

AXC F 2152 – CHANGE NOTES

Change notes for the AXC F 2152 controller

Application note
108427_en_07

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1 General information

This document contains all changes made between firmware version 1.0.0 and the current firmware version of the AXC F 2152 controller (Order No. 2404267).

Current firmware version: 2019.3

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Make sure you always use the latest documentation.
It can be downloaded at phoenixcontact.net/product/2404267.

3 Changes in firmware version 2019.3

3.1 New functions

PRL (Phoenix Redundancy Layer)

The PROFINET device functionality has been extended to include the PRL function (Phoenix Redundancy Layer).

EtherNet/IP™ device function

You can use the controller as an EtherNet/IP™ device.

Dynamic bus configuration

The controller supports the dynamic bus configuration of the Axioline F local bus.

Left-alignable INTERBUS master

The controller now supports left-alignment of the INTERBUS AXC F XT IB master (Order No. 2403018).

PLCnext Store: New app types

The controller supports the execution of the app types “function extension”, “runtime”, “library”, and “solution app”.

3.2 Known limitations and errors

- Static_String array in C++ programs
The variable sizes are incorrectly calculated in Static_String-type arrays (C++), meaning that access to the second element contained in the array and to those following is incorrect.
String arrays in IEC 61131 programs are not affected by this.
- AXC F 2152 as a PROFINET device
The AXC F 2152 cannot be operated as a PROFINET device under PROFINET controllers from third-party manufacturers.
- Monitor time of PROFINET data
The PROFINET data monitor time must be at least 24 ms. The monitor time is the product of „Reduction ratio“ and „Monitor factor“ (in PLCnext Engineer: „Profinet“ editor group, „Interface list“ editor).

- Metrics that can be transferred to the PROFICLOUD
You can transfer up to 194 variable values as metrics into the PROFICLOUD.
- Very high CPU utilization
The online connection to PLCnext Engineer may be interrupted when the controller CPU utilization is very high.
The connection interruption is indicated in PLCnext Engineer without any indication of the cause.
- Private keys stored unencrypted
The private keys for the certificates in the IdentityStore are stored unencrypted on the SD card.
Therefore, you should protect the SD card against any unauthorized physical access.
- Setting breakpoints is not supported
Setting breakpoints in debug mode results in the controller becoming unreachable.

#	Name	Function	Location	RT class	Reduction ratio	Update time	Monitor factor	Monitor time
8	192.168.1.10 / axi-558-gn-1 / ddp-1 / interface-1			RT	8	8	3	24

Reduction ratio	Update time	Monitor factor	Monitor time
8	8	3	24

Figure 1 Monitor time

4 Changes in firmware version 2019.0 LTS



Please note:
 Updating to firmware version 2019.0 LTS will reset the controller to factory default setting type 1. Any application-specific data and projects on the controller will be deleted.

4.1 New functions

Download changes

The controller now supports the “Download Changes” function. With the “Download Changes” function, program changes can be transferred to the controller during operation without interruption.

This is subject to the following conditions:

- You have not made any changes to the bus configuration.
- You have not changed the process data assignment.
- You have not changed the properties of the existing tasks (e.g., task type, interval, watchdog).
- You have not deleted any tasks or added any new tasks.

Left-alignment of Axioline F extension modules

The controller now supports left-alignment of the Axioline F AXC F XT ETH 1TX extension module (left-alignable Ethernet interface, Order No. 2403115).

New functions in the WBM

New functions are now available in the web-based management (WBM), e.g., PROFINET diagnostics and firewall configuration.

Declaring retentive data

You can now also declare variables from C++ programs as retentive data in PLCnext Engineer.

Updating Axioline F I/O data

You can now specify the refresh interval for Axioline F I/O data. This is done by selecting which task triggers the Axioline F I/O data update in the PLCnext Engineer project.

To do this, proceed as follows:

- Double-click on the “Axioline F (x)” node in the “PLANT” area.

The “/ Axioline F” controller editor group opens.

- Select the “Trigger task” view in the “Settings” editor.
- In the drop-down list, select the task that is to trigger the Axioline F I/O data update.

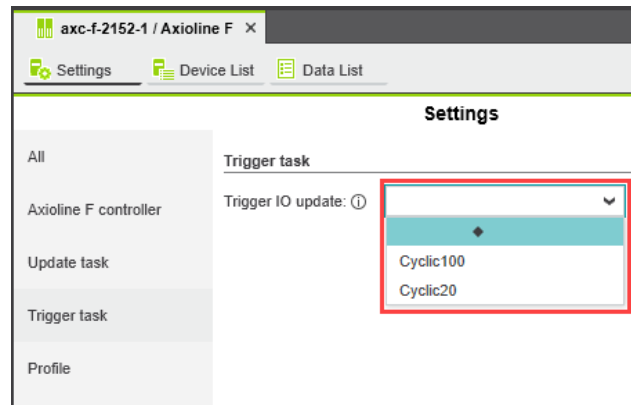


Figure 2 Select Trigger task

If you do not select a task, the update will occur by default every 50 ms.

4.2 Known limitations and errors

- AXC F 2152 as a PROFINET device
The AXC F 2152 cannot be operated as a PROFINET device under PROFINET controllers from third-party manufacturers.

- Downloading PC Worx Engineer projects to the controller
You can only download PLCnext Engineer projects to the controller with firmware version 2019.0 LTS that were created and compiled in PLCnext Engineer version 2019.0 LTS. Projects that you created in PC Worx Engineer must be re-created in PLCnext Engineer.

If you download a PC Worx Engineer project to the controller with firmware version 2019.0 LTS, the project will not run on the controller. However, no error message is displayed in PLCnext Engineer.

Please note:

The PC Worx Engineer software has been renamed to PLCnext Engineer:

- Name up to Version 7.2.3:
PC Worx Engineer
- Name starting from Version 2019.0 LTS:
PLCnext Engineer

- Monitor time of PROFINET data
The PROFINET data monitor time must be at least 24 ms. The monitor time is the product of „Reduction ratio“ and „Monitor factor“ (in PLCnext Engineer: „Profinet“ editor group, „Interface list“ editor).

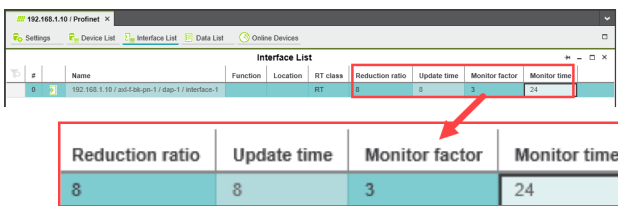


Figure 3 Monitor time

- Metrics that can be transferred to the PROFICLOUD
You can transfer up to 194 variable values as metrics into the PROFICLOUD.
- Exceeding CPU system limits
Exceeding the CPU system limits for the controller may result in an interruption of the online connection to PLCnext Engineer.
The connection interruption is indicated in PLCnext Engineer without any indication of the cause.

- Private keys stored unencrypted
The private keys for the certificates in the IdentityStore are stored unencrypted on the SD card.
Therefore, you should protect the SD card against any unauthorized physical access.
- Setting breakpoints is not supported
Setting breakpoints in debug mode results in the controller becoming unreachable.

5 Changes in firmware version 1.2.0

5.1 New functions

Design of a PLCnext Inline station

As an alternative to an Axioline F station, you can now set up a PLCnext Inline station using the controller. To do so, you need the AXC F IL ADAPT Inline adapter terminal (Order No. 1020304). You can directly install the Inline modules in series on the adapter terminal.

License verification

When an SD card is used, the controller now verifies if the SD card contains a Phoenix Contact license. You can only use the controller together with an appropriate Phoenix Contact SD card.

5.2 Notes on firmware downgrades and resetting the controller



For performing firmware downgrades, please note the following:

Downgrade to a firmware version $\leq 1.0.2$

After downgrading to a firmware version $\leq 1.0.2$, you can only use the controller **with** an SD card. Using it without an SD card is possible starting from firmware version 1.1.0.

- Ensure that the SD card has been inserted before switching the controller on, in order that the controller can use it.
- Only use an SD card provided by Phoenix Contact.

Downgrade to firmware version 1.0.0

After downgrading to firmware version 1.0.0, you can only use the reset button of the controller while an application is running. Resetting the controller to default setting type 2 is not possible.



For resetting the controller to default setting type 2, please note the following:

When restoring to default setting type 2, the firmware of the controller is also reset to the delivery state. Controllers with a firmware version $\leq 1.0.2$ can only be used **with** an SD card. Using them without an SD card is possible starting from firmware version 1.1.0.

- Ensure that the SD card has been inserted before switching the controller on, in order that the controller can use it.
- Only use an SD card provided by Phoenix Contact.

5.3 Known limitations and errors

- Time-outs during the communication with PCP devices
If more than eight PCP devices are connected at the same time, time-outs can occur during the communication between the controller and the PCP devices.
- Maximum permissible number of Axioline F local bus devices
Currently, a maximum of 30 Axioline F local bus devices is supported.
- Interrupting the PROFINET communication
When transmitting files via SFTP to the controller, the PROFINET communication is interrupted.
- Function of the reset button
When the controller is reset to default setting type 2, all LEDs light up after approx. 30 s.
To actually restore the controller to default setting type 2, you need to press and hold the reset button for another 2 s after all LEDs have lit up.

6 Changes in firmware version 1.1.0

**Please note:**

After the update to firmware version 1.1.0, the controller has to be restarted.

6.1 New functions

Use of SD card now optional

The SD card is now optional and is no longer mandatory for operating the controller.

– Operation without SD card:

All data is saved on the internal parameterization memory. If you make changes to files and directories on the internal parameterization memory, the Linux operating system generates an overlay filesystem from the changed files and directories.

– Operation with SD card:

If you use an SD card, all application-specific data (e.g. network configuration, project bus configuration, etc.) is saved to the SD card.

Two cases of SD card use can be distinguished:

- 1) There is no overlay filesystem on the SD card:
If there is an overlay filesystem on the internal parameterization memory, it is copied to the SD card.
- 2) There already is an overlay filesystem on the SD card:
If there is an overlay filesystem on the internal parameterization memory, it is **not** copied to the SD card.

The controller accesses the overlay filesystem on the SD card. The overlay filesystem on the internal parameterization memory is deleted.

**Please note:**

The SD card is recognized during initialization of the controller. If you insert the SD card during operation, the SD card will not be detected.

- Make sure that the SD card has been inserted before you switch on the controller.

Memory expanded

- The program memory of the controller has been expanded from 4 MB to 8 MB.
- The data memory of the controller has been expanded from 8 MB to 16 MB.

7 Changes in firmware version 1.0.2

**Please note:**

After an update from firmware version 1.0.0 to firmware version 1.0.2, high-level language programs created with the Phoenix Contact SDK version 1.0.0 will no longer be executable. In this case, proceed as follows:

- Download the latest version of the Phoenix Contact SDK from phoenixcontact.net/products and install it.
- Compile existing high-level language programs with the latest version of the Phoenix Contact SDK.

When updating from firmware version 1.0.1 to firmware version 1.0.2, this procedure is not necessary.

7.1 Error corrections

- PROFINET configuration
The controller was stopped when transmitting a PC Worx Engineer project with a faulty PROFINET configuration to the controller.
This error has been rectified.

7.2 Known limitations and errors

- Controller breakdown
In some rare cases the controller may break down. In case of a controller breakdown, power is disconnected to the I/O modules contained in the bus configuration.

8 Changes in firmware version 1.0.1

**Please note:**

After an update from firmware version 1.0.0 to firmware version 1.0.1, high-level language programs created with the Phoenix Contact SDK version 1.0.0 will no longer be executable. In this case, proceed as follows:

- Download the latest version of the Phoenix Contact SDK from phoenixcontact.net/products and install it.
- Compile existing high-level language programs with the latest version of the Phoenix Contact SDK.

8.1 Error corrections

- Task processing time
The programmed maximum task processing time was exceeded by occasional task processing time outliers. The ESM watchdog was triggered. This error has been rectified.
- User authentication
A user authentication security vulnerability was patched.
- Requested memory
An error occurred when memory was requested from a C++ program. The requested memory was not released again. This error has been rectified.
- Data Access Service
An error in the Data Access Service (online view in the “Data List” editor in PC Worx Engineer) has been rectified.
- Subscription service
During data query via OPC UA, an error occasionally occurred in the subscription service. This error has been rectified.