

## Service and maintenance

### 12.1 Maintenance and care

#### Introduction

Read sections "Safety-related operator controls (Page 107)" and "Safety instructions (Page 41)" of the safety notes for information on service and maintenance.

#### Scope of maintenance

The HMI device is designed for maintenance-free operation. Remember to include accessories and peripheral equipment in the maintenance.

The scope of maintenance includes:

- **Function test**

Perform an annual function test for the enabling button and EMERGENCY STOP button.

Proceed as follows:

  - Switch on the HMI device.
  - Press both enabling buttons when the "Test Enabling Button" dialog is shown.
  - Press the EMERGENCY STOP button.
- **Function test**

For the execution of the function test, the HMI device must be turned on, but not integrated. Test the function of the following operating elements:

  - EMERGENCY STOP button  
Press the emergency stop button at least once a year.
  - Enabling button  
Press both enabling buttons every time you start a project.
- **Storing the main rechargeable battery**

A lithium-ion rechargeable battery loses more than 50% of its charge capacity within three years .

Store rechargeable batteries at 40 to 60% of their capacity to ensure optimal service life. Manufacturers recommend storage at 15° C – which is optimal for aging and self-discharge.

Charge the battery every six months to 40 to 60% of its charge capacity.
- **Exchanging the transponder batteries**

Replace the transponder batteries at least every 5 years.

The changing of batteries is described in section "Setting the transponder ID and inserting the batteries (Page 79)."

### Scope of maintenance

The scope of maintenance includes:

- Cleaning the touch screen
- Cleaning the membrane keypad

### Procedure - maintenance

<b>CAUTION</b>
<b>Damage possible</b>
Using compressed air or steam cleaners, or aggressive solutions or scouring agents will damage the HMI device.
Use a cleaning cloth dampened with a cleaning agent to clean the equipment. Only use water with a little liquid soap or a screen cleaning foam.

Proceed as follows:

1. Switch off the HMI device.
2. Spray the cleaning solution onto a cleaning cloth.  
Do not spray directly onto the HMI device.
3. Clean the HMI device.  
When cleaning the display, wipe inwards from the edge of screen.

### See also

Replacing and charging the main rechargeable battery (Page 89)

Replacing the main rechargeable battery (Page 91)

## 12.2 Spare parts and repairs

If the unit needs to be repaired, ship the HMI device to the Return Center in Fürth.

The address is:

Siemens AG  
Industry Sector  
Returns Center  
Siemensstr. 2  
90766 Fürth  
Germany

You can find more detailed information on the Internet at Spare parts and repairs (<http://support.automation.siemens.com/WW/view/en/16611927>).

### See also

Accessories (Page 18)

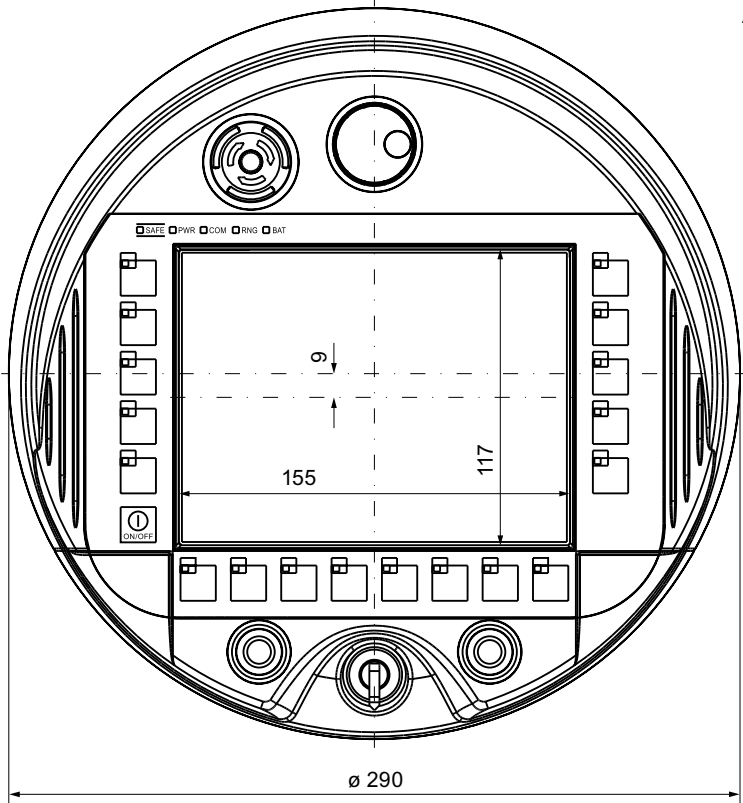
# 13

## Technical specifications

### 13.1 Dimension drawings

#### 13.1.1 Mobile Panel 277F IWLAN

Front view

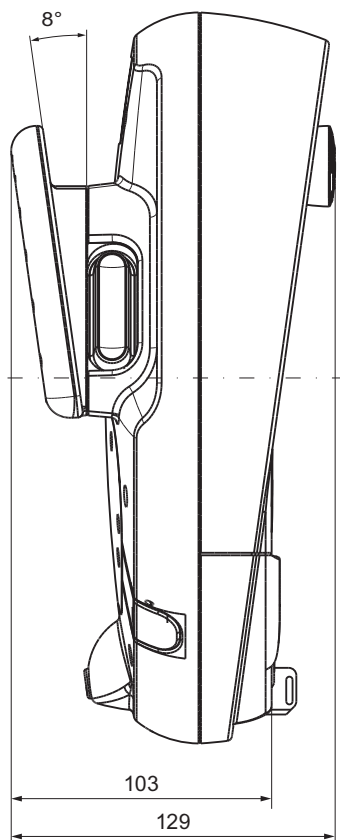


All dimensions in mm

*Technical specifications*  
*13.1 Dimension drawings*

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**Side view**

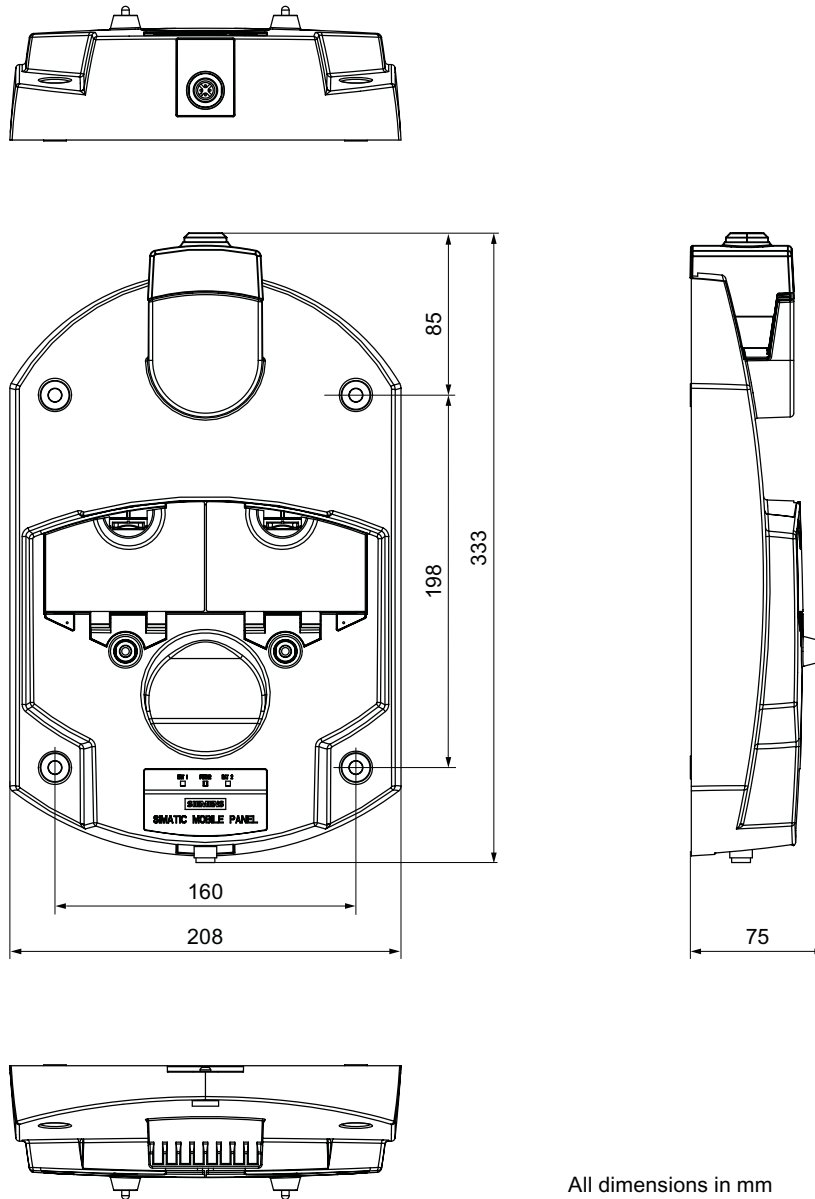


All specifications in mm

You can find additional images in the Internet at:

Image database (<http://www.automation.siemens.com/bilddb/index.aspx?att14s=35>)

### 13.1.2 Charging station

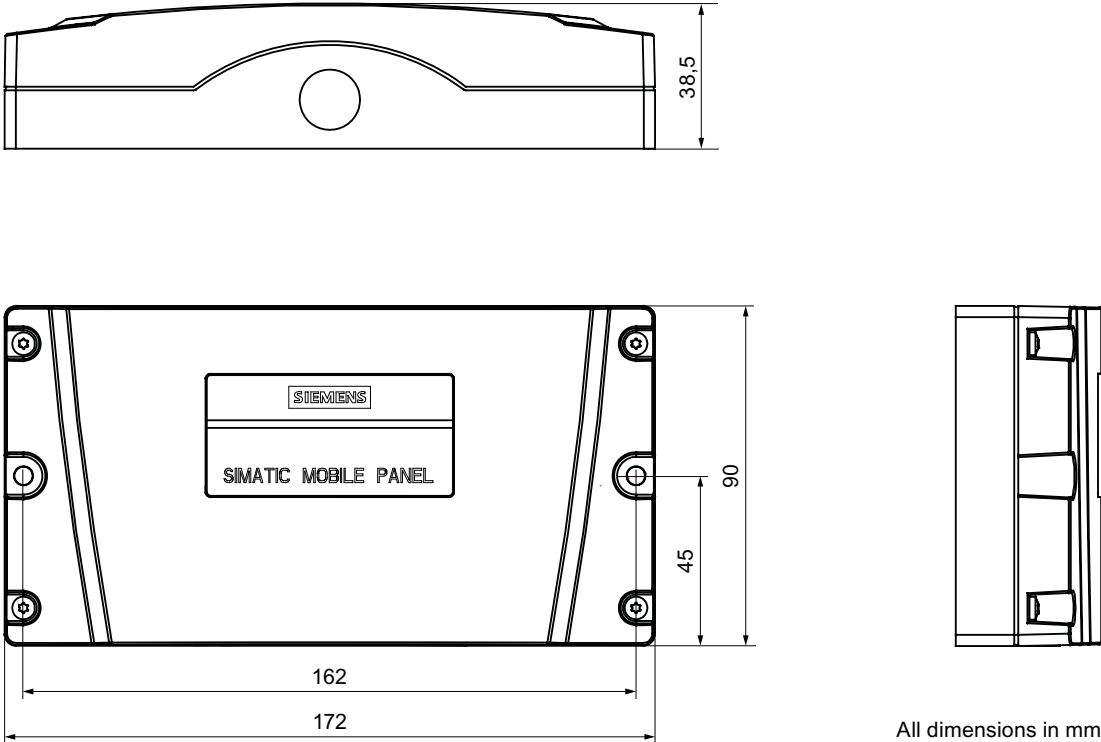


You can find additional images in the Internet at:  
Image database (<http://www.automation.siemens.com/bilddb/index.aspx?att14s=35>)

Technical specifications

13.1 Dimension drawings

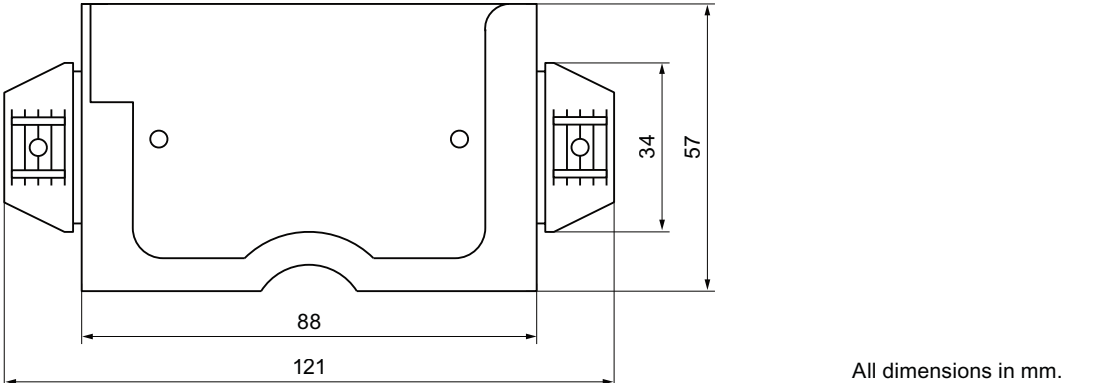
13.1.3 Transponder



You can find additional images in the Internet at:  
Image database (<http://www.automation.siemens.com/bilddb/index.aspx?att14s=35>)

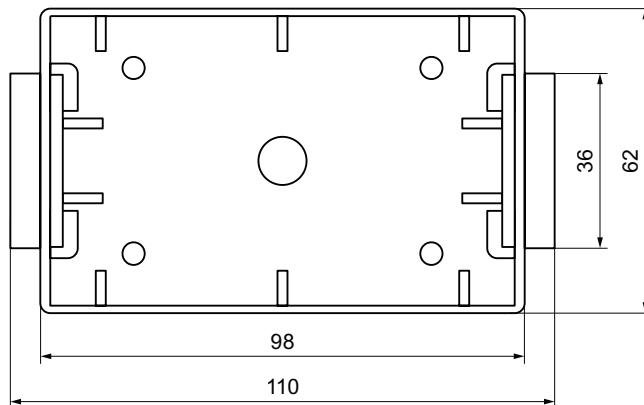
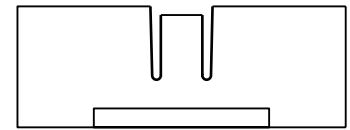
13.1.4 RFID tag

Fixing pocket



All dimensions in mm.

Spacer



Alle Angaben in mm.

You can find additional illustrations on the Internet at Image database (<http://www.automation.siemens.com/bilddb/index.aspx?att14s=35>).

Technical specifications

13.2 Specifications

13.2.1 Mobile Panel 277F IWLAN

HMI device

Weight with battery, without packaging	Max. 2,2 kg
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Display

Type	Color TFT LC display
Display area, active	151.66 mm x 113.74 mm (7.5")
Resolution	640 x 480 pixels
Colors, displayable	64k colors
Brightness control	Yes
Backlighting	CCFL
Half Brightness Life Time, typical	50 000 h
Pixel error class according to DIN EN ISO 13406-2	II

Input device

Type	Touch screen, analog, resistive Membrane keyboard
Function keys	18, with LEDs
Enabling button	1
EMERGENCY STOP button	1
Key "ON/OFF"	1
Handwheel (optional)	1 50 pulses per rotation
Key-operated switch (optional)	1 3 switch settings
Illuminated pushbutton (optional)	2 LED separately controllable

Memory

Application memory	6 MB
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## Interfaces

1 x USB	<ul style="list-style-type: none"> <li>• USB host; conforms to USB standard 1.1 (supporting low-speed and full-speed USB devices)</li> <li>• Maximum load 100 mA</li> </ul>
WLAN, 1 x	For PROFINET WLAN
RJ45, 1 x	For PROFINET LAN

## Power supply

Power supply, through	<ul style="list-style-type: none"> <li>• Main battery</li> <li>• Charging station</li> <li>• Power supply unit</li> </ul>
Bridging time	50 s

## Additional specifications

Drop height with main battery	Max. 0,5 m
Buffer time with internal clock	ca. 4 days
Radio link to transponder <ul style="list-style-type: none"> <li>• Frequency range</li> <li>• Transmission angle</li> <li>• Power</li> </ul>	2,400 to 2,483 MHz Approx. 83° -1,50 dBm (0,7 mW) EIRP -3,65 dBm (0,4 mW) ERP
WLAN <ul style="list-style-type: none"> <li>• Frequency band</li> <li>• Power, max.</li> </ul>	5,180 to 5,835 MHz 18 dBm

## Fail-safe operation

### Note

The following technical data applies for a proof-test interval of 10 years and a mean repair time of 8 hours.

In accordance with IEC 61508	
Hardware architecture	Redundant 1oo2
Hardware error tolerance	1
Safe failure fraction	99,5 %
Diagnostic test interval	10 ms
Request rate	High demand mode

Technical specifications

13.2 Specifications

High demand (PFH: probability of a dangerous failure per hour)	8,60 × 10 <sup>-11</sup> 1/h
Maximum Safety Level Achievable	SIL 3
Useful life	10 years

<b>In accordance with DIN EN ISO 13849-1</b>	
Mean time to failure (MTTF <sub>d</sub> )	1 516 years
Meantime to Restoration (MTTR)	8 hours
Diagnostic coverage (DC)	99 %
Performance level (PL)	e
Safety category	4

<b>In accordance with EN 954-1</b>	
Safety category	4

Acknowledgement time	40 ms
Response time with no fault, max.	25 ms
Discrepancy time <ul style="list-style-type: none"> <li>• EMERGENCY STOP</li> <li>• Enabling button position "Enable"</li> <li>• Enabling button position "Panic"</li> </ul>	<ul style="list-style-type: none"> <li>• 500 ms</li> <li>• 2 s</li> <li>• 1 s</li> </ul>
Distance between transponder - HMI device, maximum	8 m
Distance between RFID tag - HMI device, maximum	5 cm

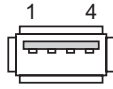
F-blocks for the safety program

F_FB_MP	1 per Mobile Panel 277F IWLAN, maximum 126
F_FB_RNG_4	1 per effective range, for which up to 4 HMI devices have logon permission
F_FB_RNG_16	1 per effective range, for which up to 16 HMI devices have logon permission
DB_STATES	1

## 13.2.2 Interface description

### USB

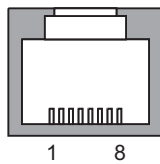
The figure below shows the pin assignment of the USB interface.



Pin	Assignment
1	+5 VDC, out (max. 100 mA)
2	USB-DN
3	USB-DP
4	GND

### RJ45

The figure below shows the pin assignment of the RJ45 interface.



Pin	Assignment
1	TD+
2	TD-
3	RD+
4	n. c.
5	n. c.
6	RD-
7	ICD+
8	ICD-

### WLAN

Operation of a wireless interface in the frequency bands 2.4 GHz and 5 GHz. The wireless interface is compatible with the following standards:

- IEEE 802.11a
- IEEE 802.11h
- IEEE 802.11b
- IEEE 802.11g

Technical specifications

13.2 Specifications

Receiver sensitivity

WLAN standard	Data transfer rate	Receiver sensitivity
IEEE 802.11a/h	54 Mbps	-74 dBm
	48 Mbps	-75 dBm
	36 Mbps	-80 dBm
	24 Mbps	-83 dBm
	18 Mbps	-86 dBm
	12 Mbps	-88 dBm
	9 Mbps	-89 dBm
	6 Mbps	-90 dBm
IEEE 802.11g	54 Mbps	-76 dBm
	48 Mbps	-77 dBm
	36 Mbps	-82 dBm
	24 Mbps	-85 dBm
	18 Mbps	-88 dBm
	12 Mbps	-91 dBm
	9 Mbps	-92 dBm
	6 Mbps	-93 dBm
IEEE 802.11b	11 Mbps	-90 dBm
	5.5 Mbps	-92 dBm
	2 Mbps	-94 dBm
	1 Mbps	-98 dBm

Transmission power

WLAN standard	Data transfer rate	Receiver sensitivity
IEEE 802.11a/h (5.18 ~ 5.7 GHz)	54 Mbps	13.5 dBm
	48 Mbps	15 dBm
	36 Mbps	16 dBm
	6-24 Mbps	17 dBm
IEEE 802.11a/h (4.92 ~ 5.16 GHz) (5.745 ~ 5.825 GHz)	54 Mbps	11.5 dBm
	48 Mbps	13 dBm
	36 Mbps	14 dBm
	6-24 Mbps	15 dBm
IEEE 802.11g (2.412 ~ 2.484 GHz)	54 Mbps	16 dBm
	48 Mbps	17 dBm
	36 Mbps	17 dBm
	6-24 Mbps	17 dBm
IEEE 802.11b	11 Mbps	20 dBm
	5.5 Mbps	20 dBm
	2 Mbps	20 dBm
	1 Mbps	20 dBm

### 13.2.3 Main battery

Main battery	
Type	Lithium ion accumulator
Operation time in normal mode	Approx. 4 h
Operation time in stand-by mode	Approx. 15 days
Charging cycles	500
Charging time	Approx. 4 h <sup>1)</sup>

- 1) The effective charging time depends on the ambient temperature. The higher the ambient temperature, the longer the charging time.

### 13.2.4 Charging station

#### Weight

Weight without packing	Approx. 1.1 kg
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#### Power supply

Nominal voltage	+24 VDC
Range, permissible	19.2 V to 28.8 V (-20%, +20%)
Transients, maximum permissible	35 V (500 ms)
Time between two transients, minimum	50 sec
Current consumption with Mobile Panel <ul style="list-style-type: none"> <li>• Typical</li> <li>• Constant current, maximum</li> <li>• Power on current surge <math>I^2t</math></li> </ul>	<ul style="list-style-type: none"> <li>• Approx. 1.5 A</li> <li>• Approx. 1.8 A</li> <li>• Approx. 1.7 A<sup>2</sup>s</li> </ul>
Current consumption with Mobile Panel and main battery in the charging compartments <ul style="list-style-type: none"> <li>• Typical</li> <li>• Constant current, maximum</li> <li>• Power on current surge <math>I^2t</math></li> </ul>	<ul style="list-style-type: none"> <li>• Approx. 2.8 A</li> <li>• Approx. 3.4 A</li> <li>• Approx. 1.7 A<sup>2</sup>s</li> </ul>
Fuse, internal	Electronic

*Technical specifications*

*13.2 Specifications*

**13.2.5 Transponder**

Weight without batteries	0,3 kg
Power supply	3 AA mignon batteries, 1.5 V
Operating life of batteries in normal operation	5 years
Radio link to HMI device	<ul style="list-style-type: none"> <li>• Frequency band</li> <li>• Transmission angle</li> </ul>
Type	Passive

**13.2.6 RFID tag**

Memory capacity	128 bytes
Memory technology	EEPROM
Protocol	ISO 15693
Data retention, at +40° C	10 years
MTBF, at + 40° C	2 x 106 hours
Read cycles	Unlimited
Write cycles, typical	200000
Write cycles, minimal	100000
Multitag-capable	Yes
Energy supply, inductive	Energy transfer (without battery)
Degree of protection in accordance with EN 60529	IP68

**Mechanical design**

Material	PC
Color	White/petrol
Dimensions (L x W x H) in mm	85.6 x 54 x 0.9

**Ambient temperature**

Operation	-25° C to +80° C
Storage/transport	-25° C to +80° C

### 13.3 WLAN radiation characteristics of the HMI device

This section contains illustrations on the radiation characteristics of various antennas.

#### Note

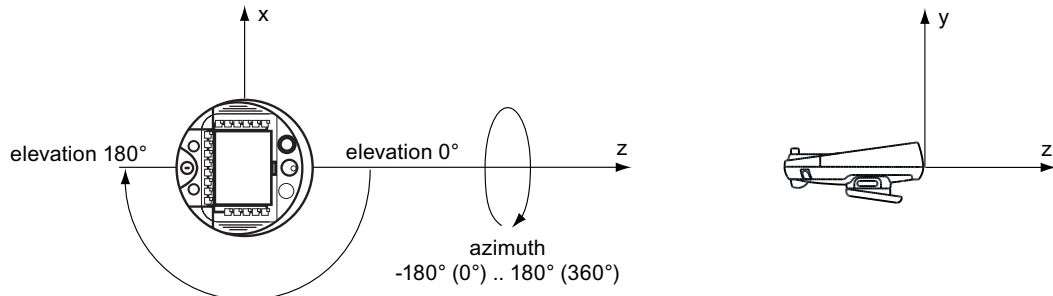
The radiation characteristics were determined under optimum conditions in a low reflection room in an antenna lab.

#### 13.3.1 Radiation characteristics in the 2.4 GHz band

Antenna type	Dual port patch antenna
Polarization	Vertical and horizontal
Frequency band	2.4 to 2.483 GHz
Antenna gain, max.	3 dBi
Impedance	50 $\Omega$

#### Range of the transmitter based on angle

The figure below shows the coordinate system applied to the HMI device.

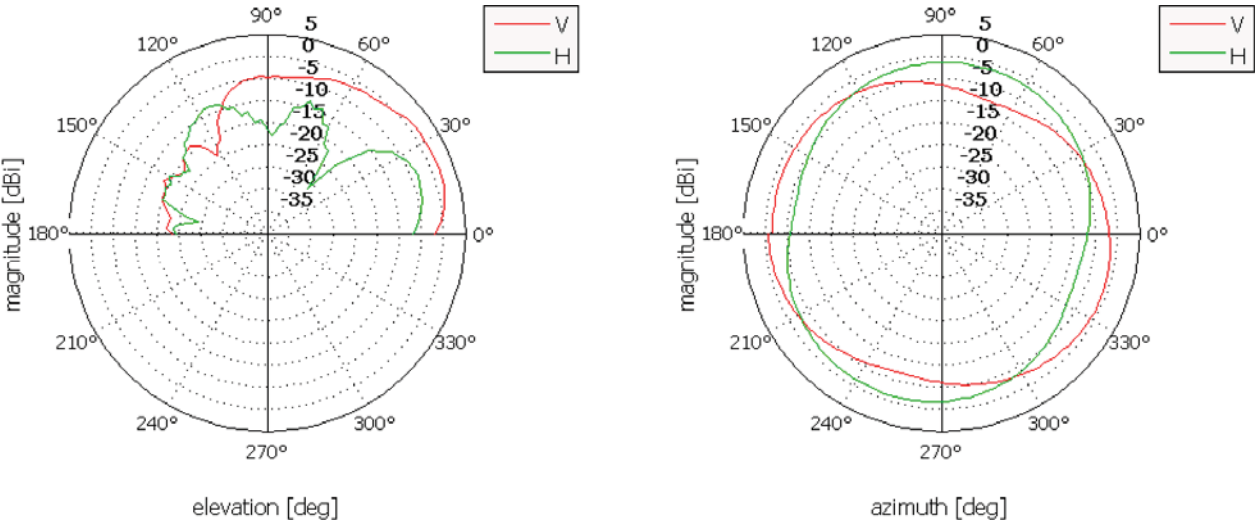


The figure below shows the range of the transmitter based on angle.

Technical specifications

13.3 WLAN radiation characteristics of the HMI device

Range at 2.45 GHz

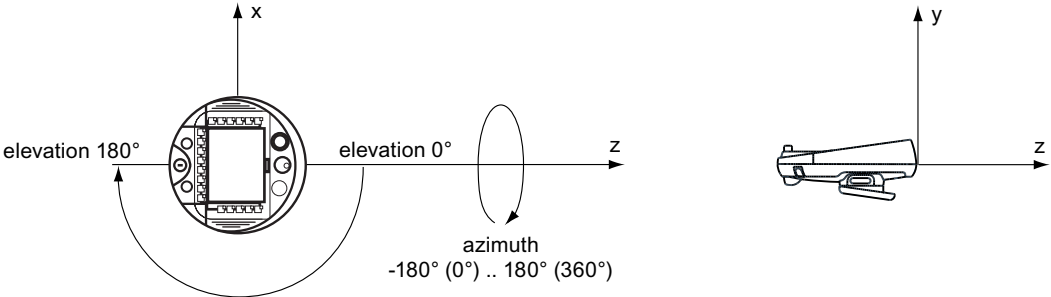


13.3.2 Radiation characteristics in the 5 GHz band

Antenna type	Dual port patch antenna
Polarization	Vertical and horizontal
Frequency band	5.0 to 5.6 GHz
Antenna gain, max.	5 dBi
Impedance	50 Ω

Range of the transmitter based on angle

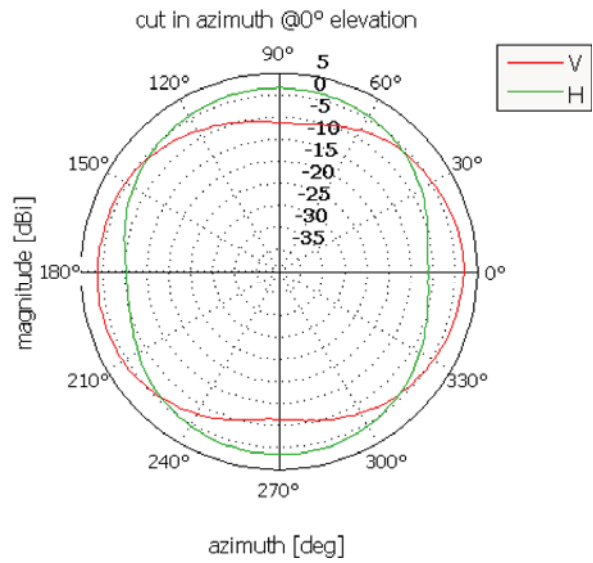
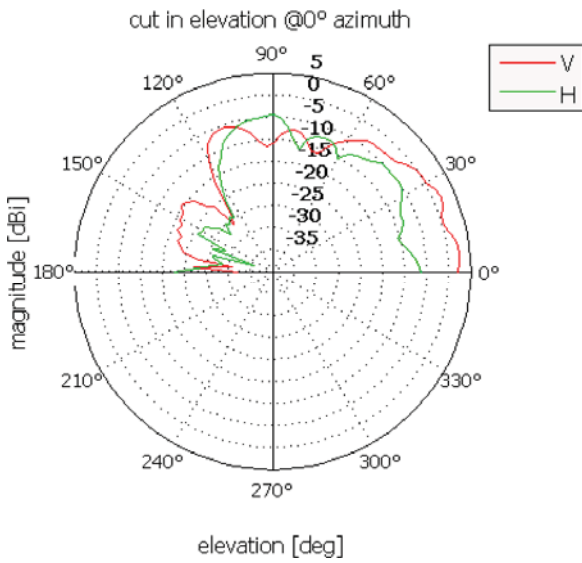
The figure below shows the coordinate system applied to the HMI device.



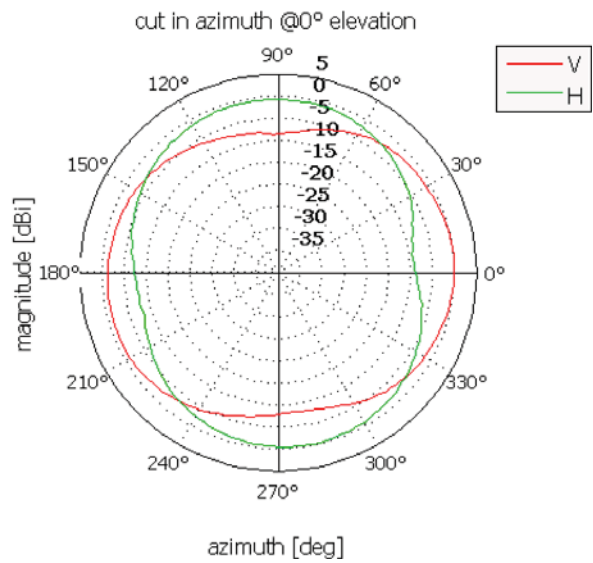
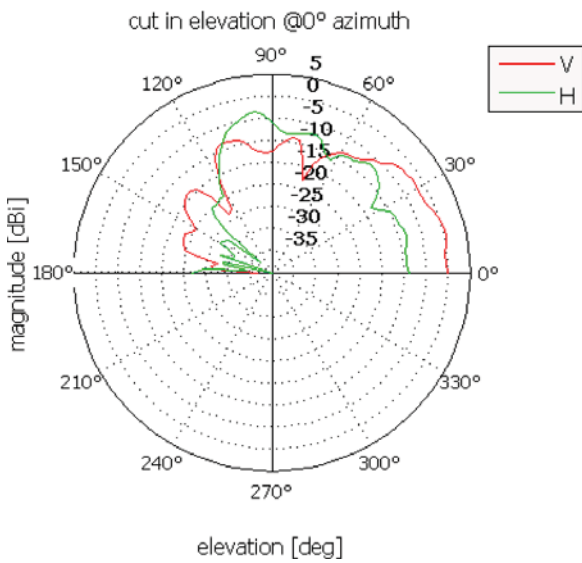
The figures below show the range of the transmitter for the various frequencies in the 5 GHz band based on angle.



Range at 5.0 GHz



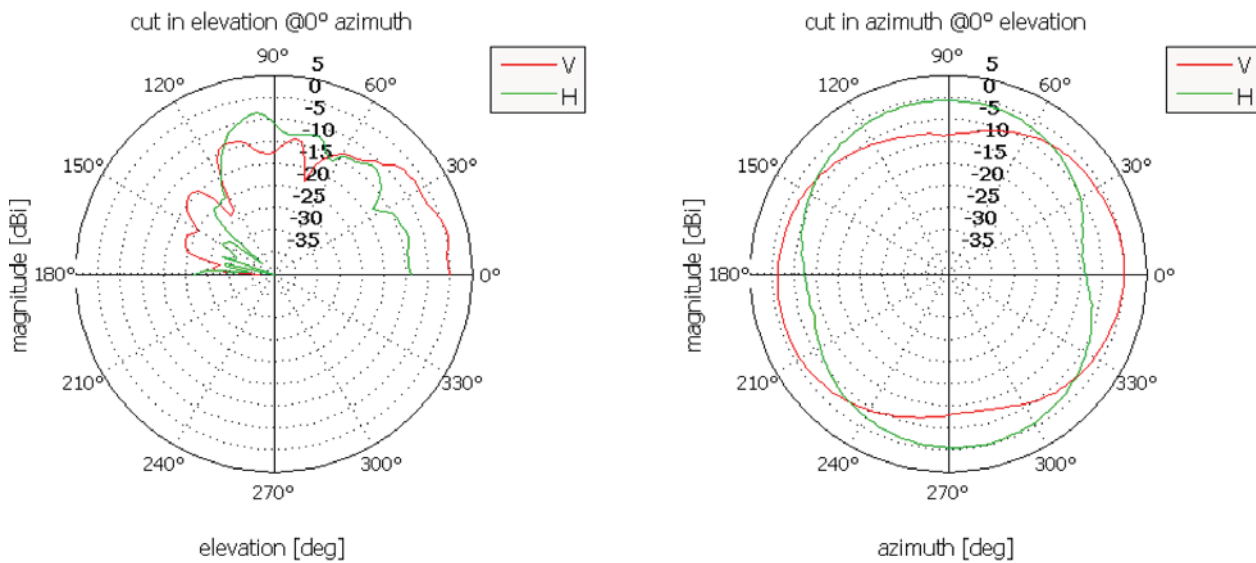
Range at 5.3 GHz



Technical specifications

13.4 Radiation characteristics of the transponder system

Range at 5.6 GHz



13.4 Radiation characteristics of the transponder system

This section contains illustrations on the radiation characteristics of various antennas.

Note

The radiation characteristics were determined under optimum conditions in a low reflection room in an antenna lab.

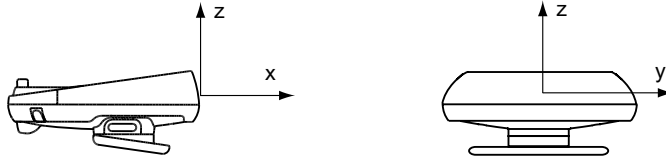
13.4.1 Radiation characteristic of HMI device

The radiation characteristics are in regards to the antennas for the transponder system.

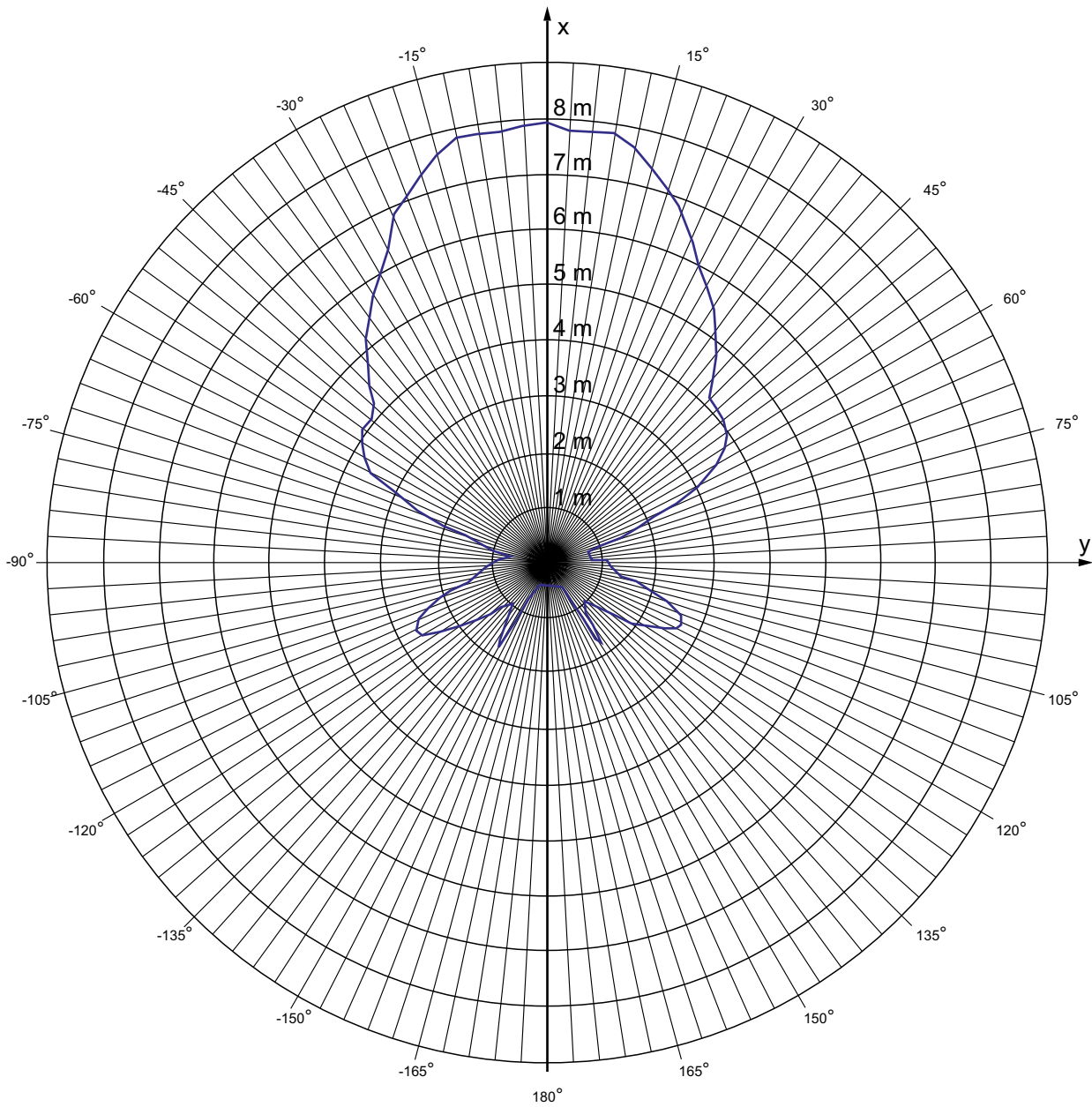
Antenna type	Dual port patch antenna
Polarization	Vertical and horizontal
Frequency band	2,400 to 2,483 MHz
Antenna gain in principle ray direction, max.	Port 1: 2,6 dBi Port 2: 2.7 dBi
Impedance	50 Ω
Full widths at half maximum, horizontal at 2.45 GHz	83°
Full widths at half maximum, vertical at 2.45 GHz	80°

### Range of the transmitter based on angle

The figure below shows the coordinate system applied to the HMI device.



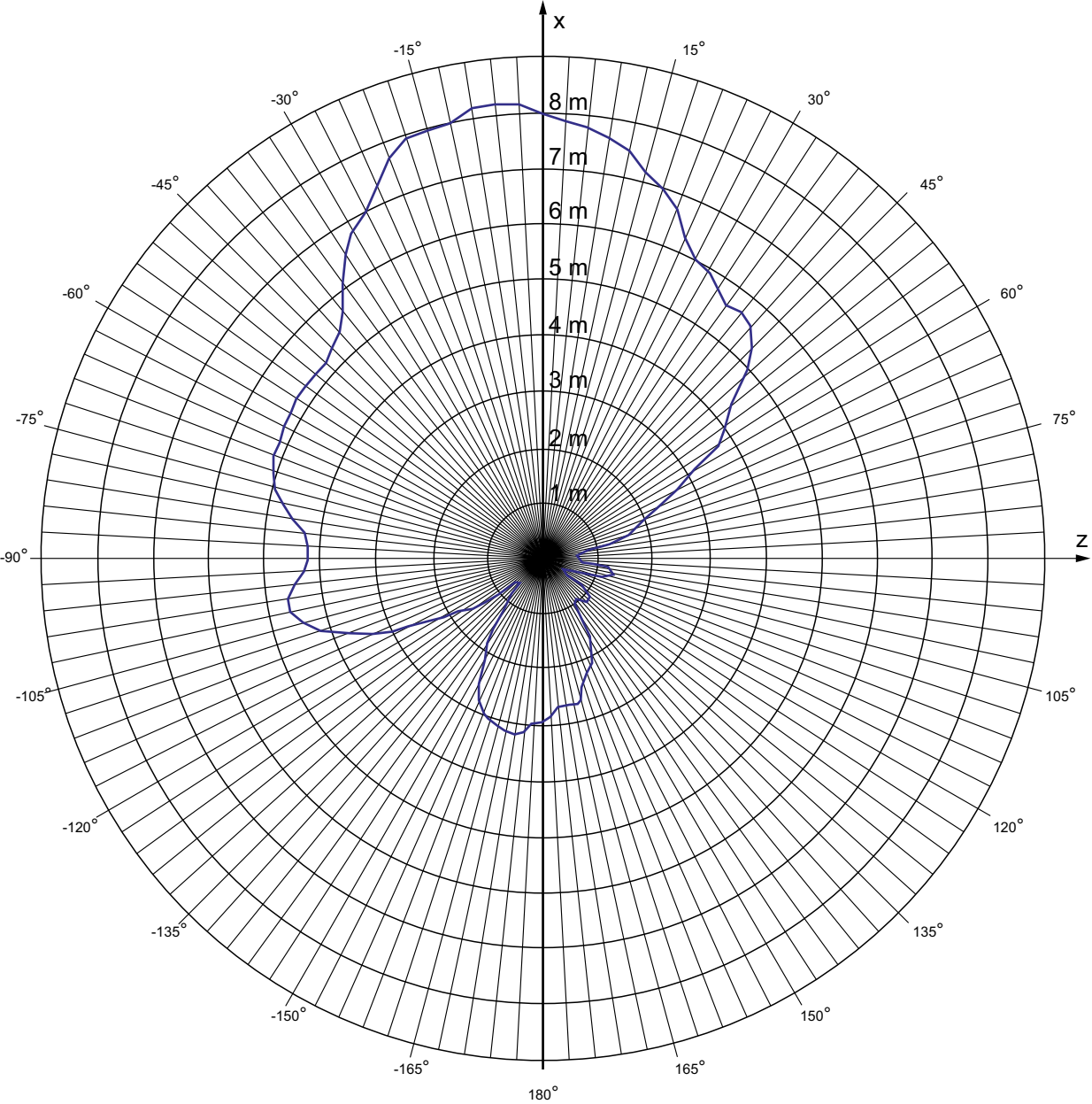
The figure below shows the range of the transmitter based on angle.



Technical specifications

13.4 Radiation characteristics of the transponder system

The figure below shows the HMI device range depending on the angular displacement to the main count direction in the z direction:



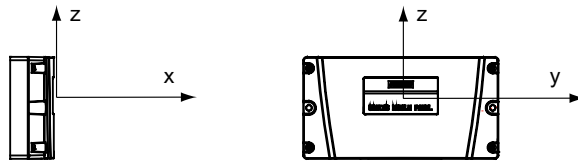
### 13.4.2 Radiation characteristic of the transponder

The radiation characteristics are in regards to the antennas for the transponder system.

Antenna type	Dual port patch antenna
Polarization	Vertical and horizontal
Frequency band	2.4 to 2.483 GHz
Antenna gain in principle ray direction, max.	Port 1: 2,6 dBic Port 2: 2.7 dBic
Impedance	50 $\Omega$
Full widths at half maximum, horizontal at 2.45 GHz	93°
Full widths at half maximum, vertical at 2.45 GHz	90°

#### Range of the transmitter based on angle

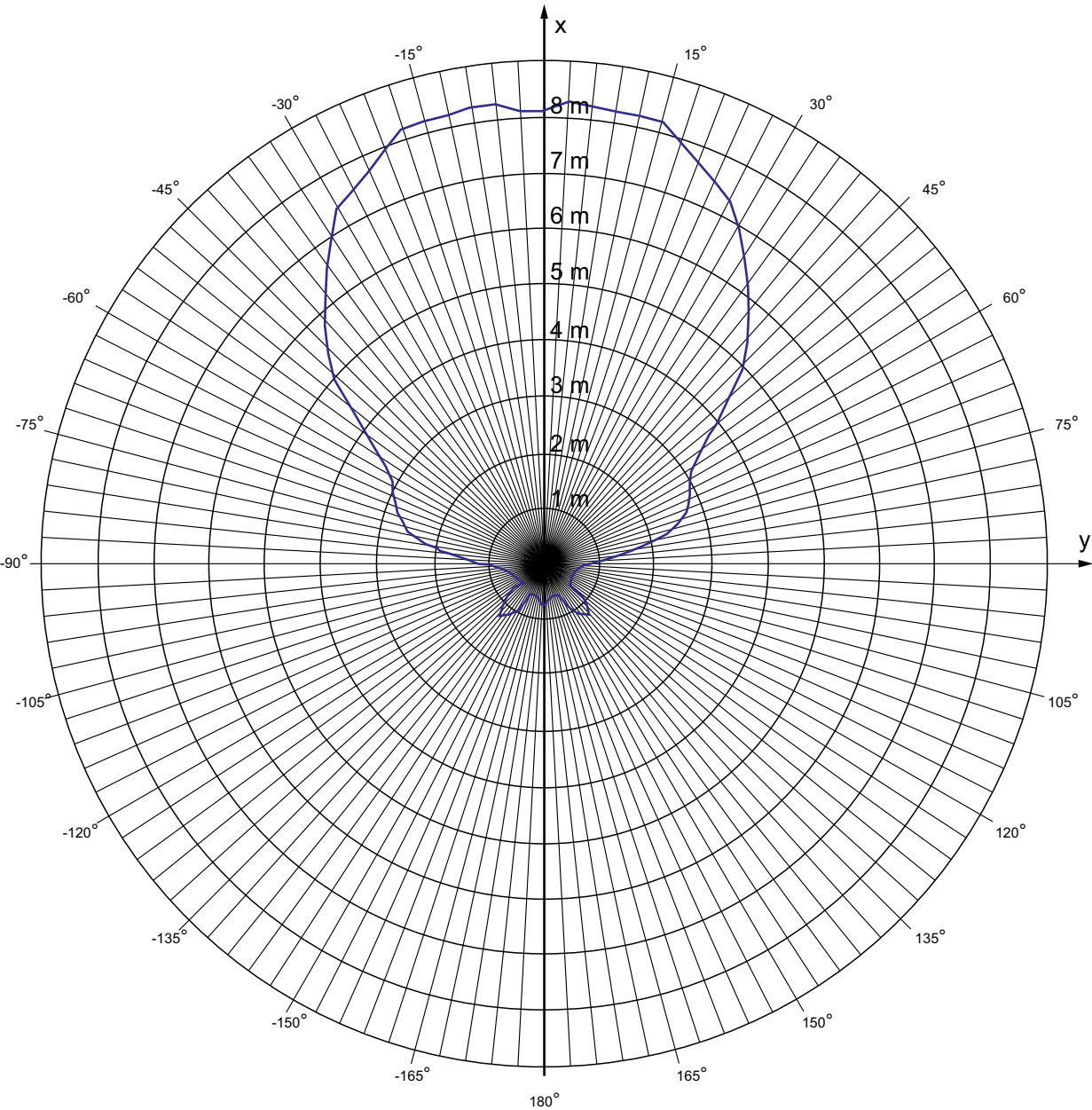
The following figure shows the coordinate system applied to the transponder.



Technical specifications

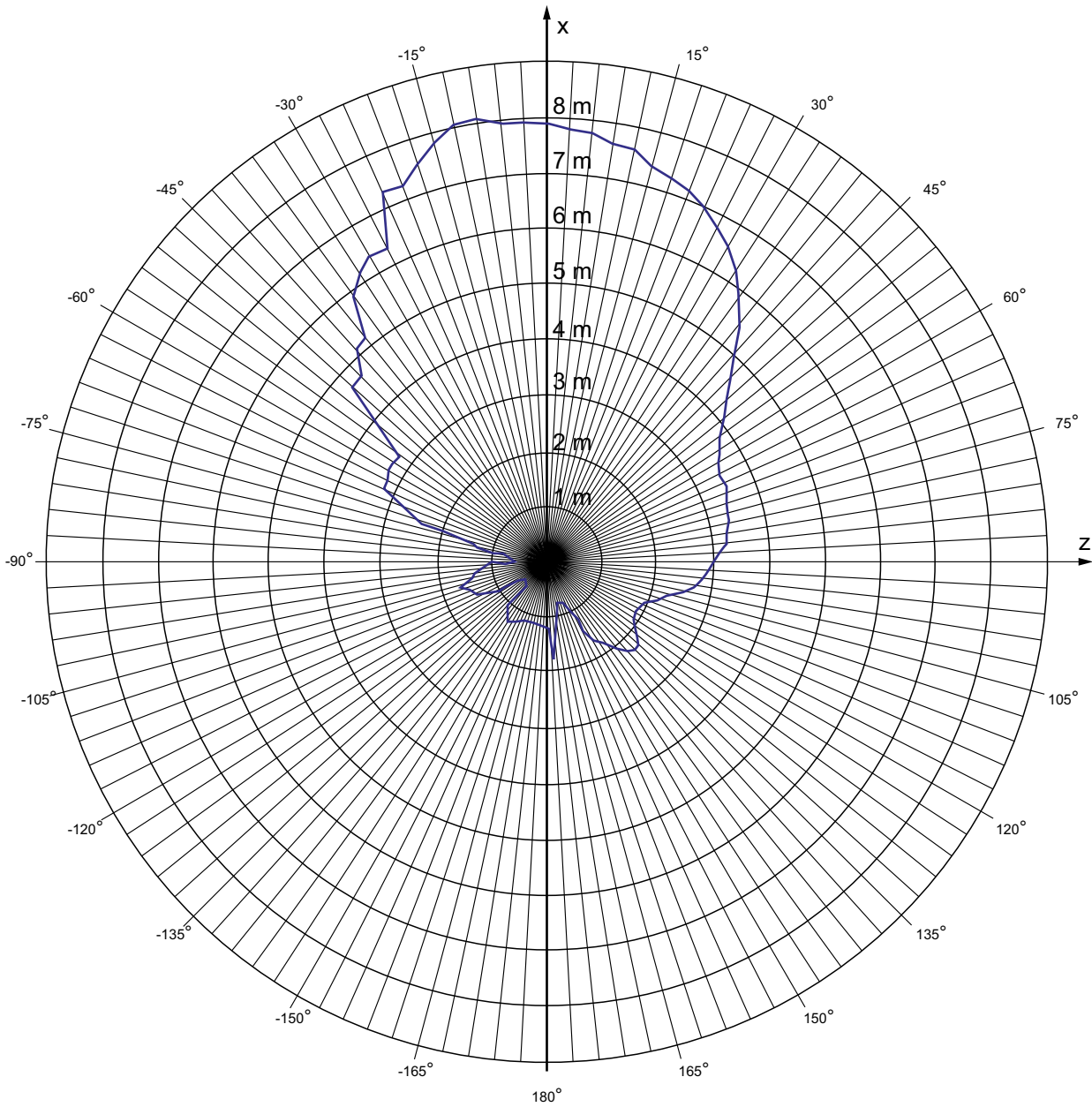
13.4 Radiation characteristics of the transponder system

The figure below shows the range of the transmitter based on angle.



13.4 Radiation characteristics of the transponder system

The following figure shows the transponder range depending on the angular displacement to the main count direction in the z direction:



*Technical specifications*

*13.4 Radiation characteristics of the transponder system*

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# A

## Appendix

### A.1 ESD guideline

#### What does ESD mean?



An electronic module is equipped with highly integrated electronic components. Due to their design, electronic components are highly sensitive to overvoltage and thus to the discharge of static electricity. Such electronic components are labeled as electrostatic sensitive devices (ESD).

The following abbreviations are commonly used for electrostatic sensitive devices:

- ESD – Electrostatic Sensitive Device
- ESD – Electrostatic Sensitive Device (internationally recognized term)

#### Electrostatic charge

##### CAUTION

##### Electrostatic charge

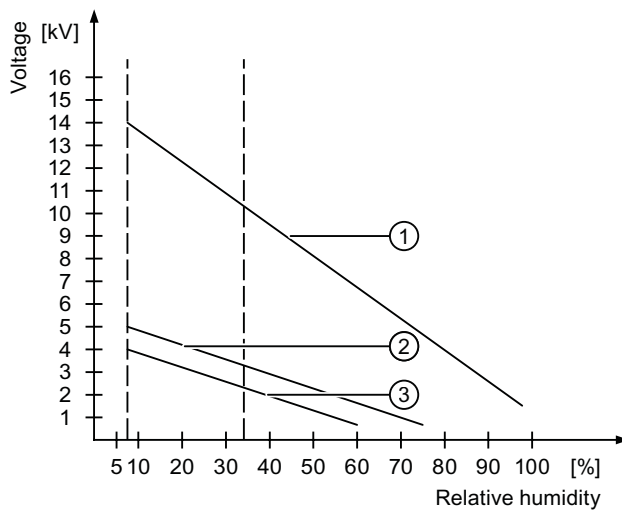
ESDs may be destroyed by voltages far below the level perceived by human beings. If you are not discharged electrostatically, the voltage that you transfer when touching a component or the contact points of a module can already cause damage.

The damage to an ESD caused by overvoltage is usually not recognized immediately. The damage only becomes apparent after a long period of operation.

Discharge any electrostatic charge of your body before you touch the ESD.

Anyone who is not connected conductively to their surroundings is subject to electrostatic charge.

The following diagram shows the maximum voltage values to which a person can be charged electrostatically. The values depend on the material and humidity. The shown values are in conformity with the specifications of EN 61000-4-2.



- ① Synthetic materials
- ② Wool
- ③ Antistatic materials such as wood or concrete

### Protective measures against discharge of static electricity

**CAUTION**

**Grounding measures**

There is no equipotential bonding without grounding. An electrostatic charge is not discharged and may damage the ESD.

When working with electrostatic sensitive devices, make sure that the person and the workplace are properly grounded.

Note the following:

- Only touch the ESD if it is absolutely necessary.
- When you touch ESD modules, avoid touching the pins or the PCB tracks.  
This precaution reduces the risk of damaging an ESD.
- Discharge electrostatic electricity from your body if you are performing measurements on an ESD.  
To do so, touch a grounded metal object before you carry out the measurement.
- Always use grounded measuring instruments.

## A.2 Typical operating procedures and potential fault scenarios


### A.2.1 Overview

This section describes typical application cases for the HMI device. The following states are graphically represented in the application cases.



- LED status
- Operability of the EMERGENCY STOP button and enabling buttons

The used icons have the following meaning:

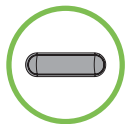

- LED display

Icon	Meaning
	Status of the LEDs that are displayed on the HMI device during the described situation. All LEDs are on.

- EMERGENCY STOP button

Icon	Meaning
	Pressing the EMERGENCY STOP button triggers an EMERGENCY STOP.
	Pressing the EMERGENCY STOP has no effect.

- Enabling button

Icon	Meaning
	The operator can release movements of the assigned machine with the enabling buttons.
	Pressing the enabling buttons has no effect.



Appendix

A.2 Typical operating procedures and potential fault scenarios

A.2.2 Switch on the HMI device.

Requirement

- The HMI device is switched off.
- The rechargeable battery is fully charged.



LED display	EMERGENCY STOP button	Enabling button
<input type="checkbox"/> SAFE <input type="checkbox"/> PWR <input type="checkbox"/> COM <input type="checkbox"/> RNG <input type="checkbox"/> BAT		

Procedure

1. Switch on the HMI device using the ON/OFF button.  
Communication via WLAN starts up. While the WLAN connection is being established the "COM" LED flashes.

Result



- WLAN communication is established.
- The HMI device displays the Windows CE Desktop with the Loader.

LED display	EMERGENCY STOP button	Enabling button
<input checked="" type="checkbox"/> SAFE <input checked="" type="checkbox"/> PWR <input checked="" type="checkbox"/> COM <input type="checkbox"/> RNG <input checked="" type="checkbox"/> BAT		

### A.2.3 Integrating the HMI device

#### Requirement

- The HMI device is switched on.
- WLAN communication is established.
- The HMI device shows the Windows CE Desktop with the Loader.

LED display	EMERGENCY STOP button	Enabling button
<input type="checkbox"/> SAFE <input checked="" type="checkbox"/> PWR <input checked="" type="checkbox"/> COM <input type="checkbox"/> RNG <input checked="" type="checkbox"/> BAT		

#### Procedure

1. Start the project.
  - PROFIsafe communication is established.
  - The "Establishment of safety connection" dialog is shown with the following icon.





- The HMI device is integrated in the safety program of the F CPU.
- The "Test enabling button" dialog opens with the following icon.



2. Press both enabling buttons when prompted until the "Panic" switch position is reached.

#### Result

- Both enabling buttons have been tested in the "Enable" and "Panic" switch positions.
- The project start screen appears.

LED display	EMERGENCY STOP button	Enabling button
<input checked="" type="checkbox"/> SAFE <input checked="" type="checkbox"/> PWR <input checked="" type="checkbox"/> COM <input type="checkbox"/> RNG <input checked="" type="checkbox"/> BAT		

Appendix




A.2 Typical operating procedures and potential fault scenarios

A.2.4 Operating the transponder system

A.2.4.1 Detecting the effective range

Requirement

- The HMI device is integrated into the safety program of the F-CPU.
- With the "Effective range name" object the HMI device shows the name and the status of the effective range in which the HMI device is located.

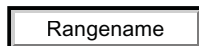
LED display	EMERGENCY STOP button	Enabling button
		

Procedure

1. Evaluate the display of the "Effective range name" operator control.

Result 1

The "Effective range name" object is displayed in white with a label.



The HMI device is in the "Rangename" effective range. It is not possible to log on at the effective range

Result 2

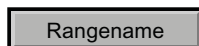
The "Effective range name" object is displayed in white without a label.



The HMI device is located outside the effective range.

Result 3

The "Effective range name" object is displayed in gray with a label.



The HMI device is in the "Rangename" effective range. Log on at the effective range is **rejected** because a different HMI device is already logged on at the effective range.

### A.2.4.2 Logging onto a machine

#### Requirement

- The "Effective range name" object is displayed in white.



- It is not possible to log on at the effective range

LED display	EMERGENCY STOP button	Enabling button

#### Procedure

1. Touch the "Effective range name" operating element.

Enter the user name and password if the "effective range name" object has password protection. The "Effective range logon" dialog opens with the following symbol.

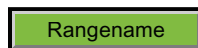


2. Enter the ID of the effective range.
3. Enter the effective range ID.
4. Confirm by clicking "OK".

The dialog box closes.

#### Result

- The HMI device is logged on in the effective range.
- The "Effective range name" object is displayed in green.



LED display	EMERGENCY STOP button	Enabling button

Appendix

A.2 Typical operating procedures and potential fault scenarios

A.2.4.3 Exiting the effective range without log off

Requirement

- The HMI device is at the border of an effective range.



LED display	EMERGENCY STOP button	Enabling button

Procedure

- You leave the WLAN area with the HMI device.



After 5 seconds the following occurs:

- The enabling buttons are deactivated.
- The "Effective range exited without logoff" dialog box opens.



- Depending on the setting of the HMI device, the vibration alarm is triggered.

The operator now has 25 seconds to enter the effective range again or log off from the effective range via the "Effective range exited without logoff" dialog box.

- Case 1 - You reenter the effective range within 25 s.
- Case 2 - You do **not** reenter the effective range within 25 s.

Results of case 1 - punctual return into the effective range

The HMI device is fully operable.

LED display	EMERGENCY STOP button	Enabling button



**Results of case 2 - no return into the effective range**

- The "Effective range exited without logoff" dialog box opens.



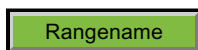
- The HMI device triggers a local rampdown and log off from the effective range.  
As long you do not confirm log off from the effective range, the dialog box is displayed on the HMI device. The operator cannot operate the plant. The effective range remains allocated.
- The HMI device is logged off from the effective range once logging off has been confirmed. The effective range is open for logging on for other HMI devices.

LED display	EMERGENCY STOP button	Enabling button
<input checked="" type="checkbox"/> SAFE <input checked="" type="checkbox"/> PWR <input checked="" type="checkbox"/> COM <input type="checkbox"/> RNG <input checked="" type="checkbox"/> BAT		

**A.2.4.4 Logging off the machine**

**Requirement**

- The "Effective range name" object is displayed in green.



- The HMI device is logged on in the effective range.

LED display	EMERGENCY STOP button	Enabling button
<input checked="" type="checkbox"/> SAFE <input checked="" type="checkbox"/> PWR <input checked="" type="checkbox"/> COM <input checked="" type="checkbox"/> RNG <input checked="" type="checkbox"/> BAT		

Appendix

A.2 Typical operating procedures and potential fault scenarios

**Procedure**

1. Touch the "Effective range name" operating element. Enter the user name and password if the "effective range name" object has password protection.

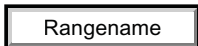
The "Effective range log-off" dialog box opens.



2. Confirm the next dialog.

**Result**

The "Effective range name" object is displayed in white.



The HMI device must be logged off from the effective range.

LED display	EMERGENCY STOP button	Enabling button
<input checked="" type="checkbox"/> SAFE <input checked="" type="checkbox"/> PWR <input checked="" type="checkbox"/> COM <input type="checkbox"/> RNG <input checked="" type="checkbox"/> BAT		

**Note**

If you have logged off from an effective range which is linked to an override switch, the "Effective range name" object is shown in the following situation:





The HMI device was removed from the effective range without having the "Override" mode on the override switch being turned off.

A.2.4.5 Activating "override" mode

Requirement

- The system has the safety system required for the "override" mode.

LED display	EMERGENCY STOP button	Enabling button
<input type="checkbox"/> SAFE <input type="checkbox"/> PWR <input type="checkbox"/> COM <input type="checkbox"/> RNG <input type="checkbox"/> BAT		

Procedure


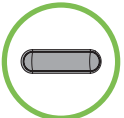
1. Enter the protection zone.
2. You log the HMI device onto the effective range that belongs to the override switch.
3. Activate the override switch.

Result

- "Override" mode is active.
- The "Effective range quality" object is displayed in green.



- The transponders are **not** evaluated for detection of the effective range.
- You can operate the plant parts that are located in the override area.
- No other HMI device cannot logon to the effective range.

LED display	EMERGENCY STOP button	Enabling button
<input type="checkbox"/> SAFE <input type="checkbox"/> PWR <input type="checkbox"/> COM <input type="checkbox"/> RNG <input type="checkbox"/> BAT		

Appendix

A.2 Typical operating procedures and potential fault scenarios

A.2.4.6 Terminating "override" mode

The "Override" mode can be closed by the operator or closed automatically by the safety program of the F CPU.

Requirement

- "Override" mode is active.



LED display	EMERGENCY STOP button	Enabling button

Procedure

1. Case 1 - you press the override switch and leave the protection zone.
2. Case 2 - you do **not** press the override switch and leave the protection zone.

Result – Scenario 1

- "Override" mode is deactivated.
- The transponders are evaluated again for detection of the effective range.
- If the HMI device is outside of the effective range at the end of the "override" mode - see chapter "Exiting the effective range without log off (Page 366)".

LED display	EMERGENCY STOP button	Enabling button

**Result – Scenario 2**

- "Override" mode is closed by the safety program of the F CPU.
- The transponders are evaluated again for detection of the effective range.
- If the HMI device is outside of the effective range at the end of the "override" mode - see chapter "Exiting the effective range without log off (Page 366)".
- Renewed enabling of the "override" mode is possible if you have turned off the override mode on the override switch.

LED display	EMERGENCY STOP button	Enabling button

**A.2.5 Operating RFID tag system**

**A.2.5.1 Logging onto a machine**

**Requirement**

- You have the HMI device at a distance of no more than 5 cm in front of an RFID tag.
- The "Effective range name (RFID)" object is shown in white labeled "Scan".



LED display	EMERGENCY STOP button	Enabling button

Appendix

A.2 Typical operating procedures and potential fault scenarios

**Procedure**

1. Touch the "Effective range name (RFID)" object labeled "Scan".

The HMI device searches for RFID tags, the "Effective range name (RFID)" object is shown in yellow labeled "Scanning".



If the "Effective range name (RFID)" object is configured with password protection, enter a valid user name and a valid password.

The "Effective range logon" dialog opens with the following symbol.



2. Read the effective range ID from the RFID tag.
3. Enter the effective range ID.
4. Click "Yes".

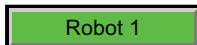
The dialog closes. The "Confirmation of logon" dialog is displayed with the following symbol.



5. Confirm the logon to the RFID tag with the enabling button.

**Result**

- You have logged on the HMI device to the machine via the RFID tag.
- The "Effective range name (RFID)" operator control is shown in green and labeled with the name of the effective range. The following figure shows the "Effective range name (RFID)" object after logon to an effective range with the name "Robot 1".



LED display	EMERGENCY STOP button	Enabling button

**A.2.5.2 Leaving a protection zone without logging off**

**Requirement**

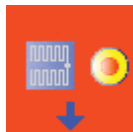
- A security system is installed for the protection zone, for example, a photoelectric sensor or a contact pressure mat.
- The HMI device has been logged on to a machine, such as "Robot 1", via an RFID tag.



LED display	EMERGENCY STOP button	Enabling button

**Procedure**

1. You leave the protection zone with the HMI device through the security system.  
The HMI device initiates a local rampdown.  
The "Forced logoff" dialog opens with the following symbol.



2. Close the "Forced logoff" dialog with "OK".

**Result**

The HMI device is logged off the machine. The machine is free again for logon.

LED display	EMERGENCY STOP button	Enabling button

Appendix

A.2 Typical operating procedures and potential fault scenarios

A.2.5.3 Logging off the machine

Requirement

- The HMI device is logged on to a machine.
- The "Effective range name" object will be displayed in green.



LED display	EMERGENCY STOP button	Enabling button

Procedure

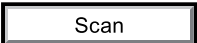
1. Confirm the "Effective range name (RFID)" object.  
The "Effective range logoff" dialog opens with the following symbol.



2. Confirm the logoff from the machine with the "Yes" button.

Result

- The HMI device is logged off the machine.
- The "Effective range name (RFID)" object is shown in white labeled "Scan".



LED display	EMERGENCY STOP button	Enabling button






## A.2.6 Faulty operating states

### A.2.6.1 Communication error for the integrated HMI device

#### Requirement

- The HMI device is integrated in the safety program of the F-CPU.
- The HMI device is not logged onto a machine.

LED display	EMERGENCY STOP button	Enabling button
		

#### Procedure

1. You are leaving the WLAN range with the HMI device.

The "COM" LED flashes. The F CPU detects a communication error and initiates a global rampdown. The "SAFE" LED goes out. The user is informed that no safety functions are available. The "No safety connection" dialog is shown with the following symbol.



2. You will return to the WLAN range within 60 seconds.

The "Acknowledgment of communication error" dialog opens with the following symbol.



3. Acknowledge the communication error. See Result 1.
4. You remain outside the WLAN.

The "Confirm removal" dialog will be displayed after 60 seconds with the following symbol.





See Result 2.

Appendix

A.2 Typical operating procedures and potential fault scenarios



**Result 1 – Return to the WLAN range**

- The "Global rampdown" signal is canceled. PROFIsafe communication is again possible.
- The HMI device is fully operable.

LED display	EMERGENCY STOP button	Enabling button
<input checked="" type="checkbox"/> SAFE <input checked="" type="checkbox"/> PWR <input checked="" type="checkbox"/> COM <input type="checkbox"/> RNG <input checked="" type="checkbox"/> BAT		

**Result 2 – No return to the WLAN range**

- The project will be closed immediately if you confirm the Confirm removal dialog within 60 seconds.
- The active project will be closed automatically if you do **not** confirm the "Confirm removal" dialog within 60 seconds.
- The Windows CE desktop with the loader is shown on the display.

LED display	EMERGENCY STOP button	Enabling button
<input type="checkbox"/> SAFE <input checked="" type="checkbox"/> PWR <input type="checkbox"/> COM <input type="checkbox"/> RNG <input checked="" type="checkbox"/> BAT		

Wireless network communication is reestablished if you later return to the WLAN range with the HMI device. Start the project again. Acknowledge the communication error in the "Acknowledgment of communication error" dialog with the following symbol.



The "Global rampdown" signal is cancelled when you acknowledge the communication error. Test the enabling buttons when the "Test Enabling Button" dialog is shown with the following symbol.



The HMI device is integrated again.

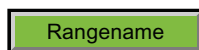
**Note**

Users can react to a fault on the HMI device by resetting the associated F\_FB\_MP to the "original state" using input "S7\_MP\_RES." This action sets the relevant HMI device to the "removed" state and the global rampdown signal is canceled.

**A.2.6.2 Communication errors with logged on HMI device**

**Starting situation**

The HMI device is logged on to a machine.



LED display	EMERGENCY STOP button	Enabling button
SAFE                      PWR                      COM                      RNG                      BAT		

**Fault**

A communication error occurs.

The F-CPU initiates a shutdown and stops the machine. The "SAFE" and "RNG" LEDs are off.

The operator is alerted that no safety-related communication is available.

**Result – Communication will be reestablished within 60 seconds**

If the communication is reestablished within 60 seconds, the "Acknowledgment of communication error" dialog will open.

If the operator acknowledges the communication error, the shutdown signal will be cancelled. PROFIsafe communication is again possible. The machine is free again for logon.

LED display	EMERGENCY STOP button	Enabling button
SAFE                      PWR                      COM                      RNG                      BAT		

Appendix



A.2 Typical operating procedures and potential fault scenarios

**Result – Communication remains interrupted for more than 60 seconds**

If communication remains interrupted for more than 60 seconds, the project will be closed. The HMI device displays the Windows CE Desktop with the loader.

Wireless network communication is reestablished if you later return to the WLAN range with the HMI device. Start the project again. Acknowledge the communication error in the "Acknowledgment of communication error" dialog.

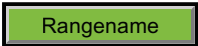
The shutdown signal is revoked. The HMI device is fully operable.


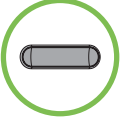
LED display	EMERGENCY STOP button	Enabling button
<input type="checkbox"/> SAFE <input checked="" type="checkbox"/> PWR <input type="checkbox"/> COM <input type="checkbox"/> RNG <input checked="" type="checkbox"/> BAT		

A.2.6.3 Internal error

**Requirement**

- The HMI device is logged on in the effective range.





LED display	EMERGENCY STOP button	Enabling button
<input checked="" type="checkbox"/> SAFE <input checked="" type="checkbox"/> PWR <input checked="" type="checkbox"/> COM <input checked="" type="checkbox"/> RNG <input checked="" type="checkbox"/> BAT		

**Procedure**

- An internal error occurs on the HMI device.

**Result**

- The F CPU performs a shutdown. The parts of the plant belonging to the effective range or protection zone is stopped.
- The project is closed immediately.
- The HMI device shows a red error display.
- All LEDs go out.
- The effective range remains allocated.

LED display	EMERGENCY STOP button	Enabling button
<input type="checkbox"/> SAFE <input type="checkbox"/> PWR <input type="checkbox"/> COM <input type="checkbox"/> RNG <input type="checkbox"/> BAT		

**A.2.7 Discrepancy error during agreement or panic**

The enabling button is two-channel. Both contacts must be closed at the same time for the "agreement" and "panic" switch positions. A discrepancy error is generated if one of the contacts is open while the other is closed. The following fault scenarios can occur:



- The enabling button is askew
- The enabling button is defective.

**A.2.7.1 The enabling button is askew**


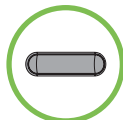
**Requirement**

The HMI device is integrated.

- The HMI device is **not** logged onto a machine.

LED display	EMERGENCY STOP button	Enabling button
<input type="checkbox"/> SAFE <input type="checkbox"/> PWR <input type="checkbox"/> COM <input type="checkbox"/> RNG <input type="checkbox"/> BAT		

- The HMI device is logged on to a machine.

LED display	EMERGENCY STOP button	Enabling button
<input checked="" type="checkbox"/> SAFE <input type="checkbox"/> PWR <input type="checkbox"/> COM <input type="checkbox"/> RNG <input type="checkbox"/> BAT		

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A.2 Typical operating procedures and potential fault scenarios

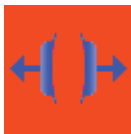
Procedure

1. Press the enabling button.
2. Press the enabling button to the switch setting "panic".

If you press the edge of an enabling button, the pressure point for the contacts is not centered. The signal is therefore transmitted only through one of the two contacts. The controller detects a discrepancy.

Result

The enabled state is withdrawn when a discrepancy is detected. The "Discrepancy error enabling button" dialog opens with the following symbol when the discrepancy time expires.



The dialog stays open until this discrepancy is corrected. Additional information on discrepancy time is available in "Mobile Panel 277F IWLAN (Page 342)", section "Fail-safe operation".

Enabling is made possible by pressing the enabling button again from the zero position.

- The HMI device is integrated but **not** logged onto a machine.

LED display	EMERGENCY STOP button	Enabling button
<p> <input type="checkbox"/> SAFE                       <input checked="" type="checkbox"/> PWR                       <input checked="" type="checkbox"/> COM                       <input type="checkbox"/> RNG                       <input checked="" type="checkbox"/> BAT                 </p>		

- The HMI device is integrated and logged onto a machine:

LED display	EMERGENCY STOP button	Enabling button
<p> <input checked="" type="checkbox"/> SAFE                       <input checked="" type="checkbox"/> PWR                       <input checked="" type="checkbox"/> COM                       <input checked="" type="checkbox"/> RNG                       <input checked="" type="checkbox"/> BAT                 </p>		

**A.2.7.2 The enabling button is defective.**

**Requirement**

- The HMI device is integrated and logged onto a machine.
- An enabling button is defective and not pressed.

Distinguish between the two scenarios:

- Scenario 1







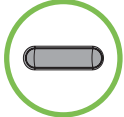
One channel of the enabling button is opened permanently.

- Scenario 2

One channel of the enabling button is closed permanently.

Discrepancy is detected in this situation. The "Discrepancy error enabling button" dialog is displayed with the following symbol.



LED display	EMERGENCY STOP button	Enabling button
 SAFE  PWR  COM  RNG  BAT		

**Procedure**

1. Press the enabling button.
2. Press the enabling button to the switch setting "panic".

**Result – Scenario 1**

- The enabled state is not activated.

The "Discrepancy error enabling button" dialog opens with the following symbol when the discrepancy time expires.



The dialog stays open until the enabling button is released. This step cancels the discrepancy. A discrepancy error is displayed again when the operator presses the enabling button once again .

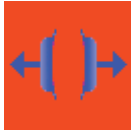
- The device must be repaired. See section "Spare parts and repairs (Page 336)".
- Press the second working enabling button to remove the HMI device.

Appendix

A.2 Typical operating procedures and potential fault scenarios

Result – Scenario 2

- The "Discrepancy error enabling button" dialog is closed and the discrepancy is cleared. The enable signal remains in deactivated state. The "Discrepancy error enabling button" dialog is displayed with the following symbol when the enabling button is released.



- The device must be repaired. See section "Spare parts and repairs (Page 336)".

A.2.8 Removing the HMI device

Requirement

- The project must be started.
- The HMI device is integrated in the safety program of the F-CPU.
- The HMI device is not logged onto a machine.

LED display	EMERGENCY STOP button	Enabling button



**Procedure**

1. To close the project, use the operator control designed for this purpose.

The "Start removal" dialog opens with the following symbol.



2. Use the "Yes" button to confirm the removal.

The "Confirm removal" dialog opens with the following symbol.



3. Press an enabling button within 60 seconds.

<b>NOTICE</b>
<b>Global rampdown</b>
A global rampdown will occur, if you do not confirm the "Confirm removal" dialog within 60 seconds with the enabling button.
Press an enabling button within 60 seconds.

**Result**

- Safety-related communication is terminated.
- The HMI device has been successfully removed from the safety program of the F-CPU.
- The project is closed.
- The HMI device shows the Windows CE Desktop with the loader.

LED display	EMERGENCY STOP button	Enabling button
<input type="checkbox"/> SAFE <input checked="" type="checkbox"/> PWR <input checked="" type="checkbox"/> COM <input type="checkbox"/> RNG <input checked="" type="checkbox"/> BAT		




Appendix

A.2 Typical operating procedures and potential fault scenarios

A.2.9 Switching off the HMI device

Requirement

- The project must be started.
- The HMI device is integrated in the safety program of the F-CPU.

LED display	EMERGENCY STOP button	Enabling button
		

Procedure

1. Close all open dialogs.
2. Press and hold the "ON/OFF" button for at least 4 seconds.  
The "Start removal" dialog opens with the following symbol.



3. Use the "Yes" button to confirm the removal.  
The "Confirm removal" dialog opens with the following symbol.





4. Press an enabling button within 60 seconds.

<p><b>NOTICE</b></p> <p><b>Global rampdown</b></p> <p>A global rampdown will occur, if you do not confirm the "Confirm removal" dialog within 60 seconds with the enabling button.</p> <p>Press an enabling button within 60 seconds.</p>
---

**Result**

- Safety-related communication is terminated.
- The HMI device has been successfully removed from the safety program of the F-CPU.
- The project is closed.
- The HMI device will be switched off.

LED display	EMERGENCY STOP button	Enabling button
<input type="checkbox"/> SAFE <input type="checkbox"/> PWR <input type="checkbox"/> COM <input type="checkbox"/> RNG <input type="checkbox"/> BAT		

**A.3 Example of application for transponder system**

**A.3.1 Configuration and operation**

The following example shows a possible application of the safety functions of the Mobile Panel 277F IWLAN.

**Note**

This example is in regards to the "override" mode in the transponder system. Further safety systems must additionally be considered in the safety program. These safety systems are independent of the "override" mode.

Observe the information about S7 Distributed Safety in the online help for S7 Distributed Safety and in the following manual:

Programming and operation manual "S7 Distributed Safety - Configuring and Programming" (<http://support.automation.siemens.com/WW/view/en/22099875>)

### Configuration example

The following sample configuration shows a robot cell which is protected by a protective fence with a protective door.

To operate the robot in "override" mode, the following devices must also be installed:

- A transponder

By logging on to this effective range, the operator is granted the permission to activate the "override" switch. Without logon to the effective range, activating the "override" switch will have no effect.

- "Override" switch

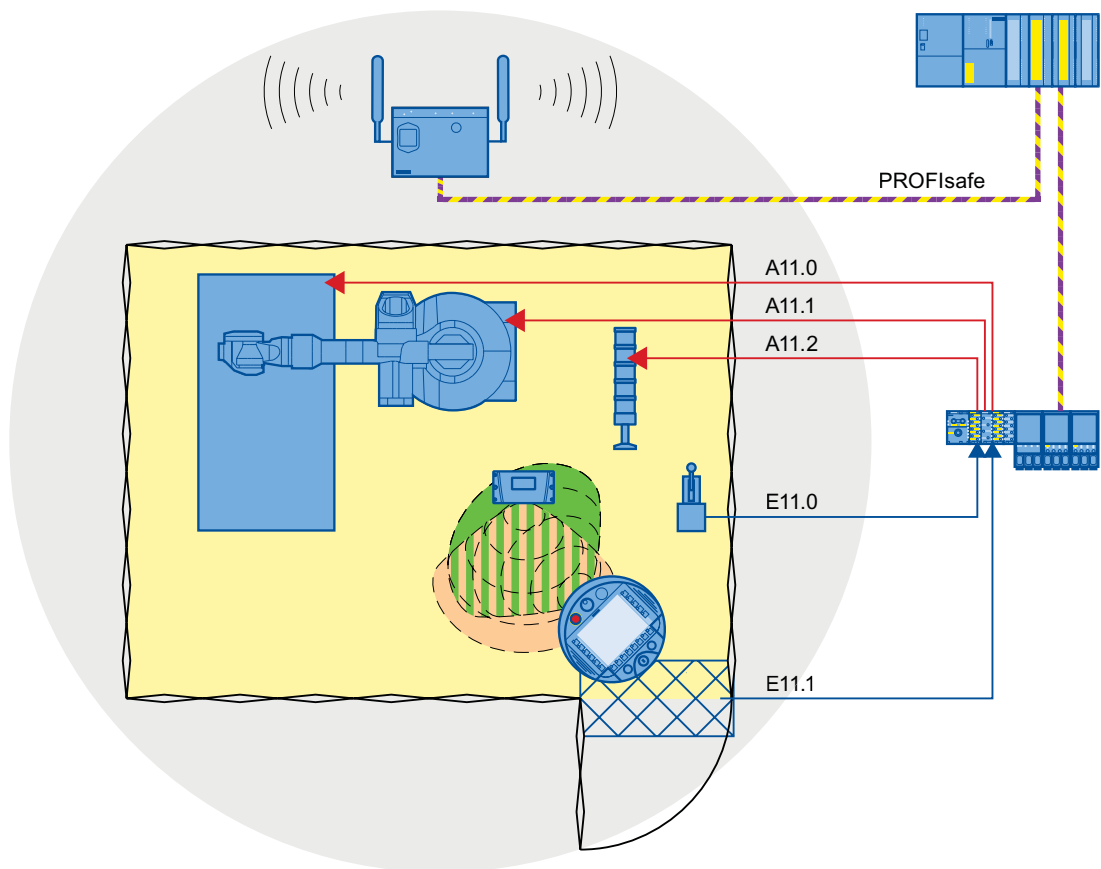
When the operator activates the "override" switch after logon to the relevant effective range, the "override" mode is activated by the positive edge of the switch.

- An alarm contact mat at the entrance to the protected area.

The alarm contact mat enables you to detect whether the operator is leaving the protected area or whether a second person is entering the protected area while the "override" mode is active. In these cases the "override" mode is automatically terminated.

Additionally, a signal light is installed, which shows that an HMI device is logged onto the effective range.

The following image shows the devices being used.



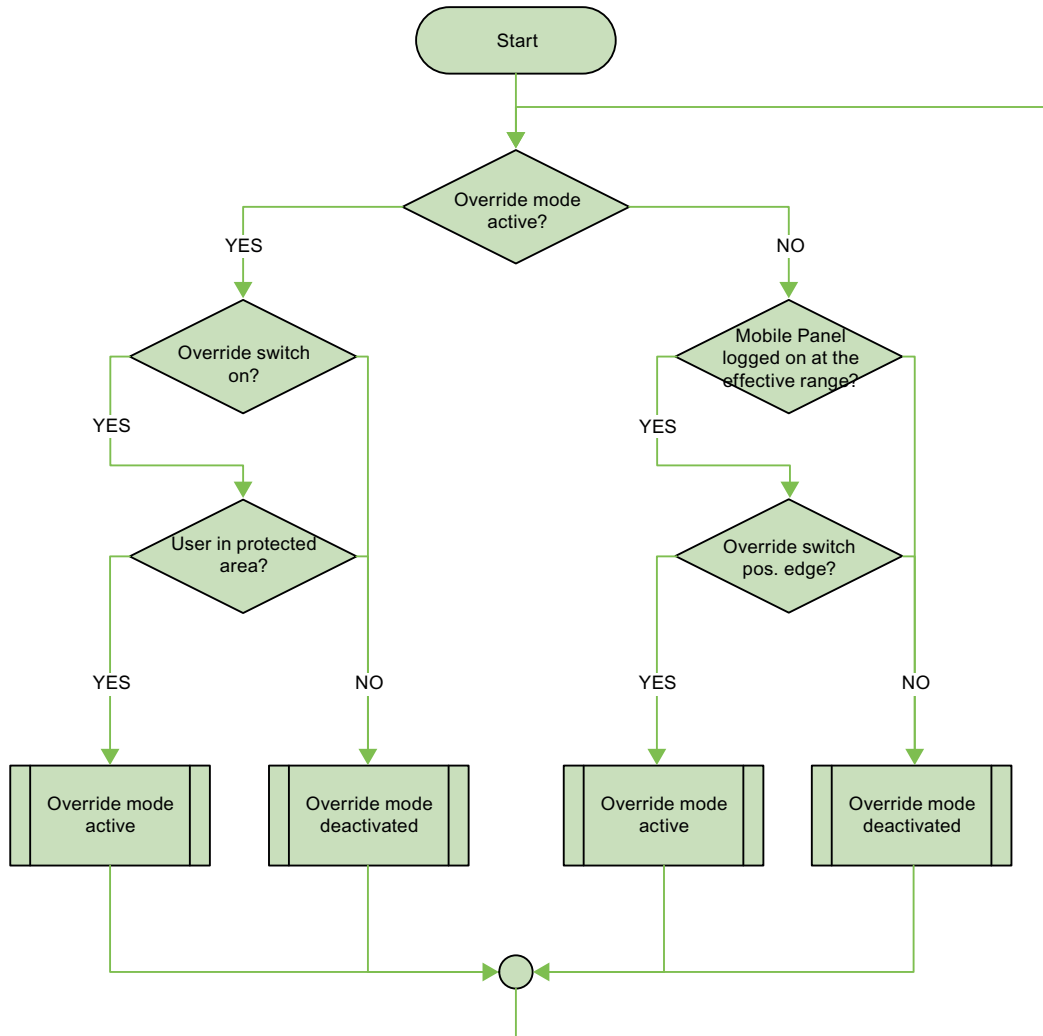
A.3 Example of application for transponder system

The following signals are used:

Function Symbolic name	Signal	Explanation
"Override" switch "Switch_Override"	I11.0	"0": "Override" switch is off "1": "Override" switch is on
Alarm contact mat "Contact_Mats"	I11.1	"0": Step on contact pressure mat "1": Do not step on alarm contact mat
Function key F1 of the HMI device "Functionkey_F1"	E0.0	"0": Function key not pressed "1": Function key pressed
Enabling button	ENABLE (F_FB_RNG_4)	"0": No enable "1": Enable
Power ON-OFF robot "E_Stop_Robot"	O11.0	"0": EMERGENCY STOP triggered. "1": Normal operation of plant.
Actuator to robot	O11.1	"0": The robot is not operated with F1 and the enabling buttons "1": The robot is operated with F1 and the enabling buttons
Signal lamp	O 11.2	"0": Effective range is not in use; the signal lamp is off "1": Effective range is in use; the signal lamp is on

**Flowchart**

The following flowchart shows the operation sequence of the example.



**A.3.2 Configuring the controller and HMI device in STEP 7**

This chapter shows you the most important settings you need to make in "HW Config" for the F CPU and for the HMI device.

**Requirement**

The following devices are required:

- See section "Equipment for HMI device and plant (Page 19)".

The following software is required:

- See section "Software requirements (Page 25)".

Procedure - fail-safe PLC

**NOTICE**

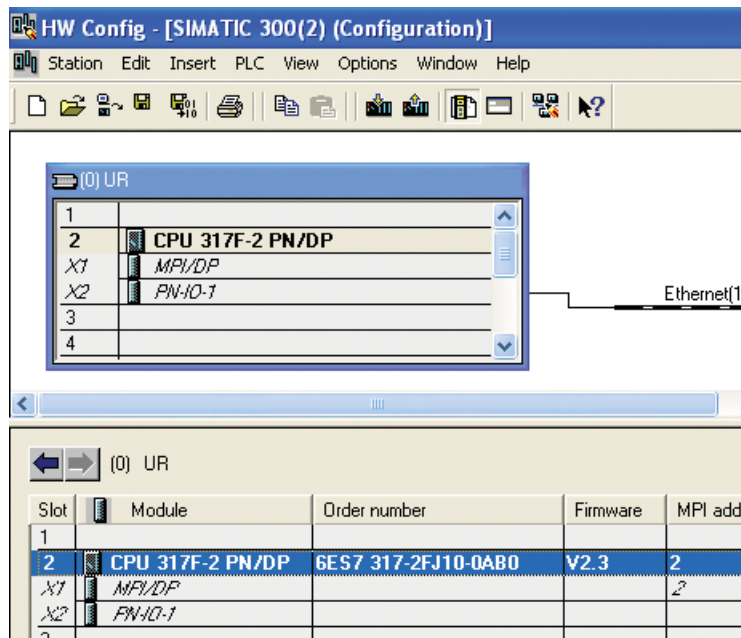
**Safety function**

Configuration of the safety functions in STEP 7 with the "SIMATIC S7 Distributed Safety" add-on package can achieve fail-safe operation according to SIL 3 or Performance Level e and Category 4 for the HMI device.

Any changes to the settings may result in the loss of the safety function.

Proceed as follows:

1. Create a STEP 7 project in the SIMATIC Manager.
2. Open the hardware configuration for the "HW Config":
3. Add the required F-CPU and a PROFINET connection.



4. Double click in the HW Config on the F-CPU.

The settings will open.

5. Select the "Cyclic Interrupts" tab.

	Cyclic Interrupts	Diagnostics/Clock
	Priority	Execution
OB30:	<input type="text" value="0"/>	<input type="text" value="5000"/>
OB31:	<input type="text" value="0"/>	<input type="text" value="2000"/>
OB32:	<input type="text" value="8"/>	<input type="text" value="1000"/>
OB33:	<input type="text" value="10"/>	<input type="text" value="500"/>
OB34:	<input type="text" value="11"/>	<input type="text" value="200"/>
OB35:	<input type="text" value="12"/>	<input type="text" value="100"/>

6. This is where you set the cycle time for the OB 35.

If the cycle time for OB 35 is set too high, message frames may be missing and there may be a delay in evaluating the "E-STOP" output of the F\_FB\_RNG\_n .

Set the cycle time for OB 35 slower than the PROFINET IO time.

7. Select the "Protection Level" group.

Protection level

1: Access protect. for F CPU  
 Can be bypassed with password

2: Write-protection

3: Write-/read protection

Password:

Enter again:

CPU contains safety program

8. Assign a password for the safety program.
9. Set the "CPU contains safety program" check box.

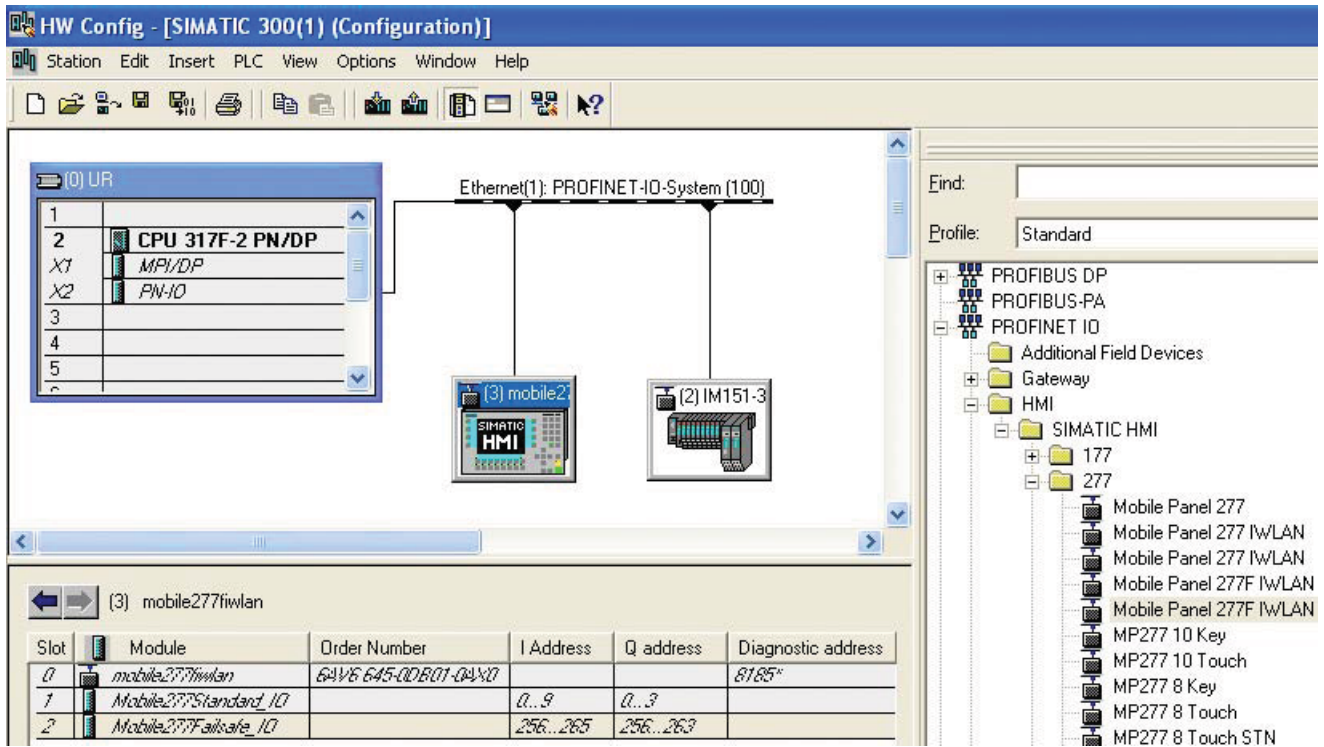
All the F-blocks required for the safe operation of the F-modules will only be compiled with this setting on compilation of the HW Config of STEP 7.



### Procedure - HMI device

Proceed as follows:

1. Add the HMI device in the HW Config.



2. Double click the Mobile Panel 277F IwLAN in HW Config.  
The properties dialog from the HMI device will be opened.

3. Double click in HW Config, detail view on the module "Mobile277Failsafe\_IO".

The properties dialog of the module "Mobile277Failsafe\_IO" for the PROFIsafe-parameter is displayed.

4. Enter a device name for the HMI device.

The device name must be unambiguous in the Ethernet subnet. This name must match the name defined in the Control Panel of the HMI device under "PROFINET" in the text box "Device name: (max. 240 characters)".

5. Change to the "Addresses" tab.

The following dialog appears:

6. Here, define the starting addresses of the inputs and the process image to which this address area belongs.

7. Here, define the starting addresses of the outputs and the process image to which this address area belongs.
8. Change to the "PROFIsafe" tab.

The following dialog appears:

Parameter name	Value	Hex
F_SIL	SIL3	
F_Block_ID	0	
F_Par_Version	1	
F_Source_Add	2000	
F_Dest_Add	200	C8
F_WD_Time	500	

9. Enter the PROFIsafe address of the HMI device in "F\_Dest\_Add".

This address must match the address on the HMI device.

10. Enter the monitoring time for the fail-safe IO-device in "F\_WD\_Time (ms)".

A valid current safety frame must reach the F-CPU and be returned to the HMI device within the monitoring time period. This guarantees that failures and errors are recognized. Corresponding reactions must be activated, which keep the fail-safe plant in a safe operating state or lead to a safe operating mode.

Select the monitoring time so that delayed safety messages are tolerated by the communication. In the case of an error, for example, upon disruption of the communication connection, the error reaction function must still react quickly enough.

### A.3.3 Safety program S7 Distributed Safety

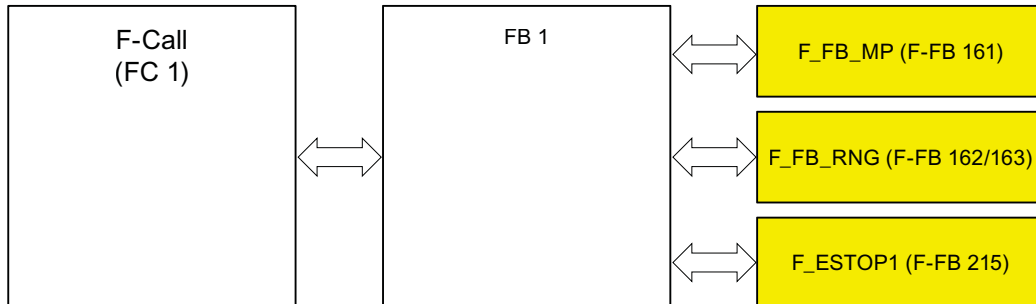
#### Functionality

The safety program of the F-CPU takes care of the following:

- The "override" mode is started when the HMI device is logged on at the effective range and there is a positive edge on the override switch.
- When the HMI device is logged on at the effective range in which the override switch is located, the signal lamp comes on.
- The "override" mode is terminated if either the override switch is activated again or if the operator leaves the protected area.
- If the "override" mode is active, the operator can control the robot by pressing a function key on the device and at the same time confirming operation with the enabling button.
- After an EMERGENCY STOP, the plant only restarts when the operator performs an acknowledgment.
- In the event of a rampdown or shutdown, the plant-specific responses are initiated.

### Program execution of the safety program

The safety program is structured as follows:



The following symbolic names are used in the networks of the sample programs

Symbolic name	Meaning
F00256_Mobile277Failsafe_IO	Fail-safe I/O DB of HMI device
MP1_FB_S7_MP_RE	Input which is set when a reset of the HMI device is performed from the F-CPU.
MP1_FB_S7_ACK_ERR	Input which is set when a communication error is acknowledged from the F-CPU.
MP1_F_DATA_PII	Word 1 of the PII of the HMI device
MP1_F_RANGE_PII	Word 2 of the PII of the HMI device
MP1_F_DATA_PIQ	Word 1 of the PIQ of the HMI device
MP1_F_RANGE_PIQ	Word 2 of the PIQ of the HMI device
Interface_DB	F-DB for the data transfer of user data
F_DB_States	F-DB for the transfer of data between the F_FB_MP of the HMI device and the F_FB_RNG_n of the effective range

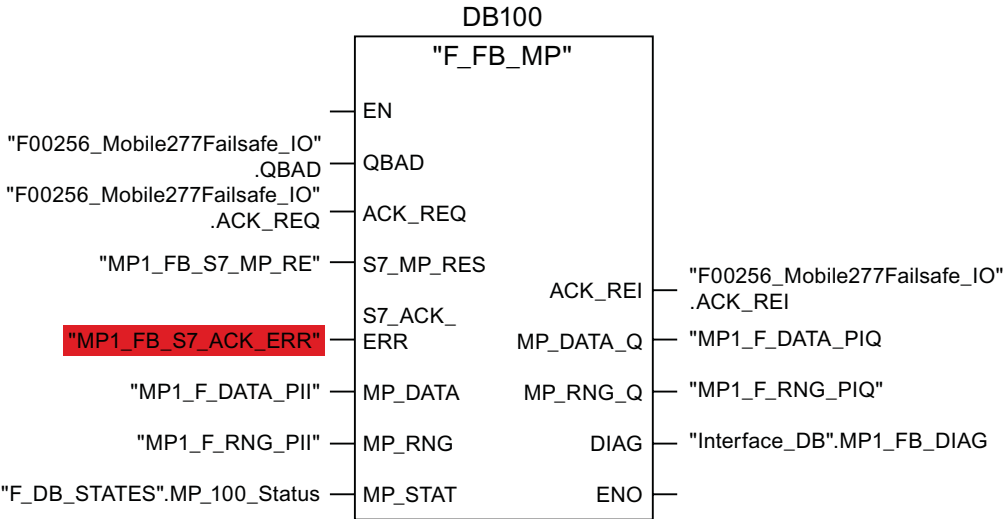
### F-CALL (FC 1)

F-CALL (FC1) is the F-process group and is called from the cyclic interrupt (OB 35). F-CALL (FC1) calls the F-program module, here FB1.

### FB 1

For reasons of program modularity, all other safety-related blocks are called from this FB. In the FB 1 you have to call the F-FBs in the sequence shown.

Network 1



In network 1 the F\_FB\_MP of the HMI device is called. With this block the controller monitors the PROFIsafe communication of the Mobile Panel 277F IWLAN. The following diagnostics information is indicated at the "DIAG" output:

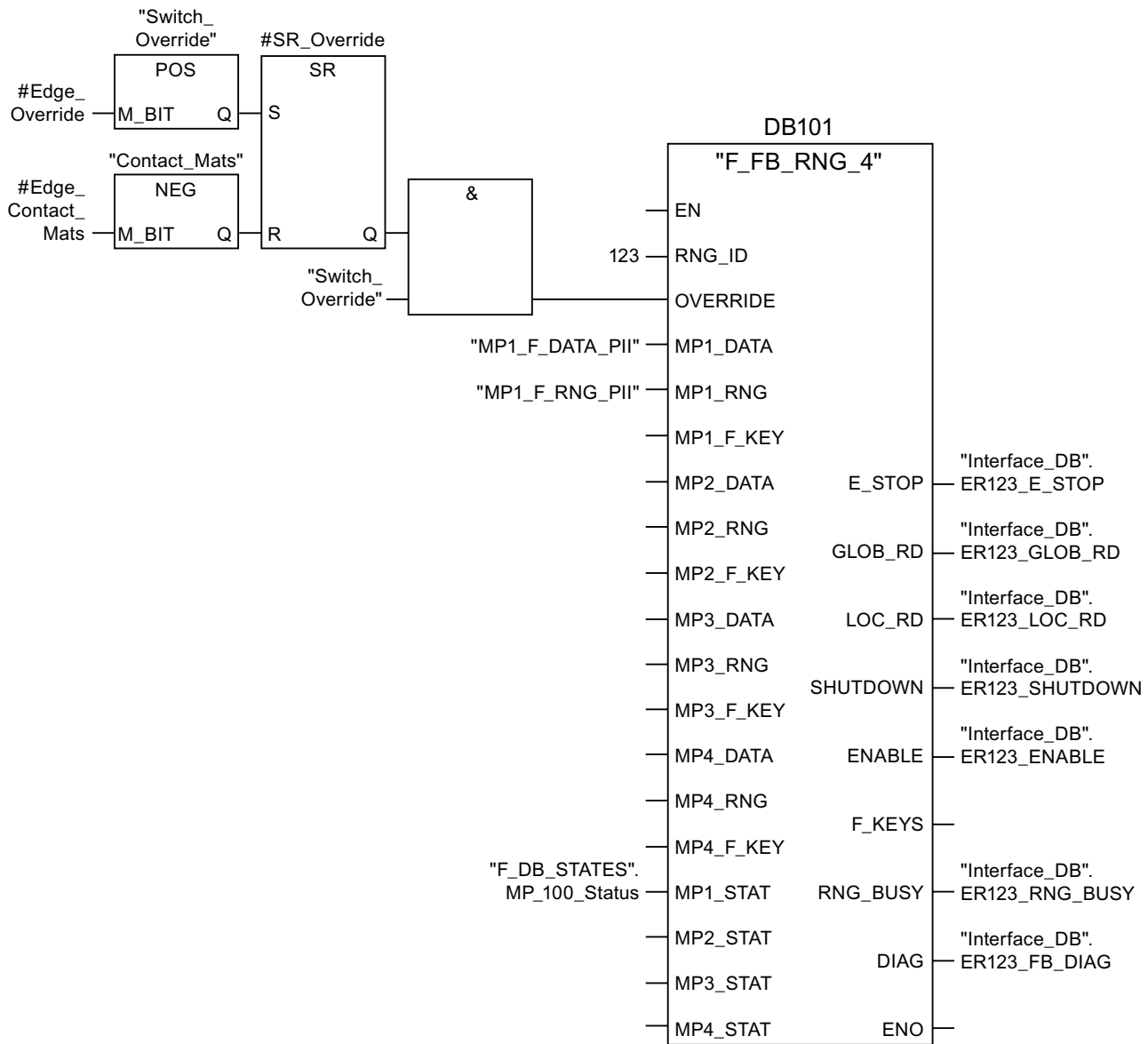
- Operating mode of the HMI device - integrated or removed
- A communication error has occurred.
- Communication error must be acknowledged

Additional information is available in the "F\_FB\_MP (Page 201)" section.

Appendix

A.3 Example of application for transponder system

Network 2



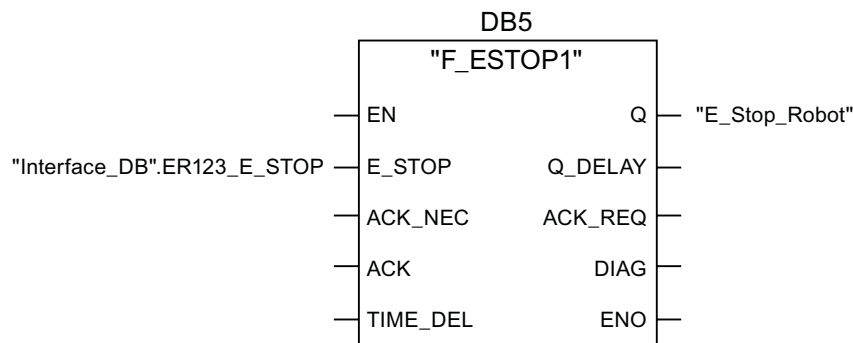
The activation of the "override" mode is controlled in this network.

- "SR\_Override" is set if the override switch is switched on, i.e. I11.0 = "1".
- "SR\_Override" is reset by a negative edge on the safety shut-off mat, i.e. I11.1 = "0".

This is the case if the operator leaves the protection zone without terminating the "override" mode. Only when the "SR\_Override" is set and the override switch is set to "on" is the "override" mode activated with the F\_FB\_RNG.

At the same time, F\_FB\_RNG monitors the signals "EMERGENCY STOP", "Global rampdown", "Local rampdown" and "Shutdown". They are scanned in networks 3 to 6.

**Network 3**



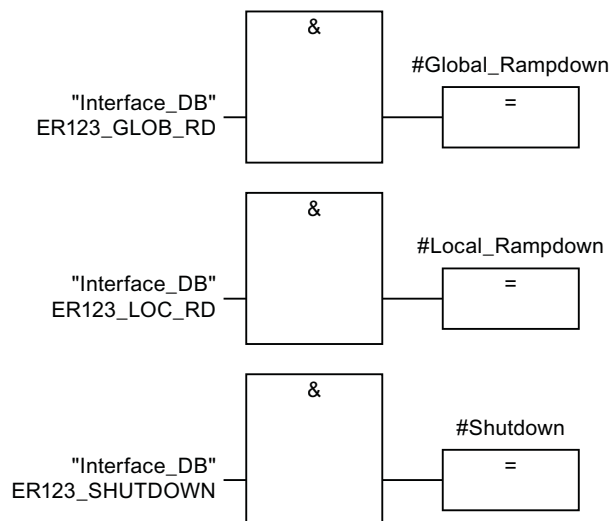
In network 3, the EMERGENCY STOP signal of the HMI device is monitored via F\_ESTOP1 from the F-library of S7 Distributed Safety. F\_ESTOP1 ensures that the plant is only able to restart following an EMERGENCY STOP after acknowledgment by the operator via the input "ACK".

**Note**

Also note the instructions for the FB 215 in the online help for the F-FBs and in the manual.

"SIMATIC S7 Distributed Safety - configuring and programming", Chapter "FB215 "F\_ESTOP1". Emergency STOP up to Stop Category 1".

**Network 4, network 5 and network 6**

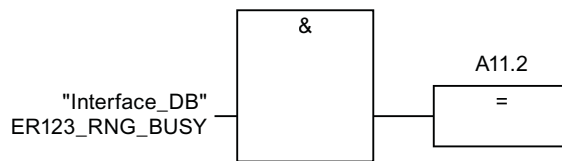


In network 4, 5 and 6 the signals for a global and a local rampdown and shutdown are processed further. Depending on the structure of the plant, a reaction upon occurrence of one of these safety states occurs. That is why these networks are not described in detail.

Appendix

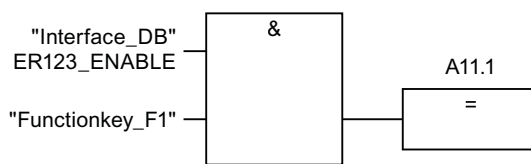
A.4 Application example RFID tag system

Network 7



If the signal "RNG\_BUSY" is set in the F\_FB\_RNG, the signal lights are controlled through the output A11.2.

Network 8



If you simultaneously presses the key F1 and the enabling button, the robot is activated via the output A11.1.

A.4 Application example RFID tag system

A.4.1 Configuration and operation

This application example shows one possible application with the safety features of the HMI device.

**Note**

In this example, the HMI device is logged onto a machine via an RFID tag within a protection zone. The security system of the protection zone consists of a wire mesh fence with a door and a contact pressure mat.

**⚠ WARNING**

**Read the documentation for S7 Distributed Safety**

An incorrectly configured or programmed system can result in death or serious injuries.

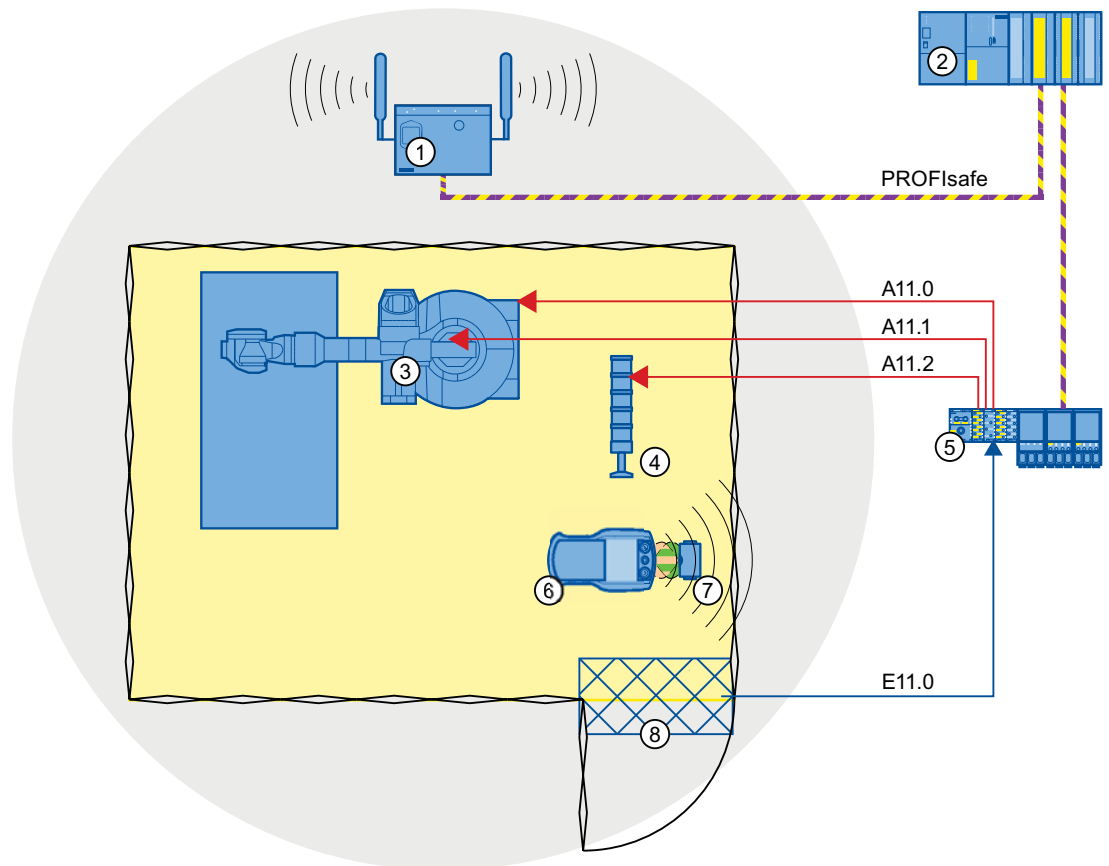
Observe the information about S7 Distributed Safety in the online help for S7 Distributed Safety and in the following manual:

Programming and operation manual "S7 Distributed Safety - Configuring and Programming" (<http://support.automation.siemens.com/WW/view/en/22099875>).



### Configuration example

The following example configuration shows a robot cell which is secured by a wire mesh fence with a contact pressure mat.



- ① Access point
- ② Fail-safe controller
- ③ Robot
- ④ Signal lamp
- ⑤ F-I/O, PROFINET IO device
- ⑥ HMI device
- ⑦ RFID tag
- ⑧ Contact pressure mat

The following signals are used:

Function Symbolic name	Signal	Explanation
Contact pressure mat "Contact_Mats"	I11.0	"0": Step on contact pressure mat "1": Do not step on contact mat
"Key1" button, configured as direct key on the HMI device:	E0.0	"0": Button not pressed "1": Button pressed