

Product Change Notification
Software Release Notice

MultiTech® Conduit®
Family of Programmable Gateways:
Conduit IoT Programmable Gateway
Conduit IP67 Base Station,
and Conduit AP Access Point



Updated Firmware Available
mPower™ Edge Intelligence

Date: March 9, 2020

Product Change Notification Number
PCN 03092020-001

I. Overview

MultiTech announces updated firmware versions for the MultiTech® Conduit® family of products, including:

- Conduit® AP Access Point
- Conduit® IoT Programmable Gateway
- Conduit® IP67 Base Station

The purpose of this Software Notification is to alert customers that updated code is available for evaluation and to provide customers important information on this new release.

New mPower AEP Versions:

- MTCAP AEP 5.1.5 (Conduit AP Access Point)
- MTCDT AEP 5.1.5 (Conduit Gateway and Conduit IP67 Base Station)

NOTE: mPower AEP 5.1.5 corrects a [critical issue](#) that was discovered in mPower AEP 5.1.2. Customers who have upgraded their firmware to mPower AEP 5.1.2 or have received hardware with mPower AEP 5.1.2 already installed should understand the critical issue and upgrade these devices to mPower AEP 5.1.5.

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II. Schedule

There are multiple versions of mPower Edge Intelligence firmware available for customer evaluation and final release.

- Downloadable Versions
 - MTCAP AEP 5.1.5 Availability: Early March
 - MTCDT AEP 5.1.5 Availability: Early March
 - Visit <http://www.multitech.net/developer/downloads/>
 - Instructions: [Upgrading Firmware Using Device Web Interface](#)
- Manufacturing
 - See [Ordering Numbers Impacted](#) for details on when MTCAP AEP 5.1.5 and MTCDT AEP 5.1.5 will be available for different devices
- DeviceHQ®
 - Cloud-based IoT Device Management
 - mPower AEP 5.1.5 Availability: Early March
 - https://www.devicehq.com/sign_in
 - Instructions: [Upgrading Firmware Using DeviceHQ](#)

NOTE:

[Critical Issue 1](#) can also be corrected by performing a [Shell Script Update](#) as outlined in the instructions below.

III. mPower™ Edge Intelligence

mPower™ Edge Intelligence is MultiTech's embedded software offering, building on the popular application enablement platform, to deliver programmability, network flexibility, enhanced security and manageability for scalable Industrial Internet of Things (IIoT) solutions.

mPower Edge Intelligence simplifies integration with a variety of popular upstream IoT platforms to streamline edge-to-cloud data management and analytics, while also providing the programmability and processing capability to execute critical tasks at the edge of the network to reduce latency, control network and cloud services costs, and ensure core functionality – even in instances when network connectivity may not be available.

In response to evolving customer security requirements, mPower Edge Intelligence incorporates a host of security features including signed firmware validation, enhanced firewall and VPN settings, secure authentication and more.

IV. Models Impacted

The following Conduit models are impacted by these firmware updates:

- Conduit® IoT Programmable Gateways
- Conduit® IoT Programmable Gateways with LoRa Accessory Cards
- Conduit® IP67 Base Stations
- Conduit® IP67 Geolocation Base Station
- Conduit® AP Access Point

For a specific list of the ordering part numbers impacted, reference [Ordering Part Numbers Impacted](#)

V. mPower AEP 5.1.5 Overview

Minimum System Requirements (MTCAP AEP 5.1.5, MTCDT AEP 5.1.5)

To install mPower AEP 5.1.5, the Conduit gateway be upgraded to mPower AEP 5.0.0 or higher. Customers that are running earlier versions of mPower should use the following upgrade process:

- mPower AEP 1.7.4
 1. Upgrade to mPower AEP 5.0.0
 2. Install mPower AEP 5.1.5
- mPower AEP 1.6.4
 1. Upgrade to mPower AEP 1.7.4
 2. Upgrade to mPower AEP 5.0.0
 3. Install mPower AEP 5.1.5
- mPower versions earlier than mPower AEP 1.6.4
 1. Upgrade to mPower AEP 1.6.4
 2. Upgrade to mPower AEP 1.7.4
 3. Upgrade to mPower AEP 5.0.0
 4. Install mPower AEP 5.1.5

Bug Fixes (MTCAP AEP 5.1.5, MTCDT AEP 5.1.5):

Firmware version mPower AEP 5.1.5 includes the following bug fixes.

1. Critical Issue: LoRa Packet Forward Log – Script Rotate

- Overview:
 - Occurs when the device LoRa Mode is set to LoRa Packet Forwarder
 - As more LoRa data is sent to the device, the LoRa Packet Forward Log file (lora-pkt-fwd-1.log) continues to grow
 - The Log rotate process eventually fails to rotate the packet forwarder logs
 - Logs are located in RAM, eventually all available RAM is used up by the log file
 - The LoRa Packet Forwarder is now unresponsive and sends no packets until the device is power-cycled
- Issue only exists in MTCAP AEP 5.1.2 and MTCDT AEP 5.1.2, which was released to a limited number of devices
- Issue does not exist when using a third-party LoRa Packet Forwarder
- Resolution:
 - Customers have two ways of resolving this critical issue
 - i. Update the entire firmware image to MTCAP AEP 5.1.5 or MTCDT AEP 5.1.5 using the [web interface](#) or [DeviceHQ](#)
 - ii. Update only the Lora Logging Package using a [Shell Script Update](#)

- The following devices were shipping from MultiTech and are impacted by this critical issue.

Model Name	Ordering Part Numbers	
Conduit® IoT Programmable Gateways		
MTCDDT-L4E1-246A-EU-GB ⁽¹⁾ MTCDDT-L4E1-247A-EU-GB ⁽¹⁾	MTCDDT-L4N1-246A-US ⁽¹⁾ MTCDDT-L4N1-247A-US ⁽¹⁾	MTCDDT-L4N1-247A ⁽¹⁾
Conduit® IoT Programmable Gateways with LoRa Accessory Cards		
MTCDDT-L4E1-246A-868-EU-GB ⁽¹⁾ MTCDDT-L4E1-247A-868-EU-GB ⁽¹⁾	MTCDDT-L4E1-246A-915-EU-GB ⁽¹⁾ MTCDDT-L4E1-247A-915-EU-GB ⁽¹⁾	MTCDDT-L4N1-246A-915-US ⁽¹⁾ MTCDDT-L4N1-247A-915-US ⁽¹⁾
Conduit® IP67 Base Stations		
MTCDDTIP-L4E1-266A-868 ⁽¹⁾ MTCDDTIP-L4E1-267A-868 ⁽¹⁾	MTCDDTIP-L4E1-266A-915 ⁽¹⁾	MTCDDTIP-L4N1-266A-915 ⁽¹⁾ MTCDDTIP-L4N1-267A-915 ⁽¹⁾
Conduit® IP67 Geolocation Base Station		
MTCDDTIP-L4E1-270A-868 ⁽¹⁾	MTCDDTIP-L4N1-270A-915 ⁽¹⁾	MTCDDTIP-L4N1-275A-915 ⁽¹⁾
Conduit® AP Access Point		
MTCAP-868-041A ⁽¹⁾	MTCAP-L4E1-868-001A ⁽¹⁾	MTCAP-LNA3-915-041A ⁽¹⁾

	Hardware Status	Manufacturing Updates	Comments
(1)	New	March 2020	<ul style="list-style-type: none"> New hardware was shipped with an earlier version of mPower firmware (AEP 5.1.2) MultiTech recommends that customers update this hardware to mPower firmware AEP 5.1.5

- Customers who have updated Near-End-of-Life (NEOL) devices or existing devices to mPower AEP 5.1.2 are also impacted
 - See [Ordering Part Numbers Impacted](#) for a complete list of impacted devices.
- Known Issue: Parity packet index was still using 0, which will break FUOTA for compliant devices
 - Issue exists in MTCAP AEP 5.1.1 and MTCDDT AEP 5.1.1 versions and AEP 5.1.0 BETA versions only
 - AEP 5.1.1 was an intermediate release for select LTE Category 4 (-L4E1) models
 - AEP 5.1.0 BETA was a beta release for select LTE Category 4 (-L4E1) models
 - Issue fixed in MTCAP AEP 5.1.5 and MTCDDT AEP 5.1.5
 - Known Issue: When using a roaming SIM card, cellular PPP issues are experienced
 - Issue exists in MTCAP AEP 5.1.0 and MTCDDT AEP 5.1.0 versions
 - Issue fixed in MTCAP AEP 5.1.5 and MTCDDT AEP 5.1.5

4. Known Issue: In firmware version mPower AEP 5.1.2, a bug was introduced that prevented the Modbus gateway code from executing, leading to the feature not working at all. This issue has been corrected in mPower AEP 5.1.5.

Feature Enhancements (MTCAP AEP 5.1.5, MTCDDT AEP 5.1.5):

Firmware version AEP 5.1.5 includes the following new features and feature enhancements.

- a. Hardware Support
 - a. Radio support **updated** for the following cellular technologies

Cellular WAN Support	Wireless Carrier
4G-LTE Category 4 North America (-L4N1 models)	AT&T Verizon

- b. Feature Enhancements
 - a. First-Time Setup
 - Setup Wizard: option added for Remote Management – DeviceHQ

- b. Network Interfaces
 - Added support for IPV6 in several specific network configurations

Network Interface	IP Mode
Bridge (Br0)	STATIC
Ethernet (Eth0)	STATIC DHCP Client
PPP Interface (ppp0)	PPP PPP – Addresses Only

- IPv6 WAN on cellular only
- c. Global DNS
 - Option added to configure the hostname of the device
 - d. Dynamic Host Configuration Protocol (DHCP) Server
 - Support added for configuring and enabling IPv6 DHCP server(s).
 - e. Setting up Wi-Fi as a WAN
 - Support added for connecting to hidden SSID networks
 - f. Updated Destination and Source Interface Firewall Rules now include OPENVPN option
 - Pre-routing rules
 - Post-routing rules
 - Input filter rules
 - Inbound forwarding rules
 - Output filter rules

- g. Added Cellular Configuration Fields
 - Cellular Mode: Select the cellular mode from the drop-down menu based on the cellular radio module in the device (Auto (default), LTE only, LTE prefer, 2G only, 3G only, or 3G prefer)
 - Modem Configuration (allows user to switch firmware from one MNO network to another).
 - L4N1 Models: AT&T (Default) or Verizon
- h. Added Password Complexity Rules: Administrative user can choose rules and limitations for user passwords, including:
 - Minimum length of passwords
 - Upper and lower case requirements
 - Special characters (non-alphanumeric)
 - Characters that are not permitted

Two modes are available:

 - Default Mode: Minimum character length and specific number of characters
 - Credit Mode: Credits are granted for each password character and extra credits are applied for certain character classes. Administrators specify a minimum number of classes. Longer passwords are the strongest.
- i. Configuring Device Access: How the device can be accessed as well as security features that decrease susceptibility and malicious activity.
 - Added remote SSH Server
- j. Managing Devices Remotely (DeviceHQ): Updates to DeviceHQ Check-In Settings
 - Single Check-In: Configure device to check-in to DeviceHQ at a specific date and time
 - Repeatable Check-In: Configure device to check-in to DeviceHQ at a specific time daily or on a specific day of the week.
- k. Upgrading Firmware from MultiTech website or DeviceHQ
 - Signed Firmware Validation is automatically used once it is enabled after upgrading from version 5.1 and higher.
- l. LoRaWAN
 - Spectral scan support with reporting to Lens
 - Multicast support for Class B
 - Multicast field added to device session:
 - 0: None
 - 1: Class B
 - 2: Class C
 - No longer need to set Uplink Counter to 1 for multicast sessions to schedule downlinks
 - Session can be modified for managing Multicast sessions
 - LoRaWAN 1.0.4 support
 - Join Server nonce counters
 - Includes validation of end-device DevNonce counter if LoRaWAN 1.0.4 support is specified in Device Profile
 - Use AU/US LinkAdrReq sub-band channel mask commands if LoRaWAN 1.0.4 support is specified in Device Profile

m. LoRaWAN FUOTA

- Customers using FUOTA should be advised to upgrade to AEP 5.1.5
- If a customer is using AEP 5.0.x with FUOTA to Dot v3.2.x, then the Dot firmware should be updated to the next release v3.3.x before updating the hardware to AEP 5.1.5
- mPower 5.1.1 compatible Beta firmware for mDot/xDot is available at <https://github.com/MultiTechSystems/Dot-AT-Firmware>
- FUOTA is being updated to be compliant with LoRa Alliance specifications
- FUOTA has been tested with the following implementations
 - Arm Mbed (<https://github.com/armmbed/mbed-os-example-lorawan-fuota>)
 - Semtech/Stackforce (<https://github.com/Lora-net/LoRaMac-node>)
 - MultiTech Dots v3.3.x (Release Date TBD)
- The update will break compatibility with MultiTech Dot v3.2.x as issues were found
 - Fragment and Parity indexes started at 0
 - Key Encryption had the encrypt/decrypt operations flipped, decrypt was incorrectly used on the end-device
 - Status messages were incorrect

Known Behaviors (MTCAP AEP 5.1.5, MTCDT AEP 5.1.5):

Receiving an SMS. MTCDT-L4N1 and MTCDTIP-L4N1 models used on the Verizon Wireless Network can send SMS messages, but are not able to receive SMS messages.

VI. Upgrading Firmware Using Web Interface

At any time in the upgrade process, customers can send an email to support@multitech.com or call +763-717-5863.

It is recommended that customers backup their configuration before performing an upgrade.

- If the firmware upgrade fails, or it does not show the login page again, wait an additional 10 minutes.
- Power off and on the hardware and log in using the web interface to check the version.
- If the version does not show the latest, then the upgrade was not successful.
- Try to perform the firmware upgrade again by repeating all the steps.

Instructions:

1. Download the latest firmware file from the <http://www.multitech.net/developer/downloads/>

NOTE: There are multiple versions of mPower AEP firmware available. Please select the file that matches the hardware model being upgraded.

2. Log into the AEP Web interface.
3. In the left navigation pane, click **Administration > Firmware Upgrade**.
4. Click Browse and select the appropriate file:
 - [MTCAP_5.1.5_upgrade-signed.bin](#)
 - [conduit_5.1.5_upgrade-signed.bin](#)
5. Click **Start Upgrade**.
6. After the firmware upgrade is complete, log back into the web GUI and verify the firmware version shown at the top of the page.
7. If you want to save any Node-RED applications, you have two options:
 - If you have a DeviceHQ account, upload Node-Red apps to DeviceHQ. (Recommended)
 - If you do not have a DeviceHQ account, save Node-RED apps you want to keep. Node-RED flows are stored on the Conduit at [/var/config/app/current/flows.json](#). You can export flows to the clipboard from the Node-RED menu or use a tool like WinSCP or SCP in Cygwin to copy [flows.json](#) to your PC.

VII. Upgrading Firmware Using DeviceHQ

At any time in the upgrade process, customers can send an email to support@multitech.com or call +763-717-5863.

DeviceHQ can update the firmware running on any supported device. Since devices have no live connection to DeviceHQ, firmware updates are made the next time a device checks into DeviceHQ.

Instructions:

1. Visit <https://www.devicehq.com>
2. Sign in to your account using your **email address** and **password**
3. Click **Devices**. The device list page opens.
4. Click the name of the device you want to update. You can update firmware on filtered devices or selected devices.
 - If you select individual devices, you update firmware on selected devices or the filtered devices.
 - If you do not select devices you update the firmware on the filtered devices.
5. Click **Schedule** and select **Upgrade Firmware**. From the list of firmware that appears, select the name of the firmware file. A confirmation message appears, informing you that the new firmware is to be applied to the device when the device next checks in.
6. To confirm that you want to update the firmware click **OK**.

NOTE: To schedule multiple devices at once, see help file within DeviceHQ

VIII. Updating Firmware Using Shell Script Update

A Shell Script Update can be performed by customers interested in updating the LoRa Logging Package provided in mPower MTCAP AEP 5.1.2 and MTCDT AEP 5.1.2.

NOTE:

The Shell Script Update is not a full mPower firmware image, it is only designed to resolve [Critical Issue 1](#) and should only be used to update mPower MTCAP AEP 5.1.2 and mPower MTCDT AEP 5.1.2

1. Visit <http://www.multitech.net/developer/downloads/>
2. Scroll down to LoRaWAN Downloads. There you will find the link: [Lora Logging 1.0-r3](#)



3. Click on the link to download the IPK file.
4. The file must be uploaded to the device. We recommend using WinSCP for secure file transfer.
<https://winscp.net/eng/index.php>
5. Load WinSCP to the root of the connection
6. Access the device using SSH and run the following command
`sudo opkg install lora-logging_1.0-r3.0_arm926ejste.ipk`
You should be asked to enter your password
7. WinSCP will run and load the IPK file.

IX. Ordering Part Numbers Impacted

The following ordering part numbers are impacted by these updates:

Model Name		Ordering Part Numbers
Conduit® IoT Programmable Gateways		
MTCDDT-246A-US-EU-GB ⁽³⁾	MTCDDT-LAT1-247A-US ⁽²⁾	MTCDDT-L4N1-247A-US ⁽¹⁾
MTCDDT-247A-US-EU-GB ⁽³⁾	MTCDDT-LVW2-246A-US ⁽²⁾	MTCDDT-L4N1-247A ⁽¹⁾
MTCDDT-H5-246A-US-EU-GB ⁽³⁾	MTCDDT-LVW2-247A ⁽²⁾	MTCDDT-L4E1-246A-EU-GB ⁽¹⁾
MTCDDT-H5-247A-US-EU-GB ⁽³⁾	MTCDDT-LVW2-247A-US ⁽²⁾	MTCDDT-L4E1-247A-EU-GB ⁽¹⁾
MTCDDT-LAT1-246A-US ⁽²⁾	MTCDDT-L4N1-246A-US ⁽¹⁾	MTCDDT-LAP3-246A-AU ⁽³⁾
MTCDDT-LAT1-247A ⁽²⁾	MTCDDT-L4N1-246A-US ⁽¹⁾	MTCDDT-LSP3-246A-US ⁽³⁾
Conduit® IoT Programmable Gateways with LoRa Accessory Cards		
MTCDDT-246A-868-EU-GB ⁽³⁾	MTCDDT-H5-247A-868-EU-GB ⁽³⁾	MTCDDT-L4E1-246A-915-EU-GB ⁽¹⁾
MTCDDT-246A-915-US-EU-GB ⁽³⁾	MTCDDT-H5-247A-915-US ⁽³⁾	MTCDDT-L4E1-247A-868-EU-GB ⁽¹⁾
MTCDDT-246A-923-JP ⁽³⁾	MTCDDT-LAT1-246A-915-US ⁽²⁾	MTCDDT-L4E1-247A-915-EU-GB ⁽¹⁾
MTCDDT-246A-US-EU-GB-923KR ⁽³⁾	MTCDDT-LAT1-247A-915-US	MTCDDT-L4N1-246A-915-US ⁽¹⁾
MTCDDT-247A-868-EU-GB ⁽³⁾	MTCDDT-LVW2-246A-915-US ⁽²⁾	MTCDDT-L4N1-247A-915-US ⁽¹⁾
MTCDDT-247A-915-US-EU-GB ⁽³⁾	MTCDDT-LVW2-247A-915-US ⁽²⁾	MTCDDT-LAP3-246A-915-AU ⁽³⁾
MTCDDT-H5-246A-868-EU-GB ⁽³⁾	MTCDDT-L4E1-246A-868-EU-GB ⁽¹⁾	MTCDDT-LAP3-247A-915-AU ⁽³⁾
		MTCDDT-LSB3-246A-923-JP ⁽³⁾
Conduit® IP67 Base Stations		
MTCDDTIP-266A-868 ⁽³⁾	MTCDDTIP-LAT1-266A-915 ⁽²⁾	MTCDDTIP-L4E1-267A-868 ⁽¹⁾
MTCDDTIP-266A-915 ⁽³⁾	MTCDDTIP-LAT1-267A-915 ⁽²⁾	MTCDDTIP-L4N1-266A-915 ⁽¹⁾
MTCDDTIP-266A-915-JP ⁽³⁾	MTCDDTIP-LVW2-266A-915 ⁽³⁾	MTCDDTIP-L4N1-267A-915 ⁽¹⁾
MTCDDTIP-266A-923KR ⁽³⁾	MTCDDTIP-LVW2-267A-915 ⁽³⁾	MTCDDTIP-LAP3-266A-915 ⁽³⁾
MTCDDTIP-267A-868 ⁽³⁾	MTCDDTIP-L4E1-266A-868 ⁽¹⁾	MTCDDTIP-LAP3-267A-915 ⁽³⁾
MTCDDTIP-267A-915 ⁽³⁾	MTCDDTIP-L4E1-266A-915 ⁽¹⁾	MTCDDTIP-LSB3-266A-923-JP ⁽³⁾
Conduit® IP67 Geolocation Base Stations		
MTCDDTIP-LAT1-270A-915 ⁽²⁾	MTCDDTIP-LVW2-270A-915 ⁽²⁾	MTCDDTIP-L4E1-270A-868 ⁽¹⁾
MTCDDTIP-LAT1-275A-915 ⁽²⁾	MTCDDTIP-LVW2-275A-915 ⁽²⁾	MTCDDTIP-L4N1-270A-915 ⁽¹⁾
		MTCDDTIP-L4N1-275A-915 ⁽¹⁾
Conduit® AP Access Points		
MTCAP-868-001A ⁽³⁾	MTCAP-915-041A ⁽³⁾	MTCAP-LNA3-915-041A ⁽¹⁾
MTCAP-868-041A ⁽¹⁾	MTCAP-L4E1-868-001A ⁽¹⁾	MTCAP-LSP3-915-001A ⁽³⁾
MTCAP-915-001A ⁽³⁾	MTCAP-LNA3-915-001A ⁽³⁾	MTCAP-LSP3-915-041A ⁽³⁾

	Hardware Status	Manufacturing Updates	Comments
(1)	New	March 2020	<ul style="list-style-type: none"> Some new hardware was shipped with an earlier version of mPower firmware (AEP 5.1.2) MultiTech recommends that customers update this hardware to mPower firmware AEP 5.1.5
(2)	NEOL	n/a	<ul style="list-style-type: none"> NEOL devices continue to ship with earlier mPower versions Devices can be individually updated by customers
(3)	Existing	60 – 90 days	<ul style="list-style-type: none"> Existing devices continue to ship with earlier mPower versions for the next 60 to 90 days Customers are encouraged to evaluate mPower AEP 5.1.5 firmware prior to this transition

X. Conduit® IoT Gateways

Conduit® family of products is the industry's most configurable, manageable, and scalable cellular communications gateways for industrial IoT applications. Network engineers can remotely configure and optimize their Conduit performance through DeviceHQ®, the world's first IoT Application Store and Device Management platform. The award-winning Conduit series comes in three variants designed to address specific IoT gateway use cases:

- **Conduit:** Indoor industrial gateway, ideal for environments that require metal casing for protection against particles and debris and require an industrial temperature range.
- **Conduit IP67 Base Station:** Outdoor IP67-rated gateway ideal suited for performing in harsh environments such as rain, snow, extreme heat, and high winds.
- **Conduit AP:** Indoor access point ideal for commercial environments (e.g., hotels, offices, retail facilities) to deepen LoRa coverage in difficult to reach places where cell tower or rooftop deployments may not perform as well.

XI. Additional Information

If you have any questions regarding this Product Change/Software Release Notification, please contact your MultiTech sales representative or visit the technical resources listed below:

World Headquarters – U.S.A.

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EMEA Headquarters – UK

+(44) 118 959 7774 | sales@multitech.co.uk

MultiTech Developer Resources:

www.multitech.net

An open environment where you can ask development related questions and hear back from MultiTech engineering or a member of this community.

Knowledge Base:

<http://www.multitech.com/kb.go>

Immediate access to support information and resolutions for all MultiTech products.

MultiTech Support Portal:

<https://support.multitech.com/support/login.html>

Create an account and submit a support case directly to our technical support team.

MultiTech Website:

www.multitech.com