

Software Release Notes

mPower® Edge Intelligence Software

Includes mPower 6.3.1

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 the DeviceHQ interface, cellular hardware support, Modbus protocols, user interface, and networking and security features.

Updated mPower 6.x.x release notes are available [< here >](#)

Downloadable Versions:

- mPower 6.3.1 Availability: November 2023
- mPower 6.3.0 Availability: May 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.

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[mPower 6.3.0](#) (May 2023)

[Operating System Overview](#)

[Revision History](#)

mPower 6.3.1 Changelog and Overview

Released: November 2023

Status: Downloadable

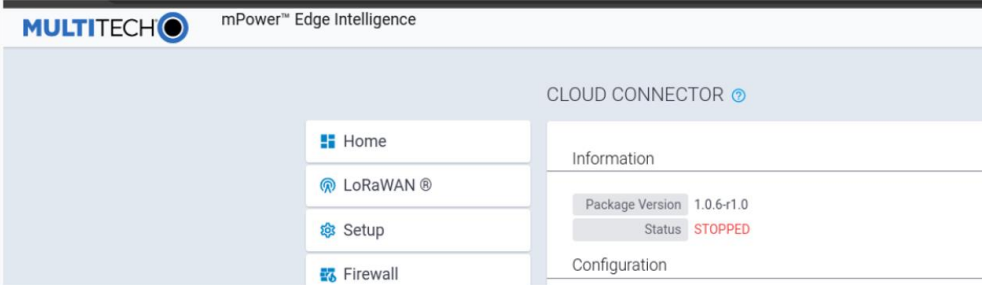
Updates in mPower 6.3.1, from [mPower 6.3.0](#)

| | | | | | | | | |
|---|----------------------------------|---|---------------------------|---------------------------------|------------------------------|--------------------------|---------------------------------|---------------------------------|
| 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 | | | | | | | | | | | | | | | | | | | | | |
|---|--|--------------------------------|-------|--|--------|--|--------|------------------------|------|---|-------|---|-------|---------------|-------|----------------------------|------|----------------------------|--------|------------------------|------------------------------------|
| BACnet AV (analog value) and BV (binary value) Support <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> 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. <table border="1"> <thead> <tr> <th>Property Type</th><th>Recommended BACnet Object Type</th></tr> </thead> <tbody> <tr> <td>uint8</td><td>Analog Input, Analog Value, Positive Integer Value</td></tr> <tr> <td>uint16</td><td>Analog Input, Analog Value, Positive Integer Value</td></tr> <tr> <td>uint32</td><td>Positive Integer Value</td></tr> <tr> <td>int8</td><td>Analog Input, Analog Value, Integer Value</td></tr> <tr> <td>int16</td><td>Analog Input, Analog Value, Integer Value</td></tr> <tr> <td>int32</td><td>Integer Value</td></tr> <tr> <td>float</td><td>Analog Input, Analog Value</td></tr> <tr> <td>bool</td><td>Binary Input, Binary Value</td></tr> <tr> <td>string</td><td>Character String Value</td></tr> </tbody> </table> Models Impacted: <ul style="list-style-type: none"> MTCAP3-LEU7-A23EEA-LEM-BAC MTCAP3-EN-A23EEA-LEM-BAC, MTCAP3-EN-A23UEA-LWM-BAC | 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 | New Feature GP-2037 MTX-5011 |
| 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 | | | | | | | | | | | | | | | | | | | | |
| BACnet Device Settings – Network Interface <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> MTCAP3-LEU7-A23EEA-LEM-BAC MTCAP3-EN-A23EEA-LEM-BAC, MTCAP3-EN-A23UEA-LWM-BAC | New Feature GP-2027 MTX-4999 | | | | | | | | | | | | | | | | | | | | |

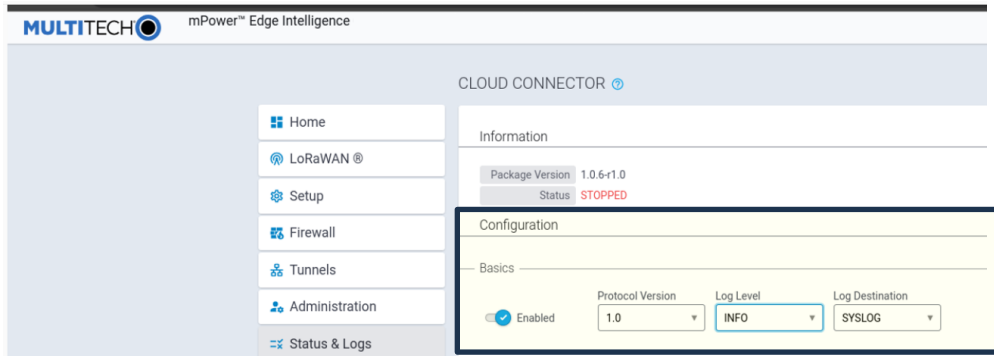
New Features & Enhancements (mPower 6.3.1)

| | |
|--|------------------------------------|
| BACnet Device Settings – Available Network Interfaces <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> MTCAP3-LEU7-A23EEA-LEM-BAC MTCAP3-EN-A23EEA-LEM-BAC, MTCAP3-EN-A23UEA-LWM-BAC | Enhancement GP-2027 MTX-4999 |
| BACnet – Change in JavaScript Engine <ul style="list-style-type: none"> 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: <ol style="list-style-type: none"> Updated decode Uplink signature. Support for normalize Uplink functionality. Models Impacted: <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> 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. <p>Please see the following link for additional info: https://multitechsystems.github.io/lorawan-app-connect-mqtt</p>  | Enhancement GP-2071 |
| Cloud Connector - User Interface Configuration <ul style="list-style-type: none"> In mPower 6.3.1, Cloud Connector is moved to the applications page | Enhancement GP-2066 |
| Cloud Connector – Updated to version 1.1 <ul style="list-style-type: none"> 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

- 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)



Enhancement
GP-2095

Cloud Connector v1.1 – Message Formatting

- 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: <ul style="list-style-type: none"> • lorawan/<GW-UUID>/down • lorawan/<GW-UUID>/clear | Manage downlinks: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • lorawan/<GW-UUID>/api_req • lorawan/<GW-UUID>/lora_req • lorawan/<GW-UUID>/log_req | Request info from the system: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • lorawan/<GW-UUID>/api_res • lorawan/<GW-UUID>/lora_res • lorawan/<GW-UUID>/log_res | Publish info from the system: <ul style="list-style-type: none"> • 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>

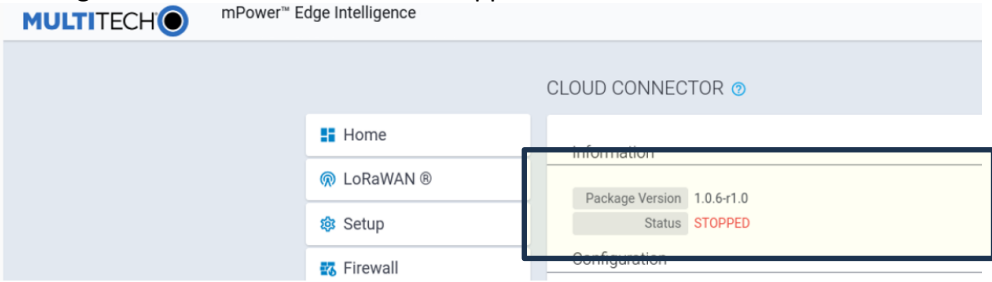
Enhancement
GP-2069

Cloud Connector v1.1 – Package Upgrades

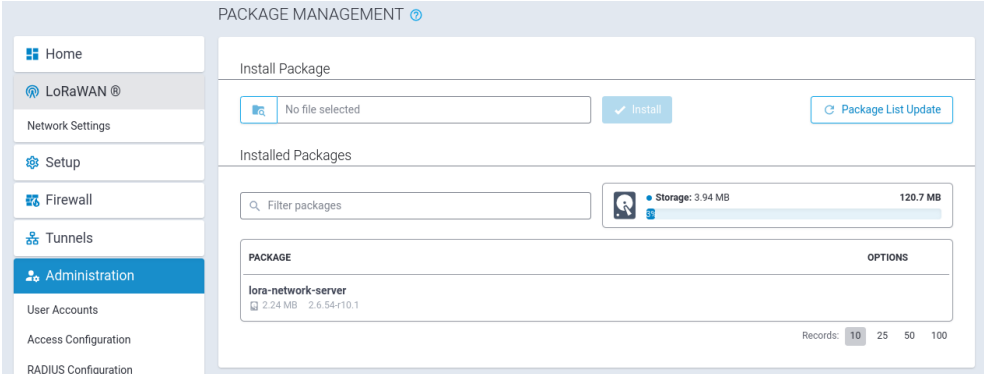
- Starting in mPower 6.3.1, Cloud Connector can be updated using the package upgrade feature.

New Feature
GP-2065
MTX-5065

New Features & Enhancements (mPower 6.3.1)

| | |
|---|------------------------|
| Cloud Connector v1.1 – LoRa Status Information <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> In mPower 6.3.1, wildcard subscriptions are removed from the remote broker <ul style="list-style-type: none"> Some brokers do not allow wildcard subscriptions In previous versions of mPower, wildcard subscriptions were allowed. | Enhancement GP-2007 |
| LoRa Spreading Factor Filters <ul style="list-style-type: none"> In mPower 6.3.1, four spreading factor filters are added <ul style="list-style-type: none"> DR5-DR10 DR7-DR10 DR5-DR12 DR7-DR12 | Enhancement GP-2013 |

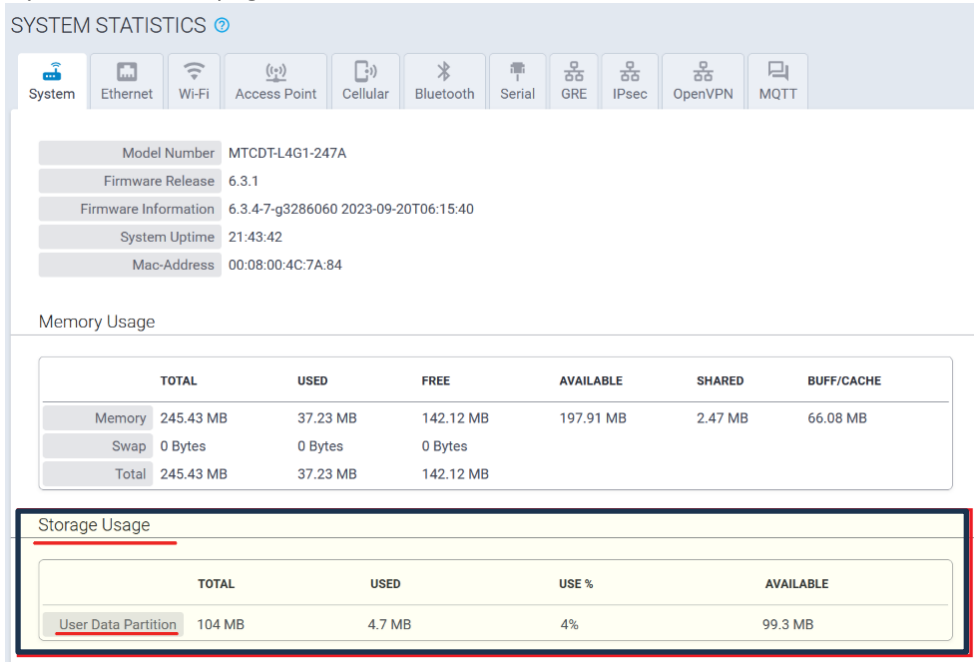
New Features & Enhancements (mPower 6.3.1)

| | |
|---|------------------------------------|
| Basic Station – EU868 Duty Cycle Update <ul style="list-style-type: none"> Updated to v2.0.6-20 Add duty-cycle bands K, L, and N Changed duty-cycle limits to match EU regulations <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> 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

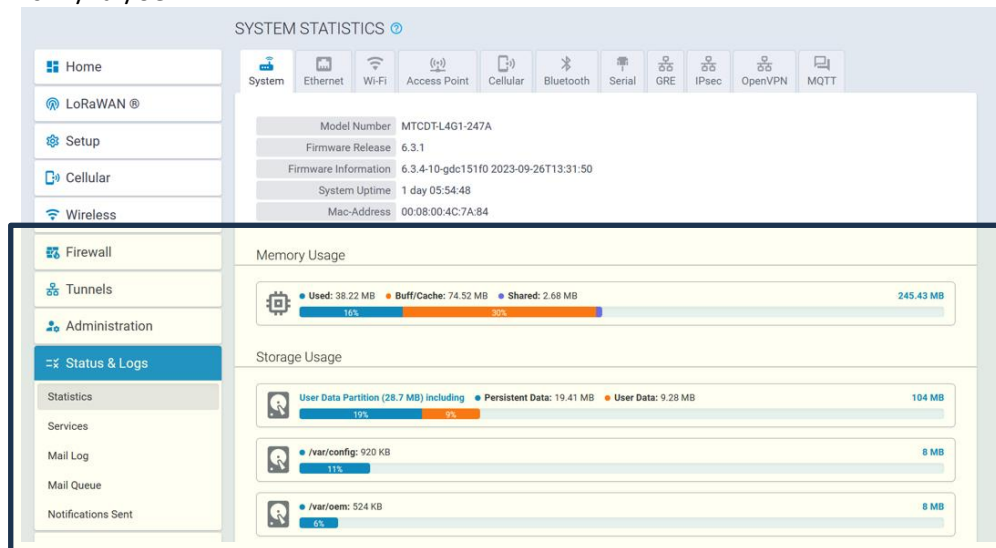
- In mPower 6.3.1, the user interface displays the external USB storage device usage on the System Statistics page.



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

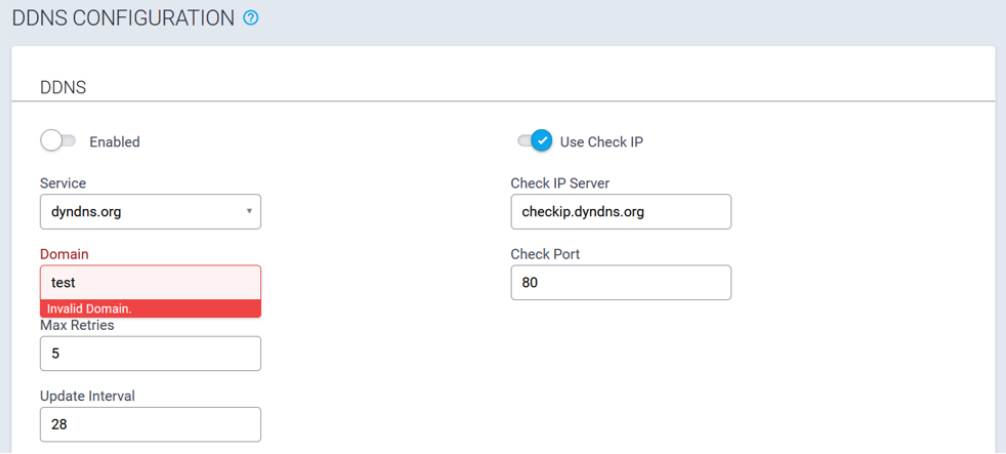


Enhancement
GP-2109

Networking & Security (mPower 6.3.1)

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|--|-------------------------|
| OpenVPN Tunnel – Tunnel Name Character Limit <ul style="list-style-type: none">• 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. | Enhancement MTX-5052 |
|--|-------------------------|

Bug Fixes (mPower 6.3.1)

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|---|-----------------------------------|
| Cellular Mode Settings <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> In mPower 6.3.0, the Server Port is incorrectly displayed. In mPower 6.3.1, this issue has been resolved. <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> In mPower 6.3.0, DDNS configuration changes are not submitted when Domain value is invalid.  <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> Models Impacted: <ul style="list-style-type: none"> 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 |
|---|---|

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

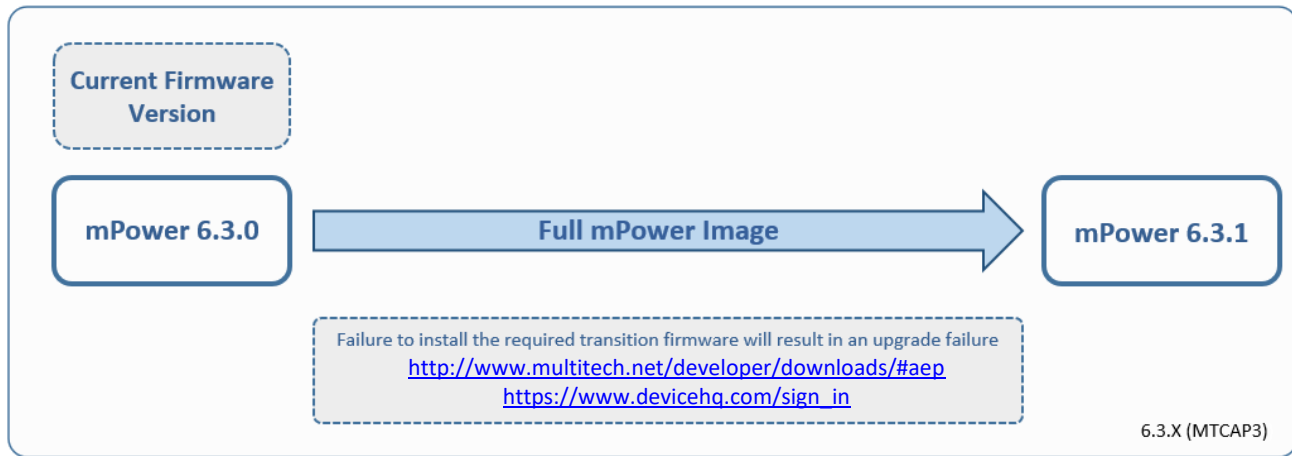
Models Impacted (mPower 6.3.1)

- 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:

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 6.3.0 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.

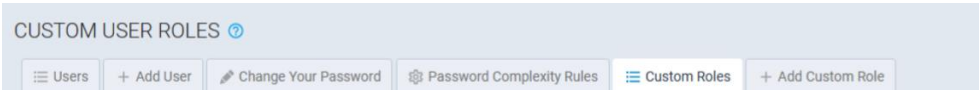
| | | | | | | | | |
|---|----------------------------------|---|---------------------------|---------------------------------|------------------------------|--------------------------|---------------------------------|---------------------------------|
| New Features & Enhancements | Operating System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

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) <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> MTCAP3-EN-A23EEA-LEM-BAC, MTCAP3-EN-A23UEA-LWM-BAC | New Feature GP-1864 MTX-4778 |
| BACnet BMS System Support – Radio Bridge Sensor Support <ul style="list-style-type: none"> Radio Bridge wireless sensor decoders are available natively <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> MTCAP3-EN-A23EEA-LEM-BAC, MTCAP3-EN-A23UEA-LWM-BAC | New Feature GP-1880 MTX-4804 |

| | |
|--|--------------------------------------|
| Software & Services – mPower API Services | |
| mPower API service statistics (api/stats/service) have been expanded to include three new settings <ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> • 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 |

| | |
|--|---|
| LoRaWAN - Adaptive Data Rate (ADR) Updates <ul style="list-style-type: none"> • nbTrans setting is added in ADR Link Request (ADRLinkReq) 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 <ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> • <i>Device Diagnostics</i> pane is added to the <i>Debug Options</i> page • User can download cellular diagnostics and cellular related logs by using the <i>Download Cellular Data</i> 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 <ul style="list-style-type: none"> • 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 |

| | |
|---|------------------------------------|
| Certificate and Key Management | |
| <ul style="list-style-type: none"> Support new Microsoft Azure Root Certificate Authority Update the certificates database to latest debian | Enhancement GP-1872 MTX-4791 |
| User Experience | |
| <p>Custom User Roles</p> <p>In previous versions of mPower, users are assigned one of three pre-defined user roles, each with different rights and permissions on the device</p> <ul style="list-style-type: none"> <u>Administrators</u> have full rights and permissions, including the ability change settings on the device <u>Engineers</u> have read/write privileges and some access to controls on the device <u>Monitors</u> have read-only access <p>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</p> <ul style="list-style-type: none"> <i>Custom Roles</i> and <i>Add Custom Role</i> 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 <ol style="list-style-type: none"> <i>WRITE – ON</i> allows custom users to modify the feature <i>WRITE – OFF</i> prevents custom users from modifying the feature <i>VISIBLE – ON</i> allows custom users to read the status of the feature <i>VISIBLE – OFF</i> hides the status of the feature from the custom user  <ul style="list-style-type: none"> 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 |
| <p>Web Interface - Dark and Light Themes</p> <p>mPower detects the user system preferences and enables light or dark scheme automatically</p> <ul style="list-style-type: none"> 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 - |
| <p>Web Interface – Save & Apply Button Behavior</p> <ul style="list-style-type: none"> <i>Save & Apply</i> button is displayed ONLY when there are changes that can be saved and applied The <i>Save & Apply</i> button is moved from the main menu and appears in the top of the page The <i>Save & Apply</i> button is animated, and it is blinks periodically | Enhancement - |
| <p>Web Interface – Main Menu Behavior</p> <ul style="list-style-type: none"> 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 |

| | |
|--|---|
| Web Interface – Date and Time Format <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> <i>Send SMS</i>, <i>Sent SMS</i> and <i>Received SMS</i> are combined into a single page The submenu label is changed to <i>Send/Received SMS</i> <i>SMS Configuration</i> and <i>Send/Received SMS</i> pages are moved under the <i>Cellular</i> main menu The <i>SMS</i> main menu has been eliminated | Enhancement GP-1705 GP-1731 MTX-4579 |

Operating System Updates (mPower 6.3.0)

| | |
|---|---|
| Upgrade to OpenSSL 1.1 <ul style="list-style-type: none"> mPower 6.3.0 supports OpenSSL 1.1.1q Previous mPower versions support OpenSSL 1.1.1o | - |
|---|---|

Networking & Security (mPower 6.3.0)

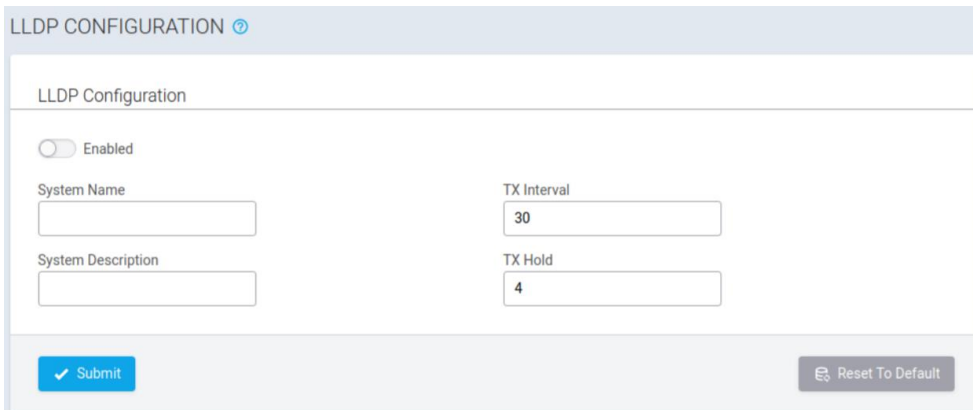
LLDP (Link Layer Discovery Protocol) Support

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

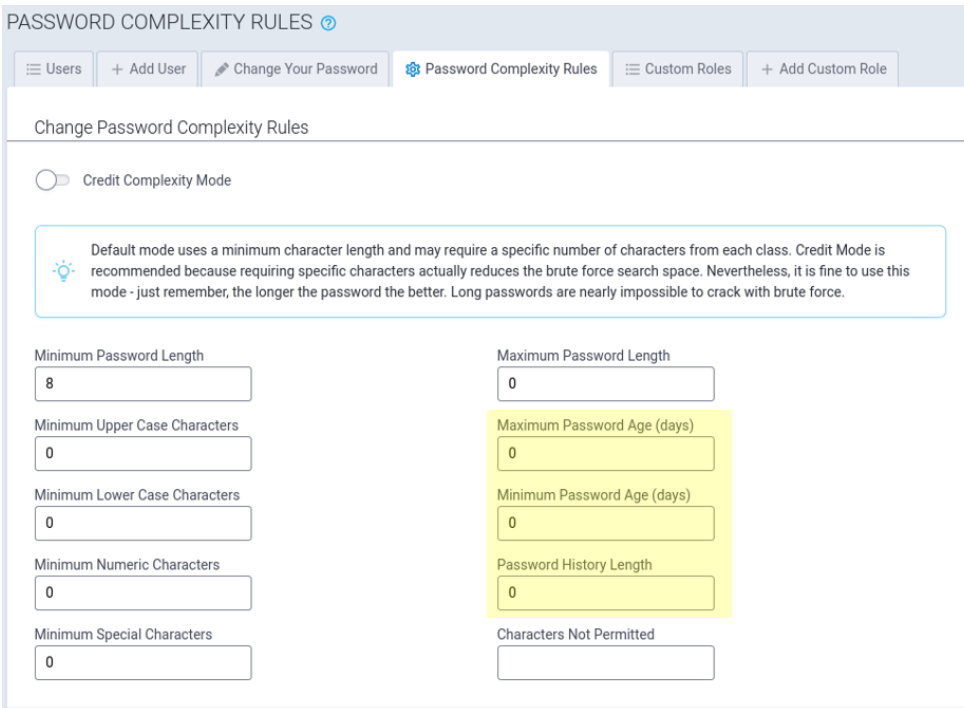
Feature Enhancement
GP-280
GP-1823

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



PASSWORD COMPLEXITY RULES ⓘ

Users + Add User Change Your Password Password Complexity Rules Custom Roles + Add Custom Role

Change Password Complexity Rules

☐ Credit Complexity Mode

Default mode uses a minimum character length and may require a specific number of characters from each class. Credit Mode is recommended because requiring specific characters actually reduces the brute force search space. Nevertheless, it is fine to use this mode - just remember, the longer the password the better. Long passwords are nearly impossible to crack with brute force.

Minimum Password Length: 8

Maximum Password Length: 0

Minimum Upper Case Characters: 0

Maximum Password Age (days): 0

Minimum Lower Case Characters: 0

Minimum Password Age (days): 0

Minimum Numeric Characters: 0

Password History Length: 0

Minimum Special Characters: 0

Characters Not Permitted:

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 <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> In previous versions of mPower, <i>Bootloader Password Authentication Status</i> is displayed as <i>Not Supported</i> when it should be <i>Supported</i> In mPower 6.3.0, this issue is resolved | GP-1866 MTX-4780 |
| Bootloader Password <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> In previous versions of mPower, the <i>Characters Not Permitted</i> setting is not properly enforced in the <i>Default</i> mode. Users can set a password using characters that the administrative user has identified as <i>Not Permitted</i> In mPower 6.3.0, this issue is resolved. User passwords cannot include characters that the administrator has defined as <i>Not Permitted</i> | IN:4612 |
| Debug Console, Silent Mode <ul style="list-style-type: none"> In previous versions of mPower, when <i>Silent Mode</i> is Enabled, output to the Debug Console should be turned off In mPower 6.0.X, Debug Console entries are logged even though <i>Silent Mode</i> is Enabled In mPower 6.3.0, this issue is resolved | GP-1878 MTX-4799 |

Bug Fixes (mPower 6.3.0)

| | |
|---|---------------------|
| U-Boot Access <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> 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 |

Deprecations (mPower 6.3.0)

| | | | | | | | | | | | | | | | |
|---|---------------------------|---------------|-----------------------|---------------|-------------------------------|---------------|--------------|---------------------------|-----------|---------------------------|---------------|--------------|----------------------|---------------------------|---------------------|
| Telnet Server Support <ul style="list-style-type: none"> 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 <table border="1" data-bbox="228 1094 1183 1369"> <tr> <td>/api/btCommand/pair</td><td>Bluetooth PAN</td></tr> <tr> <td>/api/btCommand/remove</td><td>Bluetooth PAN</td></tr> <tr> <td>/api/btCommand/accept_pairing</td><td>Bluetooth PAN</td></tr> <tr> <td>/api/devices</td><td>Legacy MultiConnect rCell</td></tr> <tr> <td>/api/gccp</td><td>Legacy MultiConnect rCell</td></tr> <tr> <td>/api/internal</td><td>Internal use</td></tr> <tr> <td>/api/powerManagement</td><td>Legacy MultiConnect rCell</td></tr> </table> | /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 | 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.

New Features & Enhancements

| Software & Services | |
|---|---|
| Updated messaging when partial configuration is applied by DeviceHQ <ul style="list-style-type: none"> 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: <p style="text-align: center;">Partial configuration has been applied. The system is going down for reboot now. (DATE/TIME)</p> 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 <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> /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 setting multicastGroupID for operations Add option for max FUOTA packet size <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> 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 | Enhancement mPower 6.0.0 |

New Features & Enhancements

| | |
|---|--|
| LoRa Default App Changes <ul style="list-style-type: none"> • MQTT QoS and Persist settings • MQTT Resubscribe on connect • Add ClientID configuration option • Add subscriptions for downlinks from remote broker <ul style="list-style-type: none"> ○ 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 <ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> ○ Message contains list of GW-EUI • Database backup to tar.gz <ul style="list-style-type: none"> ○ Backup to RAM and move into /var/config directory ○ Reduce database in /var/config/ to one-fifth <ul style="list-style-type: none"> ▪ 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 <ul style="list-style-type: none"> ○ 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: <ul style="list-style-type: none"> • 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: <i>APN is obtained automatically from the Verizon network</i> | Enhancement GP-1596 MTX-4489 mPower 6.0.1 |

New 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

RADIO STATUS ⓘ

Module Information

IMEI
IMSI
Manufacturer
Model
MDN (Phone Number)
MSID
Firmware Version
ICCID

Service Information

Home Network
Current Network
RSSI
Service
Roaming
Tower 1BD4E05

User Interface

Web User Interface, status definition updates

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

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

New Features & Enhancements

| Web Interface, CELLULAR STATISTICS Page, terminology change | | Enhancement GP-1568 MTX-4460 GP-1595 mPower 6.0.1 | | | | | | | | | |
|--|-----------|---|--|---------------------|-------------------------------------|--|--|----------------|-----------|--|--|
| <table><tr><th colspan="2">Updated Definition in mPower 6.0.1</th><th>Previous Definition</th></tr><tr><th colspan="3">CELLULAR STATISTICS Page - Cellular</th></tr><tr><td>Cellular Trace</td><td colspan="2">PPP Trace</td></tr></table> <ul style="list-style-type: none">If cellular mode is PPP, Cellular Trace is only availableAssociated HELP files have also been updated to reflect these updatesIf cellular mode is WWAN, Cellular Trace is hidden | | Updated Definition in mPower 6.0.1 | | Previous Definition | CELLULAR STATISTICS Page - Cellular | | | Cellular Trace | PPP Trace | | |
| Updated Definition in mPower 6.0.1 | | Previous Definition | | | | | | | | | |
| CELLULAR STATISTICS Page - Cellular | | | | | | | | | | | |
| Cellular Trace | PPP Trace | | | | | | | | | | |
| Web Interface, CELLULAR STATISTICS Page <ul style="list-style-type: none">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 | | Enhancement GP-1568 MTX-4460 mPower 6.0.1 | | | | | | | | | |
| Web Interface, Login Page <ul style="list-style-type: none">During the login process, if connection to the device is lost, a new message is displayed <i>Network connection is not established.</i> <div><div><div>MULTITECH</div><div>mPower™ Edge Intelligence Conduit</div><div><div>XXXX</div><div>YYYY</div><div>Login</div></div></div><div><div>!</div><div>Network connection is not established.</div></div></div> | | Enhancement GP-1581 MTX-4473 mPower 6.0.1 | | | | | | | | | |
| Username and Password – Autocomplete is Disabled <ul style="list-style-type: none">Many configuration pages within mPower require username and password informationPrevious 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 userNOTE: this behavior differs based on web browser. Some web browsers will ignore these parameters and allow autocomplete to occur | | Enhancement GP-1582 MTX-4474 mPower 6.0.1 | | | | | | | | | |
| User Interface <ul style="list-style-type: none">In earlier versions of mPower, LoRa device CSV file uploads generate a cryptic error message when the CSV file ends with an empty lineIn mPower 6.0.1, CSV files that end with an empty line will no longer generate this message | | Enhancement TS-5112111 mPower 6.0.1 | | | | | | | | | |

New Features & Enhancements

| User Experience | |
|--|--|
| Material Design Icons Simplify the User Interface <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> Updated product images added to the First-Time Setup Wizard and Support Page | Enhancement GP-1371 MTX-4217 mPower 6.0.0 |

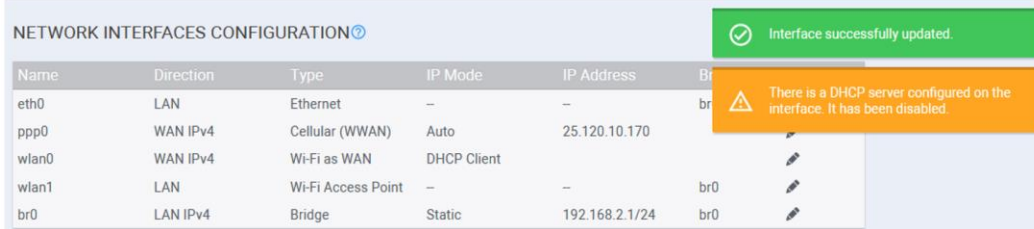
Operating System Updates

| | |
|--|--|
| Updated Yocto Version <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> Linux kernel updated to version 5.4 Previous versions of mPower used Linux kernel v4.9.240 | - mPower 6.0.0 |
| Updated Python <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> mPower 6.0.1 supports OpenSSL 1.1.1o Previous mPower versions supported OpenSSL 1.1.1n Additional information is available <ul style="list-style-type: none"> 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

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|---|---|
| <p>Continuous Ping</p> <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> Continuous Ping starts when the user clicks the Start Continuous Ping button <ol style="list-style-type: none"> The system starts pinging The button label changes to Stop Continuous Ping The message “Ping is in progress...” is displayed next to the button Continuous Ping stops when the user clicks the Stop Continuous Ping button <ol style="list-style-type: none"> The system stops pinging The button label changes to Start Continuous Ping The ping results are shown next to the Start Continuous Ping button API Changes <ul style="list-style-type: none"> api/stats/continuousPing - Continuous Ping status is stored in the “isRunning” field | <p>New Feature GP-1229 MTX-4033 MTX-4131 mPower 6.0.0</p> |
| <p>ICMP Keep Alive feature</p> <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> 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 | <p>New Feature GP-79 MTX-4167 mPower 6.0.0</p> |
| <p>Firewall Status Page</p> <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> iptables-filter.log iptables-nat.log iptables-save.log API Changes. The following API endpoints are added: <ul style="list-style-type: none"> https://192.168.2.1/api/firewall/downloadStatus https://192.168.2.1/api/firewall/status | <p>New Feature MTX-4106 mPower 6.0.0</p> |

Networking and Security

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| IPSec Tunnels <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> The system allows to specify multiple local networks and remote networks when configuring an IPSec tunnel API changes <ul style="list-style-type: none"> “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 <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> PPP-IP Pass-through Mode: <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> 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

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| <p>Service Statistics Enhancement</p> <p>The status for new services are added to the Service Statistics Page. Services and their possible statuses are listed below:</p> <p>SNMP Server</p> <ul style="list-style-type: none"> ○ SNMP Server is disabled ○ SNMP Server is running ○ SNMP Server is stopped <p>Security Violation</p> <ul style="list-style-type: none"> ○ 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) <p>Reverse SSH</p> <ul style="list-style-type: none"> ○ Reverse SSH service is disabled ○ Reverse SSH service is running ○ Reverse SSH service is stopped <p>MQTT Broker</p> <ul style="list-style-type: none"> ○ MQTT Broker service is disabled ○ MQTT Broker service is running ○ MQTT Broker service is stopped <p>Remote Management</p> <ul style="list-style-type: none"> ○ Displaying statuses from the Remote Management page <p>Continuous Ping</p> <ul style="list-style-type: none"> ○ Continuous Ping is running ○ Continuous Ping is disabled | <p>Enhancement</p> <p>GP-1295</p> <p>MTX-4142</p> <p>mPower 6.0.0</p> |
| <p>Web Server X.509 Certificate - Default details are updated</p> <ul style="list-style-type: none"> • The CN value in the default Web Server X.509 certificate is changed from ocg.example.com to mtx.example.com | <p>Enhancement</p> <p>GP-1247</p> <p>MTX-4058</p> <p>mPower 6.0.0</p> |
| <p>Firewall Settings Improvement</p> <ul style="list-style-type: none"> • Firewall “Normal Settings” is the default mode. This view was formerly “Advanced Settings” <ul style="list-style-type: none"> ○ Prerouting Rules ○ Input Filter Rules ○ Forward Filter Rules ○ Output Filter Rules • Firewall “Legacy Settings” now includes the following. This view was formerly “Normal Settings” <ul style="list-style-type: none"> ○ Port Forwarding ○ Input Filter Rules ○ Output Filter Rules | <p>Enhancement</p> <p>GP-1426</p> <p>MTX-4286</p> <p>mPower 6.0.0</p> |

Networking and Security

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| <p>IPsec, GRE, OpenVPN Tunnels - Enabled checkbox is moved to the tunnel configuration page</p> <ul style="list-style-type: none"> 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 | <p>Enhancement GP-1392 MTX-4255 mPower 6.0.0</p> |
| <p>SNMP Configuration Page - Network Address and Mask validation, IP address conversion to the Network address</p> <ul style="list-style-type: none"> 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 | <p>Enhancement GP-1468 MTX-4387 mPower 6.0.0</p> |
| <p>Network IP and Mask validation (GRE and IPsec Configuration)</p> <ul style="list-style-type: none"> 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 | <p>Enhancement GP-1453 GP-1287 MTX-4353 MTX-4118 mPower 6.0.0</p> |

Bug Fixes

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| <p>Reset to User Defined Defaults shall restore custom applications</p> <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> Device reboots overlays 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 | <p>Applications GP-1326 MTX-4154 mPower 6.0.0</p> |
| <p>libmts-io</p> <ul style="list-style-type: none"> 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 | <p>Hardware GP-114 MTX-4168 mPower 6.0.0</p> |
| <p>Rogers Wireless – Web Interface Update</p> <ul style="list-style-type: none"> 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 | <p>Hardware GP-1388 mPower 6.0.0</p> |
| <p>SMS - quotation mark character (Double universal) " is displayed with the backslash \ character in the received SMS message (like an escaped character)</p> <ul style="list-style-type: none"> 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 | <p>User Experience MTX-4359 mPower 6.0.0</p> |
| <p>Device UI inaccessible after firmware upgrade if User Authentication enabled</p> <ul style="list-style-type: none"> 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 | <p>User Experience GP-1301 MTX-4143 mPower 6.0.0</p> |

Bug Fixes

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|---|---|
| Cellular Radio Firmware Upgrade Changes <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> Customer unsuccessfully tried to setup a VPN connection using custom OVPN config file. Upon investigation the root cause was found in this string: <i>remote 20.191.55.208 1194 udp</i> If we split the string to these two, VPN connection works properly: <i>proto udp</i> <i>remote 20.191.55.208 1194</i> 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 <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> 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.

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Revision History

| Version | Author | Date | Change Description |
|---------|--------|------------|--|
| -001 | DT | 11/07/2023 | Initial Version mPower 6.3.1 and mPower 6.3.0 |