Embedded software 2105452
Modular Remote Controller (RMC-100)

August 30, 2019
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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 package 2105452.

**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 is 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2 Withdrawn software notice
The following customer package versions have been withdrawn and will not be supported.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>
<thead>
<tr>
<th>Table 2-1: Withdrawn or earlier versions</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Component</td>
<td>Part number</td>
</tr>
<tr>
<td>Customer package</td>
<td>2105452-030 or earlier</td>
</tr>
<tr>
<td>Operating System (OS)</td>
<td>2105411-030 or earlier</td>
</tr>
<tr>
<td>Flash</td>
<td>2105457-027 or earlier</td>
</tr>
</tbody>
</table>

3 Latest release
The latest software is available in customer package number 2105452-031. **Table 3-1** details the part numbers for the included components.

<table>
<thead>
<tr>
<th>Table 3-1: Software included in customer package 2105452-031</th>
</tr>
</thead>
<tbody>
<tr>
<td>Component</td>
</tr>
<tr>
<td>Operating System (OS)</td>
</tr>
<tr>
<td>Flash</td>
</tr>
</tbody>
</table>

**IMPORTANT NOTE:** Customer package (2105452) versions 027 and 028, OS (2105411) versions 027 and 028, and Flash (2105457) versions 024 and 025 were released internally and are skipped in this document. To upgrade to the 2105457-027 Flash it is required to upgrade to the 2105411-030 OS. This flash is not backwards compatible with previous OS releases.

**IMPORTANT NOTE:** If customer currently has an RMC-100 running at 300 MHz, please refer to Technical Bulletin 2106369TB-TB214 – Software update for the 300 MHZ RMC-100 - prior to upgrading the flash to the new version. Customers are being 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:
   a. Flash software part #.
b. OS software part #.

5. If the part numbers of either the flash or OS match those listed in section 2, plan to update the software to the latest versions.

5 Software download instructions

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

5.1 Software package components

The ABB Totalflow devices embedded software for 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 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

To download from the ABB website:

2. Scroll down to locate the product list.

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

1. Select the product name (RMC-100 or XCore) to display the product-specific web page.
2. Scroll down the product page, select the **Downloads** tab. 

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

3. On the navigation pane (left), scroll down, select **Software**.
4. On the list pane (right), select the required software package.
5. Click **Zip** to download.
6. Save the package when prompted. Select **Save as** to choose the desired location on the local drive.
7. Locate and extract the file from the downloaded Zip file. The extracted file has a .pkg extension.

**IMPORTANT NOTE:** For additional assistance to download software contact technical support.

### Software update instructions

**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.

#### 6.1 Update instructions for 2105452-031

Updating the software on the RMC-100 for package number 2105452-031 requires the shutdown of the Totalflow application before updating the software.
6.1.1 **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 value field next to System Shutdown and select **Yes**.

**Figure 6-1: System shutdown**

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

6.1.2 **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.

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

7.2 Package number 2105452-030.
The following enhancements are included in the customer package version 2105452-030:

7.2.1 API Liquid tube application.

- Shrinkage Factor/Stock Tank Volume
  If 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 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-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. Product will be offered in the very near future.

7.3 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.

7.3.1 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.
— Please refer to the IEC User Guide for further information on using the new enhancements.

7.3.2 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.

7.4 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.

7.4.1 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.

7.4.2 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).

7.4.3  **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 & 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.

7.5  **Package number 2105452-025**
No new features.

7.6  **Package number 2105452-022**
No new features.

7.7  **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

7.8  **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 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.

8.2 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 DIIs and AIIs 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 app 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 set 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.

8.3 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/m3. Calculations updated and are now correct.

8.4 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 Sum(Counts / k-factor) * m.
— 10059 – G5 out of memory for trends when using Remote Trend System.
— 9789 – Coriolis Data Fields Disappear on Coriolis Liquid Interface app screen

8.5 Package number 2105452-025

The following bugs are fixed:
— 10284 – Observe late counts when connected to several XMVs. 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.

8.6 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 LevelMaster application.
— 10205 – Modbus corruption issue occurring in the field during calibration of RMC.
— 10204 – TFO Modules disappear after watchdog reset.
— 10086 – During calibration 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.

8.7 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.

8.8 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 2105452-031

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

9.2 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.
3. 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:

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