BECKHOFF New Automation Technology

Manual | EN

C9900-Mxxx

Button modules

2026-03-18 | Version: 2.0

Table of contents

1 Notes on the documentation

This description is intended exclusively for trained specialists in control and automation technology who are familiar with the applicable national standards.
The documentation and the following notes and explanations must be complied with when installing and commissioning the components.
The trained specialists must always use the current valid documentation.

The trained specialists must ensure that the application and use of the products described is in line with all safety requirements, including all relevant laws, regulations, guidelines, and standards.

Disclaimer

The documentation has been compiled with care. The products described are, however, constantly under development.
We reserve the right to revise and change the documentation at any time and without notice.
Claims to modify products that have already been supplied may not be made on the basis of the data, diagrams, and descriptions in this documentation.

Trademarks

Beckhoff®, TwinCAT®, TwinCAT/BSD®, TC/BSD®, EtherCAT®, EtherCAT G®, EtherCAT G10®, EtherCAT P®, Safety over EtherCAT®, TwinSAFE®, XFC®, XTS®, and XPlanar® are registered and licensed trademarks of Beckhoff Automation GmbH.
If third parties make use of the designations or trademarks contained in this publication for their own purposes, this could infringe upon the rights of the owners of the said designations.

EtherCAT® is a registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany

Copyright

Third-party trademarks

Trademarks of third parties may be used in this documentation. You can find the trademark notices here: https://www.beckhoff.com/trademarks.

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 preventing personal injuries and damage to property.

Exclusion of liability

Beckhoff shall not be held liable in the event that this documentation is not complied with and the devices are therefore not used in line with the documented operating conditions.

2.1 Signal words

The signal words used in the documentation are classified below.

Warning on personal injuries

⚠ DANGER
High-risk hazard that will result in death or serious injury.

⚠ WARNING
Medium-risk hazard that may result in death or serious injury.

⚠ CAUTION
Low-risk hazard that may result in minor injury.

Warning on property and environmental damage

NOTICE
The environment, equipment, or data may be damaged.

2.2 Intended use

The button modules are decentralized operating units, some of which are designed for wall installation and some for mounting plate installation.

One of the differences between the C9900-Mxxx button modules is the protection rating. The following modules are IP65 protected all round:

- C9900-M894
- C9900-M900
- C9900-M998
- C9900-M229

For the following other button modules, the front is IP65, the rear IP40:

- C9900-M993
- C9900-M994
- C9900-M995
- C9900-M996
- C9900-M997
- C9900-M899

The definition of protection ratings IP65 and IP40 is as follows:

- IP65: It offers full protection against contact and against water jets (nozzle) from any angle and against dust.
- IP40: There is protection against access with a wire from 1 mm diameter. 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 can be used within the documented operating conditions.

Improper use

Do not use the device outside the documented operating conditions.

2.3 Fundamental safety instructions

The following safety instructions must be observed when handling the device.

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.
- 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.

Damage to property, loss of data and impairment of functions

- 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 [▶ 7]).
- 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

With the C9900-Mxxx button modules, you can control the central functions of a machine or system, such as emergency stop, start or stop, with buttons.

The button modules differ in the way they are mounted and in the button layout. One part of the button modules is designed for mounting using four M6 threaded holes in the back wall of the modules and the other part for installation in a wall cut-out using mounting brackets. With regard to the buttons, a distinction is made between short-stroke buttons and illuminated push buttons.

The following table shows all C9900-Mxxx button modules.

Table 1: C9900-Mxxx button modules

Button module	Description
C9900-M894	• Mounting using four M6 threaded holes • 1x emergency stop • 6x short-stroke keys • IP65 all around
C9900-M900	• Mounting using four M6 threaded holes • 1x emergency stop • 3x short-stroke keys • IP65 all around
C9900-M998	• Mounting using four M6 threaded holes • 1x emergency stop • 3x illuminated push buttons • IP65 all around
C9900-M229	• Mounting using four M6 threaded holes • 1x emergency stop • 10x short-stroke keys • IP65 all around
C9900-M993	• Installation in wall cut-out with mounting brackets • 1x emergency stop • 1x key switches • 8x short-stroke keys • Front side IP65, rear side IP40
C9900-M994	• Installation in wall cut-out with mounting brackets • 1x emergency stop • 10x short-stroke keys • Front side IP65, rear side IP40
C9900-M995	• Installation in wall cut-out with mounting brackets • 10x short-stroke keys • Front side IP65, rear side IP40

Button module	Description
C9900-M996	• Installation in wall cut-out with mounting brackets • 6x short-stroke keys • Front side IP65, rear side IP40
C9900-M997	• Installation in wall cut-out with mounting brackets • 1x emergency stop • 6x short-stroke keys • Front side IP65, rear side IP40
C9900-M899	• Installation in wall cut-out with mounting brackets • 1x emergency stop • 3x short-stroke keys • Front side IP65, rear side IP40

3.1 Structure

The button modules differ in the way they are mounted and in the button layout. The following is an example of a button module for the type of installation and the button layout.

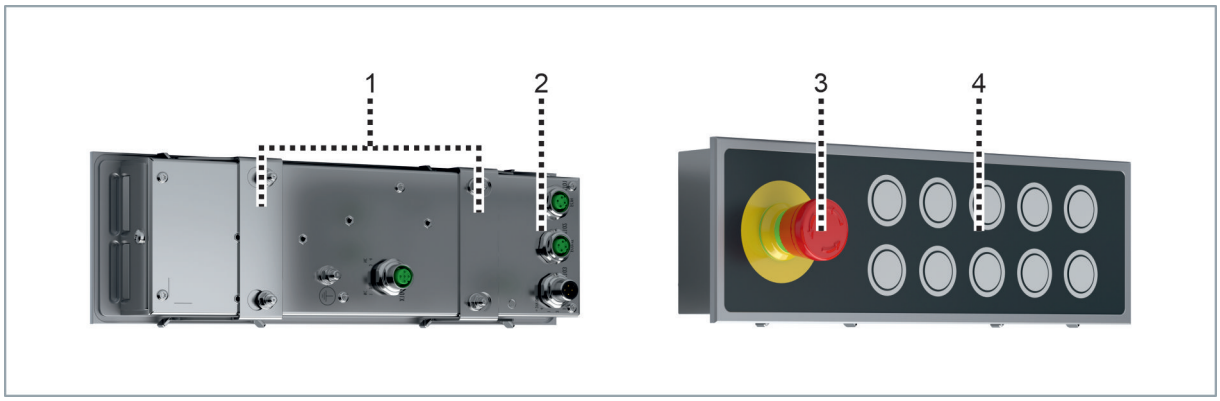

Fig. 1: Button module with mounting brackets and short-stroke buttons

Table 2: Legend - Structure

No.	Component	Description
1	Mounting bracket	Installation in wall cut-out
2	Connection section	Access to interfaces
3	Emergency stop	Safe state of the connected machine
4	Short-stroke keys	Operating the button module

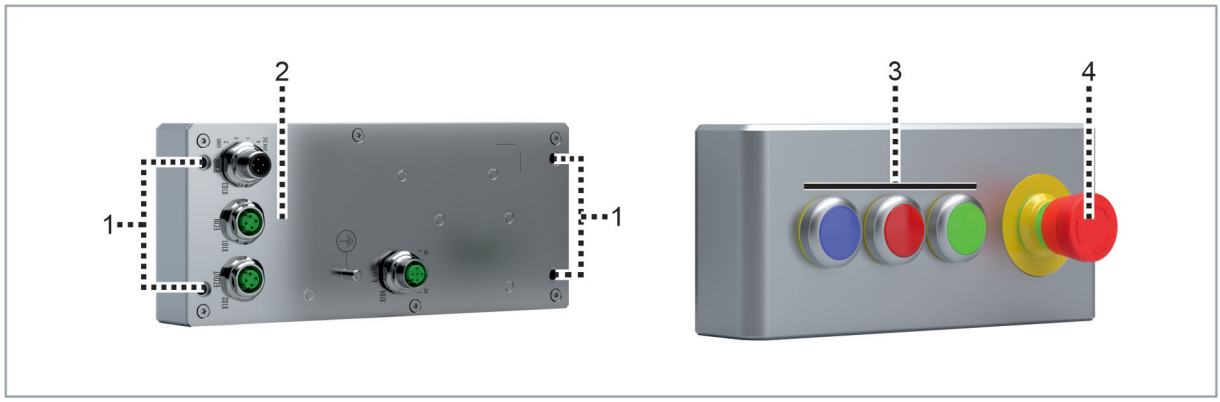

Fig. 2: Button module with threaded holes and illuminated push buttons

Table 3: Legend - Structure

No.	Component	Description
1	Threaded holes M6	Mounting over back wall
2	Connection section	Access to interfaces
3	Illuminated push button	Operating the button module
4	Emergency stop	Safe state of the connected machine

3.2 Interface description

The button modules contain the following interfaces:

- EtherCAT IN (X101)
- EtherCAT OUT (X102)
- Power supply (X103)
- Emergency stop (X104)

The interfaces are located on the rear side of the button module. C9900-M995 and C9900-M996 do not have an emergency stop.

3.2.1 EtherCAT in/out

The button modules feature both an EtherCAT input (X101) and an EtherCAT output (X102). In both cases, the EtherCAT connection is made through a 4-pin M12 socket. The round connector has an IP67 protection rating.

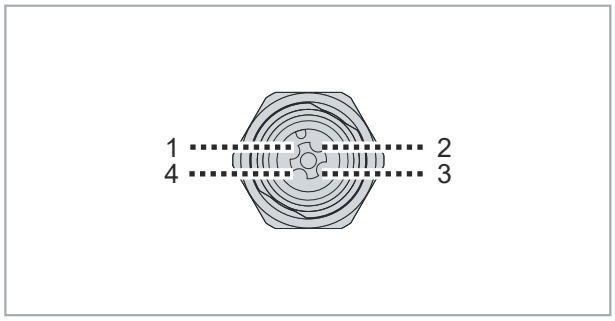

Fig. 3: EtherCAT in/out pin numbering

Table 4: EtherCAT in/out pin assignment

Pin	Signal
1	TX +
2	RX +
3	TX -
4	RX -

3.2.2 Power supply

The button modules are supplied with a nominal voltage of 24 V. The power supply is connected via a 4-pin M12 socket (X103). The round connector has an IP67 protection rating.

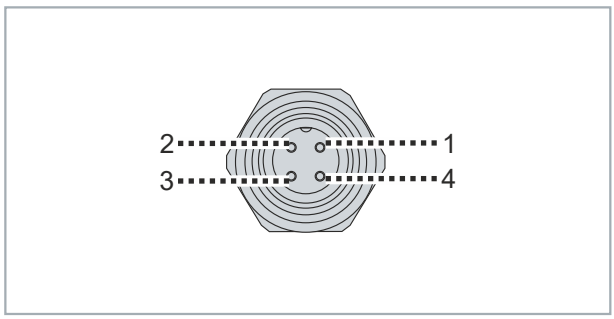

Fig. 4: Power supply pin numbering

Table 5: Voltage socket pin assignment

Pin	Signal
1	+24 V DC
2	GND
3	GND
4	+24 V DC

3.2.3 Emergency stop connection

Some of the button modules feature an emergency stop. It is connected via a 5-pin socket.

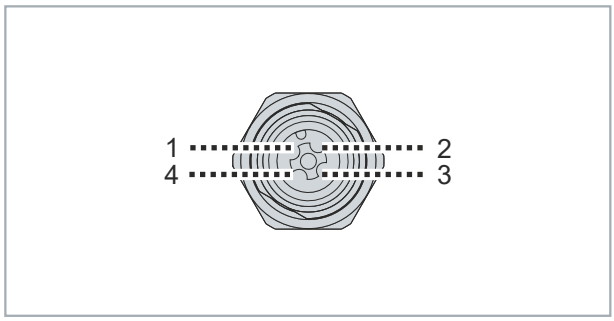

Fig. 5: Emergency stop pin numbering

Table 6: Emergency stop pin assignment

Pin	Signal
1	NC 1 (normally closed contact)
2	NC 1 (normally closed contact)
3	NC 2 (normally closed contact)
4	NC 2 (normally closed contact)

4 Commissioning

In order to use the button modules you must first commission it. The first step is to transport the button module to is operating location and unpack it. Depending on the module, this is followed either by mounting with a mounting plate or installation in the control cabinet wall and finally connection of the cables and power supply.

4.1 Transport and unpacking

Note the specified transport and storage conditions (see Chapter 6 Technical data [▶ 25]).

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 device, such as 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.

4.2 Mounting

NOTICE

Extreme environmental conditions

Extreme environmental conditions can cause damage to the device.

- Avoid extreme environmental conditions.
- Protect the device from moisture and heat.
- The environmental conditions specified for operation must be observed.

The C9900-Mxxx button modules differ, among other things, in the way they are installed. Some of the button modules are designed for mounting using four M6 threaded holes on the back, the others for installation in a wall cut-out using mounting brackets. The following table shows which button module was designed for which type of installation:

Table 7: Assignment of button module and type of installation

Button module	Mounting method
C9900-M894	Threaded holes M6
C9900-M900	Threaded holes M6
C9900-M998	Threaded holes M6
C9900-M229	Threaded holes M6
C9900-M993	Wall cut-out with mounting bracket
C9900-M994	Wall cut-out with mounting bracket
C9900-M995	Wall cut-out with mounting bracket
C9900-M996	Wall cut-out with mounting bracket
C9900-M997	Wall cut-out with mounting bracket
C9900-M899	Wall cut-out with mounting bracket

An optional mounting plate (C9900-M340) is available for the button modules for mounting using the four M6 threaded holes, which you can mount on the back of the button modules in advance.

The following chapters explain the procedure for the two types of installation mentioned.

Dimensions

The dimensions of the various button modules can be found in the Technical Drawings section of the Download Finder on the Beckhoff website. Enter the relevant module in the search bar.

4.2.1 Mounting using M6 threaded holes

There are four M6 threaded holes in the back wall of the button modules. You can use these to mount a mounting bracket or similar on the button module. You can order the C9900-M340 mounting bracket from Beckhoff as an option. This is angled at 90°. The following illustrations are examples of all button modules with the same type of installation.

To mount a button module on a wall using the Beckhoff mounting bracket, follow the steps below:

1. Attach the mounting bracket to the back wall of the button module.
2. Insert the four M6 screws supplied and tighten them.

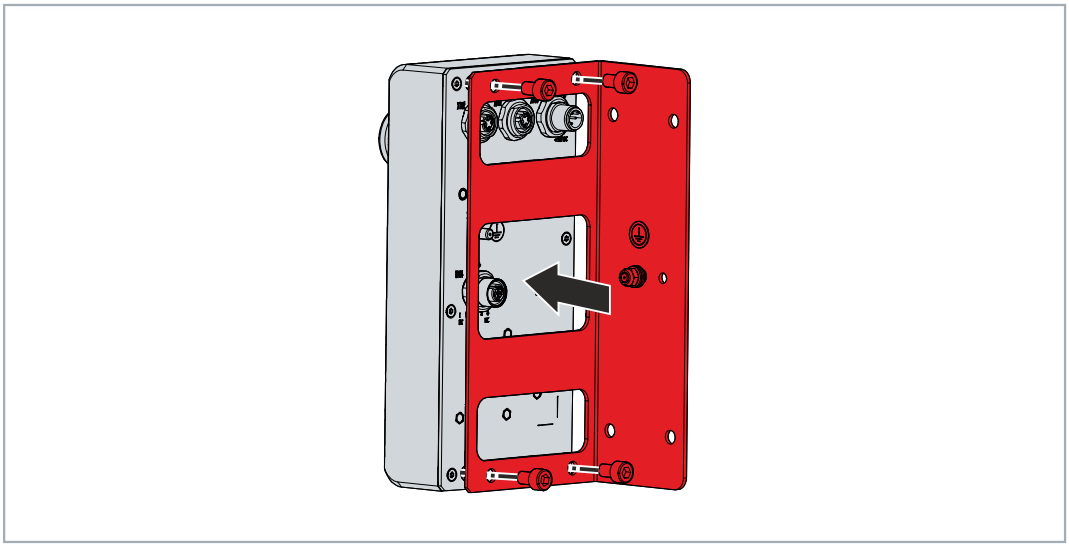

Fig. 6: Installation of mounting bracket

3. Place the angled side of the mounting bracket on the desired wall.
4. Screw the button module to the wall using the mounting bracket.

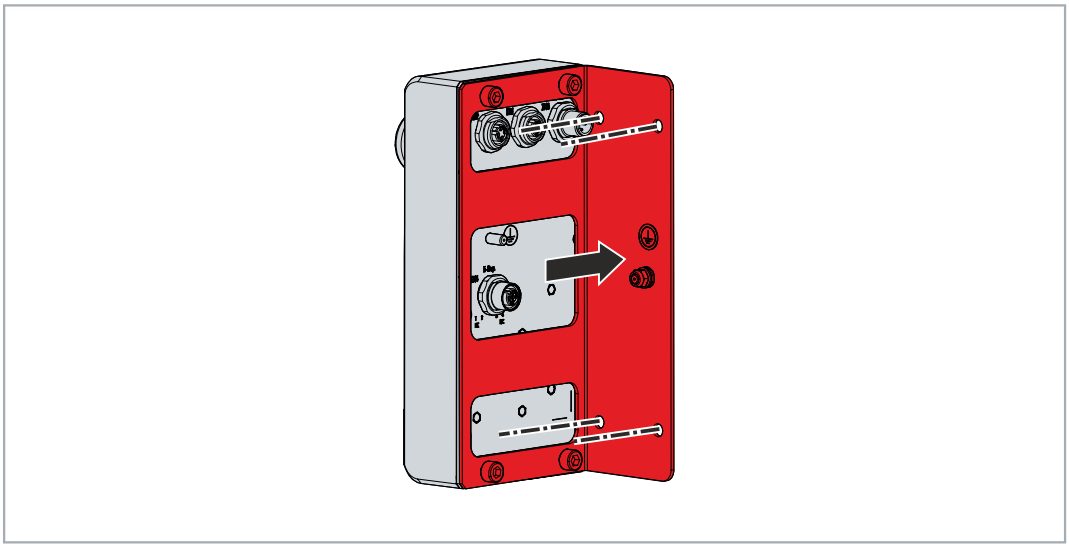

Fig. 7: Wall mounting

⇨ You have mounted the button module on the wall.

4.2.2 Installation in wall cut-out with mounting bracket

Preparation of the wall cut-out

The control cabinet or the wall intended for installation must be equipped with the necessary installation cut-out corresponding to the dimensions of the button modules.

The wall thickness must be between 1 mm and 4 mm for installation. After installation, be sure you check that there are no gaps between the keypad module and the wall.

Wall installation

The mounting brackets for installing a button module in a wall cut-out are already fitted to the module ex factory. For installation in a wall cut-out, however, you must first remove the mounting brackets again. The following illustrations are examples of all button modules with the same type of installation.

To install a button module in a wall cut-out, follow the steps below:

1. Loosen the two stop nuts on the mounting brackets using an Allen key.
2. Remove the two mounting brackets.

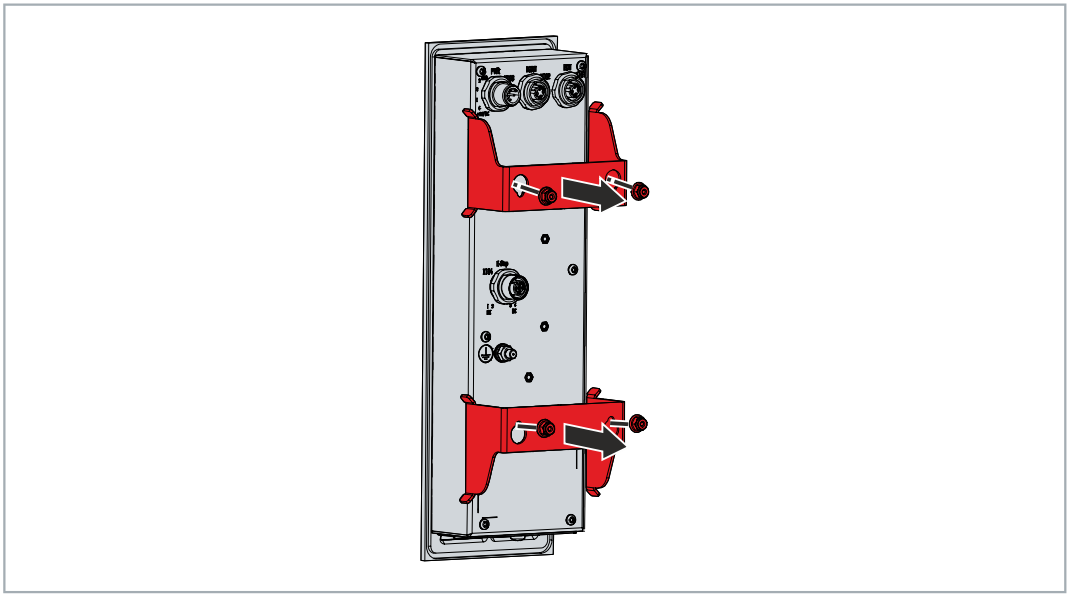

Fig. 8: Dismantling the mounting bracket

3. Insert the button module into the wall cut-out. Make sure that the module is secured against falling out until it is fastened properly.
4. Replace the mounting brackets.
5. Use an Allen key to fix the stop nuts again to a maximum torque of 1.2 Nm.

⇨ You have installed the button module in the wall cut-out.

4.2.3 Mounting insert strips/insert labels

Mounting insert strips Short-stroke buttons

On the button modules with short-stroke buttons, you have the option of labeling the buttons. You can label the button module insert strips for mounting in a wall cut-out yourself. Use this template for this purpose. You must order the button module insert strips pre-labeled for mounting using four M6 threaded holes.

To label and mount the insert strips, follow the steps below:

1. Remove the M4 screw from the clamping plate (section A).
2. Remove the clamping plate (section A).
3. Slide the insert strips into the button module. Make sure that the label is facing outwards (section B).

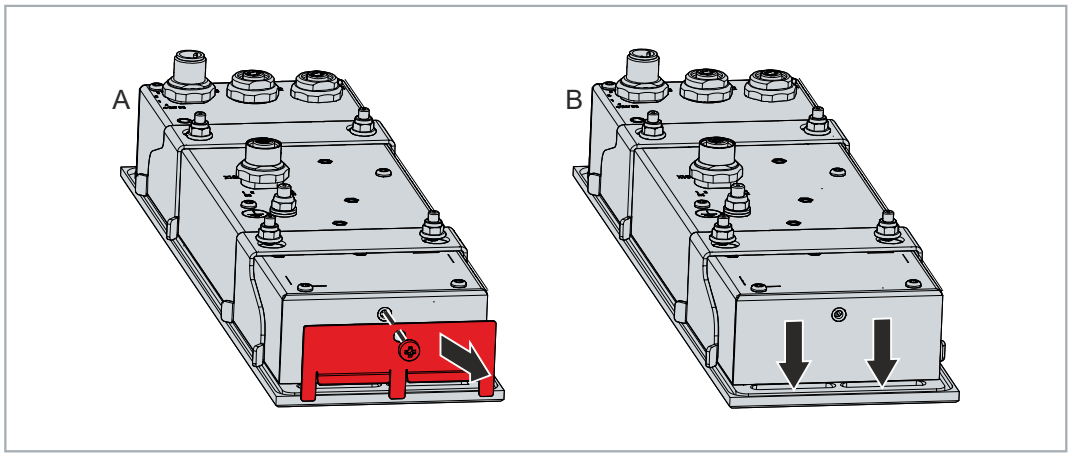

Fig. 9: Mounting of insert strips

4. Reattach the clamping lever to the button module.
5. Tighten the M4 screw again.

⇨ You have fitted the insert strips.

Mounting insert labels illuminated push buttons

The C9900-M998 button module is equipped with illuminated push buttons. You can print the insert labels in the illuminated push buttons using a conventional printer and then insert them into the buttons. The following illustration shows how to fit the insert labels.

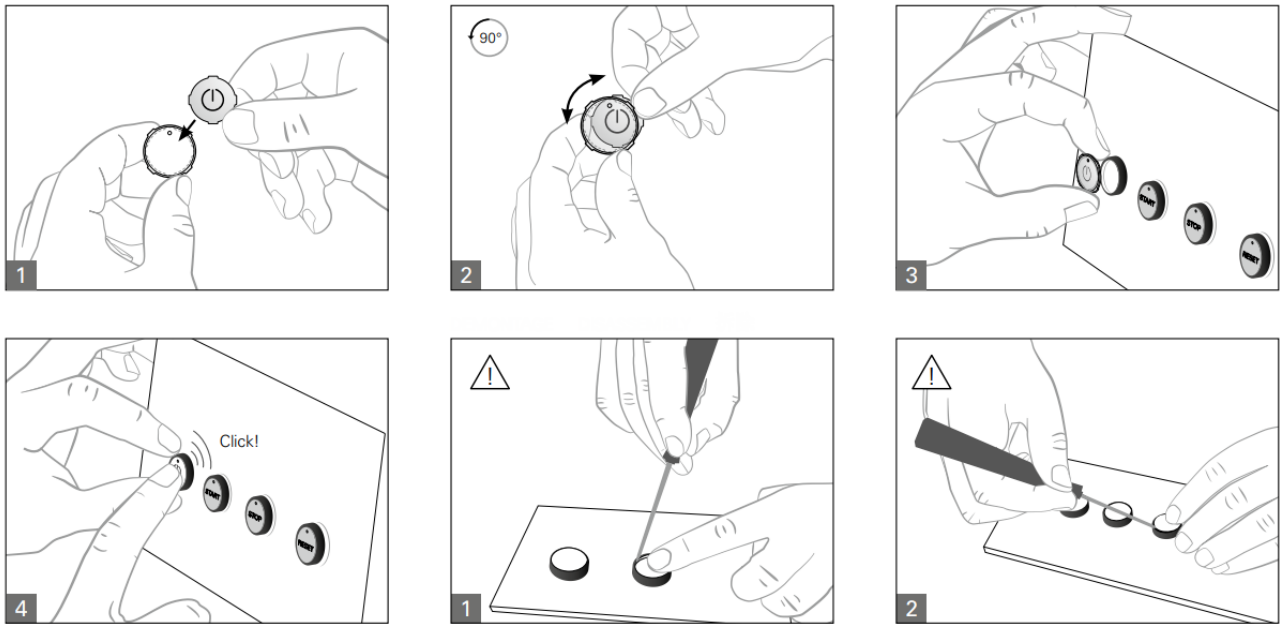

Fig. 10: Installing the insert labels

4.3 Connecting the button module

⚠ 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 make the device ready 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 24 V DC power supply is required to operate the device. A nominal voltage of at least 22 V must be applied to the power supply plug of the device at all times.

The cabling of the panel PC in the control cabinet must be done in accordance with the standard EN 60204-1:2006 PELV = Protective Extra Low Voltage:

- 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.

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

4.3.1 Grounding the button module

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.

Connect the low-impedance protective earth using the grounding bolt on the rear of the keypad module to prevent dangerous touch voltages.

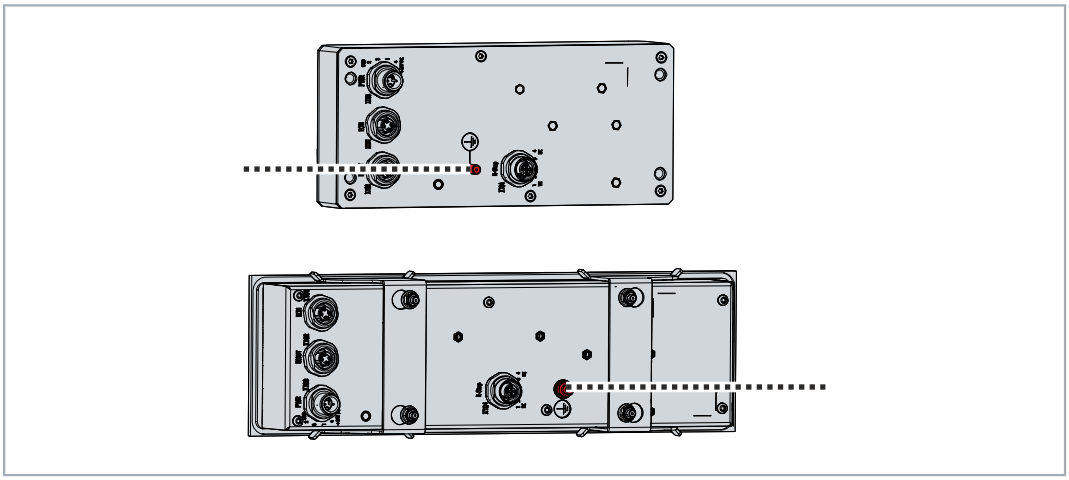

Fig. 11: Grounding bolt: protective and functional earthing

You can optionally order the C9900-M340 mounting bracket for mounting the button modules with M6 threaded holes on the rear. In this case, you must connect the grounding bolt of the button module to the grounding bolt of the mounting bracket for grounding. You must then make a connection from the mounting bracket to the central grounding point of the system.

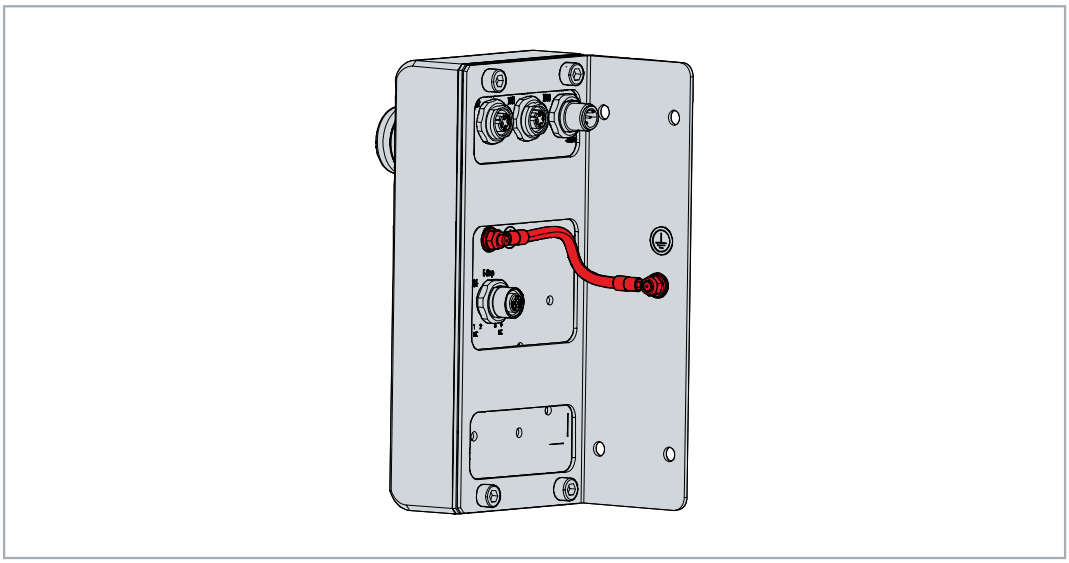

Fig. 12: Grounding mounting bracket

EMC

NOTICE

Hardware damage due to electromagnetic interference

The use of the device without a functional earth can lead to material damage due to electromagnetic interference.

- Only use the device with functional earth.

Electromagnetic compatibility (EMC) of the device 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.

To do this, the device must comply with certain protection requirements. The device 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. The functional earthing is also established using the grounding bolt on the back of the button module. To do this, connect the grounding bolt to the central grounding point of the control cabinet in which the button module 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.

4.3.2 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 the 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 of the button module.

Connecting cables

Make sure that you first ground the button module (see chapter 4.3.2 Grounding the button module [▶ 20]) and then plug in all data transmission cables.

Connecting the power supply

Proceed as follows to connect the 24 V DC power supply:

1. Plug the voltage connector into the voltage socket on the button module.
2. Connect the button module to your external 24 V power supply.
3. Switch on the 24 V power supply.

⇨ You have connected the power supply.

5 Decommissioning

NOTICE

Hardware damage due to power supply

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

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

As part of the decommissioning of the button module, you must first disconnect the power supply and cables. Depending on the type of installation, you can then either remove the module from the wall or remove it from the wall cut-out.

If you no longer wish to use the button module, please refer to chapter 5.2 Disassembly and disposal [▶ 23] for information on how to dispose of the button module correctly.

5.1 Disconnecting the power supply and cables

⚠ 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.

Before disassembling the device, you must disconnect the cables and the power supply. Follow the steps below:

1. Disconnect the button module from your external 24 V power supply.
2. Remove the voltage connector from the voltage socket.
3. Make a note of the wiring of all data transmission cables if you want to restore the cabling with another device.
4. Disconnect all data transmission cables from the button module.
5. Finally, disconnect the ground connection.

⇨ You have disconnected the cables and power supply.

5.2 Disassembly and disposal

Depending on the type of installation, you must either remove the button module from the wall or from the wall cut-out.

Removal from the wall

To remove the button module from the wall using the Beckhoff mounting bracket, follow the steps below:

1. Remove the four screws that secure the mounting bracket to the wall. Make sure that the button module is secured against falling down.

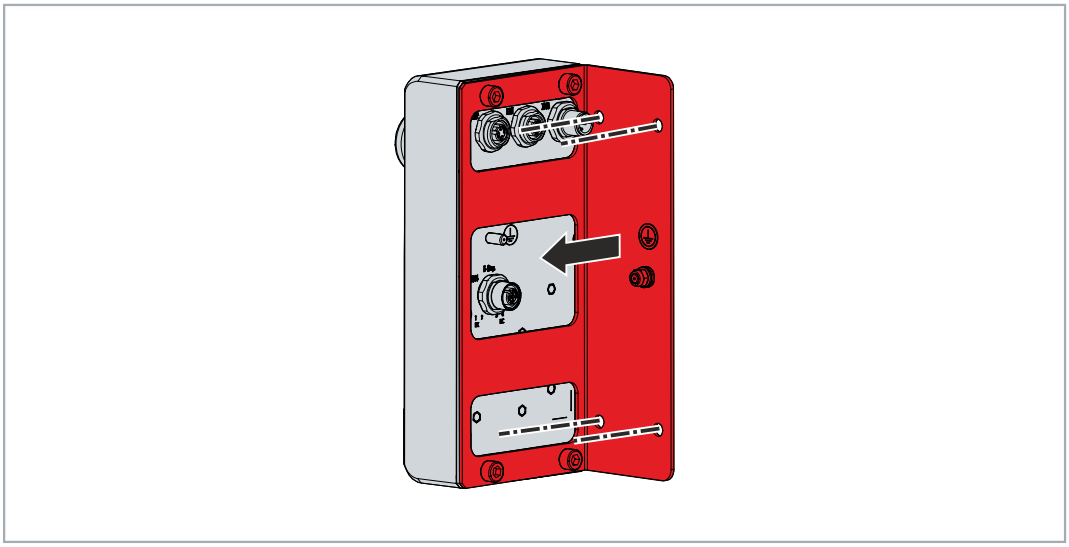

Fig. 13: Removal from the wall

2. Remove the button module from the wall.

⇨ You have removed the button module from the wall.

Dismantling from the wall cut-out

To remove the button module from the wall cut-out, follow the steps below:

1. Loosen the stop nuts on the two mounting brackets using an Allen key.
2. Remove the mounting brackets. Make sure that the module is secured against falling down.

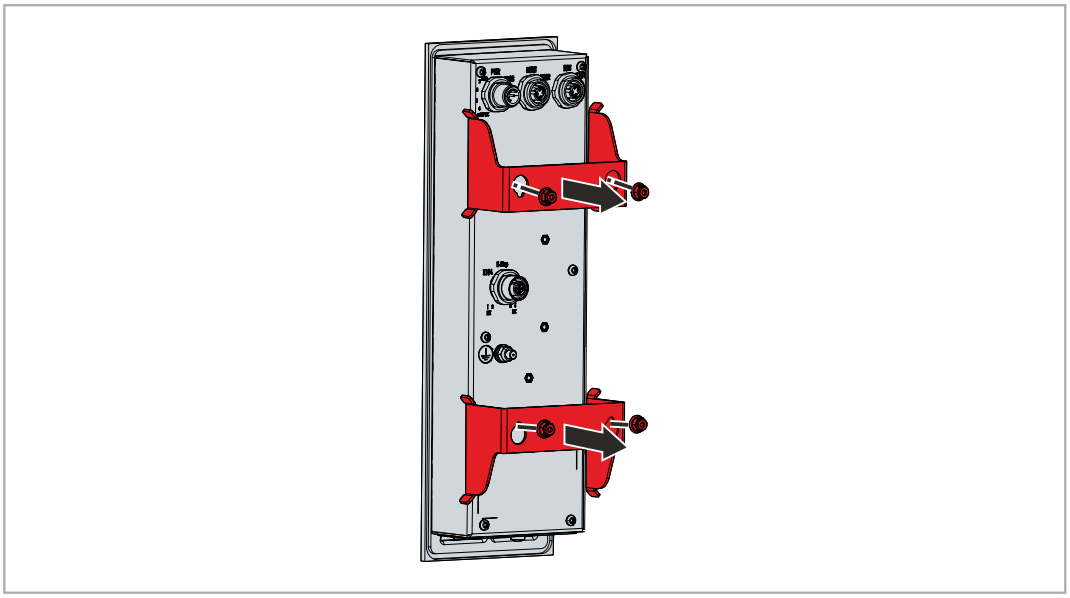

Fig. 14: Dismantling from wall cut-out

3. Remove the button module from the wall cut-out.

⇨ You have removed the button module from the wall cut-out.

6 Technical data

Table 8: Technical data

Product designation	C9900-Mxxx
Weight	
Supply voltage	22-30 V DC (24 V DC power supply unit)
Power consumption	(Data sheet?)
All-round IP65 protection	C9900-M894 C9900-M900 C9900-M998 C9900-M229
Protection class IP65 at the front, and IP40 at the rear	C9900-M993 C9900-M994 C9900-M995 C9900-M996 C9900-M997 C9900-M899
Vibration resistance (sinusoidal vibration)	EN 60068-2-6: 10 to 58 Hz: 0.035 mm 58 to 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: -20 °C ... +60 °C
Permissible air humidity	Maximum 95 %, no condensation
Transport and storage	The values for air humidity and shock resistance are to be observed during transport and storage and in operation. The vibration resistance during transport can be improved by suitable packaging of the device.

7 Support and Service

Beckhoff and their partners around the world offer comprehensive support and service, making available fast and competent assistance with all questions related to Beckhoff products and system solutions.

Download finder

Our download finder contains all the files that we offer you for downloading. You will find application reports, technical documentation, technical drawings, configuration files and much more.

The downloads are available in various formats.

Beckhoff's branch offices and representatives

Please contact your Beckhoff branch office or representative for local support and service on Beckhoff products!

The addresses of Beckhoff's branch offices and representatives round the world can be found on our internet page: www.beckhoff.com

You will also find further documentation for Beckhoff components there.

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:

- support
- design, programming and commissioning of complex automation systems
- and extensive training program for Beckhoff system components

Hotline:	+49 5246 963-157
e-mail:	support@beckhoff.com

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
e-mail:	service@beckhoff.com

Beckhoff Headquarters

Beckhoff Automation GmbH & Co. KG

Huelshorstweg 20
33415 Verl
Germany

Phone:	+49 5246 963-0
e-mail:	info@beckhoff.com
web:	www.beckhoff.com

List of figures

List of tables

Trademark statements

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