parameter that can be configured is:

```
# rcv-mail leave-mail-on-server disable
OK
```

The command **rcv-mail leave mail on server <enable/disable>** is used to indicate that email retrieved from the POP3 server should be deleted.

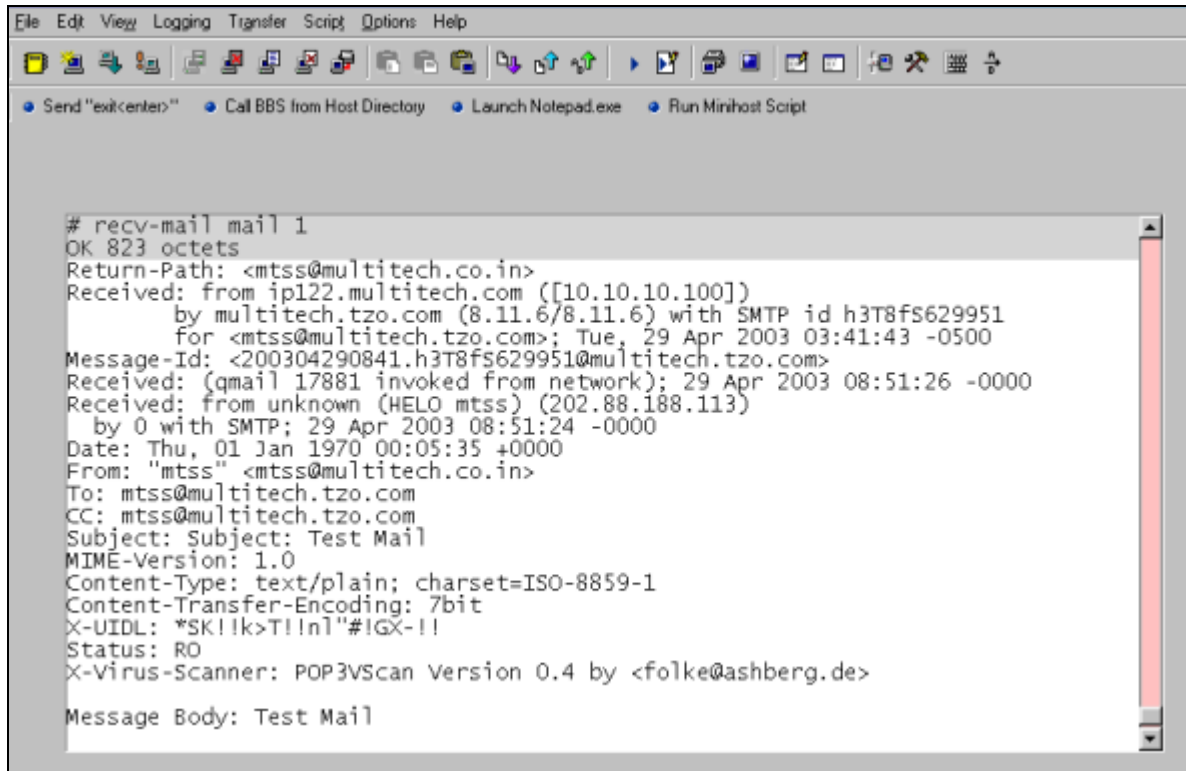
If **leave mail on server** is **disabled**, then an email retrieved from the POP3 server using the commands **rcv-mail mail** or **rcv-mail mail <n>**, where **n** is the message number, is deleted from the POP3 server. The default value is **enable**.

Configuration Scenario 1

Scenario 1 – Retrieving Emails

The command **recv-mail mail** can be used to retrieve all the emails from a POP3 server. This command will retrieve all the email with headers, message body, and attachments.

The command **recv-mail mail <n>**, where **n** is the message number, can be used to retrieve the **nth** message.



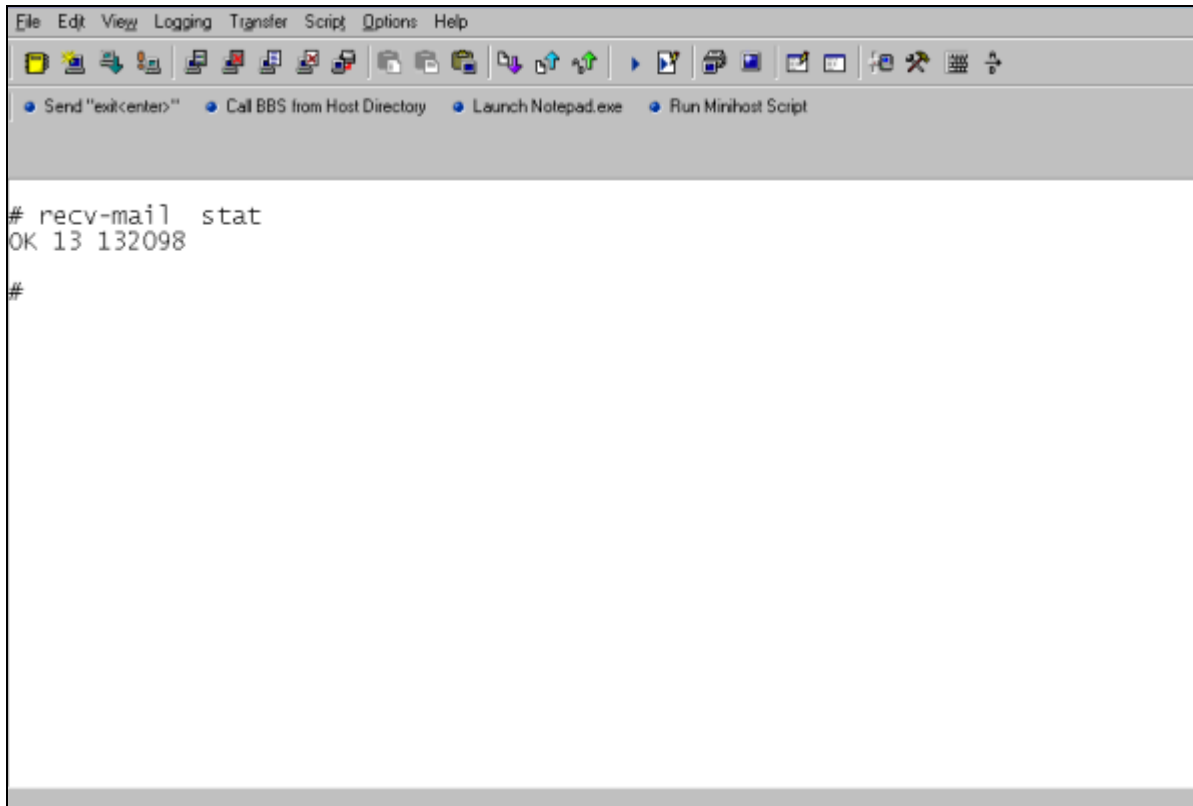
```
# recv-mail mail 1
OK 823 octets
Return-Path: <mtss@multitech.co.in>
Received: from ip122.multitech.com ([10.10.10.100])
    by multitech.tzo.com (8.11.6/8.11.6) with SMTP id h3T8fs629951
    for <mtss@multitech.tzo.com>; Tue, 29 Apr 2003 03:41:43 -0500
Message-Id: <200304290841.h3T8fs629951@multitech.tzo.com>
Received: (qmail 17881 invoked from network); 29 Apr 2003 08:51:26 -0000
Received: from unknown (HELO mtss) (202.88.188.113)
    by 0 with SMTP; 29 Apr 2003 08:51:24 -0000
Date: Thu, 01 Jan 1970 00:05:35 +0000
From: "mtss" <mtss@multitech.co.in>
To: mtss@multitech.tzo.com
CC: mtss@multitech.tzo.com
Subject: Subject: Test Mail
MIME-Version: 1.0
Content-Type: text/plain; charset=ISO-8859-1
Content-Transfer-Encoding: 7bit
X-UIDL: *SK!lk>T!ln!#!GX-!!
Status: RO
X-Virus-Scanner: POP3VScan Version 0.4 by <folke@ashberg.de>

Message Body: Test Mail
```

Configuration Scenario 2

Scenario 2 – Retrieving the Number of Emails and the Total Email Size

Use the command **recv-mail stat** to retrieve the number of emails and the total email size in octets. The output is single line.



The screenshot shows a window of a POP3 client application. The window has a menu bar with 'File', 'Edit', 'View', 'Logging', 'Transfer', 'Script', 'Options', and 'Help'. Below the menu bar is a toolbar with various icons. Under the toolbar, there are four buttons: 'Send "exit:center>"', 'Call BBS from Host Directory', 'Launch Notepad.exe', and 'Run Minihost Script'. The main area of the window is a text field containing the following text:

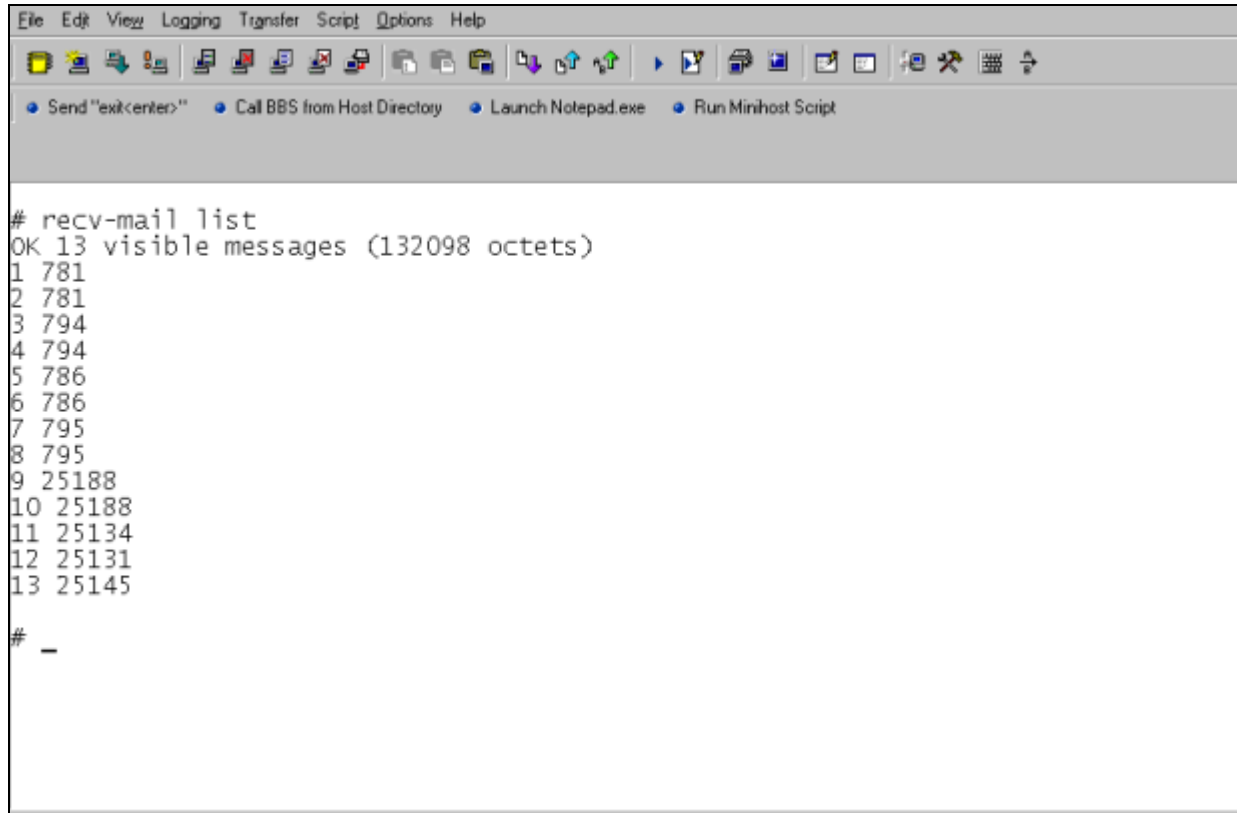
```
# recv-mail stat
OK 13 132098
#
```

Configuration Scenario 3

Scenario 3 – Retrieving the Email List

Use the command **recv-mail list** to retrieve the email list containing the message number and the size of the individual messages (in octets). The output is multi-lined.

Use the command **recv-mail list <n>** to retrieve the message size of the **n**th message. The output is multi-lined.



The screenshot shows a window with a menu bar (File, Edit, View, Logging, Transfer, Script, Options, Help) and a toolbar. Below the toolbar is a status bar with four items: "Send 'exit:center>' ", "Call BBS from Host Directory", "Launch Notepad.exe", and "Run Minihost Script". The main text area displays the following output:

```
# recv-mail list
OK 13 visible messages (132098 octets)
1 781
2 781
3 794
4 794
5 786
6 786
7 795
8 795
9 25188
10 25188
11 25134
12 25131
13 25145
# -
```

Configuration Scenario 4

Scenario 4 – Retrieving Emails Headers

Use the command **recv-mail header** to retrieve the message header of all emails. The output is multi-lined.

Use the command **recv-mail header <n>** to retrieve the message header of the **n**th email. The output is multi-lined.

```
# recv-mail header 1
OK Message follows
Return-Path: <mtss@multitech.co.in>
Received: from ip122.multitech.com ([10.10.10.100])
    by multitech.tzo.com (8.11.6/8.11.6) with SMTP id h3T8fs629951
    for <mtss@multitech.tzo.com>; Tue, 29 Apr 2003 03:41:43 -0500
Message-Id: <200304290841.h3T8fs629951@multitech.tzo.com>
Received: (gmail 17881 invoked from network); 29 Apr 2003 08:51:26 -0000
Received: from unknown (HELO mtss) (202.88.188.113)
    by 0 with SMTP; 29 Apr 2003 08:51:24 -0000
Date: Thu, 01 Jan 1970 00:05:35 +0000
From: "mtss" <mtss@multitech.co.in>
To: mtss@multitech.tzo.com
CC: mtss@multitech.tzo.com
Subject: Subject: Test Mail
MIME-Version: 1.0
Content-Type: text/plain; charset=ISO-8859-1
Content-Transfer-Encoding: 7bit
X-UIDL: *SK!!k>T!!n! "#!GX-!!
Status: RO

#
```

Configuration Scenario 5

Scenario 5 – Retrieving First *t* Lines

To retrieve the first few lines of an email, use the command **recv-mail top <n> <t>**, where **n** is the message number and **t** is the number of lines to be retrieved. This command shows the message headers and the first **t** number of lines. The output is multi-lined.

```
# recv-mail top 14 3
OK Message follows
Return-Path: <mtss@multitech.co.in>
Received: from ip122.multitech.com ([10.10.10.100])
    by multitech.tzo.com (8.11.6/8.11.6) with SMTP id h3TA4m630393
    for <mtss@multitech.tzo.com>; Tue, 29 Apr 2003 05:04:48 -0500
Message-Id: <200304291004.h3TA4m630393@multitech.tzo.com>
Received: (qmail 20968 invoked from network); 29 Apr 2003 10:14:46 -0000
Received: from unknown (HELO mtss) (202.88.188.113)
    by 0 with SMTP; 29 Apr 2003 10:12:54 -0000
Date: Thu, 01 Jan 1970 01:27:05 +0000
From: "mtss" <mtss@multitech.co.in>
To: mtss@multitech.tzo.com
Subject: Text Mail
MIME-Version: 1.0
Content-Type: text/plain; charset=ISO-8859-1
Content-Transfer-Encoding: 7bit
X-UIDL: &[g!IMod"!2-j"!h#-!!
Status: U

Message body to test the Text Mail
1.. send-mail can be tested with 8 different scenarios
2.. The scenarios are clearly mentioned in the HOWTO documeent
```

Configuration Scenario 6

Scenario 6 – Deleting an Email on the Server

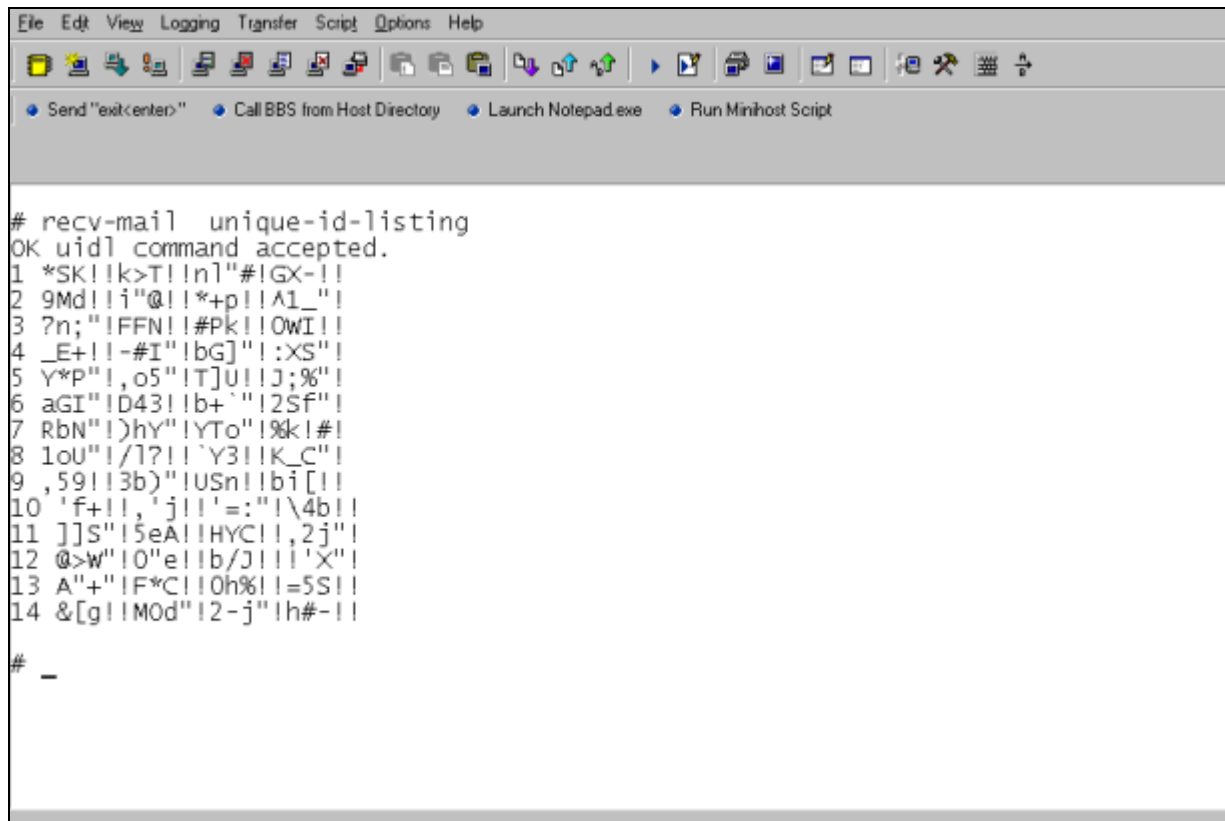
Use the command **recv-mail delete <n>**, where **n** is the message number of the email that should be deleted from the server.

```
# recv-mail delete 1
OK
```

Configuration Scenario 7

Scenario 7 – Retrieving the Unique Email ID

Use this command to retrieve the unique email ID of a message. The unique message ID is used to identify the message with a unique string.



The screenshot shows a window titled "File Edit View Logging Transfer Script Options Help". Below the menu bar is a toolbar with various icons. Underneath the toolbar are four buttons: "Send 'exit:center'", "Call BBS from Host Directory", "Launch Notepad.exe", and "Run Minihost Script". The main text area contains the following text:

```
# recv-mail unique-id-listing
OK uidl command accepted.
1 *SK!!k>T!!n!#!GX-!!
2 9Md!!i"@!!*+p!!A1_!!
3 ?n;"!FFN!!#Pk!!OwI!!
4 _E+!!-#I!!bG]!!:XS!!
5 Y*P"! ,o5"!T]U!!J;%!!
6 aGI"!D43!!b+`"!2Sf"!
7 RbN"!>hy"!YTo"!%k!#!
8 loU"!/1?!!`Y3!!K_C"!
9 ,59!!3b)"!USn!!bi[!!
10 'f+!!,'j!!'="!\4b!!
11 ]]S"!5eA!!HYC!!2j"!
12 @>w"!0"e!!b/J!!!'X"!
13 A"+"!F*C!!0h%!!=5S!!
14 &[gl!MOd"!2-j"!h#-!!

# _
```

Error Messages

- **ERROR Invalid parameters. Check POP3 parameters**

This error message is displayed if the POP3 parameters are not configured correctly. See prerequisites for POP3.

- **ERROR: Set up failed**

This error occurs if the server is not accessible or the POP3 client is not able to connect to the POP3 server on the configured port.

- **ERROR: Unable to login**

This error occurs if the POP3 client could not authenticate to the POP3 server. This could happen when the username or password is not valid.

- **Other errors**

Other errors might occur due to **timeout**, **none availability of resources**, etc.

Appendix D – Serial to Ethernet Connectivity Examples

Introduction

Serial to Ethernet Connectivity Using the Serial Dial-in Feature

This example illustrates serial to ethernet connectivity using the serial dial-in feature. The serial dial-in feature enables the SocketEthernet IP module to act as telnet client thus facilitating the serial device to access any telnet/terminal servers on the LAN. Once the session (Serial Client to Ethernet Server) is opened successfully, it allows a two-way traffic between the serial device and the remote server.

The IP module, acting as a Telnet/RAW-TCP client, accommodates the following features as per the configuration:

- Support to open the session using Telnet client (residing at IPModule) in Telnet Mode or Raw Mode.
- Support to open the session to the specified port from Serial Command prompt (Manual Dial-in).
- Switching between Command prompt and Dial-in session when the session is in Telnet mode.
- Support to open the session to the configured port directly (Serial Auto Dial-in) whenever the serial port is free.

Prerequisites

Mandatory Configuration Settings

The following items must be configured in order to use the dial-in feature:

- Enable Auto dial-in globally on all the serial ports.
set serial auto-telnet enable
- Enable Auto dial-in on the serial port s0.
set serial s0 auto-dial-in enable
- Set the Auto dial-in protocol.
set serial s0 auto-dialin-protocol telnet
- Set the Auto dial-in Server IP Address.
set serial s0 auto-dialin-ipaddress <ipaddress>
- Set the port to the one which the telnet client will be connected.
set serial s0 auto-port-port <port_number>

An ERROR message will display if any of the above details are not configured or not valid.

Optional Configuration Settings

The following details are optional configurations:

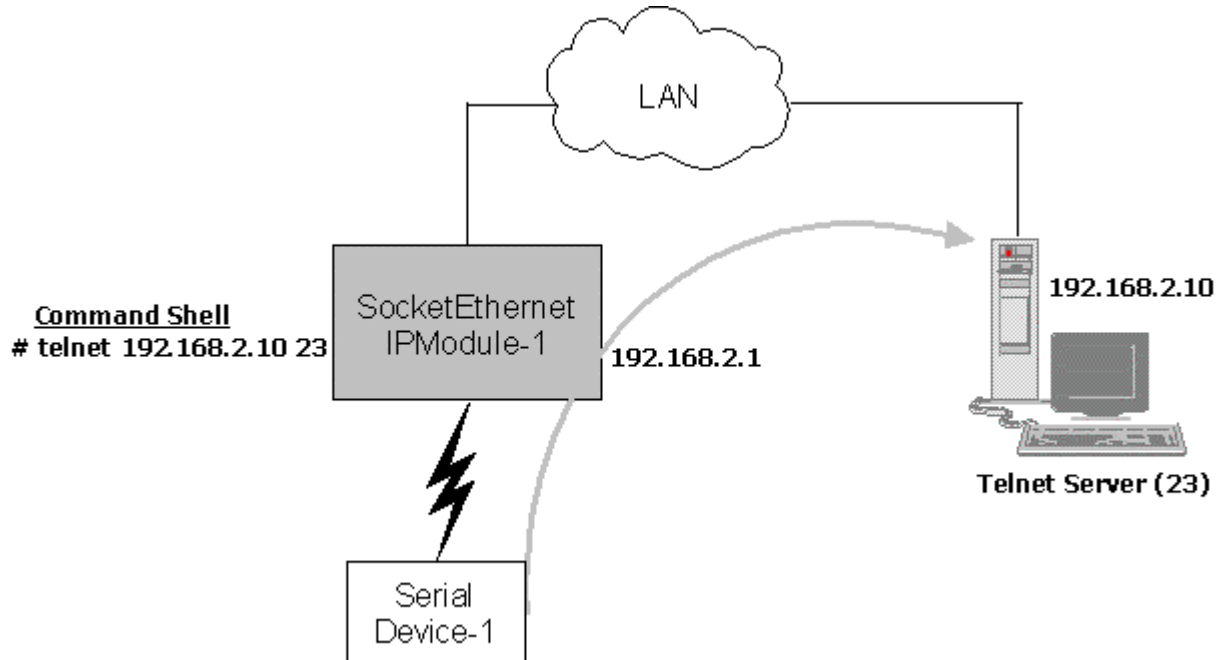
- Enable/Disable **Switching-between-Dial-in** and the Command Prompt feature.
set serial escape-monitor <enable/disable>
- Set the **Escape-Monitor-String** to switch between Dial-in and Command Prompt sessions.
set serial escape-string "+++inet"
- Set the Serial Dial-in Trigger mode. Dictates the criterion for establishing a connection. The options provided are on reception of <char/ dtr/ dtr-char/ none>. Refer the command line configuration section for a detail know how of this command.
set serial s0 auto-dialin trig-mode <char/dtr/dtr-char/none>
- Enable/Disable the Raw mode globally for all Auto-Dial-in sessions.
set ip telnet raw-mode <enable/disable>
- Enable/Disable the Raw mode for Auto-Dial-in session on serial port s0.
set serial s0 raw-dial-in <enable/disable>

Scenario 1 – Manual Serial Dial-in

Login in to the Command prompt from the serial side.

Invoke **# telnet <ip-address> <port>** at the command prompt. Once the session is opened successfully, there can be two-way traffic between the serial device and the remote server.

- You can switch from Command Prompt to Dial-in session using **restore session** command.
- You can switch from Dial-in session to Command Prompt using **<escape-monitor-string>**.



Manual Dial-in Feature Through the Command Shell

Commands to Setup Manual Dial-In in the SocketEthernet IP Module 1

```
# set ip eth0 dhcp-client disable
# set ip eth0 ip-address 192.168.2.1

# set serial s0 baud-rate 115200
# set serial s0 data-bits 8
# set serial s0 parity none
# set serial s0 stop-bits 1
# set serial s0 flow-control rts-cts
# save
```

Once the above configuration is saved on the SocketEthernet IP Module, login to the module through the serial port. At the command shell invoke:

```
# telnet 192.168.2.10 23
```

The telnet client on board in SocketEthernet IP module establishes a virtual serial tunnel between the serial device and the Telnet Server.

Notes:

- You cannot open more than one dial-in session.
- The dial-in session is closed when the telnet session is closed.
- When **escape-monitor** is enabled, care should be taken during file transfer that the **escape-monitor-string** is not part of the data.

Scenario 2 – Serial Auto Dial-in

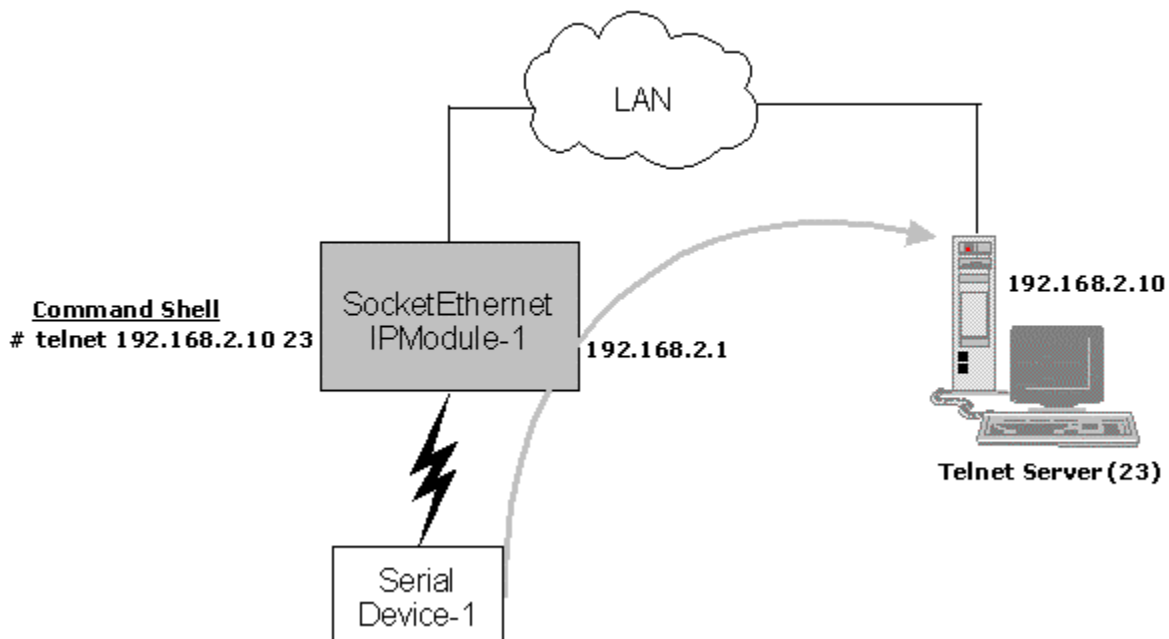
This example shows how to setup a serial auto dial-in session in telnet mode. The auto dial-in session is opened by telnet client embedded in the IP module to the configured server on a configured port.

Once the session is opened successfully, there can be two-way traffic between the serial device and the remote server.

- You can switch from Command Prompt to Dial-in session using the **restore session** command.
- You can switch from Dial-in session to Command Prompt using **<escape-monitor-string>**.

Prerequisites

- Raw mode (Global and each port) **MUST BE DISABLED** using the above-mentioned optional commands.



Auto Dial-in Feature in Telnet Mode

Commands to Setup Auto Dial-In in Telnet Mode for the SocketEthernet IP Module 1

```
# set ip eth0 dhcp-client disable
# set ip eth0 ip-address 192.168.2.1

# set serial auto-telnet enable
# set serial s0 auto-dialin enable
# set serial s0 auto-dialin trig-mode dtr-char
# set serial s0 auto-dialin-ipaddress 192.168.2.10
# set serial s0 auto-dialin-port 23
# set serial s0 auto-dialin-protocol telnet

# set serial s0 baud-rate 115200
# set serial s0 data-bits 8
# set serial s0 parity none
# set serial s0 stop-bits 1
# set serial s0 flow-control rts-cts
# save
```

When detecting either a ***DTR signal (or) any character*** received from the serial device connected to the serial port of SocketEthernet IP module, the Telnet client on board in the SocketEthernet IP module establishes a telnet session to 192.168.2.10 on port 23.

The serial tunnel between the serial device and the Telnet Server terminates in one of the following conditions.

- A physical disconnection of the serial device from the serial port of SocketEthernet IP module.
- The Telnet Client on board is terminated.
- The Telnet Server terminates the session.

Notes:

1. You cannot open more than one Dial-in session.
2. The Dial-in session is closed when the configuration session is closed (if opened).
3. When **escape-monitor** is enabled, care should be taken during file transfer that the **escape-monitor-string** is not part of the data.

Scenario 3 – Serial Auto Dial-in Session in RAW Mode

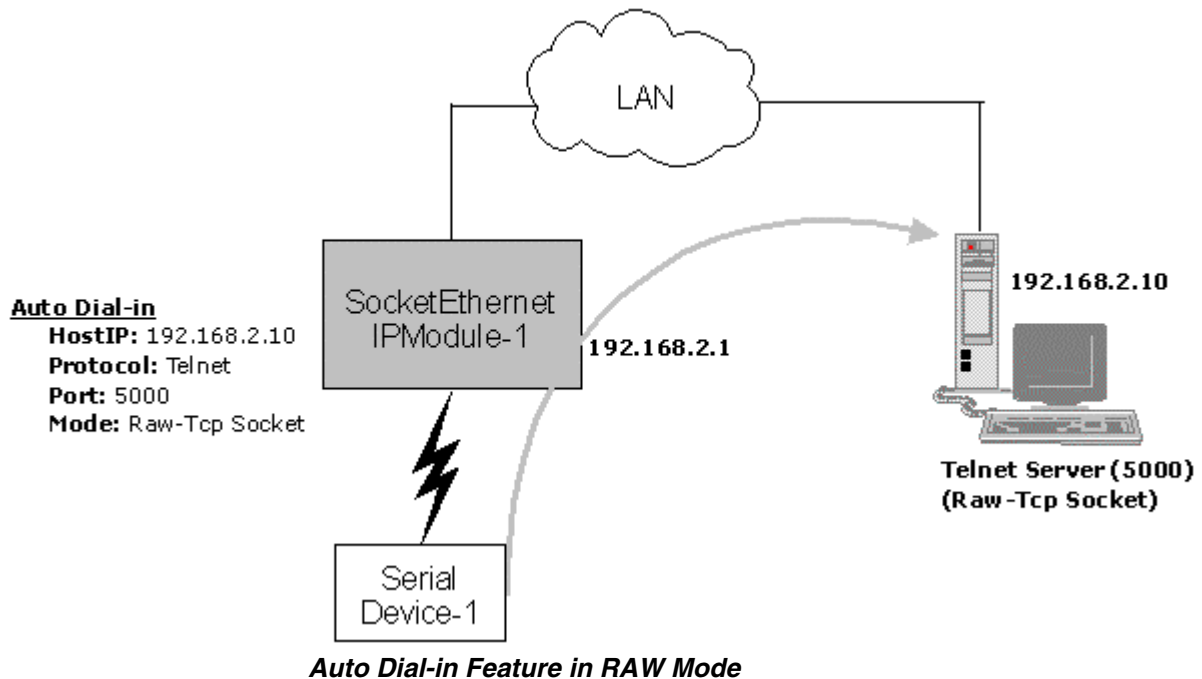
This scenario shows how to configure a serial auto dial-in session in RAW mode.

Prerequisites

RAW mode (Global and each port) **MUST BE ENABLED** using the above-mentioned optional commands.

The auto dial-in session is opened by Telnet client (embedded in the IP module) in **Raw-mode** to the configured server on a configured port number. Once the session is opened successfully, there can be two-way traffic between the serial device and the remote server.

Important – You cannot switch between Command Prompt and Dial-in session in Raw-mode.



Commands to Setup Auto Dial-In in RAW Mode for the SocketEthernet IP Module 1

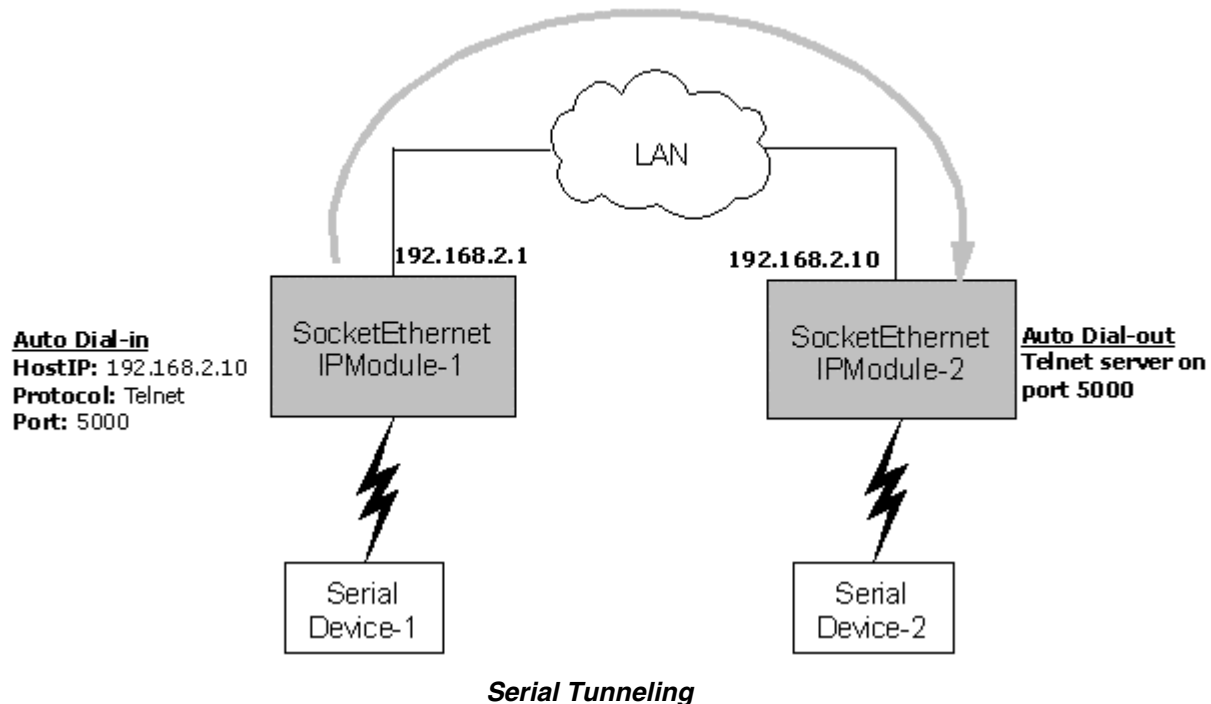
```
# set ip eth0 dhcp-client disable
# set ip eth0 ip-address 192.168.2.1
# set ip telnet raw-mode enable
# set serial auto-telnet enable
# set serial s0 raw-dialin enable
# set serial s0 auto-dialin enable
# set serial s0 auto-dialin trig-mode dtr-char
# set serial s0 auto-dialin-ipaddress 192.168.2.10
# set serial s0 auto-dialin-port 23
# set serial s0 auto-dialin-protocol telnet
# set serial s0 baud-rate 115200
# set serial s0 data-bits 8
# set serial s0 parity none
# set serial s0 stop-bits 1
# set serial s0 flow-control rts-cts
# save
```

Notes:

1. The user cannot open more than one Dial-in session.
2. You cannot switch between Command Prompt and Dial-in session in case of RAW mode.

Scenario 4 – Serial Tunneling Mode

The scenario shows a serial tunnel established between two serial devices (Serial Device-1, Serial Device-2) using SocketEthernet IP modules, which are geographically located apart.



Commands to Setup Serial Tunneling Feature using two SocketEthernetIP Modules and Commands for SocketEthernet IP Module-1 (Configure for Serial Auto Dial-in).

```
# set ip eth0 dhcp-client disable
# set ip eth0 ip-address 192.168.2.1
# set ip telnet raw-mode enable

# set serial auto-telnet enable
# set serial s0 raw-dialin enable
# set serial s0 auto-dialin enable
# set serial s0 auto-dialin trig-mode none
# set serial s0 auto-dialin-ipaddress 192.168.2.10
# set serial s0 auto-dialin-port 23
# set serial s0 auto-dialin-protocol telnet

# set serial s0 baud-rate 115200
# set serial s0 data-bits 8
# set serial s0 parity none
# set serial s0 stop-bits 1
# set serial s0 flow-control rts-cts
# save
```

Commands for SocketEthernetIP Module-2 (Configure for Telnet Auto Dial-out)

```
# set ip eth0 dhcp-client disable
# set ip eth0 ip-address 192.168.2.10
# set ip telnet auto-dialout enable
# set ip telnet raw-mode enable

# set serial s0 auto-dialout enable
# set serial s0 auto-dialout-port 5000
# set serial s0 auto-dialout-protocol telnet
# set serial s0 raw-dialout enable

# set serial s0 baud-rate 115200
# set serial s0 data-bits 8
# set serial s0 parity none
# set serial s0 stop-bits 1
# set serial s0 flow-control rts-cts
# save
```


Appendix E – Ethernet to Serial Connectivity Examples

Introduction

Ethernet to Serial Connectivity Using Telnet the Dialout Feature

This is an example of a Telnet client on an Ethernet network connecting to a remote serial device. The IP module acts as a Terminal Server using the Telnet dialout feature. This feature allows you to access the serial port and establish two-way traffic between telnet/Raw-TCP client and the serial device.

Features

The SocketEthernet IP Module, acting as a Terminal Server, accommodates the following features:

- Authenticates the serial port.
- Monitors and waits for activity on the standard telnet port (23) or user-defined RAW-Socket.
- Opens the serial port from the command prompt (manual dialout) .
- Opens the serial port directly (auto dialout) using a TCP Client according to the configured port-number.
- Switches between the command prompt and a dial-out session when the session is in Telnet mode.

Prerequisites

Mandatory Configuration Settings

The following items must be configured in order to use the dial-out feature:

- Disable the Host Interaction Mode to restrict Telnet-Dial-Out and PPP.
set serial <s0> host-interaction-mode disable
- Enable Auto dial-out globally on all the serial ports.
set ip telnet auto-dialout enable
- Enable Auto dial-out on the serial port s0 .
set serial s0 auto-dialout enable
- Set the Auto dialout port for the serial port s0 .
set serial s0 auto-dialout-port <port_number>
- Set the Auto dialout protocol for the serial port s0.
set serial s0 auto-dialout-protocol telnet

An ERROR message will displays if any of the above details are not configured or are not valid.

Optional Configuration Settings

The following details are optional configurations:

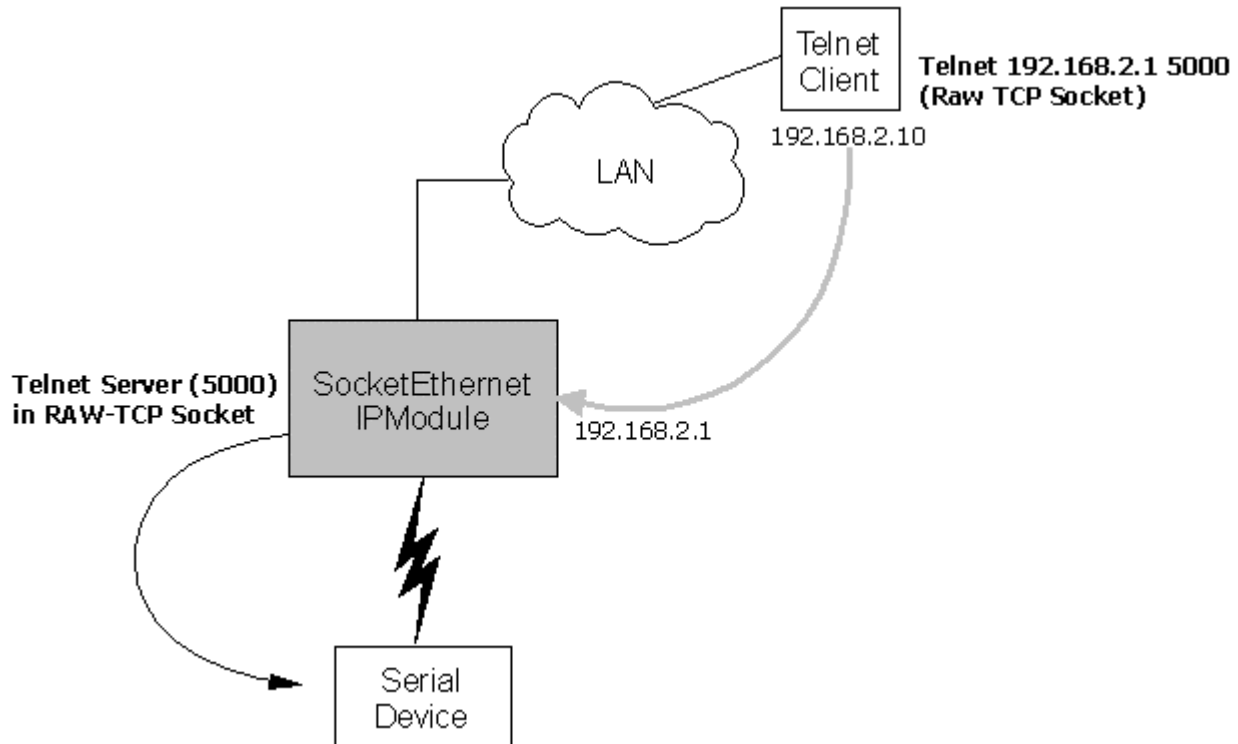
- Enable/Disable the Authentication for Dial-out session
set login auto-dialout-login <enable/disable>
- Enable/Disable the Switching-between-Dialout & CommandPrompt feature
set ip telnet escape-monitor <enable/disable>
- Set the Escape-Monitor-String to switch between Dialout and Command Prompt sessions.
set ip telnet escape-string "+++inet"
- Enable/Disable the Raw mode globally for all Dial-out sessions.
set ip telnet raw-mode <enable/disable>
- Enable/Disable the Raw mode for the serial port s0.
set serial s0 raw-dialout <enable/disable>
- Set the Baud rate for the serial port s0 to be taken for a Dialout session.
set serial s0 baud-rate <Baud-rate>
- Set the Flow control for the serial port s0 to be taken for a Dialout session.
set serial s0 flow-control <rts-cts/none>
- Set the Parity for the serial port s0 to be taken for a Dialout session.
set serial s0 parity <even/odd/none>
- Set the Data bits for the serial port s0 to be taken for a Dialout session.
set serial s0 data-bits <7/8>
- Set the Stop bits for the serial port s0 to be taken for a Dialout session.
set serial s0 data-bits <1/1.5/2>

Scenario 1 – Manual Dialout

Connect to the SocketEthernet IP module using a telnet Client on port 23 (or configuration port).

At the command prompt, invoke **# dialout serial s0**. Once the session is opened successfully, there can be two-way traffic between the telnet client and the serial device.

- You can switch from Command Prompt to Dialout session using "restore session" command.
- You can switch from Dialout session to Command Prompt using "<escape-monitor-string>" respectively.



Manual Dialout Feature Through Command Shell

Commands to Setup Manual Dial-out in the SocketEthernet IP Module

```
# set ip eth0 dhcp-client disable
# set ip eth0 ip-address 192.168.2.1
# set serial s0 baud-rate 115200
# set serial s0 data-bits 8
# set serial s0 parity none
# set serial s0 stop-bits 1
# set serial s0 flow-control rts-cts
# save
```

Once the above configuration is saved in the SocketEthernet IP Module, use a telnet client and connect to 192.168.2.1 on port 23.

On successful login, at the SocketEthernet IP module command prompt, invoke

```
# dial-out serial s0
```

The serial port now opens for use.

Notes:

1. Only one dial-out session can be open at a time.
2. The Dial-out session is closed when the Telnet session is closed, thereby releasing the serial port.
3. When Dial-out session authentication is enabled as specified in Optional commands, the session prompts for user-name and password before opening the session successfully. (Enabled by default).
4. The serial port is opened with the current serial configuration.
5. When **escape-monitor** is enabled, care should be taken during file transfer that the **escape-monitor-string** is not part of the data.

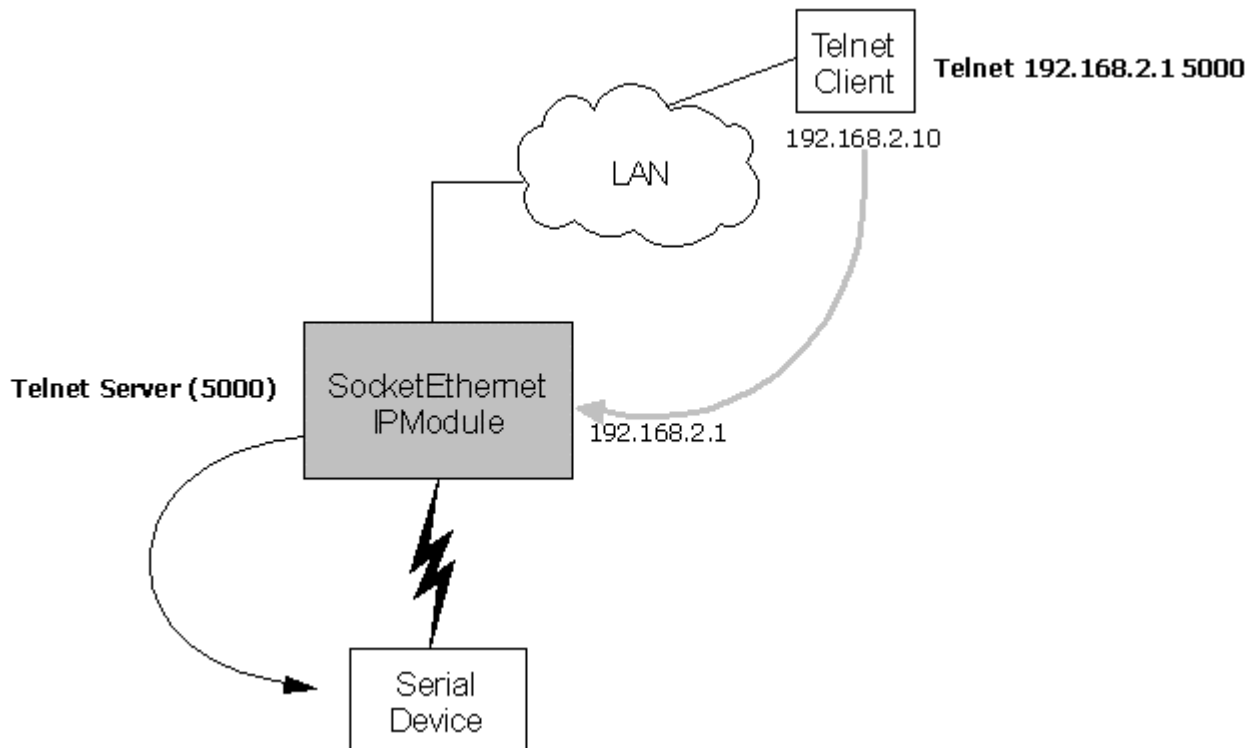
Scenario 2 – Auto Dialout

In this scenario, the Auto Dial-out session in Telnet mode is opened using a Telnet client.

Prerequisites

Raw mode (global and each port) **MUST BE DISABLED** using above-mentioned optional commands. Auto Dial-out session can be opened by a Telnet client by specifying the configured auto-dialout port.

- Once the session is opened successfully, there can be two-way traffic between the telnet session and the remote serial device.



Auto Dialout Feature in Telnet Mode

Commands to Setup Auto Dialout in Telnet Mode for the SocketEthernet IP Module

```
# set ip eth0 dhcp-client disable
# set ip eth0 ip-address 192.168.2.1
# set ip telnet auto-dialout enable

# set serial s0 auto-dialout enable
# set serial s0 auto-dialout-port 5000
# set serial s0 auto-dialout-protocol telnet

# set serial s0 baud-rate 115200
# set serial s0 data-bits 8
# set serial s0 parity none
# set serial s0 stop-bits 1
# set serial s0 flow-control rts-cts
# save
```

Once the above configuration is saved in the SocketEthernet IP module, use a telnet client and connect to 192.168.2.1 on port 5000. This eventually establishes a telnet Auto dial-out session between the SocketEthernet IP module and the serial device.

Closing the Telnet client, closes the serial port in use.

Notes:

1. Only one dialout session to the same port can be opened at one time.
2. When dialout session authentication is enabled as specified in Optional commands, the session prompts for ***user-name*** and ***password*** before opening the session successfully. (Enabled by default)
3. The serial port is opened with the current serial configuration.

Scenario 3 – Auto Dialout in RAW Mode

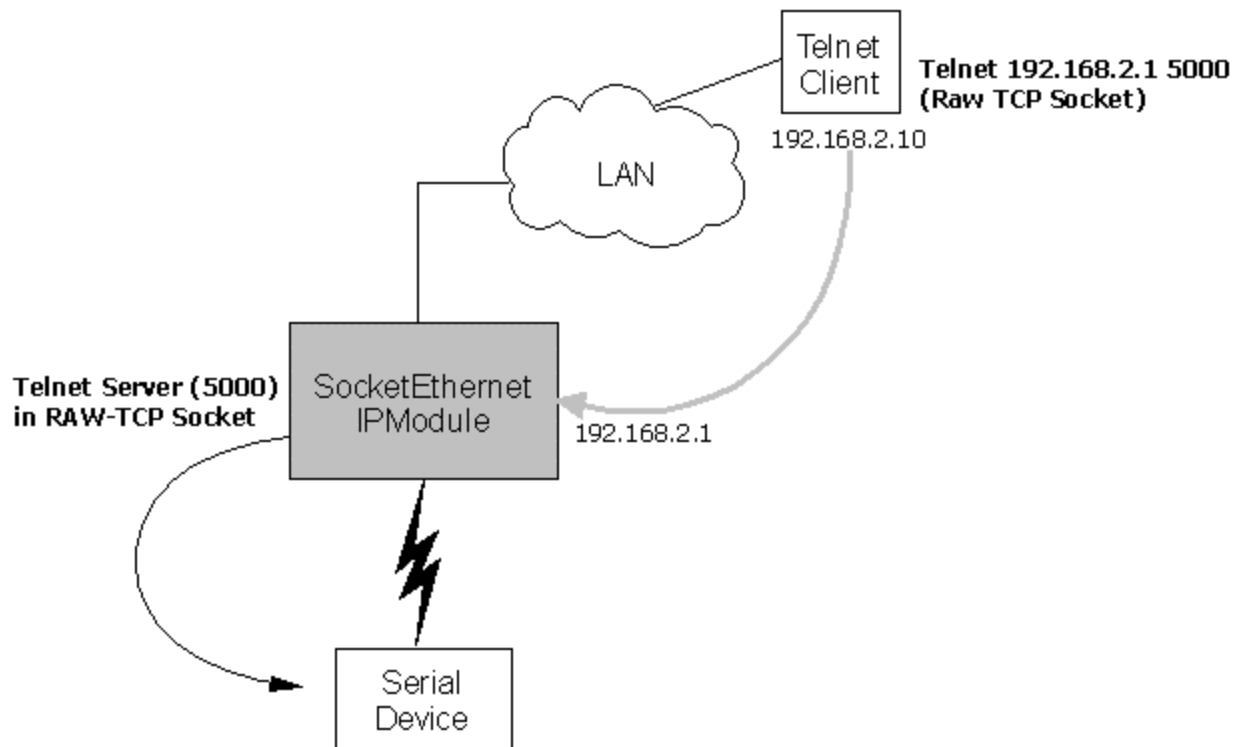
In this scenario, the Auto Dial-out session in Raw mode is opened using a RAW-TCP client.

Prerequisites

Raw mode (Global and each port) **MUST BE ENABLED** using above mentioned optional commands. The Auto Dialout session can be opened by Raw-TCP client by specifying the auto-dialout configured port. Once the session is opened successfully, there can be two-way traffic between the telnet session and the remote serial device.

Important

You cannot switch between the Command Prompt and the Dialout session in Raw-mode.



Auto Dialout Feature in RAW Mode

Commands To Setup Auto Dial-out in Raw-Mode For SocketEthernetIP Module

```
# set ip eth0 dhcp-client disable
# set ip eth0 ip-address 192.168.2.1
# set ip telnet auto-dialout enable
# set ip telnet raw-mode enable

# set serial s0 auto-dialout enable
# set serial s0 raw-dialout enable
# set serial s0 auto-dialout-port 5000
# set serial s0 auto-dialout-protocol telnet
# set serial s0 baud-rate 115200
# set serial s0 data-bits 8
# set serial s0 parity none
# set serial s0 stop-bits 1
# set serial s0 flow-control rts-cts
# save
```

Once the above configuration is saved in the SocketEthernet IP module, use a Telnet client and connect to 192.168.2.1 on port 5000 (Raw TCP socket). This eventually establishes a telnet auto-dial-out session (In RAWMODE) with the SocketEthernet IP module, thereby opening the serial port for use.

Closing the Telnet client, closes the serial port in use.

Notes:

1. You cannot open more than one dialout session to the same port.
2. When the Dial-out session authentication is enabled as specified in Optional commands, the session prompts for user-name and password before opening the session successfully.
3. The serial port is opened with the current serial configuration.

Appendix F – Remote Transparent Bridging Connectivity Examples

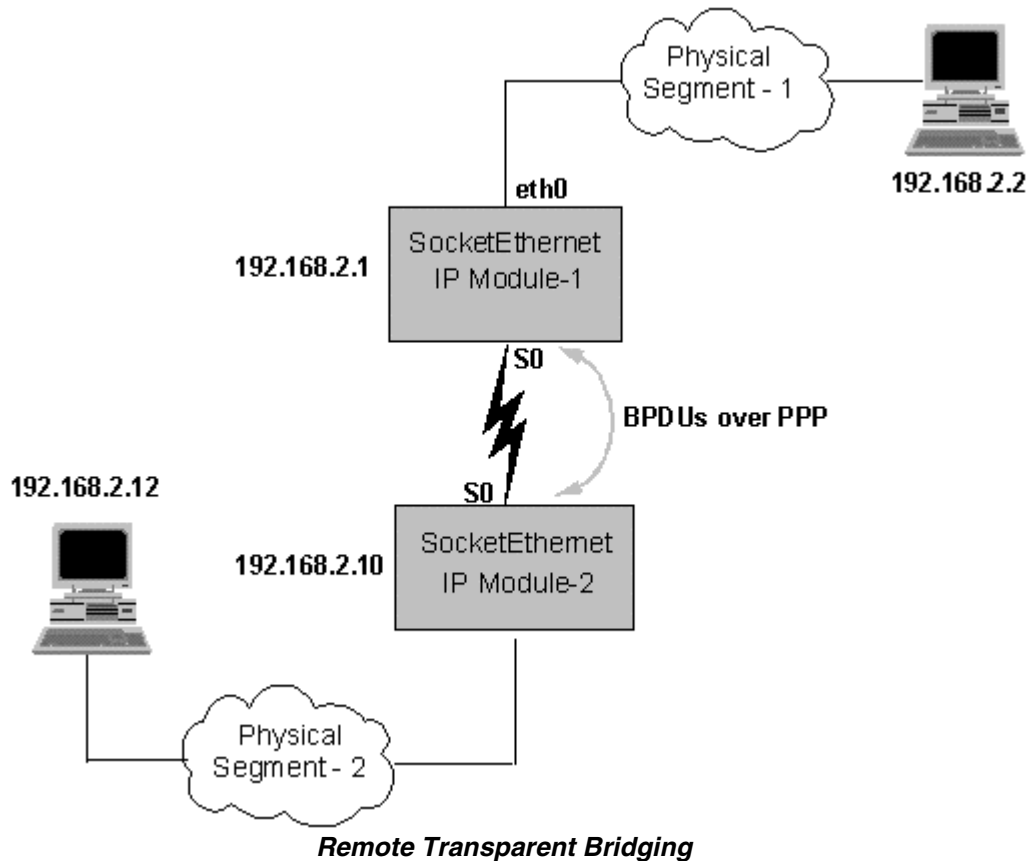
Introduction

Bridging is a feature in which multiple Local Area Networks (LANs) can be inter-connected and can enable packet forwarding between homogeneous networks or different networks.

Bridges can be grouped into categories based on various product characteristics. Using one popular classification scheme, bridges are either local or remote.

- Local bridges provide a direct connection between multiple LAN segments in the same area.
- Remote bridges connect multiple LAN segments in different areas, usually over telecommunications lines.

The SocketEthernet IP module provides **Remote Transparent Bridging**. Transparent bridging is primarily for Ethernet environments.



Remote bridging is provided over the PPP link established between two peers connected to the serial port. **Bridge Control Protocol (BCP)** is the standard method for transporting data grams over point-to-point links and is supported by the IP module.

Supported Features

Commands to Enable Authentication for PPP

```
# set ppp ppp0 authentication enable
# set ppp ppp0 authentication-type <pap/chap/pap-chap>
```

Commands to Enable PPP Compression (on both the SocketEthernet IP Modules)

```
# set ppp ppp0 compression enable
# set ppp ppp0 comp-type <both/bsd/deflate>
```

Note: These commands must be used on both SocketEthernet IP modules in the scenarios that follow.

Feature / Module Dependencies

When Bridging is Enabled

- Telnet service for configuration of SocketEthernet IP module is enabled and cannot be disabled.
- TFTP Service for Flash upgrades is also enabled and cannot be disabled.
- **PPP has to be manually enabled and other configurations also need to be made as explained in earlier sections.**
- BCP (Bridging Control Protocol) will be negotiated between the PPP peers.
- On the Ethernet:
 - DHCP Client MUST BE disabled.
- On the Serial:
 - Dial-in feature (Manual and Auto) is disabled since PPP captures the serial port.
 - Dialout feature (Manual and Auto) is disabled since PPP captures the serial port.

When Bridging Is Disabled

- PPP will be disabled. PPP alone cannot be enabled unless Bridging is enabled.
- On the Serial:
 - Dial-in feature (Manual and Auto) **can be** enabled.
 - Dialout feature (Manual and Auto) **can be** enabled.

Prerequisites and Configuration

The SocketEthernet IP module can act as a remote bridge between two different networks, which are connected through the serial link. Bridging has to be enabled on both the peers (SocketEthernet IP modules).

Remote bridging is provided over the PPP link using Bridge Control Protocol. Also the peers authenticate using Local database.

When Bridging is enabled, PPP is not enabled automatically unlike Telnet and TFTP. PPP has to be manually enabled and other PPP related configurations such as user database must be updated.

About Point-to-Point Protocol (PPP)

Point-to-Point Protocol is described in this Appendix since Remote Transparent Bridging in this example is used with PPP.

Point-to-Point Protocol (PPP) is the Internet Standard for transmission of IP packets over serial links. This protocol is commonly used in serial links (asynchronous or synchronous) to transfer packets between two endpoints. These links provide full-duplex simultaneous bi-directional operation and are assumed to deliver packets in order. It is intended that **PPP** provide a common solution for easy connection of a wide variety of hosts, bridges, and routers.

The advantage of **PPP** is that it allows for inter-operability between endpoints (for example, routers) using **PPP** for their serial communication.

Components of PPP

- A method for encapsulating multi-protocol data grams.
- A **Link Control Protocol (LCP)** for establishing, configuring, and testing the data-link connection. The LCP is used to automatically agree upon the encapsulation format options, handle varying limits on sizes of packets, detect a looped-back link and other common configuration errors, and terminate the link.
- A family of **Network Control Protocols (NCPs)** for establishing and configuring different network-layer protocols.

Prerequisites

- PPP as a stand-alone feature cannot be enabled UNLESS Bridging is enabled. PPP is provided for the support of Remote Transparent Bridging, and only BCP is negotiated. In order to enable bridging, see **Remote Transparent Bridging** later in this chapter.
- Before establishing a PPP session, users should be added to the user database. The username and password supplied by the remote peer will be authenticated using the local database.
- The following sections describe the commands to add / delete username and password to the local database.

Adding Users and Passwords

On successful execution of this command it will return an OK or an error message.

Command: # user add <username> [password]

Example: # user add user1 user1

OK

(Or)

user add user1

OK

Setting the Password

On successful execution of this command it will return an OK or an error message.

Command: # user password <username> <password>

Example: # user password user1 user1

OK

Deleting Users

On successful execution of this command it will return an OK or an error message.

Command: # user delete <username>

Example: # user delete user1

OK

PPP Configuration

PPP configuration consists of setting up the following parameters.

- Enabling PPP
- Enabling / Disabling Authentication and Authentication Type
- Configure username / password for remote peer to authenticate
- Configuring the Connect Type
- Configuring the Connect State
- Configure the modem settings

The following sections describe in detail the configuration commands in detail.

Enabling PPP

Command: # set ppp [interface] <enable/disable>
Enables PPP on the IPModule.

Example: # set ppp ppp0 enable
OK

Enabling / Disabling Authentication

This command enables or disables a PPP session's Authentication. If Authentication is enabled, then the authentication protocol, the username, and password should also be set.

Command: # set ppp [interface] authentication <enable/disable>

Example: # set ppp ppp0 authentication enable
OK

Authentication Type - Protocol

This command sets the Authentication type.

Command: # set ppp [interface] auth-type <pap/chap/pap-chap>

Example: #set ppp ppp0 auth-type pap
OK

Username and Password for Remote Peer Authentication

This command sets the username with which remote server will authenticate. If authentication is disabled, this need not be configured.

Command: # set ppp [interface] username
set ppp [interface] password

Example: # set ppp ppp0 username user1
OK
#set ppp ppp0 password user1
OK

Connection Type

This command sets the connection type. A connection type can be either direct or modem. In case of a modem connection, the modem settings also have to be configured as described in the following sections.

Command: # set serial [serial-interface] connect-type
<direct/modem>

Example: #set serial s0 connect-type direct
OK
(Or)
#set serial s0 connect-type modem
OK

Connection State

This command sets the connection state to either Dialing or Answering. In case of a modem connection, the modem settings also have to be configured as described in the following sections.

Command: # set serial [serial-interface] connect-state
<answering/dialing>

Example: #set serial s0 connect-state answering
OK
(Or)
#set serial s0 connect-state dialing
OK

Modem Settings - Applicable Only with Modem Connection Type

1. This command sets the initialization string of the modem.

Command: # set serial [serial-interface] modem init-string
<line-no> <init string>

Example: #set serial s0 modem init-string 1 ATSO
OK

2. This command sets the hangup string of the modem.

Command: # set serial [serial-interface] modem hangup-string
<hangup string>

Example: #set serial s0 modem hangup-string +++ATH0
OK

3. This command sets the dial-prefix string of the modem.

Command: # set serial [serial-interface] modem dial-prefix
<dial-prefix string>

Example: #set serial s0 modem dial-prefix ATDT
OK

4. This command is used to set the dial number on the dialing end.

Command: # set serial [serial-interface] modem dial-number
<phone no>

Example: #set serial s0 modem dial-number 224824
OK

5. This command allows you to view the PPP configuration settings.

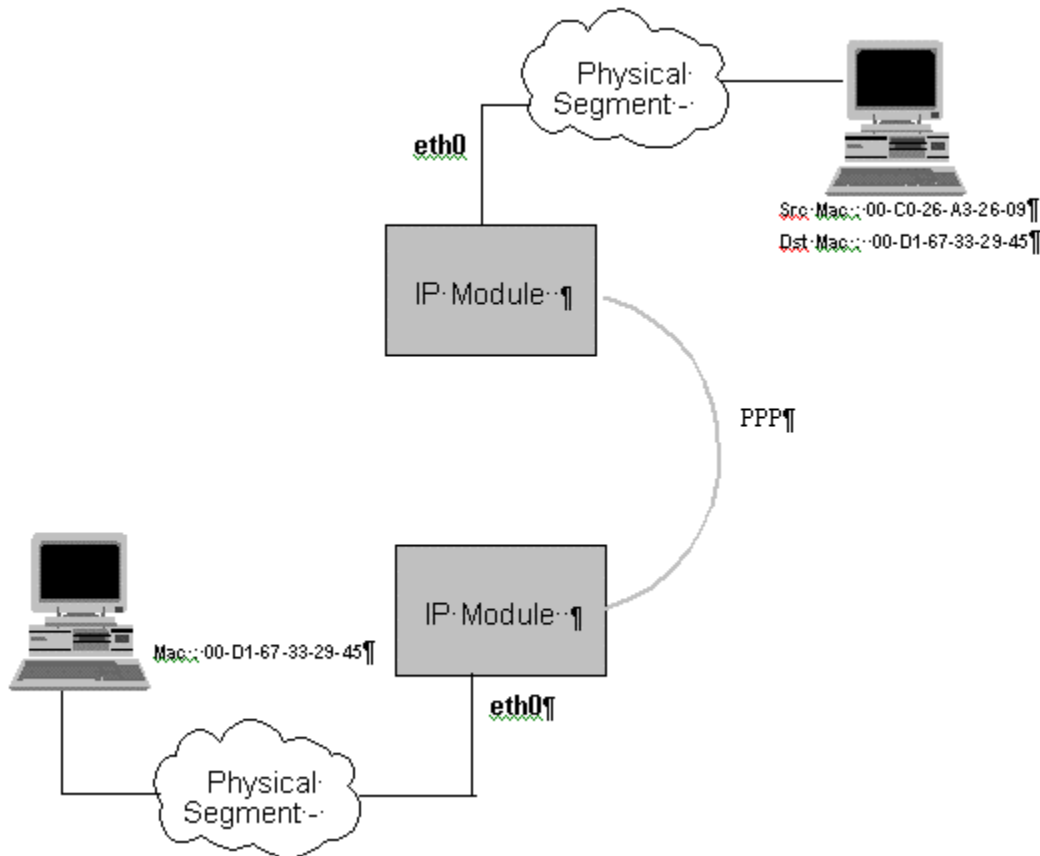
Command: # show ppp configuration

This ends the section on Point-to-Point Protocol.

Scenario 1 – PPP and Remote Bridging

Remote Bridging

This example shows a PPP session established between two IP modules over the serial port. One IP module is configured as **answering** and the other one as **dialing**. Make sure that the username, password, and authentication protocol match on both the sides. The IP module (configured for dialing) dials to the answering one, negotiates BCP, and, once the PPP link is up, the packets are bridged across.



PPP with Remote Bridging

Global Bridging Configuration

Successful execution of the command returns an OK. Otherwise, it returns an error message:

- Enable bridging.
- Set the bridge IP Address and Mask.

Refer to the **Bridge Setup Commands** for more details.

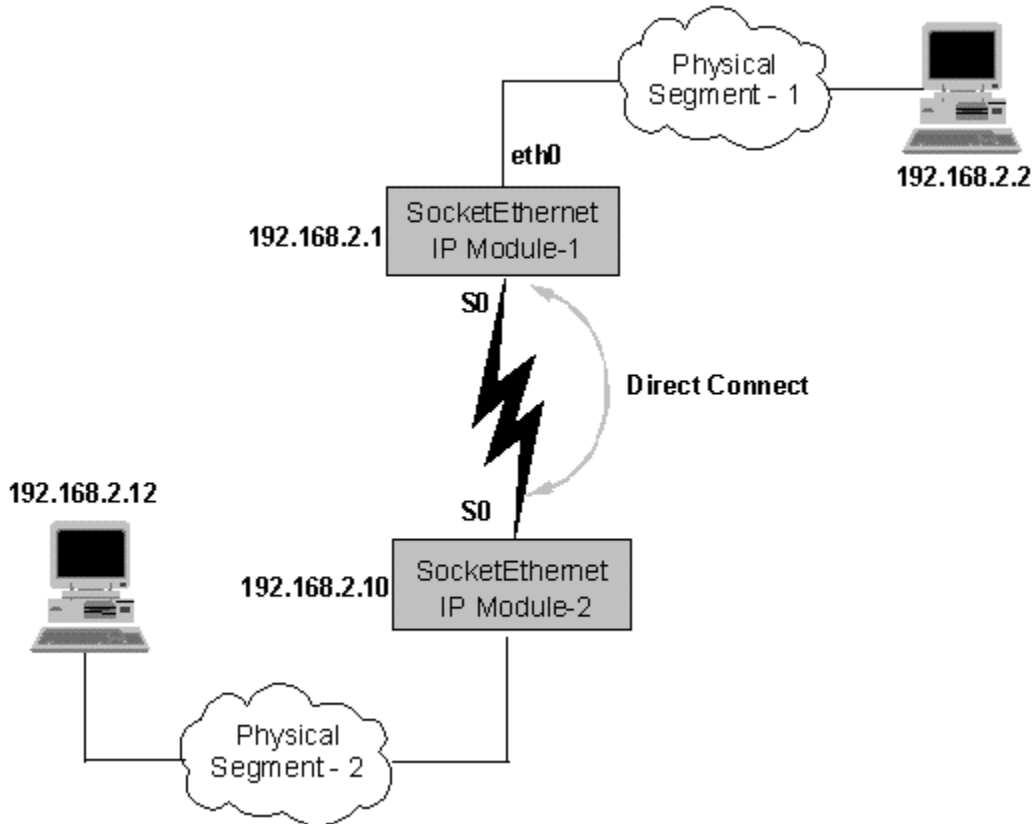
PPP Configuration Required for Bridging

- Enable PPP.
- Enable or disable Authentication.
- If authentication is enabled, the authentication protocol has to be configured. Supported protocols are PAP, CHAP (or) PAP-CHAP.
- User name and password should be configured.
- Connect type (Direct or Modem) should be configured.
- If the connect type is modem, then the modem state (Dialing / Answering), modem initialization, hang-up strings and dial up phone number has to be configured.

Refer to **PPP Setup Commands** for more details.

Scenario 2 – Remote Bridging with Direct Connection

This example of remote transparent bridging uses a direct connection between the serial ports.



Transparent Bridging - Direct Connection

Commands Setup for SocketEthernetIP Module-1

```
# set ip eth0 dhcp-client disable
# set ip eth0 ip 192.168.2.1
# set bridge enable
# set bridge ipmodule ip-address 192.168.2.1
# set ppp ppp0 enable
# set ppp ppp0 raw-mode enable
  [Only if simple AHDLC quoting on the serial port is required.]
# set serial s0 connect-type direct
# set serial s0 baud-rate 115200
# set serial s0 data-bits 8
# set serial s0 parity none
# set serial s0 stop-bits 1
# save
```


Commands Setup for SocketEthernet IP Module-2

```
# set ip eth0 dhcp-client disable
# set ip eth0 ip 192.168.2.10
# set bridge enable
# set bridge ipmodule ip-address 192.168.2.10

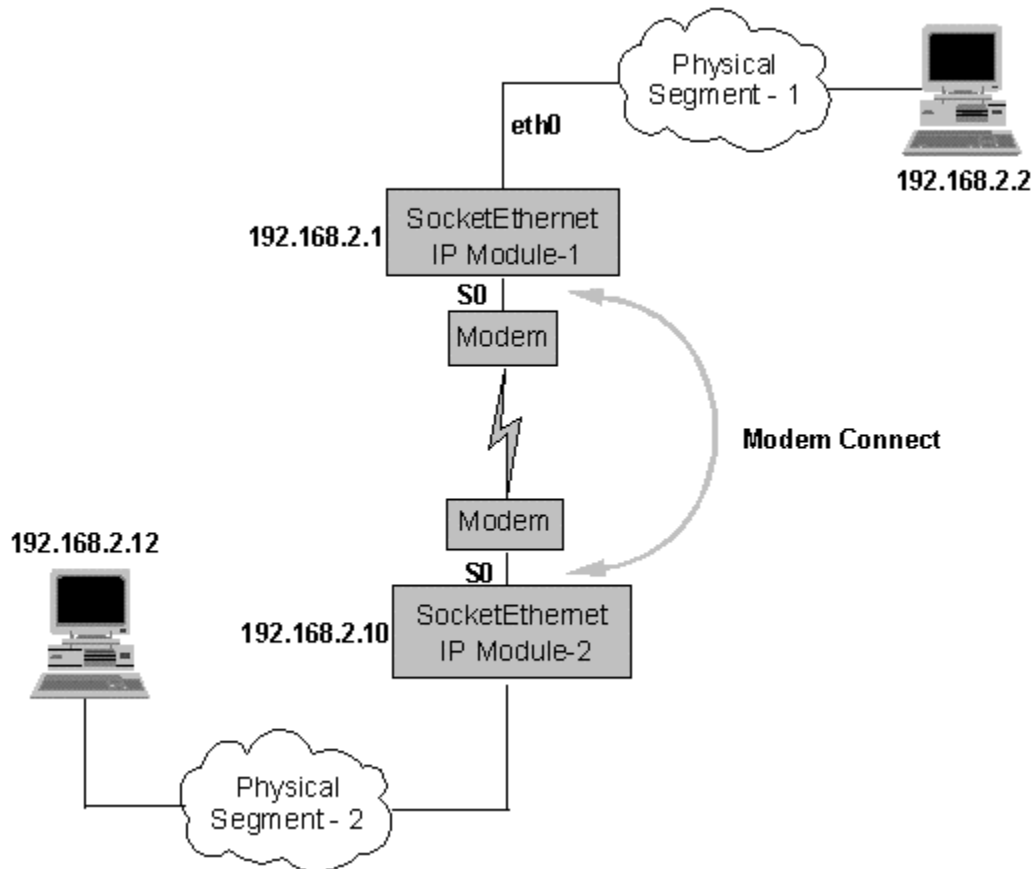
# set ppp ppp0 enable
# set ppp ppp0 raw-mode enable
    [Only if simple AHDLC quoting on the serial port is required.]
# set serial s0 connect-type direct
# set serial s0 baud-rate 115200
# set serial s0 data-bits 8
# set serial s0 parity none
# set serial s0 stop-bits 1
# save
```

Note:

For simple AHDLC quoting on the serial port, the raw-mode has to be enabled on both the SocketEthernet IP modules. Raw-mode is disabled by default

Scenario 3 – Remote Bridging with Modem Connection

This example of remote transparent bridging uses a modem connection between the serial ports.



Transparent Bridging with Modem Connection

Commands Setup for SocketEthernet IP Module-1

```
# set ip eth0 dhcp-client disable
# set ip eth0 ip 192.168.2.1
# set bridge enable
# set bridge ipmodule ip-address 192.168.2.1
# set ppp ppp0 enable
# set ppp ppp0 raw-mode enable
  [Only if simple AHDLC quoting on the serial port is required.]
# set serial s0 connect-type modem
# set serial s0 connect-state dialing
# set serial s0 modem init-string 1 "+++ATH0"
# set serial s0 modem init-string 2 "AT&F"
# set serial s0 modem dial-number 234
# set serial s0 baud-rate 115200
# set serial s0 data-bits 8
# set serial s0 parity none
# set serial s0 stop-bits 1
# save
```

Commands Setup for SocketEthernetIP Module-2

```
# set ip eth0 dhcp-client disable
# set ip eth0 ip 192.168.2.10
# set bridge enable
# set bridge ipmodule ip-address 192.168.2.10
# set ppp ppp0 enable
# set ppp ppp0 raw-mode enable
  [Only if simple AHDLC quoting on the serial port is required.]
# set serial s0 connect-type modem
# set serial s0 connect-state answering
# set serial s0 modem init-string 1 "+++ATH0"
# set serial s0 modem init-string 2 "AT&F"
# set serial s0 baud-rate 115200
# set serial s0 data-bits 8
# set serial s0 parity none
# set serial s0 stop-bits 1
```

Notes:

1. For simple AHDLC quoting on the serial port, the raw-mode has to be enabled on both the SocketEthernet IP modules. Raw-mode is disabled by default
2. SocketEthernet IP Module-1 is configured for modem dialing. SocketEthernet IP Module-2 is configured for modem answering.
3. If you wish to have a complete control on the modem-dialing end, use the chat-scripts. By default the dialing-method is **configuration**.
4. Refer the following commands in the **Command Line Section** for more details on the chat-scripts.

```
# set serial s0 modem dialing-method ?
# set serial s0 chat-script ?
```

Important Note:

The chat-script should be used ONLY FOR THE DIALING END.

Appendix G – Auto-Discovery Manager

Introduction

The Windows-Based Auto-Discovery Manager for the SocketEthernet IP Module

The Auto-Discovery Manager is a mechanism for remotely monitoring the IPModule. It also provides support for configuring several key parameters, such as DHCP Status (enable/disable), IP Address, and the Hostname of an SocketEthernet IP Module.

The Auto-Discovery mechanism is utilized by running a Windows-based Server Application that can monitor/configure the SocketEthernet IP Module. Communication between the SocketEthernet IP Module and the Windows-based Server is through MAC level broadcasts on a configured UDP port.

Auto-Discovery Components

The Auto-Discovery Manager is composed of two components:

- ***The Client Component*** – The Client component periodically broadcasts its current configuration over the network.
- ***The Server Component*** – The Server component receives the broadcasts from the client.

Client Component

The Auto-Discovery Client component is integrated with SocketEthernet IP Module. It broadcasts its current configuration over the network on a specific UDP SERVER-PORT. By default the SERVER-PORT is set to 1020. The configuration parameters broadcast are

- Version details
- MAC Address
- Static IP Address
- DHCP Status
- DHCP Assigned IP Address
- Host Name
- Broadcast interval
- Port number on which the client listens

How to Disable the Client Auto-Discovery Broadcasts

```
#set auto-discovery disable
```

Note: By default it is enabled

How to Change the Periodic Timer of Client's Broadcast

```
#set auto-discovery broadcast-timer <t secs>
```

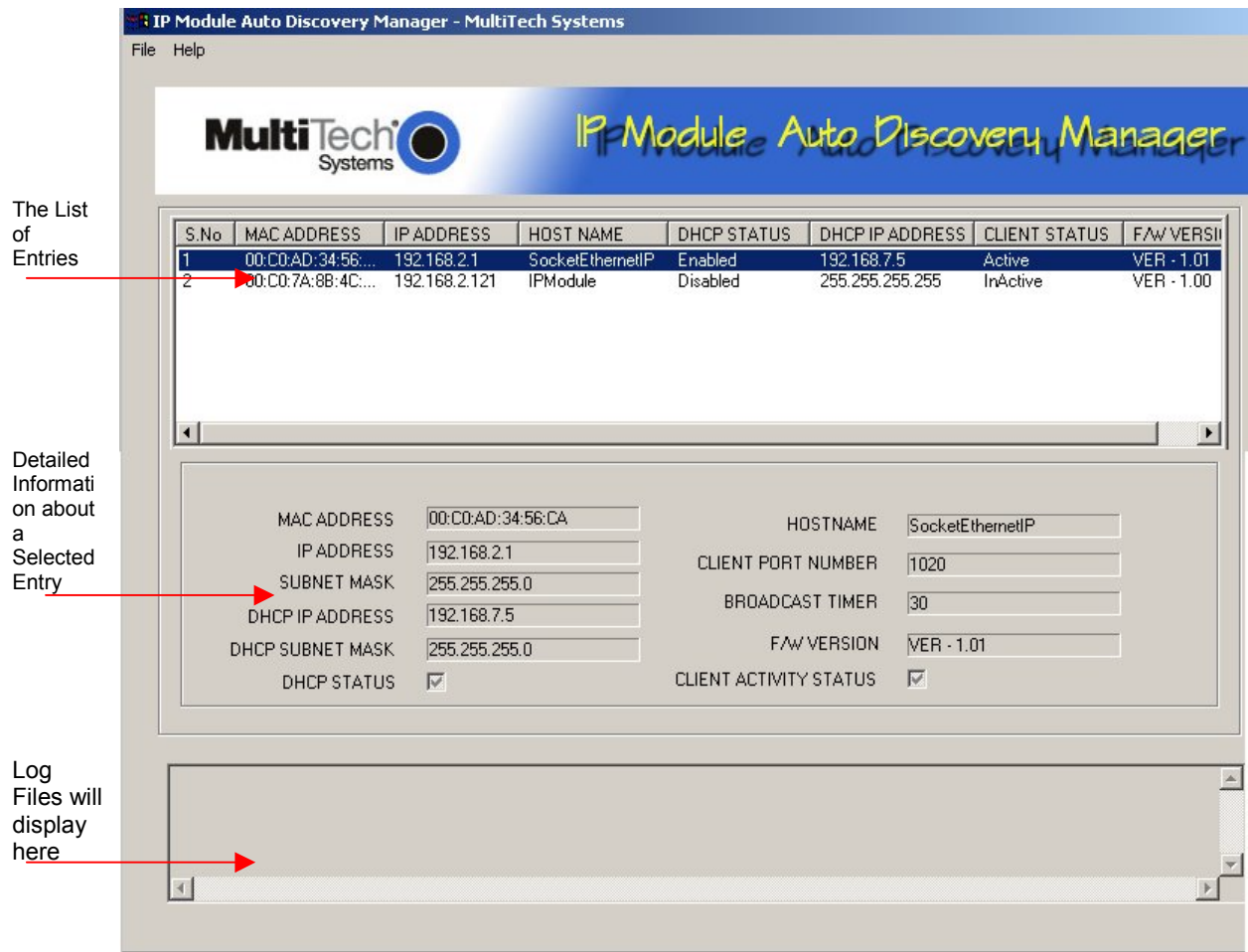
Note: By default it is 10 seconds.

How to Change the Server-Port

```
#set auto-discovery server-port <port number>
```

Server Component

The Server component listens on the SERVER-PORT. It receives the broadcasts from the client and updates the list of configuration parameters. This list can be viewed by the administrator through the User Interface:



How to View the Detailed Information

New entries are appended to the list shown on the screen above. Only the first ten entries are displayed on the screen. However the administrator can scroll down to view more entries. Clicking on an entry displays the detailed information about that entry.

How to Edit the List and Make the Changes Permanent

1. Double-click on the entry you wish to edit.

Continued: How to Edit the List and Make the Changes Permanent

- After clicking the desired entry, a new dialog box displays showing the current configuration.

Auto Discovery Manager - Edit Attributes

Edit

MAC ADDRESS 00:08:00:D2:02:3F

IP ADDRESS 192 . 168 . 2 . 1

SUBNET MASK 255 . 255 . 255 . 0

DHCP STATUS ☐

DHCP IP ADDRESS 000.000.000.000

DHCP SUBNET 000.000.000.000

HOSTNAME SocketEthernetIP

CLIENT PORT 9999

CLIENT ACTIVITY STATUS ☒

BROADCAST TIMER 10

VERSION 1.99

SET RESET RESTORE DEFAULTS CANCEL

- Enter the new parameters and click the **SET** button. The server sends the modified parameters to the client.

Upon receiving the broadcast from the Server, the Client validates the packet. The Client determines whether the packet is destined for its own MAC Address. If so, it sets the modified parameters that are different from its current configuration, and then it broadcasts the newly configured parameters.

The Client Status is set to **Active** upon the receipt of a broadcast packet.

The Client Status is made **Inactive** if there is no request from the client for a stipulated period. (3 * periodic timer value).

How to Set the Parameters to the Previous Configuration

When the **RESET** button is clicked, the parameters are set to the defaults received. In other words, **RESET** is similar to **UNDO** (it sets the modifications to the previous ones).

Supported Feature - Saving the Log

The logs can be saved to a file. They are spooled into the third part of the window in the main dialog box. To save the log:

Select **File > Save Log As** option to save the log.

Appendix H – SocketEthernet IP and SocketModem Compared

Multi-Tech Systems, Inc. is offering a family of embedded solutions, which are based upon our SocketModem form factor. By taking into account the complimentary pin-outs of the various modules, this allows great flexibility in deploying a product with a number of different communication options. We mention this now to assist in the planning of your future product enhancements.

- Our SocketEthernet IP can save you development time and effort since it is interchangeable with the SocketModem and SocketModemIP
- One design layout can support SocketModem, SocketModemIP, and the SocketEthernet IP.

For additional information on Multi-Tech’s family of embedded solutions contact:

oemsales@multitech.com

SocketModem and SocketEthernet IP Pins Compared

SocketModem Pins	SocketEthernet IP Pins
<div> <div> DAA Tip 1 <input type="checkbox"/> Ring 2 <input type="checkbox"/> </div> <div> <input type="checkbox"/> 64 SPKR : Audio <input type="checkbox"/> 63 AGND <input type="checkbox"/> 61 VCC </div> </div> <div> <div> -RESET 24 <input type="checkbox"/> DGND 26 <input type="checkbox"/> </div> <div> <input type="checkbox"/> 41 DGND: <input type="checkbox"/> 40 -DTR <input type="checkbox"/> 39 -DCD <input type="checkbox"/> 38 -CTS <input type="checkbox"/> 37 -DSR <input type="checkbox"/> 36 -RI <input type="checkbox"/> 35 -TXD <input type="checkbox"/> 34 -RXD <input type="checkbox"/> 33 -RTS </div> </div> <div> <div> DLED: <div> DCDIND 29 <input type="checkbox"/> RXIND 30 <input type="checkbox"/> DTRIND 31 <input type="checkbox"/> TXIND 32 <input type="checkbox"/> </div> </div> <div> Serial </div> </div>	<div> <div> <input type="checkbox"/> 64 NC <input type="checkbox"/> 63 GND </div> <div> <input type="checkbox"/> 61 VCCIN <input type="checkbox"/> 60 LEDSPD <input type="checkbox"/> 59 LEDCOL <input type="checkbox"/> 58 LEDLINK <input type="checkbox"/> 57 LEDACT <input type="checkbox"/> 56 LEDFDX </div> </div> <div> <div> TX+ 4 <input type="checkbox"/> TX- 5 <input type="checkbox"/> RX+ 6 <input type="checkbox"/> RX- 7 <input type="checkbox"/> </div> <div> -RESET 24 <input type="checkbox"/> GND 26 <input type="checkbox"/> </div> </div> <div> <div> <input type="checkbox"/> 41 GND <input type="checkbox"/> 40 -DTR <input type="checkbox"/> 39 -DCD <input type="checkbox"/> 38 -CTS <input type="checkbox"/> 37 -DSR <input type="checkbox"/> 36 3.3V OUT <input type="checkbox"/> 35 -TXD <input type="checkbox"/> 34 -RXD <input type="checkbox"/> 33 -RTS </div> <div> Serial </div> </div>

Note: Pin 3 is intentionally not used. This allows for safety spacing between Tip & Ring (telephone voltage) and Ethernet I/O (SELV).

Appendix I – Safety, EMC Approvals, and Regulatory Considerations

Safety and EMC Product Approvals

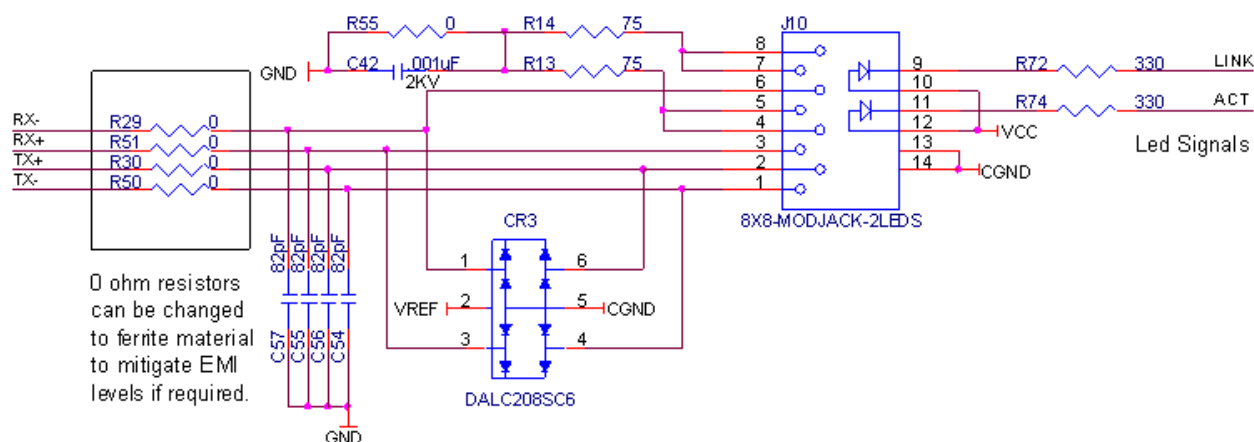
Safety	EMC Product Approvals
EN60950	EN 55022
UL1950	FCC Part 15
IEC950	Canadian EMC
AS/NZ3260	EN 55024

Regulatory Considerations

This section discusses hardware considerations, PC board layout considerations, and FCC Part 15 rules.

Hardware Considerations

Disclaimer: Multi-Tech Systems makes no warranty claims for vendor product recommendations listed below. Other vendor products may or may not operate satisfactorily. Multi-Tech System's recommended vendor products only indicate that the product has been tested in controlled conditions and were found to perform satisfactorily.



Main Board Filtering

EMC

Surface mount ferrites may need to be used on the Transmit and Receive to mitigate emission levels out the RJ-45 cable. 82pF capacitors are used to reduce the common mode emissions that may be present in certain systems. The ferrite and capacitors also aid in reducing the effects of transients that may be present on the line.

Recommended Ferrite (SMT)

Manufacturer: MuRate Erie

Part #: BLM18BB750SN1B

Recommended Capacitor

Manufacturer: AVX/Kyocera

Part #: 12061A820JAT050

Recommended Connector

Manufacturer: Amphenol

Part #: RJHS - 5381

Recommended TVS Diode Array

Manufacturer: ST Micro

Part #: Dalc208SC6

Regulatory Information

FCC Part 15 Regulation

This equipment has been tested and found to comply with the limits for a **Class A** digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Plug the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC rules. Operation of this device is subject to the following conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference that may cause undesired operation.

WARNING – Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Industry Canada

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement Canadien sur le matériel brouilleur.



EMC, Safety, and Directive Compliance

The CE mark is affixed to this product to confirm compliance with the following European Community Directives:

Council Directive 89/336/EEC of 3 May 1989 on the approximation of the laws of Member States relating to electromagnetic compatibility;

and

Council Directive 73/23/EEC of 19 February 1973 on the harmonization of the laws of Member States relating to electrical equipment designed for use within certain voltage limits.

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