SIEMENS

SIMATIC HMI

Mobile Panel 170

Quick Reference Manual

Release 09/02

A5E00184122-01

Safety Notes

This manual contains notices which you should observe to ensure your own personal safety, as well as to protect the product and connected equipment. These notices are marked as follows according to the level of danger:

Danger

indicates an imminently hazardous situation which, if not avoided, **will** result in death or serious injury.

Warning

indicates a potentially hazardous situation which, if not avoided, **could** result in death or serious injury.

Caution

used with the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

Caution

used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in property damage.

Notice

indicates that unwanted events or status can occur if the relevant information is not observed.

Note

draws your attention to particularly important information on the product, handling the product, or to a particular part of the documentation.

Operating safety and safety regulations

Detailed information on operating safety and the applicable safety regulations is provided in the "Mobile Panel 170" Equipment Manual.

Power Supply

Warning

The Mobile Panel 170 complies to Protection Class I in accordance with EN 61131-2 and EN 50178. The 24 VDC power supply must be provided by properly isolating the extra-low voltage from voltages which are dangerous on contact (e.g. by implementing a safety isolation transformer or equivalent devices).

Therefore, when dimensioning the power supply, take a voltage drop in the connection cable into account!

Quick Reference Manual – for experienced users

Important information on the Mobile Panel 170 is sumarized in this quick reference manual.

Equipment Manual

Detailed information on the Mobile Panel 170 is provided in the "Mobile Panel 170" Equipment Manual.

This is also available as a PDF file in Internet under http://www.ad.siemens.de/simatic/index_76.htm

Editor and Publisher

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Exclusion of Liability

We have checked the content of this publication for compliance with the described hardware and software. However, discrepancies cannot be excluded, with the result that we cannot guarantee total compliance. The information in this publication is, however, checked regularly, and any necessary corrections are included in the subsequent releases. We welcome any suggestions for improvement.

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Overview

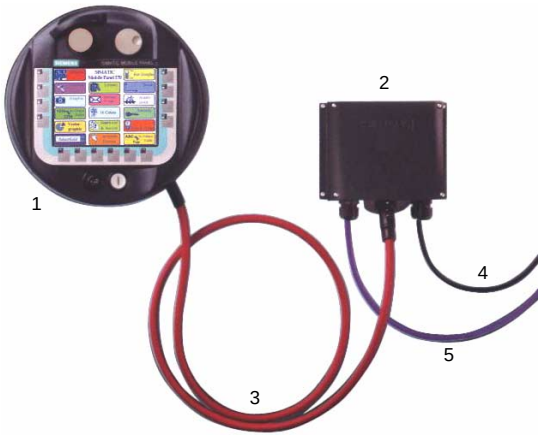


Figure 1-1 Mobile Panel 170 – design

1	Mobile Panel 170
2	Connectivity box
3	Connection cable
4	Lines for safety functions and power supply
5	Process data lines

1.1 Mobile Panel 170

Figure 1-2 Mobile Panel 170 – front view

1	Knob, optional
2	Stop button, 2-circuit, optional
3	C-STN LC display, with touchscreen, analog, resistive: 5.7”, Q-VGA resolution 320 x 240
4	Membrane keyboard with contact acknowledgement
5	Pushbutton with integrated LED, optional
6	Key-operated switch, optional

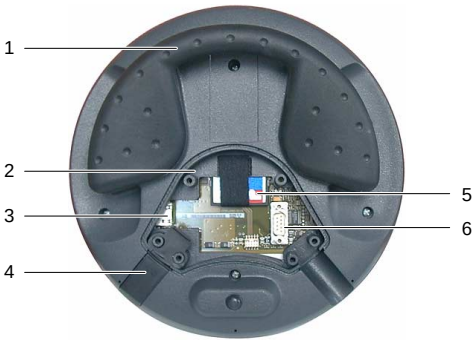


Figure 1-3 Mobile Panel 170 – rear view with open connection compartment

1	Handle
2	Connection compartment
3	RJ45 plug connector
4	Sealing plug
5	CF memory card
6	Sub-D socket

Figure 1-4 Mobile Panel 170 – side view

1	Acknowledgement buttons, 3-level, 2-circuit The Acknowledgement buttons are arranged on both sides of the Mobile Panel 170.

1.2 Connection Cable

Figure 1-5 Connection cable

1	Metallic push-pull round connection plug
2	Strain-relief and kinking protection for connection cable
3	RJ45 connector
4	Plug connector

Note

The round plug connector on the connectivity box guarantees the IP65 degree of protection when plugged in.

1.3 Wall Mounting Bracket

Figure 1-6 Wall mounting bracket

1.4 Connectivity Box

Figure 1-7 Connectivity box

1	PU screw fitting for process data cable
2	PU screw fitting for power supply cable and shield
3	PU screw fitting for cable with additional STOP and Acknowledgement button signals and accompanying PLC signals
4	Connection socket for connection cable plug
5	Dummy cap

Notice

The IP65 degree of protection on the connectivity box is only guaranteed when the connection cable or dummy plug are plugged in.

1.5 Dimensions

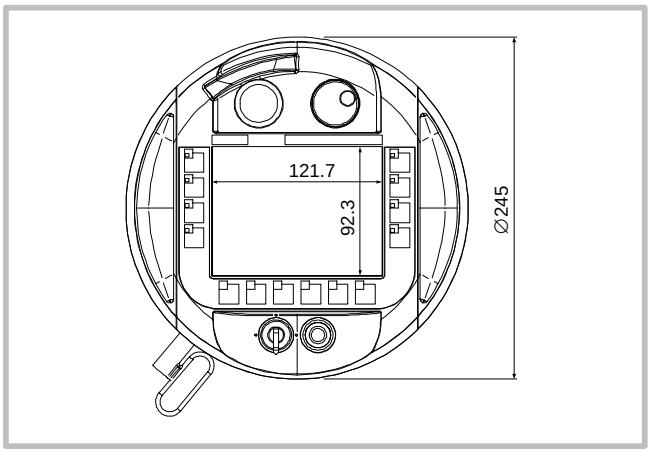


Figure 1-8 Mobile Panel 170 – front view

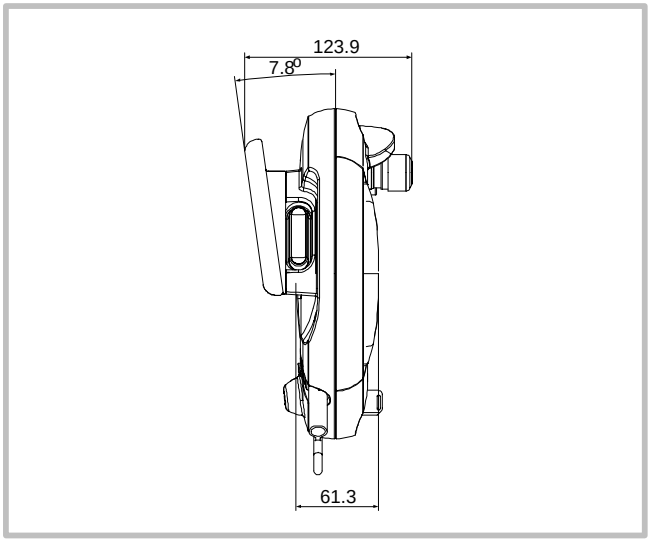


Figure 1-9 Mobile Panel 170 – side view

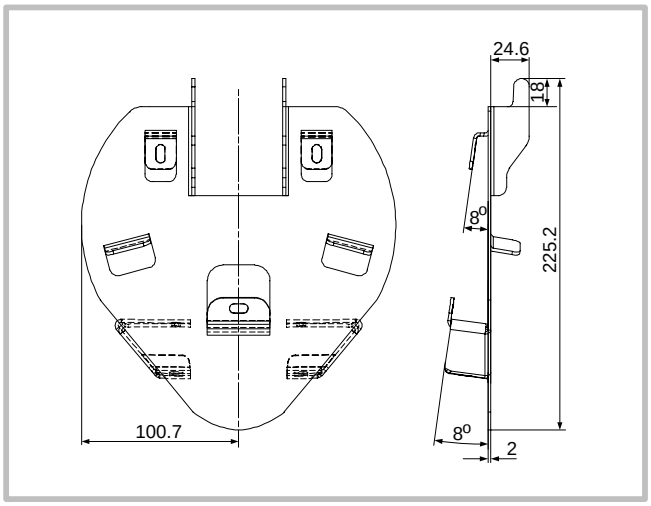


Figure 1-10 Wall mounting bracket

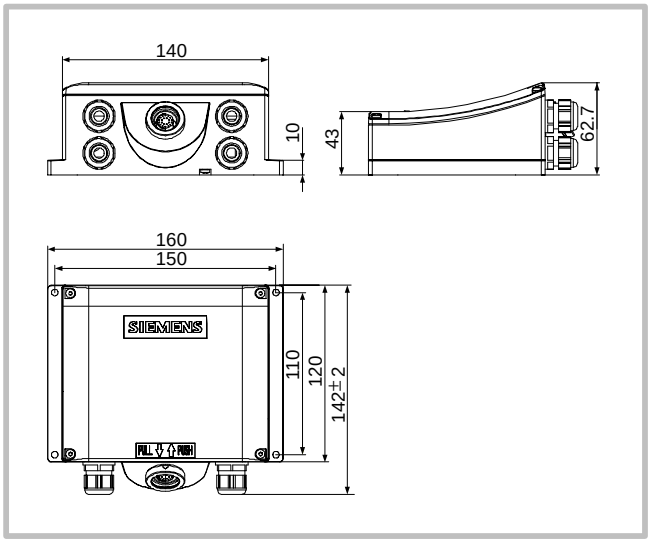


Figure 1-11 Connectivity box

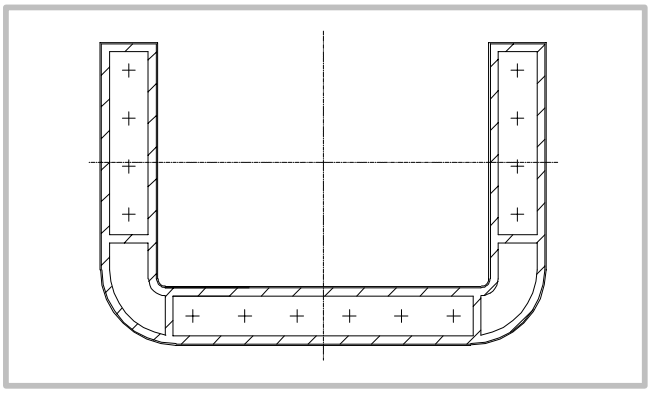


Figure 1-12 Protective cover

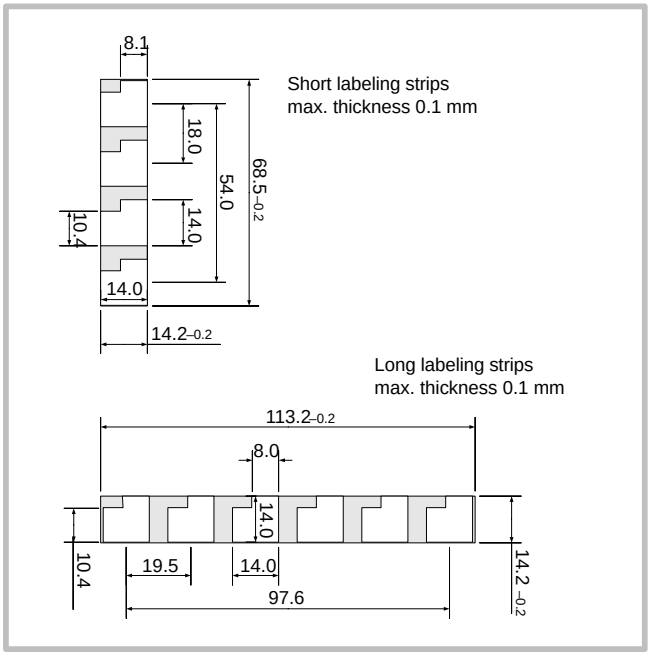


Figure 1-13 Labeling strip dimensions

Technical Data 2

2.1 Mobile Panel 170

Input medium	
Type	Touchscreen, analog, resistive, Membrane keyboard
Programmable, free labeling of function keys	14 (F1 to F8 with LEDs)
Acknowledgement buttons	2-circuit, 3-position Connection voltage: 24 VDC Current strength – maximum: 500 mA – minimum: 10 mA
STOP button	Optional, 2-circuit Connection voltage: 24 VDC Current strength – maximum: 500 mA – minimum: 10 mA The contacts are normally closed contacts.
Knob	Optional
Key-operated switch	Optional, 3 switch positions
Pushbutton with integrated LED	Optional

Operating system	MS Windows CE
Processor	RISC, 32 bit
Memory	• Flash, integrated 768 kbyte for user data (for ProTool configuration data) • CompactFlash memory card
Power supply	Via connectivity box
Clock	Hardware clock, not buffered
Dimensions, overall	Diameter: 245 mm Deep: 58 mm
Weight	Approx. 1.3 kg

Temperature • Operation • Shipping/Storage	 0 to +40 °C –20 to +60 °C
Relative humidity • Operation • Shipping/Storage	 20 to 80%, no condensation 5 to 90%, no condensation
Max. drop height	1.5 m
Degree of protection	IP65
Connection cable Bending radius, permissible	 > 40 mm

2.2 Connectivity box

Voltage supply	24 V DC (+20.4 to +28.8 V)
Power consumption, typical	Approx. 400 mA, Connectivity Box Basic Approx. 500 mA, Connectivity Box Plus Applies at 24 V with Mobile Panel 170 connected.
Dimensions, W x H x D [mm]	160 x 145 x 65
Weight	Approx. 0.35 kg, Connectivity Box Basic Approx. 0.40 kg, Connectivity Box Plus
Temperature • Operation • Shipping/Storage	 0 to +50 °C –20 to +70 °C
Relative humidity • Operation • Shipping/Storage	 35 to 85%, no condensation 35 to 85%, no condensation
Degree of protection	IP65

Installation

3

Electrical connections

Connection to	Mobile Panel 170	Connec-tivity box
Configuration computer (PU or PC)	x	–
Printer	x	–
PLC	–	x
Power supply	–	x
STOP button	–	x
Acknowledgement buttons	–	x
Monitoring signal of the STOP button	–	x
Line for input bit to connection detection	–	x

x Electrical connection necessary

3.1 Mobile Panel 170

3.1.1 Opening the connection compartment

Caution

Disconnect the Mobile Panel 170 from the connectivity box.

It is possible to inadvertently trigger the STOP button or other operating elements (key-operated switch, buttons) causing maloperations when the operating unit is set down on its front side.

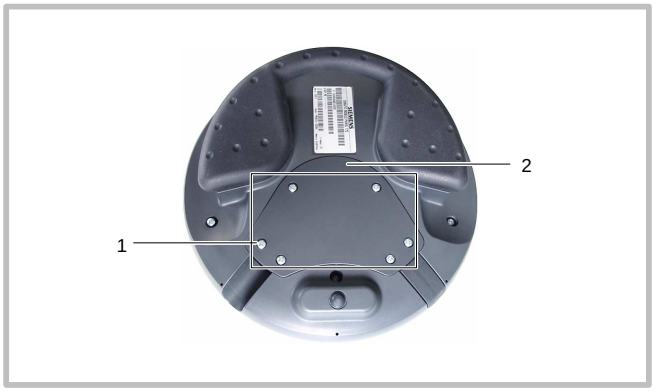


Figure 3-1 Opening the connection compartment

1. Unscrew the screws (1) approx. 1 cm.
2. Put the cover (2) with the screws in a safe place.

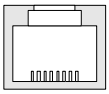
3.1.2 Connections

Figure 3-2 Arrangement of connections

No.	Name	Description	Use for
1	Slot	Memory card (CF card)	• Data storage • Backup/Restore
2	RJ45 socket	–	• Connection cable
3	Sub-D connector, 9-pin	RS 232 IF2	• Configuration computer • Printer
4	Support plug connector	–	• Connection cable

RJ45 plug connector

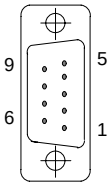
Table 3-1 Assignment of the 8-pin, RJ45 plug connector



Pin	Signal
1	RxD-B
2	RxD-A
3	CTS-B
4	RTS-B
5	RTS-A
6	CTS-A
7	TxD-B
8	TxD-A

Sub-D socket

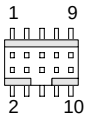
Table 3-2 Assignment of the 9-pin Sub-D socket



Pin	IF2
1	DSR
2	RxD
3	TxD
4	DTR
5	GND
6	DCD
7	RTS
8	CTS
9	Not assigned

Support plug connector

Table 3-3 Assignment of the support plug connector



Pin		Circuit
1	+24 V	Power supply
2	0 V	
3	Stop 23	Stop circuit
4	Stop 24	
5	Stop 13	
6	Stop 14	
7	Enable 1+	Acknowledgement circuit
8	Enable 1–	
9	Enable 2+	
10	Enable 2–	

3.1.3 Connecting the cable

Notice

Ensure the plug connector is fully engaged otherwise there is a danger of triggering a Stop or the communication not functioning.

Connecting the connection cable

1. Insert the connection cable (1) in the cable guide.
2. Insert the dummy plugs (2) in the cable guide not required.

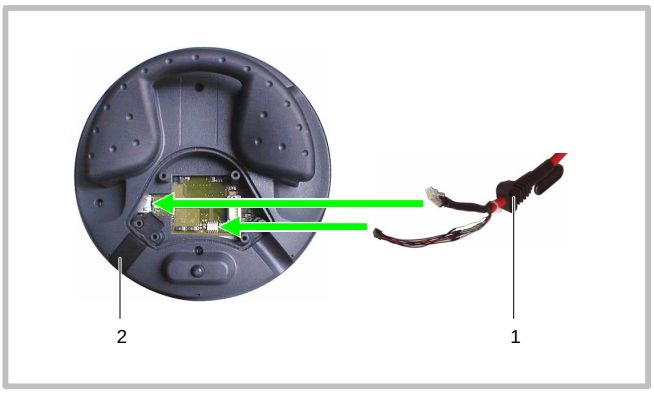


Figure 3-3 Connecting the connection cable

3. Connect the plug connectors at the contact points in accordance with Figure 3-3.
4. Check the plug connector is fitted properly.

Connecting a configuration computer or printer

Notice

Data transfer to the configuration computer and to the printer is only possible with the connection compartment open. The IP65 degree of protection is no longer realized under these conditions.

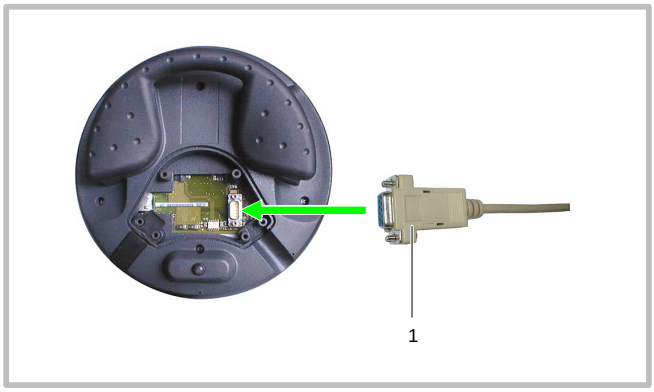


Figure 3-4 Connecting the RS 232 cable

1. Connect the plug on the RS 232 cable to the contact point as illustrated in Figure 3-4.
2. Secure the RS 232 cable with the connector fastening screws.
3. Set the Mobile Panel 170 down in a safe place.

3.1.4 Connect Configuration Computer

Connection configuration for downloading via MPI/PROFIBUS-DP

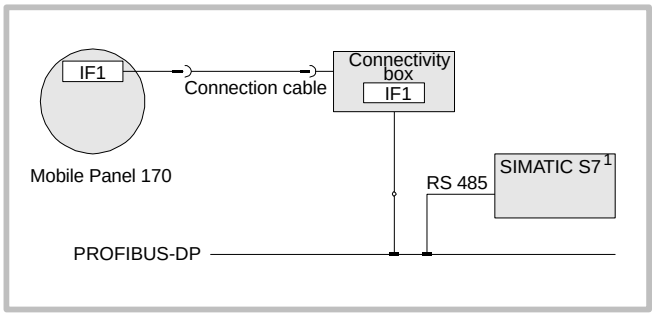


Figure 3-5 Connection configuration diagram for configuration computer

1 Use only the approved cables for connection to the SIMATIC S7 PLC.

Connection configuration for serial downloading

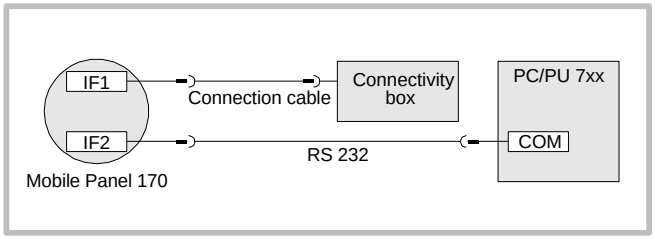


Figure 3-6 Connection configuration diagram for configuration computer

3.1.5 Connect Printer

Connection configuration

- compatible with ESC/P, 9-pin ESC/P or ESC/P2 (EPSON)
  e.g. EPSON FX850, Brother 1250
- compatible with PCL3 (Hewlett Packard)
  e.g. HP LaserJet 5M

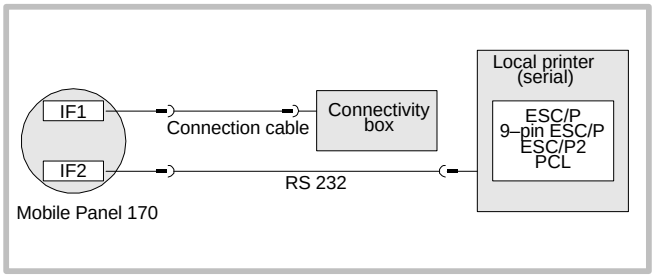


Figure 3-7 Printer connection configuration

Note

Only use a cable with braided metal screening grounded at each end for connecting the operating unit and printer.

In the Configuration menu, deactivate *Remote Control* if a serial printer is to be connected to the operating unit via the IF2 interface.

Some printers may require that the ASCII character set used in the configuration is defined on the printer as well.

Printer settings

- RS 232, whereby only the RxD, TxD and GND signals are required (refer to Chapter 3.1.2)
- 8 data bits, 1 stop bit, no parity
- Baud rate between 9600 and 57600, printer-dependent
- XON/XOFF protocol

3.2 Connectivity Box

3.2.1 Opening the connectivity box

1. Loosen the screws (1).

Figure 3-8 Connectivity box

2. Put the screws (1) and cover (2) down in a safe place.

Notice

After completing the connections, check that the PU screw fittings which are not used are fitted with rubber seals. Otherwise, the IP65 degree of protection is not guaranteed.

If the connection cable is not plugged in, cover the connection socket with the dummy cover. Otherwise, the IP65 degree of protection is not guaranteed.

3.2.2 Connections

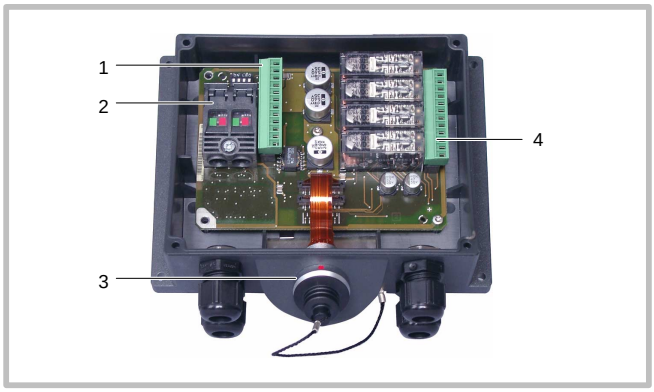


Figure 3-9 Arrangement of connections

No.	Name	Description	Use for
1	Terminal strip 1	RS 232, RS 422, RS 485	• IF1
		+24 VDC	• Power supply
2	Fast connector	–	• MPI/PROFIBUS-DP and RS 485
3	Socket	–	• Connection cable
4	Terminal strip 2	–	• Safety functions for STOP and Acknowledgement buttons • Additional functions for the PLC

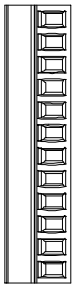
Caution

Short circuits in the connectivity box can impair the functionality of the Mobile Panels 170.

When carrying out manipulations with the housing open, it is essential to ensure that no conductive bits of residual cable or anything similar gets into the electrical circuitry and the conducting electrical wires do not come into contact with electrical circuits.

IF1 and power supply

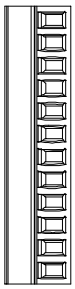
Table 3-4 Assignment of the 12-pin terminal strip 1

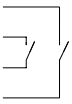


Pin	RS 232	RS 422	RS 485	Power supply
1	CTS	–	–	–
2	RTS	–	–	–
3	TxD	–	–	–
4	RxD	–	–	–
5	M	M	M	–
6	–	TxD+	Bus + (B)	–
7	–	TxD–	Bus – (A)	–
8	–	RxD+	–	–
9	–	RxD–	–	–
10	PE	PE	PE	PE
11	–	–	–	M24
12	–	–	–	P24

Safety and additional functions

Table 3-5 Assignment of the 12-pin terminal strip 2



Pin	Internal linking	Name	Circuit
1		Stop 13	STOP button see Chapter 4.2
2		Stop 14	
3		Stop 23	
4		Stop 24	
5	See Tables 3-6 and 3-7	STOP button pressed 31 [1]	PLC tracing signal
6		STOP button pressed 32 [1]	
7		Mobile Panel 170 31 plugged	
8		Mobile Panel 170 32 plugged [1]	
9		Enable 2+	Acknowledgement button see Chapter 4.3
10		Enable 1–	
11		Enable 1+	
12		Enable 2–	

[1] Applies to Connectivity Box Plus

Table 3-6 Connectivity Box Basic[1]

Link	Name	Digital input 24 V
Not connected 8 ○	Mobile Panel 170 plugged	1
to DI PLC 7 ○	Mobile Panel 170 not plugged	0

1 The “STOP button pressed” function is not available with Connectivity Box Basic.

Table 3-7 Connectivity Box Plus[1]

Link	Name	Digital input 24 V
+24 V 8 ○	Mobile Panel 170 plugged	1
to DI PLC 7 ○	Mobile Panel 170 not plugged	0
+24 V 5 ○	STOP button pressed	1
to DI PLC 6 ○	STOP button not pressed	0

1 The “STOP button pressed“ function has no fault detection and must not be used for critical safety applications!

3.2.3 Connect PLC

Communication interface for PLCs

The communication interface for all PLCs is located in the connectivity box on terminal strip 1 (refer to Table 3-4).

Siemens PLC	Protocol	Interface
SIMATIC S5	PROFIBUS-DP	IF1
SIMATIC S7	MPI[1] PPI PROFIBUS-DP	IF1
SIMATIC 500/505	NITP PROFIBUS-DP	IF1
SIMATIC WinAC Soft/Slot PLC (from V3.0)	SIMATIC S7 - 300/40020	IF1
SIMOTION	PROFIBUS-DP	IF1
SIMATIC S7-NC	PROFIBUS-DP MPI	IF1

1 Not possible with connection to SIMATIC S7-212

PLC manufacturer	Protocol	Interface
Allen Bradley	DF1[1] DH+[2] DH485[3]	IF1
GE-Fanuc Automation	SNP/SNPX	IF1
LG Industrial Systems/IMO	Dedicated communication[4]	IF1
Mitsubishi Electric Mitsubishi Melsec	FX Protocol 4	IF1 IF1
Omron	Hostlink/Multilink	IF1
Schneider Automation (Modicon)	Modicon Modbus	IF1
Schneider Automation (Telemecanique)	Uni-Telway	IF1

1 Applies for PLCs SLC500, PLC5/20, MicroLogix
2 Applies for PLCs SLC500, PLC5/20 via DF1
3 Applies for PLCs SLC500, MicroLogix
4 Lucky Goldstar via PROFIBUS-DP, also integrated to SIMATIC S7, WinAC, SIMATIC S5, SIMATIC 505

3.2.4 Connecting the MPI/PROFIBUS-DP cable

1. Stripping the MPI/PROFIBUS-DP cable.

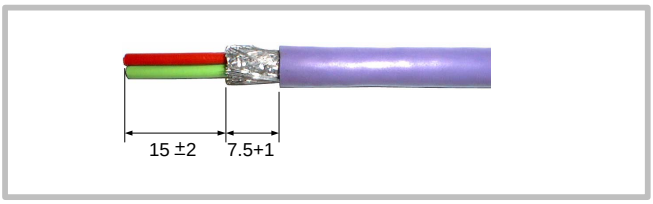


Figure 3-10 Stripping the MPI/PROFIBUS-DP cable

2. Unscrew the fast connector and open the cover (1).
3. Lever up the insulation displacement contact (4).
4. Insert the wires of the MPI/PROFIBUS-DP cable (3) according to the color-coding in the corresponding opening of the insulation displacement contact.

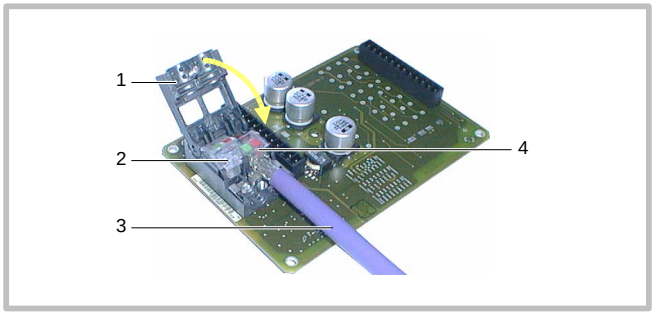


Figure 3-11 Connecting the MPI/PROFIBUS-DP cable

5. Press the insulation displacement contact down.
6. Slide the MPI/PROFIBUS-DP cable on the insulation displacement contact (2).
7. Close the cover and screw tight.

Note

If the connectivity box is the bus end subscriber, the DIP switch must be set on the free insulation displacement contact according to Table 3-8. This activates the terminal resistors.

Connection configuration

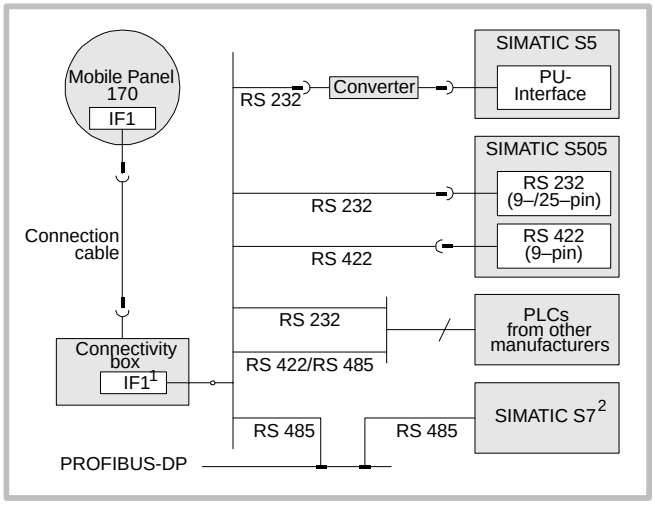


Figure 3-12 Connection configuration diagram for PLCs

1 To enable operation using the serial interface, connect either the RS 232 or RS 422/485, but not both.
2 Use only the approved cables for connection to the SIMATIC S7 PLC.

Notice

The converter must be installed in such a way as to ensure the IP65 degree of protection. Also observe the maximum permissible cable lengths for the process connection.

3.2.5 Configure interface IF1

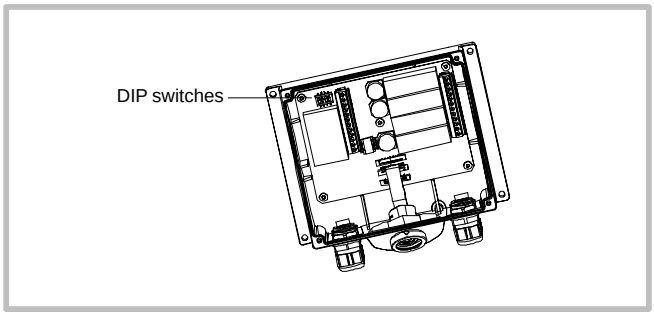


Figure 3-13 DIP switch position

Table 3-8 DIP switch settings and allocated protocol

Communication	Switch Setting
Mobile Panel 170 — Connection box — RS 232 / RS 422 — PLC	1 2 3 4 ON OFF
Mobile Panel 170 — Connection box — MPI/PROFIBUS-DP — PLC	1 2 3 4 ON OFF
Mobile Panel 170 — Connection box — MPI/PROFIBUS-DP — PLC; Last subscriber	1 2 3 4 ON OFF

3.2.6 Connecting the power supply

Note

The connectivity box has reverse pole protection.

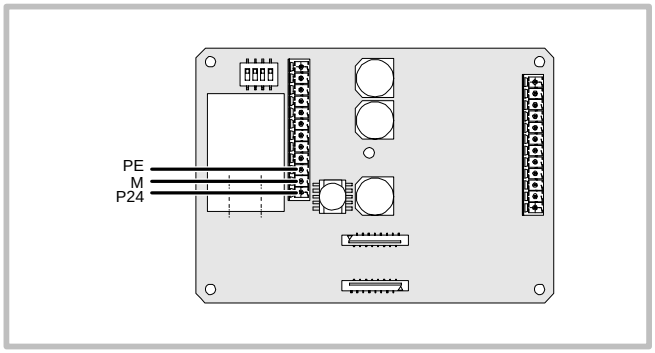


Figure 3-14 Interface for power supply and grounding conductor

Warning

Personal injury and equipment damage can occur. If the 24 VDC power supply for the Mobile Panel 170 is not correctly applied, components in the system to be monitored could be damaged and persons could be injured.

Only use a safety extra-low voltage (SELV) for the 24 VDC supply voltage to the Mobile Panel 170.

Caution

When using a 24 VDC supply, make sure that the extra-low voltage is isolated safely. Use only power supply units complying with IEC 364-4-41 or HD 384.04.41 (VDE 0100, Part 410).

The supply voltage must be within the specified voltage range. Voltages outside this range can cause malfunctions on the operating unit.

3.2.7 Starting up the connectivity box

1. Connect the connectivity box to the power supply.
2. Connect the Mobile Panel 170 connection cable to the connectivity box.
3. Switch on the power supply.

   If the Mobile Panel 170 does not start up, the connections are probably wrongly poled – switch off the power supply, swap the connections and switch on the power supply again.

   Wait for the operating system to boot.
4. Connect the configuration computer or other periphery equipment to the Mobile Panel 170.

Operation

4

4.1 Holding the Operating Unit

Figure 4-1 Lower arm support for right and left-handed users in Manual Mode

Figure 4-2 Two-handed support for data manipulation

Notice

In the case of manual control, hazard-related movements using special operating modes necessitate a lower arm support is used, as depicted in Figure 4-1.

4.2 STOP Button

Figure 4-3 STOP button

Warning

If the Mobile Panel 170 is equipped with a STOP button but it is not connected to the connection box, a stop cannot be triggered by the Mobile Panel 170 STOP button; i.e. the Mobile Panel 170's STOP button is ineffective.

Install stationary Stop buttons which are available on the system to be monitored at all times.

Warning

If the Stop circuit is defined as a Category 0 or 1 stop, the stop function must be effective regardless of the operating mode. A Category 0 stop must have priority. Releasing the STOP button must not initiate any risk-related conditions (also refer to EN 60204-1:1997 Chapter 9.2.5.3).

The stop is not a substitute for safety equipment.

Notice

Only install connectivity boxes of one type to the system to be monitored; i.e. only Connectivity Box Plus or Basic.

Notice

Applies when the Mobile Panel 170 is connected to a connectivity box:

The STOP button on the Mobile Panel 170 may be triggered if the unit is dropped and cause the machine being monitored to shut down.

4.2.1 Connectivity Box Plus

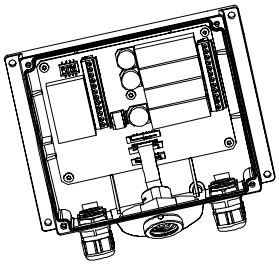


Figure 4-4 Connectivity Box Plus

Switching statuses of the Stop or Emergency Stop circuit in the case of a connected Mobile Panel 170 **with** STOP button:

Mobile Panel 170	STOP button	Switching statuses of the Stop or Emergency Stop circuit
Connected	Not pressed	The Stop or Emergency Stop circuit in the connectivity box remains closed.
Connected	Pressed	The Stop or Emergency Stop circuit in the connectivity box is **open**. System being monitored is shut down.
Not connected	–	The Stop or Emergency Stop circuit in the connectivity box remains closed.

Switching statuses of the Stop or Emergency Stop circuit in the case of a connected Mobile Panel 170 **without** STOP button:

Mobile Panel 170	STOP button	Switching statuses of the Stop or Emergency Stop circuit
Connected	Not available	The Stop or Emergency Stop circuit in the connectivity box remains closed.
Not connected	Not available	The Stop or Emergency Stop circuit in the connectivity box remains closed.

Warning

If the system to be monitored has been shut down, the STOP button may only be released or the system being monitored restarted when the reasons which caused the stop have been eliminated and starting up presents no dangers or risks.

Warning

Unplugging the Mobile Panel 170 from the Connectivity Box Plus always causes the stop or emergency stop circuit to be closed and, thus, to releasing the stop status of the system to be monitored, even if the STOP button on the Mobile Panel 170 is pressed!

Notice

There is a delay of approx. 100 ms between triggering the STOP button and the reaction of the Stop contacts in the Connectivity Box Plus.

4.2.2 Connectivity Box Basic

No function “stop loop through”.

Caution

The Stop or Emergency Stop circuit is fed via the STOP button if a Mobile Panel 170 is connected. If the connection cable from the Mobile Panel 170 to the Connectivity Box Basic is disconnected, the Stop or Emergency Stop circuit is broken and the system being monitored is shut down or an emergency stop routine is performed safely.

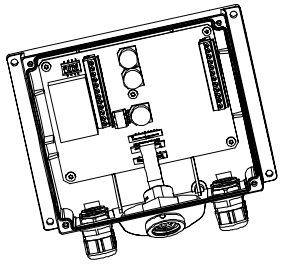


Figure 4-5 Connectivity Box Basic

Switching statuses of the Stop or Emergency Stop circuit in the case of a connected Mobile Panel 170 **with** STOP button:

Mobile Panel 170	STOP button	Switching statuses of the Stop or Emergency Stop circuit
Connected	Not pressed	The Stop or Emergency Stop circuit in the connectivity box remains closed.
Connected	Pressed	The Stop or Emergency Stop circuit in the connectivity box is **open**. System being monitored is shut down.
Not connected	–	The Stop or Emergency Stop circuit in the connectivity box is **open**. System being monitored is shut down.

Switching statuses of the Stop circuit in the case of a connected Mobile Panel 170 **without** STOP button:

Mobile Panel 170	STOP button	Switching statuses of the Stop or Emergency Stop circuit
Connected	Not available	The Stop or Emergency Stop circuit in the connectivity box remains closed.
Not connected	Not available	The Stop or Emergency Stop circuit in the connectivity box is **open**. System being monitored is shut down.

Warning

If the system to be monitored has been shut down, the STOP button may only be released or the system being monitored restarted when the reasons which caused the stop have been eliminated and starting up presents no dangers or risks.

4.2.3 Example configurations

Unit model 1 –
Mobile Panel 170 without STOP button and with Connectivity Box Basic

Connectivity boxes are not connected to the Emergency Stop circuit.

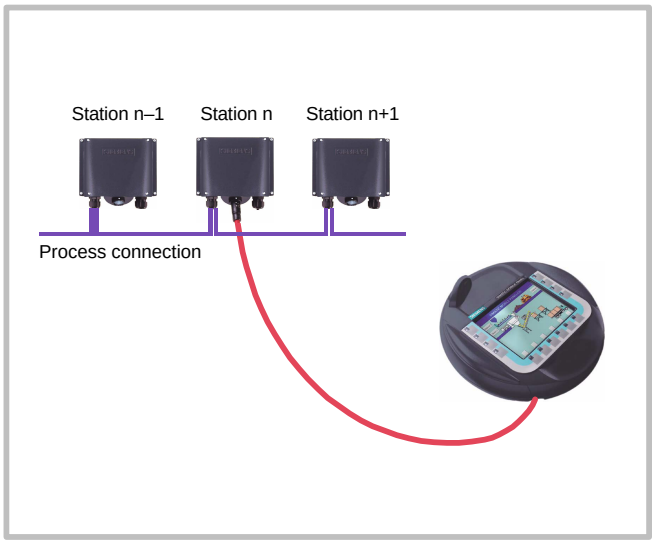


Figure 4-6 Mobile Panel 170 without STOP button

Variable connection to various units without connection to the emergency stop circuit.

Unit model 2 or 3 – Mobile Panel 170 with STOP button and with Connectivity Box Basic

Looping through in the Emergency Stop circuit when using the Connectivity Box Basic.

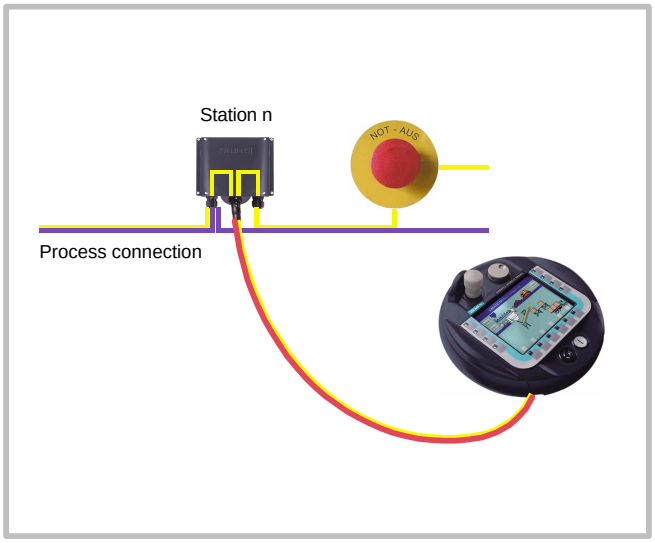


Figure 4-7 Mobile Panel 170 with STOP button and Connectivity Box Basic

- Mobile Panel 170 plugged in:
  Emergency Stop circuit is closed
- Mobile Panel 170 unplugged:
  Emergency Stop circuit is broken – Emergency Stop is triggered

Fixed connection to one unit looped in the emergency stop circuit.

Unit model 2 or 3 – Mobile Panel 170 with STOP button with Connectivity Box Plus

Looping through the Emergency Stop circuit when using the Connectivity Box Plus.

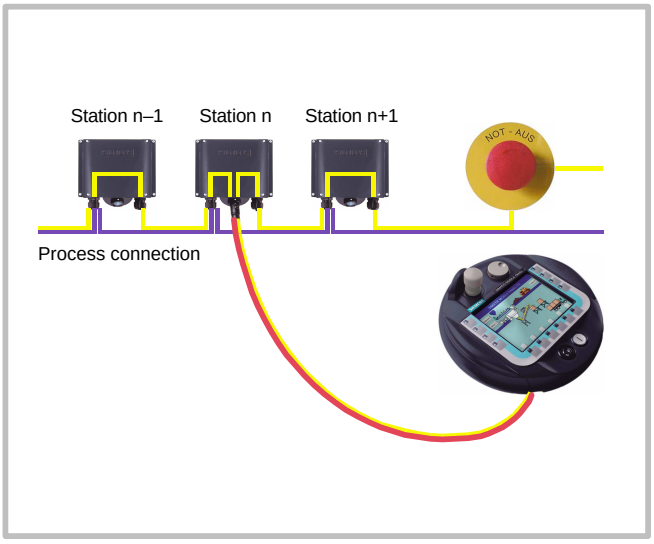


Figure 4-8 Mobile Panel 170 with STOP button and Connectivity Box Plus

- Mobile Panel 170 plugged in:
  Emergency Stop circuit is closed
- Mobile Panel 170 unplugged:
  Emergency Stop circuit is closed

Variable connection to various units looped through the emergency stop circuit.

4.3 Acknowledgement Button

Figure 4-9 Acknowledgement button

- Only one Acknowledgement button needs to be actuated
- There is no feedback to the PLC regardless of whether the Mobile Panel 170 is operated with one or two hands

Note

Since there is no electronic connection to the membrane keyboard, the Acknowledgement button and membrane keyboard can be operated simultaneously.

Switch setting

Switch setting	Function	Acknowledgement buttons	Switch status
1	Zero position	Is not pressed	OFF (open)
2	Acknowledgement	Is pressed	ON (closed)
3	Panic	Is pressed through	OFF (open)

Switching sequences of the Acknowledgement button:

Normal operation

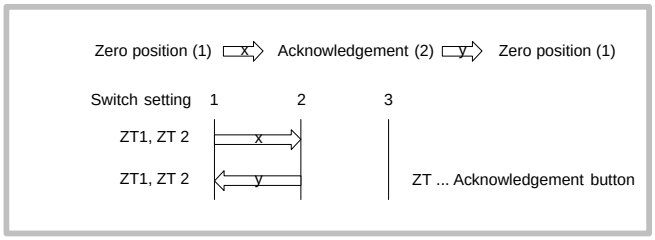


Figure 4-10 Linking of the switch positions when pressed normally

Panic operation

Switch setting “Panic” – on releasing the button, the “Acknowledgement” switch position is skipped over.

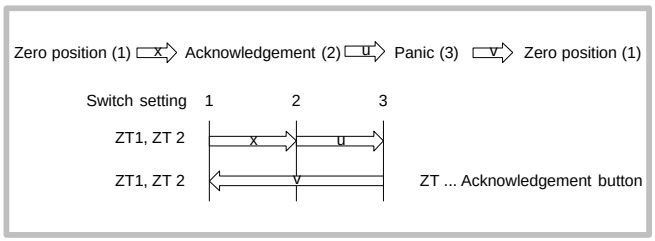


Figure 4-11 Linking of the switch positions in panic operation

- The signals from the Acknowledgement button are fed to the connectivity box via the connection cable. To use the manual special operating modes of the system to be monitored, these signals must be switched from the connectivity box, in 2-channel form, into the safety circuit to disconnect the power supply.
- The position of the Acknowledgement button can be polled via the CPU in the Mobile Panel 170 and evaluated for non-safety-related functions by the software.
- Releasing the Acknowledgement button or pressing through to the Panic position does not require an acknowledgement by the safety shutdown feature!

Special Functions

5

5.1 Connection Point Dependent Screen and Function Selection

Note

A system to be monitored can be divided into several zones or function areas by means of the connectivity boxes, whereby the safety functions can also be set up according to the zones. I.e. both the Acknowledgement button and STOP button can each only be effective for one respective zone.

Configuration detection

For different operating screens and functions at various connection points:

1. In order to detect the connectivity box to which the Mobile Panel 170 is connected in the PLC, the connectivity box must be wired to a PLC input signal on the hardware side.

   If the Mobile Panel 170 is connected to one of the connectivity boxes, the input bit in the PLC is set to ”1”.

2. These inputs can be polled by means of a ProTool tag and used in the configuration to call in and hide screens and functions.

Notice

Observe the notes in the tables 3-5 to 3-7.

Note

By using the *User Version* area pointer, it is possible to ensure that the Mobile Panel 170 is connected to the PLC defined in the configuration.

The *User Version* area pointer can only be assigned to one PLC per configuration (refer to the “Communication for Windows-based Systems” User’s Guide).

5.1.1 Application example 1

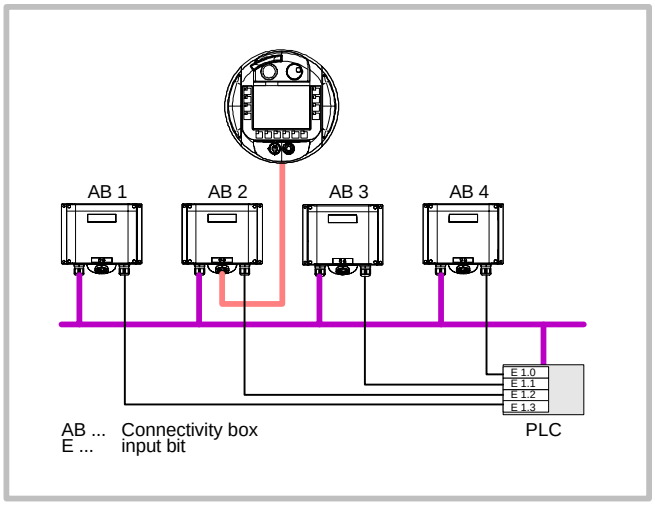


Figure 5-1 Application example 1

Each connectivity box must have a unique identification bit in the PLC.

The identification bit enables the screens and functions in the configuration to be called in and displayed using the *Select Screen Tag* according to the individual connectivity box.

5.1.2 Application example 2

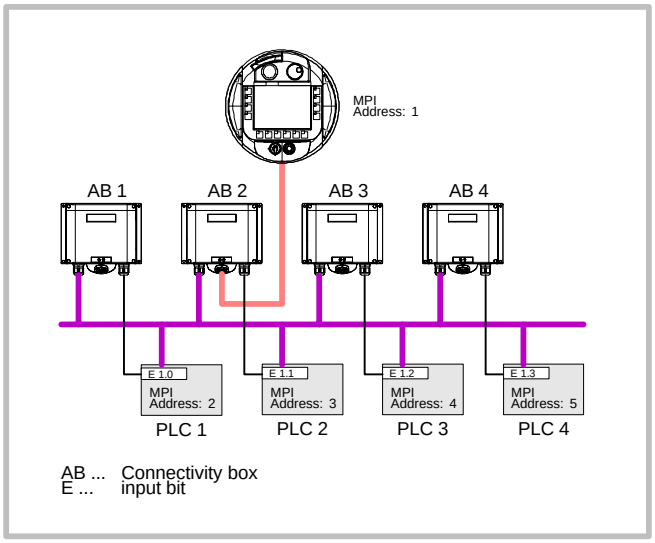


Figure 5-2 Application example 2

Each connectivity box must have a unique identification bit in the PLC.

The identification bit enables the screens and functions in the configuration to be called in and displayed using the *Select Screen Tag* according to the individual connectivity box.

Note

If practically the same screens and functions are used for all PLCs and the PLCs are of the same type, the configuration can be set up so that only one PLC connection is configured. The various PLCs can be addressed using the *Change PLC function*.

5.1.3 Application example 3

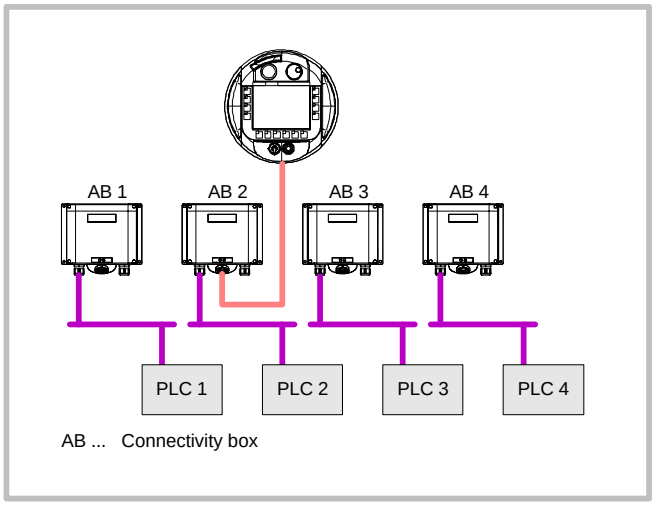


Figure 5-3 Application example 3

- Tags stored for specific PLCs can be used
- Identification bits are not necessary
- In the event of PLCs of different types (e.g. S7-300, S7-200 and SIMOTION) configure all PLCs *offline* in the configuration
- Activate the PLC according to the connection point using *Connect_Disconnect PLC* in the start screen

  Identification bits are not absolutely essential in this case. Activate the required PLC using the *Connect_Disconnect_PLC* function.

5.2 Operating Elements via Decentral Periphery

The following operating elements can be connected:

- Function keys
- Knob
- Key-operated switch
- Pushbutton with integrated LED

5.2.1 Membrane Keyboard

The membrane keyboard of the Mobile Panel 170 is comprised of the function keys F1 to F14.

Figure 5-4 Membrane keyboard

All function keys can be assigned global or picture-specific functions as:

- Direct keys
- Function keys with global function assignment
- Function keys with local function assignment (softkeys)

5.2.2 Knob

Serves to enter incremental values. The knob has no limit stop and no zero setting.

Figure 5-5 Knob

Input using the knob can be evaluated as direct decentral periphery.

5.2.3 Key-operated Switch

serves to lock certain function which can be triggered using the Mobile Panel 170.

Figure 5-6 Key-operated switch

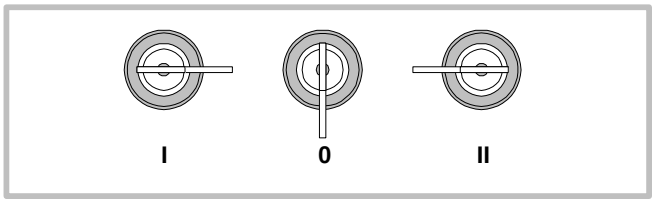


Figure 5-7 Switch positions of the key-operated switch

The switch positions can be evaluated as direct decentral periphery.

Note

The key for the key-operated switch is enclosed with the operating unit. The key does not have a specific operating unit coding. Therefore, it can be used for every Mobile Panel 170.

Remove the key after use. This prevents breaking the key should the operating unit fall.

5.2.4 Pushbutton With Integrated LED

Serves for fast digital input.

Figure 5-8 Pushbutton with integrated LED

The pushbutton with integrated LED is used to key in and is labeled with “I”. When the button is pressed, the LED lights up.

The switch positions can be evaluated as direct decentral periphery.

5.2.5 Evaluation

The configuration of the DP direct keys is described in “Communication for Windows-based Systems” User’s Guide, Part 1.

The direction pulse of the handwheel and switching status of the function keys, key-operated switch and buttons with integrated LEDs are read out directly from the Mobile Panel 170 and can be transferred to the PLC for evaluation. Five bytes are available for the evaluation.

Byte assignment

Byte assignment in the input/output area for the Mobile Panel 170 operating elements:

Key bits								Byte	LED bits							
7	6	5	4	3	2	1	0		7	6	5	4	3	2	1	0
F8	F7	F6	F5	F4	F3	F2	F1	n	F8	F7	F6	F5	F4	F3	F2	F1
		F14	F13	F12	F11	F10	F9	n+1								
					T0	S1	S0	n+2								
I7	I6	I5	I4	I3	I2	I1	I0	n+3								
D7	D6	D5	D4	D3	D2	D1	D0	n+4								

F ... Bit for function key
S ... Bit for key–operated switch
T ... Bit for button with LED

I ... Bit for knob pulse, forwards
D ... Bit for knob pulse, backwards

Figure 5-9 Byte assignment of keys and LEDs in input/output area

Bit coding

- Bit coding of the function keys

Switch setting	F1 to F14
Not pressed	0
Pressed	1

- Bit coding of the function key LEDs

Switch setting	F1 to F8
LED does not light up	0
LED lights up	1

- Bit coding of the key-operated switch

Switch setting	S1	S0	Key position
Position 0	0	0	In middle position
Position I	0	1	Turned counter-clockwise to stop
Position II	1	0	Turned clockwise to stop

- Bit coding of buttons with integrated lamps

Switch setting	T0
Not pressed	0
Pressed	1

- Bit coding of the rotary knob
  - No setpoint value is defined for the knob.
  - After the Mobile Panel 170 has started up, bytes n+3 to n+4 (refer to Figure 5-9) are set to zero.

    Turning the knob generates positive or negative pulses according to the direction it is turned. The number of positive pulses is stored in bits I0-I7 and the number of negative pulses in bits D0-D7.

    The values are entered in binary format whereby Bit 0 has the lowest value and Bit 7 the highest.

    One revolution of the knob provides 50 pulses.
  - Each knob pulse is added to the corresponding byte, n+3 or n+4, according to the direction of rotation. There are no negative values. If the permitted value range is exceeded, a flashover occurs:

    If the value 255 is increased by one pulse, it results in the value 0.

Example of bit coding the rotary knob

The following table contains an example of rotation direction definition with pulses which are stored in bytes n+3 and n+4 and measured during the time points t_1 to t_4.

Evaluation time point	Knob		Evaluation
	Pulse, Forwards	Pulse, Backwards	
t_1	255 (–1)	245 (–11)	—
t_2	10	245 (–11)	Pulse, forwards: 11 Pulse, backwards: 0 Resulting value: +11
t_3	10	4	Pulse, forwards: 0 Pulse, backwards: 15 Resulting value: –15
t_4	15	5	Pulse, forwards: 5 Pulse, backwards: 1 Resulting value: +4

The resulting value, and thus the direction of rotation, is established from the difference between two successive time points t_n and t_{n+1}. Refer to the table for the number of forward pulses and backwards pulses

- at time point t_n and
- at time point t_{n+1}

Then define the resulting value. This results from:

Resulting value =

pulses, forwards, t_{n+1} – pulses, forwards, t_n – (pulses, backwards, t_{n+1} – pulses, backwards, t_n)

Connection Examples – Safety Category 3

6

Notice

In order to ensure Safety Category 3 complying to EN 954-1, also observe the operating manual of the monitoring unit implemented.

Acknowledgement button on monitoring unit ELAN SRB-NA-R-C.27/S1

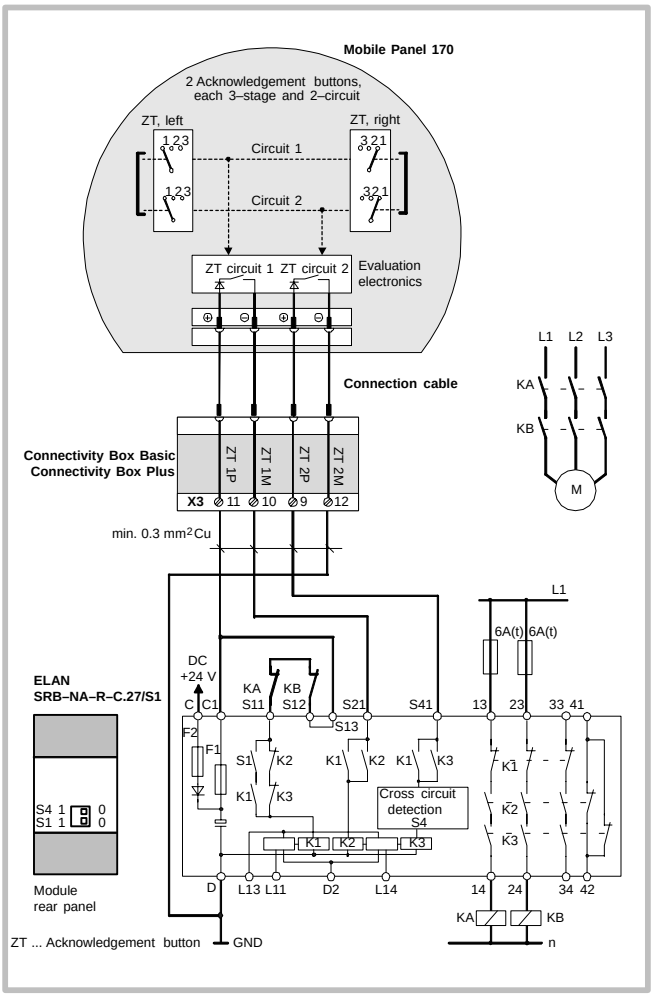


Figure 6-1 Acknowledgement button on monitoring unit ELAN SRB-NA-R-C.27/S1

All KA and KB contacts **must** have forced guidance. The switches S1 and S4 on the rear side of the module **must** be set to Position 0.

Acknowledgement button on monitoring unit PILZ PST1

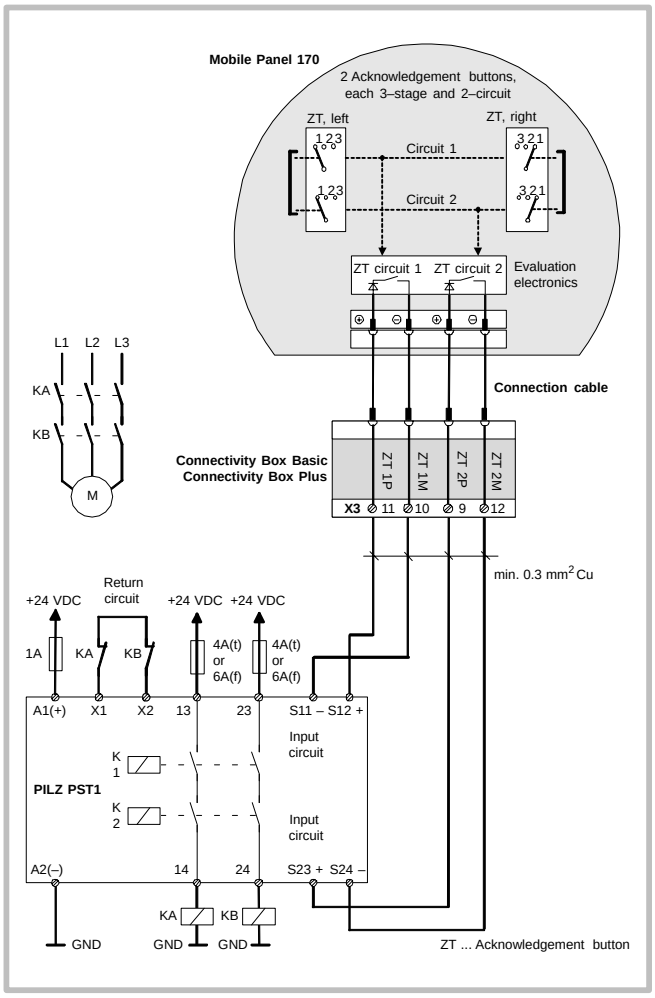


Figure 6-2 Acknowledgement button on the monitoring unit PILZ PST1

All KA and KB contacts **must** have forced guidance.

STOP button on monitoring unit SIGUARD 3TK2840

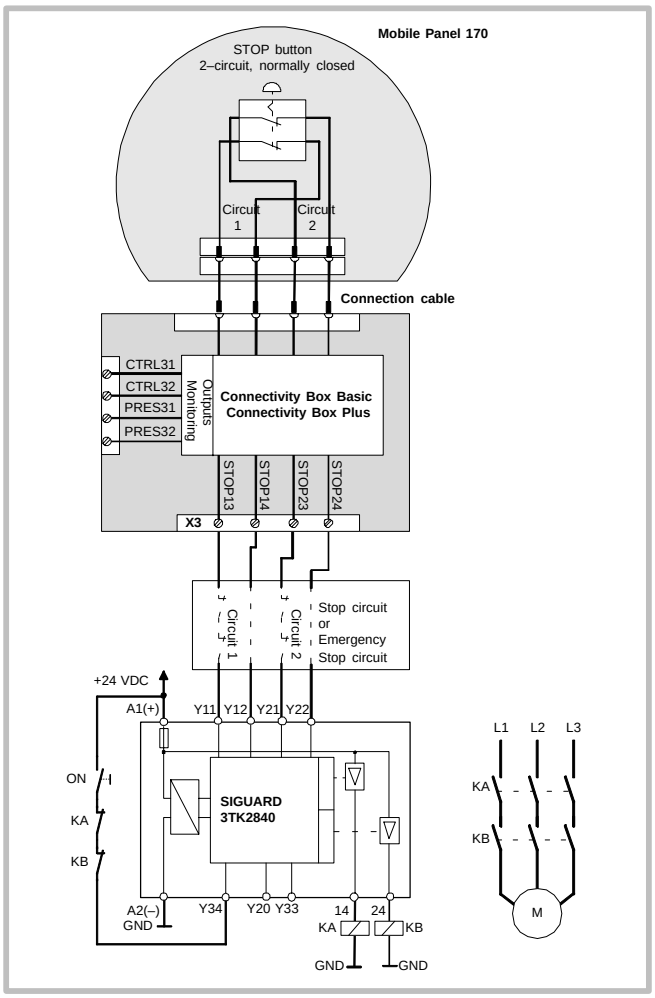


Figure 6-3 STOP button on monitoring unit SIGUARD 3TK2840

All KA and KB contacts **must** have forced guidance. The monitoring outputs must not be used for safety-related functions.

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