rexroth
A Bosch Company

Release Notes

PLC App

PLC Runtime Environment for ctrlX CORE

PLC-V-0206

Edition 05

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Table of contents

1 About this documentation 5

2 Product information 5

2.1 Product information 5

3 PLC-V-0206.3 5

3.1 New functions 5

3.1.1 Feature 842731: CODESYS EtherCAT add-on 5

3.1.2 Feature 855547: IO link add on for CODESYS fieldbuses PROFINET and EtherCAT 6

3.1.3 Feature 859801: Configurable format for mapping ENUM variables in the ctrlX Data Layer 6

3.2 Resolved defects and modifications 6

3.2.1 Bug 583808: PROFINET communication via PLC AddOn not stable 6

3.2.2 Bug 860330: Invalid values for ENUM variables following an online change 6

3.2.3 Bug 880307: Changing the display name for array elements 6

3.3 Notes on the use and known restrictions 7

3.3.1 Bug 360322: Access to 64 Bit DATE and TIME data types via OPC UA Server not possible 7

3.3.2 Bug 785366: Loading a configuration reports "Failed to load PLC runtime data" 8

4 PLC-V-0206.1 8

4.1 New functions 8

4.1.1 Feature 817659: ctrlX PLC Engineering/ctrlX IO Engineering: Update CODESYS 3.5.19.70 8

4.2 Resolved defects and modifications 8

4.2.1 Bug 666702: CXA_Datalayer.library - – DL_CreateNodeValue displays an invalid value for ErrorIdent 8

4.2.2 Bug 837481: CXA_Datalayer.library - – exception error after execution of GetMemoryMap 9

4.3 Notes on the use and known restrictions 9

4.3.1 Bug 360322: Access to 64 Bit DATE and TIME data types via OPC UA Server not possible 9

4.3.2 Bug 751137: Downloading a PLC project based on version 1.20 in Runtime version 2.x is not possible 9

4.3.3 Bug 785366: Loading a configuration reports "Failed to load PLC runtime data" 9

5 PLC-V-0206.0 10

5.1 New functions 10

5.1.1 Feature 747454: Access extension to ctrlX Data Layer by the data types UNION, BIT and ENUM 10

5.1.2 Feature 751381: Creation of external POUs via ctrlX Real-Time Software Development Kit 10

5.2 Resolved defects and modifications 10

5.2.1 Bug 695631: PLC array elements cannot be addressed directly 10

5.2.2 Bug 756526: Mapping of multidimensional arrays in the ctrlX Data Layer incorrect 11

5.2.3 Bug 761801: Temporary usage mode cannot be detected 11

5.3 Notes on the use and known restrictions 11
5.3.1 Bug 360322: Access to 64 Bit DATE and TIME data types via OPC UA Server not possible 11
5.3.2 Bug 785366: Loading a configuration reports "Failed to load PLC runtime data" 11
6 PLC-V-0204.0 12
6.1 New functions 12
6.1.1 Feature 631745: Creating and integrating external POUs in C or C++ 12
6.1.2 Feature 677349: ctrlX PLC Engineering / App PLC – Integration CODESYS 3.5.19.30 12
6.2 Notes on the use and known restrictions 12
6.2.1 Bug 360322: Access to 64 Bit DATE and TIME data types via OPC UA Server not possible 12
6.2.2 Bug 715668: ctrlX PLC Engineering – Breakpoints in several tasks lead to a "freezing" of the control 13
7 PLC-V-0202.0 13
7.1 New functions 13
7.1.1 Feature 466591: CXA_Datalayer – Access functions for Data Layer real-time area 13
7.1.2 Feature 575016: Changes to the licensing conditions from PLC App version PLC-V-0202 13
7.2 Resolved defects and modifications 14
7.2.1 Bug 660813: Exception after installation of PLC App – Restart required 14
7.3 Notes on the use and known restrictions 14
7.3.1 Bug 360322: Access to 64 Bit DATE and TIME data types via OPC UA Server not possible 14
8 Service and support 15
9 Index 17

1 About this documentation

Editions of this documentation

Edition	Release date	Notes
01	2023 – 08	Release Notes for the PLC app, Version PLC-V-0202.0
02	2023 – 11	Release Notes for the PLC app, Version PLC-V-0204.0
03	2023 – 11	Release Notes for the PLC app, Version PLC-V-0206.0
04	2024 – 05	Release Notes for the PLC app, Version PLC-V-0206.1
05	2024 – 07	Release Notes for the PLC app, Version PLC-V-0206.3

2 Product information

2.1 Product information

For the latest information on our products, go to ➦ https://www.boschrexroth.com.

For current security advisories, please refer to ➦ https://psirt.bosch.com/security-advisories/

3 PLC-V-0206.3

3.1 New functions

3.1.1 Feature 842731: CODESYS EtherCAT add-on

Description

The CODESYS EtherCAT add-on allows operation of the CODESYS EtherCAT Master in conjunction with ctrlX PLC Engineering and the PLC app, see: ➦CODESYS EtherCAT: Configurator and protocol stack in the IEC 61131-3 tool

The CODESYS EtherCAT Master can be operated on the following network interfaces:

Control variant	Network connection on the device
ctrlX CORE X3	XF51
ctrlX CORE X5	XF10 XF11
ctrlX CORE X7	XF10 XF11

After installing the add-on, the device can be configured on the node of the control unit using the “Add device...” command in the project.

Please note that you also need the appropriate license for this, which can be purchased via the Rexroth license portal.

3.1.2 Feature 855547: IO link add on for CODESYS fieldbuses PROFINET and EtherCAT

Description

For the configuration of IO link devices in conjunction with the CODESYS EtherCAT or PROFINET add-ons, the appropriate CODESYS IO link add-on is now available, see: ➦ CODESYS IO Link support integrated in the IEC 61131-3 tool

CODESYS IO link add-on can only be used in ctrlX PLC Engineering.

The use of the add-on in ctrlX IO Engineering in conjunction with the Rexroth EtherCAT Master is not supported.

Please note that you also need the appropriate license for this, which can be purchased via the Rexroth license portal.

3.1.3 Feature 859801: Configurable format for mapping ENUM variables in the ctrlX Data Layer

Description

Prior to version 2.6, PLC variables of type ENUM contained in the symbol configuration were always mapped as 32-bit integers in the ctrlX Data Layer.

From version 2.6, these variables are displayed as "real" ENUMS in the ctrlX Data Layer.

To ensure compatibility with older versions, the "enumRepresentation " setting in the "plc/admin/runtime-settings/symbol-settings" node can be used to configure the display of values in the new format (value = FLATBUFFER) or in the previous format (value = BASETYPE). The default value is FLATBUFFER.

3.2 Resolved defects and modifications

3.2.1 Bug 583808: PROFINET communication via PLC AddOn not stable

Description

During the operation of the PROFINET AddOn on a ctrlX CORE device, a cyclic communication interruption occurs. The logger displays the message "AR Consumer DHT Expired". It does not matter whether the ctrlX CORE device is running as a PROFINET control or as a PROFINET device.

Bugfix

The Linux Kernel 6.1 included in version 2.6 provides a new IP stack. This means that the error does not occur anymore. The functionality is only available from version 2.6.

3.2.2 Bug 860330: Invalid values for ENUM variables following an online change

Description

Variables of type ENUM were not mapped correctly in the ctrlX Data Layer during an online change. The corresponding values were only provided again after a download.

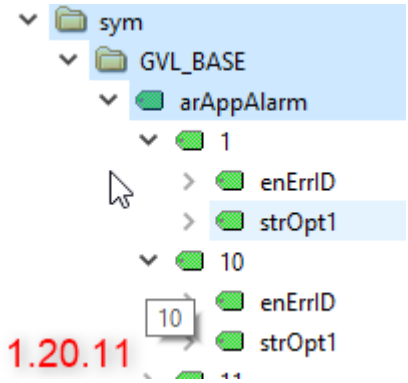
3.2.3 Bug 880307: Changing the display name for array elements

Description

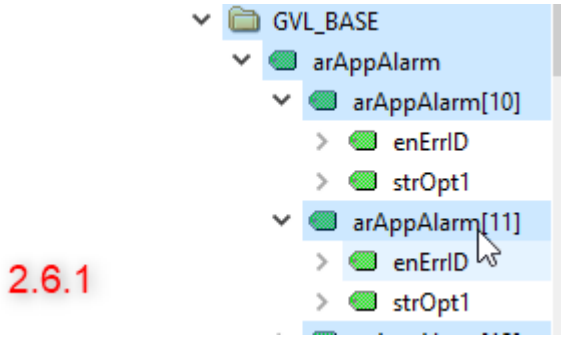
For browsing array variables via OPC UA, the "Displayname" element has been used in the metadata since version 2.6.

The browsing name was always specified as the display name in previous versions.

Example version 1.2:



Example version 2.6:



Applications, e.g. visualizations that were created with predecessor statuses and address corresponding variables via the display name, have to be adapted accordingly.

In order to continue using the original browsing format, a new parameter **"ArrayDisplayName**" with the values **"ON**" and**"OFF**" has been introduced in the Data Layer at the**plc/admin/runtime-settings/symbol-settings** node:

- **ON**: Publish display names via metadata (default).
- **OFF**: Display names not specified (< Version 2.6).

3.3 Notes on the use and known restrictions

3.3.1 Bug 360322: Access to 64 Bit DATE and TIME data types via OPC UA Server not possible

Description

Exchanging the following 64 bit data types is not supported via the OPC UA Server:

- `LDATE`
- `LDATE_AND_TIME`
- `LTOD`

The error BadTypeMismatch is returned as response to the ReadNodeValue requests.

3.3.2 Bug 785366: Loading a configuration reports "Failed to load PLC runtime data"

Description

When loading a ctrlX CORE configuration, the error "Failed to load PLC runtime data" is reported and the loading process of the PLC boot application is aborted.

A known cause of this behavior is different configurations of the PLC retain memory size on the control and in the configuration to be loaded. In this case, when loading the boot project, the PLC app detects that the required memory size is not available and aborts the loading process.

Note:

- The configured retain data size on the control has to correspond to the retain data size of the configuration to be loaded.
- A change to the retain data size always requires a restart of the PLC app to apply the change.

Preliminary troubleshooting

1. If the retain data size required by the respective configuration is known in advance, the memory size should first be set to the required size before loading the configuration and restarting the PLC app, see here: ➦ Web documentation

   It should then be possible to load the configuration without errors.

2. If the size is unknown, restart the control after loading the configuration.

   A retain mismatch is reported for the application when the boot application is loaded.

   Now carry out a cold reset of the PLC application.

   The boot application can subsequently be started.

4 PLC-V-0206.1

4.1 New functions

4.1.1 Feature 817659: ctrlX PLC Engineering/ctrlX IO Engineering: Update CODESYS 3.5.19.70

Description

The ctrlX PLC Engineering and ctrlX I/O Engineering software have been updated to CODESYS version 3.5.19.70.

4.2 Resolved defects and modifications

4.2.1 Bug 666702: CXA_Datalayer.library - – DL_CreateNodeValue displays an invalid value for ErrorIdent

Description

The DL_CreateNodeValue function block (contained in the CXA_Datalayer library) returned an invalid value for the ErrorIdent output.

4.2.2 Bug 837481: CXA_Datalayer.library - – exception error after execution of GetMemoryMap

Description

The GetMemoryMap method resulted in a nullpointer exception error after executing the method SetMemoryMap.

Bugfix

The interface for the GetMemoryMap method had to be changed.

Existing boot projects based on version 2.6.0 will therefore no longer start after an update to version 2.6.1.

4.3 Notes on the use and known restrictions

4.3.1 Bug 360322: Access to 64 Bit DATE and TIME data types via OPC UA Server not possible

Description

Exchanging the following 64 bit data types is not supported via the OPC UA Server:

- `LDATE`
- `LDATE_AND_TIME`
- `LTOD`

The error BadTypeMismatch is returned as response to the ReadNodeValue requests.

4.3.2 Bug 751137: Downloading a PLC project based on version 1.20 in Runtime version 2.x is not possible

Description

If a PLC project based on version 1.20 is loaded into a Runtime version 2.x, it is not clear from the error messages that the license model has changed between PLC app version 01 and 02 and that the project also has to be updated to version 2.x.

4.3.3 Bug 785366: Loading a configuration reports "Failed to load PLC runtime data"

Description

When loading a ctrlX CORE configuration, the error "Failed to load PLC runtime data" is reported and the loading process of the PLC boot application is aborted.

A known cause of this behavior is different configurations of the PLC retain memory size on the control and in the configuration to be loaded. In this case, when loading the boot project, the PLC app detects that the required memory size is not available and aborts the loading process.

Note:

- The configured retain data size on the control has to correspond to the retain data size of the configuration to be loaded.
- A change to the retain data size always requires a restart of the PLC app to apply the change.

Preliminary troubleshooting

1. If the retain data size required by the respective configuration is known in advance, the memory size should first be set to the required size before loading the configuration and restarting the PLC app, see here: ➦ Web documentation

   It should then be possible to load the configuration without errors.

2. If the size is unknown, restart the control after loading the configuration.

   A retain mismatch is reported for the application when the boot application is loaded.

   Now carry out a cold reset of the PLC application.

   The boot application can subsequently be started.

5 PLC-V-0206.0

5.1 New functions

5.1.1 Feature 747454: Access extension to ctrlX Data Layer by the data types UNION, BIT and ENUM

Description

Mapping PLC variables based on the `UNION`, `BIT` and `ENUM` data types is now also supported in the ctrlX Data Layer.

However, the following restrictions apply:

- Only pure bit structures can be accessed.
  If a structure also contains variables of other types in addition to variables of the type `BIT`, the structure is not mapped.
- Structures containing variables of the type `BIT` are not considered for method calls.

5.1.2 Feature 751381: Creation of external POUs via ctrlX Real-Time Software Development Kit

Description

The creation of external POUs via ctrlX Real-Time Software Development Kit is supported.

5.2 Resolved defects and modifications

5.2.1 Bug 695631: PLC array elements cannot be addressed directly

Description

If PLC variables of the type ARRAY OF ... are mapped in the Data Layer, the respective index is always resolved as separate node.

Example: A variable `myArrayElement[5]` is displayed in the tree via the path `myArrayElement/5`. This is difficult for the user to understand.

Bugfix

PLC array variables in the Data Layer are now provided with a display name.

For example, a variable `myArrayElement/5` is displayed as `myArrayElement[5]` via OPC UA.

Furthermore, despite the node address `myArrayElement/5`, access is allowed via `"[index]"` . Thus, the element cannot only be read and written via `myArrayElement/5`, but also via `myArrayElement[5]`.

Information: The variable representation can be switched using the DataLayer "Show displayname in tree" option. Thus, array elements are not only represented via the index, but with variable names + index.

5.2.2 Bug 756526: Mapping of multidimensional arrays in the ctrlX Data Layer incorrect

Description

If multidimensional arrays were mapped to the ctrlX Data Layer via the symbol configuration, not all nodes were displayed correctly. For example, the values and respective metadata were missing.

5.2.3 Bug 761801: Temporary usage mode cannot be detected

Description

If the PLC Basic license was installed on the control, the Temporary usage mode was not detected.

As a result, missing licenses for the unlicensed features were diagnosed and operation was not possible.

5.3 Notes on the use and known restrictions

5.3.1 Bug 360322: Access to 64 Bit DATE and TIME data types via OPC UA Server not possible

Description

Exchanging the following 64 bit data types is not supported via the OPC UA Server:

- `LDATE`
- `LDATE_AND_TIME`
- `LTOD`

The error BadTypeMismatch is returned as response to the ReadNodeValue requests.

5.3.2 Bug 785366: Loading a configuration reports "Failed to load PLC runtime data"

Description

When loading a ctrlX CORE configuration, the error "Failed to load PLC runtime data" is reported and the loading process of the PLC boot application is aborted.

A known cause of this behavior is different configurations of the PLC retain memory size on the control and in the configuration to be loaded. In this case, when loading the boot project, the PLC app detects that the required memory size is not available and aborts the loading process.

Note:

- The configured retain data size on the control has to correspond to the retain data size of the configuration to be loaded.
- A change to the retain data size always requires a restart of the PLC app to apply the change.

Preliminary troubleshooting

1. If the retain data size required by the respective configuration is known in advance, the memory size should first be set to the required size before loading the configuration and restarting the PLC app, see here: ➦ Web documentation

   It should then be possible to load the configuration without errors.

2. If the size is unknown, restart the control after loading the configuration.

   A retain mismatch is reported for the application when the boot application is loaded.

   Now carry out a cold reset of the PLC application.

   The boot application can subsequently be started.

6 PLC-V-0204.0

6.1 New functions

6.1.1 Feature 631745: Creating and integrating external POUs in C or C++

Description

In addition to the creation of POUs (program organization units) in the input languages of IEC 6-1131, external POUs can also be implemented "externally".

The difference is that although the POU interfaces are defined in IEC as usual, the POUs are implemented in C or C++ in the PLC runtime system. The extension has to be implemented in C or C++ and integrated into Automationcore as a CELIX bundle.

6.1.2 Feature 677349: ctrlX PLC Engineering / App PLC – Integration CODESYS 3.5.19.30

Description

ctrlX PLC Engineering and the PLC app are based on CODESYS 3.5.19.30.

6.2 Notes on the use and known restrictions

6.2.1 Bug 360322: Access to 64 Bit DATE and TIME data types via OPC UA Server not possible

Description

Exchanging the following 64 bit data types is not supported via the OPC UA Server:

- `LDATE`
- `LDATE_AND_TIME`
- `LTOD`

The error BadTypeMismatch is returned as response to the ReadNodeValue requests.

6.2.2 Bug 715668: ctrlX PLC Engineering – Breakpoints in several tasks lead to a "freezing" of the control

Description

If breakpoints are set in different tasks in a PLC project, semaphores get jammed. As a result, the PLC app no longer responds and the control has to be restarted.

Workaround

When debugging, only ever use breakpoints in program sections that are assigned to a task.

7 PLC-V-0202.0

7.1 New functions

7.1.1 Feature 466591: CXA_Datalayer – Access functions for Data Layer real-time area

Description

In the CXA_Datalayer library, access functions to the Datalayer_RT folder, access functions to the Data Layer real-time areas are now also available.

7.1.2 Feature 575016: Changes to the licensing conditions from PLC App version PLC-V-0202

Description

For the operation of the PLC app, new licenses are introduced from version PLC-V-0202:

- **ctrlX OS License - PLC Basic**
  IEC 61131 PLC runtime environment supporting 1x CPU core, 1x PLC task and up to 256 byte I/O data.
- **ctrlX OS License - PLC Standard (add-on)**
  Upgrade of PLC Basic license.
  IEC 61131 PLC runtime supporting 1x CPU core and multiple PLC tasks and up to 1024 byte I/O data.
- **ctrlX OS License - PLC Advanced (add-on)**
  Upgrade the PLC Standard license.
  IEC 61131 PLC runtime supporting multiple CPU cores and multiple PLC tasks and up to 2048 byte I/O data.
- **ctrlX OS License - PLC Performance (add-on)**
  Upgrade PLC Advanced license.
  IEC 61131 PLC runtime with support for multiple CPU cores, multiple PLC tasks and unlimited I/O data.

New in ctrlX PLC Engineering from version WRK-V-02xx

In ctrlX PLC Engineering, the tab "Licensed Software Metrics" is available on the device node of the control. The parameters to be taken into account for licensing are determined in the current project.

The tab *“Status → Licenses”* lists the licenses required for the operation of the project. If the control is connected, the existing PLC licenses are also compared in the tab.

Downloading an application is only possible if the required PLC licenses are available on the control. Otherwise, the download is rejected.

- PLC licenses acquired on the basis of PLC-V-01xx can no longer be used for the new version.
- A boot project based on PLC-V-01xx on the control can no longer be executed.
  The relevant project has to be updated with ctrlX PLC Engineering WRK-V-02xx, cleaned up and reloaded to the control.

7.2 Resolved defects and modifications

7.2.1 Bug 660813: Exception after installation of PLC App – Restart required

Description

After the PLC App had been installed, the control does not start, as an exception was triggered. The control has to be restarted.

7.3 Notes on the use and known restrictions

7.3.1 Bug 360322: Access to 64 Bit DATE and TIME data types via OPC UA Server not possible

Description

Exchanging the following 64 bit data types is not supported via the OPC UA Server:

- `LDATE`
- `LDATE_AND_TIME`
- `LTOD`

The error BadTypeMismatch is returned as response to the ReadNodeValue requests.

8 Service and support

Our worldwide service network provides an optimized and efficient support. Our experts provide you with advice and assistance. You can contact us **24/7**.

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Fax:	**+49 9352 18 4941**
Email:	➦ service.svc@boschrexroth.de
Internet:	➦ http://www.boschrexroth.com

Additional information on service, repair (e.g. delivery addresses) and training can be found on our internet sites.

Service worldwide

Outside Germany, please contact your local service office first. For hotline numbers, refer to the sales office addresses on the internet.

Preparing information

To be able to help you more quickly and efficiently, please have the following information ready:

- Detailed description of malfunction and circumstances
- Type plate specifications of the affected products, in particular type codes and serial numbers
- Your contact data (phone and fax number as well as your e-mail address)

9 Index

B

Bug 583808. 6

H

Helpdesk. 15
Hotline. 15

I

Important notes. 5

P

Product information. 5

S

Service hotline. 15
Support. 15

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