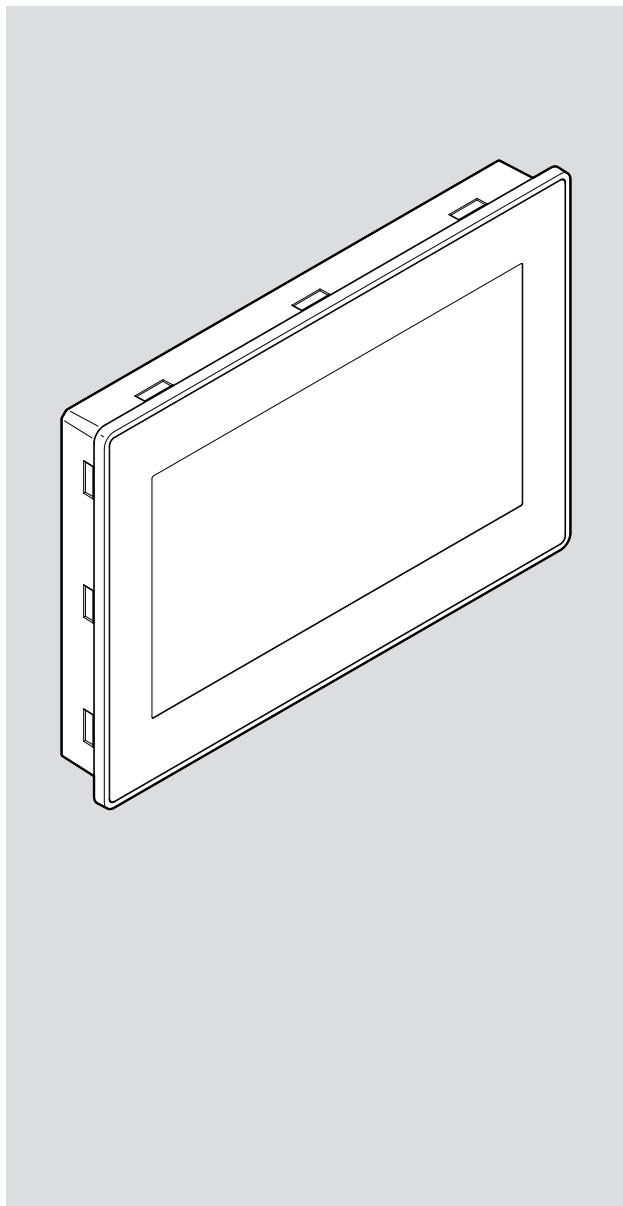


CDPX-X-B/-E1

Operator unit



FESTO

Operating instruction



8201040

8201040
2024-07
[8201042]

Original instructions

CODESYS, MODBUS, OPC UA, WINDOWS are registered trademarks of the respective trademark owners in certain countries.

Table of contents

1	About this document	4
	1.1 Applicable documents	4
	1.2 Specified standards	4
2	Safety	4
	2.1 Safety instructions	4
	2.2 Intended use	4
	2.3 Cyber security measures	4
3	Product overview	7
	3.1 Connections	7
	3.2 Function	9
4	Mounting	10
5	Earthing	12
6	System settings	13
7	Commissioning	15
8	Calibrating touchscreen	15
9	Technical data	16

1 About this document

1.1 Applicable documents



All available documents for the product → www.festo.com/sp.

1.2 Specified standards

Version	
EN 61000-6-4	EN 61000-4-5
EN 61000-6-2	EN 61000-4-6
EN 61000-4-2	EN 55011 Class A
EN 61000-4-3	CISPR 22 Class A
EN 61000-4-4	

Tab. 1: Standards specified in the document

2 Safety

2.1 Safety instructions

- Only use the product in its original condition without unauthorised modifications.
- Only use the product if it is in perfect technical condition.
- Clean the product with a clean, soft cloth and non-abrasive cleaning agents.
- Protect the device from UV radiation.
- Do not allow the product to come into contact with corrosive chemical compounds.
- Do not use tools to operate the panel keyboard or touchscreen.

2.2 Intended use

The product is an operator unit and display unit in conjunction with PLC systems.

2.3 Cyber security measures

Accidental or improper execution of functions on the product can lead to failure or malfunction of the product and thus the entire connected system. In addition, unauthorised access to information stored on the product may be possible. The system operator must therefore take appropriate measures to prevent accidental or improper access to the product. Cyber security information

→ www.festo.com/psirt.

Access with Festo service tools

The following table shows the device functions and the ports used for the specific device function.

Function [BT1]	Description	Port [BT2]	Operation
Search	The device can be found on the network with a search protocol.	990 (UDP) 991 (UDP) 10002 (UDP/ MULTICAST)	<input type="checkbox"/>
Network	The device supports the display and setting of the network parameters. On completion of setting the device will restart.	990 (UDP) 10002 (UDP/ MULTICAST)	<input type="checkbox"/>
Firmware	The device supports the download of a new firmware version.	10002 (UDP/ MULTICAST)	<input type="checkbox"/>
Backup/restore	The device supports data backup and data recovery. This will restart the device.	10002 (UDP/ MULTICAST)	<input type="checkbox"/>
Homepage	The device provides an information page for Internet browsers. In addition, after entering the user and password, it enables changes to parameters in the system, firmware updates, switching services on/off.	80 (TCP) 443 (TCP)	<input checked="" type="checkbox"/>
Identification	The device supports the prompt for identification, for example, with a flashing LED display.	10002 (UDP/ MULTICAST)	<input checked="" type="checkbox"/>
File transfer	The device supports file transfer in the command line mode.	10002 (UDP/ MULTICAST)	<input checked="" type="checkbox"/>
FTP	File transfer protocol	21 (TCP)	<input type="checkbox"/>
<input type="checkbox"/> To avoid potential damage to the system do not perform the function during operation. <input checked="" type="checkbox"/> The function can be executed during operation.			

Tab. 2: Functions available via the protocols used by Festo service tools

Access via the CODESYS development environment

The following table shows the functions and ports used for each function.

Function	Description	Port	Configurable
CODESYS communication	Connection from CODESYS to the controller, execution of system-critical commands (start/stop/reset/reload/delete application, reboot, configuration change, PLC Shell).	1740 ... 1743 (UDP) 11740 ... 11743 (TCP)	<input type="checkbox"/>
Gateway	Gateway, to connect CODESYS to the gateway (scan, wink).	1217 (TCP)	<input type="checkbox"/>
Web server	Web server for CODESYS web visualisation.	8080 (TCP)	<input checked="" type="checkbox"/>
Web server (HTTPS)	Web server for CODESYS web visualisation (https)	443 (TCP)	<input checked="" type="checkbox"/>
Network variables	Read and write access to the variable interface of the controller. The default port can be reconfigured.	1202 (UDP)	<input checked="" type="checkbox"/>
Modbus TCP server	Access to the variable interface of the controller with read and write services. The default port can be reconfigured.	502 (TCP)	<input checked="" type="checkbox"/>
Festo_EasyIP	Access to the variable interface of the controller with read and write services.	995 (UDP)	<input checked="" type="checkbox"/>
OPC UA server	Access to the variable interface of the controller with read and write services.	4840 (TCP)	<input checked="" type="checkbox"/>
<input type="checkbox"/> The network ports are always in use. <input checked="" type="checkbox"/> The network ports are only used if they are configured in the CODESYS application.			

Tab. 3: Functions available via the CODESYS development environment

Access with Festo Designer Studio

The following table shows the functions and ports used for each function.

Function	Description	Port	Configurable
FTP FTPS	Connection from Designer Studio to the CDPX HMIs, project download, firmware update, runtime system update.	21 (TCP) 990 (TCP)	–
HTTP HTTPS	Connection from Designer Studio to the CDPX HMIs, search function, project download, firmware update, runtime system update.	80 (TCP) 443 (TCP)	–

Function	Description	Port	Configurable
Codesys communication	Connection of CDPX HMIs via CODESYS protocol to CODESYS controllers, access to the variable interface of the controller by read and write services.	1740-1743 (UDP) 11740-11743 (TCP), 1200[UDP]	– <input checked="" type="checkbox"/>
ModBusTCP client	Access to the variable interface of the controller with read and write services. The default port can be reconfigured.	502 (TCP)	<input type="checkbox"/>
Festo_EasyIP	Access to the variable interface of the controller with read and write services.	995 (UDP)	<input type="checkbox"/>
OPC UA client	Access to the variable interface of the controller with read and write services.	4840 (TCP)	<input type="checkbox"/>

– The network ports are always in use.
 The network ports are only in use if the corresponding communication driver is selected in the Designer Studio project.
 The network ports are only used in connection with communication to a CODESYS V2.3 controller.

Tab. 4: Functions available with Festo Designer Studio

3 Product overview

3.1 Connections

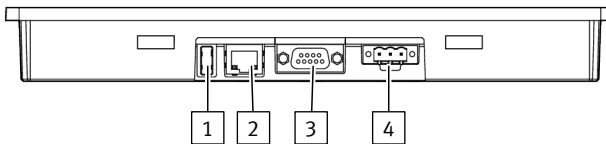


Fig. 1: CDPX-X-B-... connections

- 1 USB interface

2 Ethernet interface
- 3 Serial interface

4 Operating voltage connection

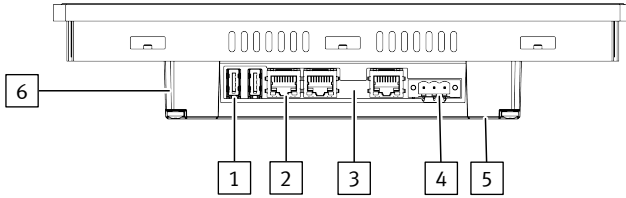


Fig. 2: CDPX-X-E1... connections

- 1** USB interface (2x)

2 Ethernet interfaces (3x)

3 Serial interface
- 4** Operating voltage connection

5 2 expansion slots for plug-in modules

6 SD card slot

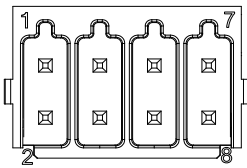
Serial interface

The serial interface is used for communication with the PLC or another type of controller. Various electrical standards are available for the signals in the PLC connector: RS-232, RS-422 and RS-485. The serial interface can be programmed via software. This requires the relevant interface to be selected in the programming software.

	Pin	RS-232	RS-422/-485
	1	GND	GND
	2	Reserved	Reserved
	3	TX	CHA
	4	RX	CHB-
	5	Reserved	Reserved
	6	+5 V output	+5 V output
	7	CTS	CHB+
	8	RTS	CHA+
	9	Reserved	Reserved

Tab. 5: CDPX-X-B serial interface with RS-232, RS-422, RS-485 electrical standard

Pins 4-3 and 8-7 must be connected externally in order to use the RS-485 plug. The connecting cable must be suitable for the type of equipment that will be connected.





	Pin	
	1	RX/CHB-
	2	TX/CHA-
	3	CTS/CHB+
	4	RTS/CHA+
	5	+5 V output
	6	GND
	7	Reserved
8	SHIELD	

Tab. 6: CDPX-X-E1 serial interface with RS-232, RS-422, RS-485 electrical standard

Pins 1-2 and 4-3 must be connected externally in order to use the RS-485 plug.

Ethernet interface

The Ethernet interface has two status indicators.

CDPX-X	B	E1
LED	Meaning	
 Green On	No activity	
 Green Flashing	Activity	
 Yellow On	Valid 100 Mbps connection found.	Valid connection found: – Over ETH0: 1000 Mbps – Over ETH1/2: 100 Mbps
 Yellow Off	Valid 10 Mbps connection found.	Valid connection found. – Over ETH0: 10/100 Mbps – Over ETH1/2: 10 Mbps

Tab. 7: LED table

3.2 Function

The product CDPX-X... is intended for use with the Designer Studio software.

- Compatible with Designer Studio version 4.5 or higher.
- Full support for vector graphics and native support for SVG graphic objects, transparency and alpha blending.
- Dynamic Objects: control of visibility and transparency, move, resize, rotate any object. Changing the properties of simple and complex objects.

Mounting

- Creating and managing multilingual applications. The additional software included in the Designer Studio enables translations by third-party companies.
- Data can be presented numerically, as text, as a bar graph, with analogue instruments or graphics.
- Data collection, alarm management, scheduler and timed actions, recipes, user management, RSS feed, rotating menu.
- Support for various communication drivers.
- Multiple communication drivers at the same time.
- Remote monitoring and remote maintenance with client-server functionality.
- Online and offline simulation in Designer Studio.
- Integrated script debugger.
- Existing collection of vector graphics, symbols and objects.

4 Mounting

The CDPX operator units are intended for front mounting.

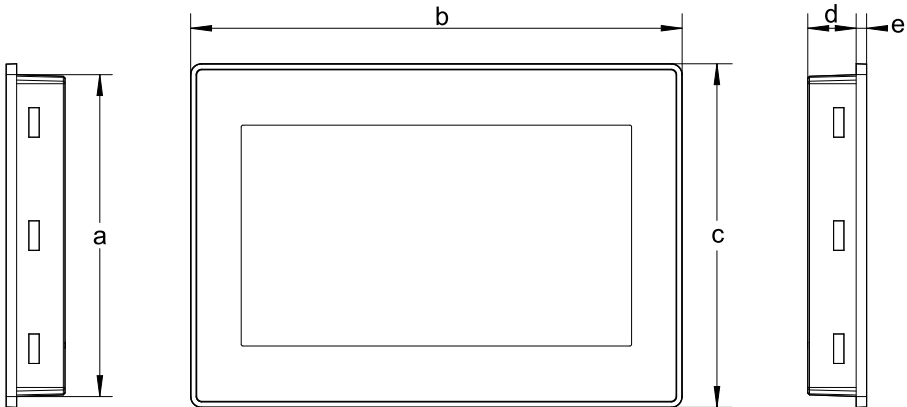


Fig. 3: CDPX-X-B-... dimensions

Dimensions		a	b	c	d	e
CDPX-X-B-4	[mm]	96	147	107	29	5
CDPX-X-B-7	[mm]	136	187	147	29	5
CDPX-X-B-10	[mm]	186	282	197	29	6

Tab. 8: CDPX-X-B-... dimensions

Mounting

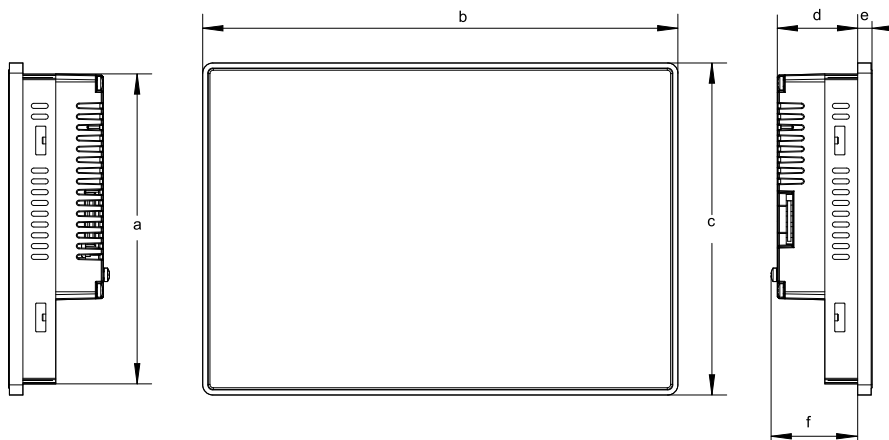


Fig. 4: CDPX-X-E1-... dimensions

Dimensions		a	b	c	d	e	f
CDPX-E1-W-7	[mm]	136	187	147	47	8	51
CDPX-E1-W-10	[mm]	186	282	197	56	8	60
CDPX-E1-W-15	[mm]	256	422	267	56	8	60

Tab. 9: CDPX-X-E1-... dimensions

The correct installation procedure must be followed in order to maintain the protection class of the front plate of the front panel:

- The edges of the cutout must be flat.
- The tightening torque for the retaining screws or nuts is 2 Nm.
- The cutout for the panel must have the following dimensions:

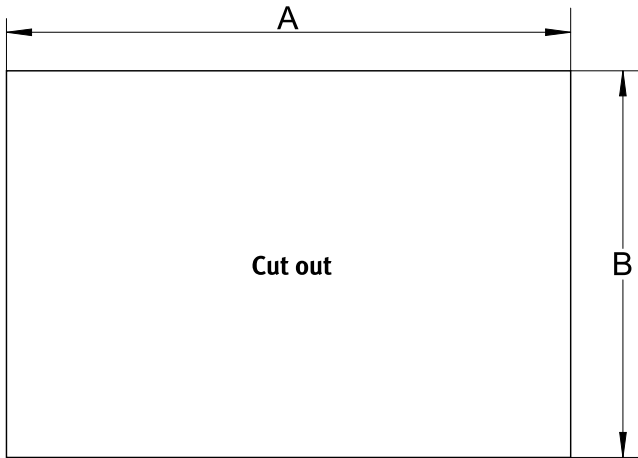


Fig. 5: Dimensions of the cutout for CDPX-X-...

Dimensions		A	B
CDPX-X-B-4	[mm]	136	96
CDPX-X-B-7	[mm]	179	136
CDPX-X-B-10	[mm]	271	186

Tab. 10: Dimensions of cutout for CDPX-X-B-...

Dimensions		A	B
CDPX-E1-W-7	[mm]	176	136
CDPX-E1-W-10	[mm]	271	186
CDPX-E1-W-15	[mm]	411	256

Tab. 11: Dimensions of cutout for CDPX-X-E1-...

- Maximum permitted deviation from the surface flatness of the cutout: ≤ 0.5 mm.
- Thickness of the frame in which the equipment is mounted: 1.5 ... 6 mm.
- Maximum roughness of the surface on which the seal is applied: ≤ 120 μm .

5 Earthing

The unit is earthed by the retaining screws or the earth plug on the housing. The earthing conductor must have a cross section of at least 1.5 mm^2 . Pin 3 of the voltage terminal must also be earthed. The 24 V plug is in the scope of delivery of the CDPX.

System settings

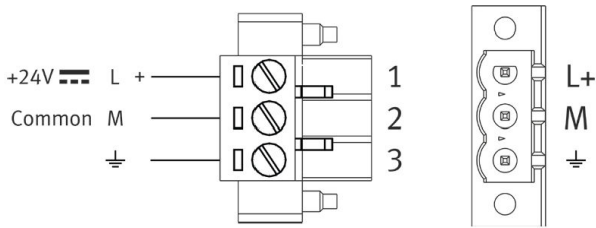


Fig. 6: 24V DC voltage terminal

Only fixed power supplies that ensure reliable electrical insulation of the operating voltage in accordance with IEC/DIN EN 60204-1 are permitted. The general requirements of IEC/DIN EN 60204-1 for PELV circuits must also be observed.

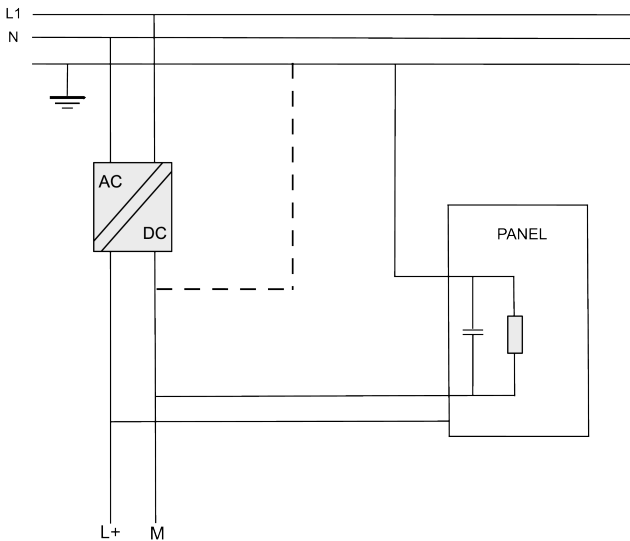


Fig. 7: CDPX-X circuit diagram, earthed power supply circuit



The power supply circuit can be floating or earthed. If the floating power system is used, note that the HMI device internally connects the common earth of the power source to a 1M Ω resistor in parallel with a 4.7nF capacitor. The power supply must have double or reinforced insulation.

6 System settings

The CDPX operator units have the 'System settings' tool (system settings), which can be used to make basic, preliminary settings on the unit.

System settings

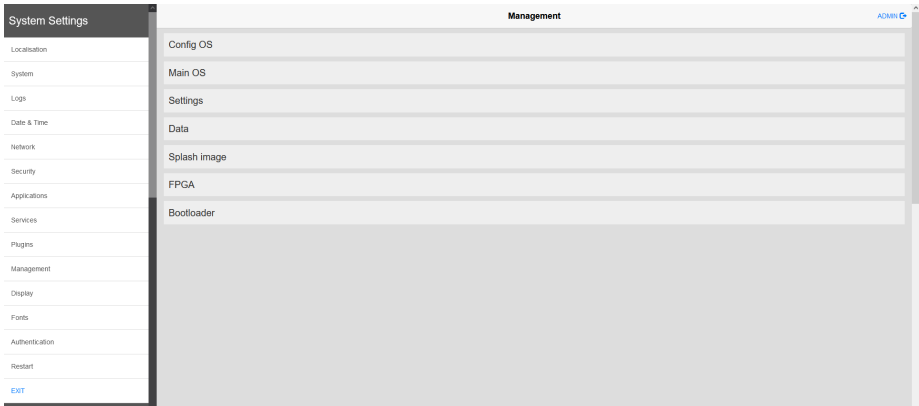


Fig. 8: System settings

There are two operating modes for the system settings: User Mode (user mode) and System Mode (system mode).

User Mode

The system settings in User Mode are activated from the context menu. The context menu is accessed by touching an unoccupied area of the touchscreen for a few seconds. The default time is two seconds. However, this is a runtime parameter that can be changed.

The User Mode offers access to the basic settings of the operator unit:

Settings	Description
Calibrate Touch	Calibration of the touchscreen user interface.
Network	Change to integrated network card options.
Time	Change of the real-time clock including time zone and daylight-saving and standard time.
Display settings	Setting the brightness and automatic switch-off of the backlight.
BSP settings	BSP version check.
Plugin list	Check for optional plug-in modules.

Tab. 12

System Mode

The system settings in System Mode can be activated using what is referred to as the emergency system access. When the system boots up, quickly tap the centre of the touchscreen multiple times with a finger. The emergency procedure can only be accessed during boot-up.

The System Mode includes the full System Settings user interface with all the available options. In addition to the “User Mode” options, the following important options are available:

Settings	Description
Format Flash	Formatting the internal flash disk. All data will be deleted.
Resize Image Area	Changing the size of the flash area.
Download Configuration OS	Checking the version of the backup operating system and updating the operating system.
Download Main OS	Checking the version of the main operating system and updating the operating system.
Download Splash Image	Changing the splash screen image.
Download Bootloader	Checking and updating the system bootloader.

Tab. 13

7 Commissioning

CDPX operator units must be programmed with the Designer Studio programming package.

To program a CDPX HMI, the operator unit must be connected to a personal computer running the Designer Studio software package. The operator unit must be in configuration mode for this process.

CDPX operator units are programmed via the Ethernet interface.

The Designer Studio software is a WINDOWS application and must be correctly installed. The WINDOWS environment is not included in the Designer Studio software package but must be previously installed on the PC.

A Designer Studio project can be transferred with the PC Ethernet interface or a USB device. The firewall must be configured for transfer over the Ethernet interface to allow Designer Studio to access the network.

If a USB device is used for the transfer, an update package must be created with Designer Studio.



The version of Designer Studio must be compatible with the runtime version of Designer Studio that is installed on the operator unit that is to be programmed. If necessary, further information regarding compatibility of the firmware and the programming software can be obtained from the customer support.

8 Calibrating touchscreen

- Tap the touchscreen at high frequency immediately after power is switched on.
 - ↳ The touchscreen displays “Tap detected.”
- Wait for the touchscreen to display “Open system settings.”
- Press and hold the touchscreen to select “Touchscreen calibration”.

9 Technical data

CDPX-X		-B	-E1
Certificates, declaration of conformity		→ www.festo.com/sp	
Operating voltage range	[V DC]	10 ... 32	
Backup battery	[mAh]	50	–
	[V]	3	–
Operating temperature	[°C]	0 ... 50	–20 ... 60
Storage temperature	[°C]	–20 ... 70	–20 ... 70
Relative humidity		5 ... 85 %, non-condensing	
Protection class in accordance with EN 60529		IP66 front panel IP20 back panel	
Electromagnetic compatibility			
Immunity to interference		→ www.festo.com/sp	

Tab. 14: Technical data

Copyright:
Festo SE & Co. KG
Ruiter Straße 82
73734 Esslingen
Germany

Phone:
+49 711 347-0

Internet:
www.festo.com