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ABB MEASUREMENT & ANALYTICS | RELEASE NOTES

# **Embedded software 2105409**

## **Flow computer ( $\mu$ FLO<sup>G5</sup>)**

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  $\mu$ FLO<sup>G5</sup> flow computer embedded software distributed in customer package number 2105409.



**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 first in the list.

## 2 Withdrawn software notice

The following customer package versions have been withdrawn and will not be supported.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**Table 2-1: Withdrawn packages**

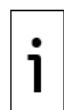
Component	Part number	Internal version
Customer package	2105409-027 or earlier	4.2.0-8 or earlier
Flash	2105298-019 or earlier	4.2.0 -8 or earlier

## 3 Latest release

The latest software is available in customer package number 2105409-032. [Table 3-1](#) details the part numbers for the included components.

**Table 3-1: Software included in customer package 2105409-032**

Component	Part number	Internal version
Operating System (OS)	2105411-035	4.0.0-8
Flash	2105298-024	4.5.0-6



**IMPORTANT NOTE:** Customer package (2105409) versions 028 through and 031, and Flash (2105298) versions 020 through 023 were released internally and are skipped in this document.

## 4 Determine software part and 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 matches 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 sites. Review the following sections to determine how to locate and download software.

### 5.1 Software package components

Embedded software for the ABB Totalflow devices 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  $\mu$ FLO<sup>G5</sup>, will be identified as FLASH package (2105298-NNN), where NNN is the revision of the package.

A package containing the operating system and flash software for the  $\mu$ FLO<sup>G5</sup> (also referred to as customer package), will be identified as Customer package (2105409-NNN), where NNN is the revision of the package.

### 5.3 Download packages from the ABB website

1. Go to [www.abb.com/upstream](http://www.abb.com/upstream).
2. Select the product name. The product home page displays.
3. Scroll down to locate and select **Downloads**.
4. On the navigation pane, scroll down to locate and select **Software**. The list of available software packages displays.
5. Locate and select the required software package.
6. Save the package in your local drive when prompted.
7. For improved security (ensure that your downloaded package is intact), locate and select the specific SHA512 for the package number.
8. Download this file to your local drive when prompted. Check files as instructed in [Software package integrity check instructions \(2107014MNAA\)](#).

**i**

**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.

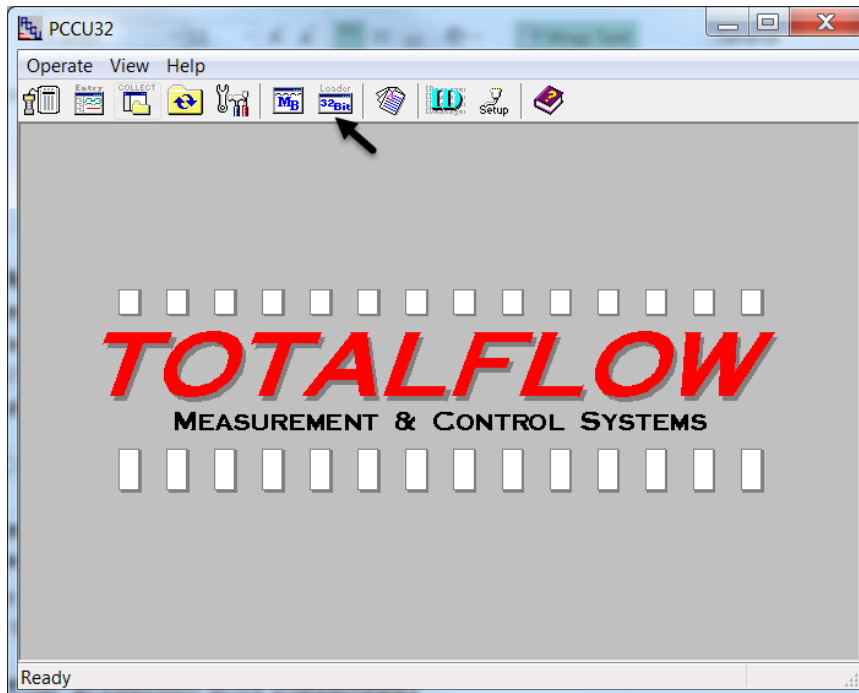
## 6 Software update instructions



**IMPORTANT NOTE:** Ensure device and measurement data are saved or backed up before any software update. For details, see the  $\mu$ FLO<sup>G5</sup> user manual or select **Help** from the PCCU top tool menu.

1. Start PCCU and select the loader icon from the top menu (see image below).

**Figure 6-1: Starting the device loader**



2. Establish a connection with the device.
3. 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.

### 7.1 Package number 2105409-032

- 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 number 2105409-027**

- New support for auto-discovery features
- Updated I/O Interface application:
  - New support for hot-swappable and hot-pluggable TFIO modules.
  - New support for remote calibration of I/O points
- Added enhanced networking features
- Updated Alarm System Application by removing an internal limitation on addressable registers by changing the register index value from one byte to two bytes.
- Repackaged the OSAL libraries with the Totalflow application so that OS upgrade is not required.

## **7.3 Package number 2105409-026**

No new features or enhancements for customer package 2105409-026.

## **7.4 Package number 2105409-025**

No new features or enhancements for customer package 2105409-025.

## **7.5 Package number 2105409-024**

No new features or enhancements for customer package 2105409-024.

## **7.6 Package number 2105409-023**

No new features or enhancements for customer package 2105409-023.

## **7.7 Package number 2105409-022**

The following new features are included in the customer package version 2105409-022:

### **7.7.1 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 m 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.

## **7.8 Package number 2105409-021**

The following enhancement is included in the customer package version 2105409-021:

- Users can now choose the bandwidth of the Ethernet interface. 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.

## **7.9 Package number 2105409-017**

The following enhancement is included in the customer package version 2105409-017:

### **7.9.1 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 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 fixed at 1 second.

### **7.9.2 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).

### **7.9.3 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.

### **7.10 Package number 2105409-014**

The following enhancement is included in customer package number 2105409-014:

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

## **8 Fixes**

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

### **8.1 Package number 2105409-032**

The following bugs are fixed:

- 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 name should be "Differential Pressure DE Alarm bit". Only fixed when a new tube is instantiated.
- 12351 - SU Coriolis tube Current tab does display Energy Rate (3.73) as zero on no flow.

### **8.2 Package number 2105409-027**

The following bugs are fixed:

- 12163 - Unable to enable network adaptor from entry mode in PCCU 7.69.1 on G5 XRC.
- CCRP US-1025418 - G5 uFlo device will disable the Ethernet port after a power cycle.
- 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, Three Reg and Trigger Reg is 255.
- 8601 - Alarm app only stores index as int8 instead of int16.
- 11837 - When adding a new trend and clicking on pre-existing trend it auto-populates the new trend with all those variables.
- 12197 - Station App does not correctly show Period Uncorrected Vol for AGA7 tube and LIQUID APP.



### 8.3 Package number 2105409-026

The following bugs are fixed:

- 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.

### 8.4 Package number 2105409-025

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.
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.
11709	The description field for holding registers is not correct.
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
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.

### 8.5 Package number 2105409-024

The following bugs are fixed:

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

### 8.6 Package number 2105409-023

The following bugs are fixed:

- 11303 – Memory leak exists that may cause devices to watchdog timeout and reset once memory has been exhausted.
- 10518 – Watchdog resets due to IO Subsystem communication performance issues.

## 8.7 Package number 2105409-022

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 will 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 device loader. 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 device loader 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.

## 8.8 Package number 2105409-021

- 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.

## 8.9 Package number 2105409-018

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

### **8.10 Package number 2105409-017**

The following bugs are fixed:

- 10284 – Late counts may be observed when connecting several XMVs using a MOXA device and setting 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.

### **8.11 Package number 2105409-014**

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 the device.
- 10086 – During calibration process the checks and calibration points are duplicated even though the current readings are correct on new units.
- 10045 - Device 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 - Device Display App and Units Convert system crash.
- 9835 - Stopping IEC resource may cause system reset on RMC.
- 9816 – Device not restoring large configurations after warm boot of the device.
- 9765 - Modbus Slave serial locks up device when changing comm parameters.

### **8.12 Package number 2105409-013**

The following bugs are fixed:

- 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.
- 9684 – Multiple connections supported on the Ethernet port can affect the device being reset due to high amounts of network traffic.
- 9401 – Communication speeds lower than 9600 baud from devices communicating with the device when using RS-485, can affect the data transfers.

## **9 Known issues and workarounds**

### **9.1 Package number 2105409-025**

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

### **9.2 Package number 2105409-023**

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

## **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 changed during the download. A corresponding SHA file is available in the ABB library for all software packages. Refer to the [Software package integrity check instructions \(2107014MNAA\)](#) for further information on using SHA512.



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