Software Release Notes

mPower® Edge Intelligence Software

Includes firmware version mPower 5.3.8s-s1

Models Impacted:

- MultiTech Conduit® Gateway
- MultiTech Conduit® IP67 200 Series Base Station
- MultiTech Conduit® IP67 Base Station
- MultiTech Conduit® AP Access Point

Overview

mPower™ Edge Intelligence is MultiTech's embedded software offering delivering programmability, network flexibility, enhanced security and manageability for scalable Industrial Internet of Things (IIoT) solutions. mPower Edge Intelligence simplifies integration with a variety of popular upstream IoT platforms to streamline edge-to-cloud data management and analytics, while also providing the programmability and processing capability to execute critical tasks at the edge of the network to reduce latency, control network and cloud services costs, and ensure core functionality – even in instances when network connectivity may not be available.

Notes

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

- Operating system updates
- New hardware supported
- New features
- Enhanced features
- Known behaviors
- Bug fixes
- Feature deprecations

Contents

Additional Resources:

- 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
- Security Advisories: http://www.multitech.com/landing-pages/security

mPower 5.3.8s-s1 Changelog and Overview

April 2022

Updates in mPower 5.3.8s-s1, from mPower 5.3.8 and mPower 5.3.7

OS Changes	New Hardware	New Features	Feature Enhancement	Known Behaviors	Bug Fixes	Deprecations	Schedule	Models Impacted	Upgrade Process

Operating System Component Updates (mPower 5.3.8s-s1)

Updated OpenSSL • OpenSSL updated to version 1.1.1n • Previous versions of mPower used OpenSSL 1.1.1b • Resolution to CVE-2022-0778 and other openSSL CVE (openSSL release notes) • MultiTech Security Advisories	GP-1535

Bug Fixes (mPower 5.3.8s-s1)

LoRa Network Server Update • Overview of Bug: In mPower 5.3.7 and mPower 5.3.8, JoinEUI using all zeros was not allowed • Overview of Fix: In mPower 5.3.8s-s1, JoinEUI using all zeros is allowed to indicate that a join server is not available • Example: App eui: 00-00-00-00-00-00-00-00	SP-5111000

Schedule (mPower 5.3.8s-s1)

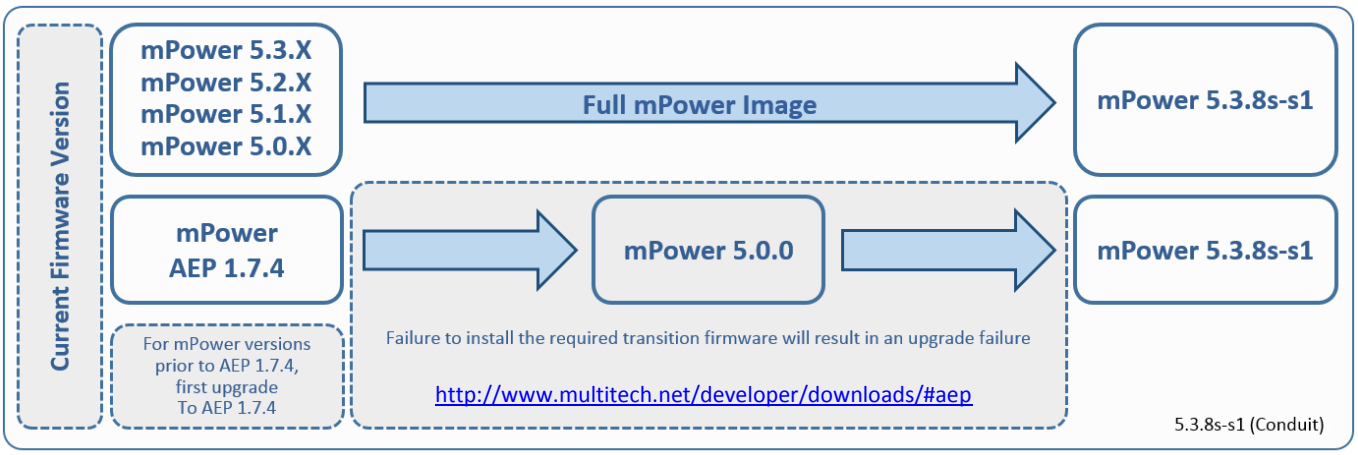
- Manufacturing Updates:
  - mPower 5.3.8s-s1 will start shipping from MultiTech starting in April 2022
- DeviceHQ
  - mPower 5.3.8s-s1 Availability: April 2022
- Downloadable Versions
  - mPower 5.3.8s-s1 Availability: April 2022
  - Visit http://www.multitech.net/developer/downloads/
- Differential Files:
  - Visit https://support.multitech.com/ to create a support case and request access to differential file updates

Models Impacted (mPower 5.3.8s-s1)

- MultiTech Conduit® Gateway
  - MTCDT-240A, MTCDT-246A, MTCDT-247A
  - MTCDT-L4E1, MTCDT-L4N1, MTCDT-LAT3, MTCDT-LAP3, MTCDT-LDC3, MTCDT-LSB3
- MultiTech Conduit® IP67 200 Series Base Station
  - MTCDTIP2-EN
  - MTCDTIP2-L4E1, MTCDTIP2-LNA3
- MultiTech Conduit® IP67 Base Station
  - MTCDTIP-266A, MTCDTIP-267A
  - MTCDTIP-L4E1, MTCDTIP-L4N1, MTCDTIP-LAP3, MTCDTIP-LDC3, MTCDTIP-LSB3
- MultiTech Conduit® AP Access Point
  - MTCAP-868, MTCAP2-868, MTCAP-915, MTCAP2-915
  - MTCAP-L4E1, MTCAP2-L4E1, MTCAP-LNA3, MTCAP2-LNA3

Upgrade Process (mPower 5.3.8s-s1)

To install mPower 5.3.8s-s1, the Conduit gateway must be upgraded to mPower 5.0.0 or higher. Customers that are running earlier versions of mPower should use the following upgrade process



mPower 5.3.8 Changelog and Overview

March 2022

Updates in mPower 5.3.8, from mPower 5.3.4b

OS Changes	New Hardware	New Feature	Feature Enhancement	Known Behaviors	Bug Fixes	Deprecations	Schedule	Models Impacted	Upgrade Process

CAUTION (mPower 5.3.8)

mPower 5.3.8 is only for use with the MTCDTIP2 devices. See Models Impacted for details.

Operating System Component Updates (mPower 5.3.8)

gpsd upgraded from 3.1.6 to 3.20 LoRa packet forwarder and LoRa gateway software now use gpsd 3.20 This resolves an issue in gpsd 3.16 • After week=2180 (October 23, 2021), gpsd time will jump back 1024 weeks (March 2002) • Also resolve issue related to an excessive number of satellite connections	[GP-972] [SP-5108754]

New Feature (mPower 5.3.8)

AT&T 3G Sunset – Impacts on 4G Devices
• mPower 5.3.8 includes important updates to the current cellular module firmware defaults. These changes will help avoid service interruption for certain MultiTech 4G products impacted by the impending AT&T 3G network sunset
  ○ Current cellular module default: CEMODE=1 (Voice Centric)
  ○ New cellular module default: CEMODE=2 (Data Centric)
• Overview of mPower 5.3.8 solution:
• Once a device is updated to mPower 5.3.8, the wireless carrier for the cellular module will be determined
• If the wireless carrier is AT&T, mPower 5.3.8 updates the cellular module firmware default
  ○ Current default: CEMODE=1 (Voice Centric)
  ○ New default: CEMODE=2 (Data Centric)
• If a wireless carrier other than AT&T is recognized (i.e. Verizon Wireless), no changes to the cellular module firmware defaults are made
• Additional Resources
  ○ AT&T Overview of 3G Sunset: https://iotdevices.att.com/att-iot/3GSunset.aspx
  ○ MultiTech Overview of AT&T 3G Sunset Impact on 4G Devices
	[GP-988]
	[GP-1111]

LoRaWAN AS923-4 Channel Plan for use in Israel
• Support for LoRaWAN operation in Israel has been added
  ○ Channel Plan: AS923-4
  ○ Band/Channels: 917 – 920 MHz
  ○ LoRaWAN Regional Parameters RP2-1.0.3
	[GP-1218]

Feature Enhancement (mPower 5.3.8)

Updates to AS923-4 (Israel) Channel Plan • Duty cycle increased to 10% when Israel channel plan is selected	[GP-1355]

Bug Fix (mPower 5.3.8)

Gateway Not Sending LoRa Packets • In isolated situations, the MTCDTIP2 stops sending LoRa packets after a packet forwarder restart • Identified when LBT is enabled	[SP-5109775]
LoRa Packet Forwarder (LPF) Update 1: • Overview of LPF Bug: Packet transmit with duration above 370ms is blocked when LBT with scan time 128 us is enabled (AS923 – Country Selection JAPAN2) • Overview of LPF Bug Fix: Maximum packet duration is 400ms when TxDwellTime is enabled which is required for AS923 – Country Selection JAPAN2	[GP-1288] [SP-5107009]
LoRa Packet Forwarder (LPF) Update 2: • Overview of LPF Bug: Packet Forwarder may stop blocking transmissions when LBT is enabled. This situation may take a few weeks to occur (Seen in mPower 5.3.3 and prior versions) • Overview of LPF Bug Fix: mPower 5.3.8 periodically restarts the LPF. Process monitor forces an exit and restart of the process. (NOTE: Earlier mPower versions would hangup when trying to exit gracefully	[GP-1288] [SP-5107009]

Schedule (mPower 5.3.8)

- Manufacturing Updates:
  - mPower 5.3.8 will start shipping from MultiTech starting in March 2022
- DeviceHQ
  - mPower 5.3.8 Availability: March 2022
- Downloadable Versions
  - mPower 5.3.8 Availability: March 2022
  - Visit http://www.multitech.net/developer/downloads/
- Differential Files:
  - Visit https://support.multitech.com/ to create a support case and request access to differential file updates

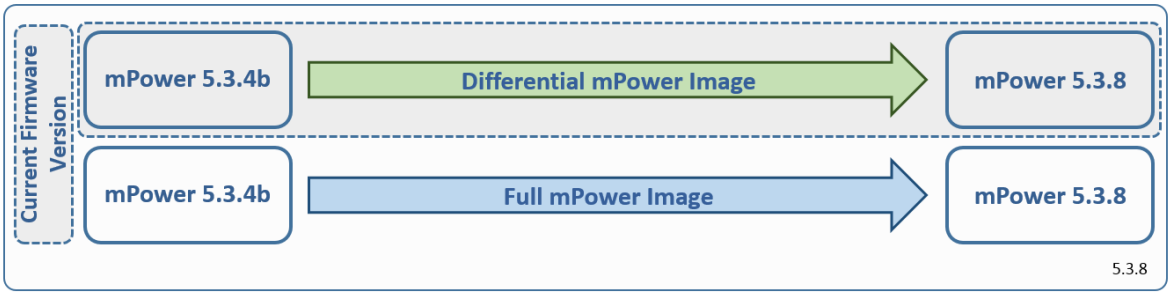
Models Impacted (mPower 5.3.8)

MultiTech Conduit® IP67 200 Series Base Station

	-B11EKP (EU868 Models)		-B11UKP (US915 Models)	
	-D1M Internal LoRa Antenna	-LIM External LoRa Antenna	-D1M Internal LoRa Antenna	-LIM External LoRa Antenna
MTCDTIP2-EN	•	•		•
MTCDTIP2-L4E1	•	•		
MTCDTIP2-LNA3				•

Upgrade Process (mPower 5.3.8)

Initial MTCDTIP2- device shipments included mPower 5.3.4b. Upgrades to mPower 5.3.8 can be done in two ways:



mPower 5.3.7 Changelog and Overview

February 2022

Updates in mPower 5.3.7, from mPower 5.3.7-RC3

OS Changes	New Hardware	New Feature	Feature Enhancement	Known Behaviors	Bug Fixes	Deprecations	Schedule	Models Impacted	Upgrade Process

New Hardware Support (mPower 5.3.7)

Support for MTCDT-246A and MTCDT-247A devices with substitute components Hardware version MTCDT-0.2	-
Support for MTCDTIP-266A and MTCDTIP-267A devices with substitute components Hardware version MTCDTIP-0.1	-

Feature Enhancement (mPower 5.3.7)

Updated WiFi driver (EN 300 328 V2.2.2 standard)	-

Known Behavior (mPower 5.3.7)

When MTAC-ETH cards are used in an MTCDT- device, mPower may identify the Ethernet ports differently, depending on the accessory card slot used and the number and type of MTAC cards used:

AP1	mPower	AP2	mPower
MTAC-ETH	ETH1	MTAC-ETH	ETH2
MTAC-ETH	ETH1	None	-
None	-	MTAC-ETH	ETH1
Other(*)	-	MTAC-ETH	ETH1

(*) MTAC-LORA-H, MTAC-GPIO, MTAC-MTSER, MTAC-XDOT

-

Bug Fix (mPower 5.3.7)

LoRa Gateway (LG)

- Issue identified in mPower 5.3.7-RC3
- Issues were identified in Class B deployments and Class B was not recommended
- Issue resolved in mPower 5.3.7

-

Schedule (mPower 5.3.7)

- Manufacturing Updates:
  - Devices that ship from MultiTech starting in February 2022 will include mPower 5.3.7
  - See part numbers impacted for details
- DeviceHQ
  - MTCDT 5.3.7 Availability: February 2022
- Downloadable Versions
  - MTCDT 5.3.7 Availability: February 2022
  - Visit http://www.multitech.net/developer/downloads/
- Differential Files:
  - Visit https://support.multitech.com/ to create a support case and request access to differential file updates

Models Impacted (mPower 5.3.7)

MultiTech Conduit® Gateway

- Hardware version MTCDT-0.2 (substitute components)
- Hardware version MTCDT-0.1 (original design)

	-240A			-246A				-247A			
	#	-868	-915	#	-868	-915	-923	#	-868	-915	-923
MTCDT	•			•	•	•		•	•	•	
MTCDT-L4E1		•		•	•	•		•	•	•	
MTCDT-L4G1				•	•	•		•	•	•	
MTCDT-L4N1	##		•	•		•		•		•	
MTCDT-LAP3				•		•					
MTCDT-LAT3											
MTCDT-LDC3											
MTCDT-LSB3											
MTCDT-LVW3											

(#) Models with no MultiTech mCard™ LoRa Gateway Accessory Cards

(##) Models with MultiTech mCard model MTAC-ETH

MultiTech Conduit® IP67 Base Station

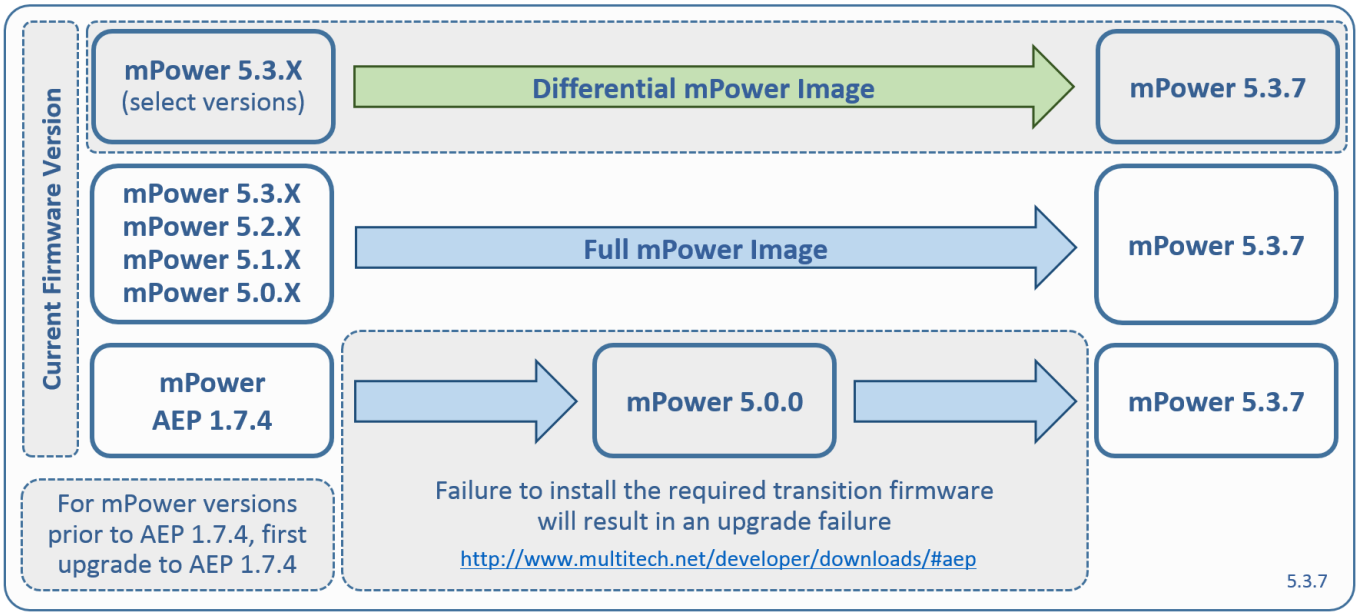
- Hardware version MTCDTIP-0.1 (substitute components)
- Hardware version MTCDTIP-0.0 (original design)

	-266A			-267A			-270A			-275A		
	-868*	-915*	-923*	-868*	-915*	-923*	-868*	-915*	-923*	-868*	-915*	-923*
MTCDTIP	•	•		•	•							
MTCDTIP-L4E1	•	•		•								
MTCDTIP-L4G1	•	•		•	•							
MTCDTIP-L4N1		•			•							
MTCDTIP-LAP3		•			•							
MTCDTIP-LDC3												
MTCDTIP-LSB3												

(*) Includes models with one or two MultiTech mCard™ LoRa Gateway Accessory Cards

Upgrade Process (mPower 5.3.7)

To install mPower 5.3.7, the Conduit gateway must be upgraded to mPower 5.0.0 or higher. Customers that are running earlier versions of mPower should use the following upgrade process



mPower 5.3.7-RC3 Changelog and Overview

January 2022

Updates in mPower 5.3.7-RC3, from mPower 5.3.7-RC1

OS Changes	New Hardware	New Feature	Feature Enhancement	Known Behaviors	Bug Fixes	Deprecations	Schedule	Models Impacted	Upgrade Process

CAUTION (mPower 5.3.7-RC3)

mPower 5.3.7-RC3 is only for use with the MTCDT and MTCDTIP devices with substitute components

Operating System Component Updates (mPower 5.3.7-RC3)

gpsd upgraded from 3.1.6 to 3.20 LoRa packet forwarder and LoRa gateway software now use gpsd 3.20 This resolves an issue in gpsd 3.16 • After week=2180 (October 23, 2021), gpsd time will jump back 1024 weeks (March 2002) • Also resolve issue related to an excessive number of satellite connections	[GP-972] [SP-5108754]

New Hardware Support (mPower 5.3.7-RC3)

Support for MTCDT-266A devices with substitute components Hardware version MTCDT-0.2	-

Feature Enhancement (mPower 5.3.7-RC3)

Downgrade Protection
• mPower 5.3.7-RC3 includes a means of identifying MTCDT (MTCDT-0.2) and MTCDTIP (MTCDTIP-0.1) devices with substitute components and limits the version of mPower that customers can use
  ○ Devices with substitute components can only be used with mPower 5.3.7-RC3 and later
  ○ Future mPower versions will not allow MTCDT-0.2 and MTCDTIP-0.1 devices with substitute components to downgrade to versions of mPower prior to mPower 5.3.7-RC3
• The downgrade protection feature prevents customers from downgrading devices to an unsupported version of mPower software
• DeviceHQ includes a similar feature that prevents customers from downgrading devices to an unsupported version of mPower software
• Error Messages: If a user attempts to downgrade a device with substitute components to an incompatible firmware version, an error message will be displayed:
  ○ Downgrade using API Command:
  "Firmware check failed. Invalid firmware version for [MTCDT-0.2] hardware."
  "Firmware check failed. Invalid firmware version for [MTCDTIP-0.1] hardware."
  ○ Downgrade using DeviceHQ:
  "Software check failed. Invalid firmware version for [MTCDT-0.2] hardware."
  "Software check failed. Invalid firmware version for [MTCDTIP-0.1] hardware."
	[GP-1386]

Updates to AS923-4 (Israel) Channel Plan • Duty cycle increased to 10% when Israel channel plan is selected	[GP-1355]

Known Behavior (mPower 5.3.7-RC3)

LoRa Gateway (LG) • LG updated to v5.0.10. Issues identified in Class B deployments. Class B not recommended • Issue resolved in mPower 5.3.7	-

Bug Fix (mPower 5.3.7-RC3)

SD Card Performance • When an SD card is used for storage or custom application development, the SD card is not always recognized • Identified in mPower 5.3.7-RC1 • Resolved in mPower 5.3.7-RC3	-
Gateway Not Sending LoRa Packets • In isolated situations, the MTCDT stops sending LoRa packets after a packet forwarder restart • Identified in mPower 5.3.5, when LBT is enabled • Resolved in mPower 5.3.7-RC3	[SP-5109775]

Schedule (mPower 5.3.7-RC3)

- Manufacturing Updates:
  - Devices that ship from MultiTech starting in January 2022 will include mPower 5.3.7-RC3
  - See part numbers impacted for details

Models Impacted (mPower 5.3.7-RC3)

- MultiTech Conduit® Gateway
  - MTCDT-240A, MTCDT-246A-868. MTCDT-246A-915, MTCDT-246A-923
  - MTCDT-L4E1, MTCDT-L4N1, MTCDT-LAP3
  - Substitute component build (hardware version MTCDT-0.2) only. Functionality of MTCDT devices with original components (hardware version MTCDT-0.1) has not been verified
- MultiTech Conduit® IP67 Base Station
  - MTCDTIP-266A
  - MTCDTIP-L4E1, MTCDTIP-L4N1, MTCDTIP-LAP3
  - Substitute component build (hardware version MTCDTIP-0.1) only. Functionality of MTCDTIP devices with original components (hardware version MTCDTIP-0.0) has not been verified

Upgrade Process (mPower 5.3.7-RC3)

mPower 5.3.7-RC3 is only for use on devices with substitute components that ship from MultiTech. There is no approved upgrade process for devices with original components

mPower 5.3.7-RC1 Changelog and Overview

December 2021

Updates in mPower 5.3.7-RC1, from mPower 5.3.5

OS Changes	New Hardware	New Feature	Feature Enhancement	Known Behaviors	Bug Fixes	Deprecations	Schedule	Models Impacted	Upgrades

CAUTION (mPower 5.3.7-RC1)

mPower 5.3.7-RC1 is only for use with the MTCDT devices with substitute components

Operating System Component Updates (mPower 5.3.7-RC1)

gpsd upgraded from 3.1.6 to 3.20 LoRa packet forwarder and LoRa gateway software now use gpsd 3.20 This resolves an issue in gpsd 3.16 • After week=2180 (October 23, 2021), gpsd time will jump back 1024 weeks (March 2002) • Also resolve issue related to an excessive number of satellite connections	[GP-972] [SP-5108754]

New Hardware Support (mPower 5.3.7-RC1)

Support for MTCDT devices with substitute components Hardware version MTCDT-0.2	-

Feature Enhancement (mPower 5.3.7-RC1)

Downgrade Protection
• mPower 5.3.7-RC1 includes a means of identifying MTCDT devices with substitute components (MTCDT-0.2) and limits the version of mPower that customers can use
  ○ Devices with substitute components can only be used with mPower 5.3.7-RC1 and later
  ○ Future mPower versions will not allow MTCDT devices with substitute components to downgrade to versions of mPower prior to mPower 5.3.7-RC1
  ○ See part numbers impacted for a complete list of models impacted
• The downgrade protection feature prevents customers from downgrading the MTCDT device to an unsupported version of mPower software
• DeviceHQ includes a similar feature that prevents customers from downgrading the MTCDT device to an unsupported version of mPower software
• Error Messages: If a user attempts to downgrade the MTCDT with substitute components to an incompatible firmware version, an error message will be displayed:
  ○ Downgrade using API Command:
  "Firmware check failed. Invalid firmware version for [MTCDT-0.2] hardware."
  ○ Downgrade using DeviceHQ:
  "Software check failed. Invalid firmware version for [MTCDT-0.2] hardware."
	[GP-1386]

Schedule (mPower 5.3.7-RC1)

- Manufacturing Updates:
  - Devices that ship from MultiTech starting in December 2021 will include mPower 5.3.7-RC1

Models Impacted (mPower 5.3.7-RC1)

  - MultiTech Conduit® Gateway, MTCDT-LAT3-240A
  - Substitute component build (hardware version MTCDT-0.2) only. Functionality of MTCDT devices with original components (hardware version MTCDT-0.1) has not been verified

mPower 5.3.5 Changelog and Overview

October 2021

Updates in mPower 5.3.5, from mPower 5.3.3

OS Changes	New Hardware	New Feature	Feature Enhancement	Known Behaviors	Bug Fixes	Deprecations	Schedule	Models Impacted	Upgrades

New Hardware Support (mPower 5.3.5)

Support for –L4G1 radio (Quectel EG25-G). Models impacted MTCDT-L4G1, MTCDTIP-L4G1	-
MTCAP2 Support for MTCAP2 devices with battery backup capability	-

New Feature (mPower 5.3.5)

AT&T 3G Sunset – Impacts on 4G Devices
• mPower 5.3.5 includes important updates to the current cellular module firmware defaults. These changes will help avoid service interruption for certain MultiTech 4G products impacted by the impending AT&T 3G network sunset
  ○ Current cellular module default: CEMODE=1 (Voice Centric)
  ○ New cellular module default: CEMODE=2 (Data Centric)
• Overview of mPower 5.3.5 solution:
• Once a device is updated to mPower 5.3.5, the wireless carrier for the cellular module will be determined
• If the wireless carrier is AT&T, mPower 5.3.5 updates the cellular module firmware default
  ○ Current default: CEMODE=1 (Voice Centric)
  ○ New default: CEMODE=2 (Data Centric)
• If a wireless carrier other than AT&T is recognized (i.e. Verizon Wireless), no changes to the cellular module firmware defaults are made
• Additional Resources
  ○ AT&T Overview of 3G Sunset: https://iotdevices.att.com/att-iot/3GSunset.aspx
  ○ MultiTech Overview of AT&T 3G Sunset Impact on 4G Devices
	[GP-988]
	[GP-1111]

New Feature (mPower 5.3.5)

Current SIM and Advanced Carrier Configuration
• In mPower 5.3.5, the system detects SIM card details (IMSI and MCC/MNC) and this data is available on the **Cellular Configuration** page under the **Current SIM** pane.
• For –L4E1, -L4N1, -LAT3, -LAP3, -LDC3, -LNA3, and -LSB3 modems, the IMSI and MCC/MNC values are read-only and are not used by the carrier detection mechanism
• For –L4G1 modems the **Advanced Carrier Configuration** feature that allows the user to configure the UE Mode of Operation manually, is implemented.
  ○ User can manually set the UE Mode of Operation for a SIM card with a specified PLMN ID (MCC/MNC). If the system detects that the MCC/MNC set by user in the Advanced Carrier Configuration corresponds to the MCC/MNC of the SIM card, the system applies UE Mode of Operation that is specified by the user.
  ○ If the user sets MCC/MNC that does not correspond to the SIM card, then the system ignores Advanced Carrier Configuration and changes the UE Mode of Operation to CS/PS Mode 2 if the MCC/MNC belongs to AT&T.
  ○ If the user **enables Advanced Carrier Configuration** and sets the **UE Mode of Operation** to **Auto**, the system verifies if the MCC/MNC belongs to AT&T. If AT&T is detected, the system sets **CS/PS Mode 2**; if MCC/MNC is **NOT** AT&T, then the system leaves the actual UE Mode of Operation without changes.
	GP-1111
	MTX-4121

LoRaWAN AS923-4 Channel Plan for use in Israel
• Support for LoRaWAN operation in Israel has been added
  ○ Channel Plan: AS923-4
  ○ Band/Channels: 917 – 920 MHz
  ○ LoRaWAN Regional Parameters RP2-1.0.3
	[GP-1218]

Bug Fix (mPower 5.3.5)

LoRa Packet Forwarder (LPF) Update 1: • Overview of LPF Bug: Packet transmit with duration above 370ms is blocked when LBT with scan time 128 us is enabled (AS923 – Country Selection JAPAN2) • Overview of LPF Bug Fix: Maximum packet duration is 400ms when TxDwellTime is enabled which is required for AS923 – Country Selection JAPAN2	[GP-1288] [SP-5107009]
LoRa Packet Forwarder (LPF) Update 2: • Overview of LPF Bug: Packet Forwarder may block transmissions when LBT is enabled. This situation may take a few weeks to occur (Seen in mPower 5.3.3 and prior versions) • Overview of LPF Bug Fix: mPower 5.3.5 periodically restarts the LPF. Process monitor forces an exit and restart of the process. (NOTE: Earlier mPower versions would hangup when trying to exit gracefully	[GP-1288] [SP-5107009]

Bug Fix (mPower 5.3.5)

DeviceHQ/Node-RED Application Update • Overview of Bug: I. DeviceHQ/Node-RED application is installed on a device with mPower 5.3.3. The application is now available in the user interface II. User sets "Set Current Configuration as User-Defined Default" with " Enable Reset to User-Defined Default" enabled III. After configuration changes are made and user defined defaults is set, select "Save & Apply" IV. Reboot the device V. After reboot is complete, DeviceHQ/Node-RED application is no longer available • Overview of Fix: Customers interested in using the DeviceHQ/Node-RED application should upgrade to mPower 5.3.5 to ensure that application is retained after user-defined default of device	[GP-1276] [SP-5105628]

Schedule (mPower 5.3.5)

mPower 5.3.5 is available for download only

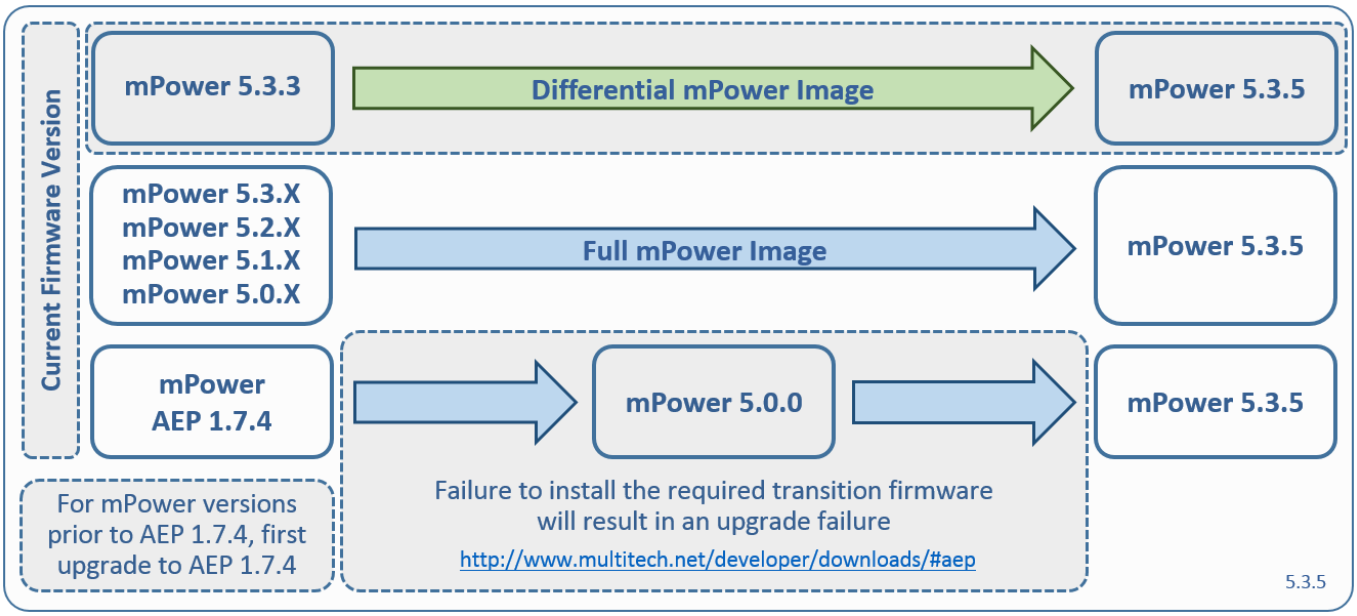
- DeviceHQ
  - MTCAP 5.3.5 Availability: October 2021
  - MTCDT 5.3.5 Availability: October 2021
- Downloadable Versions
  - MTCAP 5.3.5 Availability: October 2021
  - MTCDT 5.3.5 Availability: October 2021
  - Visit http://www.multitech.net/developer/downloads/

Models Impacted (mPower 5.3.5)

- MultiTech Conduit® Gateway
  - MTCDT-240A, MTCDT-246A, MTCDT-247A
  - MTCDT-L4E1, MTCDT-L4N1, MTCDT-LAT3, MTCDT-LAP3, MTCDT-LDC3, MTCDT-LSB3
- MultiTech Conduit® IP67 200 Series Base Station
  - MTCDTIP2-EN
  - MTCDTIP2-L4E1, MTCDTIP2-LNA3
- MultiTech Conduit® IP67 Base Station
  - MTCDTIP-266A, MTCDTIP-267A
  - MTCDTIP-L4E1, MTCDTIP-L4N1, MTCDTIP-LAP3, MTCDTIP-LDC3, MTCDTIP-LSB3
- MultiTech Conduit® AP Access Point
  - MTCAP-868, MTCAP2-868, MTCAP-915, MTCAP2-915
  - MTCAP-L4E1, MTCAP2-L4E1, MTCAP-LNA3, MTCAP2-LNA3

Upgrade Process (mPower 5.3.5)

To install mPower 5.3.5, the gateway must be upgraded to mPower 5.0.0 or higher. Customers that are running earlier versions of mPower should use the following upgrade process:



mPower 5.3.4b Changelog and Overview

May 2021

Updates in mPower 5.3.4b, from mPower 5.3.3

OS Changes	New Hardware	New Feature	Feature Enhancement	Known Behaviors	Bug Fixes	Deprecations	Schedule	Models Impacted	Upgrade Process

CAUTION (mPower 5.3.4b)

mPower 5.3.4b is only for use with the MTCDTIP2 devices

New Hardware Support (mPower 5.3.4b)

MultiTech Conduit® IP67 200 Series Base Station. New devices launched include mPower 5.3.4b • https://www.multitech.com/brands/conduit-ip67-200	-

Known Behavior (mPower 5.3.4b)

gpsd 3.1.6 encounters an issue and rolls back the clock to March 2002. • After week=2180 (October 23, 2021), gpsd time will jump back 1024 weeks (March 2002)	[GP-972] [SP-5108754]

Schedule (mPower 5.3.4b)

- Manufacturing Updates:
  - Devices that ship from MultiTech starting in May 2021 include mPower 5.3.4b
  - See part numbers impacted for details

Models Impacted (mPower 5.3.4b)

- MultiTech Conduit® IP67 200 Series Base Station
  - MTCDTIP2-EN
  - MTCDTIP2-L4E1, MTCDTIP2-LNA3

Upgrade Process (mPower 5.3.4b)

mPower 5.3.4b is only for use on MTCDTIP2 devices that ship from MultiTech. There is no approved upgrade process

mPower 5.3.3 Changelog and Overview

March 2021

Updates in mPower 5.3.3, from mPower 5.3.0

OS Changes	New Hardware	New Feature	Feature Enhancements	Known Behaviors	Bug Fixes	Deprecations	Schedule	Models Impacted	Upgrades

New Hardware Support (mPower 5.3.3)

MultiTech Conduit® AP Access Point – Power over Ethernet models • https://www.multitech.com/documents/publications/data-sheets/86002211.pdf	-
MultiTech Conduit® IP67 200 Series Base Station • https://www.multitech.com/brands/conduit-ip67-200	-

New Features (mPower 5.3.3)

Node-RED Custom Application — [GP-1276] [SP-5105628]

- A separate custom application has been developed. The user can install using DeviceHQ or the web interface:
  - DeviceHQ:
    - Within DeviceHQ, the following application is available for download: **node-red-app 0.15.3-r64.2**
  - Web Interface:
    - Visit https://support.multitech.com/ to create a support case and request access to the Node-RED Custom Application
- The Node-RED custom application includes 8 packages that are installed within the application, so the installation process will take up to 15 minutes and a reboot will be required when all packages are installed

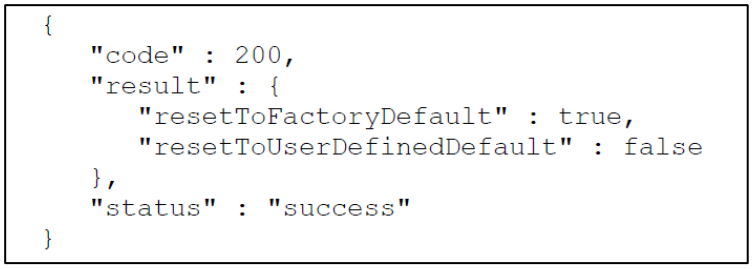
Package Name	Version
node-red-stub	1.0-r0.0
node-red-stunnel	0.1-r3.0
node-red	0.15.3-r64.0
nodejs-npm	0.10.48-r2.7.0
nodejs	0.10.48-r2.7.0
python-compiler	2.7.15-r1.0
python-misc	2.7.15-r1.0
python-multiprocessing	2.7.15-r1.0

- The system supports deleting any package manually, but this will cause failure of the Node-RED application
- As soon as the custom application is installed and Node-RED starts, the user can launch Node-RED and work with Node-RED applications
- The Node-RED application is statically linked with OpenSSL 1.0
- All other applications will only be able to use OpenSSL 1.1

New Features (mPower 5.3.3)

Updated Reset Behavior
• Save and Restore Configuration page changes
  ○ Factory Default and User-Defined default panes have been added. These options are not dependent on each other
  ○ Now it is possible to reset the configuration to factory defaults when the user-defined default configuration is set
  ○ Factory Default: Reset to factory default configuration
  ○ User-Defined Default: Three options available:
  1. Reset to User-Defined Configuration
  2. Set current Configuration as User-Defined Default
  3. Clear user-Defined Default
  ○ Reset Button Configuration: Four options available
  1. Enable Reset to Factory Default. When the RESET button is held for 5 seconds or more, the unit will be reset to the factory default settings
  2. Enable Reset to User-Defined Default. When the RESET button on the device is held for 5 seconds or more, the unit will be reset to the user-defined default settings
  3. If both Factory Default and User-Defined Default are enabled:
  ▪ If the button is pressed for between zero and 5 seconds the device will perform a soft reset
  ▪ If the button is pressed for 5 to 30 seconds, the device will perform a User-Defined Default reset
  ▪ If the reset button is pressed for greater than 30 seconds a Factory Default reset will be performed
  4. If no option is selected. The RESET button will always restart the system and will not allow you to restore the unit to factory or user-defined default
• Once the RESET Button Configuration is changed, the user must first submit the changes, followed by a confirmation message
• Once the user confirms the RESET Button Configuration, the changes are applied immediately. The device does not need to be rebooted for this change to be applied
	[GP-775]

New Features (mPower 5.3.3)

Reset to Factory Default changes
• The Web server self-signed certificate and SSH certificates are generated every time during factory reset
• The following items are removed and/or regenerated during the factory reset:
  ○ Web Server CA Certificate is deleted and new certificate is generated (new behavior)
  ○ SSH certificates are removed and new certificates are generated (new behavior)
  ○ User Defined Defaults configuration is deleted (if set)
  ○ Root CA certificates are deleted
  ○ Custom applications are deleted
  ○ Custom image, favicon and logo are deleted
  ○ Custom Applications are REMOVED when the user resets the system to USER-DEFINED DEFAULT or restores the configuration from file
• Reset Button Configuration
  ○ Reset Button Configuration is a new feature. New settings that allow to enable and disable reset to factory and user-defined configuration are implemented
  ○ RESET Button Configuration pane is added to the Save and Restore Configuration page. By default, the option “Enable Reset to Factory Default” is enabled, and “Enable Reset to User-Defined Default” is disabled. This configuration corresponds to the default settings in the Release 5.3.0 and older versions
  ○ The changes are available in **/api/resetButton:**
 
`{`
`"code" : 200,`
`"result" : {`
`"resetToFactoryDefault" : true,`
`"resetToUserDefinedDefault" : false`
`},`
`"status" : "success"`
`}`
	-

New Features (mPower 5.3.3)

Added support for LoRa Basics Station from Semtech, a LoRa packet forwarder which can be remotely managed by a configuration and update server (CUPS)
https://github.com/lorabasics/basicstation
• Features Include:
  ○ Ready for LoRaWAN Classes A, B, and C
  ○ Unified Radio Abstraction Layer supporting Concentrator Reference Designs v1.5 and v2
  ○ Powerful Backend Protocols
  ▪ Centralized update and configuration management
  ▪ Centralized channel-plan management
  ▪ Centralized time synchronization and transfer
  ▪ Various authentication schemes (client certificate, auth tokens)
  ▪ Remote interactive shell
  ○ Lean Design
  ▪ No external software dependencies (except mbedTLS and libloragw/-v2)
  ▪ Portable C code, no C++, dependent only on GNU libc
  ▪ Easily portable to Linux-based gateways and embedded systems
  ▪ No dependency on local time keeping
  ▪ No need for incoming connections
	[GP-98]
	[GP-687]

Firmware supports updates using differential updates • Firmware releases following mPower 5.3.3 can be made using a differential update image • When new mPower firmware versions are released, customers can update their devices using the full firmware image (today's solution) or using a differential update image • The differential update image only contains updates to the firmware code that has changed • The differential update image can be uploaded to the device faster than the full firmware image, reducing bandwidth and using less cellular data	[GP-445]
Support for updated AS923 frequency plans • AS923-1: AS923_FREQ_OFFSET_HZ = 0 .0 MHz (formerly known as AS923) • AS923-2: AS923_FREQ_OFFSET_HZ = -1.80 MHz • AS923-3: AS923_FREQ_OFFSET_HZ = -6.60 MHz	[GP-714]
Package management and updates added to administrative settings • Using DeviceHQ and mPower version 5.3 or later, customers can perform a package-based upgrade • Useful for delivering any security patches without rolling out a new firmware image	[GP-57] [CP-19]

Feature Enhancement (mPower 5.3.3)

Cellular radio firmware upgrades added for the following cellular radios
• MTCDT-L4N1, MTCDTIP-L4N1 (Telit LE910C4-NF)
• MTCDT-L4E1, MTCDTIP-L4E1 (Telit LE910C4-EU)
• There are two types of radio firmware upgrades:
  ○ Full Firmware Image Upgrade: When applied, the full firmware update replaces the current firmware image with the new image of the new version
  ○ Delta Firmware Upgrade: When applied, the current firmware image is updated with the differences between it and the new version, and effectively becomes the new version of firmware
	[GP-615]
	[GP-397]

Cellular Radio Registration • Cellular connection status monitoring is updated to identify a condition where the cell modem can be set to a persistent "Do Not Register" (COPS:2) • This condition may be set by the carrier, cellular module status detection, or other mechanisms • Now, when "Do Not Register" condition is met, mPower automatically resets the modem configuration (COPS:0) and attempts to recover the cellular connection • This change will allow the cellular radio to attempt a reconnection to the network and will not rectify the carrier blocking connection through account issues or carrier availability issues	[MTX-3604] [GP-804]
Cellular radio status updated to include additional details. Updates reported in the Web UI. • RSRP – LTE Signal Strength. Average power received from a single reference signal • RSRQ – LTE Signal Quality. Signal-to-noise ratio for a given signal • RSSI – Relative Received Signal Strength. Power level received by the cellular radio after the antenna and possible cable loss • Service Domain – CS domain (video/voice service) and PS domain (data service) available	[GP-310]
Includes the following LoRa Network Server behavior: • The Join Nonce Table saves nonce values from every join request from known end-devices • When end-devices cannot join, the database grows in size due to the ongoing join requests • LoRa Network Server is upgraded to version 2.3.12	-
Includes the following LoRa Network Server improvement: • The Join Nonce Table records join requests as a counter, and only the last nonce value is saved • This limits the size of the database, because the table is limited to one row per end-device • LoRa Network Server is upgraded to version 2.4.22-r0.0	-
Includes updates to Save/Restore Configuration • When there are pending changes that have not been saved to the database, a confirmation pop up message is displayed • In previous versions of mPower, when there are pending changes that have not been saved to the database, a warning message is displayed	[MTX-3607] [GP-809]

Feature Enhancement (mPower 5.3.3)

Wi-Fi as WAN • Wi-Fi as WAN is enabled, even though Wi-Fi Access Point and BLE or Bluetooth-IP and BLE are enabled • The validation on the Wi-Fi as WAN page shall be implemented and the following error messages shall be displayed: ○ *Wi-Fi as WAN cannot be enabled because Wi-Fi Access Point and Bluetooth Low Energy are enabled.* ○ *Wi-Fi as WAN cannot be enabled because Bluetooth-IP and Bluetooth Low Energy are enabled.*	[MTX-1301]
User-Defined Defaults • In mPower 5.2.X, setting the user-defined defaults requires a system reboot • In mPower 5.3.3, user-defined defaults are applied successfully without a reboot. Reboot is not needed.	MTX-3608 GP-810

Known Behavior (mPower 5.3.3)

LoRa Class C Devices • With four or more LoRa Class C end devices, the downlink gets stuck in the server queue after 20 minutes • Visit https://support.multitech.com/ to create a support case	[SP-5110772]

Bug Fix (mPower 5.3.3)

mts-io - kernel Oops on no-radio devices Model Numbers Impacted by Bug Fix: Ethernet only models Overview of Bug: • This issue manifests itself as a Linux kernel Oops and is a direct result of a bug in the mts-io kernel module • The exact place in the kernel that the Oops backtrace would point to varies due to the fact that this issue results from writing beyond the end of an array in the code of the mts-io kernel module" Overview of Bug Fix: mPower 5.3.3 has been updated to overcome this critical bug	[SP-5103807]
Call Home does not deploy device configuration • Overview of Bug: This defect was introduced when Call Home configuration settings were added to Web UI in Release 5.1. This defect is NOT ALWAYS reproducible. Actual result: the device obtained a DeviceHQ key and has remote management enabled. The configuration was uploaded to the device (according to DeviceHQ and debug console), but was not applied • Overview of Bug Fix: Resolved. The device obtained DeviceHQ key and has remote management enabled. The configuration was uploaded and applied to the device successfully	[MTX-3501]
Radio Firmware Upgrade - Remote Management • Overview of Bug: On a cellular device, when the only WAN is cellular, the annex client cannot send the status during a radio firmware upgrade because the WAN is down and the annex client sends a message to DeviceHQ at the moment when the radio modem is not connected • Overview of Bug Fix: Resolved. The annex client sends a response to DHQ as soon as the radio firmware upgrade image is downloaded successfully and validated by the device. If the file is considered as valid, annex-client sends the response to DeviceHQ server, and only after that the radio firmware upgrade process starts	[MTX-3606] [GP-808]

Bug Fix (mPower 5.3.3)

Bluetooth • Overview of Bug: Bluetooth does not reconnect when resetting Bluetooth, or changing Bluetooth-IP settings • Overview of Bug Fix: Resolved	[MTX-3611] [GP-817]
LoRa AS923 with Listen Before Talk Updates Model Numbers Impacted by Bug Fix: • Japan models: Conduit Gateway and Conduit IP67 Base Station • Korea Models: Conduit Gateway and Conduit IP67 Base Station Overview of Bug: 1. Bug has been identified in mPower 5.2.1 and mPower 5.3.0 2. Bug has also been fixed in mPower 5.2.5 3. A combination of FPGA code, LoRa Packet Forwarder, and LoRa Network Server performance results in LoRa sensors not being able to join the network 4. Listen-Before-Talk FPGA Bug • An issue has been identified with the v.33 firmware used in the MultiTech mCard™ gateway accessory card • After several hours of operations, the gateway stops blocking transmissions when an interfering signal is present 5. Listen-Before-Talk Packet Forwarder Bug • After several days of operation, the gateway is not able to transmit packets and end-devices do not receive the LoRaWAN acknowledgement (ACK) from the network server • When the end-devices do not receive the LoRaWAN ACK messages from the network server, the end-devices start to send new join requests • These repeated join requests impact the LoRa Network Server performance (see below) due to the rejected join requests • Packet Forwarder version: 4.0.1-r32.0 6. LoRa Network Server Performance • The Join Nonce Table saves nonce values from every join request from known end-devices • When end-devices cannot join because of the above packet forwarder bug, the database grows in size due to the ongoing join requests • LoRa Network Server version: 2.3.12 Overview of Bug Fix: 1. mPower 5.3.3 includes the fix to this critical issue and allows LoRa sensors to join the LoRa network as intended • LoRa Packet Forwarder is upgraded to version 4.0.1-r35.0 • LoRa Network Server is upgraded to version 2.4.22-r0.0 ○ In mPower 5.3.3, the Join Nonce Table records join requests as a counter, and only the last nonce value is saved ○ This limits the size of the database, because the table is limited to one row per end-device 2. FPGA code in the Conduit gateways and MTAC-LORA-H cards will have been upgraded to FPGA v35	[GP-964] [GP-997]

Bug Fix (mPower 5.3.3)

mts-io - kernel Oops on no-radio devices Model Numbers Impacted by Bug Fix: Ethernet only models Overview of Bug: • This issue manifests itself as a Linux kernel Oops and is a direct result of a bug in the mts-io kernel module • The exact place in the kernel that the Oops backtrace would point to varies due to the fact that this issue results from writing beyond the end of an array in the code of the mts-io kernel module" Overview of Bug Fix: mPower 5.3.3 has been updated to overcome this critical bug	[SP-5103807]
Call Home does not deploy device configuration • Overview of Bug: This defect was introduced when Call Home configuration settings were added to Web UI in Release 5.1. This defect is NOT ALWAYS reproducible. Actual result: the device obtained a DeviceHQ key and has remote management enabled. The configuration was uploaded to the device (according to DeviceHQ and debug console), but was not applied. • Overview of Bug Fix: Resolved. The device obtained DeviceHQ key and has remote management enabled. The configuration was uploaded and applied to the device successfully	[MTX-3501]
Radio Firmware Upgrade - Remote Management • Overview of Bug: On a cellular device, when the only WAN is cellular, the annex client cannot send the status during a radio firmware upgrade because the WAN is down and the annex client sends a message to DeviceHQ at the moment when the radio modem is not connected • Overview of Bug Fix: Resolved. The annex client sends a response to DHQ as soon as the radio firmware upgrade image is downloaded successfully and validated by the device. If the file is considered as valid, annex-client sends the response to DeviceHQ server, and only after that the radio firmware upgrade process starts	[MTX-3606] [GP-808]
Bluetooth • Overview of Bug: Bluetooth does not reconnect when resetting Bluetooth, or changing Bluetooth-IP settings • Overview of Bug Fix: Resolved	[MTX-3611] [GP-817]
Custom OpenVPN • Overview of Bug: Cannot access the device after it was configured as an OpenVPN client using type custom. The Custom OpenVPN configuration was not processed properly in some cases, causing a failure in iptables and firewall rules and inability to access the device • Overview of Bug Fix: Resolved. Custom OpenVPN configurations are processed properly	[MTX-3612] [GP-821] [SP-5103727]
Web User Interface Customization • Overview of Bug: /api/brand does not sanitize customizations prior to displaying in the web interface, allowing the display of executable content • Overview of Bug Fix: The API and Web User Interface validation is added to URL and Web Address fields on the Web UI Customization page	[MTX-3615] [GP-818] [SP-5103463]
Minicom Commands • Overview of Bug: When using Minicom to give commands to a modem, the device freezes for a few of seconds and then reboots without any warning • Overview of Bug Fix: Resolved. When executing minicom without parameters, an open non-existing port is used	[MTX-3662] [GP-868]

Bug Fix (mPower 5.3.3)

IPSec Tunnels
• Overview of Bug: IPSec tunnel with Pre-Shared Key does not work if User ID contains spaces
• Overview of Bug Fix: Validation is added to Local ID and Remote ID fields. If Local or Remote ID contains **"** or contains sequence of the characters **space:space**, then an error message shall be displayed:
  ○ *Invalid Local ID*
  ○ *Invalid Remote ID*
	[MTX-3628]
	[GP-841]

User Roles and Permissions
• Overview of Bug:
  ○ Firewall Settings: "Enabled" checkbox and "Submit" button are available to user. These should be hidden
  ○ Manage Apps: "Enabled" checkbox and "Actions" are available to user and should be hidden
• Resolved. The user interface is corrected and the options are hidden
	[MTX-3643]
	[GP-851]

Deprecation (mPower 5.3.3)

Native support for Node.js and Node-RED mPower 5.3.3 does not include native support for Node.js or Node-RED applications • Current mPower versions (mPower 5.2.X and earlier) include native support for Node.JS version 0.10.48-r1.7 and Node-RED version 0.15.3 • The requirement to upgrade to OpenSSL 1.1 in mPower 5.3.3 means that the Conduit family of programmable gateways can no longer support Node.js and Node-RED applications natively due to security protocol vulnerabilities that exist within Node.js and Node-RED • Node.js and Node-RED are supported by a custom application available through DeviceHQ® or the Web User Interface. See new features for details • For details on other methods to create custom applications, see creating a custom application	-
4G-LTE Category 3 Radio Support mPower 5.3.3 does not include support for category 3 cellular radios • –LAT1 (Telit LE910-NAG), -LEU1 (Telit LE910-EUG), and –LVW2 (Telit LE910-SVG) radios • Models Impacted: MTCDT-LAT1, MTCDT-LVW2, MTCDT-LEU1, MTCAP-LEU1, MTCDTIP-LAT1, MTCDTIP-LVW2, MTCDTIP-LEU1	-
3G Radio Support mPower 5.3.3 does not include support for 3G cellular radios • -H5 (Telit HE910-D) radio • Models impacted: MTCDT-H5, MTCDTIP-H5	-

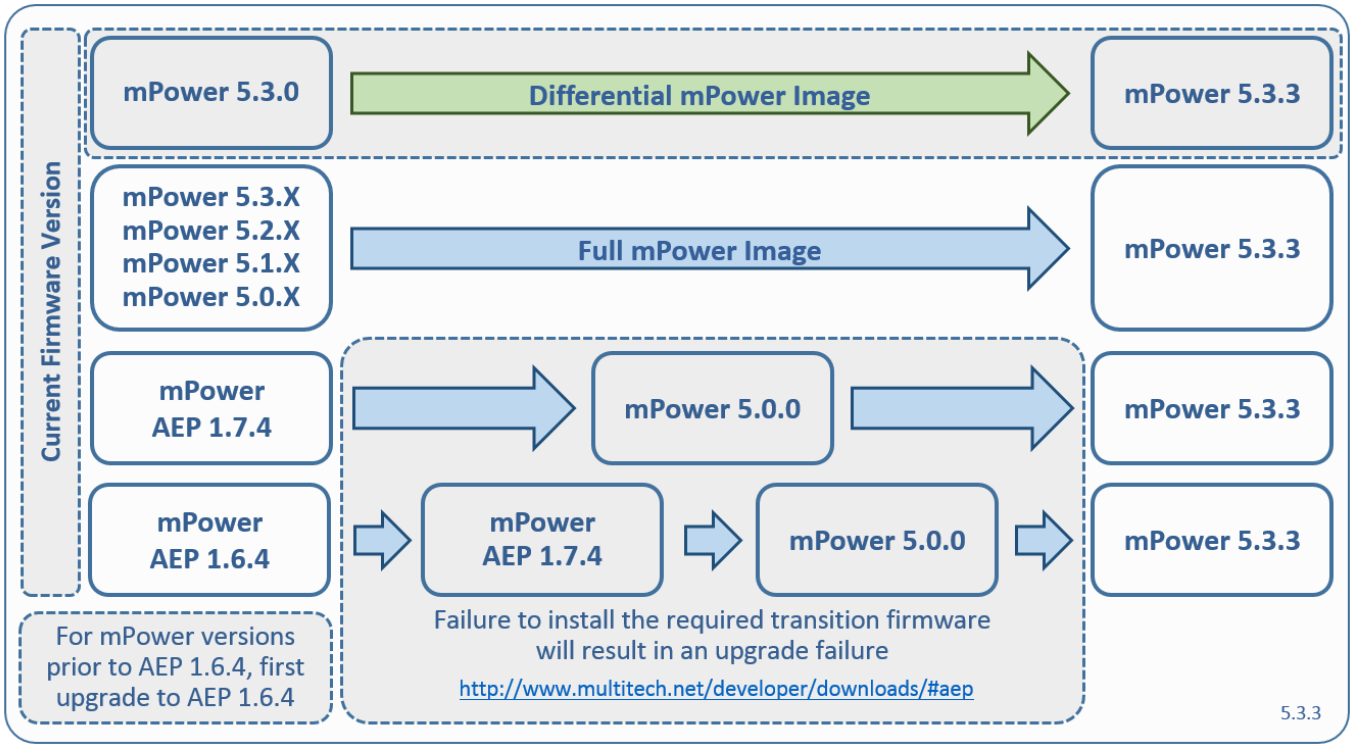
Schedule (mPower 5.3.3)

- Manufacturing (New Hardware)
  - MTCAP 5.3.3 Availability: March 2021
- Manufacturing (Active Hardware)
  - MTCAP 5.3.3 Availability: April 2021
  - MTCDT 5.3.3 Availability: April 2021
  - Devices shipping from MultiTech starting May 2021 will include mPower 5.3.3
- DeviceHQ
  - MTCAP 5.3.3 Availability: March 2021
  - MTCDT 5.3.3 Availability: March 2021
- Downloadable Versions
  - MTCAP 5.3.3 Availability: March 2021
  - MTCDT 5.3.3 Availability: March 2021
  - MTCAP 5.3.0 Availability: October 2020
  - MTCDT 5.3.0 Availability: October 2020
  - Visit http://www.multitech.net/developer/downloads/

Models Impacted (mPower 5.3.3)

- MultiTech Conduit® Gateway
  - MTCDT-240A, MTCDT-246A, MTCDT-247A
  - MTCDT-L4E1, MTCDT-L4N1, MTCDT-LAT3, MTCDT-LAP3, MTCDT-LDC3, MTCDT-LSB3
- MultiTech Conduit® IP67 200 Series Base Station
  - MTCDTIP2-EN
  - MTCDTIP2-L4E1, MTCDTIP2-LNA3
- MultiTech Conduit® IP67 Base Station
  - MTCDTIP-266A, MTCDTIP-267A
  - MTCDTIP-L4E1, MTCDTIP-L4N1, MTCDTIP-LAP3, MTCDTIP-LDC3, MTCDTIP-LSB3
- MultiTech Conduit® AP Access Point
  - MTCAP-868, MTCAP2-868, MTCAP-915, MTCAP2-915
  - MTCAP-L4E1, MTCAP2-L4E1, MTCAP-LNA3, MTCAP2-LNA3

Upgrade Process (mPower 5.3.3)



mPower 5.3.0 Changelog and Overview

February 2021

Updates in mPower 5.3.0, from mPower 5.2.5

OS Changes	New Hardware	New Feature	Feature Enhancement	Known Behaviors	Bug Fixes	Deprecations	Schedule	Models Impacted	Upgrade Process

Operating System Component Updates (mPower 5.3.0)

Updated Yocto Version • Yocto version updated to Thud (version 2.6). • Previous versions of mPower used Yocto Morty (version 2.2)	-
Updated Linux Kernel • Linux kernel upgraded to v4.9 • Previous versions of mPower used Linux kernel v3.12.70	-
Upgrade to OpenSSL 1.1 • mPower version 5.2.X supports OpenSSL 1.0.2k • Customer applications written to earlier OpenSSL versions do not require porting to the latest version	[GP-393]

Upgrade Cipher Suite to TLS 1.3
• mPower version 5.2.1 supports configurable TLS 1.0, 1.1, and 1.2
• The benefits of TLS 1.3 are:
  ○ Increased speed of encrypted connections
  ○ Improved security due to the removal of obsolete and insecure features from TLS 1.2
  ○ Greater browser support
  ○ Increased SSL server support
	[GP-382]

Update lighttpd to latest version • mPower 5.3.3 updated to lighttpd version 1.4.51 • Previous versions of mPower support lighttpd version 1.4.48	[GP-552]

New Hardware Support (mPower 5.3.0)

Gateway Accessory Card: MTAC-LORA-2G4-3 • 2.4GHz Gateway Accessory Card • Requires MCU version 1.0.1 • Additional Information: https://www.multitech.net/developer/software/lora/mtac-lora-2g4-3/ • Sales inquiries: email sales@multitech.com	[GP-393]

New Feature (mPower 5.3.0)

Added support for LoRa Basics Station from Semtech, a LoRa packet forwarder which can be remotely managed by a configuration and update server (CUPS). https://github.com/lorabasics/basicstation Features Include: • Ready for LoRaWAN Classes A, B, and C • Unified Radio Abstraction Layer supporting Concentrator Reference Designs v1.5 and v2 • Powerful Backend Protocols • Lean Design	[GP-98] [GP-687]

New Feature (mPower 5.3.0)

Updates using differential updates • Firmware releases following mPower 5.3.0 can be made using a differential update image. • When new mPower firmware versions are released, customers can update their devices using the full firmware image (today's solution) or using a differential update image. • The differential update image only contains updates to the firmware code that has changed. • The differential update image can be uploaded to the device faster than the full firmware image, reducing bandwidth and using less cellular data.	[GP-445]
Support for updated AS923 frequency plans • AS923-1: AS923_FREQ_OFFSET_HZ = 0 .0 MHz (formerly known as AS923) • AS923-2: AS923_FREQ_OFFSET_HZ = -1.80 MHz • AS923-3: AS923_FREQ_OFFSET_HZ = -6.60 MHz	[GP-714]
Package management and updates added to administrative settings • Using Device HQ and mPower version 5.3 or later, customers can perform a package-based upgrade • Useful for delivering any security patches without rolling out a new firmware image	[GP-57] [CP-19]

Feature Enhancement (mPower 5.3.0)

Cellular radio firmware upgrades added for the following cellular radios • MTCDT-L4N1, MTCDTIP-L4N1 (Telit LE910C4-NF) • MTCDT-L4E1, MTCDTIP-L4E1 (Telit LE910C4-EU) There are two types of radio firmware upgrades: • Full Firmware Image Upgrade: When applied, the full firmware update replaces the current firmware image with the new image of the new version • Delta Firmware Upgrade: When applied, the current firmware image is updated with the differences between it and the new version, and effectively becomes the new version of firmware.	[GP-615] [GP-397]
Cellular radio status updated to include additional details. Updates reported in Web UI and Device HQ. • RSRP – LTE Signal Strength. Average power received from a single reference signal. • RSRQ – LTE Signal Quality. Signal-to-noise ratio for a given signal • RSSI – Relative Received Signal Strength. Power level received by the cellular radio after the antenna and possible cable loss. • Service Domain – CS domain (video/voice service) and PS domain (data service) available	[GP-310]

Known Behaviors (mPower 5.3.0)

Change in OpenSSL certificate validation and TLS 1.3 behavior • In mPower 5.3.0 the version of OpenSSL has been upgraded to 1.1.1b. This version includes support for TLS 1.3. TLS 1.3 is more restrictive with regards to certain behaviors in certificate authentication. One significant change in OpenSSL 1.1.1b is that TLS 1.3 will not accept certificates where the current time/date is not in the certificate lifetime (i.e. either the date on the verifying system is before the lifetime starts or after the certificate lifetime has expired) • The strict enforcement of certificate lifetime in TLS 1.3 has led to the following notable behaviors in the current mPower implementation:	[GP-843]

Known Behaviors (mPower 5.3.0)

a. On firmware upgrade to mPower 5.3 from a previous version, TLS 1.3 will be disabled by default. This was done because it was found that upgrades could be performed while the device was utilizing an expired certificate. When this would happen with TLS 1.3 enabled, the user may not be able to successfully connect to the device via the Web UI if their system negotiated to use TLS 1.3 with the mPower device. b. On factory reset, TLS 1.3 will be disabled for the same reasons as above. A second reason for factory reset to disable TLS 1.3 is that if a customer has uploaded a signed certificate of their own, there is potential that the customer's certificate may not get deleted. If it is expired and TLS 1.3 is the default negotiated SSL protocol, the customer may also find themselves locked out.	
Change in start-stop-daemon behavior • The mPower upgrade from Yocto 2.2 (Morty) to Yocto 2.6 (Thud) identified that the start-stop-daemon will not allow execution of files that do not have their execute permissions explicitly set • The start-stop-daemon can be used in custom applications on mPower to start a customer program as a daemon without the customer having to implement all the "daemonization" code in their program • In previous versions of start-stop-daemon it was possible for a file to be executed even though it did not have executable permissions (i.e. -rw-r--r-- 1 root root myProgram.py) • In the current version of start-stop-daemon the program file to be executed is required to have execute permissions (i.e. -rwxr--r-- 1 root root myProgram.py)	[GP-813]
OpenVPN - Encryption Cipher Configuration Issue • In the OpenVPN configuration of tunnels on the mPower 5.3.3, there is a change to the way that OpenVPN 2.6 effectively handles the encryption cipher parameter. The argument "--cipher" has been deprecated and the "Encryption Cipher" option in the mPower Web UI has been removed • Instead of "--cipher" in OpenVPN 2.6 and "Encryption Cipher" in the Web UI the new parameter "--ncp-ciphers" that is named Negotiable Crypto Parameter (NCP) has essentially replaced "Encryption Cipher"	[GP-846]
Start-stop-daemon behavior change that may affect custom applications • With the Thud upgrade the start-stop-daemon is more concerned with executable permissions • Custom applications must have 755 versus 644 permissions regarding executions	[IN-4100]

Deprecation (mPower 5.3.0)

Native support for Node.js and Node-RED mPower 5.3.3 does not include native support for Node.js or Node-RED applications • Current mPower versions (mPower 5.2.X and earlier) include native support for Node.JS version 0.10.48-r1.7 and Node-RED version 0.15.3 • The requirement to upgrade to OpenSSL 1.1 in mPower 5.3.3 means that the Conduit family of programmable gateways can no longer support Node.js and Node-RED applications natively due to security protocol vulnerabilities that exist within Node.js and Node-RED	-

Schedule (mPower 5.3.0)

- Manufacturing Updates:
  - Devices with a Date of Manufacture (DOM) after April 2020 will include mPower 5.3.0
- DeviceHQ®
  - mPower 5.3.0 Availability: October 2020
- Downloadable Versions
  - mPower 5.2.5 Availability: October 2020
  - Visit http://www.multitech.net/developer/downloads/#aep

Models Impacted (mPower 5.3.0)

- MultiTech Conduit® Gateway
  - MTCDT-240A, MTCDT-246A, MTCDT-247A
  - MTCDT-L4E1, MTCDT-L4N1, MTCDT-LAT3, MTCDT-LAP3, MTCDT-LDC3, MTCDT-LSB3,
  - Download only: MTCDT-H5
- MultiTech Conduit® IP67 Base Station
  - MTCDTIP-266A, MTCDTIP-267A
  - MTCDTIP-L4E1, MTCDTIP-L4N1, MTCDTIP-LAP3, MTCDTIP-LDC3, MTCDTIP-LSB3
  - Download only: MTCDTIP-H5
- MultiTech Conduit® AP Access Point
  - MTCAP-868, MTCAP2-868, MTCAP-915, MTCAP2-915
  - MTCAP-L4E1, MTCAP2-L4E1, MTCAP-LNA3, MTCAP2-LNA3

Upgrade Process (mPower 5.3.0)

To install mPower 5.3.0 devices must be upgraded to mPower 5.0.0 or higher. At any time in the upgrade process, customers can open a portal case at support.multitech.com

mPower 5.2.5 Changelog and Overview

February 2021

Updates in mPower 5.2.5, from mPower 5.2.1

New Feature (mPower 5.2.5)

Updated Reset Behavior • Save and Restore Configuration page changes • Reset to Factory Default changes • Reset Button Configuration	[GP-775]

Feature Enhancement (mPower 5.2.5)

LoRa Network Server behavior: • The Join Nonce Table saves nonce values from every join request from known end-devices. • When end-devices cannot join, the database grows in size due to the ongoing join requests. • LoRa Network Server is upgraded to version 2.3.12	-
mPower 5.2.5 includes the following LoRa Network Server improvement: • The Join Nonce Table records join requests as a counter, and only the last nonce value is saved • This limits the size of the database, because the table is limited to one row per end-device • LoRa Network Server is upgraded to version 2.4.22-r0.0	-

Bug Fix (mPower 5.2.5)

Overview of Bug: 1. Bug has been identified in mPower 5.2.1. 2. A combination of FPGA code, LoRa Packet Forwarder, and LoRa Network Server performance results in LoRa sensors not being able to join the network 3. Products Impacted • Gateways using the AS923 LoRa channel plan which mandates Listen Before Talk (LBT). Currently, these gateways use FPGA code v33. • Gateways shipping with (or upgraded to) mPower 5.2.1 software. 4. Listen-Before-Talk FPGA Bug • An issue has been identified with the v.33 firmware used in the MultiTech mCard gateway accessory card. • After several hours of operations, the gateway stops blocking transmissions when an interfering signal is present. 5. Listen-Before-Talk Packet Forwarder Bug • After several days of operation, the gateway is not able to transmit packets and end-devices do not receive the LoRaWAN acknowledgement (ACK) from the network server. • When the end-devices do not receive the LoRaWAN ACK messages from the network server, the end-devices start to send new join requests. • These repeated join requests impact the LoRa Network Server performance (see below) due to the rejected join requests. • Packet Forwarder version: 4.0.1-r32.0 6. LoRa Network Server Performance	[GP-964] [GP-997]

Bug Fix (mPower 5.2.5)

• The Join Nonce Table saves nonce values from every join request from known end-devices. • When end-devices cannot join because of the above packet forwarder bug, the database grows in size due to the ongoing join requests. • LoRa Network Server version: 2.3.12 Overview of Bug Fix: 1. mPower 5.2.5 includes the fix to this critical issue and allows LoRa sensors to join the LoRa network as intended. • LoRa Packet Forwarder is upgraded to version 4.0.1-r35.0 • LoRa Network Server is upgraded to version 2.4.22-r0.0 ○ In mPower 5.2.5, the Join Nonce Table records join requests as a counter, and only the last nonce value is saved ○ This limits the size of the database, because the table is limited to one row per end-device 2. FPGA code in the Conduit gateways and MTAC-LORA-H cards will upgraded to FPGA v35	

Schedule (mPower 5.2.5)

- Manufacturing Updates:
  - Select devices with a Date of Manufacture (DOM) after mid-February 2021 will include mPower 5.2.5 and FPGA v.35 firmware.
- DeviceHQ®
  - mPower 5.2.5 Availability: mid-February 2021
- Downloadable Versions
  - mPower 5.2.5 Availability: mid-February 2021
  - Visit http://www.multitech.net/developer/downloads/#aep

Models Impacted (mPower 5.2.5)

- MultiTech Conduit® Gateway
  - MTCDT-246A-923-JP , MTCDT-246A-US-EU-GB-923KR
  - MTCDT-LSB3-246A-923-JP, MTCDT-246A-923-JP, MTCDT-LDC3-246A-JP, MTCDT-LDC3-247A-JP, MTCDT-LSB3-246A-JP
- MultiTech Conduit® IP67 Base Station
  - MTCDTIP-266A-923KR, MTCDTIP-266A-923-JP
  - MTCDTIP-LDC3-266A-923-JP, MTCDTIP-LSB3-266A-923-JP
- MultiTech mCard™ Gateway Accessory Cards
  - MTAC-LORA-H-923KR-LBT, MTAC-LORA-H-923-JP
  - MultiTech mCard Gateway Accessory Cards (MTAC-series) with a Date of Manufacture (DOM) after mid-February 2021 will include FPGA v.35 firmware

Upgrade Process (mPower 5.2.5)

To install mPower 5.2.5, devices must be upgraded to mPower 5.0.0 or higher. At any time in the upgrade process, customers can open a portal case at support.multitech.com

mPower 5.2.3 Changelog and Overview

December 2020

Updates in mPower 5.2.3, from mPower 5.2.1

OS Changes	New Hardware	New Feature	Feature Enhancement	Known Behaviors	Bug Fixes	Deprecations	Schedule	Models Impacted	Upgrade Process

New Feature (mPower 5.2.3)

Configurable Factory Reset
• The mPower user interface will be updated to include a selection for RESET button configuration. Options include:
  ○ Enable Reset to Factory Default.
  When the RESET button is held for 5 seconds or more, the unit will be reset to the factory default settings.
  ○ Enable Reset to User-Defined Default.
  When the RESET button on the device is held for 5 seconds or more, the unit will be reset to the user-defined default settings.
  ○ If both options are selected
  When the RESET button on the device is held for 5 seconds or more, the unit will be reset to the user-defined default settings. To override user-defined default configurations and restore the unit to factory default, press and hold the RESET button on the device for more than 30 seconds.
  ○ If no option is selected
  The RESET button will always restart the system and will not allow you to restore the unit to factory or user-defined default.
• Once the RESET Button Configuration is changed, the user must first submit the changes, followed by a confirmation to set the user-defined default.
• Once the user confirms the RESET Button Configuration, the changes are applied immediately. The device does not need to be rebooted for this change to be applied.
	[GP-775]

Schedule (mPower 5.2.3)

- Downloadable Versions
  - mPower 5.2.3 Availability: December 2020
  - Visit http://www.multitech.net/developer/downloads/#aep

Models Impacted (mPower 5.2.3)

- MultiTech Conduit® AP Access Point
  - MTCAP-868, MTCAP-915, MTCAP-IN865
  - MTCAP-L4E1, MTCAP-LAP3, MTCAP-LNA3

Upgrade Process (mPower 5.2.3)

To install mPower 5.2.3, devices must be upgraded to mPower 5.0.0 or higher. At any time in the upgrade process, customers can open a portal case at support.multitech.com

mPower 5.2.1 Changelog and Overview

June 2020

Updates in mPower 5.2.1 from mPower 5.1.6

OS Changes	New Hardware	New Feature	Feature Enhancement	Known Behaviors	Bug Fixes	Deprecations	Schedule	Models Impacted	Upgrade Process

Operating System Component Updates (mPower 5.2.1)

lighttpd updated to version 1.4.48	[GP-552]

New Hardware Support (mPower 5.2.1)

Support for –LVW3 radio (Telit LE910-SV-1). Models impacted MTCDT-LVW3, MTCDTIP-LVW3	[GP-359]
Support for MTAC-LORA-2G4-3 gateway access card	-

New Feature (mPower 5.2.1)

Verizon APN Setting for Verizon APN is now configurable to override what is in the PDP context	[GP-33] [GP-435]
Security (/tmp Director Change) • The /tmp directory includes the following permissions: noexec, nosuid, nodev (default noexec) • This change affects any custom applications that try to run scripts in that directory • Custom applications can no longer be executed from this directory	[GP-59]
Added PPP Configurability • IP mode in the PDP context is configurable (ipb6cp-max-configure *n*) • Maximum number of IPv6CP configure-request transmissions, default 10 (ipb6cp-max-failure *n*) • Maximum number of IPv6CP configure-NAKs returned before starting to send configure-rejects, default 10 (ipv6cp-max-terminate *n*) • Maximum number of IPv6CP terminate-request transmissions, default 3 (ipv6cp-restart *n*) • Set the IPv6CP restart interval (retransmission timeout), default 3 seconds	[GP-274]
MTU Support Support added for MTU and other connection settings through Web UI and API	[GP-341]
arping Requests Enhancement to use arp'ing to broadcast IPs on interfaces. This enhancement was implemented in order to improve Web UI responsiveness after a reboot	[GP-343]
Packet Forwarder, Listen Before Talk After several hours, the listen before talk functionality fails to block transmission. In mPower 5.2.1, the LBT process can be restarted without affecting the packet forwarder receive capabilities	[GP-524]

Feature Enhancements (mPower 5.2.1)

Reduced Boot Time Previous versions of mPower resulted in longer boot times. mPower 5.2.1 includes new features and optimization that decrease the device boot time up to 25%	[GP-256] [GP-360] [GP-362] [GP-363] [GP-364]

Feature Enhancements (mPower 5.2.1)

Shutdown Time Optimization When restarting a device, the total time to reboot also includes shutdown time. Previous versions of mPower resulted in longer shutdown times. mPower 5.2.1 has been updated to reduce shutdown time. Conduit mPower shutdown time has been shortened by 30%.	-
Save and Apply Configuration Settings without Restarting • Previous versions of mPower required a device reboot for most system configuration settings. mPower 5.2.1 has been updated to save and apply many configuration settings without the need to restart. In these cases, the user will be presented a "Save and Apply" button after making configuration settings. If "Cancel" is selected, changes are not saved. • A limited number of system configuration setting changes will still require the device to be restarted. In these cases, the user will be presented with a "Save and Reboot" button after making configuration settings. If "Cancel" is selected, changes are not saved. • Only the following configuration changes still require a reboot: ○ Access Configuration → Brute Force Prevention ○ Access Configuration → Session Timeout ○ Debug Options ○ Network Interfaces Configuration ○ X.509 Certificates (Web Server Certificate) ○ Firmware Upgrade ○ Restore Configuration ○ Cellular Configuration ○ Wi-Fi as WAN	[GP-339]
Radio Support • It has been deemed best practice to de-register the cellular radio before setting the PDP context and re-registering • The firmware will check if the PDP context values are correct. If the IP mode and APN are already correct, do not make changes to PDP context. In earlier mPower versions, PDP context changes were applied no matter what the state in the PDP context, which proved to be problematic • When checking registration on LTE cellular radios, if CREG, CGREG, and/or CEREG are available, the firmware needs to check for registered status. If any one of these returns a registered status, then device can proceed to connect • When using roaming SIMs, if 0,5 is returned by any of the registration check commands, the device can be treated as "registered" and create a connection to the network	[GP-438] [GP-439] [GP-440] [GP-441]
SMS Storage: • Earlier versions of mPower firmware stored SMS messages on the SIM card • In mPower 5.2.1, this has been changed, now SMS messages are stored on the cellular radio. • This change resolves SMS send and receive failures	[GP-515]
ppp_pre_chat Updates Earlier mPower versions execute some separate paths for FWSWITCH radios that do the exact same thing for the different modes including PDP context handling. mPower 5.2.1 has been updated to handle these requests in the same manner whenever possible	[GP-327]

Feature Enhancements (mPower 5.2.1)

Cellular Radio Reset Customer feedback has reported that occasionally, the cellular radio needs to be reset when it is unable to register on the wireless network. mPower 5.2.1 has been updated to include a new option to help resolve this issue: "Radio Reset Registration Failure"	[GP-443]
Node-Red Log Node-Red log and log rotate updates. This change supports Node-RED logging and rolling the log as it grows. Previously Node-RED logging has been turned off by default, causing some devices to reboot due to the RAMFS taking up all the memory.	[GP-354] [GP-147]
LoRa Network Server Update The LoRa Network Server has been updated to v 2.3.10. Previous mPower releases supported version 2.3.0	-
LoRa WAN Updates • SPI path added to all utilities • Add Multicast option to session pop-up box. Three options: OFF, B or C • LoRa Channel Plans: Added support for ISM2400 channel plan	[GP-448] [GP-474]
Support for Passive FTP Sessions Users can enable nf_conntrack_helper when they create FTP rules in the web user interface	[GP-516]
Web User Interface: HTML 5 Updates Local storage issue was causing unresponsive user interface after device was updated to mPower 5.1.5. mPower 5.2.1 has been updated to correct this issue	[GP-521]
DeviceHQ Custom Application Support When installing a new application, the backup of the original application will now be optional. If the installation of the new application fails, the original application will not be restored	[GP-540]

Known Behaviors (mPower 5.2.1)

Packet Forwarder, Listen before Talk After several hours, the listen before talk functionality fails to block transmission (FPGA firmware V33, MTCAP and MTAC-LORA-XXX)	-
OpenVPN Tunnel Names • In earlier versions of mPower firmware, customers have created OpenVPN tunnel names that include spaces • After upgrading to mPower 5.0, mPower 5.1, or mPower 5.2.X, the device can become inaccessible due to the spaces in the OpenVPN tunnel name • Customers are encouraged to rename OpenVPN tunnel names and remove spaces prior to upgrading to mPower 5.2.1	[MTX3353]

Bug Fixes (mPower 5.2.1)

GRE Tunnel In mPower 5.0 versions, the network interface configuration was changed and in some cases worked incorrectly. In mPower 5.2.1, GRE Tunnel IP address has been added to the GRE tunnel configuration page to correct this issue.	[GP-336]
Tx Continuous Attenuator Util Tx continuous attenuator setting was not getting set. This has been corrected in mPower 5.2.1	[GP-449]
Remote Management Repeatable Time Option When Remote Management (DeviceHQ) is enabled and repeatable option set at Daily, an extra colon is added to the end of the time (i.e. 9:00:). Functionally, this works but the user receives an "Invalid Repeat Time" message because of the extra colon. This has been corrected in mPower 5.2.1	[GP-499]
LoRaWAN Downlink queue page shows the same packet for each detail link. Page has been updated and shown as packets deleted based on packet if field.	[GP-508]
User-Interface Dialog Box Update When the browser window is small enough for a hidden left menu, if the user selects one of the Commands options a pop-up with "OK | Cancel" is provided. The user cannot reach the dialog as it is behind the progress overlay. In full size browser this does not happen. This has been corrected in mPower 5.2.1	[GP-522]
API Updates Several API commands have been reported to be susceptible to OS command injection strings. In mPower 5.2.1, the following characters and sequences (separated by commas) are now prohibited in API commands that use the system() call: &, &&, |, ||, ;, $ `, 0x0a, \n	[GP-541]
–L4E1 (3G behavior) Improved performance with configurable MTU size. Default is set at 1228.	[GP-542]
User Interface Updates: The following user interface issues have been corrected in mPower 5.2.1 • NodeRED: The development app is in the "Updating" state when trying to run it instead of other Node RED app • Firmware Upgrades: On firmware upgrade, some downloads can result in memory overuse. If firmware upgrade is successful, there is no issue	[GP-543] [GP-549] [GP-550]

Schedule (mPower 5.2.1)

- Manufacturing
  - Devices shipping from MultiTech starting August 2020 will include mPower 5.2.1
- DeviceHQ
  - MTCAP 5.2.1 Availability: May 2020
  - MTCDT 5.2.1 Availability: May 2020
- Downloadable Versions
  - MTCAP 5.2.1 Availability: May 2020
  - MTCDT 5.2.1 Availability: May 2020
  - Visit http://www.multitech.net/developer/downloads/#aep

Models Impacted (mPower 5.2.1)

- MultiTech Conduit® Gateway
  - MTCDT-240A, MTCDT-246A, MTCDT-247A
  - MTCDT-L4E1, MTCDT-L4N1, MTCDT-LAT3, MTCDT-LAP3, MTCDT-LDC3, MTCDT-LSB3, MTCDT-H5
  - Download only: MTCDT-LAT1, MTCDT-LVW2, MTCDT-LEU1
- MultiTech Conduit® IP67 Base Station
  - MTCDTIP-266A, MTCDTIP-267A
  - MTCDTIP-L4E1, MTCDTIP-L4N1, MTCDTIP-LAP3, MTCDTIP-LDC3, MTCDTIP-LSB3
  - Download only: MTCDTIP-LAT1, MTCDTIP-LVW2, MTCDTIP-LEU1
- MultiTech Conduit® AP Access Point
  - MTCAP-868, MTCAP2-868, MTCAP-915, MTCAP2-915
  - MTCAP-L4E1, MTCAP2-L4E1, MTCAP-LNA3, MTCAP2-LNA3

Upgrade Process (mPower 5.2.1)

To install mPower 5.2.1, devices must be upgraded to mPower 5.0.0 or higher. At any time in the upgrade process, customers can open a portal case at support.multitech.com

mPower 5.1.6 Changelog and Overview

March 2020

Updates in mPower 5.1.6 from mPower 5.1.5

OS Changes	New Hardware	New Feature	Feature Enhancement	Known Behaviors	Bug Fixes	Deprecations	Schedule	Models Impacted	Upgrade Process

Feature Enhancement (mPower 5.1.6)

• Previous versions of mPower 5.x firmware experience an intermittent behavior. • When a user refreshes their web browser or tries to log in, the user interface becomes unresponsive. • The “wait” animation appears and then never disappears. • This has been fixed in mPower 5.1.6.	-

Models Impacted (mPower 5.1.6)

- MultiTech Conduit® Gateway
  - MTCDT-240A, MTCDT-246A, MTCDT-247A
  - MTCDT-L4E1, MTCDT-L4N1, MTCDT-LAT3, MTCDT-LAP3, MTCDT-LDC3, MTCDT-LSB3, MTCDT-H5
  - Download only: MTCDT-LAT1, MTCDT-LVW2, MTCDT-LEU1
- MultiTech Conduit® IP67 Base Station
  - MTCDTIP-266A, MTCDTIP-267A
  - MTCDTIP-L4E1, MTCDTIP-L4N1, MTCDTIP-LAP3, MTCDTIP-LDC3, MTCDTIP-LSB3
  - Download only: MTCDTIP-LAT1, MTCDTIP-LVW2, MTCDTIP-LEU1
- MultiTech Conduit® AP Access Point
  - MTCAP-868, MTCAP2-868, MTCAP-915, MTCAP2-915
  - MTCAP-L4E1, MTCAP2-L4E1, MTCAP-LNA3, MTCAP2-LNA3

mPower 5.1.5 Changelog and Overview

March 2020

Updates in mPower 5.1.5 from mPower 5.1.2

OS Changes	New Hardware	New Feature	Feature Enhancement	Known Behaviors	Bug Fixes	Deprecations	Schedule	Models Impacted	Upgrade Process

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

Known Behaviors (mPower 5.1.5)

Receiving an SMS MTCDT-L4N1 and MTCDTIP-L4N1 models used on the Verizon Wireless Network can send SMS messages, but are not able to receive SMS messages.	-
Web Browser. Intermittent behavior identified. • Previous versions of mPower AEP 5.x firmware experience an intermittent behavior. • When a user refreshes their web browser or tries to log in, the user interface becomes unresponsive. • The “wait” animation appears and then never disappears. • This has been fixed in mPower 5.1.6.	-

Bug Fix (mPower 5.1.5)

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

Models Impacted (mPower 5.1.5)

- MultiTech Conduit® Gateway
  - MTCDT-240A, MTCDT-246A, MTCDT-247A
  - MTCDT-L4E1, MTCDT-L4N1, MTCDT-LAT3, MTCDT-LAP3, MTCDT-LDC3, MTCDT-LSB3, MTCDT-H5
- MultiTech Conduit® IP67 Base Station
  - MTCDTIP-266A, MTCDTIP-267A
  - MTCDTIP-L4E1, MTCDTIP-L4N1, MTCDTIP-LAP3, MTCDTIP-LDC3, MTCDTIP-LSB3
- MultiTech Conduit® AP Access Point
  - MTCAP-868, MTCAP2-868, MTCAP-915, MTCAP2-915
  - MTCAP-L4E1, MTCAP2-L4E1, MTCAP-LNA3, MTCAP2-LNA3

mPower 5.1.2 Changelog and Overview

December 2019

Updates in mPower 5.1.2 from mPower 5.1.1

OS Changes	New Hardware	New Feature	Feature Enhancement	Known Behaviors	Bug Fixes	Deprecations	Schedule	Models Impacted	Upgrade Process

New Hardware Support (mPower 5.1.2)

Support for –L4N1 radio (Telit LE910C4-NF). Models impacted MTCDT-L4N1, MTCDTIP-L4N1	-

Bug Fix (mPower 5.1.2)

Issue: Parity packet index was still using 0, which will break FUOTA for compliant devices
• Issue exists in mPower 5.1.1 and mPower 5.1.0 BETA versions only
  ○ mPower 5.1.1 was an intermediate release for select LTE Category 4 (-L4E1) models
  ○ mPower 5.1.0 BETA was a beta release for select LTE Category 4 (-L4E1) models
• Issue fixed in mPower 5.1.2
	-

Models Impacted (mPower 5.1.2)

- MultiTech Conduit® Gateway
  - MTCDT-240A, MTCDT-246A, MTCDT-247A
  - MTCDT-L4E1, MTCDT-L4N1, MTCDT-LAT3, MTCDT-LAP3, MTCDT-LDC3, MTCDT-LSB3, MTCDT-H5
- MultiTech Conduit® IP67 Base Station
  - MTCDTIP-266A, MTCDTIP-267A
  - MTCDTIP-L4E1, MTCDTIP-L4N1, MTCDTIP-LAP3, MTCDTIP-LDC3, MTCDTIP-LSB3
- MultiTech Conduit® AP Access Point
  - MTCAP-868, MTCAP2-868, MTCAP-915, MTCAP2-915
  - MTCAP-L4E1, MTCAP2-L4E1, MTCAP-LNA3, MTCAP2-LNA3

Feature Enhancements (mPower 5.1.1)

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<tr><td>Network Interfaces
• Added support for IPV6 in several specific network configurations
• IPv6 WAN on cellular only
<table><tr><th>Network Interface</th><th>IP Mode</th></tr><tr><td>Bridge (Br0)</td><td>STATIC</td></tr><tr><td>Ethernet (Eth0)</td><td>STATIC
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<tr><td>Global DNS
• Option added to configure the hostname of the device</td><td>-</td></tr>
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<tr><td>Setting up Wi-Fi as a WAN
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<tr><td>Updated Destination and Source Interface Firewall Rules now include OPENVPN option
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• Post-routing rules
• Input filter rules
• Inbound forwarding rules
• Output filter rules</td><td>-</td></tr>
<tr><td>Added Cellular Configuration Fields
• Cellular Mode: Select the cellular mode from the drop-down menu based on the cellular radio module in the device (Auto (default), LTE only, LTE prefer, 2G only, 3G only, or 3G prefer)
• Modem Configuration (allows user to switch firmware from one MNO network to another).
○ L4N1 Models: AT&T (Default) or Verizon</td><td>-</td></tr>
<tr><td>Added Password Complexity Rules
• Administrative user can choose rules and limitations for user passwords, including: Minimum length of passwords, upper and lower case requirements, special characters (non-alphanumeric), characters that are not permitted
• Two modes are available:
○ Default Mode: Minimum character length and specific number of characters
○ Credit Mode: Credits are granted for each password character and extra credits are applied for certain character classes. Administrators specify a minimum number of classes. Longer passwords are the strongest.</td><td>-</td></tr>
</table>

Feature Enhancements (mPower 5.1.1)

Configuring Device Access • How the device can be accessed as well as security features that decrease susceptibility and malicious activity. • Added remote SSH Server	-
Managing Devices Remotely (DeviceHQ): Updates to DeviceHQ Check-In Settings • Single Check-In: Configure device to check-in to DeviceHQ at a specific date and time • Repeatable Check-In: Configure device to check-in to DeviceHQ at a specific time daily or on a specific day of the week.	
Upgrading Firmware from MultiTech website or DeviceHQ • Signed Firmware Validation is automatically used once it is enabled after upgrading from version 5.1 and higher.	-

LoRaWAN
• Spectral scan support with reporting to Lens
• Multicast support for Class B
• Multicast field added to device session: 0: None, 1: Class B, 2: Class C
  ○ No longer need to set Uplink Counter to 1 for multicast sessions to schedule downlinks
  ○ Session can be modified for managing Multicast sessions
• LoRaWAN 1.0.4 support
  ○ Join Server nonce counters
  ▪ Includes validation of end-device DevNonce counter if LoRaWAN 1.0.4 support is specified in Device Profile
  ○ Use AU/US LinkAdrReq sub-band channel mask commands if LoRaWAN 1.0.4 support is specified in Device Profile
	-

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

Known Behavior (mPower 5.1.1)

Issue: Parity packet index was still using 0, which will break FUOTA for compliant devices • Issue exists in mPower 5.1.1 versions and mPower 5.1.0 BETA versions only • Issue fixed in mPower 5.1.2	-

Bug Fix (mPower 5.1.1)

Issue: When using a roaming SIM card, cellular PPP issues are experienced • Issue exists in mPower 5.1.0 • Issue fixed in mPower 5.1.1	-

Models Impacted (mPower 5.1.1)

- MultiTech Conduit® Gateway
  - MTCDT-240A, MTCDT-246A, MTCDT-247A
  - MTCDT-L4E1, MTCDT-L4N1, MTCDT-LAT3, MTCDT-LAP3, MTCDT-LDC3, MTCDT-LSB3, MTCDT-H5
- MultiTech Conduit® IP67 Base Station
  - MTCDTIP-266A, MTCDTIP-267A
  - MTCDTIP-L4E1, MTCDTIP-L4N1, MTCDTIP-LAP3, MTCDTIP-LDC3, MTCDTIP-LSB3
- MultiTech Conduit® AP Access Point
  - MTCAP-868, MTCAP2-868, MTCAP-915, MTCAP2-915
  - MTCAP-L4E1, MTCAP2-L4E1, MTCAP-LNA3, MTCAP2-LNA3

Additional Information

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

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EMEA Headquarters – UK
+(44) 118 959 7774 | sales@multitech.co.uk

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

Knowledge Base
http://www.multitech.com/kb.go
Immediate access to support information and resolutions for all MultiTech products.

MultiTech Support Portal
support.multitech.com
Create an account and submit a support case directly to our technical support team.

MultiTech Website
www.multitech.com

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Revision History

Version	Author	Date	Change Description
-007	DT	4/11/2022	mPower 5.3.7: Known Behavior added mPower 5.3.3: Known Behavior added
-006	DT	03/28/2022	mPower 5.3.8s-s1 added
-005	DT	03/01/2022	mPower 5.3.8 added
-004	DT	02/15/2022	mPower 5.3.7: Models Impacted updated (-L4G1 models) mPower 5.3.7: Feature Enhancement added mPower 5.3.7-RC3: Known Behavior added mPower 5.3.7-RC1: Known Behavior added mPower 5.3.5: New Hardware Support updated (battery backup models)
-003	DT	02/03/2022	mPower 5.3.7: Updates to Models Impacted and Upgrade Instructions mPower 5.3.4b: Known Behavior added
-002	DT	01/31/2022	mPower 5.3.7 added
-001	DT	01/21/2022	mPower version 5.3.7-RC3, 5.3.7-RC1, 5.3.5, and legacy mPower versions added