

PXI-CORE Edge controller

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1 Important product information



Warning!

Operation of this equipment in a residential environment could cause radio interference.

1.1 Disposal instructions



Old electrical and electronic appliances.

Electrical or electronic devices that are no longer serviceable must be collected separately and sent for environmentally compatible recycling (in accordance with the European Waste Electrical and Electronic Equipment Directive).

To dispose of old electrical or electronic devices, you should use the return and collection systems put in place in the country concerned.

1.2 FCC Statement - Wired Class A digital device (unintentional radiator)

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

1.3 CE Class A Statement



Warning!

The operation of this equipment in a residential environment could cause radio interference

1.4 FCC suppliers declaration of conformity

Product(s):

Material	Commercial code	Material description
F.01U.395.004	PXI-CORE	Edge controller

Compliance statement

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. this device must accept any interference received, including interference that may cause undesired operation.

Responsible party

Bosch Security Systems LLC
130 Perinton Parkway
14450 Fairport, NY, USA
www.boschsecurity.us

1.5

KCC Statement



기자재명 : PXI-CORE Edge controller
모델명 : PXI-CORE
수입업체(상호)명 : 로버트보쉬코리아유한회사
제조국 : 독일 (Germany)
제조일자 : 별도표기

R-R-RB9-PXICORE 제조자 : Bosch Security Systems B.V.

2 About this manual

The purpose of this user manual is to provide the required information needed for the installation (hardware and software) and access to the web-based Graphical User Interface of the Bosch PXI-CORE edge controller.

This manual, or an update, in pdf format is available as download from www.boschsecurity.com.

2.1 Intended audience and use

This manual is intended for everyone who is authorized to install and configure the PXI-CORE edge controller and related products.

Intended use of the equipment

- The device may only be operated under the mounting and installation conditions specified in this document.
- The device may only use component configurations, software and firmware specified in this document.

2.2 Copyright notice

Unless otherwise indicated, this publication is the copyright of Bosch Security Systems B.V. All rights are reserved.

2.3 Trademarks

Throughout this document trademark names may have been used. Rather than put a trademark symbol in every occurrence of a trademark name, Bosch Security Systems states that the names are used only in an editorial fashion and to the benefit of the trademark owner with no intention of infringement of the trademark.

2.4 Notice of liability

While every effort has been taken to ensure the accuracy of this document, neither Bosch Security Systems nor any of its official representatives shall have any liability to any person or entity with respect to any liability, loss or damage caused or alleged to be caused directly or indirectly by the information contained in this document.

Bosch Security Systems reserves the right to make changes to features and specifications at any time without prior notification in the interest of ongoing product development and improvement.

3 About the PXI-CORE

3.1 Introduction

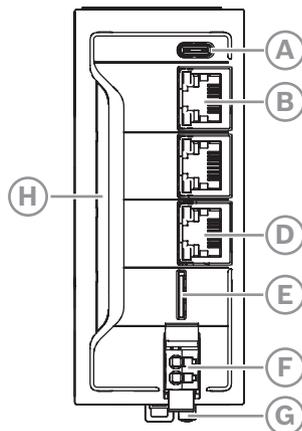
The PXI-CORE Edge controller is the HW base unit for smart integration. It consists of a compact DIN-rail mountable hardware unit, Linux operating system and firmware. Smart integration stands for integration between Bosch Building Technology systems and devices. Next to this HW base unit the dedicated Intelligent control SW App for the PXI-CORE Edge controller is required which is sold separately. Information of the Intelligent control App will reveal the features and supported systems and devices.

This smart integration solution connects to IP based systems and devices utilizing the available IP interface. The Intelligent control App is running on the PXI-CORE Edge controller. Installation, updates and configuration of this App can be done remotely from any location via the web-GUI. The PXI-CORE Edge controller is equipped with a Trusted Platform Module (TPM) 2.0, has a full secure boot support, secured HTTPS web interface connection and supporting CA signed certificates for authentication. All to ensure a high level of cyber security.

3.2 Quick start

This quick start section of the manual describes the required steps to make the PXI-CORE, and installed application(s), up and running fast. For detailed instructions, refer to *Detailed installation procedures and instructions, page 10*.

Quick start procedure:



1. Connect the PXI-CORE to the:
 - Ethernet network (D) (XF51). Connect your configuration device (PC, laptop, tablet) to the same network that the PXI-CORE is connected to.
 - External 24 V power supply (F) (XD10).
2. Power on the PXI-CORE via the connected power supply.
3. Check the device LED bar (H):
 - red: power-up.
 - blinking blue: starting up.
 - green: ready to use.
4. Open your web browser and enter the IPv6 address (see product label):
 - Example IPv6 address: `https://[fe80::2680:34ff:fe84:62e0]`. Be sure to type the correct address (e.g. double colon after `https://[fe80]`).
 - Accept the risk for the self-signed certificate.

- If this method fails, please refer to *Troubleshooting, page 21*.
- 5. Logon to the PXI-CORE:
 - Enter user name and password. Both: bosch (factory default)
- 6. Get or set an IPv4 address:
 - Go to Settings > Connectivity > (XF51) eth1. Check if you have an IPv4 address assigned from a DHCP server. If not, manually assign an IPv4 address clicking in the plus (+) sign in IP addresses. Note that an IPv4 address is required to allow communication to other BT products (Praesensa, Praesideo, B/G Series control panels, ONVIF cameras).
- 7. Install your application(s):
 - 1) Go to and click Settings > Apps.
 - 2) Set the PXI-CORE edge controller in Service Mode by clicking the blue Operation mode/Service mode button.
The LED (H) color changes from green to blinking blue.
 - 3) Click the Install from file button and browse to the application files.
 - 4) Select your file(s) and click the Install button to finalize the installation process.
You can select multiple files at once.
 - 5) Set the PXI-CORE back in Operation Mode by clicking the blue Operation mode/Service mode button.
The LED bar (H) color changes from blinking blue to green.

4 Detailed installation procedures and instructions

This section provides mounting instructions and installation instructions. It provides installation methods commonly encountered in commercial applications and all applicable codes. Follow the mechanical installation and electrical installation steps in the order they are set up in the next chapters.



Notice!

All work activities necessary for the installation, connection and commissioning are to be carried out by electrically skilled persons only.

4.1 Mechanical installation

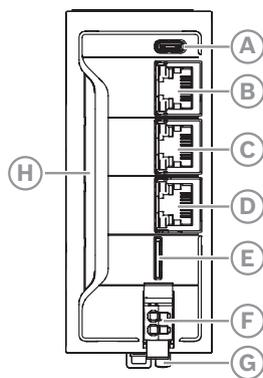
4.1.1 Parts included

Make sure that all parts are included and not damaged. If the packaging or any parts are damaged, contact your shipper. If any parts are missing, contact your Sales or Customer Service Representative.

The box contains the following parts:

Quantity	Component
1	PXI-CORE edge controller
1	24 V power connector, RTB, 2-pin (power supply not included)

Parts check and identification



- A USB-C port
- B Ethernet port XF10 (second network port for advanced installations)
- C Ethernet port XF50 (not used)
- D Ethernet port XF51
- E SD card slot (up to 32 GB). FAT32 formatted: can be formatted via the GUI of the PXI-CORE
- F 24 V power connector, RTB, 2-pin
- G Battery case
- H LED bar

4.1.2 Mounting

Cabinet/terminal box mounting

The device has the degree of protection IP20 and is thus intended for the use in a closed cabinet or terminal box of the degree of protection IP54 or higher. For environmental data, including ambient temperatures, refer to *Technical data, page 25*.

Mounting on a mounting rail

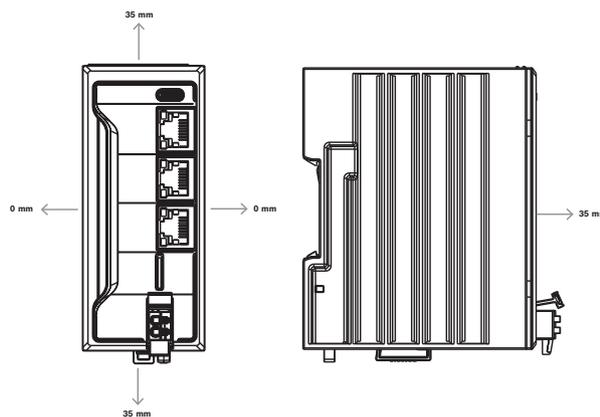
Before mounting, be sure that the device is disconnected from voltage.

- **IMPORTANT:** Connect the voltage only after the device is mechanically and electrically mounted correctly.

Mount the device on a 35 mm standard mounting rail. The preferred overall height of the mounting rail is 7.5 mm (corresponds to TH 35-7.5 acc. to EN 60715).

To mount on a mounting rail:

1. Seat the bottom of the clip into the bottom channel of the rail. Then, press it in and up slightly until it clicks into place.
2. Mount the device only vertically to ensure air cooling in the device:
 - For sufficient cooling, provide at least 35 mm of free space to front, rear, top and bottom sides of the device. The natural convection supports the forced cooling air flow. Heat pockets can thus not result in the device.
 - For information on ambient temperatures, refer to *Technical data, page 25*.

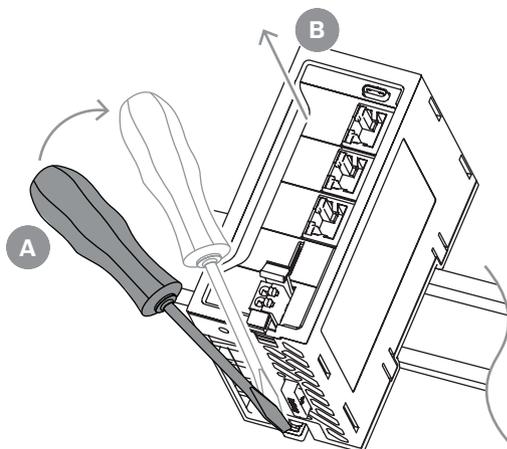


Dismounting from a mounting rail

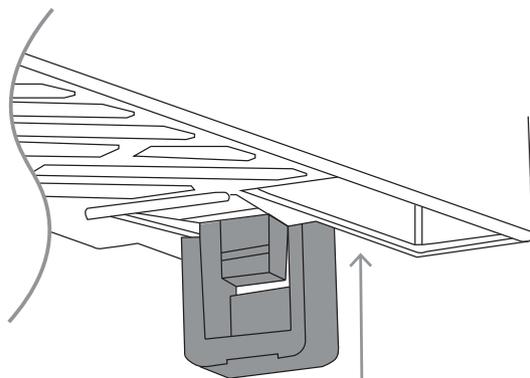
To dismount from a mounting rail:

1. Disconnect the device from voltage and other connections.
2. Use a suitable tool (e.g. slotted screwdriver), and put it into the lower disengaging mechanism (base latch) of the device.

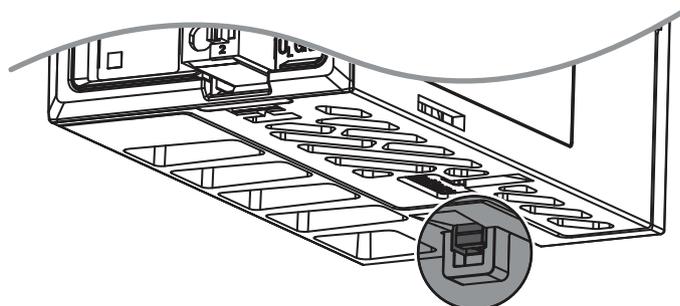
3. Disengage the device pulling down the lower disengaging mechanism with the suitable tool (A).
 - The base latches are locked in the open position.
4. Remove the device vertically from the mounting rail (B).



5. The base latches engage again in idle position. If required, gently push the lower disengaging mechanism to lock the latches (see arrow).



NOTE: Release the clamping of the open position again before remounting the controller on the support rail. Press the locking lever for release of the clamping of the open position.



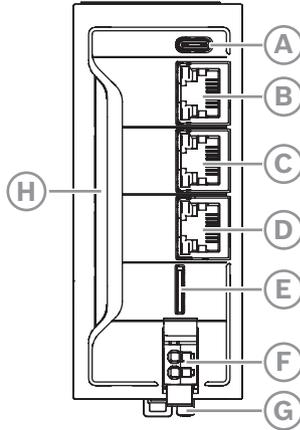
4.2 Electrical installation

The PXI-CORE edge controller communicates with your configuration device via Ethernet port XF51 connected to an Ethernet network, and is DC-powered from an external 24 VDC power supply. If required, the XF10 Ethernet port can be used for connection to your computer (PC).



Caution!

Attaching and detaching connections under voltage can damage the device!
Switch off and/or disconnect the supply voltage before attaching or detaching any connections!



Item	Connection	Function	Type	Manual section
A	XF01	USB female connector, type C.	USB 2.0	
B D	XF10 XF51	Ethernet 10/100/1000 Mbit sockets	RJ45, 8-pin	<i>Ethernet ports, page 14</i>
C	XF50	Not used		
E	CF01/SD01	SD-card slot	Micro SD-card	<i>SD card slot, page 16</i>
F	XD10	24 VDC input socket	2-pin (2-wire)	<i>Power supply XD10, page 14</i>
G	GB01	Battery case	-	<i>Battery case GB01, page 17</i>
H	-	LED bar	LED	Booting

Cabling precautions

- Do not route cables parallel to motor cables or other strong interference sources to avoid the coupling of interferences.
- The Ethernet cabling may not leave the building.
- Observe the bending radius of the cables used when laying the connecting lines.
- Use strain reliefs for all cables.
- Keep the maximum possible distance from interference sources.
- Refer to *Technical data, page 25*.

4.2.1 Ethernet ports

The PXI-CORE edge controller has two functional Ethernet connectors: XF51 and XF10.

- XF51 is the main Ethernet port, and is the connection to an Ethernet network.
 - XF10 is a port for diagnoses on connection problems and for the advanced use cases.
- XF50 Ethercat port is (currently) not used and described.

4.2.2 Power supply XD10

The PXI-CORE edge controller is powered from a 24 VDC/8 W galvanic separated power supply. Not included, can be purchased locally.

The used power supply has to comply with the following minimal specifications:

- 24 VDC +/-10%.
- Current of 0.4 A.
- Power of 8 VA or higher.

For Canada, additional power supply requirements apply:

- Maximum current of 4 A.
- The used power supply has:
 1. Limited power supply, or
 2. Class 2 approved power supply output acc. to CAN/CSA-C22.2.

Connecting



Notice!

Connect the power supply according to the indicated voltage polarity as shown on the device. A wrong polarity does not damage the device but the LED bar does not light up.



Notice!

IMPORTANT

Be sure that the 24 VDC power supply is disconnected from primary mains/AC voltage before making any connection!

To connect the device:

1. Remove the press fit plug (if not already done) from the PXI-CORE edge controller:
 - Press and hold the locking lever using a screwdriver, while moving the plug slowly outwards and downwards.
 - Take out the plug from the connector holder.

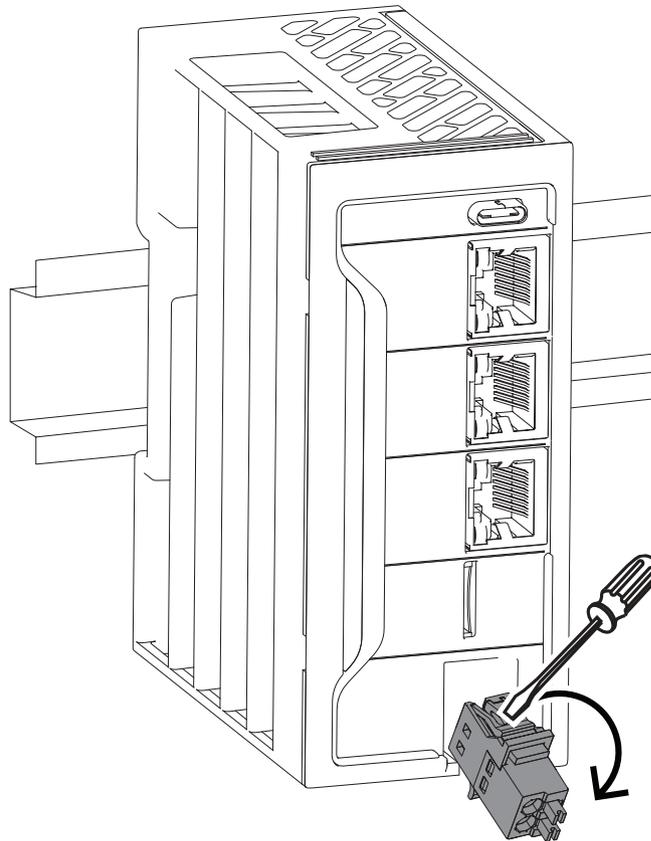
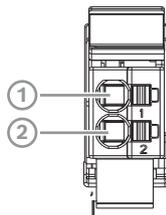


Figure 4.1: Removing the press fit plug

2. Use the supplied press fit plug, and connect the 24 VDC wiring to the appropriate slot of the connector XD10, observing polarity:
 - Use only copper AWG 16 (1.5 mm²) wiring.
 - Observe the wiring color convention: red for + (1) and blue for - (2).
 - Remove wire isolation for about 5 mm before inserting the wires into the connector XD10.

When inserting the wires, keep the push button of the push-in terminal pressed. Release the push-in terminal to lock the wires in.

 - Use only wiring approved for temperatures of at least 60 °C.



Notice!

IMPORTANT

Connect the ground of the power supply to the blue connection point (2).
 Connect the +24 V to the red connection point (1).

3. When reinstalling the press fit plug to the device, align the bottom fit of the plug with the bottom horizontal pins in the PXI-CORE edge controller. Align the connector obliquely.

4. When the bottom fit of the plug lands on the horizontal pins of the device, engage the plug upwards and towards the connector holder on the device. You hear a click noise when the connector is locked in the final position.

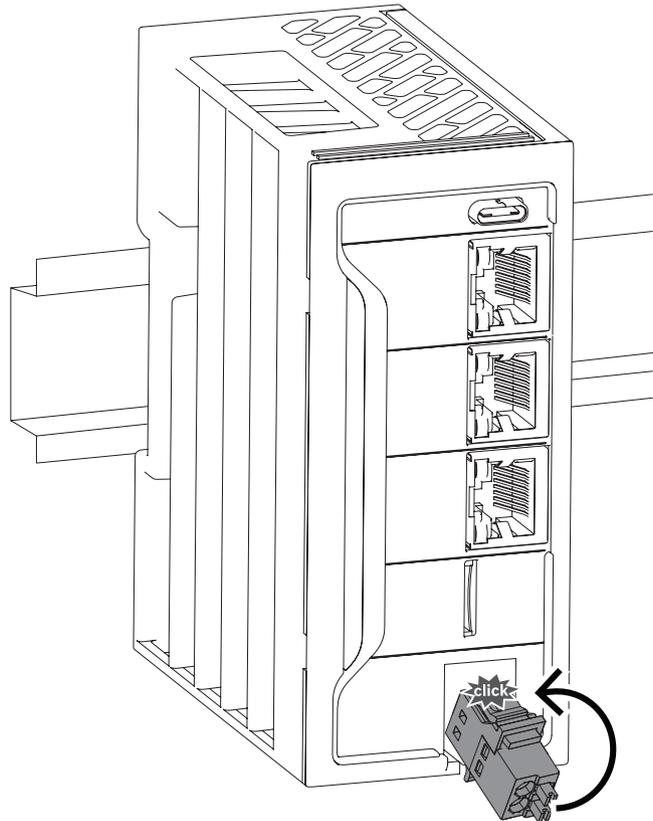


Figure 4.2: Reattaching the press fit plug

5. Connect the other side of both wires to the 24 VDC output of the power supply device, observing polarity:
 - wiring color convention: red for + and black for -.



Notice!

IMPORTANT

The 24 VDC voltage supply has to be routed separately from lines carrying higher voltages.

6. Connect the primary mains/AC power supply voltage, and power on the 24 VDC power supply device:
 - Continue with Power on.



Notice!

The power connector LED will light up green when connected and inserted correctly in the PXI-CORE edge controller.

4.2.3

SD card slot

The SD-card slot on the front of the device is provided to plug in a micro SD-card. It can be used to extend the internal device memory to hold firmware update files.

4.2.4 Battery case GB01

An internal battery is included and working in the device upon delivery. The battery is used to extend the buffer time of the real-time internal clock. A circuit monitors the battery state. A discharged battery causes an incorrect system time.

- For instructions on changing the battery, refer to Maintenance > *Battery change*, page 24.

5 Web-based graphical user interface

5.1 User

The user <user name> currently logged in is shown on the top right-side of the PXI-CORE web interface, next to the (person) icon button. For more information, refer to *Users & Permissions*, page 18.

5.1.1 Change the password

To change the logged-in user password:

1. Click the <user name> top right icon:
2. Click **Change password**.
3. In the **Change password** dialog, enter the old and new password, and confirm with the new password.
4. Click the **Change password** button to confirm.

5.1.2 Logging out

To log out from the PXI-CORE web server:

1. Click the <user name> top right icon.
2. Click **Log out**.
3. In the dialog, click the **Log out** button or **Cancel** button:
 - At logout, the Login page reloads.

5.2 Settings

The **Settings** menu is used to browse through the system configuration sections.

- ▶ Click the **Settings** button in the left side navigation bar to select:
 - *Connectivity*, page 17.
 - *Date & Time*, page 18.
 - *Users & Permissions*, page 18.
 - *Certificates & Keys*, page 18.
 - *SSH*, page 18.
 - *Proxy*, page 18.
 - *Storage*, page 18.
 - *Shutdown*, page 18.
 - *Licenses*, page 18.
 - *Information*, page 18.

5.2.1 Connectivity

The **Connectivity** setting is used to manage and configure network IP settings. One static IP address is already configured for eth0 upon delivery. Both eth0 (XF10) and eth1 (XF51) have DHCP enabled by default.

Use this menu to make any changes to the IP configuration.

5.2.2

Date & Time

Date & Time sets the date and time of the internal clock of the PXI-CORE edge controller and optionally configures a synchronization with a NTP server.

5.2.3

Users & Permissions

The **Users & Permissions** setting is used to create and manage users and user groups. It can also be used to configure individual permissions for users.

The user management menu provides setting options for the password and session policies.

To edit users, groups and rights, the user must have the right permissions.

The management of users and permissions ensures that the protected device functionality is only used by authorized personnel. You can specify certain permissions in the respective profile to allow or deny access to functionalities and applications.

5.2.4

Certificates & Keys

The **Certificates & Keys** setting lists installed certificates for applications (Apps) with the name and description for which certificates and keys can be managed.

The device incorporated Certificates & Keys app is an interface for the user to manage client and server certificates and keys and to load it to, or delete it from, the device.

5.2.5

SSH



Notice!

SSH is not used, and therefore it is blocked.

5.2.6

Proxy

This function is used in cases where the internet connectivity requires a proxy server. This might be needed if you want to connect the PXI-CORE edge controller to the remote portal.

5.2.7

Shutdown

The PXI-CORE can be shutdown or restarted.



Notice!

When using the Shutdown function, the device needs a physical power cycle to start up again. You need to be near the device before using it.

5.2.8

Licenses

Advanced users can use specific third party licensed apps on the PXI-CORE which can be managed via the menu entry. Each core comes with a pre-installed Node-Red license.

5.2.9

Information

The **Information** setting provides information on the implemented hardware. You can find detailed information about your PXI-CORE edge controller including dynamic usage numbers (load).

The information is shown via tabs which are divided into hardware-specific categories.

5.2.10

Storage

Storage indicates the free space of the NAND flash available for the Apps in the internal storage. If too low, unused applications can be removed.

5.3 Diagnostics

The diagnostics section allows you to get detailed information from the apps running on the PXI-CORE edge controller to analyze possible issues.



Notice!

By default the logbook starts empty after a power cycle. You can enable persistency to analyze difficult issues but be aware this causes more wear on the internal flash. If the persistency is no longer needed, disable it immediately.

5.4 About

The **About** section provides product information on the present PXI-CORE edge controller software instance:

- Copyright.
- Supplier information.
- **Open source components** button:
 - Refer to *Open Source Components, page 19*.
- **EULA** (End User License Agreement) button:
 - Click the **EULA** button to open the file.
- Generate system report. Click the **Generate report** button to produce a .zip file, which includes:
 - Apps JSON Source File.
 - Logbook.csv files.
 - System information JSON Source File.

5.4.1 Open Source Components

The Open Source Components section provides information on open source components implemented into the PXI-CORE software instance.

1. Go to/click **About**.
2. Below **See also**, click the **Open Source Components** button:
 - The Open Source Components overview becomes available.

5.5 Not used functions

The following functions are not used for BT applications:

- **Automation**
- **Data Layer**



Caution!

Data Layer is not used! Do not to use the **Data Layer** setting or its settings on the PXI-CORE edge controller.

Using the **Data Layer** results in malfunctioning of the PXI-CORE edge controller and its installed applications and configurations.

- **Scheduler**



Caution!

Scheduler is not used! Do not to use the **Scheduler** or its settings on the PXI-CORE edge controller.

Using the **Scheduler** results in malfunctioning of the PXI-CORE edge controller and its installed applications and configurations.

- **Backup and restore**

– **Configurations**



Notice!

The **Configurations** menu has no specific use for the BT user.

6 Troubleshooting

This chapter presents the possible issues with maintenance actions focused on finding and solving the cause in a structured way. In large systems it can be difficult to find the root cause of a problem. In that case it is often helpful to create a minimum size system with only the troubled device and the necessary devices to make it work, using short and proven cables. If the problem is absent, extend the system in steps until the problem shows up again.



Notice!

Experience and analysis of repair shop data has revealed that in most cases system malfunction is not caused by defective devices, but by wiring errors, configuration errors and application errors. Read the product documentation carefully, especially the installation manual, the configuration manual and the release notes. If possible, use the latest software version (available as free download).

6.1 Connection problems

If you are not successful in connecting to the PXI-CORE graphical user interface via the IPv6 address, fall back to the static IPv4 address of the PXI-CORE edge controller.

To connect the PXI-CORE graphical user interface via the static IPv4 address:

1. Connect the PXI-CORE port XF51 to your main network.
2. Connect your preferred device (e.g. PC), via a wired connection, to port XF10.
3. Assign the static IP-address 192.168.1.10 to your preferred device.
4. Open your web browser and enter the address 192.168.1.1.
5. Accept the risks for the self-signed certificate.
6. Login with the factory default credentials: Refer to *Quick start, page 8* and follow steps 5 through 7.

If the assigned IPv4 address of XF51 is unknown:

- Check the assigned IPv4 for the Ethernet port XF51 (eth1) in the **Connectivity** menu. Make sure you are connected to the web-GUI via the port XF10 [eth0].
- If eth1 (XF51) does not have an IPv4 address assigned, you probably do not have a DHCP server on your main network. You can assign a static IP to eth1 (XF51) via the IPv4 tab, e.g. 192.168.2.100/24.



Notice!

Please do not use any address from the 192.168.1.0/24 range on port eth1 (XF51).

If this is necessary, remove the static IP 192.168.1.1 for port eth0 (XF10) to avoid conflicts.

- Alternatively, depending on your Windows PC settings, the PXI-CORE will also show up in your Windows Explorer network sessions. Double clicking the icon PXI-CORE opens the GUI.

6.2 App installation problems

If you cannot click the **Install from file** button:

- Make sure the PXI-CORE is in service mode when installing apps (blinking blue LED bar).

If the upload of an app is successful but the app is not installed:

- Make sure you only use official Bosch-signed apps provided. By default, apps from unknown sources are not accepted for security reasons.

7 Maintenance

Only skilled staff can perform maintenance work in the device. If hardware or software components have to be exchanged, contact your Bosch representative, or ensure that only skilled staff changes the respective components.

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

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

The device requires minimum maintenance. Read and follow the instructions on this chapter to keep the device in good condition.

7.1 Preventive maintenance

Cleaning

Wipe clean only with a dry or damp cloth.



Notice!

Do not use alcohol, ammonia or petroleum solvents or abrasive cleaners to clean the devices.

Depending on the pollution degree in the operating environment, check at regular intervals that the air inlets for ventilation are not obstructed by dust. Use a dry cloth or a vacuum cleaner to remove dust.

Operate the device within specifications

When designing the device, Bosch largely avoided using wear parts. The parts subject to wear and tear are dimensioned to last longer than the lifetime of the products when they are operated normally. Operate the devices within their specifications.

Software updates

Bosch continually works on improving and developing the software. Regularly check whether there is a new version of the software that provides additional benefits. Information and software downloads are available on the Bosch product related pages on the internet (www.boschsecurity.com).

Regular maintenance

Regularly (e.g. twice per year, or following local legislation) check the correct operation of the complete system.

- Check for changes of the environmental conditions and update the system if needed. Include the following tasks into the maintenance schedule:
- Check all plug and terminal connections of the components for proper tightness and possible damage at least once a year.
- Ensure that cables are not broken or crushed.
- Replace damaged parts immediately.

7.2 Corrective maintenance

In case of fault reports, a qualified technician should perform:

- Fault analysis;
- Elimination of the part that causes the failure;
- Replacement of the part;

- Test of the associated functions.

7.3 Battery change

Exchange the battery of the device every three years, if NOT operational 24/7. Under normal use the battery lasts longer than three years. If replacement is necessary, replace it with a CR1025 type battery.

To replace the battery:

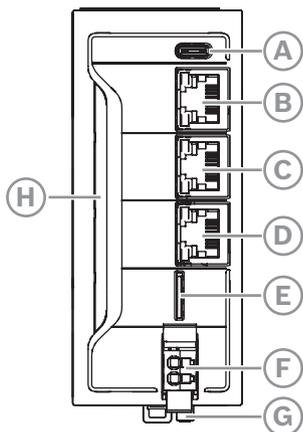
1. Disconnect the power from the device.
2. Remove the battery and replace with a new one.



Notice!

If you replace the battery within 2 minutes you do not lose your actual date and time setting.

The battery holder is located on the bottom side (G) of the PXI-CORE. Refer to *Battery case GB01, page 17*.



The Graphical user interface indicates the empty battery status. If this happens, replace the battery immediately. Failure to do so will cause the loss of the current date and time on a power outage.

8 Technical data

Electrical

Nominal voltage	24 VDC SELV/PELV
Maximum voltage range of the supply voltage allowed	18 VDC to 31.2 VDC (incl. all tolerances and ripple)
Max. current consumption at a nominal voltage of 24 V	320 mA
Max. power consumption at a nominal voltage of 24 V	7.68 W
Fuse protection	eFuse, 2.0 A
Secure model	TPM 2.0
Processor	Zync Ultrascale+, 64 bit, 4 × ARM A53
RAM	2 GB DRAM
Communication interfaces RJ45	2 × Ethernet connection (10 MB, 100 MB, 1 GB)
USB	1 × USB host, TYPE C (USB2.0), maximum cable length of 3 m.
SD card	Slot for microSD card Max. 32GB. FAT32
Battery	CR1025

Environmental

Climatic conditions	
Operating temperature (derating applies)	-25 °C - +55 °C (-13 °F - 131 °F)
Altitude (operating)	-500 to + 5000 m (-1640 to 16404 ft)
Storage and transport temperature	-40 °C to +70 °C (-40 °F - 158 °F)
Humidity (non condensing)	5 — 95%

Mechanical

Enclosure	
Dimensions (H x W x D)	105 x 45 x 87 mm (4.13 x 1.77 x 3.43 in) 19 in, 1U
Ingress protection	IP20
Weight	314 g

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