BECKHOFF New Automation Technology

Manual | EN

CP69xx

Control Panel

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1 Notes on the documentation

This description is only intended for the use of trained specialists in control and automation engineering who are familiar with the applicable national standards.

The following instructions and explanations must be followed during installation and commissioning of the components. The responsible staff must ensure that the application or use of the products described satisfy all the requirements for safety, including all the relevant laws, regulations, guidelines and standards.

Disclaimer

The documentation has been prepared with care. The products described are, however, constantly under development. For that reason the documentation is not in every case checked for consistency with performance data, standards or other characteristics. In the event that it contains technical or editorial errors, we retain the right to make alterations at any time and without warning. No claims for the modification of products that have already been supplied may be made on the basis of the data, diagrams, and descriptions in this documentation. All illustrations shown are only examples. The configurations depicted may deviate from the standard.

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Copyright

Delivery state

All the components are supplied in particular hardware and software configurations appropriate for the application. Changes to the hardware or software configuration are permitted, provided they are within the specified limits for power consumption and power loss (please refer to the respective data sheet).

Currentness

Please check whether you are using the current and valid version of this document. The current version is always available for download from the Beckhoff website. In case of doubt, contact Technical Support.

Delivery conditions

In addition, the general delivery conditions of the company Beckhoff Automation GmbH & Co. KG apply.

2 For your safety

The signal words and their meanings are explained in the chapter on safety. They contain fundamental safety instructions that are essential for the avoidance of personal injuries and damage to property.

Exclusion of liability

Beckhoff shall not be liable in the event of non-compliance with this documentation and thus the use of the devices outside the documented operating conditions.

2.1 Signal words

The signal words used in the documentation are classified below.

Warning of personal injuries

⚠ DANGER
Hazard with high risk of death or serious injury.

⚠ WARNING
Hazard with medium risk of death or serious injury.

⚠ CAUTION
There is a low-risk hazard that can result in minor injury.

Warning of property and environmental damage

NOTICE
There is a possibility of damage to the environment, equipment or data.

2.2 Intended use

The the Control Panel is intended for use as a control system for automation, visualization and communication in machine and system engineering.

The control panel is designed for industrial application in machine and system engineering. It serves as the operating unit of the machine or plant.

The DVI/USB extension technology integrated in the -0000 Control Panel enables the panel to be located up to 50 m away from the PC.

The CP-Link 4 technology integrated in the -0010 Control Panel enables the panel to be located up to 100 m away from the PC via a CP-Link 4 cable with optionally integrated or separate 24 V power supply, depending on the transmitter module.

The DVI/USB extension technology integrated in the CP3921-150x-0000 Control Panel enables the panel to be located up to 50 m away from the PC.

The CP-Link 4 technology integrated in the CP3921-150x-0010 Control Panel enables the panel to be located up to 100 m away from the PC via a CP-Link 4 cable. The 24 V power supply must be provided by a separate cable.

The device has been developed for an IP20 working environment. This involves finger protection and protection against solid foreign objects up to 12.5 mm. There is no protection against water. Operation of the devices in wet and dusty environments is not permitted.

The front of the device is designed for an IP50 working environment. There is complete protection against contact and dust in harmful quantities. It is not protected against water.

The rear of the device is designed for an IP20 working environment. It is protected against the penetration of fingers and solid foreign bodies of 12.5 mm in diameter or larger in size. It is not protected against water. Operation of the device in wet and dusty environments is not permitted. The specified limits for technical data must be adhered to.

The front of the panel PC is designed for an IP54 working environment. There is complete protection against contact and against dust in harmful quantities, as well as protection against splash water on all sides.

The rear side is designed for a working environment that meets the IP20 protection rating. This involves finger protection and protection against solid foreign objects up to 12.5 mm. There is no protection against water. Operation of the device in wet and dusty environments is not permitted. The specified limits for technical data must be adhered to.

The front of the panel PC is designed for an IP65 working environment. It offers full protection against contact and against dust, as well as protection against water jets (nozzle) from any angle.

The rear side is designed for a working environment that meets the IP20 protection rating. It is protected against the penetration of fingers and solid foreign bodies of 12.5 mm in diameter or larger in size. It is not protected against water. Operation of the device in wet and dusty environments is not permitted. The specified limits for technical data must be adhered to.

The device has been developed for an IP65 working environment. It offers full protection against contact (dust-tight) and against water jets (nozzle) from any angle.

The specified limits for technical data must be adhered to.

The device can be used within the documented operating conditions.

Potentially hazardous area

For the operation of the industrial PC in hazardous area Zone 2, the device adaptation by the is required.

The industrial PC is only suitable for the following hazardous areas:

- For Zone 2 where gas is present as a combustible material. Zone 2 means that the environment is usually either not explosive or only for a short period of time.

The industrial PC must be installed in a housing with an IP54 protection rating for gas according to EN 60079-7 or IEC 60079-7.

Improper use

Do not use the device outside the documented operating conditions.

The industrial PC is not suitable for use in the following environments:

- The industrial PC may only be used in Zone 2 and only with a suitable housing.
- The industrial PC is not suitable for use in aggressive environments, for example with aggressive gases or chemicals.
- The industrial PC is not suitable for residential areas. Relevant standards regarding interference emissions must be observed. The device must be installed in a housing or a control cabinet with suitable shielding.

2.3 Fundamental safety instructions

The following safety instructions must be observed when handling the the Control Panel.

Application conditions

- Do not use the device under extreme environmental conditions.
- Only use the device in hazardous areas if it is explicitly designed for this purpose.
- Do not carry out any work on the device while it is live. Always switch off the supply voltage for the device before mounting it, replacing device components or rectifying malfunctions. This does not apply to the replacement of hard disks in a RAID configuration.
- Do not carry out any work on the device while it is live. Always switch off the supply voltage for the device before mounting it, replacing device components or rectifying malfunctions.
- Never plug or unplug connectors during thunderstorms. There is a risk of electric shock.
- Ensure that the device has a protective and functional earth connection.
- Observe hot surfaces when using the device. There is a risk of burns.

Damage to property, loss of data and impairment of functions

- If you change the hardware and software configurations, you must keep within the specified limits of power consumption and power loss (please refer to the respective data sheet).
- Ensure that only trained specialists with a control and automation engineering background, operate the device. Use by unauthorized persons can lead to damage to property and loss of data.
- In the case of a 24 V DC power supply unit, fuse the power supply line according to its cross-section to protect the supply line in the event of a short circuit.
- In case of fire, extinguish the device with powder or nitrogen.

2.4 Operator's obligation to exercise diligence

The operator must ensure that

- the products are used only for their intended purpose (see Chapter 2.2 Intended use [▶ 6]).
- the products are only operated in sound condition and in working order.
- the products are operated only by suitably qualified and authorized personnel.
- the personnel is instructed regularly about relevant occupational safety and environmental protection aspects, and is familiar with the operating instructions and in particular the safety instructions contained herein.
- the operating instructions are in good condition and complete, and always available for reference at the location where the products are used.

2.5 Notes on information security

The products of Beckhoff Automation GmbH & Co. KG (Beckhoff), insofar as they can be accessed online, are equipped with security functions that support the secure operation of plants, systems, machines and networks. Despite the security functions, the creation, implementation and constant updating of a holistic security concept for the operation are necessary to protect the respective plant, system, machine and networks against cyber threats. The products sold by Beckhoff are only part of the overall security concept. The customer is responsible for preventing unauthorized access by third parties to its equipment, systems, machines and networks. The latter should be connected to the corporate network or the Internet only if appropriate protective measures have been set up.

In addition, the recommendations from Beckhoff regarding appropriate protective measures should be observed. Further information regarding information security and industrial security can be found in our https://www.beckhoff.com/secguide.

Beckhoff products and solutions undergo continuous further development. This also applies to security functions. In light of this continuous further development, Beckhoff expressly recommends that the products are kept up to date at all times and that updates are installed for the products once they have been made available. Using outdated or unsupported product versions can increase the risk of cyber threats.

To stay informed about information security for Beckhoff products, subscribe to the RSS feed at https://www.beckhoff.com/secinfo.

3 Product overview

The single-touch built-in Control Panel is designed for control cabinet installation and is available in a wide range of diagonals. It can be used for a wide range of automation tasks.

The Control Panel has the following features:

- Various display sizes and resolutions:
  - 5.7-inch, 640 x 480
  - 6.5-inch, 640 x 480
  - 12-inch, 800 x 600
  - 15-inch, 1024 x 768
  - 19-inch, 1280 x 1024
- TFT display
- Sheet-steel housing with aluminum front, front IP65, rear IP20
- Front laminate in different variants:
  - only display without keys
  - function keys, with 10 special PLC keys with LEDs
  - numeric PC keyboard (US layout), with 10 special PLC keys with LEDs
  - alphanumeric PC keyboard (US layout), with 10 special PLC keys with LEDs
- Control cabinet installation via pull-out clamping levers for fast installation without loose parts
- 24 V DC power supply unit

3.1 Structure

Fig. 1: CP69xx_structure

Table 1: Key: CP69xx structure

No.	Component	Description
1	Display and touch screen glass	Operating the Control Panel
2	Clamping lever	Mounting the Control Panel in the panel of the control cabinet
3	Grounding bolt	Functional earth of the Control Panel
4	Access to interfaces	Interfaces on the underside

3.2 Interface description

In the basic configuration, the Control Panel includes the following interfaces:

- DVI Extended input (X101)
- USB Extended input (X102)
- USB input (X103)
- USB output (X104, X105)
- Power supply (X106)

The interfaces are located on the back of the Control Panel at the bottom of the connection section (see fig. 2).

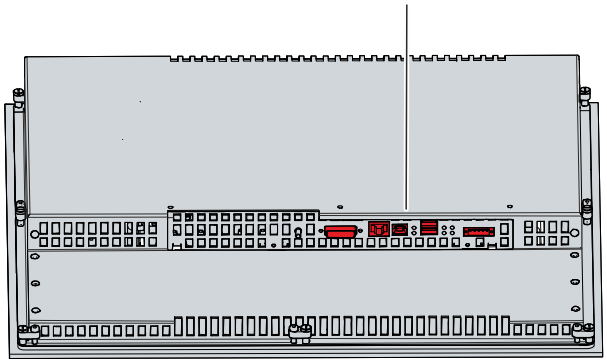

Fig. 2: CP69xx_connection section

3.2.1 DVI Extended input

The control panel has a DVI Extended input (X101). It is used to transmit the graphics signal from the industrial PC to the control panel.

The graphics signal is transferred directly via a DVI cable over a distance of 50 m max. Such a cable length leads to strong distortion of the graphics signal on arrival at the control panel. A signal processor is used in the control panel to fully restore the DVI signal. The industrial PC requires a conventional DVI output.

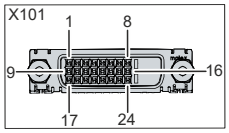

Fig. 3: CP69xx_DVI-E input Pin numbering

Table 2: DVI Extended interface pin assignment

Pin	Connection	Pin	Connection	Pin	Connection
1	TMDS Data 2 +	9	TMDS Data 1 -	17	TMDS Data 0 -
2	TMDS Data 2 +	10	TMDS Data 1 +	18	TMDS Data 0 +
3	TMDS Data 2/4 Shield	11	TMDS Data 1/3 Shield	19	TMDS Data 0/5 Shield
4	TMDS Data 4 -	12	TMDS Data 3 -	20	TMDS Data 5 -
5	TMDS Data 4 +	13	TMDS Data 3 +	21	TMDS Data 5 +
6	DDC Clock	14	+ 5 V Power	22	TMDS Clock Shield
7	DDC Data	15	Ground (+ 5 V, Analog H/V Sync)	23	TMDS Clock +
8	Analog Vertical Sync	16	Hot Plug Detect	24	TMDA Clock -

Setting the data transfer rate

If the distance between the PC and the control panel is large, the transfer rate for the DDC file must be limited. The DDC file is transferred from the control panel to the PC to tell the PC the properties of the display such as timing and resolution.

The VideoBIOS in the graphics card, or in case of on-board graphics the VideoBIOS in the motherboard, contains the definition of the transfer rate for the DDC file. This value must be 50 kHz or less. If this value is too high, the image is either not displayed or only displayed after Windows starts.

Windows graphic drivers also contain a value for the transfer rate of the DDC file. If no image is displayed under Windows, a graphic driver must be used that contains a value of 50 kHz or less for the DDC file transfer.

3.2.2 USB Extended input

The Control Panel has a USB extended input (X102) in the form of an RJ45 socket. The Control Panel is connected to the CU8801 USB-to-USB extended converter box via the interface. The interface transmits USB 2.0 with 480 Mbit/s.

To realize a distance of 50 m without hubs, USB Extended converts the USB signal so that it can be transmitted via a 50 m CAT-5 cable. In the Control Panel the signal is converted back to USB. This is not an Ethernet connection. No Ethernet switch or hub can be integrated in the USB-Extended cable.

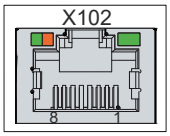

Fig. 4: CP69xx_USB-E input pin numbering

Table 3: USB E input pin assignment

Pin	Signal	Description
1	T2 +	Pair 2
2	T2 -	
3	T3 +	Pair 3
4	T1 +	Pair 1
5	T1 -	
6	T3 -	Pair 3
7	T4 -	Pair 4
8	T4 -	

3.2.3 USB input

The Control Panel has a USB input (X103) with socket type B. The USB input is used to connect the Control Panel directly to the standard output of an Industrial PC at distances of up to 5 m. USB specification 2.0 is supported.

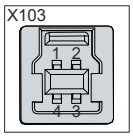

Fig. 5: CP69xx_USB input pin numbering

Table 4: USB interface pin assignment

Pin	Connection
1	Vbus
2	D -
3	D +
4	GND

3.2.4 USB output

The Control Panel has two USB outputs (X104, X105) with socket type A. The interfaces are used to connect peripheral devices with USB connection. USB specification 2.0 is supported.

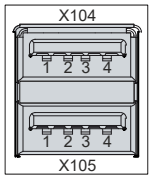

Fig. 6: CP69xx_USB output pin numbering

Table 5: USB interface pin assignment

Pin	Connection
1	Vbus
2	D -
3	D +
4	GND

3.2.5 Power supply

The Control Panel is supplied with a nominal input voltage of 24 V_{DC}. The power supply and the protective earth of the device are connected via the 5-pin voltage socket (X106).

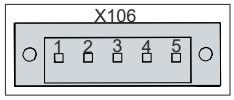

Fig. 7: CP69xx_voltage socket pin numbering

Table 6: Voltage socket pin assignment

Pin	Signal	Description
1	NC	not used
2	NC	not used
3	⏚	Protective earth
4	-	24 V power supply, negative pole
5	+ 24 V	24 V power supply, positive pole

The plug for the power supply is specified for 16 A and can accommodate wire cross-sections of up to 1.5 mm^2. For long supply lines, use 1.5 mm^2 cables to achieve a low voltage drop on the supply line. There should be at least 22 V at the power supply plug of the Control Panel, so that the Control Panel remains switched on during voltage fluctuations. The plug is included in the delivery. You can obtain a replacement plug from your Beckhoff Sales using the following ordering option:

- C9900-P927: power supply connector for CP69xx Control Panel, 5-pin connector with strain relief for the external supply cable

3.3 Status LEDs

The Control Panel has six status LEDs. They are located on the rear side in the connection section of the panel (see fig. 8).

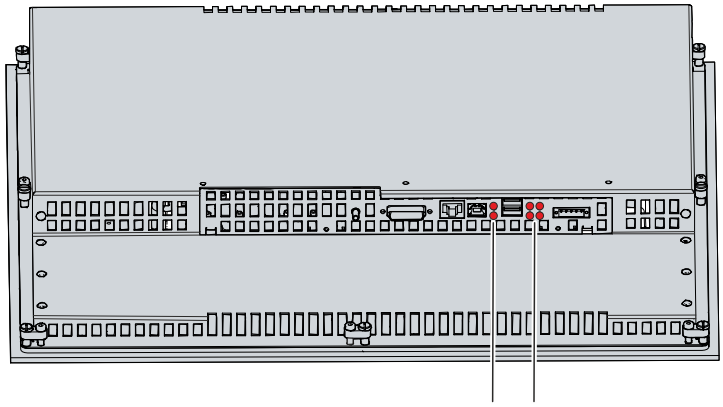

Fig. 8: CP69xx_Status LEDs

The LEDs have the following meanings:

Table 7: LED functions

LED	Name	Meaning
1	No function	
2	No function	
3	USB 1	USB 1 interface in operation
4	USB 2	USB 2 interface in operation
5	Power Good	Input voltage OK
6	24 V in	Power supply established

3.4 Name plate

The name plate provides information on the equipment fitted to the Control Panel. The name plate shown here serves only as an example.

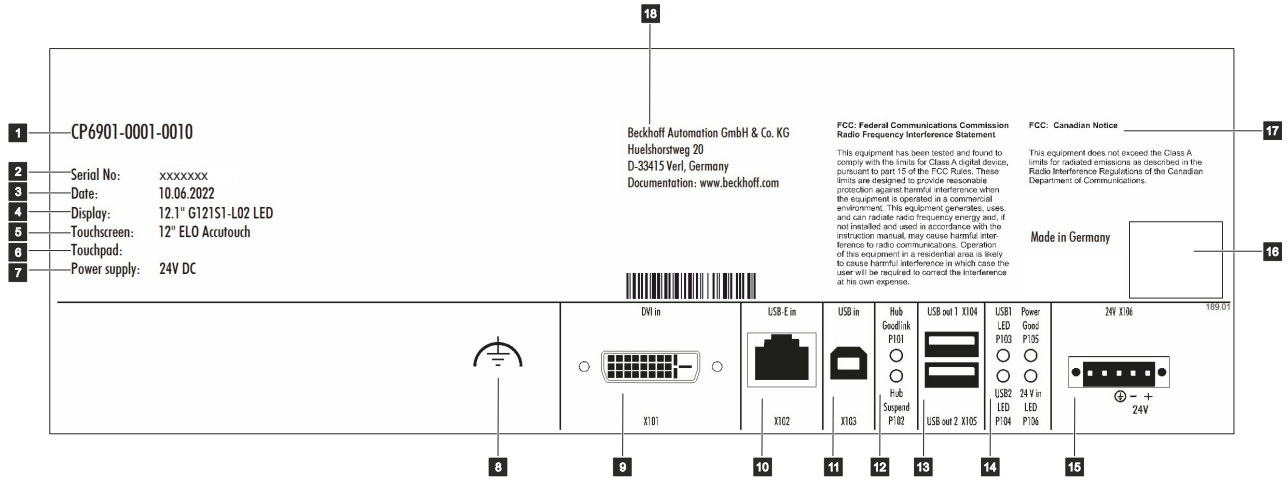

Fig. 9: CP69xx_name plate

Table 8: Key CP69xx name plate

No.	Description
1	Model: The last four digits indicate the device generation.
2	Serial number (BTN)
3	Date of manufacture
4	Display
5	Touch screen
6	Touch pad
7	Power supply: 24 V_{DC}, NEC class 2
8	Grounding bolt for functional earthing of the Control Panel
9	DVI Extended interface (X101)
10	USB Extended Interface (X102)
11	USB input (X103)
12	Status LEDs P101 and P102 without function
13	USB output (X104, X105)
14	Status LEDs for USB and power supply (P103-P106)
15	Connection of the power supply and protective earth of the Control Panel (X106)
16	Symbols Note: here are the symbols applicable to the device such as CE, EAC, UKCA,  . The approvals of your device can be found on the name plate and in chapter 9.2 Approvals.
17	FCC approval
18	Address of the vendor

3.5 Key functions

You can order your Control Panel with different versions of the front laminate. You can choose between a panel without buttons and a panel with different button configurations. Please refer to the current price list for specific ordering options.

The following table provides information about the functions of the available keys.

Table 9: Key functions CP69xx

Key	Function
	Move the cursor one step in the corresponding direction
	*Home* = cursor to beginning of the line *End* = cursor to end of the line
	*Pg Up* = scroll forward one page *Pg Dn* = turn back one page
	*Tabulator* = cursor to next input field *Shift* + *Tab* = cursor to previous input field
	*Del* = delete character to the right of the cursor
	*Enter* = confirm input
	*Backspace* =delete character to the left of the cursor
	*Shift* pressed with letter = upper case instead of lower case letter *Shift* pressed with number = mapped character instead of number
	*Caps Lock* = permanent pressing of the *Shift* key (pressing the *Shift* key deactivates the function)
	*Ctrl, Alt* = change the meaning of a key pressed at the same time
	Open the start menu of the operating system in use

	Opening the properties window of a selected object
	*Esc* = close dialog box, cancel operations
	Set printed character to the cursor position
	*Function keys F1-F10* = functions of the keys determined by the software
	*Special keys* = Special keys with LED that can be determined by the automation software TwinCAT

3.6 Connection kits

The following optional connection kits are available:

Table 10: CP69xx connection kits

Connection kits	Description
C9900-K560	1 m connection kit for CP69xx, consisting of: DVI cable 1 m, USB cable 1 m
C9900-K513	3 m connection kit for CP69xx, consisting of: DVI cable 3 m, USB cable 3 m
C9900-K515	5 m connection kit for CP69xx, consisting of: DVI cable 5 m, USB cable 5 m
C9900-K625	10 m connection kit for CP29xx-0000, CPX29xx-0000 and CP69xx-xxxx-0010 consisting of: 10 m DVI cable, 10 m Cat.5 cable for USB-E-2.0, CU8801 USB-to-USB-E-2.0 converter for DIN rail mounting next to the PC and 1 m USB cable for connecting the USB-to-USB-E-2.0 converter to the PC
C9900-K626	20 m connection kit for CP29xx-0000, CPX29xx-0000 and CP69xx-xxxx-0010 consisting of: 20 m DVI cable, 20 m Cat.5 cable for USB-E-2.0, CU8801 USB-to-USB-E-2.0 converter for DIN rail mounting next to the PC and 1 m USB cable for connecting the USB-to-USB-E-2.0 converter to the PC
C9900-K627	30 m connection kit for CP29xx-0000, CPX29xx-0000 and CP69xx-xxxx-0010 consisting of: 30 m DVI cable, 30 m Cat.5 cable for USB-E-2.0, CU8801 USB-to-USB-E-2.0 converter for DIN rail mounting next to the PC and 1 m USB cable for connecting the USB-to-USB-E-2.0 converter to the PC
C9900-K628	40 m connection kit for CP29xx-0000, CPX29xx-0000 and CP69xx-xxxx-0010 consisting of: 40 m DVI cable, 40 m Cat.5 cable for USB-E-2.0, CU8801 USB-to-USB-E-2.0 converter for DIN rail mounting next to the PC and 1 m USB cable for connecting the USB-to-USB-E-2.0 converter to the PC
C9900-K629	50 m connection kit for CP29xx-0000, CPX29xx-0000 and CP69xx-xxxx-0010 consisting of: 50 m DVI cable, 50 m Cat.5 cable for USB-E-2.0, USB-to-USB-E-2.0 converter CU8801 for DIN rail mounting next to the PC and 1 m USB cable for connecting the USB-to-USB-E-2.0 converter to the PC
C9900-K777	1 m connection kit for CP69xx, consisting of: 1 m DisplayPort to DVI cable, 1 m USB cable
C9900-K778	3 m connection kit for CP69xx, consisting of: 3 m DisplayPort to DVI cable, 3 m USB cable
C9900-K779	5 m connection kit for CP69xx, consisting of: 5 m DisplayPort to DVI cable, 5 m USB cable

4 Commissioning

To use the control panel, you must first put it into operation. The first step is to transport the device to is operating location and unpack it. This is followed by installing the device in the control cabinet front, connecting the cables and the power supply and finally switching on the control panel. Since the control panel does not have its own power switch, switching the power supply on and off also switches the control panel on and off.

Operating the control panel

NOTICE

Damage to the touch screen

Operating the touch screen with unsuitable objects may damage the touch screen.

- Only operate the touch screen with your bare finger or with your finger using a suitable glove.
- If you use gloves, make sure that no hard particles such as metal shavings, glass splinters or similar adhere to the glove.

If you, as the user, require additional protection for the touch screen against dirt and scratching, for example due to dirty hands, this can be achieved with a Beckhoff protective film. The film provides short-term protection for a few days.

You can either order your device directly with the protective film applied or order a film individually and apply it yourself. Please refer to the price list for the available protective films according to the display size of your device.

Proceed as follows to attach the protective film to the touch screen:

1. Ensure that the environment is as dust-free as possible.
2. Thoroughly clean the surface of the device to be fitted with the film and remove all grease residues.
3. Detach the film from the backing at the short edge and place it on the surface.
4. Gradually remove the film from the backing. At the same time, use a doctor blade or other object with a soft rubber or felt edge to apply the film.
5. Brush away air bubbles towards the edge with a doctor blade or other object with a soft rubber or felt edge.

⇨ The film is now fitted.

If you want to remove the protective film again, you must proceed with caution so as not to damage the touch foil, which is located between the glass pane of the control panel and the applied protective film.

To remove the protective film, proceed as follows:

1. Carefully loosen one corner of the protective film.
2. Carefully pull the protective film off the control panel at the loosened corner at as flat an angle as possible.

⇨ You have removed the protective film.

4.1 Transport and unpacking

The specified storage conditions must be adhered to (see chapter 8 Technical data [▶ 34]).

Despite the robust design of the unit, the components are sensitive to strong vibrations and impacts. During transport the device must therefore be protected from mechanical stress. Appropriate packaging of the Control Panel, in particular the original packaging, can improve the vibration resistance during transport.

NOTICE

Hardware damage due to condensation

Unfavorable weather conditions during transport can cause damage to the device.

- Protect the device against moisture (condensation) during transport in cold weather or in case of extreme temperature fluctuations.
- Do not put the device into operation until it has slowly adjusted to the room temperature.
- Should condensation occur, wait for about 12 hours before switching the device on.

Unpacking

Proceed as follows to unpack the device:

1. Check the packaging for transport damage.
2. Remove packaging.
3. Keep the packaging for possible future transport.
4. Check your delivery for completeness by comparing it with your order.
5. Check the contents for visible shipping damage.
6. In case of discrepancies between the package contents and the order, or in case of transport damage, please inform Beckhoff Service (see Chapter 9.1 Service and Support).

4.2 Control cabinet installation

NOTICE

Extreme environmental conditions

Extreme environmental conditions can cause damage to the device.

- Avoid extreme environmental conditions.
- Protect the device against dust, moisture and heat.

NOTICE

Lack of air circulation

Incorrect installation of the control panel prevents air circulation in the device and thus causes overheating and functional impairment.

- Only install the control panel as shown in the corresponding wall in the orientation shown.

The CP69xx Control Panel is designed for installation in the front of a control cabinet in machine and system engineering. Please observe the environmental conditions prescribed for the operation (see Chapter 8 Technical data [▶ 34]).

Dimensions

The dimensions of the Control Panel can be found on the Beckhoff website: https://www.beckhoff.com/de-de/support/downloadfinder/technische-zeichnungen/.

All dimensions are in mm.

Preparation of the control cabinet

The control cabinet must have the required installation cutout according to the device dimensions of the Control Panel.

The wall thickness must be between 2 mm and 5 mm for installation. After installation, be sure to check the tightness between the Control Panel and the installation wall.

Please also note the following for installation in a control cabinet:

- Position the Control Panel such that reflections from light sources on the screen are avoided as far as possible.
- For the correct installation height, use the position of the screen for guidance. This should always be optimally visible to the user.
- Do not expose the Control Panel to direct sunlight.

Installation in the control cabinet

Once you have made the required cutout in the control cabinet, you can install the Control Panel in the control cabinet. Clamping levers are provided at the back of the housing for mounting of the device. In the delivery state, the clamping levers are folded onto the device (see Fig. 10).

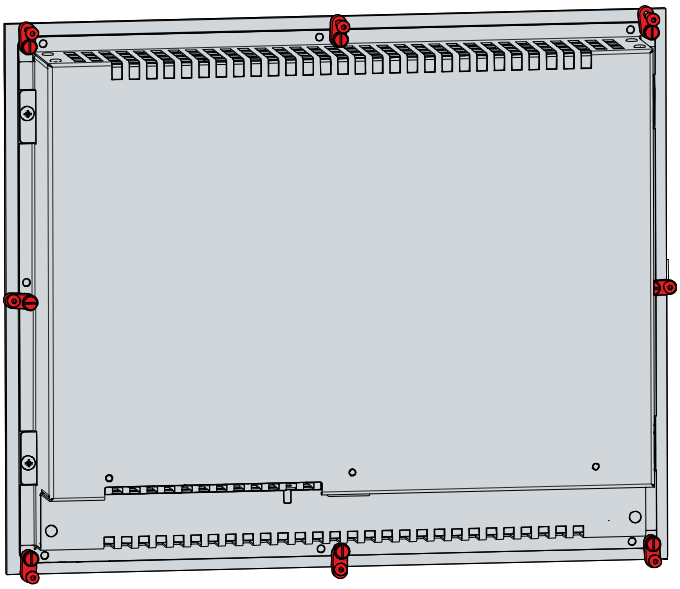

Fig. 10: CP69xx_delivery state clamping lever

To install and secure the Control Panel in the control cabinet, follow the steps shown in Fig. 11 and 12:

1. Insert the Control Panel at the intended position in the panel of the control cabinet. Make sure that the device is secured against falling out until it is fastened properly.

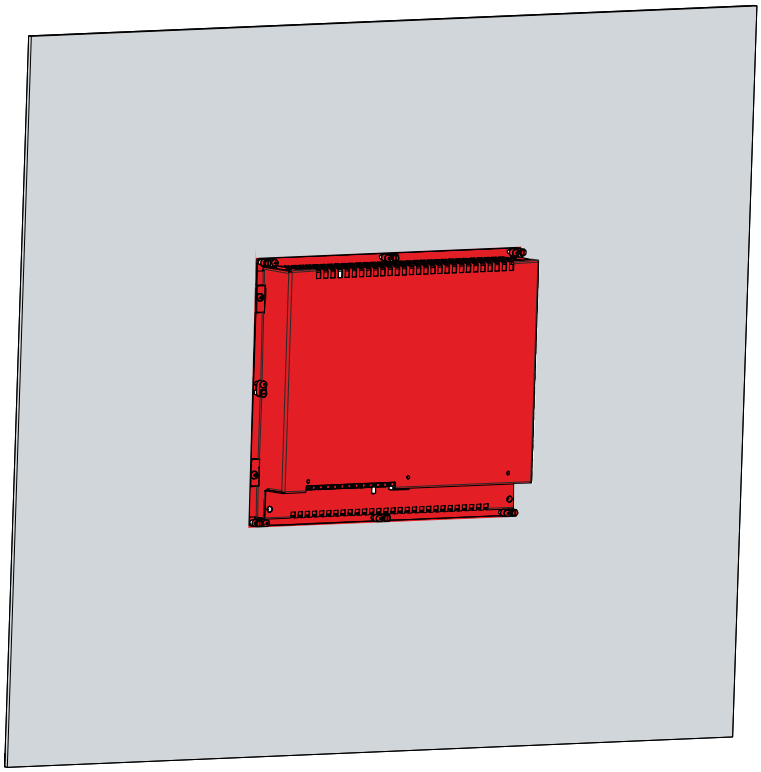

Fig. 11: CP69xx_wall positioning

2. Fold out the clamping levers 90° (section A and B).
3. Tighten the clamping levers with the Allen key 3.0 mm (section C).

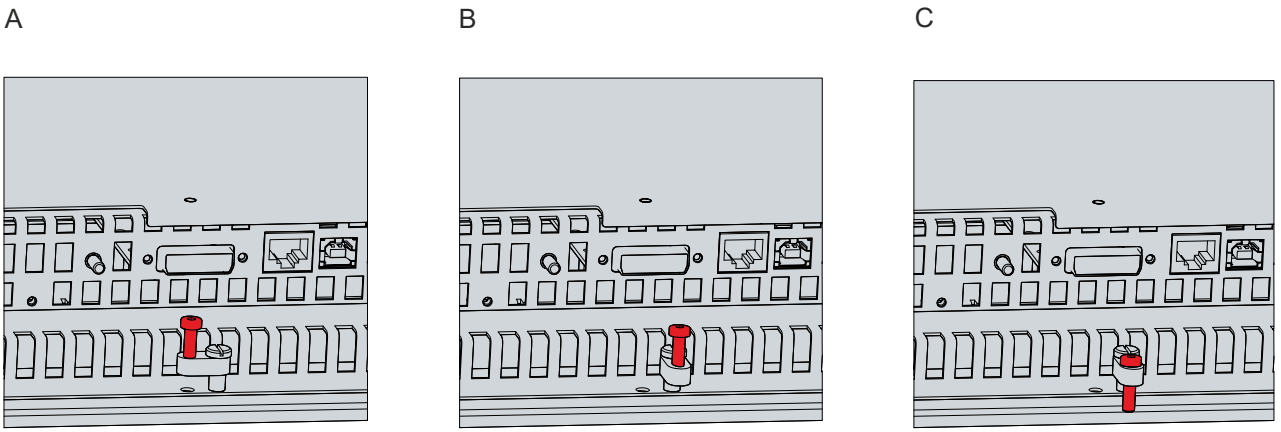

Fig. 12: CP69xx_control cabinet installation

4.3 Connecting the Control Panel

⚠ CAUTION

Risk of electric shock

Dangerous touch voltages can lead to electric shock. To avoid electric shock, observe the following:

- Never connect or disconnect the device cables during a thunderstorm.
- Provide protective earthing for handling the device.

To prepare the control panel for operation, you have to connect it. The first step is to ground the device. Then you can connect the cables and the power supply.

An external power supply unit providing 24 V DC (-15 %/+20 %) from an isolated source is required for the power supply. This source must be protected by a UL 248 rated fuse with a maximum rating of 4 A.

Connect the control panel in the control cabinet according to standard EN 60204-1:2006 Protective Extra Low Voltage (PELV):

- The PE conductor (protective earth) and the "0 V" conductor of the voltage source must be on the same potential (connected in the control cabinet).
- Standard EN 60204-1:2006, section 6.4.1:b stipulates that one side of the circuit, or a point of the energy source for this circuit must be connected to the protective conductor system.

Devices connected to the control panel with their own power supply must have the same potential for the PE "0 V" conductors as the control panel (no potential difference).

4.3.1 Mounting power supply cable

Install the cable for the power supply of the Control Panel using the material supplied for connector assembly. It consists of a 5-pin connection strip and a strain relief housing with cable tie.

If you require a replacement for the voltage connector or the strain relief housing, you can order these from Beckhoff Sales using the following ordering option:

- C9900-P927: power supply connector for CP69xx or CP66xx Control Panel, 5-pin connector with strain relief for the external supply cable

Mounting power supply cable

First mount the plug on the cable as follows:

1. Remove a few centimeters of the cable sheath.
2. Remove the insulation from the wire ends (8-9 mm).
3. Crimp the ferrules onto the stripped wire ends.
4. Insert the cable ends with the ferrules into the 5-pin connection strip. For the pin assignment of the connector, see Chapter 3.2.5 Power supply [▶ 14].
5. Screw the cable ends into the 5-pin connection strip.

⇨ You have mounted the plug on the cable.

Assembly of the strain relief housing

Now mount the strain relief housing on the previously connected plug and supply cable as shown in Fig. 13:

1. Thread the cable tie into the lower part of the strain relief housing (section A).
2. Insert the connection strip into the lower part of the strain relief housing (section B).
3. Tighten the cable tie and remove the plastic tab (section C).
4. Attach the upper part of the strain relief housing by snapping it onto the lower part (section D).

⇨ You have mounted the strain relief housing.

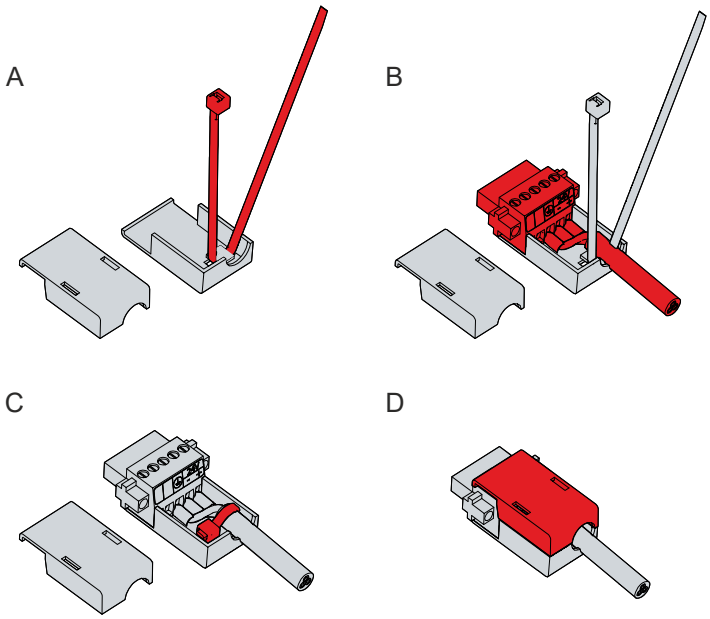

Fig. 13: CP69xx_assembly of strain relief housing

To remove the strain relief housing, proceed as follows:

1. Use your fingers to bend the latching lugs on the lower part slightly outwards (see Fig. 14).
2. Lever the upper part off the lower part.
3. Cut the cable tie.

⇨ You have removed the strain relief housing.

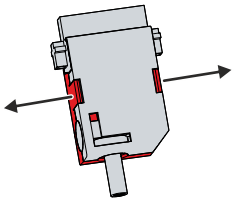

Fig. 14: CP69xx_disassembly of strain relief housing

4.3.2 Grounding the Control Panel

Potential differences are minimized and electrical currents are diverted to the ground through grounding or potential equalization of electronic devices. This is to prevent dangerous touch voltages and electromagnetic interference.

Protective earth

The protective grounding of a device serves to avoid dangerous touch voltages. According to the EN 60204-1 standard (Chapter 8 Potential equalization), protective grounding is required if:

- the device exceeds dimensions of 50 mm x 50 mm,
- the device can be touched or encompassed over a large area,
- contact between the device and active parts is possible,
- an insulation fault may occur.

Establish low-resistance protective earth of the Control Panel via the voltage connection to avoid dangerous touch voltages. There is a pin in the voltage socket for the protective earth (PE).

EMC

NOTICE

Hardware damage due to electromagnetic interference

Using the Control Panel without functional earth can lead to hardware damage due to electromagnetic interference.

- Only use the device with functional earth.

Electromagnetic compatibility (EMC) of the Control Panel includes on the one hand not affecting other devices and equipment by electromagnetic interference and on the other hand not being disturbed by electrical or electromagnetic effects itself.

The Control Panel must comply with certain protection requirements. The Control Panel has EMC interference immunity according to EN 61000-6-2. The EMC interference emission of the device meets the requirements of EN 61000-6-4.

The functional earth is necessary for the EMC of the device. You establish functional earthing via the grounding connection between the grounding bolt in the connection section on the rear side of the Control Panel (see Fig. 15) and the central grounding point of the control cabinet in which the Panel is installed. Use wires with a cross-section of at least 4 mm^2 or a flat conductor for the ground connection, as the circumference of the conductor should be as large as possible.

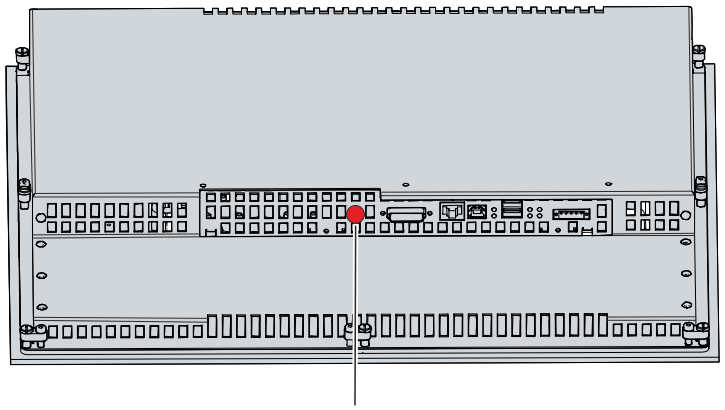

Fig. 15: CP69xx_grounding bolt functional earthing

4.3.3 Connecting cables and power supply

NOTICE

Incorrect connection procedure

Incorrect procedure when connecting the cables and the power supply can cause hardware damage.

- Follow the documented procedure for connecting the cables and the power supply.
- Always connect all cables first and only then switch on the power supply.
- Please read the documentation for the external devices prior to connecting them.

The connections are located at the rear in the connection section of the device.

Connecting cables

Make sure that you first ground the panel (see Chapter 4.3.2 Grounding the control panel [▶ 27]) and then plug in all data transmission cables.

When connecting the control panel to an industrial PC with UPS output, Beckhoff recommends using this for the connection so that the display is also active in UPS mode. Only one control panel may be connected to the UPS output on the PC.

Connect power cable

Cables with a maximum cable cross-section of 1.5 mm^2 can be used for connecting the power supply. For long supply lines, use 1.5 mm^2 cables to achieve a low voltage drop on the supply line. There should be at least 22 V at the power supply plug of the control panel, so that the panel remains switched on during voltage fluctuations.

Proceed as follows to connect the 24 V_{DC} power supply unit:

1. First mount the power supply cable with the 5-pin connection strip without its strain relief housing.
2. Plug the voltage connector into the voltage socket on the panel.
3. Screw the voltage connector to the voltage socket.
4. Connect the panel to your external 24 V power supply.
5. Switch on the 24 V power supply.
6. Measure the voltage at the 5-pin connection strip of the panel.
7. Mount the strain relief housing on the 5-pin connection strip.

5 Decommissioning

NOTICE

Hardware damage due to power supply

A connected power supply can cause damage to the Control Panel during disassembly.

- Disconnect the power supply from the device before starting to disassemble it.

When taking the Control Panel out of operation, you must first disconnect the power supply and cables. You can then remove the device from the control cabinet.

If you do not wish to use the Control Panel any further, chapter 5.2 Disassembly and disposal [▶ 30] provides information on the correct disposal of the device.

5.1 Disconnecting the power supply and cables

⚠ CAUTION

Risk of electric shock

Disconnecting the control panel during a thunderstorm can lead to electric shock.

- Never disconnect the cables of the control panel during a thunderstorm.

Before disassembling the control panel, disconnect the power supply and the cables. Follow the steps below:

1. Shut down the control panel.
2. Disconnect the control panel from the external 24 V power supply.
3. Loosen the screw connection between the voltage socket and the voltage connector.
4. Remove the voltage connector from the voltage socket.
5. Remove the power supply cable if the connector is to remain with the panel.
6. Make a note of the wiring of all data transmission cables if you want to restore the cabling with another device.
7. Disconnect all data transfer cables from the control panel.
8. Finally, disconnect the ground connection.

⇨ You have disconnected the power supply and the cables.

Also see about this

Mounting power supply cable [▶ 25]

5.2 Disassembly and disposal

In order to be able to dismount the control panel from the control cabinet, you must first have disconnected the power supply and the cables (see Chapter 5.1 Disconnecting the power supply and cables [▶ 29]).

To remove the control panel from the control cabinet, follow the steps shown in Fig. 16 and 17:

1. Loosen the clamping levers with a 3.0 mm Allen key (sections A and B). Make sure that the device is secured against falling out of the control cabinet wall.
2. Fold the clamping levers back by 90° onto the housing (section C).

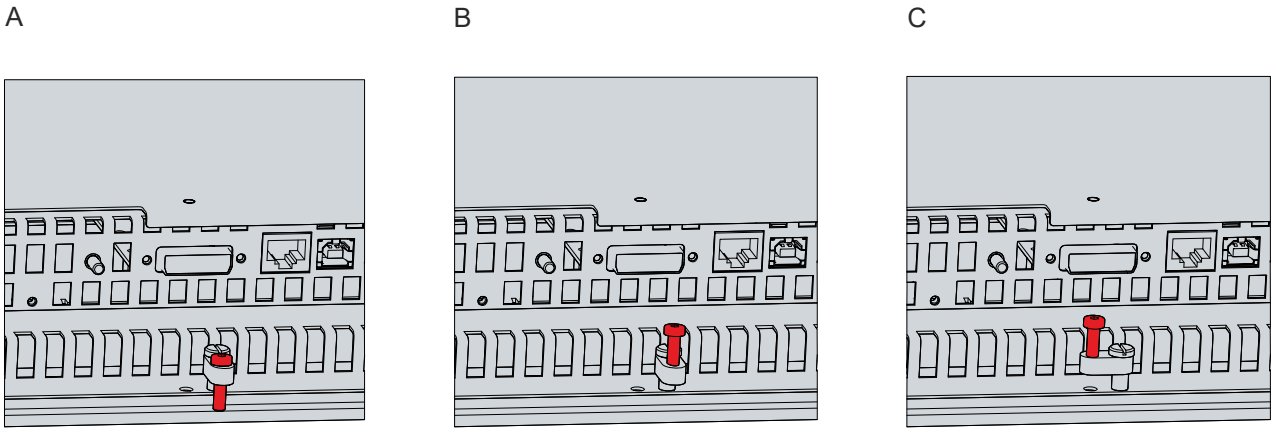

Fig. 16: CP69xx_removal from the control cabinet

⇨ You can now remove the control panel from the corresponding cutout in the control cabinet wall.

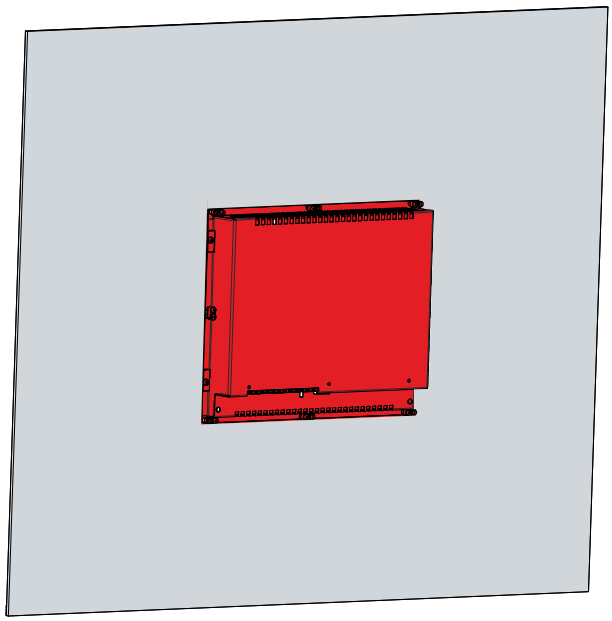

Fig. 17: CP69xx_removal installation cutout

Disposal of the control panel

When disposing of the control panel the national electronic waste regulations must be followed.

For disposal, you must remove the device from the control cabinet.

6 Maintenance

Maintenance measures increase the efficiency of the device by ensuring long-term functionality. Cleaning the device contributes to this.

Defective pixels in the TFT display are production-related and are not grounds for complaint.

Cleaning

NOTICE

Unsuitable cleaning agents

The use of unsuitable cleaning agents can damage the device.

- The control panel should only be cleaned as specified.

It is essential to observe the following aspects when cleaning the control panel:

- Ensure that no dust enters the panel via the rear.
- Never use compressed air to clean the panel.
- Maintain an ambient temperature range of 0 °C to 55 °C.

Cleaning agents

In order to avoid damage to the front of the control panel during cleaning, you must use suitable cleaning agents. Examples include:

- benzine
- spirit
- glass cleaner

Avoid the following cleaning agents:

- detergents with scouring or abrasive components
- metal cleaning objects such as razor blades or steel spatulas
- steam jet cleaner or very hot water
- cold water with a heated device
- high water pressure, e.g. high-pressure cleaner

Cleaning the front screen

You can clean the front screen of the control panel during operation. In order to avoid inadvertent touch entries when doing this, you must first set the device to "Cleaning Mode" with the help of the Beckhoff Control Tool.

The Beckhoff Control Tool does not start automatically when the connected PC starts up. Proceed as follows to activate the "Cleaning Mode" of the Beckhoff Control Tool:

1. Click the Beckhoff Control Tool to start it.
   ⇨ When the tool is started, a small sun symbol appears in the taskbar.
2. Right-click the sun symbol. Touch the sun when operating via the touch screen.
3. Select the "Cleaning Mode" (see Fig. 18).

⇨ "Cleaning Mode" is activated. You can now clean the front panel.

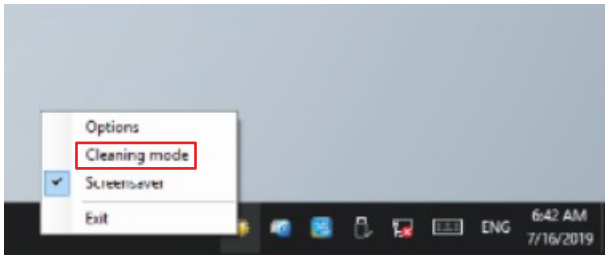

Fig. 18: CP69xx_Select Cleaning Mode

You can set the duration for which the panel should remain in "Cleaning Mode". The period can be set between 5 and 120 seconds. Right-click the sun symbol again and click "Options". Now select the appropriate period (see fig. 19).

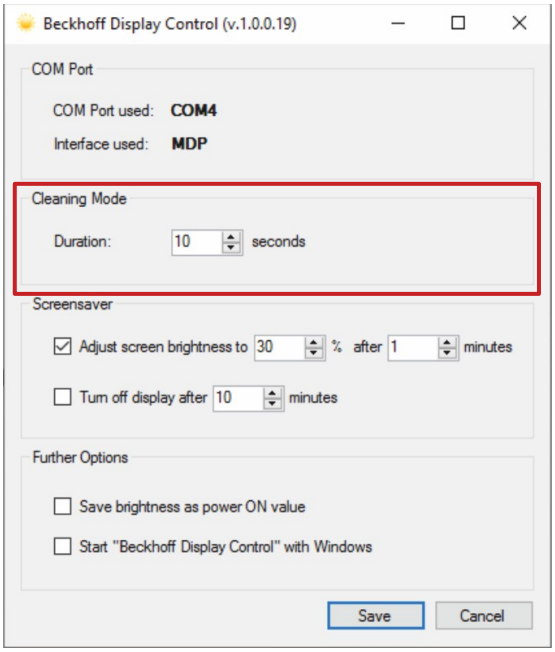

Fig. 19: CP69xx_Options

Repair

Only the vendor may repair the device. If a repair should be necessary, contact Beckhoff Service (see Chapter 9.1 Service and Support [▶ 35]).

7 Troubleshooting

Table 11: Troubleshooting

Fault	Cause	Measures
No Control Panel function	Lack of power supply to the Control Panel Cable not connected	Check the power supply cable 1. Correctly connect the cable 2. Call Beckhoff Service
USB error during access with TwinCAT via USB	Cycle time in TwinCAT set to 10 ms (standard)	Increase the cycle time to between 50 ms and 80 ms
No picture/backlight	Problem with the cable connections	Check DVI cable connection

Beckhoff recommends using Beckhoff connection cables and connection kits.

8 Technical data

Table 12: Technical data

Product designation	CP69xx		
Supply voltage	22-30 V_{DC} (24 V_{DC} power supply unit, NEC class 2)		
Power consumption	Data sheet for calculating power consumption and power loss in the download finder: https://www.beckhoff.com/de-de/support/downloadfinder/suchergebnis/?c-1=40717316		
Protection rating	Front IP65, rear IP20		
Vibration resistance (sinusoidal vibration)	EN 60068-2-6:	10 ... 58 Hz:	0.035 mm
		58 ... 500 Hz:	0.5 G (~ 5 m/ s^2)
Shock resistance (shock)	EN 60068-2-27:	5 G (~ 50 m/ s^2), duration: 30 ms	
EMC interference immunity	conforms to EN 61000-6-2		
EMC interference emission	conforms to EN 61000-6-4		
Permissible ambient temperature	Operation: 0 °C ... +55 °C Transport / storage: -25 °C ... +65 °C		
Permissible relative air humidity	Maximum 95%, no condensation		
Transport and storage	The same values for air humidity and shock resistance are to be observed during transport and storage as in operation. Suitable packaging of the control panel can improve the resistance to impact during transport.		

9 Appendix

In the appendix you will find information for servicing and details of the approvals that your device has.

9.1 Service and support

Beckhoff and its worldwide branch offices offer comprehensive service and support, providing fast and competent assistance with all issues relating to Beckhoff products and system solutions.

Beckhoff Service

The Beckhoff Service Center supports you in all matters of after-sales service:

- on-site service
- repair service
- spare parts service
- hotline service

Hotline: + 49 5246/963-460
email: service@beckhoff.com

If your device requires service, please indicate the serial number, which you can find on the name plate.

Beckhoff Support

Support offers you comprehensive technical assistance, helping you not only with the application of individual Beckhoff products, but also with other, wide-ranging services:

- World-wide support
- Design, programming and commissioning of sophisticated automation systems
- extensive training program for Beckhoff system components

Hotline: + 49 5246/963-157
email: support@beckhoff.com

Headquarters

Beckhoff Automation GmbH & Co. KG
Hülshorstweg 20
33415 Verl
Germany

Phone: + 49 5246/963-0
email: info@beckhoff.de

The addresses of the worldwide Beckhoff branches and agencies can be found on our website at http://www.beckhoff.com/.

You will also find further documentation for Beckhoff components there.

9.2 Approvals

Your device has the following approvals:

- CE
- EAC
- UKCA
- FCC

You will find all other applicable approvals on the name plate of your device.

FCC approvals for the United States of America

FCC: Federal Communications Commission Radio Frequency Interference Statement

This device was tested and complies with the limits for a digital device of class A, according part 15 of the FCC regulations. These limits are designed to provide adequate protection against adverse interference, if the device is used in a commercial environment. This device generates, uses and may emit radio frequency energy and may cause adverse interference with radio communications, if it is not installed and used in accordance with the operating instructions. If this device is used in a residential area it is likely to cause adverse interference, in which case the user must take appropriate countermeasures in order to eliminate the interference at his own expense.

FCC approvals for Canada

FCC: Canadian Notice

This device does not exceed the class A limits for radiation, as specified by the Radio Interference Regulations of the Canadian Department of Communications.

List of figures

List of tables

More Information:
www.beckhoff.com/cp69xx

Beckhoff Automation GmbH & Co. KG
Hülshorstweg 20
33415 Verl
Germany
Phone: +49 5246 9630
info@beckhoff.com
www.beckhoff.com