

# Embedded software 2105452, 2106260

## RMC-100, RMC-100LT

FEBRUARY 16, 2022

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## 1 Purpose

These release notes detail new features and modifications, functional changes, and bug fixes made to the remote modular controller (RMC-100) embedded software distributed in customer packages 2105452 (RMC-100, standard) and 2106260 (RMC-100, LITE).



**IMPORTANT NOTE:** This document includes release information on the most current version as well as several previous versions. The release details for the latest version are always described first.

## 2 Withdrawn software notice

The following customer package versions have been withdrawn and will not be supported. Plan to replace the software with a known working version or upgrade to the latest version as indicated in this document.

**Table 2-1: Withdrawn or earlier versions RMC-100**

Component	Part number	Internal version
Customer package	2105452-039 or earlier	4.4.0-4 or earlier
Flash	2105457-036 or earlier	4.4.0-4 or earlier

**Table 2-2: Withdrawn or earlier versions RMC-100-LITE**

Component	Part number	Internal version
Customer package	2106260-010 or earlier	4.4.0-3 or earlier
Flash	2106229-010 or earlier	4.4.0-3 or earlier

### 3 Latest release

The latest software is available in customer package number 2105452-040.

**Table 3-1: Software included in customer package RMC-100: 2105452-040**

Component	Part number	Internal version
Operating System (OS)	2106487-004	4.4.0-2
Flash	2105457-037	4.5.0-6

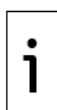
The latest software is available in customer package number 2106260-011.

**Table 3-2: Software included in customer package RMC-LT: 2106260-011**

Component	Part number	Internal version
Operating System (OS)	2106487-004	4.4.0-2
Flash	2106229-011	4.5.0-6



**IMPORTANT NOTE:** To use Flash 2105457-031 or 2106229-005 or later, upgrade to OS 2106487-001 is required. New flash versions are not backwards compatible with previous OS releases. Customer package (2105452) versions 027 and 028 were released internally and are skipped in this document.



**IMPORTANT NOTE:** If the customer currently has an RMC-100 running at 300 MHz, please refer to Technical Bulletin 2106369TB-TB214 – 300 MHZ RMC-100 prior to upgrading the flash to the new version. Customers are requested to change their RMC-100 300 MHz speeds to 720 MHz prior to performing the upgrade.

### 4 Determine software part or version numbers

To determine the software part or version numbers currently installed in your device:

1. Connect to the device on PCCU entry mode.
2. On the navigation tree select the top node on the tree, or the station name.
3. Select the **Registry** tab.
4. Locate and take note of the following:
  - Flash software part number
  - OS software part number
5. If the part numbers of either the flash or OS match those listed in section 0, plan to update the software to the latest versions.

### 5 Software download instructions

Software is available for download from ABB websites. Review the following sections to determine how to locate and download software.

#### 5.1 Software package components

The ABB Totalflow devices embedded software is distributed in packages. Packages may contain all or some of the components required for the device operation. Depending on the changes performed on each release, all or some components may have been modified.

Packages may include:

- Operating system and boot software (OS, Boot)
- Main application (Flash)
- Default base device configuration file (Config)

For a more detailed description, see the Device Loader help topics available by clicking **Help** from PCCU.

## 5.2 Locating the software

Each customer package is identified by the software component included in the package and the part number and revision. For example:

- A package containing the flash for the RMC-100, will be identified as FLASH package (2105457-NNN), where NNN is the revision of the package.
- A package containing the operating system and flash software for the RMC-100 (also referred to as customer package), will be identified as Customer package (2105452-NNN), where NNN is the revision of the package.

## 5.3 Download packages from the ABB website

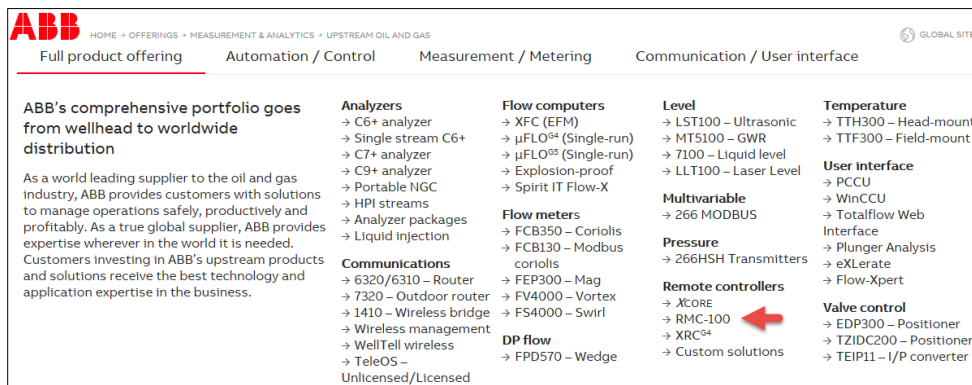


**IMPORTANT NOTE:** The website images shown in this procedure are used as examples. The images may show older versions of software. Always make sure to download the latest software available.

To download from the ABB website:

1. Go to [www.abb.com/upstream](http://www.abb.com/upstream).
2. Scroll down to locate the product list.

**Figure 5-1: ABB Totalflow website – Main page full product offering**



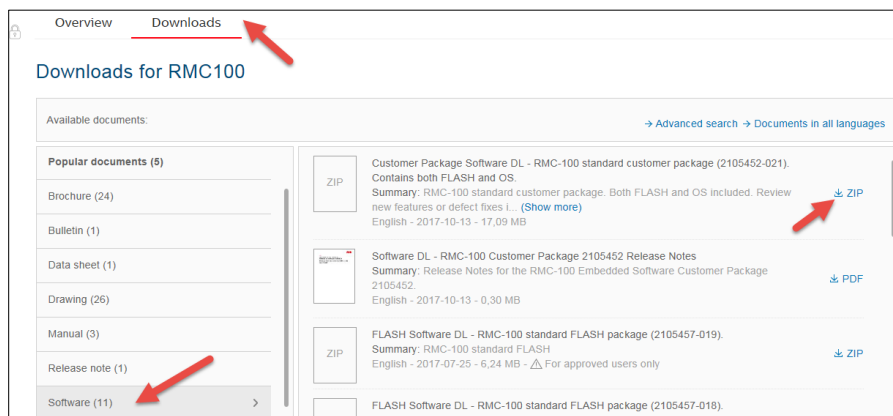
3. Select the product name (RMC-100 or XCore) to display the product-specific web page.

**Figure 5-2: ABB Totalflow website – Product specific web page**



4. Scroll down the product page and select the **Downloads** tab.

**Figure 5-3: RMC-100 downloads**



5. On the navigation pane (left), scroll down, select **Software**.
6. On the list pane (right), select the required software package.
7. Click **Zip** to download.
8. Save the package when prompted. Select **Save as** to choose the desired location on the local drive.
9. Locate and extract the file from the downloaded Zip file. The extracted file has a .pkg extension.
10. For improved security (ensure that your downloaded package is intact), locate and select the specific SHA512 for the package number.
11. Download this file to your local drive when prompted. Check files as instructed in [Software package integrity check instructions \(2107014MNAA\)](#).



**IMPORTANT NOTE:** The SHA512 file is used to verify that the downloaded software has not been corrupted during download and is valid. This is not required but highly recommended. See section [10](#) for more information. The SHA512 file name includes the number and version of the associated package. There is a file for each part number. Make sure you download the SHA512 that matches the software package number you need to check. For assistance downloading software, contact technical support.

## 6 Software update instructions



**NOTICE – Service disruption.** Do not upgrade your device until you have reviewed if there are known issues in the latest customer package (or flash) you plan to use for your upgrade. Refer to section [9 Known issues and workarounds](#). Some issues may cause service disruption if not performed following ABB recommendations or during a planned maintenance window.



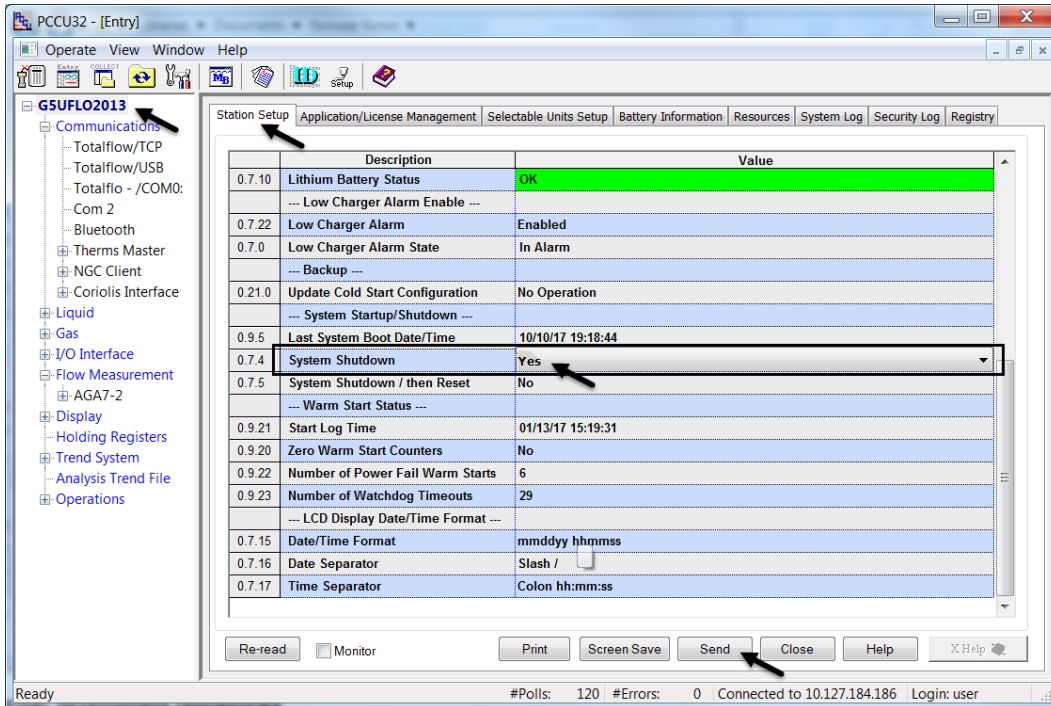
**IMPORTANT NOTE:** Ensure device and measurement data are saved or backed up before software updates. For details, see the RMC user manual or select **Help** from the PCCU top tool menu.

Updating the software on the RMC-100 and RMC-LT requires the shutdown of the Totalflow application before updating the software.

### 6.1 Shutdown the Totalflow application

1. Start PCCU and connect to the device in Entry mode.
2. From the top menu, select **View** and select **Expert**.
3. On the navigation tree, select the top node or station name.
4. On the Station Setup tab, scroll down to **System Shutdown** command.
5. Click the value field next to System Shutdown and select **Yes**.
6. Click **Send** to shut down the Totalflow application.

**Figure 6-1: System shutdown**



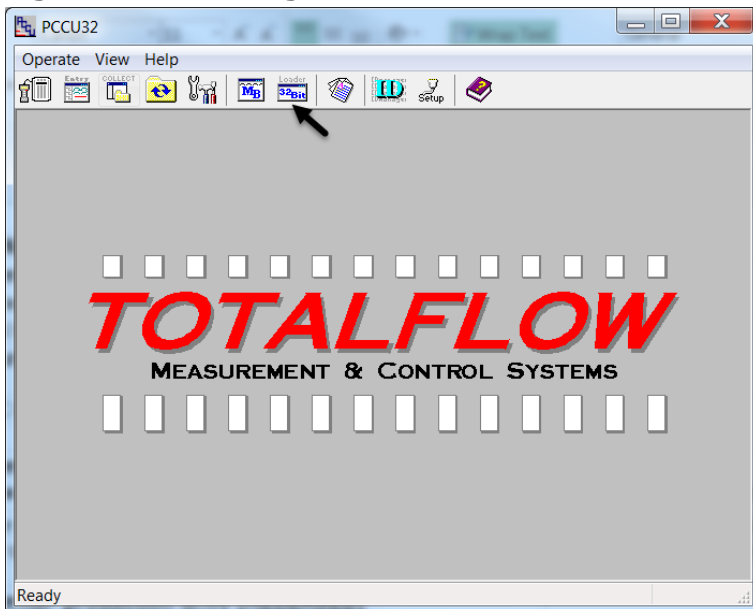
7. Click **Send**. Sending this command to the device will set the device to loader mode.
8. Click **Close**.

## 6.2 Update the software

Use the device loader utility to update the software:

1. From the top PCCU tool bar, select the **loader** icon.

**Figure 6-2: Starting the device loader**



2. Establish a connection with the device.
3. When the device loader screen displays, click **Help** for detailed update instructions.



**IMPORTANT NOTE:** The Flash and OS should be updated when a new release is available. Contact ABB technical support regarding questions of backwards compatibility between previous versions of flashes and OS.

## 7 Release features

Features or enhancements for each version can be reviewed in this section.



**IMPORTANT NOTE:** Customer package (2105452) versions 027 and 028 were released internally and are skipped in this document.

### 7.1 Package numbers 2105452-040, 2106260-011 (RMC LITE)

The following new features have been added to the Totalflow RMC-100 and RMC-100-Lite devices:

- Added Gross Volume calculation to the API Liquid application:
  - Added Gross Volume registers to current measurement data.
  - Added register based read access to Gross Volume registers.
  - Included Gross Volume Daily and Log Period QTR records.
- Added monthly accumulators for volumes, mass, flowing pressure and flowing temperature to the API Liquid application:
  - Added Monthly Accumulator registers to current measurement data.
  - Added register based read access to Monthly Accumulator registers.
- Added a new application: Batch Log. This application has the following capabilities:
  - It is user configurable and provides flexibility to create custom logs.
  - It allows up to 10 Batch Groups per Batch Log app instance and 10 Batch Logs per Batch Log Group
  - Each Batch Log can have up to 50 numeric values and 20 string values.
  - Supports batch trigger types of hourly, daily, weekly, and monthly logging.
  - Supports register access and remote protocol access (DSID)

### 7.2 Package numbers 2105452-039, 2106260-010 (RMC LITE)

The following new features have been added to the Totalflow RMC-100 and RMC-100-Lite devices:

#### 7.2.1 MQTT (client) enhancements

- Support **On Request Birth Payload** based on the ABB Ability standard
- Added support data publishing for the Totalflow Holding Registers Application based on the ABB Ability standard

#### 7.2.2 MQTT (REST) configuration UI enhancements

- Support for Secure MQTT REST Interface
- Support for search and pagination
- Support for application software signing
- Application data publishing support:
  - Holding Registers, AGA-3, AGA-7, Plunger Control, API Liquid SU, Gas Lift, and Shutdown.
- Snapshot data publishing support:
  - For AGA3, AGA7, API Liquid SU: Events, trends, alarms, daily and custom logs
  - For Plunger, Gas Lift and Shutdown applications: Events, trends, and alarms
  - For Holding Registers: trends and alarms
- Several configuration and management options across several REST Interface pages:
  - Initial (MQTT parameter) configuration, application and register configuration
  - User management
  - Audit Logging with report download support
  - MQTT Protocol and Sparkplug Statistics



**IMPORTANT NOTE:** See section [9 Known issues and workarounds](#) for additional details on data publishing and MQTT functionality limits for this software version.

### 7.3 Package numbers 2105452-038, 2106260-009 (RMC LITE)

The following new features have been added to the Totalflow RMC-100 and RMC-100-Lite devices

- Updated XIO Interface app to support Data Transfer app on the XIO
- Updated RMC-100 Lite Totalflow application license scheme. RMC-100 Lite now supports up to 104 standard applications (including 4 default apps), 4 XIO apps, 2 IEC apps, and 4 Station apps.

### 7.4 Package numbers 2105452-037, 2106260-008 (RMC LITE)

No new features or enhancements for customer package 2105452-037 or 2106260-008.

### 7.5 Package numbers 2105452-035, 2106260-006 (RMC LITE)

The following new features have been added to the Totalflow RMC-100 and RMC-100-Lite device:

- Updated PID Controller Application including:
  - Making the application calibration, zero setpoint and shutdown aware
  - Inhibiting manual mode windup
  - Adding options to Controller Reset Mode
  - Adding additional override statistics
- Updated Gas Lift Application including:
  - Adding compressor limits
  - Adding a grouping option
  - Adding a continuous optimization mode
  - Adding multiple optimization options
  - Move the graph pop-up from the GUI screen to a tab
  - Making the Gas Lift application PID aware
  - Improving the usability of the Step Rate Test
- Updated Alarm System Application by removing an internal limitation on address-able registers by changing the register index value from one byte to two bytes.
- Updated Station Application to allow G5 XFC, G5 XRC and RMC Lite to instantiate up to 4 Station Applications.
- Repackage the OSAL libraries with the Totalflow application so that OS upgrade is not required

### 7.6 Package numbers 2105452-034, 2106260-005 (RMC LITE)

The following new features have been added to the Totalflow RMC-100 and RMC-100-Lite devices

- New support for **Extendable IO (XIO)** devices on the RMC and RMC-LITE controllers. XIOs support distributed I/O and serial port expansion:
  - New XIO Interface application for XIO-RMC integration
  - New support for the Ethernet-Serial Passthrough Application.
- New support for auto-discovery features in the RMC, uFLOG5/XSeriesG5.
- Updated I/O Interface application:
  - New support for hot-swappable and hot-pluggable TFIO modules.
  - New support for remote calibration of I/O points
- Updated networking tab interface
  - Added enhanced networking features in RMC, uFLOG5/XSeriesG5 devices
  - Added IEC performance statistics warnings about use of unsecured protocols for cybersecurity awareness.



## 7.7 Package numbers 2105452-033, 2106260-004 (RMC LITE)

The following new features have been added to the Totalflow RMC and G5 XSeries devices. PCCU supports these new features in its entry mode configuration screens.

- New Station application to support:
  - Multiple meter run flowrates/volumes to be summed for station totalization
  - Basic multi-tube (run) tube switching that enables or disables meter tubes based on low/high limits of flowrates/volumes



**IMPORTANT NOTE:** This is a new station application for G5 XSeries and RMC that is different from and not compatible with the station application provided on G4 devices.

## 7.8 Package number 2105452-032

Support for the MQTT protocol has been added to the RMC. The MQTT protocol is turned off by default. Refer to the [Digital Oilfield User Manual](#) and the [Enable MQTT How to Guide](#) for assistance in using the protocol.

## 7.9 Package number 2105452-031

No new features or enhancements for customer package 2105452-031.

## 7.10 Package number 2105452-030

The following enhancements are included in the customer package version 2105452-030.

### 7.10.1 API Liquid tube application

- Shrinkage Factor/Stock Tank Volume  
If the user chooses to enable Shrinkage Factor/Stock Tank Volume, the Stock Tank Volume will then be calculated from Net Standard Volume and either a user-entered or live measured Shrinkage Percentage. Also, average Shrinkage Factor and total Stock Tank Volume will be logged in Log Period and Daily QTRs.
- Drive Gain Monitor/Log in QTRs  
If the user chooses to enable Drive Gain Monitor/Log in QTRs, the Coriolis Drive Gain will then be updated every second from a user-provided Drive Gain Source Register. Also, a flow weighted or linear average value (user-selectable) of Drive Gain will be logged in Log Period and Daily QTRs.
- User-Selectable Input Units  
Users can now choose to assign various volume or mass K factor units to their pulse inputs and various volume or mass flow rate units to the input flow rate if they are getting volume or mass flow rate inputs from the primary meter. If they are using pulse inputs, they can also specify a volume or mass flow rate unit to be used for Multi Meter Factor reference flow rates. For flow rate inputs, the unit for the input flow rate is also used for Multi Meter Factor reference flow rates.
- Light Hydrocarbons EVP Calculation  
Added "Test EVP Calc Per TP-15" tab to API Liquid tube applications' entry mode screens which allows users to calculate Equilibrium Vapor Pressure under various density and temperature conditions.
- RMC-100-LITE support  
A new product offering that allows customers to purchase an RMC 300 MHz device (as compared to the current 720 MHz option). The RMC-LITE will be limited to 25 instantiated applications and will only operate at a speed of 300 MHz. The product will be offered in the very near future.

## 7.11 Package number 2105452-029

The following enhancements are included in the customer package version 2105452-029:

- The IEC application is now capable of running multiple IEC application instances.
- Users can now choose the bandwidth of the Ethernet interface.

### **7.11.1 IEC application**

- All the available programming options can now be used in the IEC resource (customer logic development environment) as recommended in the IEC 61131.
- There are now 5 different application credits available in the application table.
- There is now an IEC Base application along with four different application package levels (Tiers).
- Each application credit allows for only one IEC resource to run.
- Users will have the capability to instantiate up to 10 IEC applications onto the device. Any combinations of the different application package tiers can be used.
- Users can select, create, and delete their own custom IEC resource in a common folder.
- Refer to the IEC User Guide for further information on using the new enhancements.

### **7.11.2 Ethernet Stat Changes**

- Users can set the Ethernet bandwidth and the duplex mode depending upon the other devices (switches etc.) in the network. Several different bandwidths are now selectable in the Communications - Ethernet tab.
- Users can now set Ethernet data rate limiting on incoming and outgoing Ethernet traffic.
- New Ethernet usage statistics are now available to allow the user to monitor traffic for bandwidth utilization, dropped packets or error packets etc. at any point of time. Users can trend these parameters to get a historical view of the activity on the Ethernet. These new statistics are in the Communications - Ethernet tab.

## **7.12 Package number 2105452-026**

The following enhancement is included in the customer package version 2105452-026:

- US AGA3, US AGA7 and API Liquid tube applications can now run in Enhanced mode which activates the following new features.

### **7.12.1 US AGA3 tube application**

- A new part number is designated to the tube application when it is running in Enhanced mode.
- Added capability to alarm on SP and DP out of the range of URL and Calibrated Span and various other conditions, and the capability to log the activation and clearance of these alarms.
- Added informational fields: Facility Measurement Point, Company Name, Primary Meter Type and Heating Value Saturation Condition.
- Added capability to calculate Barometric Pressure from Location Elevation.
- Non-resettable volume, energy and mass accumulators are now rolled over independently when they cross the 1 trillion set point and a new event is logged when each one of these rollovers occur.
- Added capability to calculate Compressibility and Density using GERG2008 method.
- Added support for new analysis components: Neopentane (neoC5), Hexane plus (C6+), Heptane plus (C7+) and Nonane plus (C9+).
- Added capability to log analysis in QTRs.
- A new event is logged when the tube application's Device/App ID (aka. meter ID) or description changes.
- Volume calculation period is fixed at 1 second.

### **7.12.2 US AGA7 tube application**

- A new part number is designated to the tube application when it is running in Enhanced mode.
- Added capability to alarm on SP out of the range of URL and Calibrated Span and various other conditions, and the capability to log the activation and clearance of these alarms.
- Added informational fields: Facility Measurement Point, Company Name and Heating Value Saturation Condition.

- Added capability to calculate Barometric Pressure from Location Elevation.
- Non-resettable volume, uncorrected volume, energy and mass accumulators are now rolled over independently when they cross the 1 trillion set point and a new event is logged when each one of these rollovers occurs
- Added capability to calculate Compressibility and Density using GERG2008 method.
- Added support for new analysis components: Neopentane (neoC5), Hexane plus (C6+), Heptane plus (C7+) and Nonane plus (C9+).
- Added capability to log analysis in QTRs.
- A new event is logged when the tube application's Device/App ID (aka. meter ID) or description changes.
- Volume calculation period is forced to be the same as flow period which can be from 1 to 60 seconds by which 60 seconds is divisible.
- Added support for various input types: Synchronous Pulse, Manufactured Pulse, Flow Rate and Accumulator.
- Added No Flow Cutoff for all input types.
- Added support for multi-point K factors.
- Added support for multi-point meter factors.
- Added calculation and QTR logging of Meter Output (this was Counts for Pulse Inputs for un-Enhanced AGA7 tubes) and IV (this was uncorrected volume for un-Enhanced AGA7 tubes).

### **7.12.3 API Liquid tube application**

- A new part number is designated to the tube application when it is running in Enhanced mode.
- Added capability to alarm on PF out of the range of URL and Calibrated Span and various other conditions, and the capability to log the activation and clearance of these alarms.
- Added informational fields Facility Measurement Point, Company Name and Primary Meter Type.
- Added capability to calculate Barometric Pressure from Location Elevation.
- A new event is logged when the tube application's Device/App ID (aka. meter ID) or description changes.
- Non-resettable indicated volume, indicated standard volume, gross standard volume, net standard volume, sediment and water volume and mass accumulators are now rolled over independently when they cross the 1 million set point and a new event is logged when each one of these rollover occurs.

### **7.13 Package number 2105452-025**

No new features.

### **7.14 Package number 2105452-022**

No new features.

### **7.15 Package number 2105452-021**

The following enhancement is included in the customer package version 2105452-021:

- Added a command to view the ARP cache table from SSH

### **7.16 Package number 2105452-020**

No new features.

## **8 Fixes**

Bug or defect fixes for each version are described in this section.



**IMPORTANT NOTE:** Customer package (2105452) versions 027 and 028 were released internally and are skipped in this document.

## 8.1 Package numbers 2105452-040, 2106260-011 (RMC LITE)

The following bugs are fixed:

- 12435 - Shutdown app fails to trigger on low system voltage.
- 12419 - Plunger does not obtain Arrived state.
- 12415 - CCRP US-1047295 -QTR shows incorrect Battery Voltage
- 12413 - High Priority - Critical Severity - Multiple vulnerabilities can be exploited and result in remote code execution in root context
- 12392 - New Tube Alarm # 6 has the wrong name: "Density DE Alarm Bit". The correct name should be "Differential Pressure DE Alarm bit". Only fixed when a new tube is instantiated.
- 12360 - Gas Lift Rejects Manual Inject Rate
- 12351 -SU Coriolis tube Current tab does display Energy Rate (3.73) as zero on no flow.
- 12325 - Unable to rename Data Transfer App (rename is grayed out)

## 8.2 Package numbers 2105452-039, 2106260-010 (RMC LITE)

The following bugs are fixed:

- 12387 - REST UI- The Register Config Page does not show any variable for the Holding Registers app.
- 12393 - Device loses MQTT connection with MQTT broker when disabling or enabling data types. Also disabling data type Float, results in Float64 being disabled as well.

## 8.3 Package numbers 2105452-038, 2106260-009 (RMC LITE)

The following bugs are fixed:

- 12363 - AI TFIO parameters do not update upon replacement of the module
- 12343 - Can't set the Watchdog Enable for TFIO DO Module
- 12252 - Adding a new Holding Register App under Capacity tab are not displaying correct default parameters

## 8.4 Package numbers 2105452-037, 2106260-008 (RMC LITE)

The following bugs are fixed:

- 12371 - Gas Lift Tubing Length not saved
- 12360 - Gas Lift Rejects Manual Inject Rate

## 8.5 Package numbers 2105452-035, 2106260-006 (RMC LITE)



**NOTICE – Service disruption.** If you have existing IEC applications instantiated in your device, do not upgrade your device with customer package 2105452-035 (or flash package 2105457-032) until you have reviewed the known issues for this package in section [9.1 Package number 2105452-039, -010](#) (RMC LITE)

There are several known limitations when configuring the MQTT functionality in the RMC. Review this carefully before connecting the RMC to a broker.

### 8.5.1 Device configuration issues and limits

- If two RMCs use the same device name for connection to an MQTT broker, both RMCs go into a connect-disconnect loop (communication with the broker cannot be successfully established). To avoid this condition, ensure each device name is unique before connecting the device to an MQTT broker.

- The RMC does not have the necessary Trusted Platform Module (TPM) capabilities and configuration options for secure in-device storage of certificates. Users can not upload and manage a chain of certificates for identification and authentication.

### 8.5.2 Application configuration limits

- Enabling or disabling application data publishing is only supported from the MQTT REST UI. PCCU does not support any MQTT configuration options. PCCU only provides a way to enable the MQTT REST Interface and the MQTT client functionality (for connection to MQTT brokers).
- When publishing trend data publishing for multiple trends, the trend log period must be the same across the different trend files. Also, the same registers cannot be declared either in a Trend file or across different files more than once.
- The trend log period should be greater than 10 seconds across each trend file.
- Trend definitions for an application on the REST user interface may not be updated correctly if the associated trend file is deleted in PCCU.
- Alarm definitions for an application on the REST user interface may not be updated correctly if the associated Alarm app is deleted in PCCU.
- A register's name in the Holding Registers application cannot start with a space or null character.
- Due to RMC's memory limitation, the maximum number of Holding Registers app instances supported is: 30 instances with a maximum of 1000 registers per instance.
- Using duplicate names when configuring Holding Registers application instances and data types in PCCU causes errors in the REST Interface (data is not display correctly). To avoid issues on the REST interface, do not use duplicate names when configuring holding registers in PCCU. Make sure all names are unique.

### 8.5.3 Application data limits

When implementing MQTT take in consideration the following limits:

Snapshot data:

- Alarm Application: A maximum of 30 instances with a maximum of 1000 alarm variables per instance
  - Trend Application: A Maximum of 50 trend files

Application data:

- Maximum number of reference registers allowed:
  - For Shutdown: 8 each for Wells, AI, DI, and DO
  - For API Liquid SU: 12 for Meter Factor references and 11 for K Factor references
  - Holding Registers: A maximum of 30 instances with a maximum of 1000 registers per instance

Package number 2105452-034, -035. Do not start new IEC applications on your RMC-100 until you have carefully reviewed technical bulletin [2107406TB-TB218](#).

The following bugs are fixed:

- 12271 - Wedge gas 'fixed analysis data' not summing user entered values.
- 12205 - Loading XRC config causes RMC cpu frequency to change
- 12197 - Station App does not correctly show Period Uncorrected Vol for AGA7 tube and LIQUID APP
- 12184 - CCRP US-1018501 - Upgrading RMC from flash version -030 to -031 fails when the RMC is running customer config
- 12145 - API Liquid app, K factor register (app.7.3) does not update

- 12138 - RMC Totalflow.log has grown to 3295 KB. It is logging error twice a minute.
- 11837 - When adding a new trend and clicking on pre-existing trend it auto populates the new trend with all those variables.
- 11790 - Cannot add xx.xx.xxxxx 9 Digit registers to Alarms app
- 11642 - CCRP US-983778, Alarm app register app.array.256 changes to app.array.0
- 9153 - Alarm App: Maximum register array size for Input Reg, Thres Reg and Trigger Reg is 255
- 8601 - Alarm app only stores index as int8 instead of int16

## 8.6 Package numbers 2105452-034 and 2106260-005



**NOTICE – Service disruption.** If you have existing IEC applications instantiated in your device, do not upgrade your device with customer package 2105452-034 (or flash package 2105457-031) until you have reviewed the known issues for this package in section [9.1 Package number 2105452-039, -010](#) (RMC LITE)

There are several known limitations when configuring the MQTT functionality in the RMC. Review this carefully before connecting the RMC to a broker.

### 8.6.1 Device configuration issues and limits

- If two RMCs use the same device name for connection to an MQTT broker, both RMCs go into a connect-disconnect loop (communication with the broker cannot be successfully established). To avoid this condition, ensure each device name is unique before connecting the device to an MQTT broker.
- The RMC does not have the necessary Trusted Platform Module (TPM) capabilities and configuration options for secure in-device storage of certificates. Users can not upload and manage a chain of certificates for identification and authentication.

### 8.6.2 Application configuration limits

- Enabling or disabling application data publishing is only supported from the MQTT REST UI. PCCU does not support any MQTT configuration options. PCCU only provides a way to enable the MQTT REST Interface and the MQTT client functionality (for connection to MQTT brokers).
- When publishing trend data publishing for multiple trends, the trend log period must be the same across the different trend files. Also, the same registers cannot be declared either in a Trend file or across different files more than once.
- The trend log period should be greater than 10 seconds across each trend file.
- Trend definitions for an application on the REST user interface may not be updated correctly if the associated trend file is deleted in PCCU.
- Alarm definitions for an application on the REST user interface may not be updated correctly if the associated Alarm app is deleted in PCCU.
- A register's name in the Holding Registers application cannot start with a space or null character.
- Due to RMC's memory limitation, the maximum number of Holding Registers app instances supported is: 30 instances with a maximum of 1000 registers per instance.
- Using duplicate names when configuring Holding Registers application instances and data types in PCCU causes errors in the REST Interface (data is not display correctly). To avoid issues on the REST interface, do not use duplicate names when configuring holding registers in PCCU. Make sure all names are unique.

### 8.6.3 Application data limits

When implementing MQTT take in consideration the following limits:

Snapshot data:

- Alarm Application: A maximum of 30 instances with a maximum of 1000 alarm variables per instance
  - Trend Application: A Maximum of 50 trend files

Application data:

- Maximum number of reference registers allowed:
  - For Shutdown: 8 each for Wells, AI, DI, and DO
  - For API Liquid SU: 12 for Meter Factor references and 11 for K Factor references
  - Holding Registers: A maximum of 30 instances with a maximum of 1000 registers per instance

Package number 2105452-034, -035. Do not start new IEC applications on your RMC-100 until you have carefully reviewed technical bulletin [2107406TB-TB218](#).

The following bugs are fixed:

- CCRP US-993525 - RMC controller running IEC applications can become unresponsive.
- CCRP US-996744 - tfData config folder was deleted when customer upgraded RMC-100 OS and flash.
- CCRP US-999839 - Customer-built Isagraf causes high cpu load.
- 12089 - PCCU crashes when moving cursor over the trend graph view.
- 12093 - Application Licensing not applied to general applications instantiated outside of the application table.

## 8.7 Package number 2105452-033

The following bugs are fixed:

Bug number	Description
11014	PCCU Ethernet tab has no scroll bar to see full screen content.
11351	PCCU Last Calc Doubles tab is displaying incorrect value for Stock Tank Flow Rate.
11367	Part number of Applications (0.5.app) do not show on Display. Required for BLM.
11311	Liquid Coriolis interface quits polling on loss of power to Coriolis.
11276	Liquid Coriolis does not increment Error Poll to its set limit.
10306	When testing the Liquid Coriolis Application using BLM flash 2104340-035 if the Coriolis meter is unplugged from its comm port while operating and then plugged back in, the meter does not auto-recover.
10172	Liquid Coriolis App Exceeds Error Limits.
10043	Data from the Liquid Coriolis Help Files not available.
9421	Liquid Coriolis Help files not available.
9283	Error Limit (0-60) and Timeout (10-3600) of fields values are out of range displaying incorrect limit message until either Error Limit or Timeout field is put back within their allowable ranges.
9262	PCCU locks up after error message shows in the Communication Setup tab.
9211	Coriolis Meter and Micro Motion is displaying Advanced Tab in Basic and Advanced Modes. Should only display in Expert mode. The requirement to display Advanced tab only in Expert mode has been removed.
11295	TFIO will not show up after custom config is loaded.
11504	Operations app forgets its station name after a shutdown/reset command.
11548	Gas Coriolis CFX output shows AGA7 Calculation Method.
11513	G5 XFC - Valve control application cannot write to VC module (address 0) AO output. Get 'Undefined' or 'NaN' in the AO output registers.
11390	Cannot transfer more than 1 IEC credit for all Tiers (1, 2, 3, and 4).
11709	The description field for holding registers is not correct.

<b>Bug number</b>	<b>Description</b>
11589	Holding registers 950 and higher always show value 0.
11694	Operations Periodic tab, rows 256 and greater show a blank Interval field.
10641	Operation Playback files will not handle a negative value.
11784	Operations - Write playback block after changing Pause status via automation.
11556	Laptop File Utility GUI would not display Created Date Column.
11805	The sampler accumulator keeps incrementing when there is no flow and the volume accumulator keeps accumulating during no flow.
11860	Holding registers (Holding & Oper & PID & Comm) cannot be set to size zero.
11928	G5 - API Liquid App accumulates negative flow rates.
11950	Unable to change Gauge Pressure Group for SU Tubes. Calc tests are failing
7460	Save and restore functionality of XRC doesn't work when the flash folder contains a .csv file (for playback operations).
11942	After allowing the RMC to run over a period, the device can no longer be accessed.
11939	Digital Oilfield is turned on by default when it should be disabled.
11979	PCCU show multiple INI errors as AGA3 is interpreted as an IO app.
11349	Standard AGA3 help file for General tab is missing information.

## **8.8 Package number 2105452-032**

The following bugs are fixed:

- 11581 - I/O Subsystem communication improvements for SYNC CAN.

## **8.9 Package number 2105452-031**

The following bugs are fixed:

- 11303 - Memory leak exists that may cause devices to watchdog timeout and reset once memory has been exhausted.
- 11449 - Watchdog resets due to IO Subsystem communication performance issues.

## **8.10 Package number 2105452-030**

The following bugs are fixed:

- 10469 - IEC app overwrites station app register.
- 10518 - CFX Output showing Gauge instead of Absolute for some G3 devices.
- 10533 - PID app will not retain Station name.
- 10570 - Shutdown app forgets configuration settings on DIs and AIs tabs.
- 10751 - AGA7 Enhanced reports show Ultrasonic as "Sonic".
- 11042 - Product management wants to limit the number of applications on G5-Uflo to 24.
- 11043 - G4 Simulator should be updated to include fix for Light Hydros (refer to bug 10978).
- 11085 - Liquid tube app "Pulses Min" column in PCCU Laptop Daily View always shows zero when primary meter type is Coriolis, PD or Other.
- 11156 - Comm app port name is not saved to cold configurations.
- 11157 - Operations app holding register array size not saved for value 0.
- 11159 - G5 RMC reset (same fix made on X Series). (The Issue was discovered to occur with IEC applications instantiated. It was found that when Isagraf started, it would get a copy of its file descriptors from Totalflow. Both Totalflow and Isagraf would get a copy of the USB file descriptors during start up. When 32-bit loader connection is established through USB, Totalflow would close its handle in order to hand it over to deviceloader. But ISaGRAF process would still have its copy of the handle. When USB was unplugged and plugged back in would cause the TTY driver to generate a hang-up signal to deviceloader process group causing the device reset).
- 11161 - Corrupt operations app configurations on the periodic tab (G5 RMC).
- 11163 - Analysis Trend Application not creating analysis files (G5 RMC)



- 11165 – SU Liquid tube with primary meter type of Coriolis is missing the Indicated Standard Volume column in the View Daily Flow Data and Log Period Data tabs.
- 11177 – API LIQUID SU embedded app does not correctly average PF, TF, Meter Factor, Ctl, Cpl of Log Period Data after a Warm Start.

### **8.11 Package number 2105452-029.**

The following bug is fixed:

- 10978 – Light Hydrocarbon calculations were incorrect for liquid volumes whenever the density is less than 611 kg/m<sup>3</sup>. Calculations updated and are now correct.

### **8.12 Package number 2105452-026**

The following bugs are fixed:

- 10567 – API Liquid App logs Flowing API Gravity incorrectly, when Input Density unit is in API and the input Flowing Density varies during a log period
- 10566 – Memory leaks in Oil Custody Transfer app and Liquid Coriolis Data Interface app.
- 10389 – Setting a Totalflow device to an invalid volume calculation type can crash the device.
- 10322 – Remote configuration of Trip Contacts for AGA7 "DP/AVol/UVol" and SULIQUID "IV/PM/IV FR/Mass FR" not working
- 10314 – Totalflow Crashes on a customer's Modbus/TCP Server Configuration.
- 10282 – Operations Periodic function R1 > Out does not transfer the value of input register of type AI such as 7.4.0 to output register of type Float such as 9.0.0.
- 10280 – Bad value logged for Density in Liquid app when there is no flow.
- 10270 – Oil Custody Transfer App causes a crash when used without a Level Master App.
- 10269 – API liquid tube not being updated by Micromotion Coriolis via Liquid Coriolis Data Interface app.
- 10084 – Device not returning the correct IV formula for  $\text{Sum}(\text{Counts} / \text{k-factor}) * \text{m}$ .
- 10059 – G5 out of memory for trends when using Remote Trend System.
- 9789 – Coriolis Data Fields Disappear on Coriolis Liquid Interface app screen

### **8.13 Package number 2105452-025**

The following bugs are fixed:

- 10284 – Observe late counts when connected to several X MVs. Use a MOXA device and set the Response Delay to 0.
- 10228 – LCD display on device will continue to show a Loading message upon startup if there is no Device application present.
- 9685 – Watchdog resets may be experienced by devices that result in restarts.

### **8.14 Package number 2105452-022**

The following bugs are fixed:

- 10244 - Trend File Utilities Application may display Trend.cfg and other non-related files within the list of Trend Files.
- 10220 – More diagnostics data added to the Linux kernel logs to aid in troubleshooting.
- 10219 – The Core Dumps directory do not have read permissions for the Totalflow user key.
- 10215 – Reading string registers from terminal mode displays corrupted data due to buffer not being cleared between consecutive register get calls.
- 10208 - System Log's reset status lacks information.
- 10206 – Oil Custody Transfer application causes a crash when used without a Level-Master application.
- 10205 – Modbus corruption issue occurring in the field during calibration of RMC.
- 10204 – TFIO Modules disappear after watchdog reset.

- 10086 – During calibration process the checks and calibration points are duplicated even though the current readings are correct on new units.
- 10045 - RMC Operation may lock up and eventually watchdog reset when changing the number of periodic operations.
- 9989 – Security measures added for denial of service attacks and port flooding. SSH and SFTP have been upgraded to latest versions.
- 9967 – Unit Conversion APP not saving files to TFCold during update to ColdStart.
- 9984 - RMC-100 Display App and Units Convert system crash.
- 9835 - Stopping IEC resource may cause system reset on RMC
- 9816 – RMC not restoring large configurations after warm boot of the device.
- 9765 - Modbus Slave serial locks up device when changing Comm parameters.

### **8.15 Package number 2105452-021**

The following bugs are fixed:

- 9770 – Onboard IO stops working.
- 9855 – If the gateway is statically configured, the device should ignore ICMP redirects.
- 9856 - The G5 Loader system should not require a shutdown to upgrade software.
- 9860 – Operations Application: User INI part number not being retained on power cycle and warm start.
- 9891 – Slow shutdown and restart of Totalflow during a software upgrade.
- 9893 - The Coriolis Interface application and the Gas Coriolis application are accessing data from the interface application. This causes the Gas Coriolis to lose one second at the top of hour in Hourly Log Records.

### **8.16 Package number 2105452-020**

The following bugs are fixed:

- 9684 – Multiple Ethernet ports and connections can have an effect on the device being reset due to high amounts of network traffic.
- 9401 – Communication speeds lower than 9600 baud from devices communicating with an RMC when using RS-485, can influence data transfers.

## **9 Known issues and workarounds**

### **9.1 Package number 2105452-039, -010 (RMC LITE)**

There are several known limitations when configuring the MQTT functionality in the RMC. Review this carefully before connecting the RMC to a broker.

#### **9.1.1 Device configuration issues and limits**

- If two RMCs use the same device name for connection to an MQTT broker, both RMCs go into a connect-disconnect loop (communication with the broker cannot be successfully established). To avoid this condition, ensure each device name is unique before connecting the device to an MQTT broker.
- The RMC does not have the necessary Trusted Platform Module (TPM) capabilities and configuration options for secure in-device storage of certificates. Users can not upload and manage a chain of certificates for identification and authentication.

#### **9.1.2 Application configuration limits**

- Enabling or disabling application data publishing is only supported from the MQTT REST UI. PCCU does not support any MQTT configuration options. PCCU only provides a way to enable the MQTT REST Interface and the MQTT client functionality (for connection to MQTT brokers).
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### 9.1.3 Application data limits

When implementing MQTT take in consideration the following limits:

Snapshot data:

- Alarm Application: A maximum of 30 instances with a maximum of 1000 alarm variables per instance
  - Trend Application: A Maximum of 50 trend files

Application data:

- Maximum number of reference registers allowed:
  - For Shutdown: 8 each for Wells, AI, DI, and DO
  - For API Liquid SU: 12 for Meter Factor references and 11 for K Factor references
  - Holding Registers: A maximum of 30 instances with a maximum of 1000 registers per instance

## 9.2 Package number 2105452-034, -035

Bug 12247 - All existing IEC applications may stop running when starting a new additional IEC application. This may result in loss-of-control of outputs associated with those control algorithms.



**NOTICE – Service disruption.** If you have existing IEC applications instantiated in your device, do not upgrade your device with customer packages 2105452-034 or -035 (or Flash packages 2105457-031 or -032), and start new IEC applications until you have reviewed technical bulletin [2107406TB-TB218](#). The bulletin provides recommendations and IEC application restart instructions.

## 9.3 Package number 2105452-033

Bug 11944 – USB connections to devices may lock up while performing one second screen monitors via PCCU or logging into the device for an extended period of time. These lockups usually occur within the PCCU host software that will result in having to restart PCCU. In extreme circumstances, the device may have to be restarted.

## 9.4 Package number 2105452-031

11456 – Changing the configuration for the onboard I/O can cause the instantaneous pulse rate to spike momentarily.

## 9.5 Package number 2105452-029

10992 – IEC resources that are not activated in an existing configuration or newly downloaded configuration are deleted when the OS and Flash upgrade is downloaded.

Workaround: Before upgrading the OS and Flash on the device:

1. Download all IEC resource package files onto the device that could be used in the configuration.
2. Download the OS and Flash upgrade.

11015 – An IEC resource in a TfCold app slot instance that shares the same app slot instance in TfData will be copied to the TfData app slot. The consequence of this issue is that if the user instantiates a different IEC tiered instance than previously used in the same app slot, there can be multiple IEC resources residing in the same app slot instance in TfData.

Workaround: Before reusing the same app slot instance for a different IEC tier:

1. From the Application/License Management tab, delete the IEC instance app slot to be reused.
2. Go to the Station Setup tab, select **Delete** and Re-create TfCold from the Update Cold Start Configuration (0.21.0) and click **Send**.
3. Return to the Application/License Management tab to reuse the app slot instance for the new IEC tier.

## 10 SHA512 Security Feature

SHA512 is an algorithm used to confirm the integrity of data that is downloaded from a site. ABB is now providing a checksum value for each software package downloaded from the ABB library that allows users to confirm that no data is missing or was changed during the download. A corresponding SHA file is available in the ABB library for all software packages.

Please refer to the [Software package integrity check instructions \(2107014MNAA\)](#) for further information on using SHA512.

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