



ABB MEASUREMENT & ANALYTICS | RELEASE NOTES

Embedded software 2106200 Extendable IO (XIO)

APRIL 3, 2024

Table of Contents

1	Purpose.....	2
2	Withdrawn software notice.....	2
3	Latest release.....	2
4	Determine software part or version numbers.....	2
5	Software download instructions.....	2
5.1	Software package components.....	2
5.2	Locate the software.....	3
5.3	Download packages from the ABB website.....	3
6	Software update instructions.....	5
6.1	Software update instructions.....	5
7	Release features.....	6
7.1	Package number 2106200-014.....	6
7.2	Package number 2106200-013.....	6
7.3	Package number 2106200-012.....	6
7.4	Package number 2106200-011.....	6
7.5	Package number 2106200-010.....	6
7.6	Package number 2106200-009.....	6
7.7	Package number 2106200-008.....	7
7.8	Package number 2106200-007.....	7
7.9	Package number 2106200-006.....	7
7.10	Package number 2106200-004.....	7
7.11	Package number 2106200-003.....	7
7.12	Package number 2106200-002.....	7
8	Fixes.....	8
8.1	Package number 2106200-014.....	8
8.2	Package number 2106200-013.....	8
8.3	Package number 2106200-012.....	8
8.4	Package number 2106200-011.....	8
8.5	Package number 2106200-010.....	9
8.6	Package number 2106200-009.....	9
8.7	Package number 2106200-008.....	9
8.8	Package number 2106200-007.....	10
8.9	Package number 2106200-006.....	10
8.10	Package number 2106200-003.....	10
9	Known issues and workarounds.....	10
9.1	Package number 2106200-013.....	10
9.2	Package number 2106200-012.....	10
9.3	Package number 2106200-011.....	11
9.4	Package number 2106200-010.....	11
9.5	Package number 2106200-002 and later.....	11
10	SHA512 Security Feature.....	12

1 Purpose

These release notes detail new features and modifications, functional changes, and bug fixes made to the XIO embedded software distributed in customer package 2106200.



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2 Withdrawn software notice

The following customer package versions have been withdrawn and will not be supported.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.



IMPORTANT NOTE: The following XIO versions have been skipped: Customer package 2106200-005 and Flash 2106198-007.

Table 2-1: Withdrawn or earlier versions for XIO packages

Component	Part number	Internal version
Customer package	2106200-013 or earlier	4.9.0
Flash	2106198-013 or earlier	4.9.0

3 Latest release

The latest software is available in customer package number 2106200-014.

Table 3-1: Software included in the XIO customer package 2106200-014 (4.9.1)

Component	Part number	Internal version
Operating System (OS)	2106196-008	4.9.0
Flash	2106198-014	4.9.1

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 [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 is distributed in packages. Packages may contain all or some of the components required for 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 Locate 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 Remote XIO, will be identified as FLASH package (2106198-NNN), where NNN is the revision of the package.
- A package containing the operating system and flash software for the Remote XIO (also referred to as customer package), will be identified as Customer package (2106200-NNN), where NNN is the revision of the package.

5.3 Download packages from the ABB website

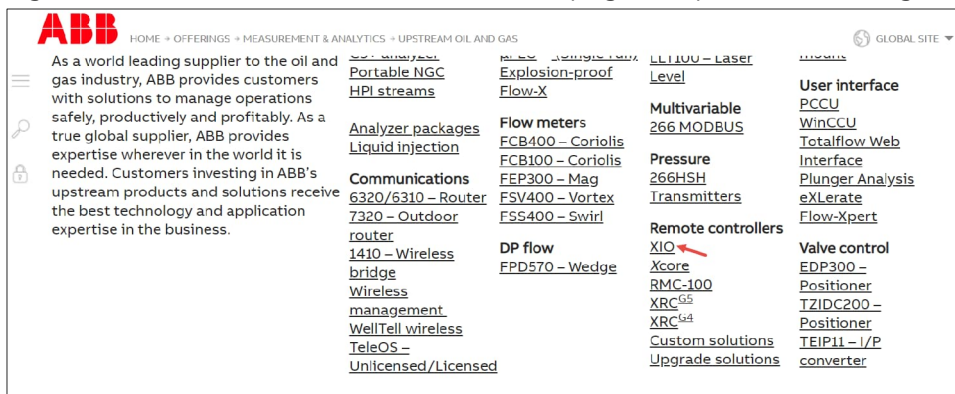


IMPORTANT NOTE: The website images shown in this procedure are used as examples. The images may show older versions of software. Always make sure to download the latest software available.

To download from the ABB website:

1. Go to www.abb.com/upstream.
2. Scroll down to locate the product list.

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



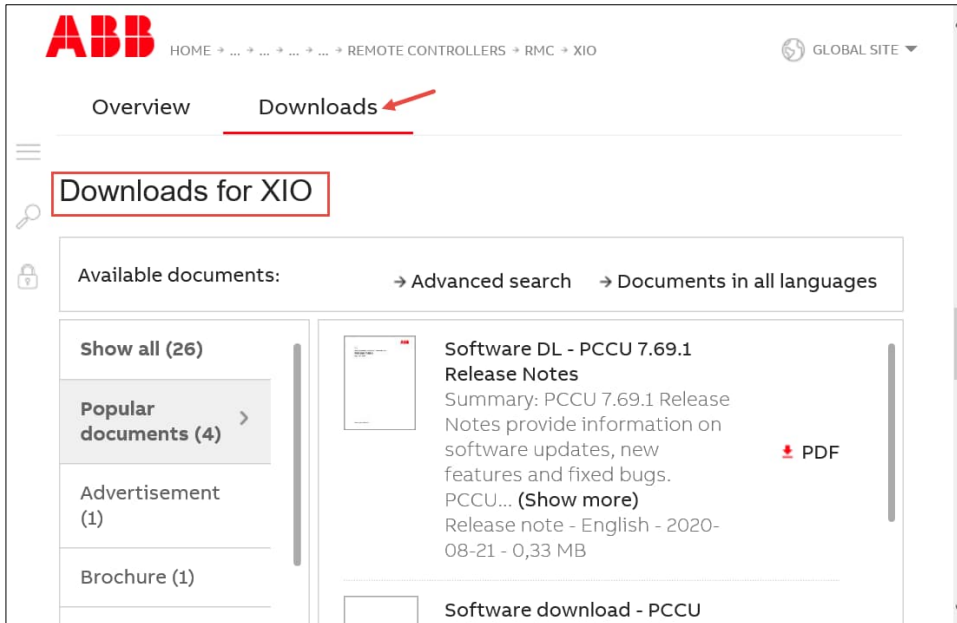
3. Select the product name (XIO) to display the product-specific web page.

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



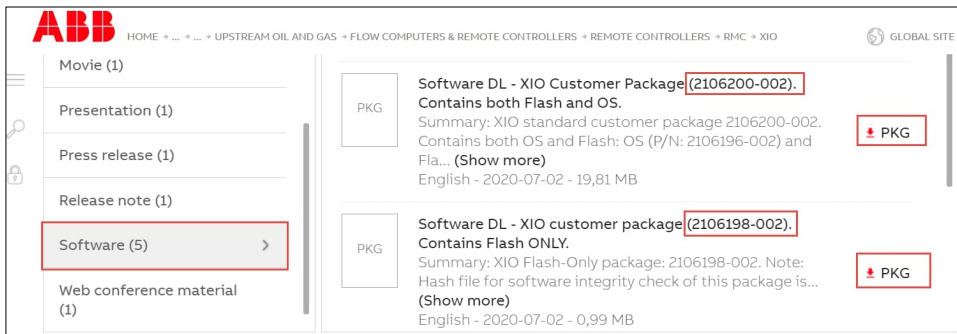
4. Scroll down the product page and select the Downloads tab.

Figure 5-3: XIO-100 downloads



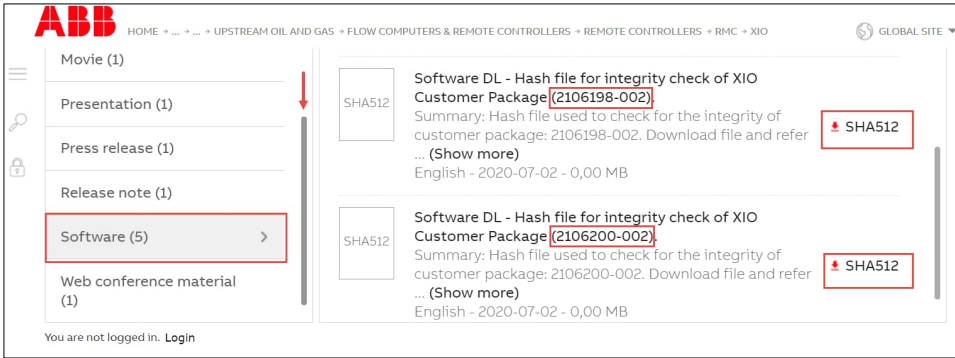
5. On the navigation pane (left), scroll down and select Software (Figure 5-4).

Figure 5-4: Software listed for product



6. On the list pane (right on Figure 5-4), select the required software package. Typically, only the latest officially released versions are listed. If you need an earlier version and cannot find it, contact ABB Technical Support.
7. Click Zip (or PKG) to download. The software files show with the .zip extension if compressed or .PKG if not.
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 (if file is compressed). The extracted file has a .pkg extension.
10. For improved security (and to ensure that your downloaded package is intact), locate and select the specific SHA512 for the package number (Figure 5-5.)

Figure 5-5: Locating SHA512 files



- Download this file to your local drive when prompted. Check files as instructed in the [Software package integrity check instructions](#).



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 ([Figure 5-5](#)). 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



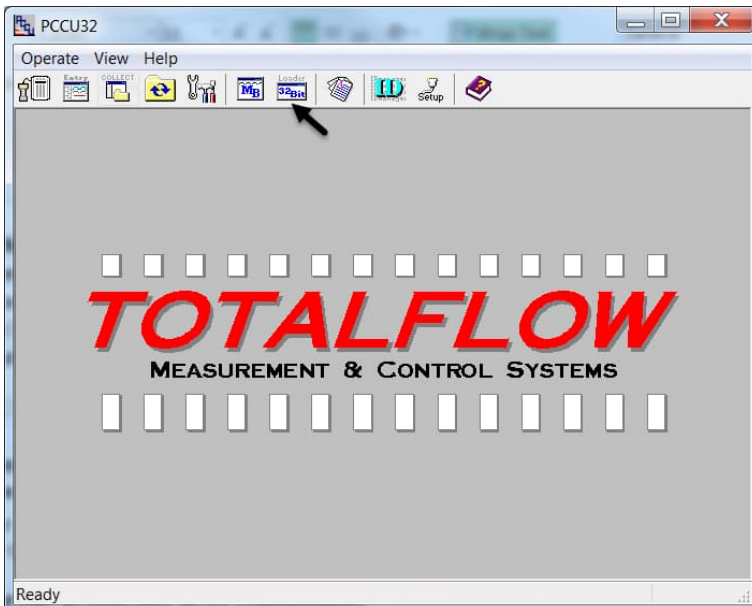
IMPORTANT NOTE: Ensure device and measurement data are saved or backed up before software updates. For details, see the XIO user manual or select Help from the PCCU top tool menu.

6.1 Software update instructions

Use the device loader utility to update the software:

- From the top PCCU tool bar, select the loader icon.

Figure 6-1: Starting the device loader



- Establish a connection with the device.
- 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.

7.1 Package number 2106200-014

The following new features have been added to the XIO:

- XIO License chargeable credits set to a maximum of 10.
- Added support for the Selectable Units (SU) AGA3, AGA7, and API Liquid Applications.

7.2 Package number 2106200-013

The following new features have been added to the XIO:

- In the API Liquid SU app, added option to enable or disable rounding for calculating Ctl, Cpl, and Densities for Light Hydrocarbons.

7.3 Package number 2106200-012

The following new features have been added to the XIO:

- Added support for ABB Totalflow AGA7 measurement application
- Updated application licensing scheme from 2106200-009 release
 - Maximum of 4 chargeable credits allowed
 - No application-level restriction on the AGA3, Gas Lift, and Plunger Control applications.

7.4 Package number 2106200-011

None.

7.5 Package number 2106200-010

The following new features have been added to the Totalflow XIO Device:

- Added averaging, logging for Static Pressure Gauge:
 - Added Static Pressure Type (Absolute vs. Gauge) in Device Setup section of Characteristics Data for Enhanced Mode US AGA3, US AGA7 and API Liquid SU tube applications.
 - Added average Static Pressure Gauge in Log Period and Daily QTRs for Enhanced Mode US AGA3 and US AGA7 tube applications.
 - Added a register for Static Pressure Gauge of current second and a register for average Static Pressure Gauge of last calculation period for Enhanced Mode US AGA3 and US AGA7 tube applications.
- Improvements to the Plunger Control application:
 - Added Plunger Arrival Detection by Pressure Spike.
 - Added "PI-Accum" and "OFF" options to "Detection Type".
 - Added automatic configuration of PID/VC application registers when PID/VC application is selected for Valve Control.
 - Added timer tuning to Closed Timer and Afterflow Timer.
 - Changed to not lock the Valve Control for setpoint changes.

7.6 Package number 2106200-009

The following changes have been added to the XIO device.

- Added Port Forwarding support:
 - TCP traffic can be forwarded from external to internal ports
- Added support for PCCU entry mode network connections through a port forwarding XIO
- Added support for 32 Bit Loader network connections through a port forwarding XIO
- Added Network Diagnostic tool support:
 - Ping and Traceroute utilities added
- Added support for additional Totalflow applications:
 - AGA3 measurement (maximum of 2 instances)
 - Gas Lift (maximum of 1 instance)

- Plunger Control (maximum of 1 instance)
- Shutdown (No limits)
- Increased Watchdog Fail Safe timeout to a maximum of 180 seconds to support radio communications

7.7 Package number 2106200-008

No new features.

7.8 Package number 2106200-007

The following changes have been added to the XIO devices:

- Operating System changes to detect and handle the absence of Wi-Fi Module

7.9 Package number 2106200-006

No new features.



IMPORTANT NOTE: XIO package version 2106200-005 was skipped.

7.10 Package number 2106200-004

The following new features have been added to the XIO devices:

- Added support for XIO-00, XIO-04 and XIO-08 devices based on number of serial ports
- Added the Totalflow Data Transfer application for data transfer between the XIO and the RMC or any other controller
- Added support for the Totalflow XIO Interface app in XIO
- Added support for the Totalflow Alarms application in XIO

7.11 Package number 2106200-003

The following new features have been added to the XIO devices:

- 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 Alarm System Application by removing an internal limitation on address-able registers by changing the register index value from one byte to two bytes.

7.12 Package number 2106200-002

This package supports the XIO in its initial release to the market. The following features are available:

- Support for subset of Totalflow control applications available in other products (PCCU continues to be the host-based user interface):
 - System
 - Generic Communication
 - Coriolis Interface
 - Liquid Coriolis Interface
 - Wireless Remote I/O
 - LevelMaster
 - Therms Master
 - Operations
 - Holding Registers
 - Trend System
 - PID Control
 - Updated I/O Interface Application:
 - o New support for hot-swappable and hot-pluggable TFIO modules
 - o New support for remote calibration of I/O points
- New XIO-specific applications/services:
 - XIO Server (Read/write) for XIO-RMC integration
 - Ethernet-to-Serial Passthrough Application

- New support for auto-discovery features
- Added enhanced Ethernet networking and Wi-Fi features (XIO Wi-Fi Client functionality support)

8 Fixes

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

8.1 Package number 2106200-014

No bug fixes for this revision.

8.2 Package number 2106200-013

The following bugs are fixed:

Bug number	Description
12679	Protocol logging can lose data from truncating. CRC is not always logged for Total-flow protocol.
12696	Incorrect temperature in API Liquid SU app's hourly and daily QTRs when Base Temperature is 15 or 20 degrees Celsius.
12709	API Liquid SU application Light Hydrocarbon calculation for compressibility factor (Cpl) is not compliant with API 11.2.2.
12714	API Liquid SU app Light Hydrocarbon calculation for temperature correction (Ctl) is not compliant with API 11.2.4.
12717	Default variable names in the Holding Registers application have a leading space.
12721	The API Liquid SU application calculates incorrect temperature correction (Ctl) for Specialized Liquid per API 11.1.7.2.
12751	Rx and Tx Rate Limit not settable

8.3 Package number 2106200-012

The following bugs are fixed:

Bug number	Description
12751	Rate Limit option not settable in Network screen for XIO.
CCRP# US-1084156, US-1084157	XIO Flash is not working

8.4 Package number 2106200-011

The following bugs are fixed:

Bug number	Description
Shutdown Application	
12731*	Reset (x.3.1) & (x.3.2) and Shutdown (x.3.7) & (x.3.8) registers now tolerate non "1" values to activate, they are changed to "1". This would be seen if the indirect register contains a float value or a counter value.
12726	Shutdown can now occur if a reset indirect register value (x.3.2) is stuck on. This can occur if a button is broken or jammed on. Trigger will occur only on "rising edge".
Plunger Application	
12744	Remote Reset will write a zero back thru the indirect register (x.3.27) (if set). This will allow a host to send a non-zero for reset, then it will self-clear, and host does not need to write a zero.
12732	Plunger will not reset if in shutdown fail state.
12731*	Reset (x.1.8) & (x.3.27) register now tolerate non "1" values to activate, they are changed to "1". This would be seen if the indirect register contains a float value or a counter value.

Bug number	Description
12725 (CCRP# US-1080087)**	Shutdown can now occur if a reset indirect register (x.3.27) is stuck on. This can occur if a button is broken or jammed on. Trigger will occur only on "rising edge".
12723 (CCRP# US-1080087)**	Reset will always force plunger to "Startup Mode (x.1.20)". State 1(closing valve) is default.

* Bug 12731 covers both the Shutdown and Plunger apps.

** CCRP# US-1080087 includes both bug 12725 and 12723

8.5 Package number 2106200-010

The following bugs are fixed:

Bug number	Description
12177	I/O Interface application IIC Statistics tab fails to list connected TFIO modules
12265	Tube applications' water correction factor (Fw) allows negative water volume
12430	Valve Status is missing from Plunger application
12539	I/O Interface application missing IIC Statistics
12544	XFrame request blocks are not executed when a block with a non-existing IP address is encountered
12550	API Liquid app calculates incorrect ctl, cpl and ctpl when Thermal Expansion Factor is User Entered (this is typically the case when Liquid Type is Special Application)
12564	Plunger application needs a register for External Pressure
12591	Needs to have a Volume Correction Error Code if input is out of range
12612	G5/RMC/XIO devices delete existing file of same name before successfully receiving a new file from the host.
12626	Temperature should be logged as 0 in Log Period and Daily QTRs for API Liquid tube application when there is no flow during the log period or contract day
12628	Shutdown application AI delay timer incorrectly increments when no alarm
12654	Role Based Access Control (RBAC) is not supported on Bluetooth connections.
12668	Plunger reset if caused by Shutdown will reset regardless of Safety Reset Mode.

8.6 Package number 2106200-009

The following bugs are fixed:

Bug number	Description
12413	Critical Severity - Multiple vulnerabilities can be exploited and result in remote code execution in root context
12458	XIO Ethernet watchdog pet fails over radio
12160	RMC ftp server rejects keyfile: totalflowuser.ppk
12499	RMC stops writing Ethernet Watchdog pet to XIO
12500	RMC writes XIO Pet Watchdog command to wrong tcp port
12544	XFrame request blocks not being executed when a block with a non-existing IP address is encountered

8.7 Package number 2106200-008



IMPORTANT NOTE: The following bug fixes were not reported when this build was released.

Bug number	Description
12430	Valve Status is missing from Plunger application
12419	Plunger application does not obtain Arrived state

8.8 Package number 2106200-007

None

8.9 Package number 2106200-006

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 – After adding a new Holding Register App, the Holding Registers' Capacity tab Type and Name are Float for all holding register arrays.



IMPORTANT NOTE: XIO package version 2106200-005 was skipped.

8.10 Package number 2106200-003

The following bugs are fixed:

- 12271- Wedge gas 'fixed analysis data' not summing user entered values.
- 12197- Station App does not correctly show Period Uncorrected Vol for AGA7 tube and LIQUID APP
- 12156- Bool not supported for generic comm app client/host causing rolling device resets on XIO at least
- 12154- [UDC] XIO Interface app incorrectly consumes a General Credit.
- 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, Three Reg and Trigger Reg is 255
- 8601- Alarm app only stores index as int8 instead of int16.

9 Known issues and workarounds

The following are known issues about the XIO embedded software. Some these issues have associated workarounds. Please review carefully.

9.1 Package number 2106200-013

There are known limitations in this release:

- [Bug 12494] The Gas Lift critical flow rate is not calculated when the plunger state is: Afterflow.

9.2 Package number 2106200-012

- [12773] Unable to establish PCCU connection with the XIO using Ethernet when the XIO Wi-Fi client mode is enabled, but not configured (or is configured incorrectly).
 - If Client Wi-Fi mode is required, an AP must be online for the WiFi client to operate properly. Be sure to configure the target Access Point (AP) parameters correctly in the XIO and that the AP is online. If the target AP parameters are correct in the XIO, troubleshoot the AP itself and its connection to the network.
 - If Client Wi-Fi mode is not required, be sure to disable the mode.

Workarounds:

If the Wi-Fi client is required:

1. Verify that the target AP is configured correctly and is online (network connection should be active, AP's SSID should be advertised, and DHCP enabled if required).
2. Establish Entry-mode PCCU connection with the XIO using the USB port.
3. Select Communications on the PCCU Entry-mode navigation tree.
Select the Networking tab.
4. Make sure the XIO WiFi client IP configuration is correct:
 - a. Select the DHCP Enable box if the XIO will obtain its IP address from the AP, or

- b. Configure IP parameters manually.
- 5. Make sure the target AP SSID and passcode are configured correctly.
- 6. Click Send.
- 7. Click Restart.
- 8. Verify connection with the XIO using Ethernet. If the XIO (Wi-Fi Client)-AP connection is successfully established, the ability to connect with the device using Ethernet should be restored. Please note that if the AP goes offline, the XIO Wi-Fi client will persist in its attempts to connect with the AP, causing the issue again.

If the Wi-Fi client is not required:

- 1. Establish Entry-mode PCCU connection with the XIO using the USB port.
- 2. Select Communications on the PCCU Entry-mode navigation tree.
- 3. Select the Networking tab.
- 4. Clear the State Enable box in the Wi-Fi Network section.
- 5. Click Send to confirm change.

9.3 Package number 2106200-011

There are known limitations in this release. Please review the associated bug number and the workaround.

9.3.1 Plunger reset command does not return plunger to previous state.

- [12734] If the Startup Mode (on Plunger Setup > General Setup tab) is set to: Previous State, a reset of the Plunger function does not cause the Current State (on Plunger > Summary tab) to change as expected.

Workaround: To avoid this condition set the Startup Mode (on Plunger Setup > General Setup tab) to: 1 Closing Valve, or 6 Afterflow then, click Send.

9.4 Package number 2106200-010

There are known limitations in this release. Please review the associated bug number and the workaround.

9.4.1 Plunger application: Fail Tune

[Bug 12683] Plunger Fail tune not functional for Valve 2: Closed and 6: Afterflow conditions, Turner, Casing Slope (aka Casing Sway) and Casing Rise.

9.4.2 RBAC TCP Authentication changes itself to Enabled when security file is sent

[Bug 12664] Role Based Access Control (RBAC) can be Enabled or Disabled for individual TCP ports on Totalflow devices. RBAC authentication can be enabled or disabled independently for each communication app on the device. When a new security file is sent to the Totalflow device, the RBAC authentication setting for the communications app may be unexpectedly changed.

Workaround:

- 1. Edit the security file before sending to the device:
 - a. Set Port Configuration / Network Ports to Disabled.
 - b. Send the security file to the device. This will temporarily turn off RBAC authentication for ALL communication apps using a TCP port in the device.
- 2. To re-enable RBAC authentication for each individual communication app using a TCP port:
 - a. Connect to the device using PCCU Entry mode.
 - b. Select Communications > [communication app name] > Setup tab.
 - c. Set Authentication (app.0.37) to Enable or Enable by Security Switch.

9.5 Package number 2106200-002 and later

- The XIO does not have a hardware circuit to monitor the 12-24V incoming line voltage. For this reason:
 - The XIO embedded software does not support sleep mode when the line voltage drops below 10.9V. There is no support for configuration for low power use (This configuration is available in other ABB flow computers and remote controllers).

- The AGA-3 application always provides a value of 0V for the XIO Battery / External voltage.

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](#) for further information on using SHA512.

ABB Inc.
Measurement & Analytics
Quotes: US-IAMA.inquiry@us.abb.com
Orders: US-IAMA.order@us.abb.com
Training: US-IAMA.training@us.abb.com
Support: upstream.support@us.abb.com
+1 800 442 3097 (opt. 2)

Additional free publications are available for download at:
www.abb.com/upstream

Main Office -
Bartlesville
7051 Industrial Blvd
Bartlesville, OK 74006
Ph: +1 918 338 4888

Texas Office - Hou-
ston
3700 W. Sam Houston
Parkway S., Suite 600
Houston, TX 77042
Ph: +1 713 587 8000

We reserve the right to make technical changes or modify the contents of this document without prior notice. With regard to purchase orders, the agreed particulars shall prevail. ABB does not accept any responsibility whatsoever for potential errors or possible lack of information in this document.

We reserve all rights in this document and in the subject matter and illustrations contained therein. Any reproduction, disclosure to third parties or utilization of its contents - in whole or in parts – is forbidden without prior written consent of ABB.

Copyright© 2024 ABB all rights reserved