Original User Manual

Series Touch Industrial PLC

Christ Electronic Systems GmbH

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03/2025

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Instruction Manual: Touch Industrial PLC

1 Identification

Target group

This document is not intended for end customers! Necessary safety instructions for the end customer must be passed on by the machine builder or system provider and adopted in the respective national language.

Intended use

The devices described in this documentation are intended to enable the user to control, operate, observe, drive and visualise certain processes in industry or industrial contexts / environments. The devices must be used within the conditions and limits described in this documentation.

Improper use

The devices have not been designed and manufactured for use in applications where serious danger to life and health may occur. The equipment must not be used for the following purposes:

- Control of nuclear reactions in nuclear power plants
- Control systems of weapons
- Automatic control of aircraft air traffic control and mass transport systems
- Medical equipment for life support

Technical changes

Christ Electronic Systems GmbH reserves the right to change the information, designs and technical data contained in this documentation without prior notice.

History

The following editions of the manual have already been published:

Version	Comment
12/2024 Rev. 00	First edition
01/2025 Rev. 01	Chapter 4.2 Status LED: green flashing signal removed Chapter 4.3 Reset button: green flashing signal removed Chapter 4.7 Power Fail Sequence (FRAM): Text revision

03/2025 Rev. 02	Entire document: Terminology and wording adapted Chapter 4.4.1 bis 4.4.4 Applications Config Button inserted Chapter 7.1 Torque: Torque specified for M2 Chapter 7.4 Earth Connection: detailed description Chapter 9 Accessories and spare parts: inserted Chapter 11 Maintenance: Safety note damage caused by oil added Chapter 11.2 Maintenance: inserted Chapter 12.3 Power Consumption: inserted Chapter 12.5 Environmental Conditions: inserted Chapter 13.2 RoHS: Addition inserted

Table 1: History

Design of safety instructions

The general structure of the safety instructions is shown below:

NOTICE	
	**Type of hazard and source of hazard** Consequences in the event of non-compliance with the guideline ➢ Measures to avoid hazards

The meaning of the colours of the safety instructions is shown below:

⚠ DANGER	
	**Indicates an imminent danger** Failure to follow the instructions may result in death or serious injury.

⚠ WARNING	
	**Indicates a dangerous situation** Failure to follow the instructions may result in serious injury.

⚠ CAUTION	
	**Indicates a possible dangerous situation** Failure to follow the instruction may result in injury.

NOTICE	
	**Indicates user tips and useful information** Important information to avoid malfunctions.

2 Product description

The PLC touch panels from Christ Electronic Systems combine innovative technology with high efficiency and offer customized solutions for industrial control applications. Thanks to integrated CODESYS software, the panel combines HMI and soft PLC functionality. This eliminates the need for a separate control unit in the control cabinet and not only reduces space requirements, but also costs and installation effort. The combination of a very powerful i.MX8 processor for an industrial controller, a robust design and sophisticated interfaces ensures optimum adaptation to a wide range of industrial requirements.

The intuitive WebConfig interface enables simple and user-friendly configuration of the panels. This means that adjustments, such as network configuration or display settings, can be made quickly and efficiently without any programming effort. This allows seamless integration into existing automation systems. The panels also have an NVRAM, which ensures reliable protection of remanent control data in the event of power failures. This ensures continuous operation even under demanding conditions.

Another highlight of the PLC touch panels is their versatility in use: the devices are suitable for different HMI applications and offer scalable performance from simple to complex control tasks. High-quality materials and careful production in Germany underline the durability and reliability of this solution.

Whether in production, mechanical engineering or other industrial applications - the PLC touch panels from Christ Electronic Systems are the ideal choice for companies that rely on modern automation and are looking for a flexible and future-proof control and visualization solution. Thanks to the use of CODESYS, the system offers an open platform that can be adapted to individual requirements and enables continuous further development.

2.1 System Overview

i.MX 8M Plus

CPU	NXP® i.MX 8M Plus QuadCore
Graphic	3D: Vivante™ GC7000UL / 2D: Vivante™ GC520L
Interfaces	2 x USB 3.0 Port (Type A) 2 x 1 Gbit Ethernet (RJ45) 1 x RS-232 / RS-485 / CAN (setting at Christ) (Sub-D), galvanic isolated 1 x Status LED (RGB-LED) 1 x Run/Stop LED (Bicolor-LED)

Table 2: System overview i.MX 8M Plus

2.2 Housing Variant VESA

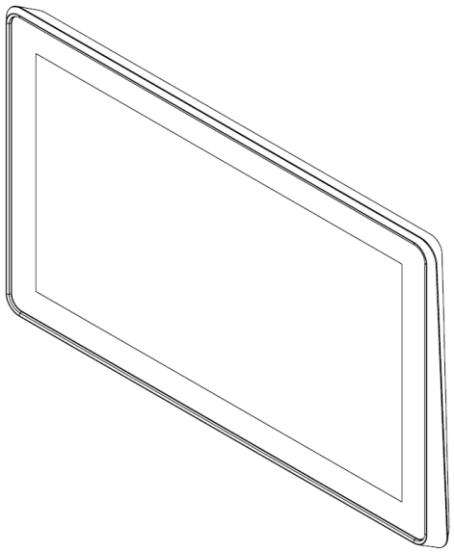


Illustration 1: VESA Front

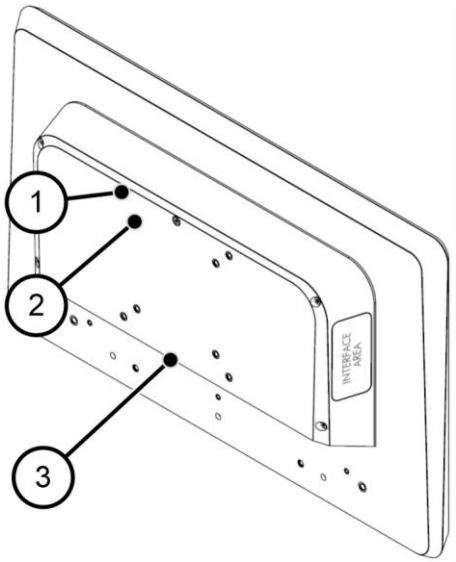


Illustration 2: VESA Rear

1	VESA MIS-D, 100
2	VESA MIS-D, 75
3	Interface Area

Table 3: VESA Front and VESA Rear

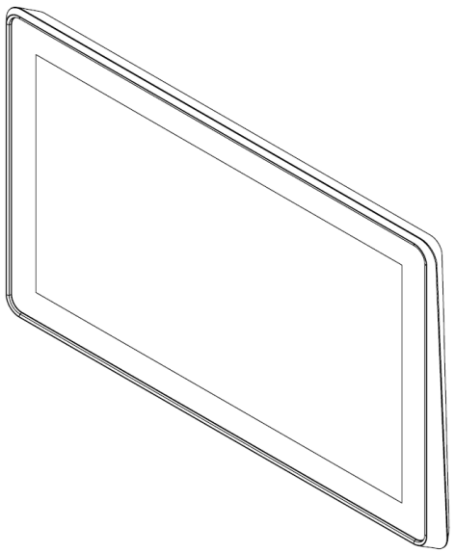


Illustration 3: VESA IP65 Front

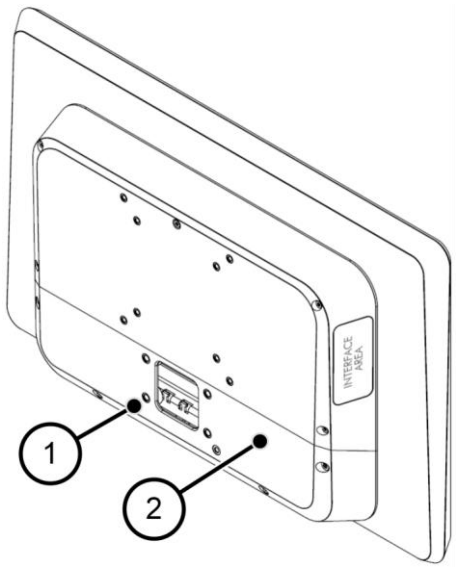


Illustration 4: VESA IP65 Rear

1	VESA MIS-D, 75
2	Interface Cover

Table 4: VESA IP65 Front and VESA IP65 Rear

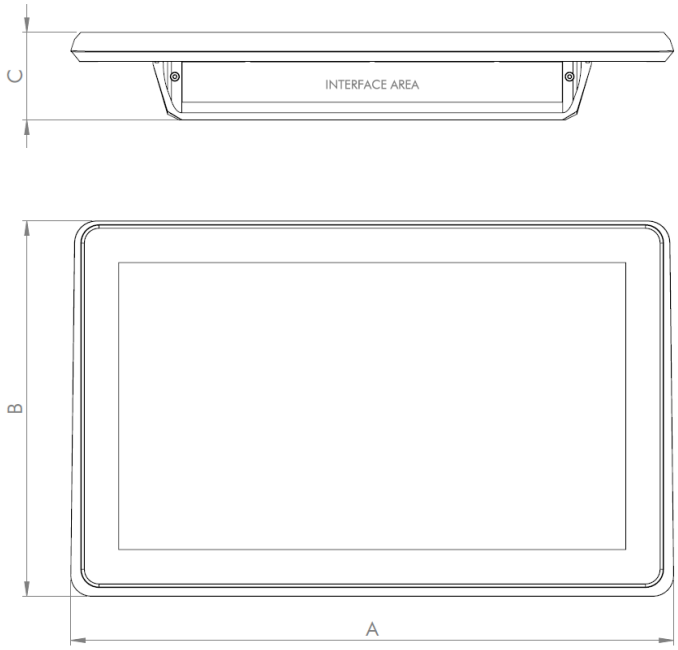


Illustration 5: Dimensions VESA

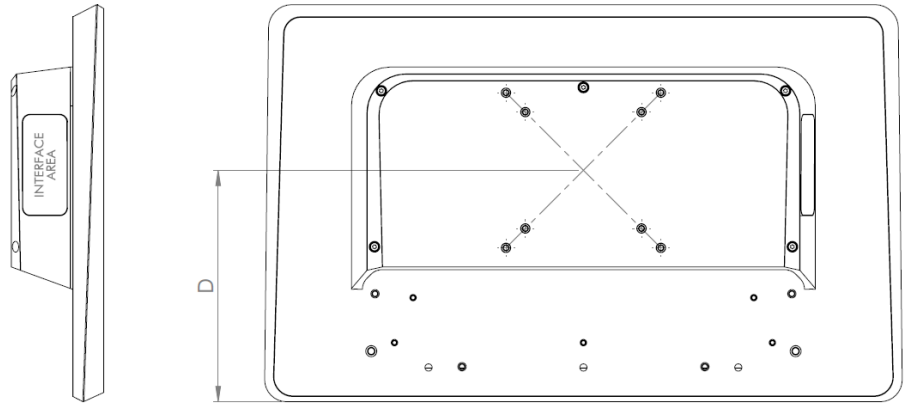


Illustration 6: Dimensions VESA Rear

Dimensions are given in millimeters.

Size	A	B	C	D
7"	211	144	55	75
10.1"	276	190	58	105
10.4"	274	215	58	130
12.1"	325	222	58	137
13.3"	357	224	58	148
15"	369	288	58	149
15.6"	412	256	58	149
18.5"	477	293	61	149
21.5"	548	334	61	149
24"	604	367	61	149

Table 5: Dimensions VESA

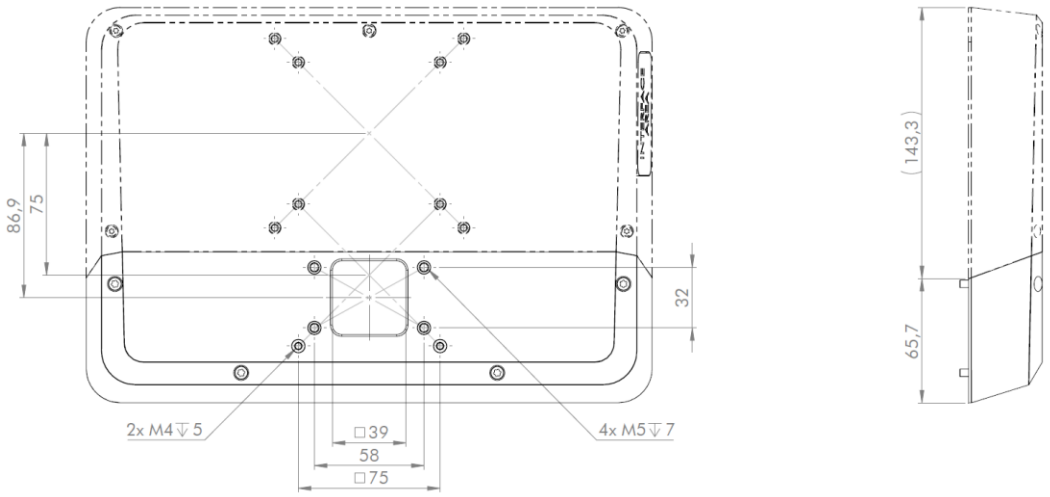


Illustration 7: VESA IP65 Cover

The cover for IP65 protection is available for sizes 13.3 to 24.

2.3 Housing Variant VESA Automation

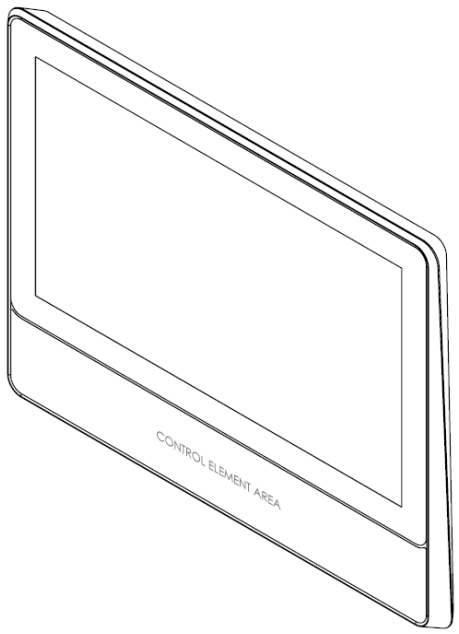


Illustration 8: VESA Automation Front

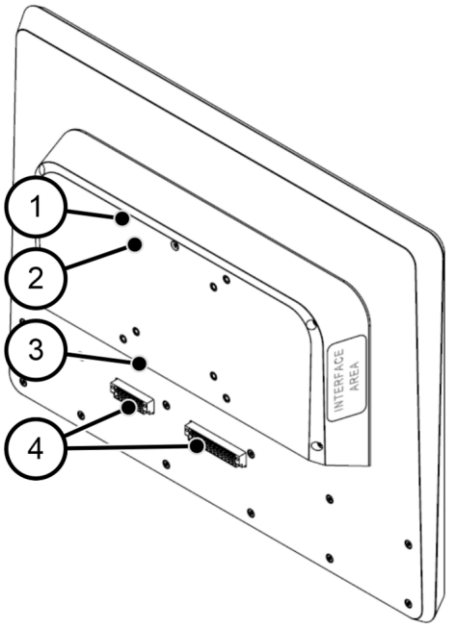


Illustration 9: VESA Automation Rear

1	VESA MIS-D, 100
2	VESA MIS-D, 75
3	Interface Area
4	Extension Connector

Table 6: VESA Automation Front and VESA Automation Rear

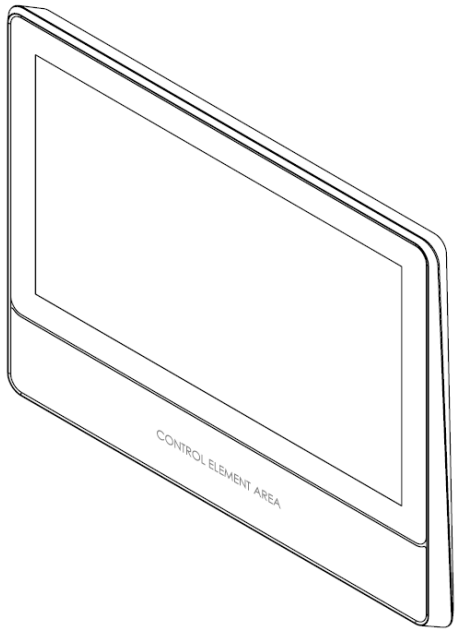


Illustration 10: VESA Automation IP65 Front

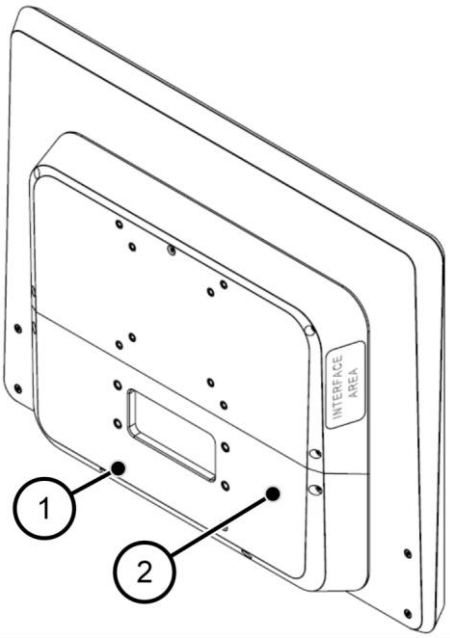
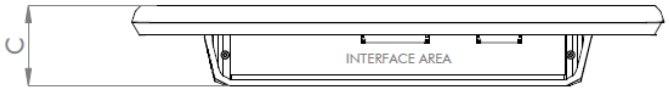


Illustration 11: VESA Automation IP65 Rear

1	VESA MIS-D, 100
2	Interface Cover

Table 7: VESA Automation IP65 Front and VESA Automation IP65 Rear



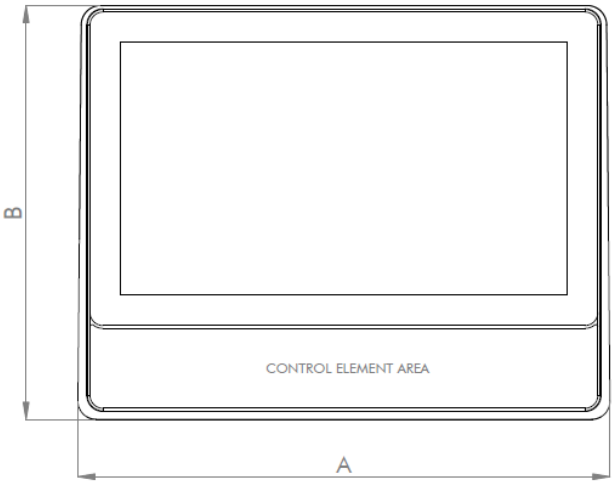


Illustration 12: Dimensions VESA Automation

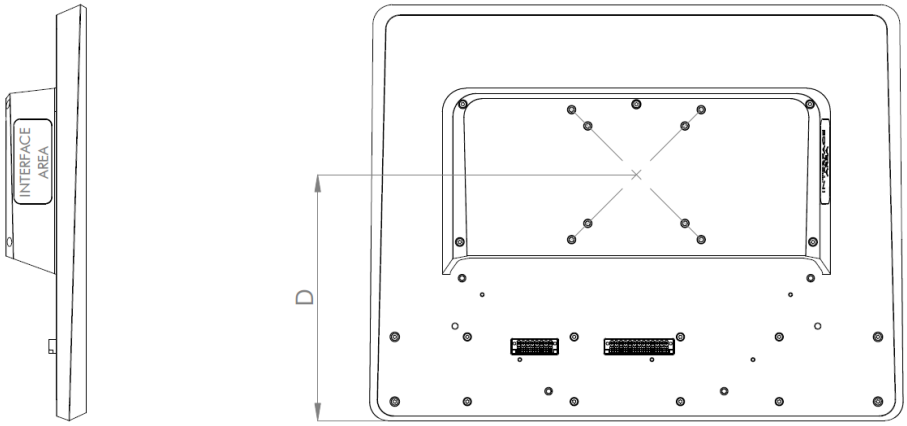


Illustration 13: Dimensions VESA Automation Rear

Dimensions are given in millimeters.

Size	A	B	C	D
13.3"	357	288	62	189
15.6"	412	320	62	189
18.5"	477	357	62	189
21.5"	548	398	62	189
24"	604	431	62	189

Table 8: Dimensions VESA Automation

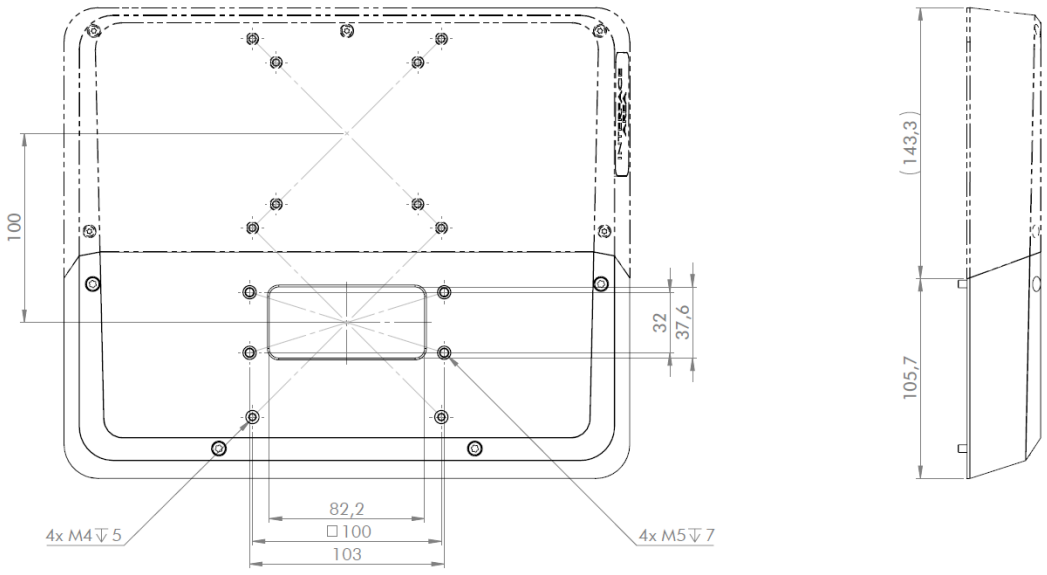


Illustration 14: VESA Automation IP65 Cover

The cover for IP65 protection is available for sizes 13.3 to 24.

We offer the following components for installation on the front of the unit. Pushbuttons, selector switch, key lock switch and emergency stop are purchased from the manufacturer Georg Schlegel GmbH & Co. KG.

Pushbuttons

Series	SHORTRON® base-plate mounting
Degree of protection	IP65
Travel	2.3 mm
Illumination	Yes, white LED
Labeling Option	Yes[1]
Front Bezel	Silver-Coloured
Operating Temperature	-25 °C ... 70 °C
Contact Elements	max. 2 x NC / 2 x NO / 1 x NC + 1 x NO
Nameplate	Transparent: Blue, Yellow, Green, Transparent, Red, White Non-transparent: Black

Key Lock Switch

Series	SHORTRON® base-plate mounting
Degree of protection	IP65
Switchin function	Latching
Illumination	No
Labeling Option	No
Front Bezel	Silver-Coloured
Operating Temperature	-25 °C ... 70 °C
Contact Elements	max. 2 x NC / 2 x NO / 1 x NC + 1 x NO

[1] Possible designation plates are provided by your contact person

Selector Switch

Series	SHORTRON® base-plate mounting
Degree of protection	IP65
Switching function	Latching / non latching
Illumination	Yes, white LED
Labeling Option	No
Front Bezel	Silver-Coloured
Operating temperature	-25 °C ... 70 °C
Contact Elements	max. 2 x NC / 2 x NO / 1 x NC + 1 x NO

Emergency Stop

Series	SHORTRON®
Type	FRVKOOIP
Degree of protection	IP65
Illumination	No
Labelling Option	No
Front Bezel	Yellow
Operating Temperature	-25°C ... 70°C
Contact Elements	2 x NC + 1 x NO
Switching Position Indicator	Yes
Release	Twist right or left
Anti-lock Collar	Yes

USB

Degree of protection	IP65
USB	USB 2.0
Illumination	No
Labelling Option	No
Front Bezel	Black
Operating Temperature	-25°C ... 80°C

Manufacturer	ELATEC GmbH
Type	TWN4 MULTITECH NANO M
Degree of protection	IP65
Frequencies	125 kHz / 13.56 MHz
Operating temperature	-25°C ... 80°C
Transponder	**125 KHz:** AWID, Cardax[1], CASI-RUSCO, Deister[1], EM4100, 4102, 4200[2], EM4050, 4150, 4450, 4550, EM4305[3], FDX-B[4], EM4105[4], UltraProx[4], HITAG 1[5], HITAG 2[5], HITAG S[5], ICT[6], IDTECK, Isonas, Keri, Miro, Nedap[1], PAC[6], Pyramid, Q5, T5557, T5567, T5577, TIRIS/HDX[4], TITAN (EM4050), UNIQUE, ZODIAC **13.56 MHz / ISO14443A:** LEGIC Advant[7], MIFARE Classic EV1[8], MIFARE Classic, MIFARE Mini, MIFARE DESFire EV1, MIFARE DESFire EV2[9], MIFARE DESFire Light[6], MIFARE Plus S, X, MIFARE Pro X[10], MIFARE Smart MX[10], MIFARE Ultralight, MIFARE Ultralight C, MIFARE Ultralight EV1[8], NTAG2xx, SLE44R35[10], SLE66Rxx (my-d move)[10], Topaz **13.56 MHz / ISO18092 ECMA-340:** NFC Forum Tag 1-5, NFC Peer-to-Peer, Sony FeliCa[11], NFC Active and passive communication mode **13.56 MHz / ISO14443B:** Calypso[10], Calypso Innovatron protocol[10], CEPAS[10], HID iCLASS[7], Moneo[10], Pico Pass[12], SRI4K, SRIX4K, SRI512, SRT512 **13.56 MHz / ISO15693:** EM4x33[10], EM4x35[10], HID iCLASS[7], HID iCLASS SE/SR[7], ICODE SLI, LEGIC Advant[7], M24LR16/64, MB89R118/119, SRF55Vxx (my-d vicinity)[10], Tag-it, PicoPass[12]
Manufacturer	ELATEC GmbH
Type	TWN4 MULTITECH NANO LEGIC 42 M

[1] hash value only
[2] only emulation of 4100, 4102
[3] from FW V4.05
[4] 134.2 kHz only
[5] without encryption
[6] on request
[7] UID only
[8] read/write enhanced security features on request
[9] EV2/EV3 supported as part of the EV1 downward compatibility
[10] read/write in direct chip command mode
[11] UID + read/write public area
[12] UID only, read/write on request

Degree of protection	IP65
Frequencies	125 kHz / 13.56 MHz
Operating tempera-ture	-25°C ... 80°C
Tran-sponder	**125 KHz:** AWID, Cardax[1], CASI-RUSCO, Deister[1], EM4100, EM4102, EM4200[2], EM4050, EM4150, EM4450, EM4550, EM4305, HITAG 1[3], HITAG 2[3], HITAG S[3], ICT[4], IDTECK, ISONAS, Keri, Miro, Nedap[1], Pyramid, Q5, T5557, T5567, T5577, TITAN (EM4050), UNIQUE, ZODIAC **13,56 MHz / ISO14443A:** LEGIC Advant, MIFARE Classic EV1[5], MIFARE Clas-sic, MIFARE Mini, MIFARE DESFire EV1, MIFARE DESFire EV2[6], MIFARE DES-Fire EV3[6], MIFARE DESFire Light[4], MIFARE Plus S/X, MIFARE Smart MX[7], MIFARE Ultralight, MIFARE Ultralight C, MIFARE Ultralight EV1[5], NTAG2xx, SLE44R35[7], SLE66Rxx (my-d move)[7], HID iCLASS DESFire[8], HID iCLASS MIFARE Classic[8], HID iCLASS SEOS[8] **13,56 MHz / ISO18092 ECMA-340:** NFC Forum Tag 1-5[9], Sony FeliCa[10] **13,56 MHz / ISO14443B:** Calypso[7], CEPAS[7], HID iCLASS[8], Pico Pass[8] **13,56 MHz / ISO15693:** EM4x33[7], EM4x35[7], HID iCLASS[8], HID iCLASS SE/SR/Elite[8], ICODE SLI, LEGIC Advant, M24LR16/64, SRF55Vxx (my-d vicin-ity)[7], Tag-it, PicoPass[8] **LEGIC Prime:** LEGIC Prime

[1] nur Hashwert

[2] nur Emulation von 4100, 4102

[3] ohne Verschlüsselung

[4] auf Anfrage

[5] lesen/schreiben erweiterte Sicherheitsmerkmale auf Anfrage

[6] als Teil der EV1-Abwärtskompatibilität unterstützt

[7] lesen/schreiben im direkten Chip-Befehlsmodus

[8] nur UID

[9] NFC Forum Tag 1 nicht unterstützt

[10] UID + lesen/schreiben öffentlicher Bereich

2.4 Housing variant Front Panel

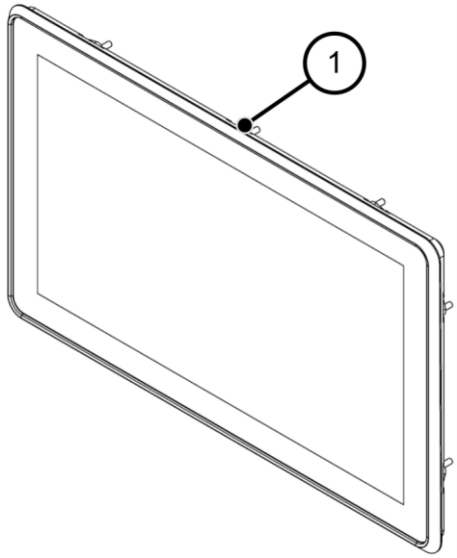


Illustration 15: Front Panel Front

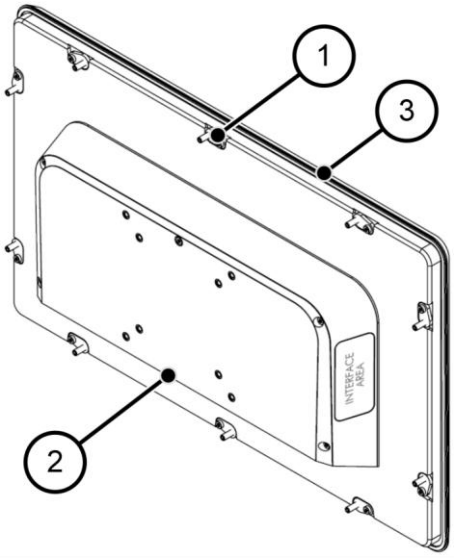
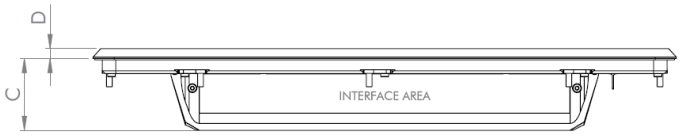


Illustration 16: Front Panel Rear

1	Fastening Clamp
2	Interface Area
3	Seal

Table 9: Front Panel Front und Front Panel Rear



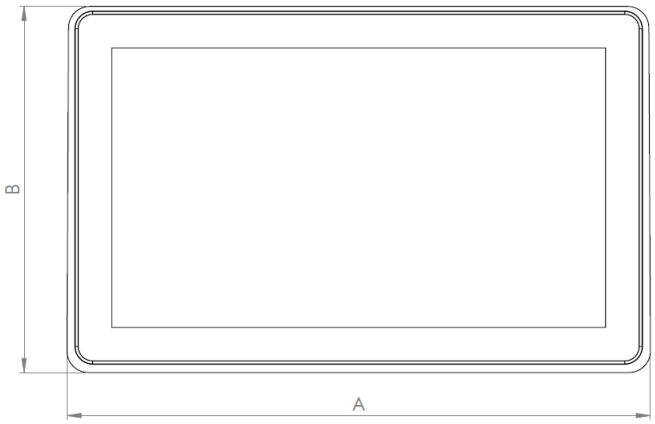


Illustration 17: Dimensions Front Panel

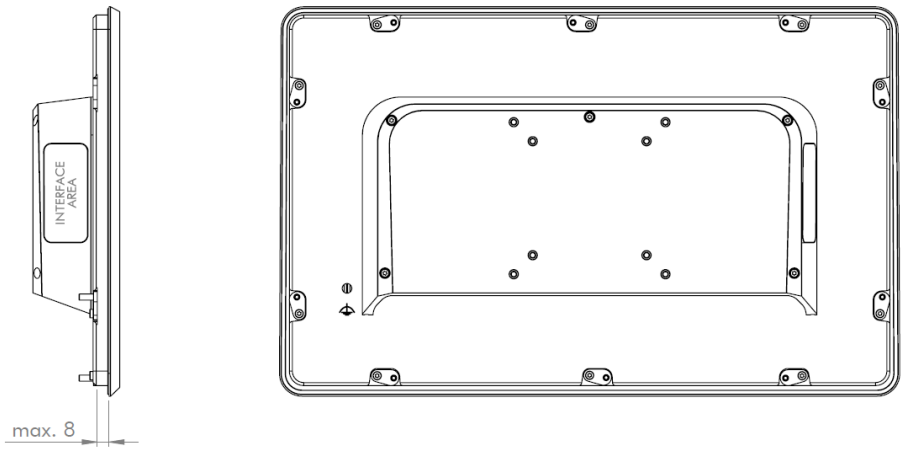


Illustration 18: Dimensions Front Panel Rear

The drawing of the Front Panel is exemplary and may show deviations to the device. The detailed technical drawing can be found in the specific data sheet.

Dimensions are given in millimeters.

Size	A	B	C	D
7"	208	145	47	7
10.1"	273	190	50	7
10.4"	274	217	50	7
12.1"	322	222	52	7
13.3"	354	224	50	7
15"	366	288	52	7
15.6"	409	256	52	7
18.5"	474	293	52	7
21.5"	545	334	52	7
24"	601	367	54	7

Table 10: Dimensions Front Panel

NOTICE

Mounting the device in a non-flat cutout

Malfunctions occur and the appliance may be damaged or destroyed. The appliance does not seal properly with the mounting plate and water may enter.

➢ Once the cutout has been produced, care must be taken to ensure that the material does not warp. If the material is deformed, it must be straightened again. The material must not be straightened by mounting the device.

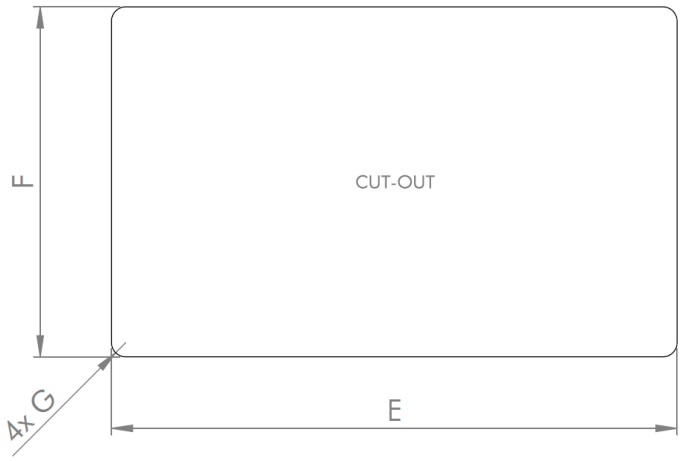


Illustration 19: Dimensions Front Panel Cutout

Dimensions are given in millimeters.

Size	E	F	G
7"	196	134	R 10
10.1"	262	179	R 10
10.4"	262	206	R 10
12.1"	310	211	R 10
13.3"	343	213	R 10
15"	355	277	R 10
15.6"	397	245	R 10
18.5"	463	283	R 10
21.5"	533	323	R 10
24"	590	356	R 10

Table 11: Dimensions Front Panel Cutout

2.5 Housing Variant Open Frame

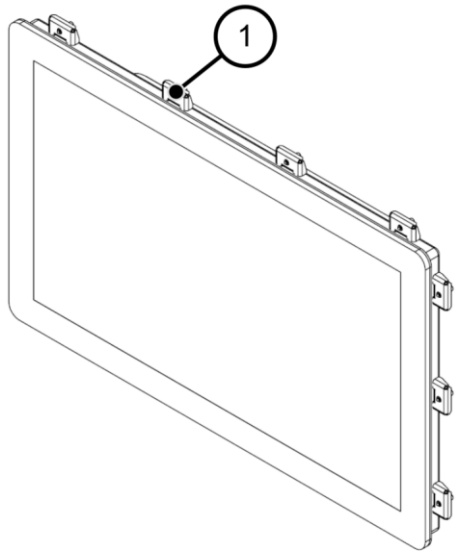


Illustration 20: Open Frame Front

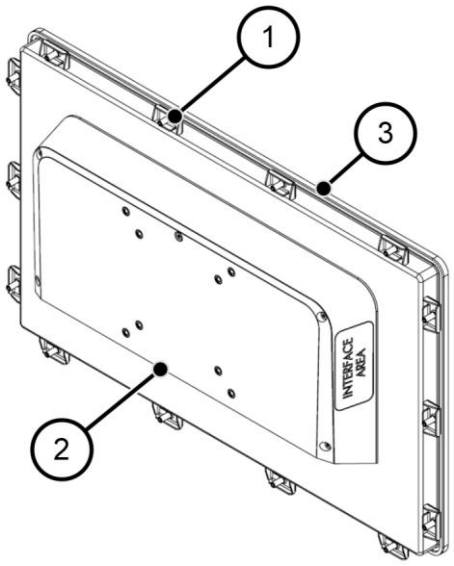


Illustration 21: Open Frame Rear

1	Fastening Clamp
2	Interface Area
3	Seal

Table 12: Open Frame Front und Open Frame Rear

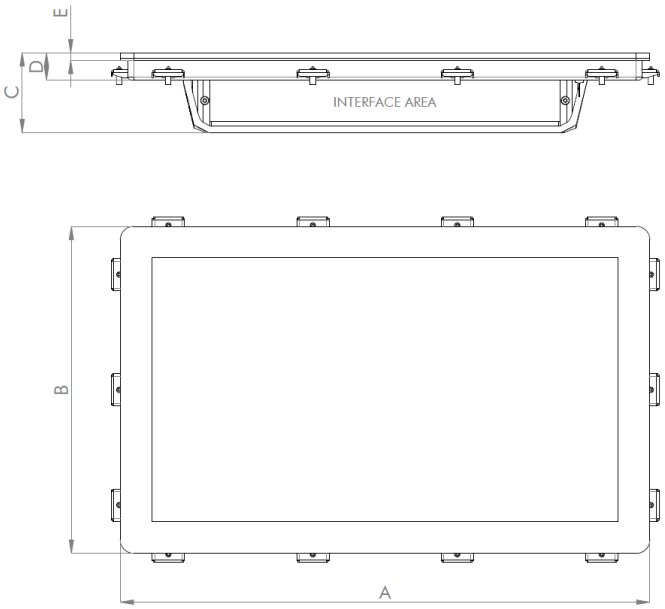


Illustration 22: Dimensions Open Frame

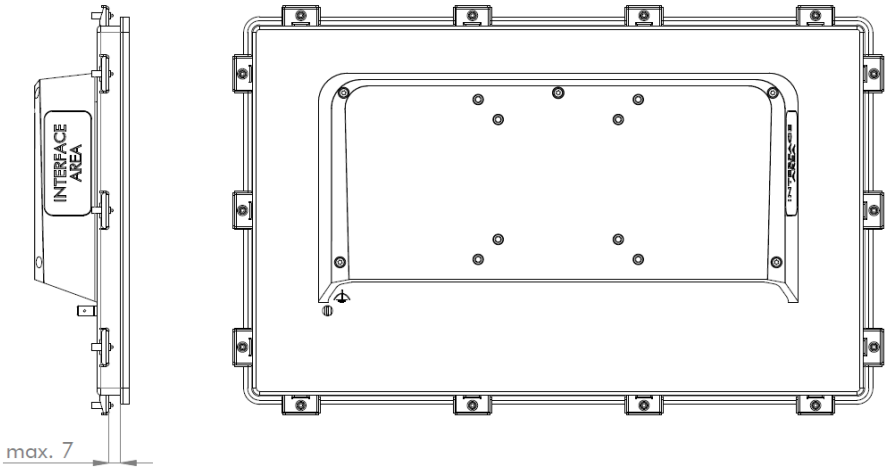


Illustration 23: Dimensions Open Frame Rear

The drawing of the Open Frame is exemplary and may show deviations to the device. The detailed technical drawing can be found in the specific data sheet.

Dimensions are given in millimeters.

Size	A	B	C	D	E
7"	192.2 ± 0.2	131.2 ± 0.2	56	20	5.7
10.1"	257.6 ± 0.2	176.2 ± 0.2	59	20	5.7
10.4"	254.8 ± 0.2	202 ± 0.2	59	20	5.7
12.1"	305.9 ± 0.2	208 ± 0.2	59	20	5.7
13.3"	338.7 ± 0.2	210.3 ± 0.2	59	20	5.7
15"	350.3 ± 0.2	274.3 ± 0.2	59	20	5.7
15.6"	393 ± 0.3	242.4 ± 0.3	59	20	5.7
18.5"	458.6 ± 0.3	279.6 ± 0.3	59	20	5.7

Table 13: Dimensions Open Frame

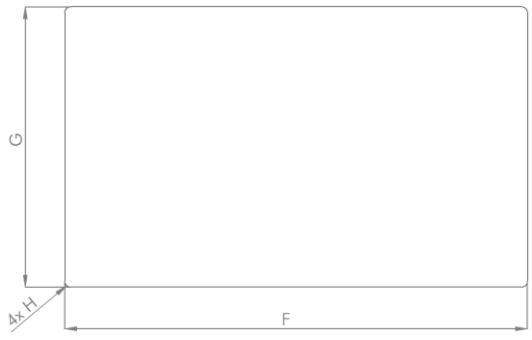


Illustration 24: Dimensions Open Frame Cutout Counterplate

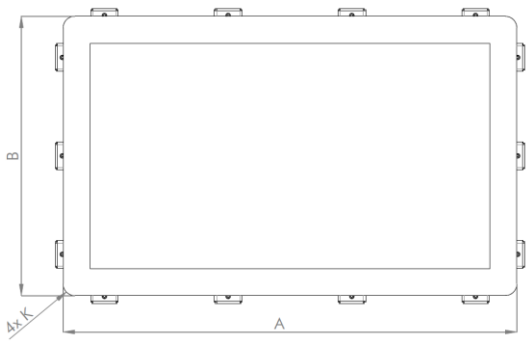


Illustration 25: Dimensions Open Frame Cutout Front- and Spacerplate

Dimensions are given in millimeters.

Size	F	G	H	K
7"	182	121	R5	R10 ± 0.2
10.1"	248	166	R5	R10 ± 0.2
10.4"	245	192	R5	R10 ± 0.2
12.1"	296	198	R5	R10 ± 0.2
13.3"	329	200	R5	R10 ± 0.2
15"	340	264	R5	R10 ± 0.2
15.6"	383	232	R5	R10 ± 0.2
18.5"	449	270	R5	R10 ± 0.2

Table 14: Dimensions Open Frame Cutout

Installation Open Frame

The actual cut-out-dimensions of the front- and spacerplate need to be subjected to the prevalant assembly situation (production tolerances, ambient temperature, etc.) and therefore to be defined by the customer.

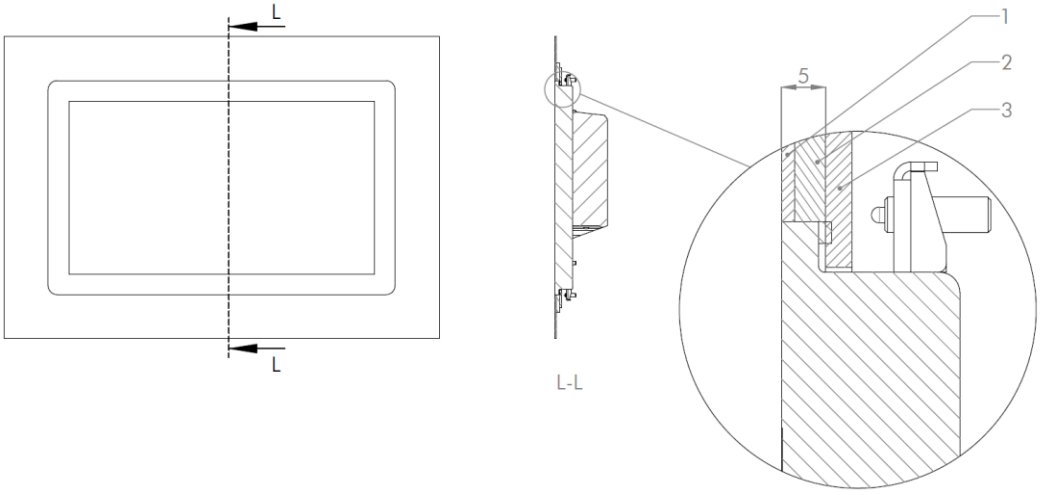


Illustration 26: Installation Open Frame Cutout

1	Frontplate
2	Spacerplate
3	Counterplate

3 Description Hardware

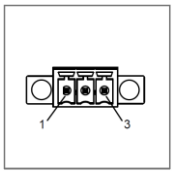
The description of the hardware refers to the device interfaces and the possible extensions for the device.

3.1 External Interfaces

NOTICE	
	External cable for Power Supply Malfunction occur ➢ Prepare a proper earth connection on the power supply

NOTICE	
	Signal and data cables Malfunction occur ➢ Signal and data cables must be shielded and of high quality.

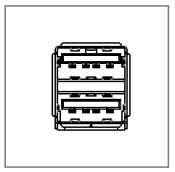
Supply Connector screwable



Mating Connector	Phoenix Connector MC 1,5 / 3-STF-3.5 (screwable)	
PIN	**Function**	**Description**
1	GND	Ground
2	FE	Functional Earth
3	+24 VDC	Supply

Table 15: Pinout Supply Connector screwable

USB Host 3.0 (Type A)

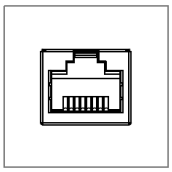


PIN	Function	Description
1	VBUS	USB VCC
2	D-	USB Data-
3	D+	USB Data+
4	GND	USB Ground
5	StdA_SSRX-	SuperSpeed transmitter differential pair
6	StdA_SSRX+	SuperSpeed transmitter differential pair
7	GND_DRAIN	Ground for signal return
8	StdA_SSTX-	SuperSpeed receiver differential pair
9	StdA_SSTX+	SuperSpeed receiver differential pair

Table 16: Pinout USB 3.0

Ethernet Gigabit

CAT6 S/FTP cables must be used.



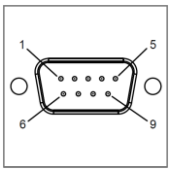
PIN	Function	Description
1	D1+	Transmit Data +
2	D1-	Transmit Data -
3	D2+	Receive Data+
4	D3+	Bidirectional +
5	D3-	Bidirectional -
6	D2-	Receive Data -
7	D4+	Bidirectional +
8	D4-	Bidirectional -

Table 17: Pinout Ethernet Gigabit

RS-232

The RS-232 interface is electrically isolated from the power supply and all other interfaces with a dielectric strength of 0.5 kV.

Sufficiently shielded cables with a conductor cross-section of 0.34 mm² must be used.



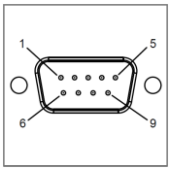
PIN	Function	Description
1	--	--
2	RS-232 RX	RS-232 Receive Signal
3	RS-232 TX	RS-232 Transmit Signal
4	--	--
5	RS-232_GND	RS-232 Ground
6	--	--
7	--	--
8	--	--
9	--	--

Table 18: Pinout RS-232

RS-485

The RS-2485 interface is electrically isolated from the power supply and all other interfaces with a dielectric strength of 0.5 kV.

Sufficiently shielded cables with a conductor cross-section of 0.34 mm² must be used.



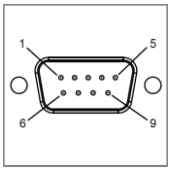
PIN	Function	Description
1	RS-485 N	RS-485 Negative Signal
2	RS-485 P	RS-485 Positive Signal
3	--	--
4	--	--
5	RS-485_GND	RS-485 Ground
6	--	--
7	--	--
8	--	--
9	--	--

Table 19: Pinout RS-485

CAN

The CAN interface is electrically isolated from the power supply and all other interfaces with a dielectric strength of 0.5 kV.

Sufficiently shielded cables with a conductor cross-section of 0.34 mm² must be used.

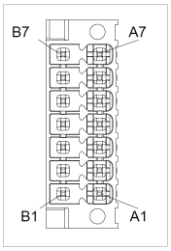


PIN	Function	Description
1	--	--
2	CAN_L	CAN Low Signal
3	CAN_GND	CAN Ground
4	--	--
5	--	--
6	--	--
7	CAN_H	CAN High Signal
8	--	--
9	--	--

Table 20: Pinout CAN

RS-232, RS-485, CAN

The RS-485 and CAN interface is galvanically isolated from the power supply and all other interfaces with a dielectric strength of 0.5 kV. The RS-232 interface is not electrically isolated.
Sufficiently shielded cables with a conductor cross-section of 0.34 mm² must be used.

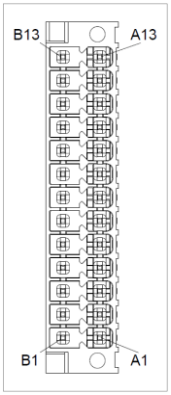


PIN	RS-232	RS-485	CAN
A1	RS-232_RX	--	--
B1	RS-232_TX	--	--
A2	RS-232_RTS	--	--
B2	RS-232_CTS	--	--
A3	FE	FE	FE
B3	GND_RS-232	--	--
A4	--	RS-485_P	--
B4	--	RS-485_N	--
A5	FE	FE	FE
B5	--	GND_RS-485	--
A6	--	--	CAN Low
A6	--	--	CAN High
A7	FE	FE	FE
B7	--	--	GND_CAN

Table 21: Pinout RS-232, RS-485, CAN

Phoenix DMCV 1,5/13-G1F-3,5-LR P20THR

The assignment for P4 depends on which configuration has been made.
GND must be fed in. Cannot be tapped there. The LEDs must be supplied with 24 VDC.



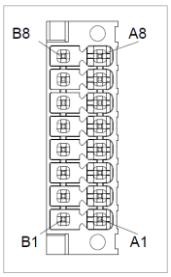
PIN	Function	Description	PIN	Function	Description
A1	--	--	B7	P4_C2	Position 4 Contact 2
B1	--	--	A8	P4_C3	Position 4 Contact 3
A2	--	--	B8	P4_C4	Position 4 Contact 4
B2	--	--	A9	E_C1	Emergency Stop Contact 1
A3	--	--	B9	E_C2	Emergency Stop Contact 2
B3	--	--	A10	E_C3	Emergency Stop Contact 3

A4	--	--	B10	E_C4	Emergency Stop Contact 4
B4	--	--	A11	--	--
A5	--	--	B11	P4_LED	Position 4 LED
B5	--	--	A12	--	--
A6	--	--	B12	--	--
B6	--	--	A13	GND	Ground
A7	P4_C1	Position 4 Contact 1	B13	--	--

Table 22: Pinout Phoenix DMCV 1,5/19-G1F-3,5-P20THR

The pin assignment may vary. This can be found in the device-specific data sheet.

Phoenix DMCV 1,5/8-G1F-3,5-LR P20THR



PIN	Function	Description	PIN	Function	Description
A1	--	--	A5	P8_C1	Position 8 Contact 1
B1	--	--	B5	P8_C2	Position 8 Contact 2
A2	--	--	A6	P8_C3	Position 8 Contact 3
B2	--	--	B6	P8_C4	Position 8 Contact 4
A3	P6_C1	Position 6 Contact 1	A7	--	--
B3	P6_C2	Position 6 Contact 2	B7	P6_LED	Position 6 LED
A4	P6_C3	Position 6 Contact 4	A8	--	--
B4	P6_C4	Position 6 LED	B8	P8_LED	Position 8 LED

Table 23: Pinout Phoenix DMCV 1,5/8-G1F-3,5-LR P20THR

The pin assignment may vary. This can be found in the device-specific data sheet.

3.2 Add-On

3.2.1 Extensions in the interface area side

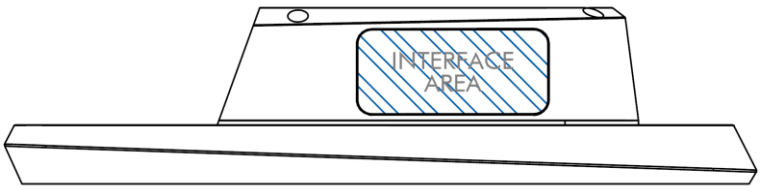


Illustration 27: Extensions in the interface area side

USB 2.0 side

Interface	1 x USB Host 2.0 (Type A)
Degree of protection	IP64 (IP67 with protection cap)

Table 24: Add On side USB 2.0

4 Function Description

The PLC devices are based on the embedded Linux operating system with real-time patch. The CODESYS® Runtime with integrated PLC application, the EtherCAT, CANopen and Modbus TCP fieldbuses and the visualization of the controller via WebVisu or TargetVisu, depending on the license, are displayed in the foreground. At the same time, WebConfig runs in the background and can be used to make device settings.

Sensitive data is stored via an NVRAM and the buffer memory in the event of a power loss.

A possible interface combination and the function descriptions for the LEDs and buttons are shown below as an example.

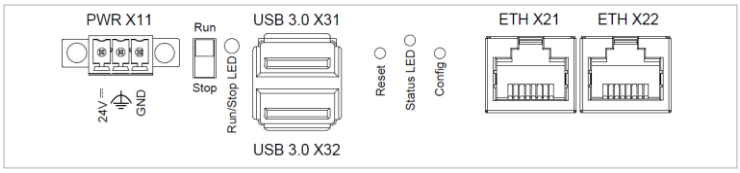


Illustration 28: Example Interfaces

4.1 Run/Stop LED

The behavior of the Run/Stop LED is explained below:

Situation	Run/Stop LED	Visualization
No CODESYS® applikation available	permanently off	
CODESYS® applikation running	permanently green	
CODESYS® Applikation stopped	permanently red	

4.2 Status LED

The behavior of the Run/Stop LED is explained below:

Situation	Status LED	Visualization
Device starts up	heartbeat green	
CODESYS® Runtime running	permanently green	
CODESYS® Runtime not available	permanently red	
Switch to WebConfig	flashing blue	

4.3 Reset Button

If the reset button is pressed for at least 3 seconds and less than 10 seconds, the device performs a restart. If the command is recognized, the status LED gives a green signal for a moment and then changes to a red signal. If the device is shut down, the status LED is off.

If a CODESYS® application is still running, it is automatically stopped.

If the reset button is pressed for more than 10 seconds and less than 20 seconds, the device performs a factory reset. If the command is recognized, the status LED gives a short red flashing signal. It then changes to a steady red light. If the device is shut down, the status LED is off.

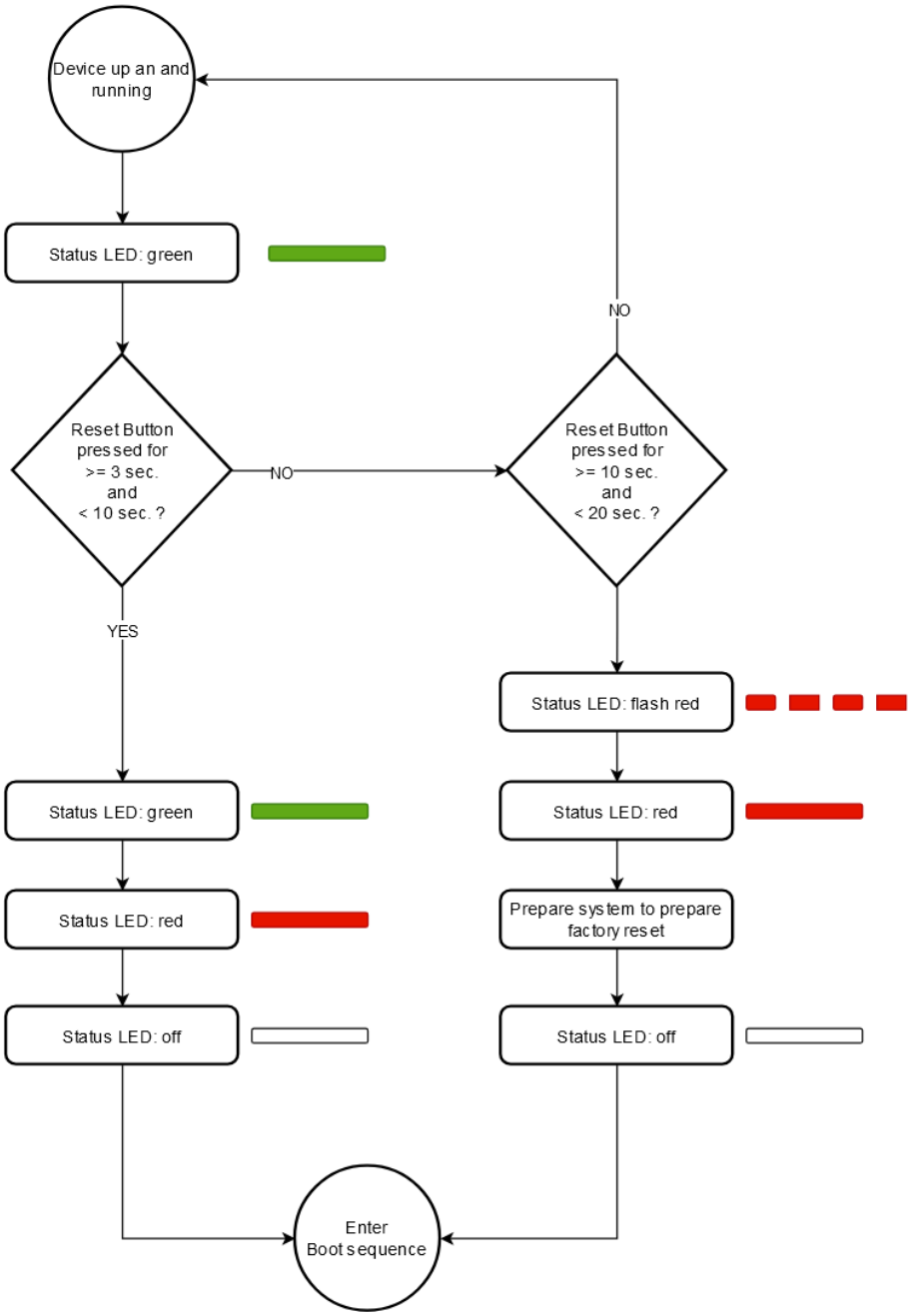


Illustration 29: Reset Button Sequence

4.4 Config Button

If the Config Button is pressed for at least 2 seconds, the device switches to the WebConfig interface. This is signaled by a short, blue flashing signal from the status LED. If CODESYS® applications are running, they are not stopped.

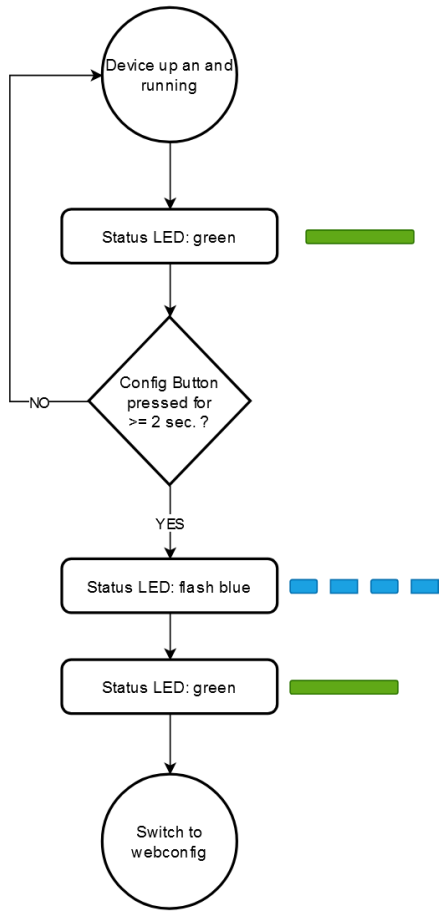


Illustration 30: Config Button Sequence

4.4.1 Config button application without visualisation

If the Config button is pressed for at least 2 seconds, the device switches to the WebConfig start interface. From there, depending on the setting in the WebConfig application (see Web-Config instructions), the device has several options.

- Switch to the configured application (e.g. via a URL)
- Open the WebConfig login page via https:/localhost:8081
- Remain in the WebConfig start interface if no available application is found

Pressing the hidden software buttons (see WebConfig instructions) opens the WebConfig login page opens. From here you can return to the WebConfig start interface by pressing the Back button.

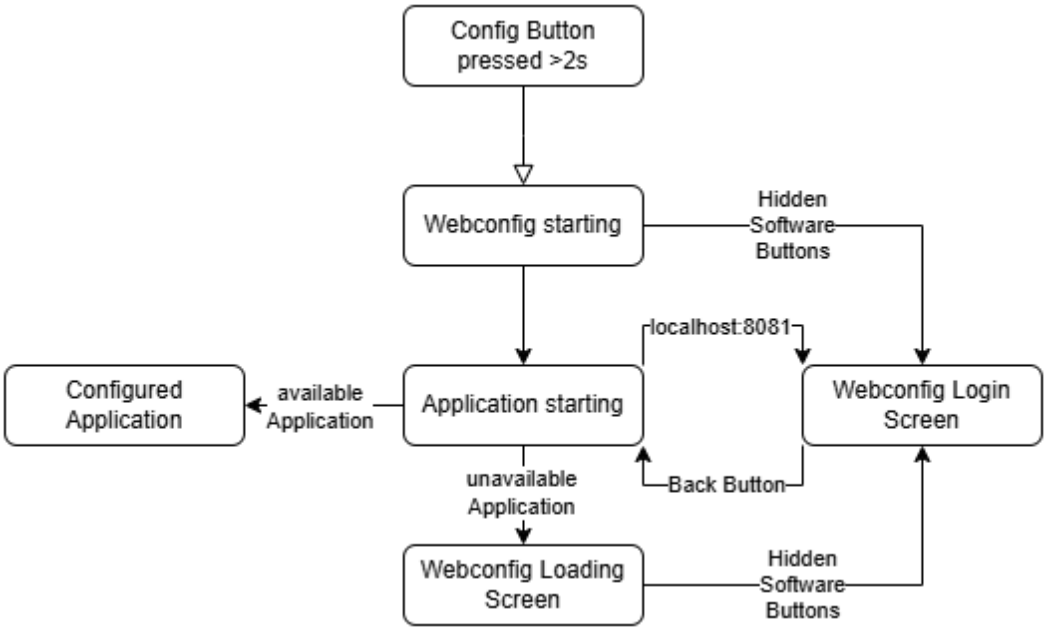


Illustration 31: Config button application without visualisation

4.4.2 Config button application with TargetVisu

If the Config button is pressed for at least 2 seconds, the device switches to the WebConfig start interface. VFrom there, depending on the setting in the WebConfig application (see Web-Config instructions), the device has several options.

- Switch to the configured application (e.g. via a URL)
- Open the WebConfig login page via https:/localhost:8081
- Remain in the WebConfig start interface if no available application is found

Pressing the hidden software buttons (see WebConfig instructions) opens the WebConfig login page opens. From here, pressing the Back button takes you to the TargetVisu.

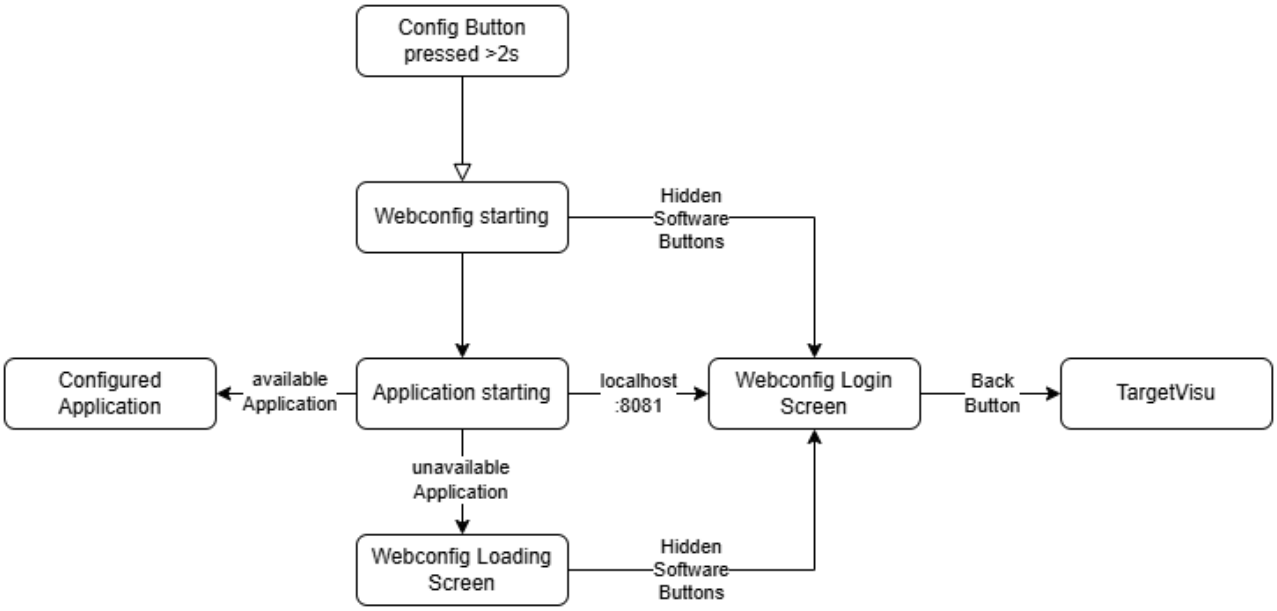


Illustration 32: Config button application with TargetVisu

4.4.3 Config button application with WebVisu

If the Config button is pressed for at least 2 seconds, the device switches to the WebConfig start interface. From there, depending on the setting in the WebConfig application (see Web-Config instructions), the device has several options.

- Switch to the configured application (e.g. via a URL)
- Open the WebConfig login page via https:/localhost:8081
- Open the WebVisu via https:/localhost:8080
- Remain in the WebConfig start interface if no available application is found

Pressing the hidden software buttons (see WebConfig instructions) opens the WebConfig login page opens. From here you can return to the WebConfig start interface by pressing the Back button.

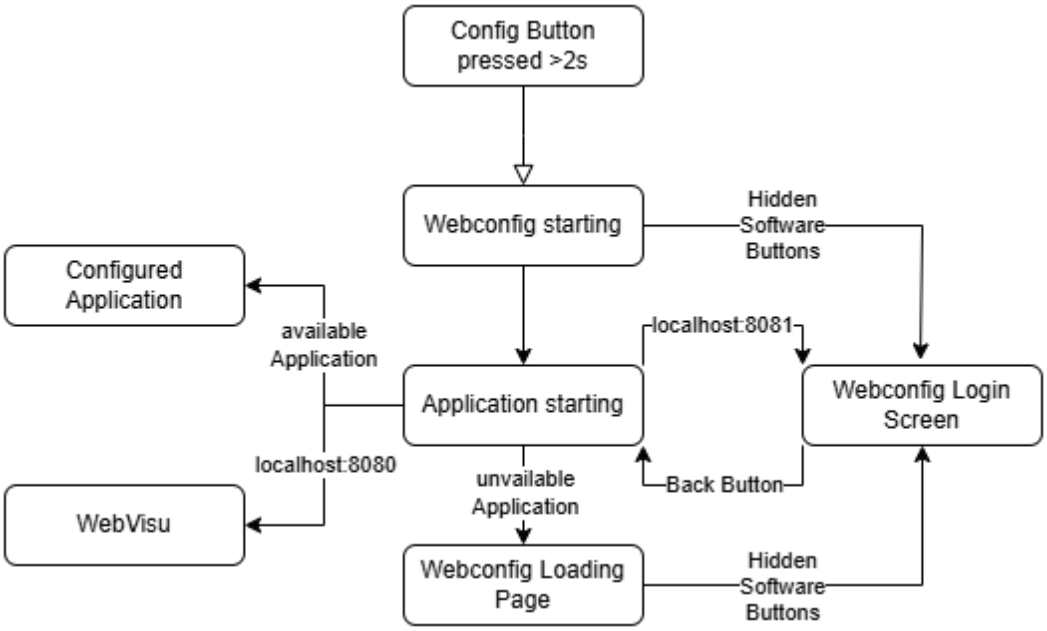


Illustration 33: Config button application with WebVisu

4.4.4 Config button application with TargetVisu and WebVisu

If the Config button is pressed for at least 2 seconds, the device switches to the WebConfig start interface. From there, depending on the setting in the WebConfig application (see Web-Config instructions), the device has several options.

- Switch to the configured application (e.g. via a URL)
- Open the WebConfig login page via https:/localhost:8081
- Open the WebVisu via https:/localhost:8080
- Remain in the WebConfig start interface if no available application is found

Pressing the hidden software buttons (see WebConfig instructions) opens the WebConfig login page opens. From here, pressing the Back button takes you to the TargetVisu.

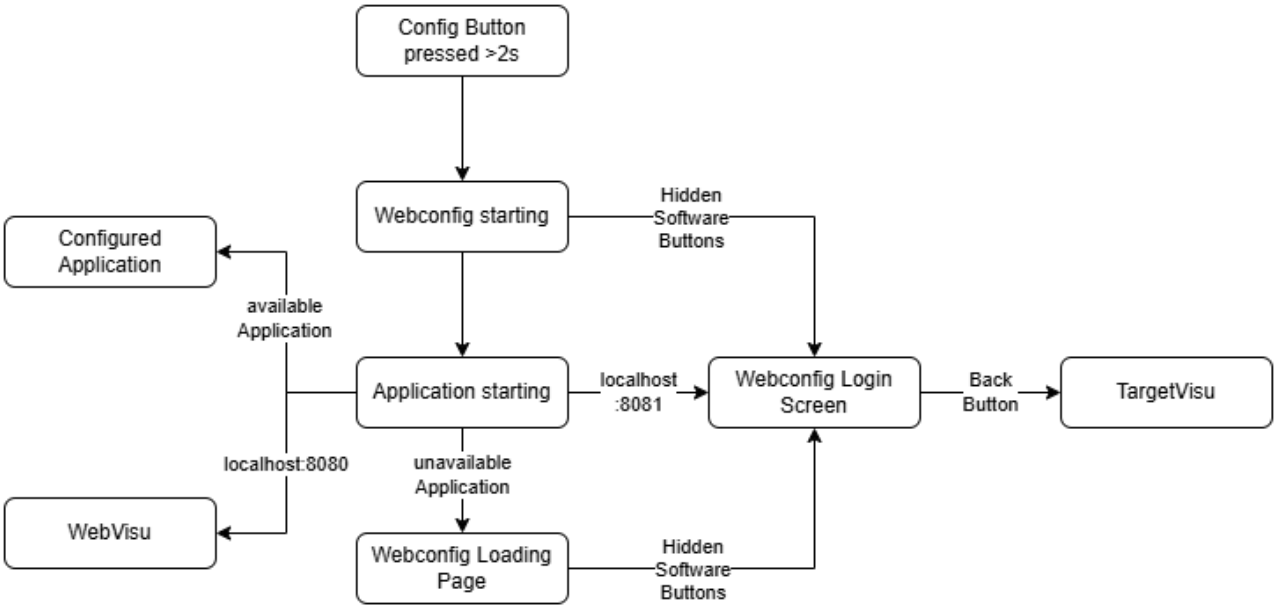


Illustration 34: Config button application with TargetVisu and WebVisu

4.5 Boot Sequence

If the device is supplied with power, it starts the boot process. The status LED displays a heartbeat in green.

The persistent memory is then integrated and then the config manager sequence is started. This executes the boot up sequence and checks whether the WebConfig application is running. If this is the case, the status LED changes to green. If the WebConfig application is not running, the status LED changes to red.

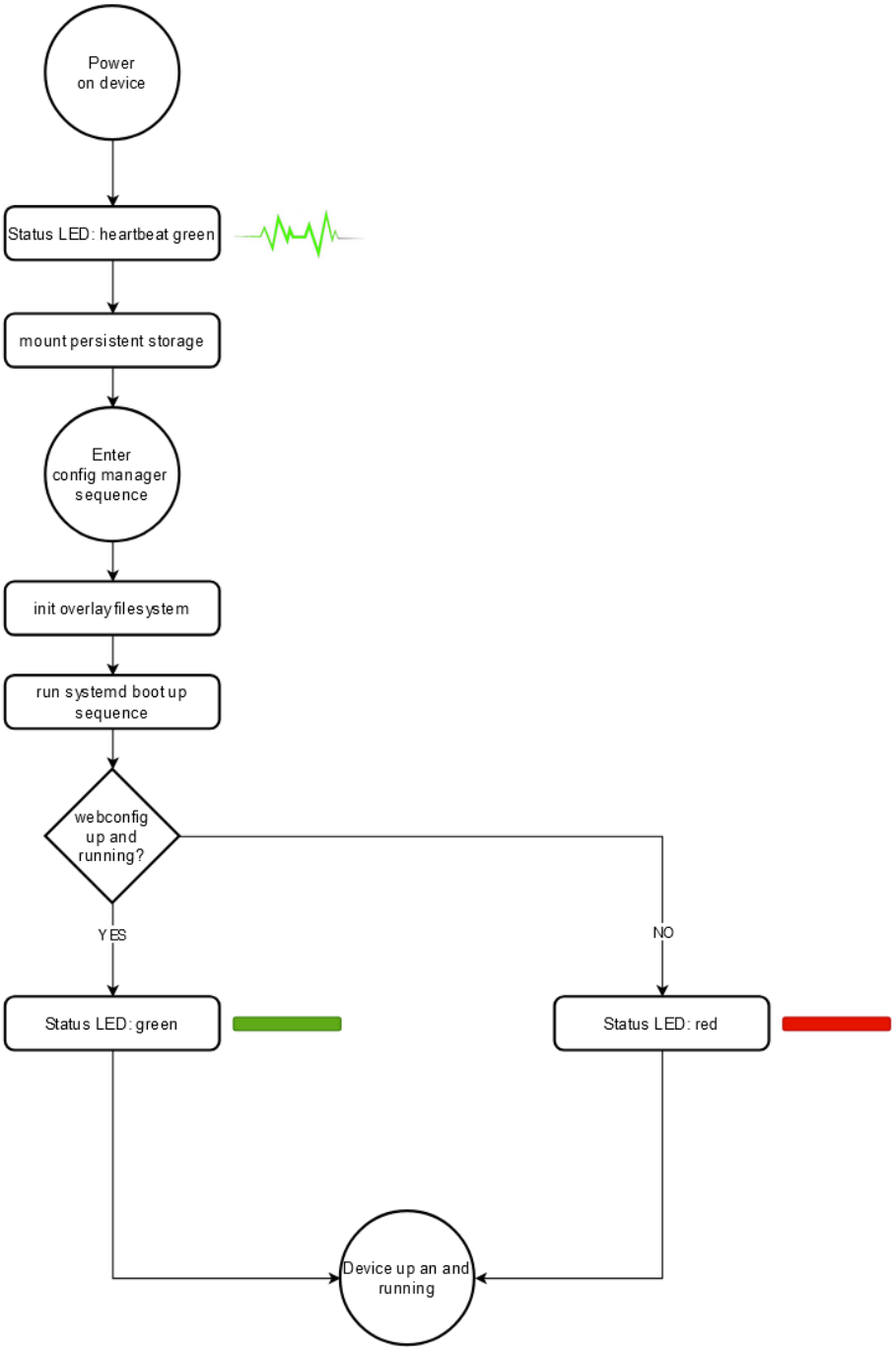


Illustration 35: Boot Sequence

4.6 Config Manager Sequence

The Config Manager sequence is part of the boot sequence and checks whether a backup exists that is to be restored.

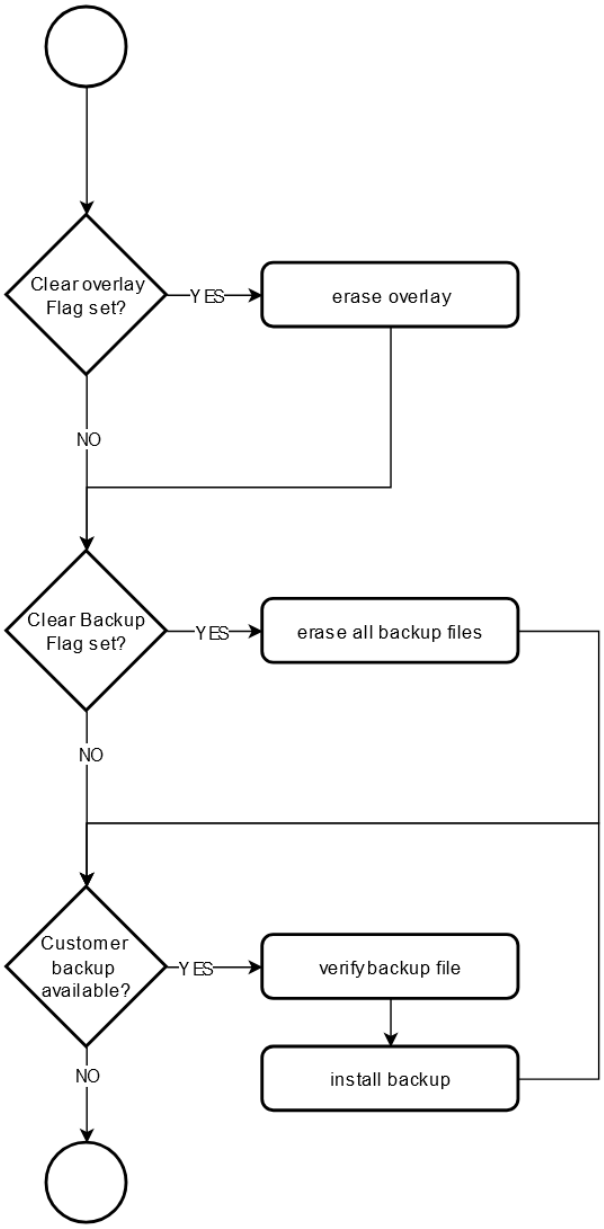


Illustration 36: Config Manager Sequence

4.7 Power Fail Sequence (FRAM)

The power fail sequence is executed if a voltage interruption with a duration of more than 200 ms occurs during operation of the device; this is indicated by a red status LED and the remanent data with a maximum size of 128 kB is automatically saved with a security of ≥ 99.99 % and automatically restored when the device is restarted.

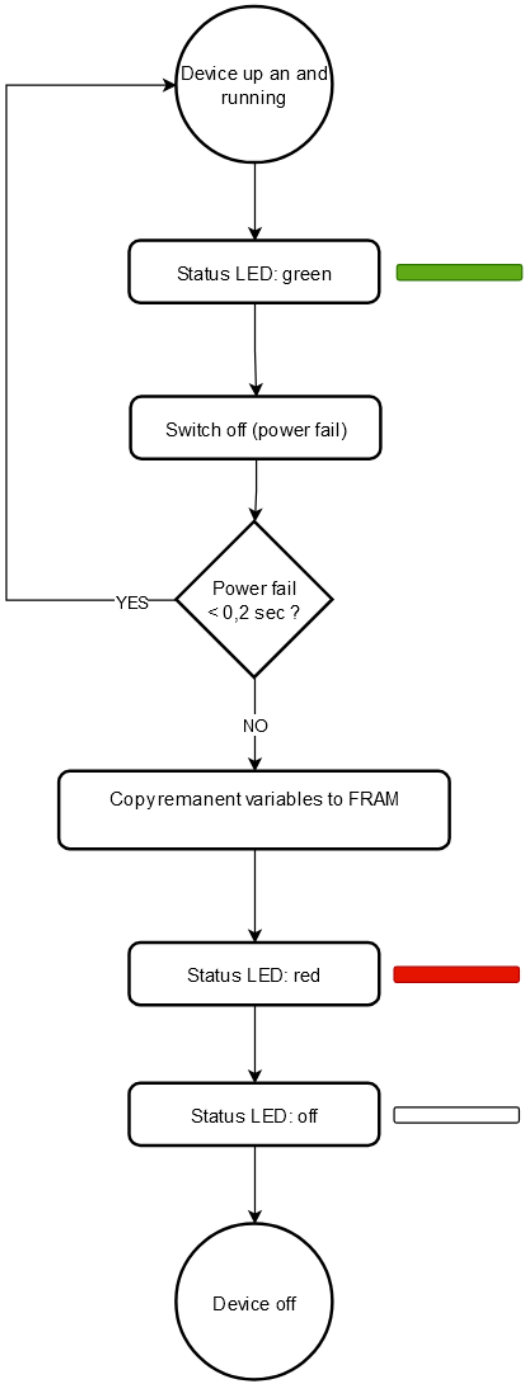


Illustration 37: Power Fail Sequence

5 Licences

Basic licences:

All information on the licences is considered below:

All licences support these fieldbus technologies:

- EtherCAT Master
- Modbus TCP Master
- CANopen Manager

The visualization can be carried out via CODESYS® Target Visu or CODESYS® WebVisu.

Performance levels differ between the processing speed PL-1 (1.35 GHz) and PL-2 (1.8 GHz).

Licence designation	Performance Level	CODESYS® TargetVisu	CODESYS® WebVisu
Licence CODESYS® V3 Linux ARM64 Performance Level 1 Control&Fieldbus	PL-1 (1,35 GHz)	--	--
Licence CODESYS® V3 Linux ARM64 Performance Level 1 Control&Fieldbus +TargetVisu	PL-1 (1,35 GHz)	x	--
Licence CODESYS® V3 Linux ARM64 Performance Level 1 Control&Fieldbus +WebVisu	PL-1 (1,35 GHz)	--	x
Licence CODESYS® V3 Linux ARM64 Performance Level 1 Control&Fieldbus +TargetVisu&WebVisu	PL-1 (1,35 GHz)	x	x
Licence CODESYS® V3 Linux ARM64 Performance Level 2 Control&Fieldbus	PL-2 (1,8 GHz)	--	--
Licence CODESYS® V3 Linux ARM64 Performance Level 2 Control&Fieldbus +TargetVisu	PL-2 (1,8 GHz)	x	--
Licence CODESYS® V3 Linux ARM64 Performance Level 2 Control&Fieldbus +WebVisu	PL-2 (1,8 GHz)	--	x
Licence CODESYS® V3 Linux ARM64 Performance Level 2 Control&Fieldbus +TargetVisu&WebVisu	PL-2 (1,8 GHz)	x	x

Table 25: Basic licences

Upgrade Licences

The basic licences can be extended with upgrade licences. This allows the processing load of the applications can be disturbed across several CPU cores.

Licence designation	Performance Level	CODESYS® Multicore Support
Licence CODESYS® V3 Linux ARM64 Performance Level 1 CODESYS®-Multicore-Support 2 Cores	PL-1 (1,35 GHz)	2 Cores

Licence CODESYS® V3 Linux ARM64 Performance Level 1 CODESYS®-Multicore-Support 4 Cores	PL-1 (1,35 GHz)	4 Cores
Licence CODESYS® V3 Linux ARM64 Performance Level 2 CODESYS®-Multicore-Support 4 Cores	PL-2 (1,8 GHz)	4 Cores

Table 26: Upgrade licences

6 Fieldbus

6.1 CANopen

CANopen support in CODESYS® is based on the standard implementation of the CAN interface (3S CAN driver interface). CODESYS® CANopen Device includes

- a slave configurator fully integrated into the CODESYS® programming system. No external tool is required to configure the bus system or the I/O data used.
- a CANopen communication stack in the form of a CODESYS® library in accordance with CiA 301. The protocol stack is portable for different platforms and does not have to be permanently implemented on the device. The IEC 61131-3 programming system translates the stack together with the application code into native machine code and loads it into the controller.
- an application interface for diagnostics and object dictionary access. Available without additional software.

6.2 EtherCAT

EtherCAT is a powerful real-time Ethernet fieldbus system with an open protocol. The EtherCAT master integration in the IEC 61131-3 programming system CODESYS® includes:

- an integrated configurator for the master and the connected slaves
- a portable protocol stack in the form of a CODESYS® library
- a runtime system component for direct access to the Ethernet interface
- Diagnostic functions in the programming system and for runtime monitoring by the IEC 61131-3 application

6.3 Modbus TCP

Modbus Configurator

The configurator for CODESYS® Modbus TCP Master consists of editors for the following device categories, which are hierarchically attached in the device tree:

- Ethernet: The Ethernet adapter settings such as IP address, subnet mask etc. are configured here.
- Modbus TCP Master: A TCP Master mode can be added under the Ethernet node. Modbus-specific communication settings can be defined here, e.g. the 'Response timeout' to define how long to wait for a response from a Modbus TCP slave.
- Modbus TCP slave: Several Modbus TCP slave devices can be inserted under the Modbus TCP master. The slave address and a series of Modbus commands (including the associated I/O mapping) are defined here, which are then processed by the driver and exchanged with this Modbus TCP slave.

Device description files

Modbus TCP slaves are described in CODESYS®-devdesc.xml format, as there is generally no native description format such as GSD or GSDML for Modbus devices. For example, it can be used to predefine description texts for Modbus registers, which are then analysed by the configurator. It is also possible to define Modbus commands that are automatically created as soon as devices are added to the project.

Modbus driver library

The Modbus driver supports all Modbus function codes for the exchange of I/O data: * FC 01 - Read Coils * FC 02 - Read Discrete Inputs * FC 03 - Read Holding Registers * FC 04 - Read Input Registers * FC 05 - Write Single Coil * FC 06 - Write Single Register * FC 15 - Write Multiple Coils * FC 16 - Write Multiple Registers * FC 23 - Read/ Write Multiple Registers

A scheduling mechanism checks in sequence which of the predefined commands are due for execution in each bus cycle and executes the first pending command (e.g. trigger variable or time difference since the last execution).

7 Mounting

This chapter describes all the steps for assembly. The following warnings are safety instructions that must be applied throughout the assembly chapter and in every other life cycle of the device.

⚠ DANGER	
	**Danger from electric shock, explosion or electric arc** Serious injury or death ➢ Pull out the mains plug and do not open the covers

⚠ WARNING	
	**Dropping a device** Injuries and bruises to the legs and / or feet ➢ Wear safety shoes

Note for the installation site

This device is not designed for outdoor use.

Make sure that the ambient temperature and humidity are within the ranges which are specified under Environmental Conditions.

The device must not be exposed to direct sunlight.

Make sure that the device is installed so that is accessible for the operator.

Installation instructions

Check the package contents for any visible damage and for completeness.

In case of damage, do not install the device and contact the Christ Service.

The strength of the material of the mounting cutout must be sufficiently high.

The dimensions for the mounting cutouts are listed in the chapters Housing variant front panel and Open Frame .

7.1 Torque

All screws must be tightened to the following tightening torques unless a different tightening torque is required.

Screw	Torque
M2	0.3 Nm
M3	1.0 Nm
M4	2.3 Nm

7.2 Power Supply

The device is designed for a power supply of 24 V DC. The power supply unit must meet the requirements of SELV or PELV in accordance with IEC 61131-2.

7.3 Connection of the power supply

Use conductors with a cross-section of 0.75 mm² to 1.5 mm². Use the MC 1,5/ 3-STF-3,5 PCB connector from Phoenix.

Strip the insulation from the individual wires of the conductor (1). Insert these into the connection contacts (3) of the PCB connector and tighten the screw contacts (2) with a screwdriver and a maximum torque of 0.3 Nm.

The rear view (4) of the connector is shown for clarification.

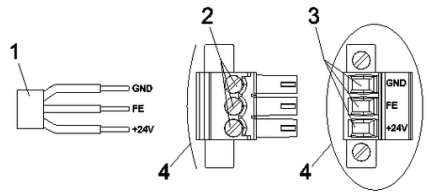


Illustration 38: Connection of the power supply

7.3.1 Reverse polarity at the connector plug

A reverse polarity protection diode is installed internally.

Reverse polarity	Effect on the Christ device	Effect on other components
GND and PE	No effect	No effect
GND and 24 V	No effect	No effect
PE and 24 V	No effect	If a USB device is connected, a short circuit may occur on the power supply unit.

Table 27: Reserve polarity at the connection plug

7.3.2 Operation outside the voltage range

Voltage range	Effect on the Christ device
< 16.8 V	The device does not start
> 31.2 V	The device will be destroyed

Table 28: Operation outside the voltage range

7.4 Earth Connection

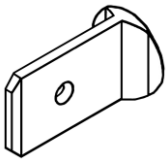
NOTICE	
	**Earthing not connected** Not guaranteed functionality of the device ➢ All earth connections must be connected to an earth point

VESA / VESA Automation

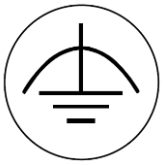
The appliance complies with protection class III and does not require protective earthing. However, functional earthing may be useful to reduce electromagnetic interference (EMC). If the device is mounted on a metal VESA mount, this can be used as a conductive connection for earthing. The resistance between the back cover of the device and the VESA bracket must be less than 0.5 Ohm. The bracket to which the device is attached via the VESA mount must have a sufficient connection to earth. For example, the support arm should be connected to the switch cabinet or the earthing rail using a cable with a cross-section of 1.5 mm².

Front Panel / Open Frame

The device corresponds to protection class III and does not require protective earthing. Functional earthing must be ensured to reduce electromagnetic interference (EMC). A cable with a cross-section of at least 1.5 mm² must be laid at the earthing connection to the central earthing point of the switch cabinet or system. The earthing connection is labelled with a corresponding engraving.



Earth connection



Engraving

7.5 Mounting Front Panel

NOTICE	
	**Seal does not close** Moisture penetration into the device ➢ Select the correct thickness and material of the mounting plate for the cutout. Tighten the screws with a defined torque

Step 1:

Install the front panel into the cutout

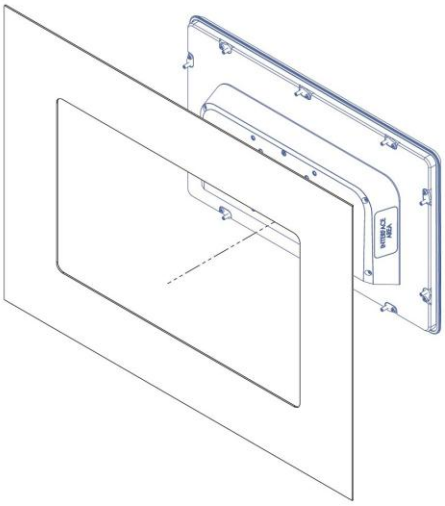


Illustration 39: Montage Front Panel Schritt 1

Step 2:

The fastening clamps must lie entirely behind the mounting plate

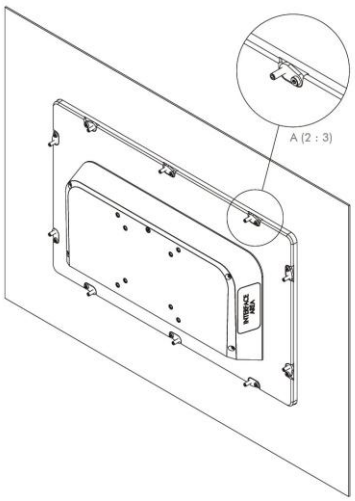


Illustration 40: Mounting Front Panel Step 2

Step 3:

Turn the fastening clamps outwards and tighten to the specified torque. (M3 - 1.0 Nm)

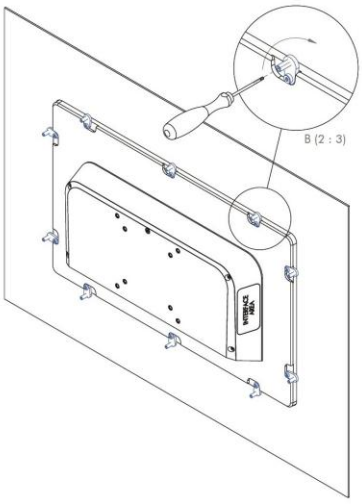


Illustration 41: Mounting Front Panel Step 3

7.6 Mounting Open Frame

Step 1:

Install the Open Frame Panel into the cutout

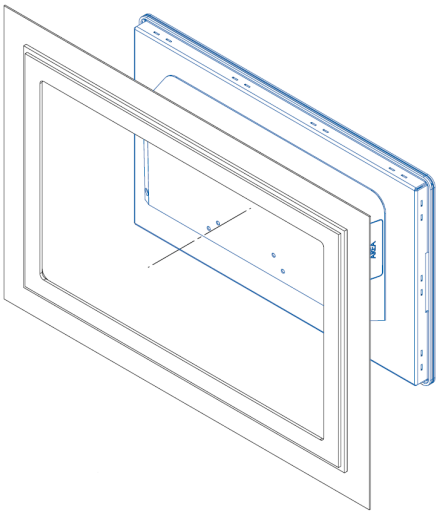


Illustration 42: Mounting Open Frame Step 1

Step 2:

1 - Lightly screw the grub screw into the mounting bracket

2 - Insert the mounting bracket into the slots

3 - Engage the mounting bracket to one side

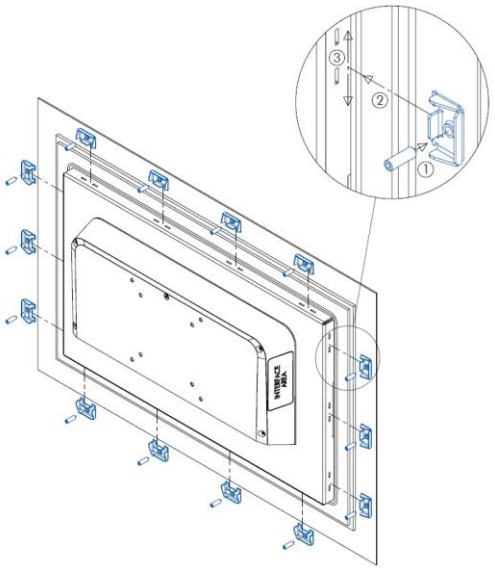


Illustration 43: Mounting Open Frame Step 2

Schritt 3:

Tighten the grub screws to the specified torque.
(M3 - 1.0 Nm)

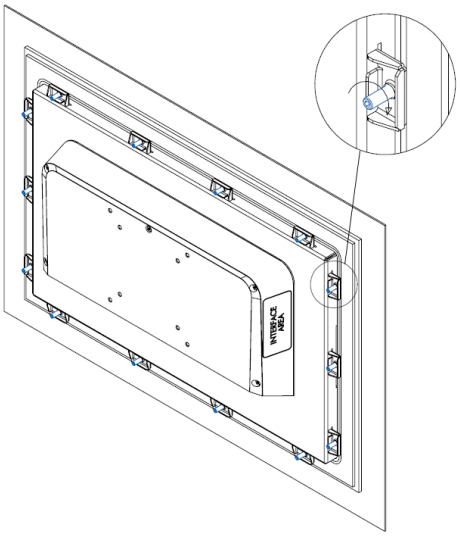


Illustration 44: Mounting Open Frame Step 3

7.7 Mounting IP cover

Step 1:

Screw 1 x strain relief and assembly aid M3 x 5 to the front frame with 5 x cylinder screw.

Tightening torque: 1.0 Nm

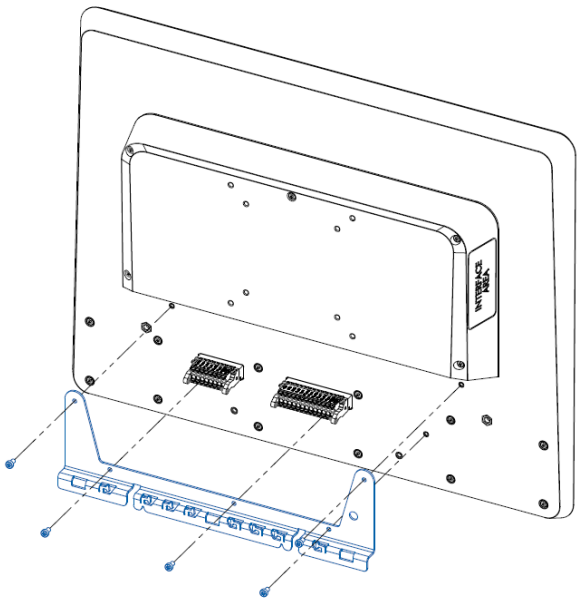


Illustration 45: Mounting IP cover step 1

Step 2:

Screw 2 x setscrew ISO 2342 with slot and cone point M5 x 12 into the front frame.

Tightening torque: 2.0 Nm

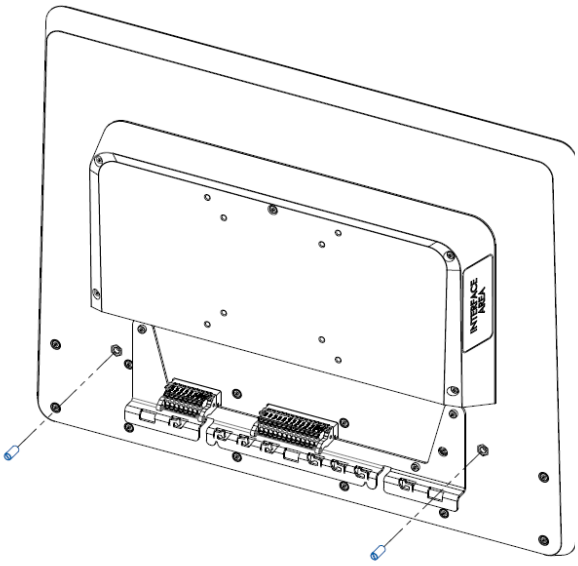


Illustration 46: Mounting IP cover step 2

Step 3:

Screw the IP cover onto the front frame.

Tightening torque: 2.3 Nm

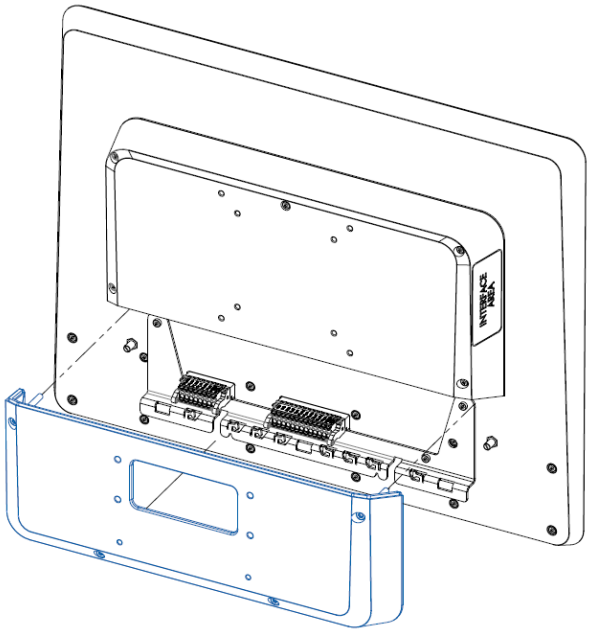


Illustration 47: Mounting IP cover step 3

7.8 Mounting support arm

7.8.1 Attach support arm to the device

Step 1:

Unscrew 4 x countersunk screw M3 x 6 and remove the cover plate.

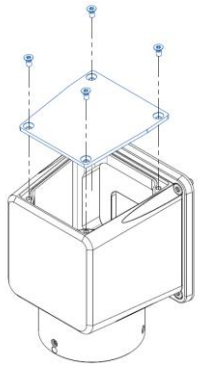


Illustration 48: Mounting support arm step 1

Step 2:

Place support arm on tube. Alignment: Indentation facing backwards, means equal rotation in both directions.

Tighten three grub screws. The tightening torque depends on the material of the pipe and must be defined by the customer.

Tube: max. AØ 48.3 mm

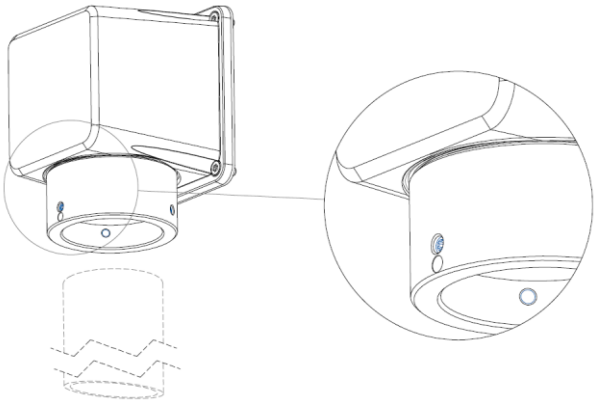


Illustration 49: Mounting support arm step 2

Step 3:

Screw on the device with 4 x cylinder head screws M4 x 8 and carry out the wiring.

Tightening torque: 2,3 Nm

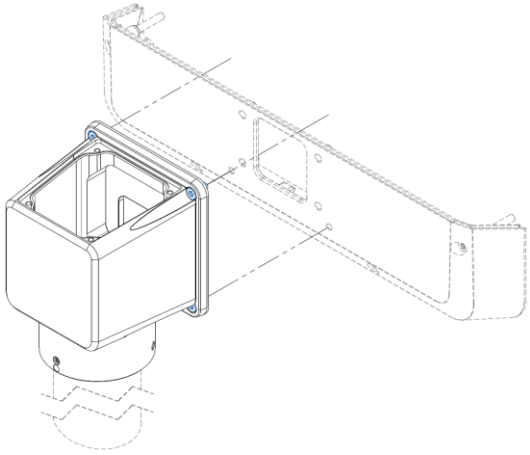


Illustration 50: Mounting support arm step 3

Step 4:

Insert the cover plate and screw on with 4 x countersunk screws M3 x 6.

Tightening torque: 1,0 Nm

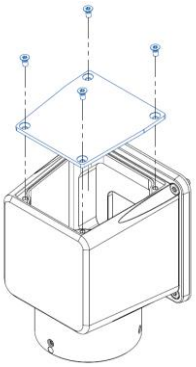


Illustration 51: Mounting support arm step 4

7.8.2 Fixing the rotation

The support arm can be adjusted in stages.
Fixing the rotation of the support arm:
Tighten the grub screw.

Tightening torque: 1.0 Nm

Recommendation: Fixing the support arm in horizontal alignment (shown in the illustration: vertical alignment)

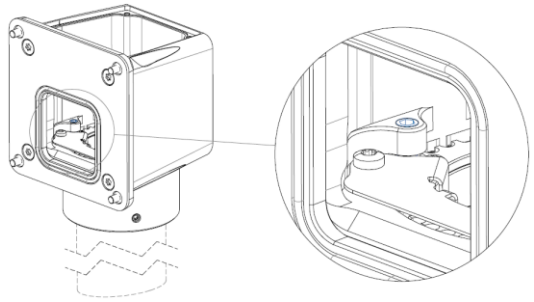


Illustration 52: Fixing the rotation

7.8.3 Conversion of the flange plate

Step 1:

Unscrew 4 x countersunk screw M4 x 12 and store with the serrated lock washers. Separate the flange plate from the support arm.

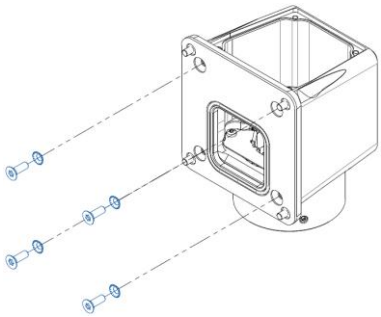


Illustration 53: Conversion of the flange plate step 1

Step 2:

The support arm base body can be rotated in any direction. The alignment between the cut-out in the support plate and the Christ IP extension must match.

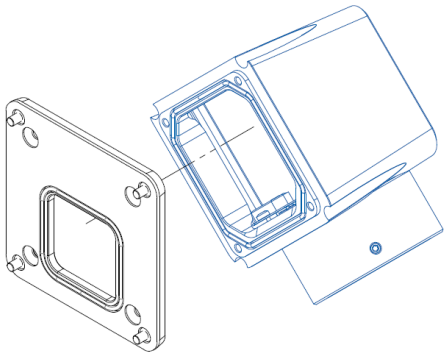


Illustration 54: Conversion of the flange plate step 2

Step 3:

Attach the flange plate and screw on with 4 x countersunk screw M4 x 12 and serrated lock washer.

Tightening torque: 2.3 Nm

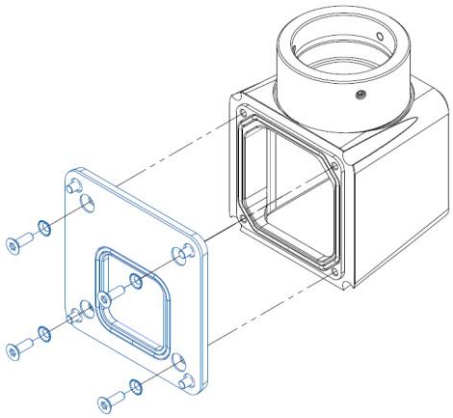


Illustration 55: Conversion of the flange plate step 3

8 Commissioning

8.1 Initial configuration using WebConfig

In order for the host PC, which is required for programming, to be able to communicate with the Touch PLC via the Ethernet network, both devices must be in the same subnet, which in most cases is done automatically.

Otherwise, this can also be done manually via the WebConfig network settings.

8.2 Programming with Codesys

You will find helpful tips and articles on the following pages:

CODESYS Tutorials: https://www.codesys.us/codesys-tutorials.html

CODESYS Forge: https://forge.codesys.com/prj/wiki/Home/

8.2.1 Preparation

Programming with CODESYS requires the CODESYS Development System, which can be downloaded from the CODESYS Store.

Important: The version of the CODESYS IDE must match the version of the CODESYS Runtime.

In addition to the development environment, the appropriate proprietary PLC device description is required. This can be called up and downloaded for each device licence constellation in the download area of the Christ website.

8.2.2 Device installation

To programme the Touch PLC, its device information must first be installed in the development environment.

1. Open the CODESYS Development System. Open the "Device repository" under "Tools".

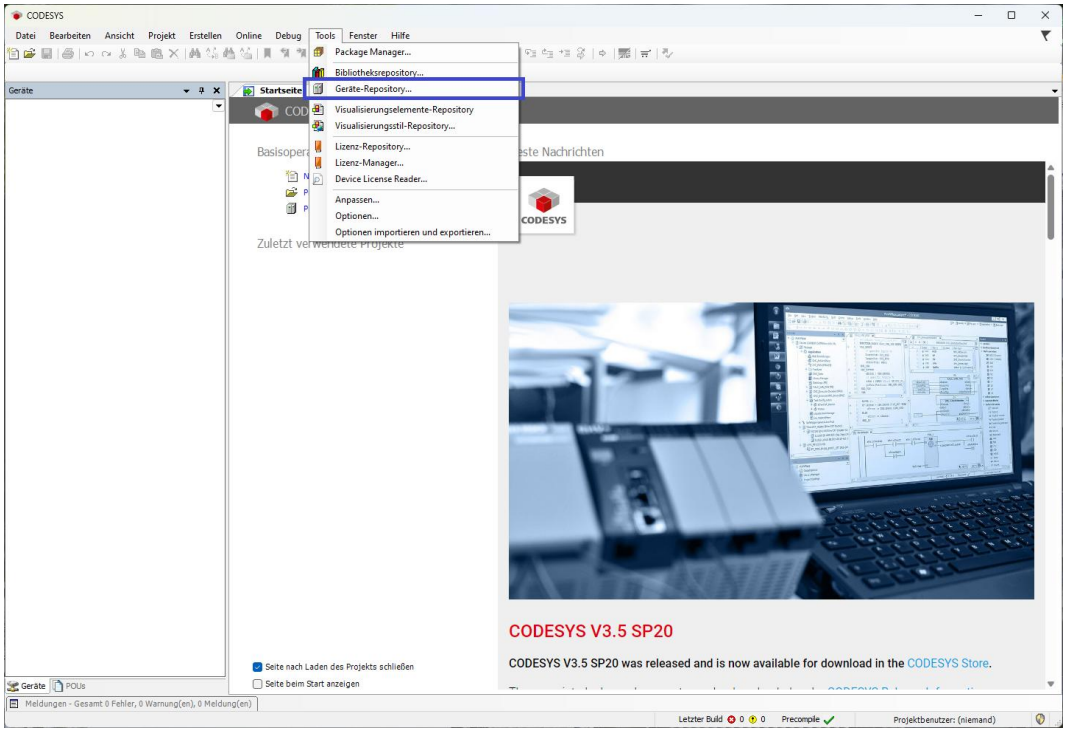


Illustration 56: Development systems

2. Use the "Install" button to select and install the device description file (xml format) previously downloaded from the Christ website.

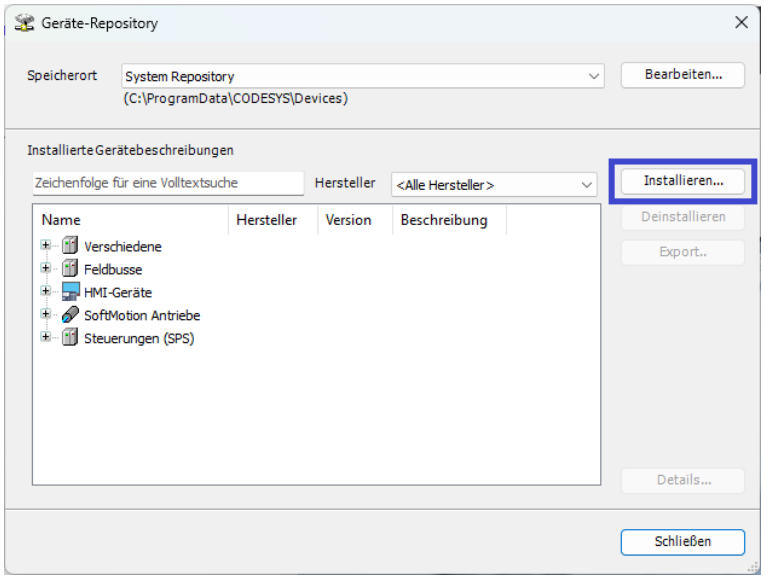


Illustration 57: Install device description file

After successful installation, the device is displayed in the repository, is therefore known to the development environment and can be used.

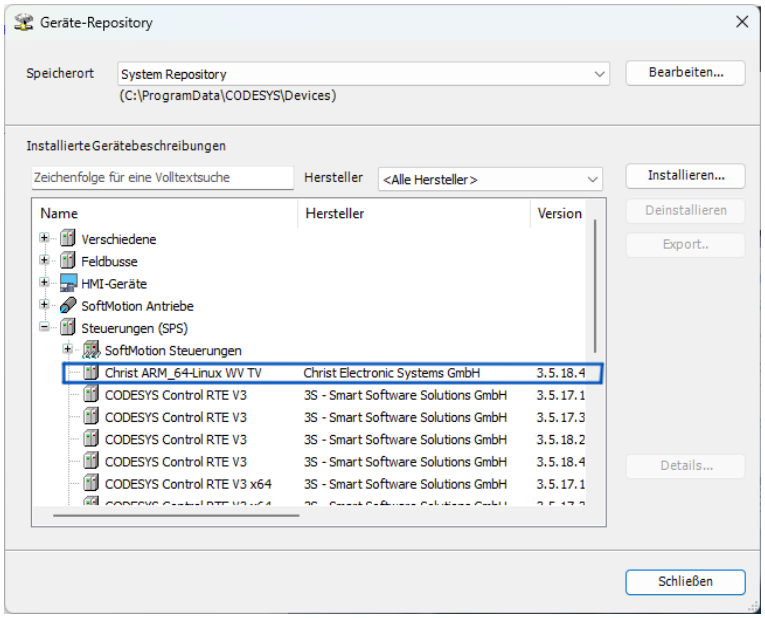


Illustration 58: Device in the device-repository

8.2.3 Create first project and control login

1. Create Project

A project must be created in order to programme the control unit. To do this, create the project via "New project" - "Standard project" and select the appropriate device and the desired programming language.

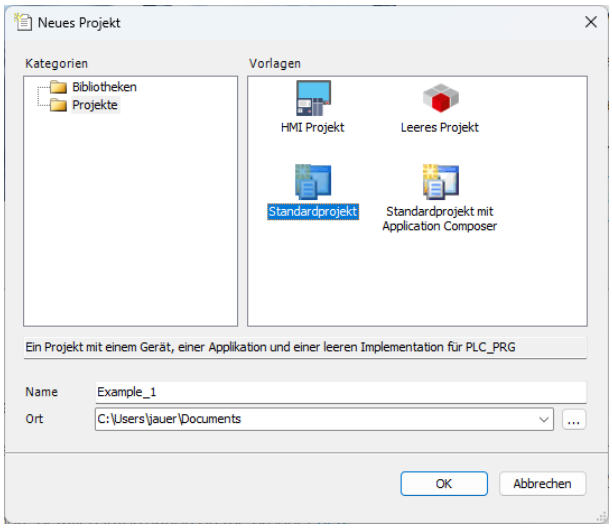


Illustration 59: Create project - new project

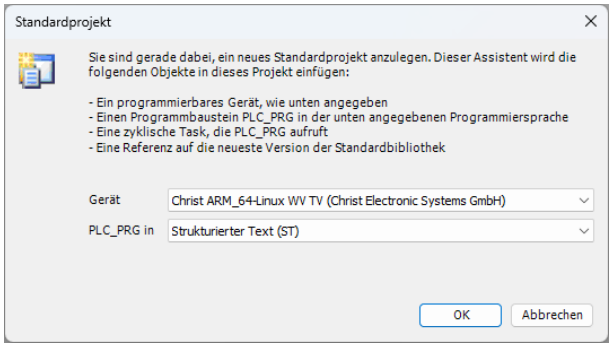


Illustration 60: Create project - standard project

2. Connect control unit

Double-click on the device in the device tree to display the current connection status in the "Device" tab. If the Touch PLC is in the network and Runtime is running, it can be connected to the host PC via "Search network".

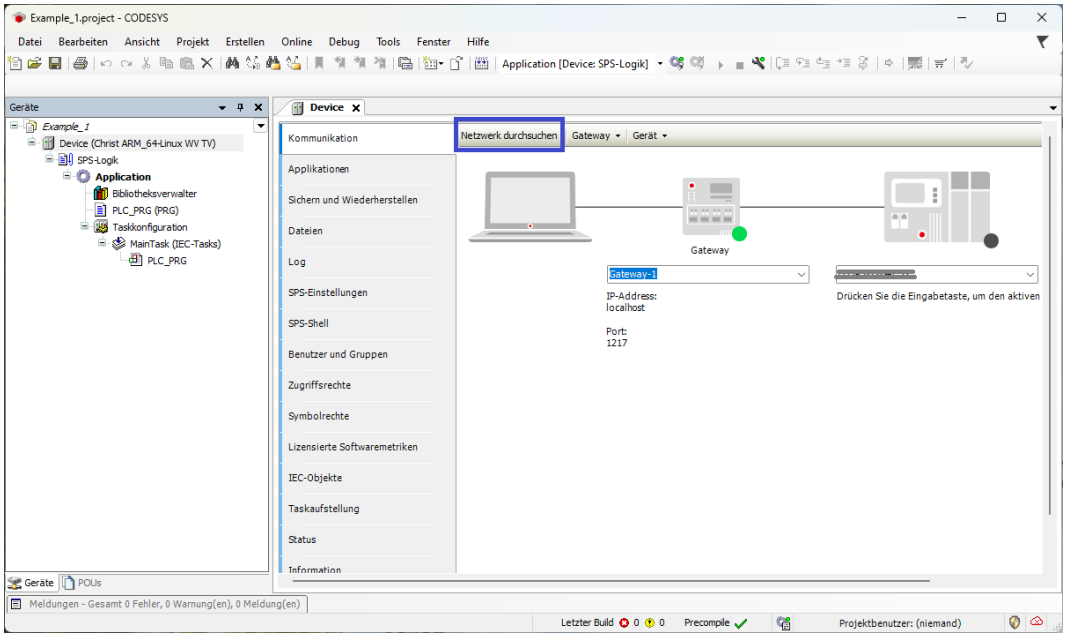


Illustration 61: Connect control unit - search network

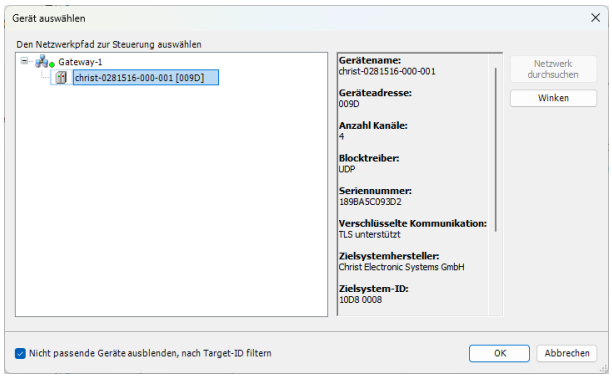


Illustration 62: Connect control unit - select device

3. A successful connection is confirmed by a round green field on the selected device in the "Device" tab.

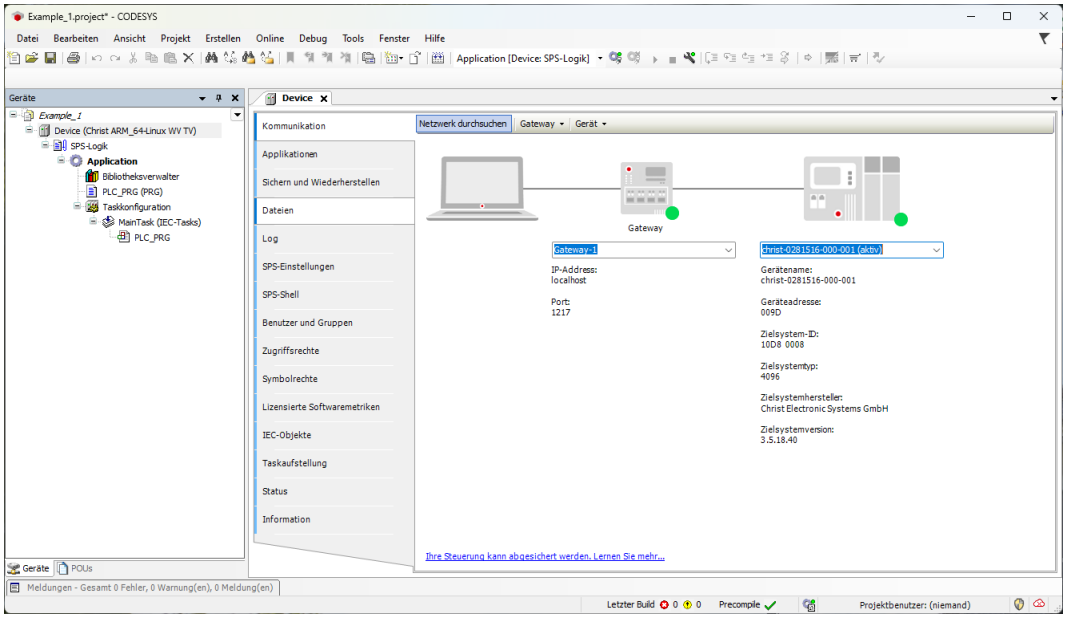
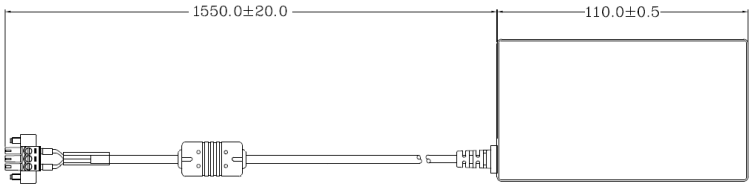


Illustration 63: Successful connection

9 Accessories and Spare Parts

The accessories listed here have been checked by Christ and are compatible with the products. The following accessories are available:

9.1 Power supply



Input Voltage	90 - 264 VAC
Input Current	max. 1 A
Input Frequency	47 - 63 Hz
Consumption with unloaded output	max. 0.075 W
Output Voltage	24 VDC
Output Current	max. 2.5 A
Interne Verbindungen	GND and PE are internally connected
Temperature Range Operation	0 - 70°C
Humidity Operation	20 - 80% RH non condensing

Table 29: Power supply

NOTICE	
	**The power supply shown here has a limited power capacity.** If the required power of the device exceeds the rated capacity of the power supply, the device may not operate properly. ➢ In this case, the customer must select and size an appropriate power supply.

10 Software

The Software chapter describes settings and functions that may be required to use the device.

10.1 WebConfig

The instructions for WebConfig can be found in the Download section of the Christ website: Downloads

10.2 Device description files

The device description files suitable for the device can be downloaded from the download area of the Chrsit website under the "PLC Device Description" tab: Downloads

11 Maintenance

The following chapter describes maintenance measures that can be performed by a qualified end user.

NOTICE	
	**Damage to the seals, damage to the housing** Loss of IP protection class ➢ There must be no permanent exposure to substances containing large amounts of oils or fats.

11.1 Cleaning

⚠ DANGER	
	**Triggering unintended functions** Loss of control of the plant / machine / device ➢ The appliance may only be cleaned when it is disconnected from the power supply.

To clean the device, use a soft cloth moistened with detergent solution or screen cleaner.

The cleaning agent must not be applied directly to the device. Under no circumstances may aggressive solvents, chemicals or scouring agents be used.

11.2 Maintenance

It does not require any maintenance on the part of the user.

12 Technical Data

This chapter summarizes the technical data.

12.1 Mechanical Specifications

Housing Front	Glass
Housing	Aluminium
Weight	see Table Weight
Dimensions	see Table VESA see Table Automation see Table Front Panel
Mounting	VESA 75/100
Cooling	Passive

Table 30: Dimensions

The weight specifications are maximum guideline values. They are given in the unit kilogram [kg].

	VESA	VESA Automation	Front Panel	Open Frame
7"	1.4	--	1.4	--
10.1"	2.3	--	2.3	1.9
10.4"	2.3	--	2.3	tbd
12.1"	2.7	--	2.7	tbd
13.3"	2.8	tbd	2.7	tbd
15"	3.7	--	3.7	tbd
15.6"	3.8	4.5	3.8	tbd
18.5"	4.9	5.8	4.7	tbd
21.5"	5.9	7.0	5.7	tbd
24"	6.5	7.6	6.3	tbd

Table 31: Weight

For IP65 rear, the above weight specification must be supplemented by the corresponding value:

VESA	0.5 kg
VESA Automation	0.6 kg

Table 32: IP65 Weight

12.2 Electrical Specifications

Supply Voltage	16.8 VDC ... 31.2 VDC
Fuse	Internal fuse: 3.5 A time lag, non-exchangeable External fuse: Must be considered in the final installation
Power Consumption	see table Power Consumption
Inrush Current (load-independent)	max. 70A for 80 µs (Used power supply: FSP060-DAAN3)
External Power Supply	SELV / PELV
Earthing	Functional Earthing (Cable cross-section has to be identical to the supply lines)
Battery Lifetime	4 years (with operation permanently switched off)

Table 33: Electrical Specifications

12.3 Power Consumption

Display Size	Power Consumption
7"	up to 20 W
10.1"	up to 30 W
10.4"	up to 30 W
12.1"	up to 35 W
13.3"	up to 40 W
15"	up to 35 W
15.6"	up to 45 W
18.5"	up to 55 W
21.5"	up to 45 W
24"	up to 50 W

Table 34: Power Consumption

12.4 Electromagnetic Compatibility

Emitted Interference	IEC 61000-6-2 and IEC 61000-6-4 Zone B
Immunity of supply line DC	± 2 kV according to IEC 61000-4-4; Burst ± 0,5 kV according to IEC 61000-4-5; Surge asymmetrical
Immunity of shielded signal lines	±1 kV according to IEC 61000-4-4; Burst ±1 kV according to IEC 61000-4-5; Surge (signal lines longer than 30 m)
ESD	± 4 kV Contact discharge according to EN61000-4-2 ± 8 kV Air discharge according to EN 61000-4-2
Immunity of conducted emission	10 V 150 kHz – 80 MHz, 80% AM according to IEC 61000-4-6
Immunity of high-frequency radiation	10 V/m 80 MHz – 1 GHz, 80% AM according to IEC 61000-4-3 3 V/m 1 GHz – 6 GHz, 80% AM according to IEC 61000-4-3

Table 35: Electromagnetic Compatibility

12.5 Environmental Conditions

Ambient Temperature (Standard Conditions)	0 ~ 50 °C
Ambient Temperature (Different Conditions)	0 ~ 40 °C (see device-specific datasheet)
Storage Temperature	-10 ~ 70 °C
Humidity	5 ~ 80 % (non-condensing)
Protection Class (Standard Conditions)	IP65 (IP20 rear)
Protection Class (Different Conditions)	IP65 (see device-specific datasheet)
Shock Resistance (Sinusoidal Vibration)	EN 60068-2-6: 5...9 Hz at individual amplitudes of 1,5 mm 9...200 Hz constant acceleration: 30 m/s² X, Y, Z orientations with 10 cycles (approx. 10 min)
Shock Resistance (Shock)	EN 60068-2-27 70 m/s², 3 times in X, Y, Z - orientations
Transportation and Storage	Suitable packaging can dampen vibrations and reduce their impact on the product.
max. Installation Altitude	2000 m
Cooling	Natural Air Convection

Table 36: Environmental Conditions

12.5.1 Storage and transport

Certain conditions must be observed during transport and storage.

Storage temperature	-10 ~ 70 °C
Humidity	5 ~ 80 % (non condensing)
Tansport and storage	For vibration resistance requirements, see "Environmental conditions" The device is supplied in shock-resistant packaging. It is recommended to use this packaging during transport or to use packaging that is at least as shock-resistant.

Table 37: Storage and transport

12.6 Temperature test

The values for ambient temperature and humidity were determined under worst-case conditions.

The test ran under 100 % utilisation of:

- CPU
- RAM
- Brightness of the display

12.7 IP Protection Class

The protection class only can be guaranteed under the following conditions:

- The device is installed correctly
- All components and covers of the interfaces are assembled
- Compliance with all environmental conditions

12.8 Display Specifications

Color Depth	8 bit
Lifetime	min. 50,000 h
Viewing Angle (right/left/up/down)	min. 85°/85°/85°/85°
Backlight	LED

Table 38: Display Specifications

NOTICE

Pixel Errors

Due to the manufacturing process, displays may contain faulty pixels (pixel errors), which do not constitute a claim or warranty within the limits described below.

The international standard ISO 9241-307:2009 defines, on an international level, the maximum permissible pixel errors in an LC-display. This standard discribes different error types, in consideration of different pixel error classes.

There are the following pixel error classes, each with three differnet error types:

Maximum acceptable errors per 1 Mio. pixels according to ISO 9241-307:2009				
error class	error type 1 pixel constantly illuminatied	error type 2 pixel constantly dark	error type 3 subpixel constantly illuminatied	error type 4 subpixel constantly dark
0	0	0	0	0
I	1	1	n = 0 to 2 2 - n	2 x n + 1
II	2	2	n = 0 to 5 5 - n	2 x n
III	5	15	max. 50	max. 50
IV	50	150	max. 150	max. 150

Why this classification of errors?

Each pixel of a display contains three subpixels which have the basic colors red, green and blue. The combination makes it possible to show a wide spectrum of colors.

Considering for example the display solution of 1280 x 800 pixels, thereof a total of 1,024000 pixels or 3,072000 subpixels are embedded in the display area. This means , the display holds 3,072000 single transistors at an area of 261.1 mm by 163.2 mm.

These figures make it clear that it is not possible to specifically produce defect-free displays even by today's manufacturing standards.

Christ Electronic Systems GmbH therefore adapts to the corresponding requirements of most international manufacturers. The displays must always comply with error class II. If the permissible number of errors of the pixel error class II is not exceeded, there is also no complaintable "failure" of the display.

Refering to the calculation, the following errors can occur in the display:

- Max. 2 constantly illuminated and 2 constantly dark pixels
- Max. 5 constantly illuminated or 10 constantly dark subpixel

Avoid burn-in on displays

NOTICE	
	**Images that do not change** "Image shadows", "ghost images" arise ➢ Changing displayed images, screen saver, energy-saving mode

With LC displays, so-called "ghost images" or "image shadows" can occur under certain circumstances. These are images that remain from the previous image and are felt to be "burnt into" the display. These do not remain forever. If "image shadows" occur, the device should be switched off for a longer period of time so that the burnt-in image disappears.

To avoid "ghost images" or "image shadows", the following behaviour is recommended:

- Do not display still images over an extended period of time
- Change standing images at short intervals
- Switch off the unit or use the energy-saving mode when not in use
- Use the screen saver function

13 Standards and Approvals

The device meets the following requirements.

13.1 CE Marking

The device has been tested in accordance with the applicable EU directives and the associated harmonized standards.

13.2 RoHS

The device complies with the requirements of EU Directive 2011/65/EU (RoHS 2) and its amendment EU 2015/863 (RoHS 3).

13.3 Electromagnetic Compatibility

The device fulfils the requirements for electromagnetic compatibility with the harmonised standards listed below:

EN 61131-2	Programmable logic controllers - Part 2: Equipment requirements and testing

13.4 Environmentally Appropriate Disposal

The device must not be disposed of with domestic waste.

The appliance complies with the requirement of the EU Directive WEEE 2012/19/EU, which is symbolised by the symbol with the crossed-out dustbin.

In order to enable environmentally friendly recycling, the various materials must be separated from one another.

Disposal must be carried out in accordance with the applicable legal regulations.

Component parts	Disposal
Enclosure	Metal Recycling
Electronic	Electronics Recycling
Paper / cardboard packaging	Paper / Cardboard boxes Recycling
Plastic packing materials	Plastics Recycling

14 Technical Support

Despite the highest quality standards and detailed function tests of all our products, damage or failure can always occur in the daily handling of our equipment. The failure of a ma-chine in production costs a lot of money. That is why the Christ company processes complaints as quickly as possible.

You can send the device to us without prior notice. All you need to do is fill out the repair cover letter and enclose it with the touch panel or IPC so that the service department can start the repair quickly.When the device arrives, it goes through a defined process that clearly documents all processes and makes the respective status traceable. As soon as your panel or IPC is registered in our system, you will receive a confirmation of receipt so that you can also get a precise overview.

Technical Support can be contacted as follows:

Service, Repair and Technical Support
Phone: +49 8331 8371-500
Fax: +49 8331 8371-497
E-Mail: service@christ-es.de

Or directly via the Homepage.
Christ Service

14.1 Device Seal

A device seal is affixed to every Christ device in order to prove whether the device has been opened by a third party. In case of a defect, please do not open the device, but contact our service department. They will discuss the further procedure with you.
Opening the device will void the warranty.

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