Software Release Notes

mPower® Edge Intelligence Software

Models Impacted:

MultiTech Conduit® AP 300 Series (MTCAP3)

Overview

This document includes the release notes and cumulative changelog for mPower Edge Intelligence embedded software. Detailed information is listed in reverse chronological order, starting with the latest mPower release

The latest version includes new features and enhancements to support DeviceHQ interface, cellular hardware support, Modbus protocols, user interface, and networking and security features.

Downloadable Versions:

- mPower 6.3.5 Availability: December 2024
- mPower 6.3.2 Availability: January 2024
- mPower 6.3.1 Availability: November 2023
- Visit http://www.multitech.net/developer/downloads/

mPower™ Edge Intelligence is MultiTech's embedded software offering delivering network flexibility and 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.

Contents

mPower 6.3.5 Changelog and Overview

Released: December 2024
Status: Shipping (see model numbers impacted)

Updates in mPower 6.3.5, from mPower 6.3.2

New Features & Enhancements	Operating System	Networking & Security	Bug Fixes	Known Behaviors	Deprecations	Schedule	Models Impacted	Upgrade Process

New Features & Enhancements (mPower 6.3.5)

Hardware Support	
New hardware versions available for MTCAP3 devices • MTCAP3 .R1 devices with 1 GB flash memory • Hardware version MTCAP3-0.1 • See model numbers impacted for details	
Downgrade Protection Overview: mPower 6.3.5 identifies the MTCAP3 hardware version and only allows users to download approved mPower versions, preventing a mismatch between hardware and software • MTCAP3 (hardware version MTCAP3-0.1) devices with 1 GB flash memory can only be used with mPower 6.3.5 and later • Error Messages: If a user attempts to downgrade an MTCAP3 (hardware version MTCAP3-0.1) to an incompatible firmware version, an error message will be displayed: o Downgrade using API Command: "Firmware check failed. Invalid firmware version for [MTCAP3-0.1] hardware." o Downgrade using DeviceHQ: "Software check failed. Invalid firmware version for [MTCAP3-0.1] hardware."	

Networking and Security (mPower 6.3.5)

WWAN Mode	
• 3G Network Shutdown (European Union and United Kingdom): Updates are provided to avoid service interruption from 3G networks shutdown to maintain cellular connection. • In previous versions of mPower, the WWAN MTU packet size is set to 1430 bytes to align with mobile network operator (MNO) requirements. • Occasionally, an MNO sends packets up to 1500 bytes in size. These packets are rejected because they exceed the MTU size. • In mPower 6.3.5, the MTU packet size is set to 1500 bytes, which results in fewer receive packet rejections.	GP-2221 MTX-5211

Bug Fixes (mPower 6.3.5)

Modem Configuration Settings • In previous versions of mPower, when modem configuration settings are changed using APN or PDP mode, cellular mode changes are ignored until the device is rebooted. All setting changes are applied properly when the user reboots the device • In mPower 6.3.5, this issue has been resolved. System reboot is automatically enforced when cellular mode changes are made	GP-2317 GP-1998 MTX-5285
User Interface - LoRaWAN Networking • In previous versions of mPower, when setting LoRaWAN Basic Station configuration, the side bar menu options are not updated as expected. Refreshing the page updates the menu properly • In mPower 6.3.5, this issue has been resolved. The side bar menu is updated properly	GP-2319

Known Behaviors (mPower 6.3.5)

If the gateway fails to boot-up completely or there is a CPU reset during boot-up three (3) times in a row, the gateway will switch to use the secondary partition on the subsequent boot sequence. The failure to completely boot may be from power disconnect during boot-up or caused by power loss or brown-out during boot-up.

Bug:
If power is lost while data remains held in memory waiting to be written to flash, there is a probability of data corruption resulting in the device reverting to commissioning mode

Resolution: Changes are made for synchronous memory writes reducing the window to the time it takes the NAND to write to physical media.

Correction in mPower Version Reporting to DeviceHQ: For devices running or upgraded to versions 6.3.1 or 6.3.2, DeviceHQ reports the mPower version as 6.3.5, 6.3.6 or 6.3.7. This issue has been corrected, and DeviceHQ now accurately reflects the current version of the mPower software.

Schedule (mPower 6.3.5)

- mPower 6.3.5 Availability: Shipping December 2024

Models Impacted (mPower 6.3.5)

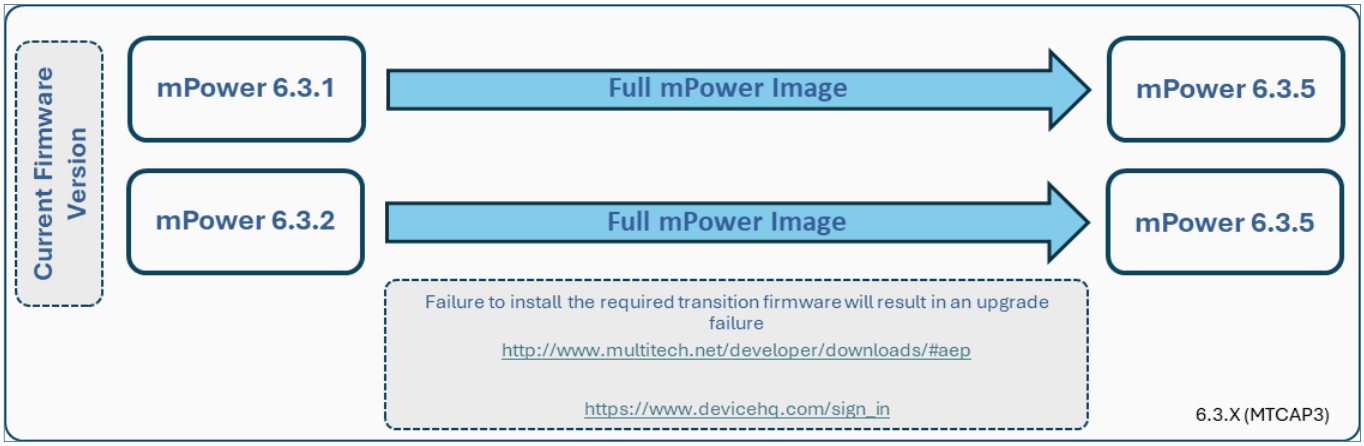
- MultiTech Conduit® AP 300 Series models are supported
- MultiTech Conduit® AP 300 Series models with 1 GB flash memory (New)

Model Number	Description
MTCAP3-LNA7D-A23UEA-LUM.R1	LTE Category 4, 1 GB Memory, mPower Programmable Access Point, 8-channel, 915 MHz w/external LoRa antenna and Accessory Kit (Canada, United States)
MTCAP3-LEU7-A23EEA-LEM.R1	LTE Category 4, 1 GB Memory, mPower Programmable Access Point, 8-channel, 868 MHz w/external LoRa antenna and Accessory Kit (European Union, United Kingdom)

Model Number	Description
MTCAP3-LNA7D-A23UEA-DUM.R1	LTE Category 4, 1 GB Memory, mPower Programmable Access Point, 8-channel, 915 MHz w/internal LoRa antenna and Accessory Kit (Canada, United States)
MTCAP3-LEU7-A23EEA-DEM.R1	LTE Category 4, 1 GB Memory, mPower Programmable Access Point, 8-channel, 868 MHz w/internal LoRa antenna and Accessory Kit (European Union, United Kingdom)
MTCAP3-EN-A23EEA-LEM.R1	Ethernet-only, 1 GB Memory, mPower Programmable Access Point, 8-channel, 868 MHz w/external LoRa antenna and Accessory Kit (European Union, United Kingdom)
MTCAP3-EN-A23UEA-LWM.R1	Ethernet-only, 1 GB Memory, mPower Programmable Access Point, 8-channel, 915 MHz w/external LoRa antenna and Accessory Kit (Canada, United States)
MTCAP3-EN-A23EEA-DEM.R1	Ethernet-only,1 GB Memory, mPower Programmable Access Point, 8-channel, 868 MHz w/internal LoRa antenna and Accessory Kit (European Union, United Kingdom)
MTCAP3-EN-A23UEA-DWM.R1	Ethernet-only, 1 GB Memory, mPower Programmable Access Point, 8-channel, 915 MHz w/internal LoRa antenna and Accessory Kit (Canada, United States)

Upgrade Process (mPower 6.3.5)

Customers that are running earlier versions of mPower should use the following upgrade process.



Using an old configuration file on new Conduit devices may result in the new devices becoming non-functional. To successfully update new Conduit devices, create separate configuration templates for each type of Conduit device:

- Cellular radio (-LNA7, -LEU7, -EN)
- mPower version (mPower 6.3.1, mPower 6.3.2)

When upgrading a device fleet:

1. Upgrade the mPower version on one device
2. Modify the user-specific configuration settings

3. Perform in-house testing and adjust settings if necessary
4. Use the newly developed configuration file as part of field updates when the new version of mPower is widely deployed

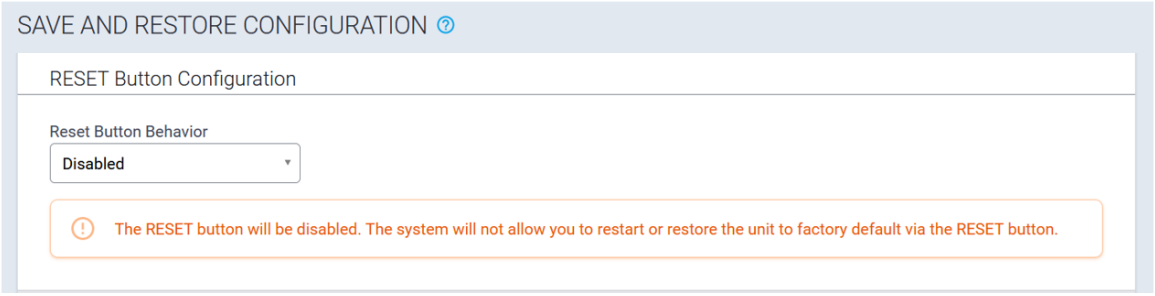
mPower 6.3.2 Changelog and Overview

Released: January 2024
Status: Downloadable

Updates in mPower 6.3.2, from mPower 6.3.1

New Features & Enhancements	Operating System	Networking & Security	Bug Fixes	Known Behaviors	Deprecations	Schedule	Models Impacted	Upgrade Process

New Features & Enhancements (mPower 6.3.2)

Hardware Support	
RESET Button Configuration In the User Interface, the Save and Restore Configuration page has been updated to include a new RESET Button Configuration. The following option is available: • **Disabled** – The system will not allow you to restart or restore the unit to factory default via the RESET button 	Enhancement GP-2207 TS-5116215

Bug Fixes (mPower 6.3.2)

LoRa Basic Station	-
• In previous versions of mPower, Actility station configuration was not working as expected In mPower 6.3.2, this issue has been resolved	

Bug Fixes (mPower 6.3.2)

LoRa Packet Forwarder
• In mPower 6.3.2, when two different LoRa Gateway Accessory Cards are installed, the gateway will select the accessory card that matches the channel plan selected in the Network Server Configuration
• Example:
  ○ US915 channel plan is selected
  ○ One MTAC-LORA-H-915 and one MTAC-LORA-H-868 are installed in the gateway
  ○ LoRa traffic will be directed through the MTAC-LORA-H-915 accessory card
• In previous versions of mPower, both accessory cards were being used, even though only one matched the selected channel plan
	-

Cloud Connector • In previous versions of mPower, HTTP protocol uplinks were blocked on MQTT lock • In mPower 6.3.2, this issue has been resolved	-

Known Behaviors (mPower 6.3.2)

DeviceHQ® Cloud-Based Device Management • For devices that have been shipped with or upgraded to mPower 6.3.2, DeviceHQ reports the mPower version as mPower 6.3.7	-

Schedule (mPower 6.3.2)

- Downloadable Versions
  - mPower 6.3.2 Availability: January 2024
    - Visit http://www.multitech.net/developer/downloads/
  - DeviceHQ: January 2024

Models Impacted (mPower 6.3.2)

- MultiTech Conduit® AP 300 Series models
- Hardware version MTCAP3-0.0

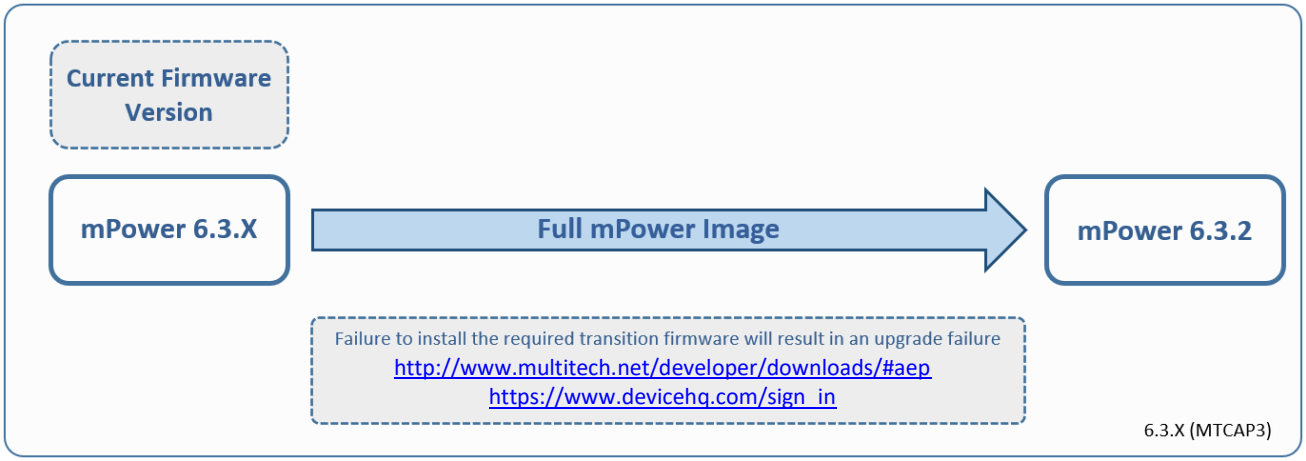
Model Number	Description
MTCAP3-EN-A23UEA-LWM	Ethernet-only, 915 MHz w/external LoRa antenna (Canada, United States)
MTCAP3-EN-A23UEA-LWM-BAC	Ethernet Only, BACnet 915 MHz w/external LoRa antenna (Canada, United States)
MTCAP3-EN-A23UEA-DWM	Ethernet-only, 915 MHz w/internal LoRa antenna (Canada, United States)
MTCAP3-EN-A23EEA-LEM	Ethernet-only 868 MHz w/external LoRa antenna (European Union, United Kingdom)
MTCAP3-EN-A23EEA-LEM-BAC	Ethernet Only, BACnet 8-channel, 868 MHz w/external LoRa antenna (European Union, United Kingdom)
MTCAP3-EN-A23EEA-DEM	Ethernet-only, 868 MHz w/internal LoRa antenna and Accessory Kit (European Union, United Kingdom)

Models Impacted (mPower 6.3.2)

MTCAP3-LNA7D-A23UEA-LUM	LTE Category 4, 915 MHz w/external LoRa antenna and Accessory Kit (Canada, United States, AT&T, Verizon)
MTCAP3-LNA7D-A23UEA-DUM	LTE Category 4, 915 MHz w/internal LoRa antenna (Canada, United States, AT&T, Verizon)
MTCAP3-LEU7-A23EEA-LEM	LTE Category 4, 868 MHz w/external LoRa antenna (European Union, United Kingdom)
MTCAP3-LEU7-A23EEA-LEM-BAC	LTE Category 4, BACnet 868 MHz w/external LoRa (European Union, United Kingdom)
MTCAP3-LEU7-A23EEA-DEM	LTE Category 4, 868 MHz w/internal LoRa antenna (European Union, United Kingdom)

Upgrade Process (mPower 6.3.2)

Customers that are running earlier versions of mPower should use the following upgrade process.



Using an old configuration file on new Conduit devices may result in the new devices becoming non-functional. To successfully update new Conduit devices, create separate configuration templates for each type of Conduit device:

- Cellular radio (-LNA7, -LEU7, -EN)
- mPower version (mPower 6.3.0, mPower 6.3.1)

When upgrading a device fleet:

5. Upgrade the mPower version on one device
6. Modify the user-specific configuration settings
7. Perform in-house testing and adjust settings if necessary
8. Use the newly developed configuration file as part of field updates when the new version of mPower is widely deployed

mPower 6.3.1 Changelog and Overview

Released: November 2023
Status: Shipping

Updates in mPower 6.3.1, from mPower 6.3.0

New Features & Enhancements	Operating System	Networking & Security	Bug Fixes	Known Behaviors	Deprecations	Schedule	Models Impacted	Upgrade Process

New Features & Enhancements (mPower 6.3.1)

Software & Services - Payload Data Manager	

New Features & Enhancements (mPower 6.3.1)

<table>
<tr>
<td>

BACnet AV (analog value) and BV (binary value) Support

- mPower 6.3.1 has been updated to include support for BACnet objects AV and BV.
- mPower 6.3.1 supports the following BACnet object types:
  - Analog Input
  - Analog Value (new)
  - Binary Input
  - Binary Value (new)
  - Positive Integer Value
  - Integer Value
  - Character String Value
- The BACnet object type depends on the type of the sensor property. The table below lists sensor property types and corresponding BACnet object types.

Property Type	Recommended BACnet Object Type
uint8	Analog Input, Analog Value, Positive Integer Value
uint16	Analog Input, Analog Value, Positive Integer Value
uint32	Positive Integer Value
int8	Analog Input, Analog Value, Integer Value
int16	Analog Input, Analog Value, Integer Value
int32	Integer Value
float	Analog Input, Analog Value
bool	Binary Input, Binary Value
string	Character String Value

- Models Impacted:
  - MTCAP3-LEU7-A23EEA-LEM-BAC
  - MTCAP3-EN-A23EEA-LEM-BAC, MTCAP3-EN-A23UEA-LWM-BAC

</td>
<td>New Feature
GP-2037
MTX-5011</td>
</tr>
<tr>
<td>

BACnet Device Settings – Network Interface

- mPower 6.3.1 monitors the network interface settings.
- When the IP address and/or subnet of the network interface that BACnet device uses for communication has changed, the change is detected, and a corresponding system update is made so the bacnetOut daemon continues working properly.
- Models Impacted:
  - MTCAP3-LEU7-A23EEA-LEM-BAC
  - MTCAP3-EN-A23EEA-LEM-BAC, MTCAP3-EN-A23UEA-LWM-BAC

</td>
<td>New Feature
GP-2027
MTX-4999</td>
</tr>
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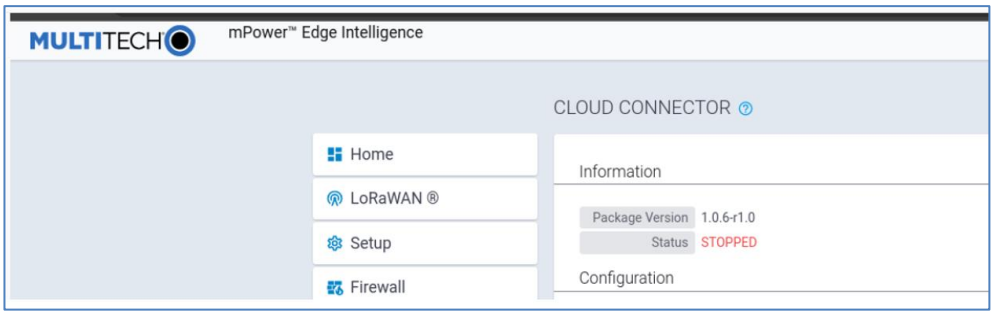
<td>

BACnet Device Settings – Available Network Interfaces

- mPower 6.3.1 allows the selection of any Ethernet network interface available in the system: br0, eth0, eth1, eth2, swi1, swi2, swi3, swi4; regardless of LAN or WAN interface.
- Models Impacted:
  - MTCAP3-LEU7-A23EEA-LEM-BAC
  - MTCAP3-EN-A23EEA-LEM-BAC, MTCAP3-EN-A23UEA-LWM-BAC

</td>
<td>Enhancement
GP-2027
MTX-4999</td>
</tr>
</table>

New Features & Enhancements (mPower 6.3.1)

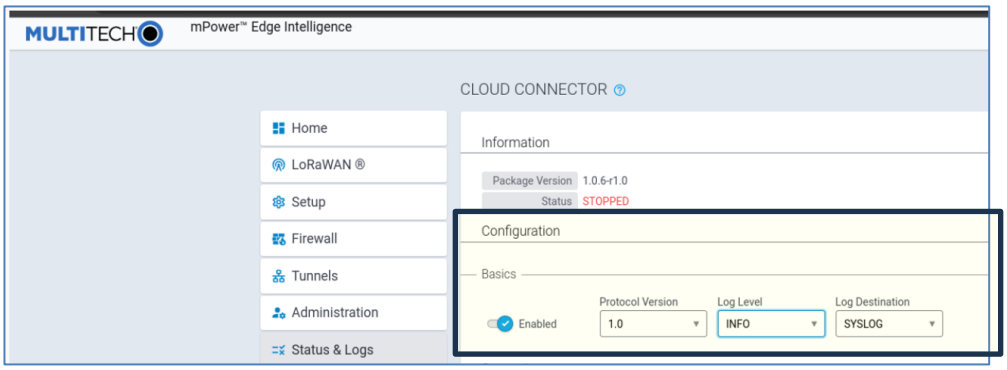
BACnet – Change in JavaScript Engine • In mPower 6.3.1, Payload Management code is executed using QuickJS JavaScript Engine • Previous mPower versions used Duktape JavaScript Engine • QuickJS JavaScript Engine is aligned with The Things Network (TTN) recommendations and allows other updates to be made: 1. Updated decode Uplink signature. 2. Support for normalize Uplink functionality. • Models Impacted: ○ MTCAP3-LEU7-A23EEA-LEM-BAC ○ MTCAP3-EN-A23EEA-LEM-BAC, MTCAP3-EN-A23UEA-LWM-BAC	Enhancement GP-2110 MTX-5086
Software & Services – LoRaWAN Features	
Default Application – Name Change to Cloud Connector • In mPower 6.3.1, the Default Application is renamed Cloud Connector • Cloud Connector allows last mile bi-directional communication from the gateway to a cloud application (Generic MQTT, AWS & Azure) without needing to deploy custom code on each gateway; this allows LoRaWAN uplinks and downlinks to be easily consumed and produced by a cloud application. New features include the ability to trigger request and receive responses via MQTT for LoRa queries, logging, and device API's. Please see the following link for additional info: https://multitechsystems.github.io/lorawan-app-connect-mqtt 	Enhancement GP-2071
Cloud Connector - User Interface Configuration • In mPower 6.3.1, Cloud Connector is moved to the applications page	Enhancement GP-2066
Cloud Connector – Updated to version 1.1 • mPower 6.3.1 supports Cloud Connector version 1.1 (new) or version 1.0 • Detailed technical information is available on the MultiTech Systems github page https://github.com/MultiTechSystems/lorawan-app-connect/blob/master/app-connect.py3	Enhancement

New Features & Enhancements (mPower 6.3.1)

Cloud Connector v1.1 – Basic Configuration

Enhancement
GP-2095

- In Cloud Connector v1.1, there are three basic configuration settings
- Protocol Version: v1.0 or v1.1
- Log Level: ERROR, WARNING, INFO, DEBUG, TRACE, or MAXIMUM
- Log Destination: SYSLOG or FILE (and file path)



Cloud Connector v1.1 – Message Formatting

Enhancement
GP-2069

- In Cloud Connector v1.1, API Commands, LoRa requests, and LoRa responses are in a consistent format so they can be easily parsed by third-party software.

v1.1 messages	V1.0 messages
Manage downlinks: • lorawan/<GW-UUID>/down • lorawan/<GW-UUID>/clear	Manage downlinks: • lorawan/<APP-EUI>/<DEV-EUI>/down • lorawan/<GW-EUI>/<DEV-EUI>/down • lorawan/<GW-UUID>/<DEV-EUI>/down • lorawan/<APP-EUI>/<DEV-EUI>/clear • lorawan/<GW-EUI>/<DEV-EUI>/clear • lorawan/<GW-UUID>/<DEV-EUI>/clear
Request info from the system: • lorawan/<GW-UUID>/api_req • lorawan/<GW-UUID>/lora_req • lorawan/<GW-UUID>/log_req	Request info from the system: • lorawan/<APP-EUI>/<GW-UUID>/api_req • lorawan/<APP-EUI>/<GW-UUID>/lora_req • lorawan/<APP-EUI>/<GW-UUID>/log_req
Publish info from the system: • lorawan/<GW-UUID>/api_res • lorawan/<GW-UUID>/lora_res • lorawan/<GW-UUID>/log_res	Publish info from the system: • lorawan/<APP-EUI>/<GW-UUID>/api_res • lorawan/<APP-EUI>/<GW-UUID>/lora_res • lorawan/<APP-EUI>/<GW-UUID>/log_res

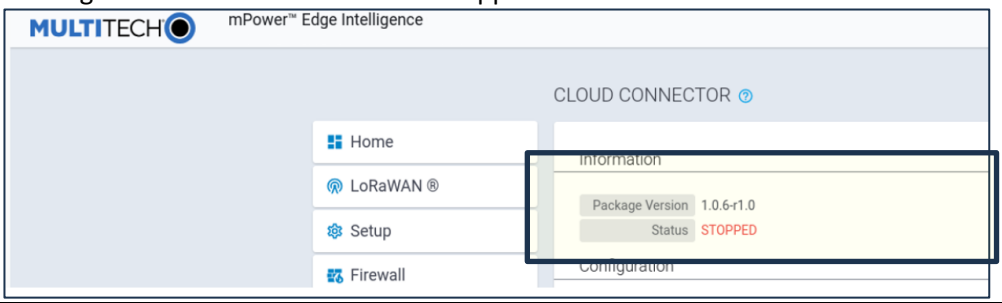
- https://github.com/MultiTechSystems/lorawan-app-connect/blob/master/app-connect.py3

Cloud Connector v1.1 – Package Upgrades

New Feature
GP-2065
MTX-5065

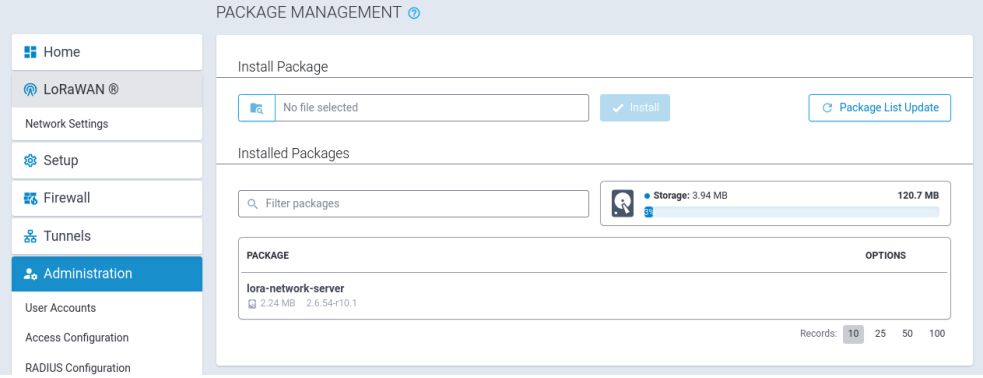
- Starting in mPower 6.3.1, Cloud Connector can be updated using the package upgrade feature.

New Features & Enhancements (mPower 6.3.1)

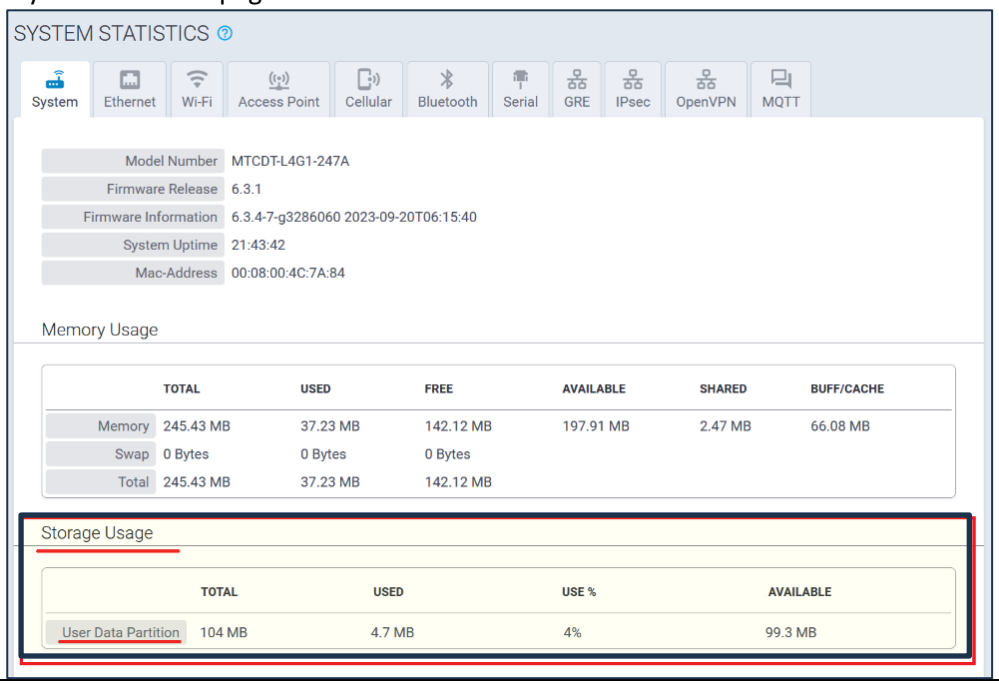
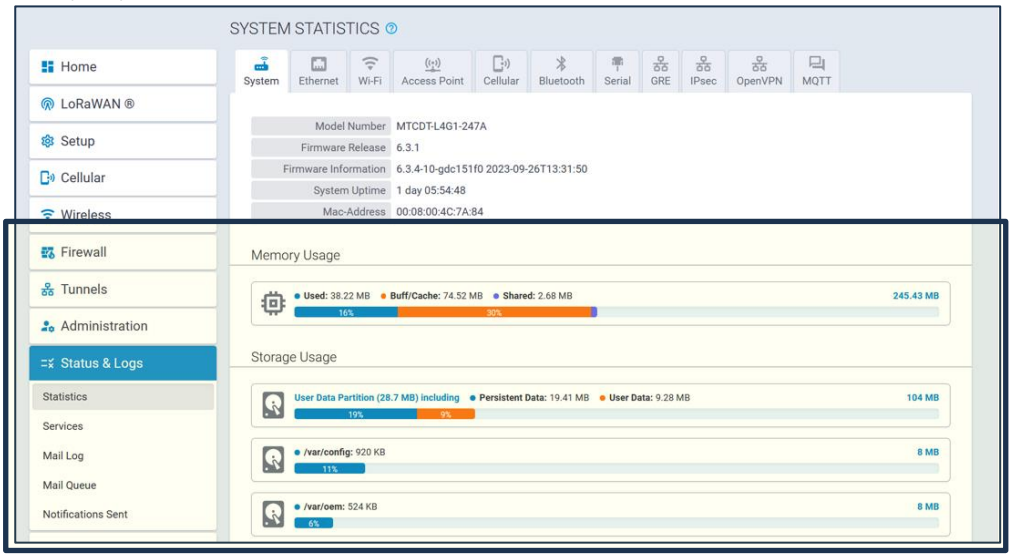
Cloud Connector v1.1 – LoRa Status Information • In mPower 6.3.1, Cloud Connector runs independently from the LoRa Network Server. Basic Station configuration can be changed through MQTT.	New Feature GP-2072
Cloud Connector v1.1 – APP-EUI Support • Cloud Connector v1.1 (new) has removed the APP-EUI limitation, and the gateway listens to all APP-EUI sensor messages. • Cloud Connector v1.0 was limited to one APP-EUI configuration for receiving sensor data. • In previous versions of mPower, Cloud Connector was limited to one APP-EUI configuration for receiving sensor data.	Enhancement GP-2094
Cloud Connector v1.1 – Package Version and Running Status • In mPower 6.3.1, the user interface is updated to display the package version and running status of the Cloud Connector application. 	Enhancement GP-2100
Cloud Connector v1.1 – API Requests and Responses – Transaction ID • In mPower 6.3.1, Cloud Connector API requests and API responses include a transaction ID. • The transaction ID allows the gateway and sensor to track a specific message transaction through its lifecycle, helping monitor the progress of the transaction and ensuring that it is successfully processed.	Enhancement GP-2068
Cloud Connector v1.1 - Subscribe on Session Present • In Cloud Connector v1.1, the server maintains a sticky session and subscribes only when the server sends session_present=false	Enhancement GP-2090
Gateway UUID Update • In mPower 6.3.1, the format for the gateway UUID (universally unique identifier) has been updated to comply with the Open Software Foundation (OSF) standard. • In previous versions of mPower, the UUID was formatted differently.	Enhancement GP-2097
Remote Broker - Wildcard Subscriptions • In mPower 6.3.1, wildcard subscriptions are removed from the remote broker ○ Some brokers do not allow wildcard subscriptions • In previous versions of mPower, wildcard subscriptions were allowed.	Enhancement GP-2007

LoRa Spreading Factor Filters
• In mPower 6.3.1, four spreading factor filters are added
  ○ DR5-DR10
  ○ DR7-DR10
  ○ DR5-DR12
  ○ DR7-DR12
	Enhancement
	GP-2013

New Features & Enhancements (mPower 6.3.1)

Basic Station – EU868 Duty Cycle Update • Updated to v2.0.6-20 • Add duty-cycle bands K, L, and N • Changed duty-cycle limits to match EU regulations ○ https://www.thethingsnetwork.org/docs/lorawan/regional-parameters/eu868/ • Also add nodc option to allow the LoRaWAN Network Server manage duty cycle	Enhancement GP-2086
User Experience	
Administration, Package Management • In mPower 6.3.1, installed packages can be updated if another version of the package is available. • This feature is only available to the administrator role. • Previous versions of mPower only allowed administrators to install new packages and remove existing packages. 	New Feature GP-2065 MTX-5065

New Features & Enhancements (mPower 6.3.1)

System Statistics – Storage Usage • In mPower 6.3.1, the user interface displays the external USB storage device usage on the System Statistics page. 	Enhancement GP-2109 MTX-5084
Status & Logs, System Statistics • In mPower 6.3.1, Memory Usage and Storage Usage are displayed in a graph. Previously, this information was available in a table. • In mPower 6.3.1, Storage Usage is displayed in three categories: ○ User Data Partition ○ /var/config ○ /var/oem 	Enhancement GP-2109

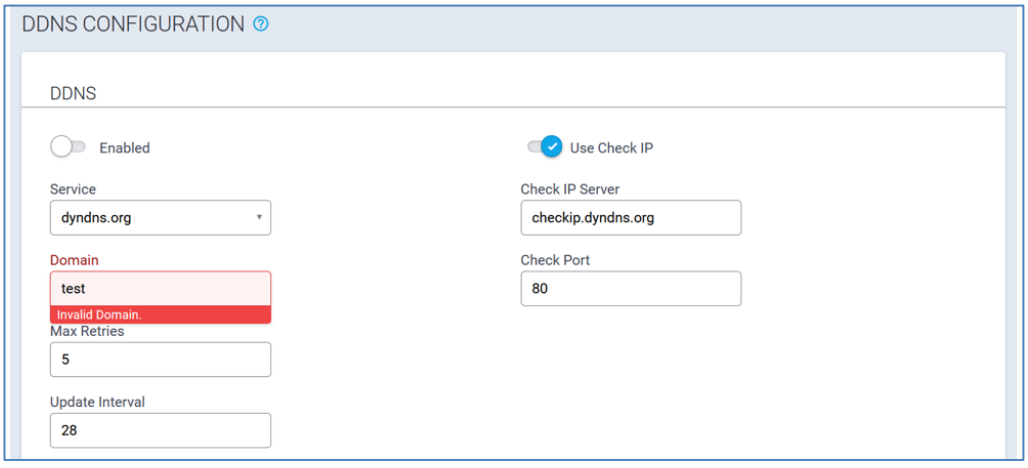
Networking & Security (mPower 6.3.1)

<table>
<tr><td>OpenVPN Tunnel – Tunnel Name Character Limit
In previous versions of mPower, OpenVPN tunnel names could be a maximum of 15 characters.
When a 15 character name is entered, only the first 12 characters are displayed.
In mPower 6.3.1, the tunnel name character limit is reduced to 12 characters.</td><td>Enhancement
MTX-5052</td></tr>
<tr><td>SNMP Configuration – Add support for MIB OID Values
In mPower 6.3.1, support for standard RFC1213-MIB and the following read-only OID values is implemented:
<table>
<tr><th>Name</th><th>OID Description</th></tr>
<tr><td>sysDescr</td><td>A textual description of the device.
The system returns the following information:
Product ID
Serial Number
mPower Firmware Release
vendor ID
Example:
MTCDT-246A-915.R3-WW
S/N 12345678
mPower 6.3.0
Multi-Tech Systems</td></tr>
<tr><td>sysObjectID</td><td>Identification of the device.
Gateway device
1.3.6.1.4.1.995.16.1.2.1</td></tr>
<tr><td>sysUpTime</td><td>The uptime of the SNMP service.
The time (in hundredths of a second) since the network management portion of the system was last re-initialized.</td></tr>
<tr><td>sysContact</td><td>Identification of the contact person for this device, together with information on how to contact this person.
Empty by default
Configurable on SNMP Configuration page</td></tr>
<tr><td>sysName</td><td>Assigned name for this managed device
By convention, this is the device’s fully qualified domain name
Empty by default
Configurable on SNMP Configuration page</td></tr>
<tr><td>sysLocation</td><td>The physical location of this device
Example: “telephone closet, 3rd floor”
Empty by default
Configurable on SNMP Configuration page</td></tr>
<tr><td>sysServices</td><td>The set of services that this device offers.
mPower device
76</td></tr>
</table>
</td><td>New Feature
GP-1871
MTX-4817
TS-5113882</td></tr>
</table>

Bug Fixes (mPower 6.3.1)

Cellular Mode Settings • In mPower 6.3.0, when the modem configuration settings are changed, and the changes are applied, cellular mode settings are ignored. • This occurs in APN and PDP context mode • Models Impacted: ○ Conduit AP 300 Series Models: MTCAP3-LEU7, MTCAP3-LNA7 • In mPower 6.3.1, this issue has been resolved.	Hardware GP-1998 MTX-4952
OpenVPN Tunnel Cipher Suite • In mPower 6.3.0, cipher suites list does not appear when TLS Cipher Suite is set to ADVANCED. • User is creating or editing the OpenVPN tunnel (Server or Client mode) in TLS Authorization Mode • In mPower R.6.3.1 the issue has been resolved.	Networking & Security MTX-5026
Access Configuration Page – ICMP Settings • In mPower 6.3.0, the ICMP hints for settings on the Access Configuration page were incorrect • In mPower 6.3.1, the ICMP hints have been updated.	User Experience MTX-5056

First Time Setup Wizard – Remote Management Port Values
• In mPower 6.3.0, the Server Port is incorrectly displayed.
• In mPower 6.3.1, this issue has been resolved.
  ○ When SSL Enabled is ON, Server Port is 5798.
  ○ When SSL Enabled is OFF, Server Port is 5799.
	User Experience
	MTX-5047

DDNS Configuration Page • In mPower 6.3.0, DDNS configuration changes are not submitted when Domain value is invalid.  • In mPower R.6.3.1 the issue has been resolved.	Networking & Security MTX-5049

Known Behaviors (mPower 6.3.1)

BACnet Payload Management- Sensor Decoder That Run in a Loop
• Models Impacted:
  ○ MTCAP3-LEU7-A23EEA-LEM-BAC
  ○ MTCAP3-EN-A23EEA-LEM-BAC, MTCAP3-EN-A23UEA-LWM-BAC
• It is possible to write a sensor decoder that runs in a loop.
• A sensor decoder that runs in a loop is not valid sensor decoder behavior and may negatively affect the whole system.
• mPower 6.3.1 includes a five second timeout that prevents the decoder from running in a loop.
	Payload Management GP-2114 MTX-5092

DeviceHQ® Cloud-Based Device Management • For devices that have been shipped with or upgraded to mPower 6.3.1, DeviceHQ reports the mPower version as mPower 6.3.6	-

Schedule (mPower 6.3.1)

- Downloadable Versions
  - mPower 6.3.1 Availability: October 2023
    - Visit http://www.multitech.net/developer/downloads/
  - DeviceHQ: October 2023
- Manufacturing Updates: BACnet BMS Models
  - Models Impacted

Model Number	Description
MTCAP3-EN-A23UEA-LWM-BAC	Ethernet Only, BACnet 915 MHz w/external LoRa antenna (Canada, United States)
MTCAP3-EN-A23EEA-LEM-BAC	Ethernet Only, BACnet 8-channel, 868 MHz w/external LoRa antenna (European Union, United Kingdom)
MTCAP3-LEU7-A23EEA-LEM-BAC	LTE Category 4, BACnet 868 MHz w/external LoRa (European Union, United Kingdom)

  - Device shipments starting in November 2023 will include mPower 6.3.1
- Manufacturing Updates: All other Conduit AP 300 Series models
  - Devices that ship from MultiTech starting in December 2023 will include mPower 6.3.1

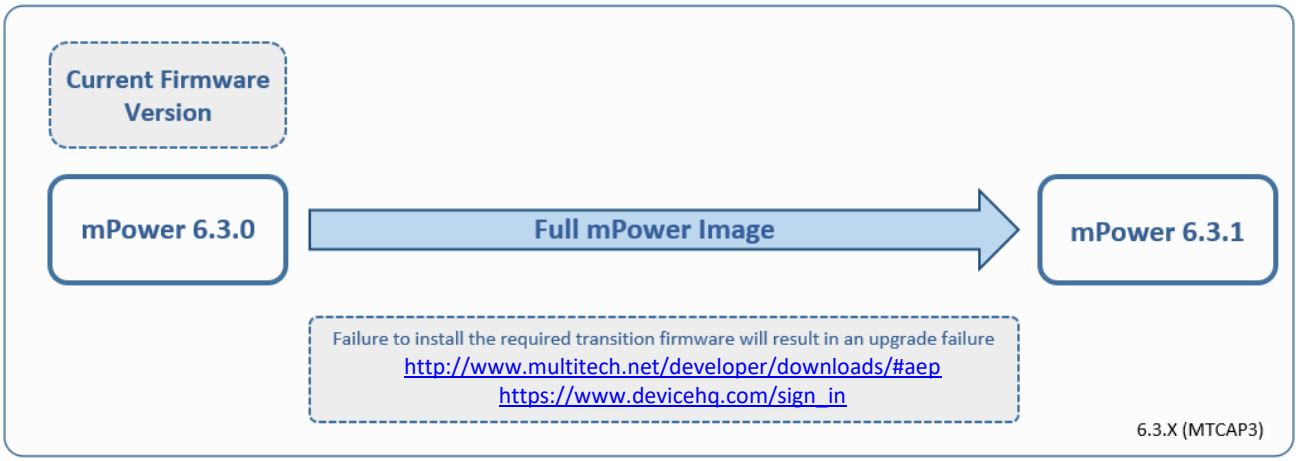
Models Impacted (mPower 6.3.1)

- MultiTech Conduit® AP 300 Series models

Model Number	Description
MTCAP3-EN-A23UEA-LWM	Ethernet-only, 915 MHz w/external LoRa antenna (Canada, United States)
MTCAP3-EN-A23UEA-LWM-BAC	Ethernet Only, BACnet 915 MHz w/external LoRa antenna (Canada, United States)
MTCAP3-EN-A23UEA-DWM	Ethernet-only, 915 MHz w/internal LoRa antenna (Canada, United States)
MTCAP3-EN-A23EEA-LEM	Ethernet-only 868 MHz w/external LoRa antenna (European Union, United Kingdom)
MTCAP3-EN-A23EEA-LEM-BAC	Ethernet Only, BACnet 8-channel, 868 MHz w/external LoRa antenna (European Union, United Kingdom)
MTCAP3-EN-A23EEA-DEM	Ethernet-only, 868 MHz w/internal LoRa antenna and Accessory Kit (European Union, United Kingdom)
MTCAP3-LNA7D-A23UEA-LUM	LTE Category 4, 915 MHz w/external LoRa antenna and Accessory Kit (Canada, United States, AT&T, Verizon)
MTCAP3-LNA7D-A23UEA-DUM	LTE Category 4, 915 MHz w/internal LoRa antenna (Canada, United States, AT&T, Verizon)
MTCAP3-LEU7-A23EEA-LEM	LTE Category 4, 868 MHz w/external LoRa antenna (European Union, United Kingdom)
MTCAP3-LEU7-A23EEA-LEM-BAC	LTE Category 4, BACnet 868 MHz w/external LoRa (European Union, United Kingdom)
MTCAP3-LEU7-A23EEA-DEM	LTE Category 4, 868 MHz w/internal LoRa antenna (European Union, United Kingdom)

Upgrade Process (mPower 6.3.1)

Customers that are running earlier versions of mPower should use the following upgrade process.



Using an old configuration file on new Conduit devices may result in the new devices becoming non-functional. To successfully update new Conduit devices, create separate configuration templates for each type of Conduit device:

- Cellular radio (-LNA7, -LEU7, -EN)
- mPower version (mPower 6.3.0, mPower 6.3.1)

When upgrading a device fleet:

9. Upgrade the mPower version on one device
10. Modify the user-specific configuration settings
11. Perform in-house testing and adjust settings if necessary
12. Use the newly developed configuration file as part of field updates when the new version of mPower is widely deployed

mPower 6.3.0 Changelog and Overview

Released: May 2023
Status: Retired November 2023. Replaced by mPower 6.3.1

mPower 6.3.0 is the first version of mPower software to ship on MTCAP3 devices.

New Features & Enhancements (mPower 6.3.0)

Software & Services - Payload Data Manager	
BACnet BMS System Support In mPower 6.3.0, LoRaWAN sensors can be quickly integrated into a Building Management System (BMS) • The MultiTech gateway decodes the data from a LoRaWAN sensor and maps the sensor data into BACnet objects • Uplink and downlink messages are available • Previously, BACnet was supported in mPower 5.5.2 • Devices Impacted: MTCAP-868-041A-BAC, MTCAP-915-041A-BAC • Devices Impacted: • MTCAP3-EN-A23EEA-LEM-BAC, MTCAP3-EN-A23UEA-LWM-BAC	New Feature GP-1864 MTX-4778
BACnet BMS System Support – Radio Bridge Sensor Support • Radio Bridge wireless sensor decoders are available natively Acceleration Sensor Air Temperature and Humidity Sensor Contact Sensor Door and Window Sensor Push Button Sensor Temperature Sensor Tilt Sensor High-Precision Tilt Sensor Ultrasonic Sensor High-Bandwidth Vibration Sensor Low-Bandwidth Vibration Sensor Voltmeter Water-Leak Sensor • Customers can create their own custom sensor decoders and load them onto the gateway. Contact support@multitech.com for details • Devices Impacted: ○ MTCAP3-EN-A23EEA-LEM-BAC, MTCAP3-EN-A23UEA-LWM-BAC	New Feature GP-1880 MTX-4804

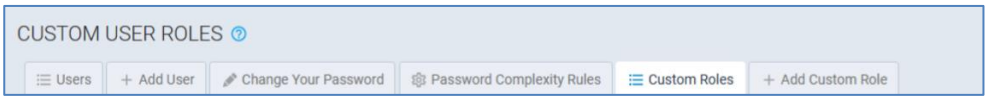
New Features & Enhancements (mPower 6.3.0)

Software & Services – mPower API Services	
mPower API service statistics (api/stats/service) have been expanded to include three new settings • reverseSSH • snmpServer • mqttBroker	Enhancement GP-1747 MTX-4626
A complete list of mPower API changes: https://www.multitech.net/developer/software/mtr-software/mtr-api-reference/api-changes/	-
Software & Services – LoRaWAN Features	
MultiTech LENS® - API Connection Improvements • A retry mechanism has been implemented to handle cURL timeouts gracefully and improve the chances of successful communication with the LENS API • After a cURL timeout occurs, multiple attempts are made before the request is considered a failure	Enhancement -
MultiTech LENS® - Channel Frequency List • LENS join requests will include the Channel Frequency List (CFList), ensuring that devices have the correct channel list • US915 and AU915 devices using LoRaWAN 1.3 only	New Feature GP-1895
LoRa Default App Update – Cloud Services • The LoRa Default App has been updated to include options for connection to AWS IoT Core and Microsoft Azure IoT Cloud Services • The LoRaWAN Default App supports HTTPS or MQTTS messages to securely transmit LoRaWAN data from the gateway to an IoT cloud service	Enhancement GP-1605
LoRa Default App Update – Local AppNet EUI versus LENS AppNet EUI • The local AppEUI settings will be used if there is a conflict with the LENS AppNet EUI settings. The LENS AppNet EUI settings will be overridden • In previous versions of mPower, when the local AppEUI settings conflict with the LENS AppNet EUI settings, the LENS AppNet EUI settings take precedent • In customer deployments, there should be no conflict and the local AppEUI settings should be used	Enhancement -
LoRa Default App Update – Additional Error Messages Added • Additional LoRa Default Application error messages have been added to improve the customer experience	Enhancement GP-1679
LoRa Packet Forwarder – Updates to AS923 Channel Defaults • Updates made to AS920-923 (“AS1”) and AS923-925 (“AS2”) channel plans to match the defaults required by The Things Network (TTN) • Data Rate DR6 and DR7 frequencies have been adjusted • NOTE: TTN recommends using Basics Station instead of LoRa Packet Forwarder	Enhancement GP-1567
LoRa Join Server – Support for Third-Party Join Servers Added • Local App EUI settings and Default App Profile settings have been updated to allow the Conduit embedded LoRa network server to connect to a third-party join server • The Semtech LoRaWAN Join Server is supported by this capability https://www.loracloud.com/documentation/join_service	New Feature GP-1859 TS-5113447

New Features & Enhancements (mPower 6.3.0)

LoRaWAN - Adaptive Data Rate (ADR) Updates • nbTrans setting is added in ADR Link Request (ARDLinkReq) command • nbTrans refers to the number of transmission attempts allowed for a device to successfully send a data packet at a particular data rate before the network adjusts the data rate • The ADRLinkReq command requests a change in the data rate or other adaptive parameters to the network server. This command is part of the process for enabling or disabling ADR functionality or adjusting other ADR-related settings	Enhancement GP-1841
LoRa Basics Station – Support for firmware/program update using CUPS protocol • The LoRa Basics Station software provides credential management and firmware update interface using the Configuration and Update Server (CUPS) protocol. The CUPS protocol provides secure firmware update delivery with ECDSA signatures • This feature is supported by AWS IoT Core • https://docs.aws.amazon.com/iot/latest/developerguide/connect-iot-lorawan-update-firmware.html	New Feature GP-1894 TS-5114179
ChirpStack Gateway Bridge v4 Support • The Conduit LoRa Packet Forwarder is updated to connect to ChirpStack Network Server through the ChirpStack Gateway Bridge • ChirpStack Documentation: https://www.chirpstack.io/gateway-bridge/gateway/multitech/	New Feature GP-1329
Hardware Support	
Cellular Configuration Page – Radio Reboot Options • Cellular PPP is enabled: Radio Reboot Enabled option available • Cellular WWAN is enabled: Radio reboot enabled option is not available	Enhancement GP-1869 MTX-4785
Verizon APN Changes • Verizon Class 3 APN is set automatically over-the-air (OTA) without user intervention • If the current APN is incorrect, the user can enter a new APN • This is a one-time setting change • Devices impacted: MTCAP3-LNA7	Enhancement GP-1801 MTX-4705 GP-1828 MTX-4740
Cellular Diagnostics Feature • *Device Diagnostics* pane is added to the *Debug Options* page • User can download cellular diagnostics and cellular related logs by using the *Download Cellular Data* button • Cellular diagnostic information is recorded when it is requested by the user • Downloadable report can be saved on a computer hard drive and shared with others when diagnosing connection issues	New Feature GP-1834 MTX-4744
MQTT Broker – Bridge TLS Version Setting • The Bridge TLS version for mPower and the MQTT broker must be the same for the connection to succeed • TLS version menu is added to the MQTT Broker Configuration page • When TLS is enabled, three selections are available: TLSv1.1, TLSv1.2, TLSv1.3 • TLSv1.2 is the default value	Enhancement GP-1710 MTX-4586

New Features & Enhancements (mPower 6.3.0)

Certificate and Key Management	
• Support new Microsoft Azure Root Certificate Authority • Update the certificates database to latest debian	Enhancement GP-1872 MTX-4791
User Experience	
Custom User Roles In previous versions of mPower, users are assigned one of three pre-defined user roles, each with different rights and permissions on the device • Administrators have full rights and permissions, including the ability change settings on the device • Engineers have read/write privileges and some access to controls on the device • Monitors have read-only access In mPower 6.3.0, the administrator can create custom user roles and set the permissions for each custom user role based on organizational need and use case • *Custom Roles* and *Add Custom Role* are new menus under Administration, User Accounts • The administrator creates a new name and description for each custom user role • When a custom user role is defined, the administrator will identify which mPower features can be accessed by the custom user 1. *WRITE – ON* allows custom users to modify the feature 2. *WRITE – OFF* prevents custom users from modifying the feature 3. *VISIBLE – ON* allows custom users to read the status of the feature 4. *VISIBLE – OFF* hides the status of the feature from the custom user  • When the administrator assigns a user to a custom user role, the user will only have access to the features defined by the administrator	New Feature GP-1572 GP-1599
Web Interface - Dark and Light Themes mPower detects the user system preferences and enables light or dark scheme automatically • User can switch the theme any time while working with web user interface • The web user interface theme toggle is present in the mPower header and is available only when a user is logged in	New Feature -
Web Interface – Save & Apply Button Behavior • *Save & Apply* button is displayed ONLY when there are changes that can be saved and applied • The *Save & Apply* button is moved from the main menu and appears in the top of the page • The *Save & Apply* button is animated, and it is blinks periodically	Enhancement -
Web Interface – Main Menu Behavior • It is possible to open/expand all menus and see all submenus available • User must click on the main menu to expand the list of available items • The menu will stay expanded until the user clicks on it again • The menu will not close automatically when opening other menu items	Enhancement GP-1734 MTX-4612

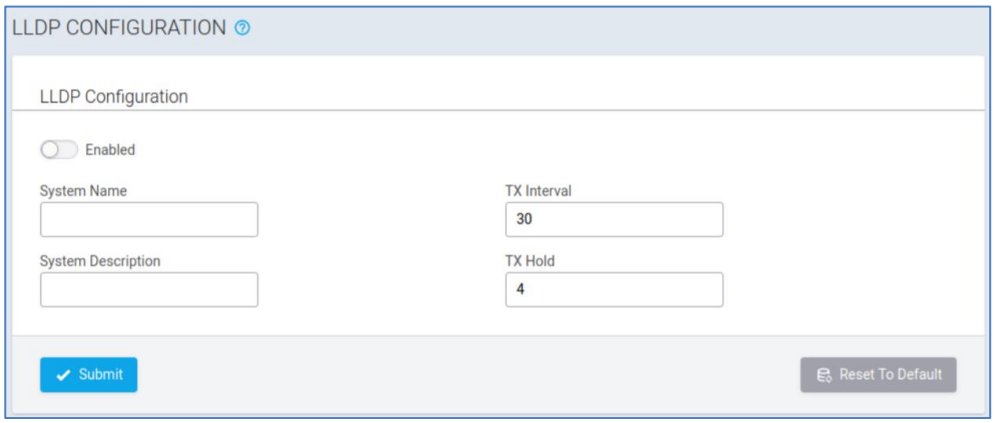
New Features & Enhancements (mPower 6.3.0)

Web Interface – Date and Time Format • mPower detects the user system preferences for date and time format and automatically matches the system format when date and time are displayed within the user interface	Enhancement IN-4635 MTX-4636
Web Interface – Send and Received SMS • *Send SMS, Sent SMS* and *Received SMS* are combined into a single page • The submenu label is changed to *Send/Received SMS* • *SMS Configuration* and *Send/Received SMS* pages are moved under the *Cellular* main menu • The *SMS* main menu has been eliminated	Enhancement GP-1705 GP-1731 MTX-4579

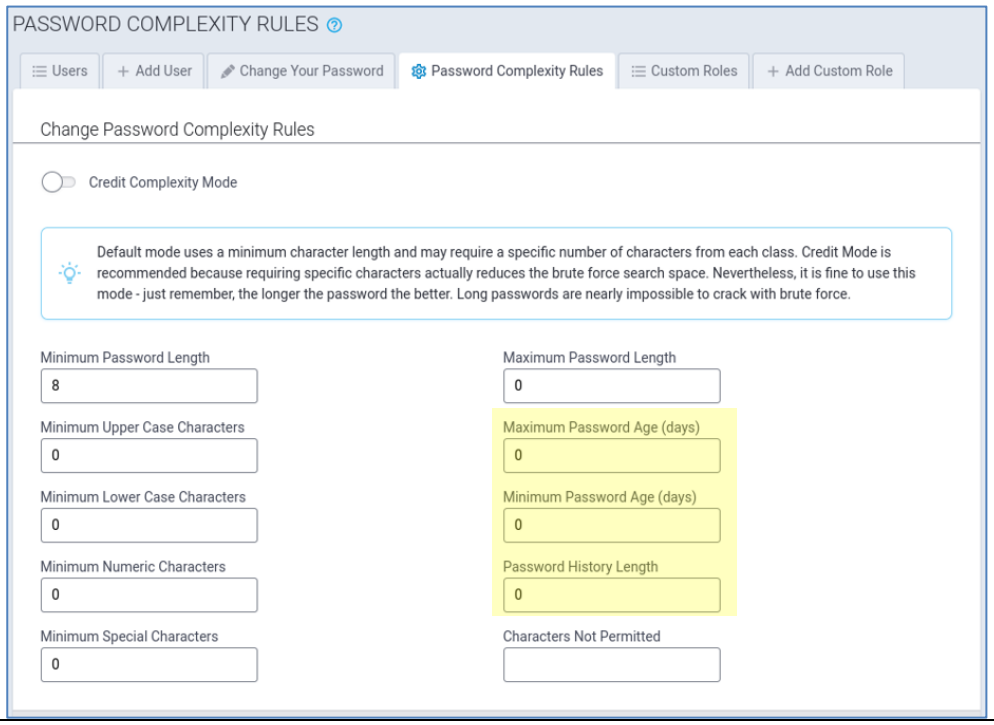
Operating System Updates (mPower 6.3.0)

Upgrade to OpenSSL 1.1 • mPower 6.3.0 supports OpenSSL 1.1.1q • Previous mPower versions support OpenSSL 1.1.1o	-

Networking & Security (mPower 6.3.0)

LLDP (Link Layer Discovery Protocol) Support
As local area networks expand and include more devices and more types of devices, tools are required to help network administrators locate, monitor and configure network devices
 	
The Link Layer Discovery Protocol (LLDP) is a vendor-neutral link layer protocol used by network devices for advertising their identity, capabilities, and neighbors on a local area network based on IEEE 802 technology, principally wired Ethernet. The LLDP feature allows the network manager to see on the connected switch which device is connected to which port on the switch, how much power is being requested, what the IP address is, etc. Using this information, they can determine where the Conduit is located and, if necessary, remotely disconnect power to the Conduit in case of PoE-powered device.
 	
LLDP Configuration is available under *Setup*. When LLDP is enabled, additional settings are available
• System Name
• System Description
• TX Interval (in seconds)
  ○ LLDP frame transmission interval
  ○ Integer value, range 5 – 32768 seconds
  ○ Default value = 30 seconds
• TX Hold (multiplier of the TX interval)
  ○ The amount of time, as a multiple of the TX interval, that a receiving device holds an LLDP packet before discarding it
  ○ Integer value, range 2 – 10
  ○ Default value = 4
 	
 
 	
	New Feature
	GP-14

Networking & Security (mPower 6.3.0)

Password Complexity - Password Expiration *Password Complexity Rules* page has been updated to include settings for password age and password history length **Password Age** • Maximum Password Age: A password expiration interval is configurable in days. When a user password expires due to the age of the password, the user will be prompted to change their password before their next login • Minimum Password Age: The minimum number of days for which a password cannot be changed **Password Complexity – History Length** The number of previous passwords (including the current password) that will be remembered for a user account before a specific password can be reused 	Feature Enhancement GP-280 GP-1823
Easily Retrieve IPv4 and IPv6 Addresses • New SMS command: #wanips • Overview: One SMS command that can be sent to an mPower device to retrieve all WAN IPv4 and IPv6 addresses available to the device	New Feature GP-1629
Private APN – Incorrect Date and Time • In previous versions of mPower, customers using a private APN can experience issues associated with inaccurate date and time • mPower 6.3.0 has been updated so cellular date and time can be used instead of GPS or a private ntp server	New Feature GP-139

Bug Fixes (mPower 6.3.0)

LoRaWAN - Uplink Packets • In previous versions of mPower, the port value for empty uplink packets is incorrectly reported • In mPower 6.3.0, this issue has been resolved. Port value in Network Server database is set to "0" for empty packets	GP-1867 GP-1887 TS-5113991
LoRaWAN - AU915 Downlink • In previous versions of mPower, AU915 device messages do not include ADRLinkReq in the first downlink • In mPower 6.3.0, this issue has been resolved	GP-1862 TS-5113968
LoRaWAN – mPower LENS API Service • In previous versions of mPower, it was discovered that there was no timeout set for cURL calls using the LENS API. The result is failed calls to LENS • In mPower 6.3.0, this issue has been resolved	GP-1882 TS-5113450
Custom Application Contains Special Characters • In previous versions of mPower, in the web user interface, if the filename for a custom application contains a special character (~!@#$%^&*()_), the application cannot be deleted in the API or the user interface • In mPower 6.3.0, this issue is resolved	GP-1774 MTX-4676
Empty SMS Messages • In previous versions of mPower, if a 0 byte (empty) SMS message is accepted by the device, the system can crash • In mPower 6.3.0, this issue is resolved	GP-1838
Save & Apply Error – Bluetooth Configuration • In previous versions of mPower, error message "Request is not allowed" is presented when Bluetooth Configuration changes are made • In mPower 6.3.0, this issue is resolved	GP-1777 MTX-4683
Bootloader Password • In previous versions of mPower, *Bootloader Password Authentication Status* is displayed as *Not Supported* when it should be *Supported* • In mPower 6.3.0, this issue is resolved	GP-1866 MTX-4780
Bootloader Password • In previous versions of mPower, Bootloader Password Validation fails to set a password • In mPower 6.3.0, this issue is resolved	GP-1873 MTX-4789
Password Complexity Rules • In previous versions of mPower, the *Characters Not Permitted* setting is not properly enforced in the *Default* mode. Users can set a password using characters that the administrative user has identified as *Not Permitted* • In mPower 6.3.0, this issue is resolved. User passwords cannot include characters that the administrator has defined as *Not Permitted*	IN:4612
Debug Console, Silent Mode • In previous versions of mPower, when *Silent Mode* is Enabled, output to the Debug Console should be turned off • In mPower 6.0.X, Debug Console entries are logged even though *Silent Mode* is Enabled • In mPower 6.3.0, this issue is resolved	GP-1878 MTX-4799

Bug Fixes (mPower 6.3.0)

U-Boot Access • In previous versions of mPower, during system boot and system reboot, u-boot is not available when it should be • In mPower 6.3.0, this issue is resolved	GP-1879 MTX-4800

Known Behaviors (mPower 6.3.0)

Cellular radio improvement for devices used on the AT&T network • The cellular radio used in MTCAP3-LNA7D models is a "data-only" radio and does not include voice support.	-
Ethernet-Only Devices Include Cellular Configuration Settings In mPower 6.3.0, cellular configuration settings are present in the setup Wizard and in the user interface for Ethernet-only devices • Ethernet-only devices do not include a cellular radio, and cellular configuration settings should not be present in the setup Wizard or the user interface • The user can skip these settings when setting up an Ethernet-only device	MTX-4734
DeviceHQ® Cloud-Based Device Management • For devices that have been shipped with or upgraded to mPower 6.3.0, DeviceHQ reports the mPower version as mPower 6.3.1	-

Deprecations (mPower 6.3.0)

Telnet Server Support • Support for Telnet Server is deprecated from mPower 6.3.0 and device API • Telnet is not a secure protocol	GP-1787 MTX-4691
Legacy API Commands Legacy API commands, that are no longer used by recent mPower versions, are deprecated from mPower 6.3.0 •	GP-1788 MTX-4692

/api/btCommand/pair	Bluetooth PAN
/api/btCommand/remove	Bluetooth PAN
/api/btCommand/accept_pairing	Bluetooth PAN
/api/devices	Legacy MultiConnect rCell
/api/gccp	Legacy MultiConnect rCell
/api/internal	Internal use
/api/powerManagement	Legacy MultiConnect rCell

Schedule (mPower 6.3.0)

- Downloadable Versions
  - mPower 6.3.0 Availability: May 2023
    - Visit http://www.multitech.net/developer/downloads/
  - DeviceHQ: May 2023
- Manufacturing Updates:
  - Starting in May 2023, all devices that ship from MultiTech will include mPower 6.3.0.

Models Impacted (mPower 6.3.0)

- MultiTech Conduit® AP 300 Series models
  - MTCAP3-EN models
  - MTCAP3-LEU7 models
  - MTCAP3-LNA7 models

Upgrade Process (mPower 6.3.0)

mPower 6.3.0 is the first version of mPower to ship on MTCAP3 devices, no upgrades are necessary.

Features Included in mPower 6.3.0

Overview: Previous versions of mPower are not available for use in MTCAP3 devices. However, many features and capabilities from earlier versions of mPower are included in mPower 6.3.0 for use on MTCAP3 devices.

Features & Enhancements

Software & Services	
Updated messaging when partial configuration is applied by DeviceHQ • In mPower 6.0.0, when a device checks into DeviceHQ and performs a partial configuration upgrade, the system displays a status message on Web UI: **Partial configuration has been applied.** **The system is going down for reboot now. (DATE/TIME)** • In previous mPower releases, the Web UI does not show a message	Enhancement GP-418 MTX-4140 IN003879 mPower 6.0.0

Multiple LoRa User Interface and API Changes
• Added Duty-cycle info to Gateways page if ISRAEL plan is selected or duty-cycle is enabled
• Added Default Device Profile for local join server on Key Management page
• API Default packet forwarder GW SOURCE for EUI to hardware
  ○ The web page would not load an EUI unless the Basic Settings were shown
• Add delete all end-device and session records button
• Add option to append csv/json device records to the current list on key management page
• Add button to delete all items from downlink queue for all devices
• API options to get a single device or session record use DevEUI
  ○ /api/lora/devices/00-11-22-33-44-55-66-77
  ○ /api/lora/sessions/00-11-22-33-44-55-66-77
• Added option for settingmulticastGroupID for operations
• Add option for max FUOTA packet size
  ○ Field in Network Settings > Datarate settings
  ○ Field in Operations > Show Settings section
	Enhancement
	mPower 6.0.0

LoRa Firmware Update Over The Air (FUOTA) Updates • LoRa FUOTA Version 1.0.17 • Added an option for maximum packet size to control fragmentation • Added an option for setting multicast group ID	Enhancement mPower 6.0.0
LoRa Packet Forwarder Changes	Enhancement

Features & Enhancements

• Packet Forwarder Version 4.0.17 • LoRa Gateway Version 5.0.11 • Add hardware reset on start-up and restart • Support added for two MTAC-LORA-H-868 or two MTAC-LORA-H-915 LoRa gateway accessory cards	mPower 6.0.0

LoRa Default App Changes
• MQTT QoS and Persist settings
• MQTT Resubscribe on connect
• Add ClientID configuration option
• Add subscriptions for downlinks from remote broker
  ○ lorawan/gweui/deveui/down
  ○ lorawan/gwuuid/deveui/down
• Add subscription for moved devices to publish to remote broker
• lorawan/appeui/deveui/moved
	Enhancement
	mPower 6.0.0

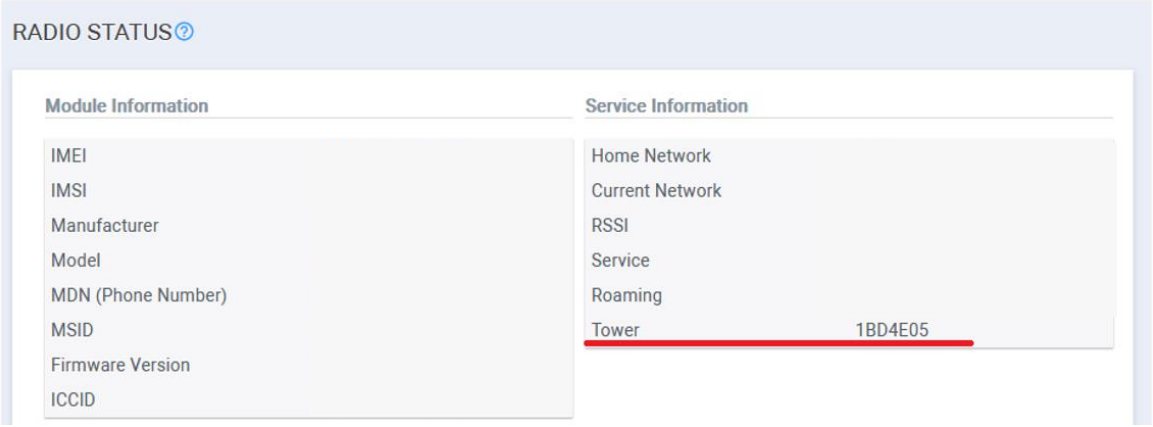
LoRa Network Server Changes
• LoRa Network Server Version 2.5.37
• Add setting for max FOTA packet size (maxRx2PacketSize)
• Add a command to delete all queued downlinks
• Add a command to get single device or session by EUI
• Add a command to delete all devices and sessions
• Add a command to add list of devices or sessions
• Publish lora/<APP-EUI>/<DEV-EUI>/moved topic when device is deleted by command, from user interface or DeviceHQ
  ○ Message contains list of GW-EUI
• Database backup to tar.gz
  ○ Backup to RAM and move into /var/config directory
  ○ Reduce database in /var/config/ to one-fifth
  ▪ 2MB database takes 400K with redundant backup files
• Activate Tx Param controller for LW102 AU915 and AS923 devices on Join
• LENS: published moved MQTT messages when check in update moves devices
• LNS version 2.5.37 added fields to the “up” mqtt messages
  ○ name – device name
  ○ product_id – device product ID
  ○ serial_number – device serial number
  ○ hardware_version – device hardware versionm
  ○ firmware_version – device firmware version
	Enhancement
	mPower 6.0.0

LoRa: Semtech LoRa Basics™ Station Changes: • Updated to version 2.0.6-5 • AU915 Channel Plan – Default transmit power changed to 30 dBm	Enhancement GP-1459 GP-1270 mPower 6.0.0
Hardware Support	
Verizon Wireless – Updated APN Behavior Devices impacted: MTCAP3-LNA7 models When the MNO is defined as Verizon, the SMS command **#apn** returns the message: *APN is obtained automatically from the Verizon network*	Enhancement GP-1596 MTX-4489 mPower 6.0.1

Features & Enhancements

RADIO STATUS Page

- Tower ID is now presented in the Service Information section
- In previous versions of mPower, the Tower ID was presented on the dashboard page, under Cellular



Enhancement
GP-1657
MTX-4547
mPower 6.0.1

User Interface

Web User Interface, status definition updates

Updated Status Definition in mPower 6.0.1	Previous Status Definition
DEVICE INFORMATION Page - Cellular WAN State	
Link is up	PPP Link is up
Link is down	PPP Link is down
In process of establishing link	In process of establishing PPP link
Cellular is not running	PPP is not running
SERVICE STATISTICS Page - TCM/ICMP Keep Alive	
IDLE, since link is not up	IDLE, since PPP link is not up
CELLULAR STATISTICS Page - Cellular Link	
Link is up	PPP Link is up
Link is down	PPP Link is down
In process of establishing link	In process of establishing PPP link
Cellular is not running	PPP is not running
NETWORK INTERFACE CONFIGURATION Page - Network Type	
Cellular PPP	PPP
Cellular WWAN	PPP
NETWORK INTERFACE CONFIGURATION – IPv4 Settings - Mode	
Auto	PPP
Auto – Addressed Only	PPP – Addresses Only

- Associated HELP files have also been updated to reflect these updates
- All other Cellular WAN status are unchanged

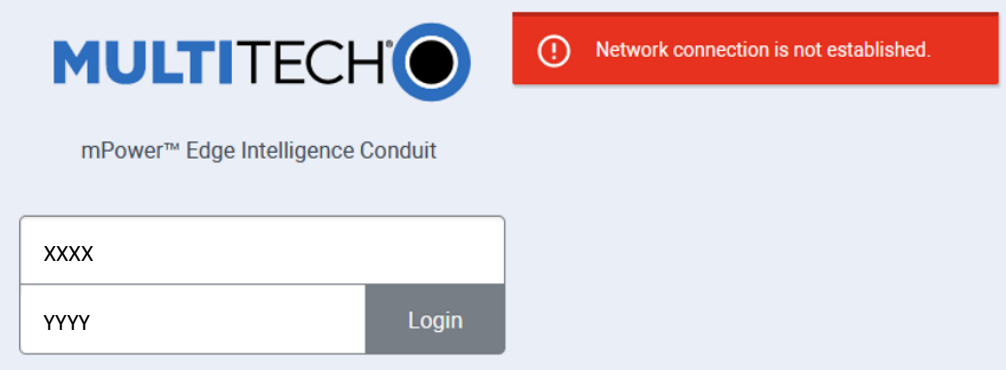
Enhancement
GP-913
MTX-4189
GP-1595
mPower 6.0.1

Features & Enhancements

<table>
<tr><td>Web Interface, CELLULAR STATISTICS Page, terminology change

<table>
<tr><th>Updated Definition in mPower 6.0.1</th><th>Previous Definition</th></tr>
<tr><td colspan="2">CELLULAR STATISTICS Page - Cellular</td></tr>
<tr><td>Cellular Trace</td><td>PPP Trace</td></tr>
</table>

If cellular mode is PPP, Cellular Trace is only available
Associated HELP files have also been updated to reflect these updates
If cellular mode is WWAN, Cellular Trace is hidden

</td><td>Enhancement
GP-1568
MTX-4460
GP-1595
mPower 6.0.1</td></tr>
<tr><td>Web Interface, CELLULAR STATISTICS Page
Cellular logs pane is added and always displayed, regardless of cellular mode (PPP or WWAN)
The cellular logs pane includes all logs related to cellular functionality</td><td>Enhancement
GP-1568
MTX-4460
mPower 6.0.1</td></tr>
<tr><td>Web Interface, Login Page
During the login process, if connection to the device is lost, a new message is displayed
Network connection is not established. 
</td><td>Enhancement
GP-1581
MTX-4473
mPower 6.0.1</td></tr>
<tr><td>Username and Password – Autocomplete is Disabled
Many configuration pages within mPower require username and password information
Previous versions of mPower allowed this information to be filled in automatically when the user remembers the login credentials.
In mPower 6.0.1, autocomplete is disabled and username and password fields must be completed in full by the user
NOTE: this behavior differs based on web browser. Some web browsers will ignore these parameters and allow autocomplete to occur</td><td>Enhancement
GP-1582
MTX-4474
mPower 6.0.1</td></tr>
<tr><td>User Interface
In earlier versions of mPower, LoRa device CSV file uploads generate a cryptic error message when the CSV file ends with an empty line
In mPower 6.0.1, CSV files that end with an empty line will no longer generate this message</td><td>Enhancement
TS-5112111
mPower 6.0.1</td></tr>
</table>

Features & Enhancements

User Experience	
Material Design Icons Simplify the User Interface • Material design icons are added throughout the user interface • Material design icons are a set of universal icons used to improve usability and simplicity • Additional Information: https://materialdesignicons.com/	Enhancement GP-1362 MTX-4201 mPower 6.0.0
Updated Product Images • Updated product images added to the First-Time Setup Wizard and Support Page	Enhancement GP-1371 MTX-4217 mPower 6.0.0

Operating System Updates

Updated Yocto Version • Yocto version updated to Dunfell (version 3.1). • Previous versions of mPower used Yocto Thud (version 2.6)	GP-1322 MTX-4162 mPower 6.0.0
Updated Linux Kernel • Linux kernel updated to version 5.4 • Previous versions of mPower used Linux kernel v4.9.240	- mPower 6.0.0
Updated Python • Python updated to version 3.8.11 • Previous versions of mPower used Python 2.7	GP-1224 MTX-4164 mPower 6.0.0
RF Survey • The RF Survey is not available for LTE devices and is removed from mPower 6.0.0 • **Page 404** is displayed when trying to access the page using the direct link: /rf_survey	Deprecation GP-1444 MTX-4321 mPower 6.0.0

Upgrade to OpenSSL 1.1
• mPower 6.0.1 supports OpenSSL 1.1.1o
• Previous mPower versions supported OpenSSL 1.1.1n
• Additional information is available
  ○ MultiTech Security Advisories
  ○ CVE-2022-1292
	GP-1600
	MTX-4493
	mPower 6.0.1

Networking and Security

DHCP Server Interface • In previous versions of mPower, when a network interface is excluded from br0 and had its own DHCP server configured, the DHCP server remains enabled when the interface is added back to the br0 • In mPower 6.0.1, a yellow warning message is displayed on the **NETWORK INTERFACES CONFIGURATION** window 	GP-1654 MTX-4542 mPower 6.0.1
IP Masquerading The IP Masquerading feature allows users to enable or disable IP Masquerading for WAN interfaces of the device • Main points ○ IP Masquerading feature can be used with WAN interfaces only ○ IP Masquerading is enabled by default. When IP Masquerading feature is enabled, the device performs IP address translation of client network traffic to the corresponding WAN interface ○ When IP Masquerading feature is disabled, the device passes client network requests unchanged to the corresponding WAN interface • API Changes api/ni/nis: “wanMasquerade” option is added for each network interface	New Feature MTX-4104 mPower 6.0.0
Remote Syslog Feature Enhancement: TCP and SSL/TLS support • New settings are implemented for the Remote Syslog feature: ○ TCP Protocol support ○ SSL/TLS Protocol support ○ Configurable Port • The **Hostname** read-only field is added to the Remote Syslog pane. The hostname value is a part of log entries that are transferred to the remote Syslog Server. The **hostname** value can be configured in the **Hostname Configuration** pane on the **Status | Global DNS** page • API Changes ○ api/syslog ○ api/help/syslog ○ api/secureprotocols/rsyslogd	New Feature GP-869 MTX-4178 GP-1365 MTX-4205 mPower 6.0.0

Networking and Security

Support 802.1X authentication on the Ethernet interface(s)

- 802.1X Authentication feature is available for Ethernet network interface (Eth0) if it is not in the Bridge (BR0). For other network interfaces, including Bridge (BR0), this feature is not available and is hidden on Web UI
- The 802.1X Authentication settings depend on the Authentication Method. By default, the Authentication Method is NONE
- The system supports the following authentication methods:
  - EAP-PWD
  - EAP-TLS
  - EAP-TTLS
  - EAP-PEAP

The following settings are available and depend on the Authentication Method:

Setting	Description
Authentication method	Type of the authentication
Username	Identity (user name) to authenticate the user in the inner (phase 2) authentication
Password (not used in EAP-TLS)	The secret string to be used for EAP-PWD authentication
Anonymous ID	Anonymous identity to authenticate the user in the outer (phase 1) authentication
CA Certificate (not used in EAP-PWD)	X.509 Certification Authority certificate
Domain Match (not used in EAP-PWD, optional)	Domain substring for server certificate validation
Subject Match (EAP-TLS only, optional)	Subject substring for server certificate validation
Client Certificate (EAP-TLS only)	X.509 client certificate
Private Key (EAP-TLS only)	Private key of the client
Private Key Password (EAP-TLS only)	Password to decrypt the private key
Authentication Method (EAP-TTLS and EAP-PEAP only)	Type of the inner (phase 2) authentication
PEAP Version (EAP-PEAP only)	Version of the PEAP protocol

New Feature
GP-355
GP-1328
MTX-3053
MTX-4119
MTX-4170
mPower 6.0.0

Ping Feature Settings: New Options

- Number of Requests: The number of ping requests. The default is 4. The maximum is 120
- Packet Size (Bytes): Specifies the number of data bytes to be sent.
  - Packets include an additional 28 bytes of data (8 bytes ICMP header and 20 bytes IP header)
  - The default packet size is 56 bytes (which equates to into 84 bytes of data due to ICMP header and IP header)
- When packet size of 0 bytes is requested, the actual packet size is 28 bytes due to ICMP header and IP header
- Do Not Fragment: Enable to prevent fragmentation. Without fragmentation, the ping fails if the ping packet exceeds MTU size for the network path. By default, the option is disabled

New Feature
GP-1279
MTX-4036
MTX-4131
mPower 6.0.0

Networking and Security

Continuous Ping
• The Continuous Ping feature allows users to start a continuous ping to an IP address or URL through a specific interface
• Continuous Ping is available on the Debug Options page
• To start a continuous ping, users specify **IP Address** or **URL**, **Network Interface**, **Packet Size,** and enable or disable the **Do Not Fragment** option
  ○ Continuous Ping starts when the user clicks the **Start Continuous Ping** button
  1. The system starts pinging
  2. The button label changes to **Stop Continuous Ping**
  3. The message "Ping is in progress…" is displayed next to the button
  ○ Continuous Ping stops when the user clicks the **Stop Continuous Ping** button
  1. The system stops pinging
  2. The button label changes to **Start Continuous Ping**
  3. The ping results are shown next to the **Start Continuous Ping** button
• API Changes
  ○ api/stats/continuousPing - Continuous Ping status is stored in the "**isRunning**" field
	New Feature
	GP-1229
	MTX-4033
	MTX-4131
	mPower 6.0.0

ICMP Keep Alive feature
• Overview: Sometimes when working with private networks, the size of the ping request is regulated. It needs to be configurable to satisfy private network requirements
• In mPower 6.0.0, new setting "Packet Size (Bytes)" is added next to the ICMP Count in the ICMP/TCP Check pane
  ○ The Packet Size setting specifies the number of data bytes to be sent
  ○ Packets include an additional 28 bytes of data (8 bytes ICMP header and 20 bytes IP header)
  ○ The default packet size is 56 bytes (which equates to into 84 bytes of data due to ICMP header and IP header)
  ○ When packet size of 0 bytes is requested, the actual packet size is 28 bytes due to ICMP header and IP header
	New Feature
	GP-79
	MTX-4167
	mPower 6.0.0

Firewall Status Page
• The **Status** page is added under the **Firewall** main menu
• Firewall status page contains Filter tables in the **Filter Rules** pane, NAT tables in the **NAT Rules** pane, and iptables-save command output in the **IP Tables Dump**
• The **Download** button allows users to download an archive file that contains the same information that is displayed on Web UI; there are three files in the archive:
  ○ **iptables-filter.log**
  ○ **iptables-nat.log**
  ○ **iptables-save.log**
• API Changes**.** The following API endpoints are added:
  ○ https://192.168.2.1/api/firewall/downloadStatus
  ○ https://192.168.2.1/api/firewall/status
	New Feature
	MTX-4106
	mPower 6.0.0

Networking and Security

IPSec Tunnels • The "Allow All Traffic" checkbox is added to the IPsec tunnel configuration. The option is disabled by default when adding a new tunnel • When the checkbox is disabled, all traffic through the tunnel is dropped and the user has to add firewall rules manually to allow the traffic. Enabling the checkbox allows all traffic through the tunnel without creating explicit rules to allow traffic by subnet and/or connection attributes • When performing a firmware upgrade from a previous firmware version that does not have this setting, all existing tunnels will have the "Allow All Traffic" checkbox enabled and corresponding firewall rules will be set in the system, so nothing will change in tunnel behavior after upgrade • When adding a new tunnel, if the "Allow All Traffic" checkbox is not checked, then all traffic through the tunnel will be dropped. The user will have to add a corresponding firewall rules on the Firewall Settings page • API Changes ○ The "allowAllTraffic" is added to the api/ipsecTunnels collection	New Feature GP-1361 MTX-4200 mPower 6.0.0
IPSec Tunnels - Multiple Remote Networks Support • The system allows to specify multiple local networks and remote networks when configuring an IPSec tunnel • API changes ○ "remoteSubnets" array replaced the "remoteNetworkIp" and "remoteNetworkMask" in the /api/ipsecTunnels collection	New Feature GP-1337 MTX-4180 mPower 6.0.0

Ping Feature – Update the Network Interfaces List
• The list of the network interfaces available in the Network Interface dropdown list is updated.
• The list of available network interfaces depends on the hardware configuration.
• The following network interfaces are available:
  ○ ANY
  ○ BRIDGE (BR0)
  ○ CELLULAR
  ○ ETHERNET (ETH0)
	Enhancement
	GP-1320
	MTX-4150
	mPower 6.0.0

PPP-IP Pass-through / Serial Modem Mode - Hide Ping features from the Debug Options Page
• PPP-IP Pass-through Mode:
  ○ It is not possible to Ping directly from the device
  ○ The Ping and Continuous Ping features are not available in the Debug Options Page
• Serial Modem Mode:
  ○ Continuous Ping feature is not available
  ○ Ping feature is available. Network Interface options: ANY, BRIDGE (BR0) and ETHERNET (ETH0)
	Enhancement
	MTX-4093
	mPower 6.0.0

Networking and Security

Service Statistics Enhancement The status for new services are added to the Service Statistics Page. Services and their possible statuses are listed below: SNMP Server ○ SNMP Server is disabled ○ SNMP Server is running ○ SNMP Server is stopped Security Violation ○ Security violation is disabled ○ Security violation has not been detected ○ Security violation has been detected (shown if the /var/log/tomoyo/reject_003.log log is NOT empty) Reverse SSH ○ Reverse SSH service is disabled ○ Reverse SSH service is running ○ Reverse SSH service is stopped MQTT Broker ○ MQTT Broker service is disabled ○ MQTT Broker service is running ○ MQTT Broker service is stopped Remote Management ○ Displaying statuses from the Remote Management page Continuous Ping ○ Continuous Ping is running ○ Continuous Ping is disabled	Enhancement GP-1295 MTX-4142 mPower 6.0.0
Web Server X.509 Certificate - Default details are updated • The CN value in the default Web Server X.509 certificate is changed from **ocg.example.com** to **mtx.example.com**	Enhancement GP-1247 MTX-4058 mPower 6.0.0
Firewall Settings Improvement • Firewall "Normal Settings" is the default mode. This view was formerly "Advanced Settings" ○ Prerouting Rules ○ Input Filter Rules ○ Forward Filter Rules ○ Output Filter Rules • Firewall "Legacy Settings" now includes the following. This view was formerly "Normal Settings" ○ Port Forwarding ○ Input Filter Rules ○ Output Filter Rules	Enhancement GP-1426 MTX-4286 mPower 6.0.0

Networking and Security

IPsec, GRE, OpenVPN Tunnels - Enabled checkbox is moved to the tunnel configuration page • This is an improvement that does not affect the GRE, IPSec and OpenVPN functionality and API • The "Check" icon in the Enabled column on the GRE, IPSec or OpenVPN Tunnel Configuration page does not allow the user to enable or disable a tunnel • To enable or disable a tunnel, click the **Enabled** checkbox while adding or editing tunnel	Enhancement GP-1392 MTX-4255 mPower 6.0.0
SNMP Configuration Page - Network Address and Mask validation, IP address conversion to the Network address • In previous mPower releases, the system displayed an error if the entered IP Address and Mask do not match while adding an IP network to the Allowed IP Addresses list on the SNMP Configuration page • In mPower 6.0.0 the system automatically converts the IP address based on the Mask value, and adds a corresponding valid Network Address to the list	Enhancement GP-1468 MTX-4387 mPower 6.0.0
Network IP and Mask validation (GRE and IPSec Configuration) • The system (Web UI) checks the entered IP Address and Mask and automatically converts the IP address value to a valid Network Address while adding or editing GRE or IPsec Tunnels • The API validation of the entered Network Address and Mask is implemented, and the system does not allow to save the settings if the Network Address and Mask do not match • For example, user enters **Remote Network Route** as **192.168.2.2** and the **Remote Network Mask** as **24** while editing a GRE Tunnel. The Network Address in this case is 192.168.2.0, and the system will automatically change it and add a valid Network address, so the remote network route will be a valid value of **192.168.2.0/24** • The same conversion is performed for Local Networks and Remote Networks when adding or editing an IPSec tunnel	Enhancement GP-1453 GP-1287 MTX-4353 MTX-4118 mPower 6.0.0

Bug Fixes

Reset to User Defined Defaults shall restore custom applications
• If a custom application is installed while a user sets the current configuration as user-defined defaults, the system shall try to restore it when performing reset to User Defined defaults
• Main use case
  ○ Install a custom application, configure the device, save the changes, and set the current configuration as user-defined defaults
  ○ Change the configuration (make any changes you need), save and apply the changes.
  ○ Click "Reset to User Defined Defaults"
• Result
  ○ Device reboots
  ○ overlayfs is reset
  ○ The system installs the custom application from /var/persistent
  ○ Device reboots again as soon as the custom app is installed. NOTE: Actual behavior depends on the custom application
  ○ When device boots, the custom application is installed
	Applications
	GP-1326
	MTX-4154
	mPower 6.0.0

libmts-io • MCC and MNC values are retrieved incorrectly from table • In mPower 6.0.0, MCC and MNC values are retrieved correctly for further carrier detection	Hardware GP-114 MTX-4168 mPower 6.0.0
Rogers Wireless – Web Interface Update • In mPower 6.0.0, the Web Interface (Cellular, Radio Status) has been updated to display the following with a Rogers SIM is inserted in the device **Home Network: Rogers Wireless** • In earlier versions of mPower software, the Web Interface (Cellular, Radio Status) displays the following when a Rogers SIM was inserted in the device **Home Network: Rogers AT&T Wireless**	Hardware GP-1388 mPower 6.0.0
SMS - quotation mark character (Double universal) " is displayed with the backslash \ character in the received SMS message (like an escaped character) • An extra slash character is added before the quotation mark " in the sent and received messages • In mPower 6.0.0, the issue is resolved, and an extra slash is no longer added to the Sent and Received SMS messages	User Experience MTX-4359 mPower 6.0.0
Device UI inaccessible after firmware upgrade if User Authentication enabled • If User Authentication feature was enabled prior to the firmware upgrade, UI will be inaccessible with SSL error when the upgrade is finished. To restore access to the device user should either reboot the device or restart lighttpd service. This may lead to the issues with upgrade in the field if there is no physical access to the device and no ssh access or SMS commands are enabled • This issue exists in previous released firmware (mPower 5.2.1 and mPower 5.3.0) • In mPower 6.0.0, the issue is resolved, and user can access the device after performing upgrade if the User Authentication is enabled	User Experience GP-1301 MTX-4143 mPower 6.0.0

Bug Fixes

Cellular Radio Firmware Upgrade Changes • Menu name changed to "Cell Radio FW Upgrade" • Page name changed to “Cellular Radio Firmware Upgrade” • “Cell Radio Firmware Upgrade” shall be in the setup menu, below time configuration (PPP-IP pass-through mode and serial modem mode)	User Experience GP-1451 MTX-4343 mPower 6.0.0
Custom OpenVPN config breaks iptables • Customer unsuccessfully tried to setup a VPN connection using custom OVPN config file. • Upon investigation the root cause was found in this string: *remote 20.191.55.208 1194 udp* • If we split the string to these two, VPN connection works properly: *proto udp* *remote 20.191.55.208 1194* • Corresponding changes are implemented, and such custom configuration can be applied, and the tunnel connection will be established successfully	Networking GP-1421 MTX-3873 SP-5105937 mPower 6.0.0
Save & Apply restart redirects to LAN when connected through WAN • When connected through the WAN, the Web UI redirects to a LAN IP (Ethernet eth0) when executing a Save & Apply that requires a reboot • In mPower 6.0.0, if the current device IP is external (public) IP address or this is a domain name, redirection will be performed to the same address. Otherwise, the system will redirect to LAN IP address	Networking GP-1006 IN-4375 MTX-4040 mPower 6.0.0
PPP-IP Passthrough Mode – multiple farpd instances are running if connection re-establishes • In some cases, there are multiple farpd instances running at the same time. The issue occurs when the PPP-IP Passthrough mode cellular connection is interrupted. When the cellular connection reestablishes, the system runs a new farpd instance, but does not end the previous one. This issue does not affect the functionality • In mPower 6.0.0, when cellular connection re-establishes and new settings are obtained, the farpd service restarts and there is only one farpd service in the services list	Networking MTX-4350 mPower 6.0.0

Operating System Overview

	mPower 6.3.X
Yocto Embedded Software	Dunfell version 3.1
Linux Kernel	version 5.4
OpenSSL	1.1.1q
TLS	TLS 1.2, TLS 1.3 Configurable
Python	3.8.11
Node-RED	Deprecated
lighttpd	version 1.4.59

Additional Information

mPower Software Lifecycle Management

https://www.multitech.com/documents/publications/sales-flyers/mPower%20Software-Lifecycle%20Management.pdf

Security Advisories

https://www.multitech.com/landing-pages/security

Downloads

http://www.multitech.net/developer/downloads/

Getting Started

http://www.multitech.net/developer/software/aep/creating-a-custom-application/

API Reference:

http://www.multitech.net/developer/software/mtr-api-reference/

Support:

Visit https://support.multitech.com/ to create a support case

DeviceHQ, Cloud-based IoT Device Management

Login: https://www.devicehq.com/sign_in

MultiTech Developer Resources

www.multitech.net

Knowledge Base

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

MultiTech Support Portal

support.multitech.com

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

MultiTech Website

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Revision History

Version	Author	Date	Change Description
-005	MP	01/28/2025	mPower 6.3.5 Known Behaviors and updates sections updated
-004	DT/MP	11/11/2024	mPower 6.3.5 added
-003	DT	02/13/2024	mPower 6.3.2 Known Behaviors added mPower 6.3.1 Known Behaviors updated mPower 6.3.1 updated • Networking and Security, SNMP Configuration • Add support for MIB OID Values
-002	DT	01/31/2024	mPower 6.3.2 added
-001	DT	11/07/2023	Initial Version mPower 6.3.1 and mPower 6.3.0