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## Using the 2nd- Generation Mobile Panel in a Safety- Related Application

WinCC V14, KTP400F, KTP700F, KTP900F, STEP 7  
Safety Advanced

<https://support.industry.siemens.com/cs/ww/de/view/103497649>

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# 1 Task

## 1.1 Introduction

The KTP400F, KTP700F and KTP900F Mobile are suitable for a wide range of applications in the industrial environment. Its mobility and robustness allows it to be used even in applications where other HMI operator panels cannot be used at all or only with considerable effort.

Using a specific example, the application example describes how to integrate the

- emergency stop button
- enabling button

of the KTP400F, KTP700F and KTP900F Mobile into a safety-related application.

### Note

When this document uses the term 'Mobile Panel', this always refers to the KTP400F, KTP700F and KTP900F Mobile.

## 1.2 Overview of the automation task

A robot to be operated is located in an area protected by a safety fence. For adjustment and maintenance work, this area can be entered through a safety door.

- The robot is operated using a mobile HMI operator panel.
- "Service mode":
  - Safety door open.  
When the safety door is open, an enabling button **must** be additionally pressed to operate the robot.  
The operating mode is selected using a key-operated switch.
- Manual/Automatic mode:
  - When the safety door is closed, the robot is operated in Manual/Automatic mode.  
The "Manual mode" selection is password protected.
- Emergency stop command device:
  - An emergency stop command device must be available during operation in the protected area.
  - Another emergency stop command device must be available outside the safety fence.
- The risk analysis for the safety function requires PL e according to ISO 13849-1 / SIL 3 according to IEC 62061.

## 1.3 Safety notices

**WARNING****Unauthorized restart of the plant**

When the EMERGENCY stop button was activated, the plant must not be restarted until it is acknowledged by the operator. In your safety program, use FB 215 ESTOP1 to ensure acknowledgment by the operator.

**WARNING****Unauthorized automatic restart of the plant**

The safety program must ensure that an automatic restart of the plant is not possible after setting the RESET. The operator is required to perform a separate action in order to restart the plant.

**WARNING****Necessary F-FBs**

You have to integrate the following fail-safe blocks into your safety program:

- One FB198 F\_FB\_KTP\_Mobile for each operator panel.  
The assigned operator panel is monitored using this F-FB.
- One FB199 F\_FB\_KTP\_RNG for each connection box.  
F\_FB\_KTP\_RNG provides the safety-related signals for the machine part assigned to a connection box.
- FB 215: ESTOP1.  
With this block, you make sure that, following an EMERGENCY stop, operator acknowledgment must be made before the plant restarts. You will find this block in the "Safety Advanced" F-library in the following block container:  
"Communication > Fail-safe HMI Mobile Panels > -- KTP Mobile --".

## 2 Solution

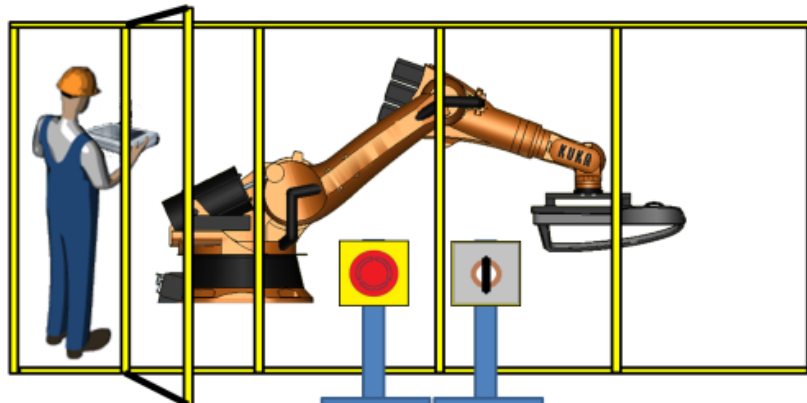
### 2.1 Overview

#### Plant overview

The following figure shows the plant overview with the most important components.

- Drive to control the robot
- KTP900F Mobile Panel.
  - The Mobile Panel features a connecting cable that is connected to a connection box. It is used for power supply and signal transmission.
  - Mobile Panel and F-CPU communicate via PROFIsafe.
  - The emergency stop button and the enabling button of the Mobile Panel are evaluated directly using the safety program of the F-CPU.
- Area with safety fence and access through a safety door.
  - The safety door has two position switches.
- External emergency stop command device.
- Key-operated switch to select "Service mode".

Figure 2-1



### What does the application example include?

The application example describes the following:

- Hardware used
- Circuit diagram
- Program description
  - STEP 7 user program
  - STEP 7 safety program
- How to use the application example

### Scope

The application example does not include a description of...

- ISO 13849-1 / IEC 62061  
For more information, see the "Safety Evaluation Tool". The online tool approved by the German Technical Inspectorate provides fast and safe support in evaluating safety functions of your machine [\8](#).
- "safety of machinery"
- how to use the WinCC TIA Portal software

Basic knowledge of these topics is required.

### Validity

The application example was created with the following software.

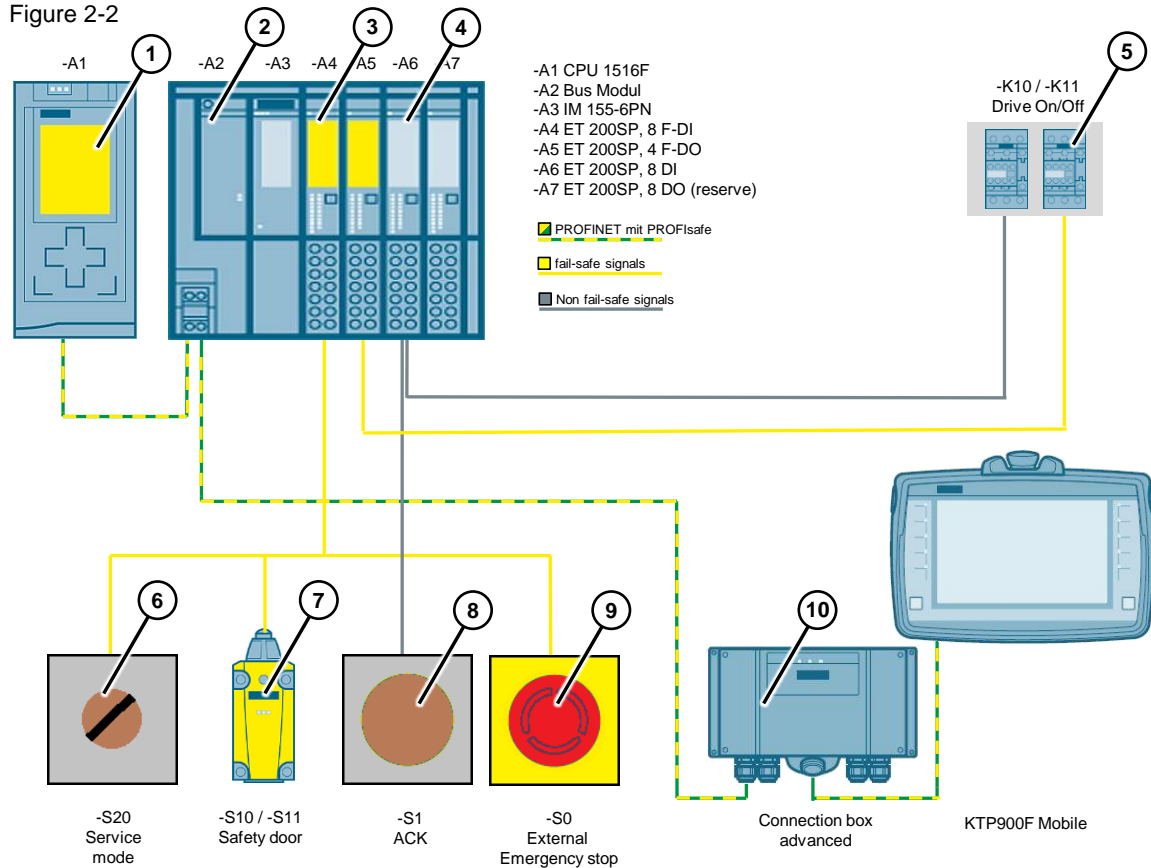
- STEP 7 Professional V14 SP1.
- STEP 7 Safety Advanced V14 SP1.
- WinCC (TIA Portal) V14 SP1 or higher.

## 2.2 Hardware configuration

### 2.2.1 Hardware configuration overview

The diagrammatic representation below shows the most important components.

Figure 2-2



1. Fail-safe CPU
2. ET 200SP interface module
3. ET 200SP, fail-safe digital input / output modules
4. ET 200SP, standard digital input / output modules
5. Contactors for switching the robot drive on/off
6. External key-operated switch for selecting "Service mode"
7. Position switch (safety door)
8. External button for acknowledging fault messages and reintegrating the F-DI / F-DQ modules
9. External emergency stop command device
10. KTP900F Mobile Panel with connection box advanced



## 2.2.2 Hardware components used

Table 2-1

Component	No.	Article number	Note
KTP900F Mobile	1	6AV2125-2JB23-0AX0	-
Connection box advanced	1	6AV2125-2AE23-0AX0	-
Connecting cable, PN, 5m	5m	6AV2181-5AF05-0AX0	-
DIN rail, 480 mm	1	6ES7390-1AE80-0AA0	-
Load power supply. PS 307; 120/230V AC, 24V DC, 10A	1	6ES7307-1KA02-0AA0	-
CPU 1516F-3 PN/DP	1	6ES7516-3FN01-0AB0	-
SIMATIC S7, memory card for S7-1X00 CPU/SINAMICS, 3.3 V FLASH, 24 MBYTE	1	6ES7954-8LF02-0AA0	-
IM 155-6 PN HF	1	6ES7155-6AU00-0CN0	-
F-DI 8x24VDC HF	1	6ES7136-6BA00-0CA0	-
F-DQ 4x24VDC/2A PM HF	1	6ES7136-6DB00-0CA0	-
DI 8x24VDC ST	1	6ES7131-6BF00-0BA0	-
DQ 8x24VDC/0.5A ST	1	6ES7132-6BF00-0BA0	Reserve (not used in this application)
Contactors AC-3 3KW/400V, 1NC, 24V DC	3	3RT2015-1BB2	-
Auxiliary switch blocks 2NO + 2NC	3	3RH2911-1FA22	-
Command points	4	3SB3801-0EG3 3SB3801-0DD3	<ul style="list-style-type: none"> <li>• Emergency stop command device</li> <li>• Safety door switches</li> <li>• Acknowledgment button</li> <li>• Key-operated switch</li> </ul>

## 2.2.3 Software components used

Table 2-2

Component	No.	Article number	Note
STEP 7 Professional V14 SP1	1	6ES7822-1AA04-0YA7	This version or higher
WinCC Advanced V14 SP1	1	6AV2102-0AA04-0AA5	This version or higher
STEP 7 Safety Advanced V14 SP1	1	6ES7833-1FA14-0YA5	This version or higher

## 2.2.4 Sample files and projects

The following list contains all files and projects that are used in this example.

Table 2-3

Component	Note
103497649_KTPxxxF_Mobile_2nd_DOC_en.pdf	This document.
103497649_KTPxxxF_Mobile_2nd_Getting_Started_DOC_en.pdf	Getting Started.
103497649_KTPxxxF_Mobile_2nd_Code.zip	The .zip file contains the program for the application example and a default configuration.

## 2.3 Design of the control elements and contactors

To achieve the required PL d or SIL 2, the hardware components must meet certain requirements. These requirements are described in this chapter.

Table 2-4

No.	Device	In conjunction with a safety program
1.	Stationary emergency stop command devices	Two-channel switch with two NC contacts. The signals are read using a fail-safe digital input module.  <b>Note</b> All emergency stop buttons associated with the emergency stop command device are connected in series.
2.	Emergency stop (Mobile Panel)	Evaluation via PROFIsafe  Alternative: Evaluation using SIRIUS safety relays.
3.	Enabling button (Mobile Panel)	Evaluation via PROFIsafe  Alternative: Evaluation using SIRIUS safety relays.
4.	Error acknowledgment / reintegration of F-DI / F-DQ modules	Button with single-channel operating element (NO contact). The signal is read using a standard digital input module.  Alternative: Acknowledgment using "FB187" (F_ACK_OP). Only possible in conjunction with an F-CPU and STEP 7 Safety Advanced.
5.	Mode selector	Key-operated switch with operating element (e.g., NO contact). The signal is read using a standard digital input module.  <b>Note</b> The Mobile Panel features a key-operated switch. Alternatively, this switch can be used for mode switching. Evaluation is performed via "direct key evaluation".
6.	Safety door switches	The safety door requires two position switches with a single-channel operating element (NC contact). The signals are read using a fail-safe digital input module.
7.	Control of the contactors	The contactors are switched on and off using a fail-safe digital output module.

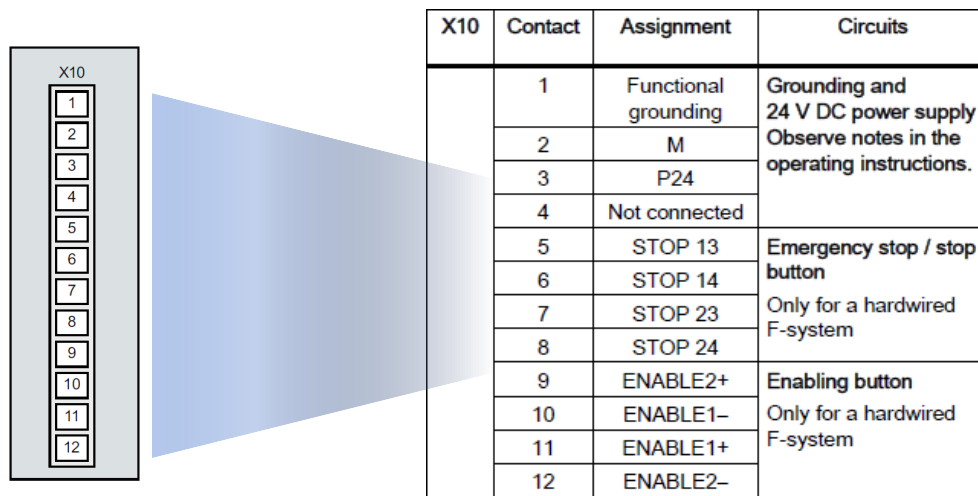
No.	Device	In conjunction with a safety program
8.	Readback signals (contactors)	Two contactors are used for safe shutdown of the drive. The first contactor's NC contact is interconnected in series with the second contactors NC contact and read using a standard digital input module. In the safety program, the certified "FB FDBACK" block is used to evaluate the signal.

### 2.3.1 Mobile Panel, connection box advanced

#### X10 interface assignment

X10 terminal block, 12-pin: 24V DC power supply

Figure 2-3



### 2.3.2 ET 200SP, 8 F-DI electronic module

The 8 F-DI 24V DC digital electronic module is used for collecting the safety-related signals.

The external emergency stop command device is connected to two opposite inputs of the digital module on a two-channel basis (1oo2 evaluation).

The two position switches of the safety door are connected on a single-channel basis and each is assigned one input of the digital module (1oo1 evaluation).

#### Pinout

Channel 0, 4:	DI0 – DI4	(1 <sup>1</sup> ) DI0 + (9) VS0 – (5) DI4 + (13) VS4
Channel 1, 5:	DI1 – DI5	(2) DI1 + (10) VS1 – (6) DI5 + (14) VS5
Channel 2, 6:	DI2 – DI6	(3) DI2 + (11) VS2 – (7) DI6 + (15) VS6
Channel 3, 7:	DI3 – DI7	(4) DI3 + (12) VS3 – (8) DI7 + (16) VS7

For details about the pinout, see the supplied circuit diagram or Chapter [4.2](#) "[Circuit diagram](#)".

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<sup>1</sup> The value in brackets is the terminal on the module

## 3 Basics

### 3.1 Safety notices

Make yourself familiar with the safety notices and general information in the Mobile Panel's operating instructions. For the operating instructions, use the following link:

<https://support.industry.siemens.com/cs/en/en/ps/14746/man>

### 3.2 Operating modes

Machine tools have predefined operating modes. This application example uses the following operating modes.

- Automatic mode
  - In this mode, it is not possible to enter the protected area. Automatic mode must be disabled before the safety door can be opened and the protected area can be entered.  
If the safety door is opened in Automatic mode, the robot drive is switched off.
- Manual mode (setup mode)
  - Operators must have received specific training before they are allowed to use this mode. This mode can only be selected by entering a password. The drive is controlled in jog mode. The safety devices must be closed. If the safety door is opened in Manual mode, the drive is immediately switched off.
- Service mode (process monitoring in production)
  - In contrast to the previous modes, the user can monitor and control the protected area when the safety device (door) is open. An additional enabling button is required to operate the robot. Releasing the enabling button immediately stops the robot drive.

In all three modes, the stationary emergency stop command device and the emergency stop button of the Mobile Panel are active.

## 3.3 Mobile Panel

### PROFIsafe

PROFIsafe ensures F-communication between two partners.

The Mobile Panel supports communication via PROFIsafe. This functionality provides the option to evaluate the emergency stop button and the enabling button of the Mobile Panel directly in the F-CPU. It is therefore no longer necessary to wire additional modules.

### Connection box advanced

Three different connection boxes are available for the Mobile Panel.

The connection box used in this application example, **advanced**, can be integrated into an existing emergency stop circuit.

The Mobile Panel can be removed from the connection box without opening the assigned emergency stop circuit.

When used in conjunction with PROFIsafe, the Mobile Panel must first be logged off of the network.

### Emergency stop button

The signal of the emergency stop button of the Mobile Panel can be further processed via PROFIsafe or using suitable external evaluation units such as safety relays.

When the Mobile Panel is connected to the connection box, the emergency stop button must be active.

Depending on the operating mode, the emergency stop button lights up. In this application example, the emergency stop button lights up when the Mobile Panel is logged on to the safety program.

For details about the various operating modes, refer to the manual.

### Enabling button

The signal of the enabling button of the Mobile Panel can be further processed via **PROFIsafe** or using suitable external evaluation units such as safety relays.

#### Note

The enabling button is only needed if required by the operating mode. This would be the case, for example, in "Service mode".

## 3.4 Logging out of the safety program

Before you disconnect the Mobile Panel from the connection box, log the Mobile Panel out of the safety program using the "TerminatePROFIsafe" system function (1) or exit the running project.

If you do not log out before disconnecting, the system triggers an emergency stop.

Once you have logged out, the emergency stop button and the enabling button are **no** longer active.

## 4 Configuration Guide

### 4.1 General information

#### Sample project

The supplied sample project contains all the settings described in this chapter. The robot's movements are animated using a graphic list and only intended to illustrate the function.

#### Program information

The following measures were implemented in the STEP 7 program to avoid the risk of misuse by an unauthorized hold-down of the enabling button.

- The enabling button must be released within a specified period and then returned to the "acknowledgment" position.  
Select this period based on the activity of the system to be monitored.
- It is not allowed to use the enabling button alone to switch on the drive.
  - Always press the enabling button **before** switching on the drive.
  - Pressing the "Drive on" button and then pressing the enabling button does not activate the drive.

#### STEP 7 program

- The user program is used to control the robot drive.
- The safety program is used to evaluate the safety-related functions.

#### HMI configuration

The HMI configuration contains all the functions for controlling the robot drive. The "robot's" movements are simulated using a graphic list.

#### Note

Follow the safety notices and general information in the Mobile Panel manual. (For the operating instructions, use the following link:  
<https://support.industry.siemens.com/cs/en/en/ps/14746/man>)

## 4.2 Circuit diagram

The circuit diagram contains the data for implementing the automation task shown in Chapter 1.2.

The circuit diagram has 8 pages and corresponds to the test setup that was used to test the functionality of the automation task.

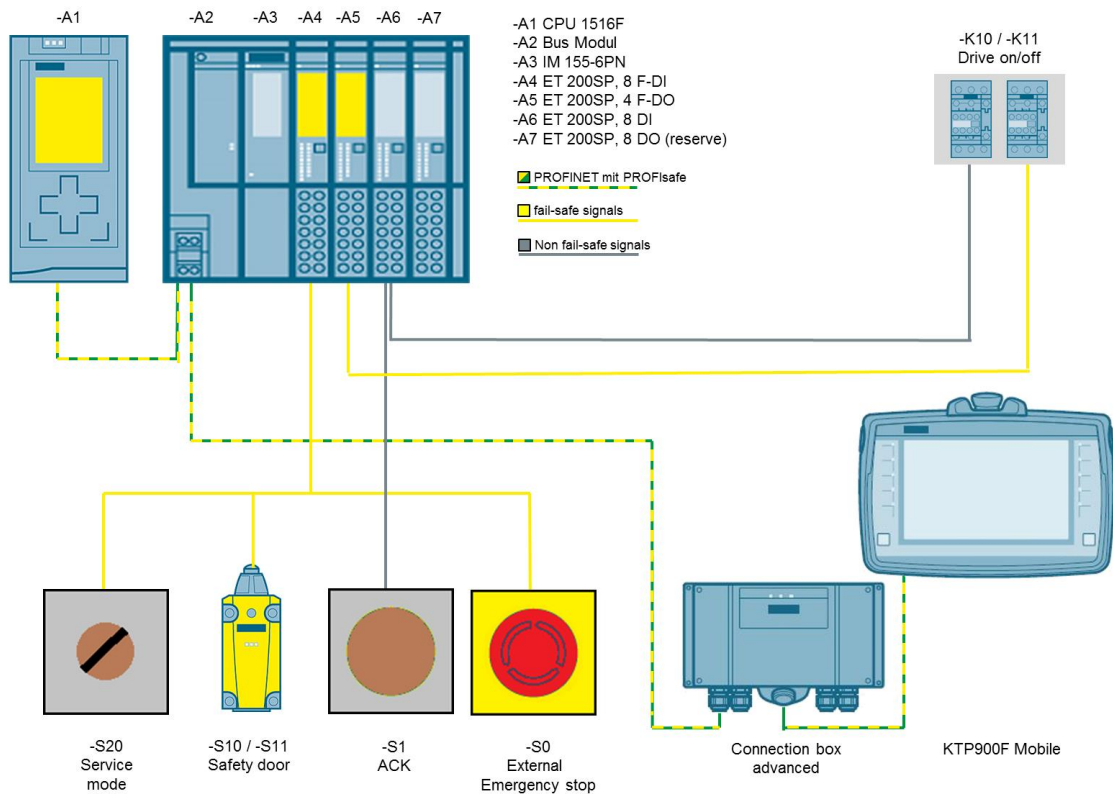
### Notes

- The circuit diagram is included in this application example as a separate document.
- Depending on the required automation task, additional evaluation units and protective measures may be necessary.

### Circuit diagram, page 1

Hardware and signal exchange overview.

Figure 4-1



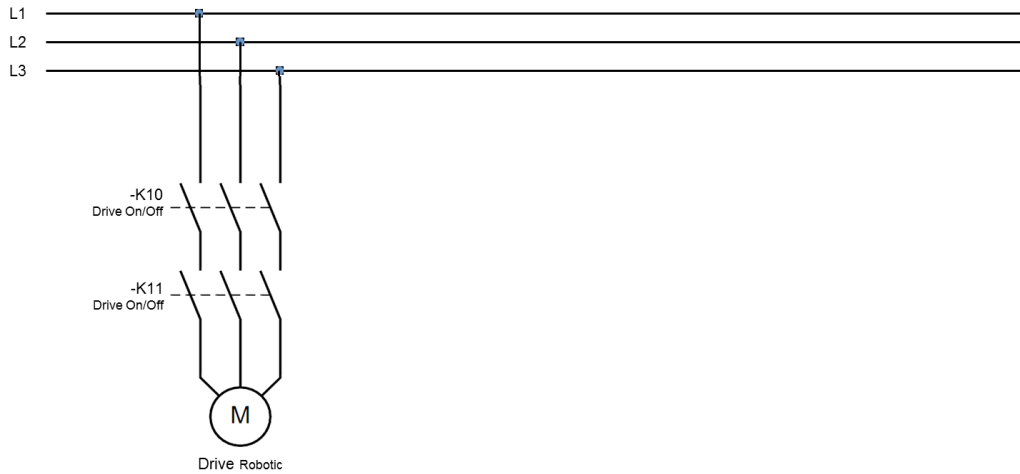


**Circuit diagram, page 2**

Load circuit overview.

Contactors –K10 and –K11 are used to switch the robot drive on and off.

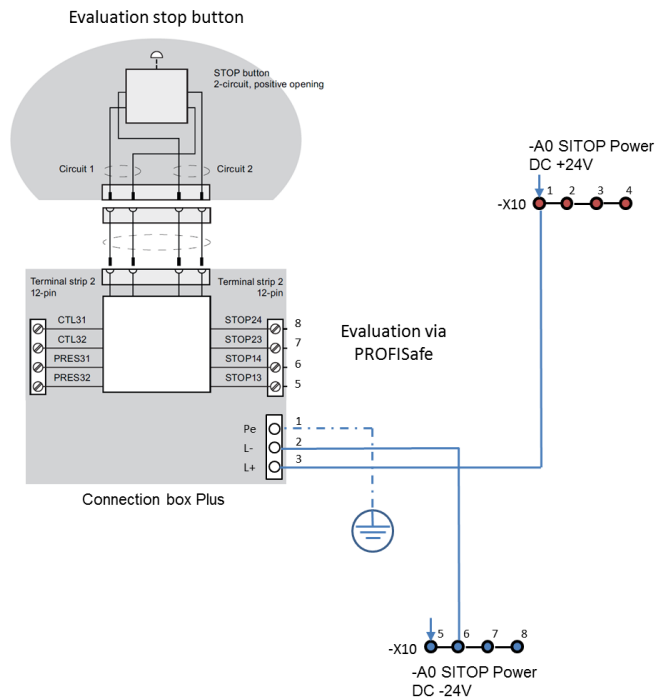
Figure 4-2



**Circuit diagram, page 3**

The emergency stop button of the Mobile Panel is evaluated directly in the F-CPU via PROFISafe.

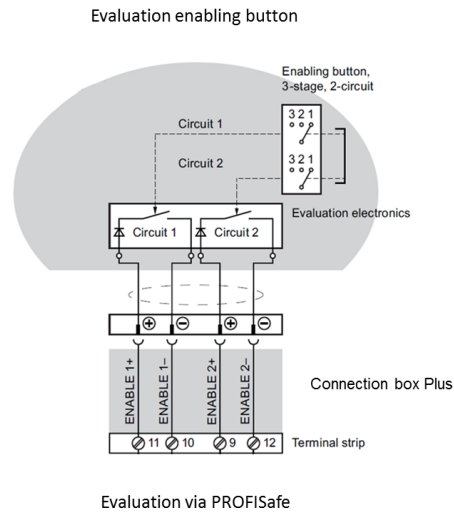
Figure 4-3



**Circuit diagram, page 4**

The enabling button of the Mobile Panel is evaluated directly in the F-CPU via PROFIsafe.

Figure 4-4

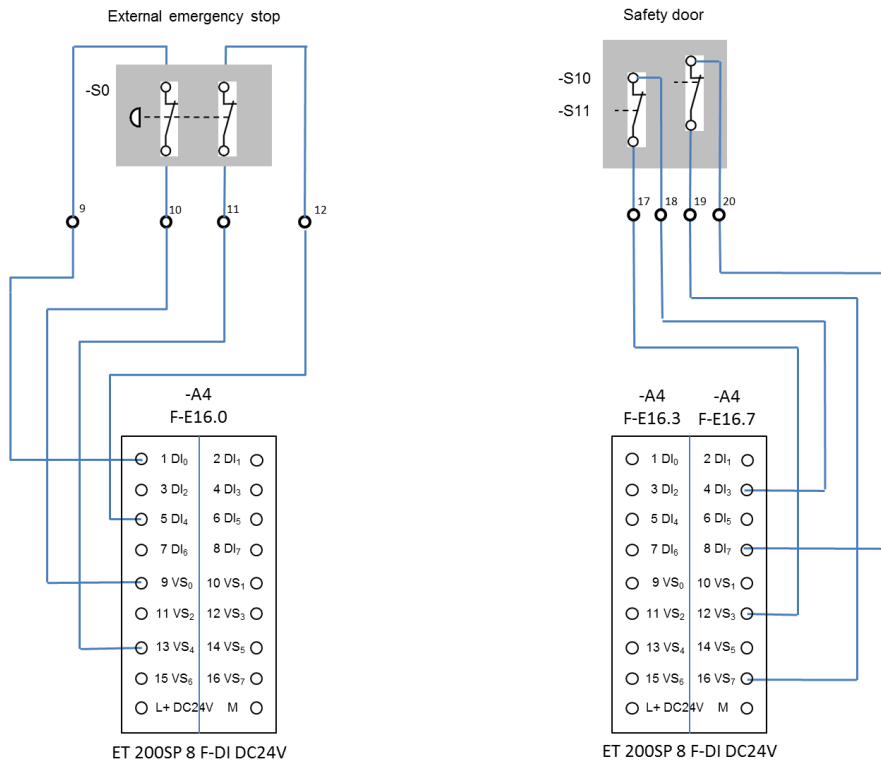


**Circuit diagram, page 5**

The page shows the pinout of the F-DI module.

- External emergency stop command device. Implementation of 1oo2 evaluation – channel 0, 4.
- Safety door position switches. Implementation of 1oo1 evaluation – channel 3 (-S10) and channel 7 (-S11).

Figure 4-5



**Circuit diagram, page 6**

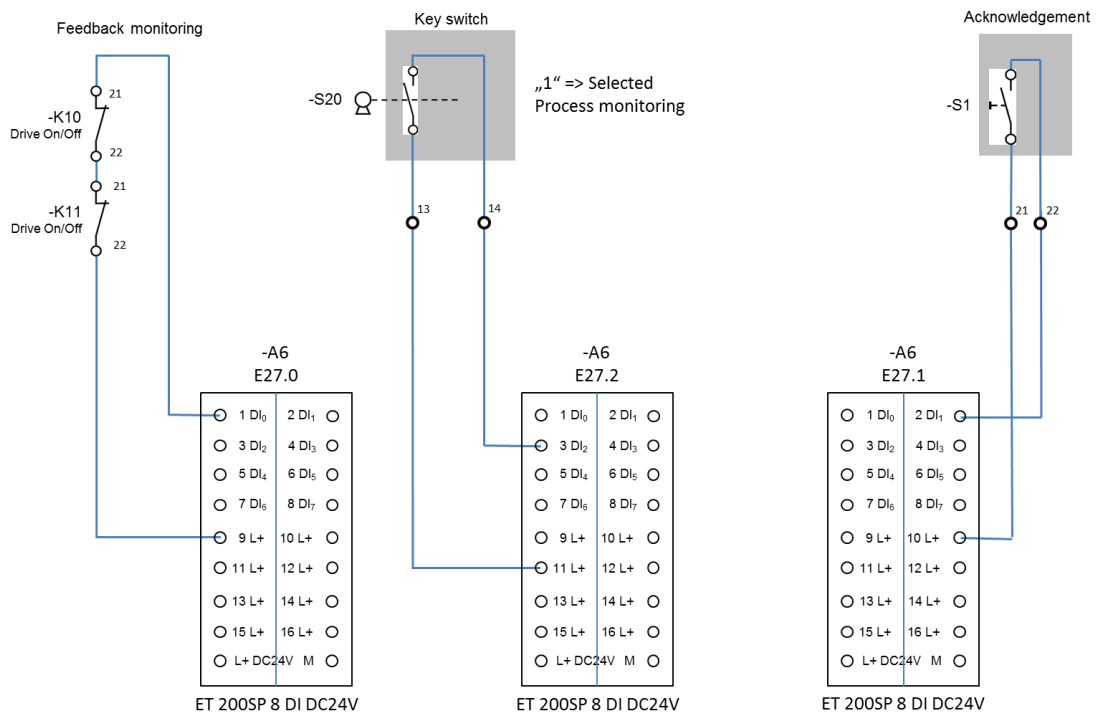
The page shows the pinout of the DI standard module.

- For feedback circuit monitoring of contactors –K10 and –K11.
- For the key-operated switch for changing "Service mode".
- For the external button for acknowledging fault messages and reintegrating the F-DI / F-DQ modules.

**Note**

Fault messages can also be acknowledged using the HMI operator panel. The messages are acknowledged in the control program using the F-FB187 "F\_OP" function block.

Figure 4-6

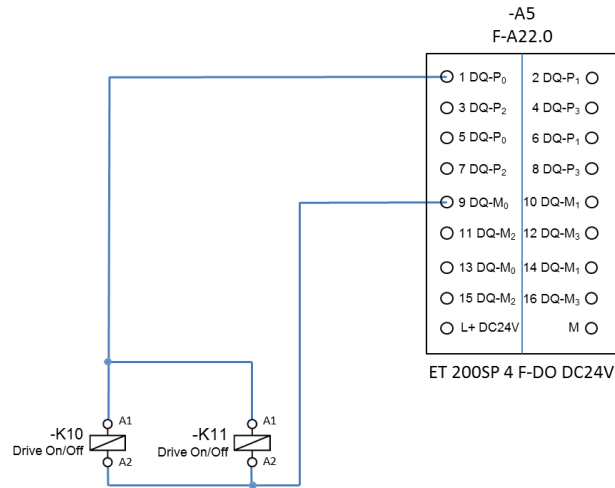


**Circuit diagram, page 7**

The page shows how to connect contactors –K10 and –K11 using the F-DO module.

The contactors are used to functionally, safely switch the robot drive on and off.

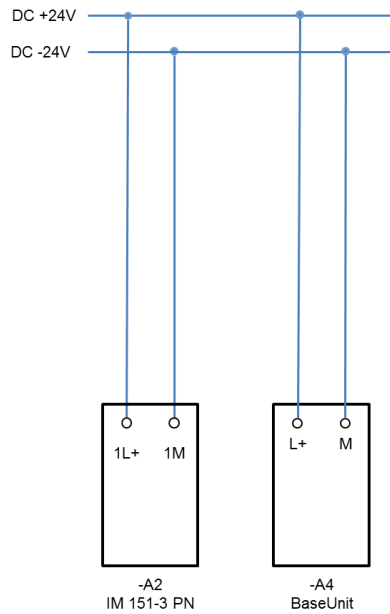
Figure 4-7



**Circuit diagram, page 8**

The page shows the power supply for the ET200 SP.

Figure 4-8



## 4.3 WinCC TIA Portal project

### 4.3.1 Hardware configuration

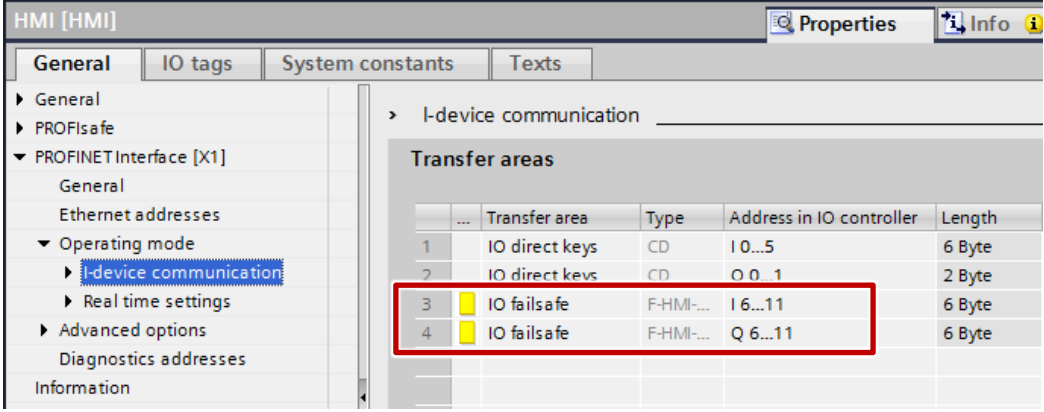
**Note** The supplied sample project contains all the settings listed in this chapter.

Table 4-1

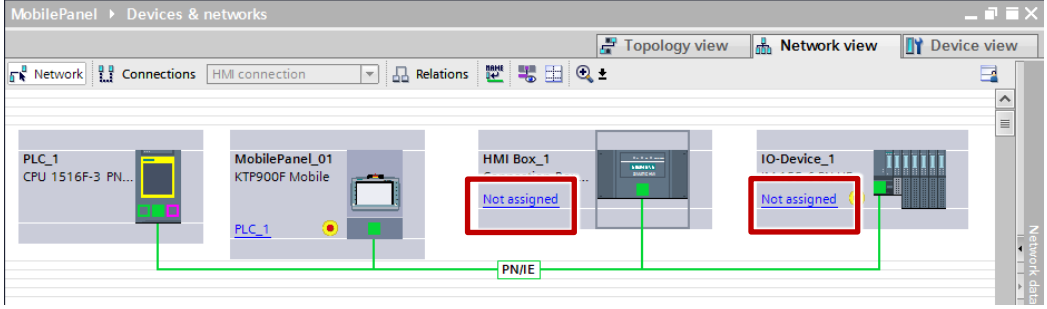
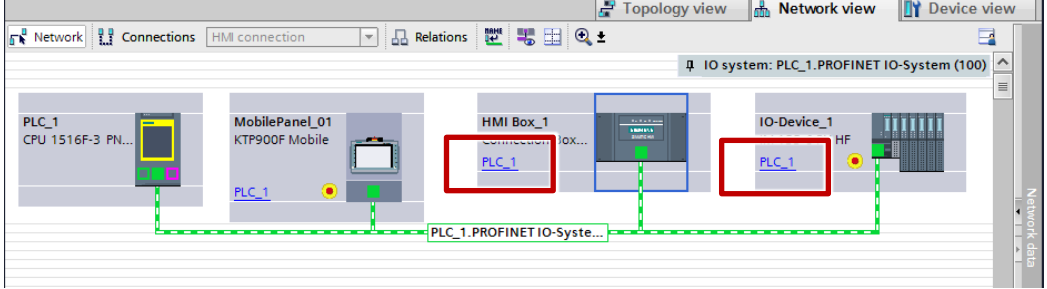
No.	Description
1.	<p><b>F-CPU</b></p> <ul style="list-style-type: none"> <li>• Create a new WinCC V14 project.</li> <li>• Insert an F-CPU into the project tree. In this application example, insert a "CPU 1516F-3 PN/DP".</li> <li>• Open the F-CPU device configuration and select the "Device view".</li> <li>• Open the CPU properties.</li> <li>• In the area navigation, select "General &gt; PROFINET interface [X1] &gt; Ethernet addresses".               <ul style="list-style-type: none"> <li>- Interface: Use the drop-down list to select a subnet or add a new one.</li> <li>- IP protocol: Enter the IP address.</li> <li>- PROFINET: Optionally specify a PROFINET device name. The name is not further evaluated.</li> </ul> </li> </ul> <p>The default settings were applied to the F-parameters of the F-CPU. List items that contain F-parameters are indicated by rectangles silhouetted in yellow. Check each parameter and modify it, if necessary.</p>
2.	<p><b>ET 200SP</b></p> <ul style="list-style-type: none"> <li>• In the Device configuration, open the Network view.</li> <li>• In the hardware catalog, select the interface module in "Distributed IO &gt; ET 200SP &gt; Interface modules &gt; PROFINET &gt; IM 155-6 PN HF" and use drag and drop to move the module to the graphic area of the Network view.</li> <li>• Select the module and go to the Device view.</li> <li>• In the area navigation, select "General &gt; PROFINET interface [X1] &gt; Ethernet addresses".               <ul style="list-style-type: none"> <li>- Interface: From the drop-down list, select the previously created subnet.</li> <li>- IP protocol: Enter the IP address.</li> <li>- PROFINET: Specify a PROFINET device name. The name is not further evaluated.</li> </ul> </li> <li>• In the hardware catalog, check the "Filter" check box. All available ET 200SP components will be displayed.               <ul style="list-style-type: none"> <li>- Select the folders of the components used and use drag and drop to move the modules to the module slots.</li> </ul> <p>In this example: See Hardware components used, Chapter <a href="#">2.2.2</a>.</p> </li> </ul> <p>View of the completed station configuration</p>

No.	Description
4.	<p><b>ET200SP, configuring the F-DI module</b></p> <ul style="list-style-type: none"> <li>Select the F-DI module.</li> <li>In the area navigation, select "General &gt; F-parameters". <ul style="list-style-type: none"> <li>The default settings were applied.</li> </ul> </li> <li>In the area navigation, select "General &gt; DI parameters". <ul style="list-style-type: none"> <li>The following parameters depend on the assignment of the inputs and their evaluation (e.g., 1oo2 evaluation, etc.). Please refer to the modules in the hardware plan and the connections used there. Unused channels should be deactivated.</li> <li><b>Channel parameters</b> <ul style="list-style-type: none"> <li>Channel 0, 4: Evaluation 1oo2 External emergency stop command device.</li> <li>Channel 1, 5: Deactivated.</li> <li>Channel 2, 6: Deactivated.</li> <li>Channel 3, 7: Evaluation1oo1 Safety door position switches.</li> </ul> </li> <li><b>Sensor supply</b> <ul style="list-style-type: none"> <li>Sensor supply for channels 0, 3, 4, 7 is activated.</li> <li>Sensor supply for channels 1, 2, 5, 6 is not activated.</li> </ul> </li> <li><b>IO addresses</b> <ul style="list-style-type: none"> <li>The default settings were applied.</li> <li>In this application example: I16.0 to I21.7</li> </ul> </li> </ul> </li> </ul>
5.	<p><b>Configuring the F-DQ module</b></p> <ul style="list-style-type: none"> <li>Select the F-DO module.</li> <li>In the area navigation, select "General &gt; F-parameters". <ul style="list-style-type: none"> <li>The default settings were applied.</li> </ul> </li> <li>In the area navigation, select "General &gt; DQ parameters". <ul style="list-style-type: none"> <li>Please refer to the hardware plan. Unused channels should be deactivated.</li> <li><b>DQ parameters</b> <ul style="list-style-type: none"> <li>Channel 0: Activated Control of contactors -K10 / -K11 (functionally switch drive on/off).</li> <li>Channel 1 to 3: Deactivated.</li> </ul> </li> <li><b>IO addresses</b> <ul style="list-style-type: none"> <li>The default settings were applied.</li> <li>In this application example: Q22.0 to Q26.7</li> </ul> </li> </ul> </li> </ul>

No.	Description
6.	<p><b>DI module</b></p> <ul style="list-style-type: none"> <li>• Select the DI module.</li> <li>• In the area navigation, select "General &gt; Module Parameters &gt; Channel template". <ul style="list-style-type: none"> <li>- The channel template was activated. (Channels 0 to 7 all use the "channel template".)</li> </ul> </li> <li>• In the area navigation, select "General &gt; Input 0 - 7 &gt; I/O addresses" and enter the start addresses. The default settings were applied. In this application example: I27 to I27.7</li> </ul>
7.	<p><b>DO module</b></p> <ul style="list-style-type: none"> <li>• Select the DO module.</li> <li>• In the area navigation, select "General &gt; Module Parameters &gt; Channel template". <ul style="list-style-type: none"> <li>- The channel template was activated. (Channels 0 to 7 all use the "channel template".)</li> </ul> </li> <li>• In the area navigation, select "General &gt; Output 0 – 7 &gt; I/O addresses". The default settings were applied. In this application example: Q2.0 to Q2.7</li> </ul>
8.	<p><b>Mobile Panel</b></p> <ul style="list-style-type: none"> <li>• Go to the Network view.</li> <li>• In the Mobile Panel's hardware catalog, go to "HMI &gt; SIMATIC Mobile Panel &gt; 9" display &gt; KTP900FF Mobile" and use drag and drop to move the Mobile Panel to the graphic area of the Network view.</li> <li>• Select the Mobile Panel and go to the Device view.</li> <li>• In the area navigation, select "General &gt; PROFINET interface [X1] &gt; Ethernet addresses". <ul style="list-style-type: none"> <li>- IP protocol: Enter the IP address.</li> <li>- PROFINET: Specify a PROFINET device name. The name must match the PROFINET name in the device settings on the Mobile Panel in "Settings &gt; PROFINET". In this application example: mobile (see <a href="#">link</a>).</li> </ul> </li> </ul>
9.	<p><b>Mobile Panel</b></p> <ul style="list-style-type: none"> <li>• In the area navigation, select "General &gt; PROFINET interface [X1] &gt; Operating mode". <ul style="list-style-type: none"> <li>- Check the "<b>IO device</b>" check box. Now you can select the IO controller from the drop-down list.</li> </ul> </li> </ul>
10.	<p><b>Mobile Panel</b></p> <ul style="list-style-type: none"> <li>• In the area navigation, select "General &gt; PROFIsafe &gt; Enable PROFIsafe ". <ul style="list-style-type: none"> <li>- Select the "Enable PROFIsafe" button. The button can only be activated if the "IO device" check box has been checked.</li> </ul> </li> </ul>

No.	Description
11.	<p><b>Mobile Panel</b></p> <ul style="list-style-type: none"> <li>In the area navigation, select "General &gt; PROFINET interface [X1] &gt; PROFIsafe &gt; PROFIsafe parameters". <ul style="list-style-type: none"> <li>F-parameters: If necessary, manually modify the F-monitoring time.</li> </ul> </li> </ul> <p><b>F-destination address:</b>  The F-destination address you set here must match the PROFIsafe address on the Mobile Panel in "Settings &gt; PROFIsafe" (see <a href="#">link</a>).  In this application example: 33.</p>
12.	<p><b>Mobile Panel</b></p> <ul style="list-style-type: none"> <li>In the area navigation, select "General &gt; PROFINET interface [X1] &gt; PROFIsafe &gt; Operating mode". <ul style="list-style-type: none"> <li>I-device communication: Now you can modify the transfer areas for the input and output range for "IO failsafe".  In the safety program, these addresses are evaluated in the "F_FB_KTP_Mobile" block (see <a href="#">link</a>).</li> </ul> </li> </ul> 
13.	<p><b>Mobile Panel</b></p> <ul style="list-style-type: none"> <li>Go to the Network view.</li> <li>Create an HMI connection between the F-CPU and the Mobile Panel.</li> </ul>
14.	<p><b>Connection box</b></p> <ul style="list-style-type: none"> <li>Go to the Network view.</li> <li>In the hardware catalog, go to "HMI &gt; SIMATIC Mobile Panel &gt; System Components &gt; Connection Box advanced" to select the connection box and use drag and drop to move the connection box to the graphic area of the Network view.</li> <li>Select the connection box and go to the Device view.</li> <li>In the area navigation, select "General &gt; PROFINET interface [X1] &gt; Ethernet addresses". <ul style="list-style-type: none"> <li>Interface: Select a subnet from the drop-down list.</li> <li>IP protocol: Enter the IP address.</li> <li>PROFINET: Specify a PROFINET device name.  The name is not further evaluated.</li> </ul> </li> </ul>

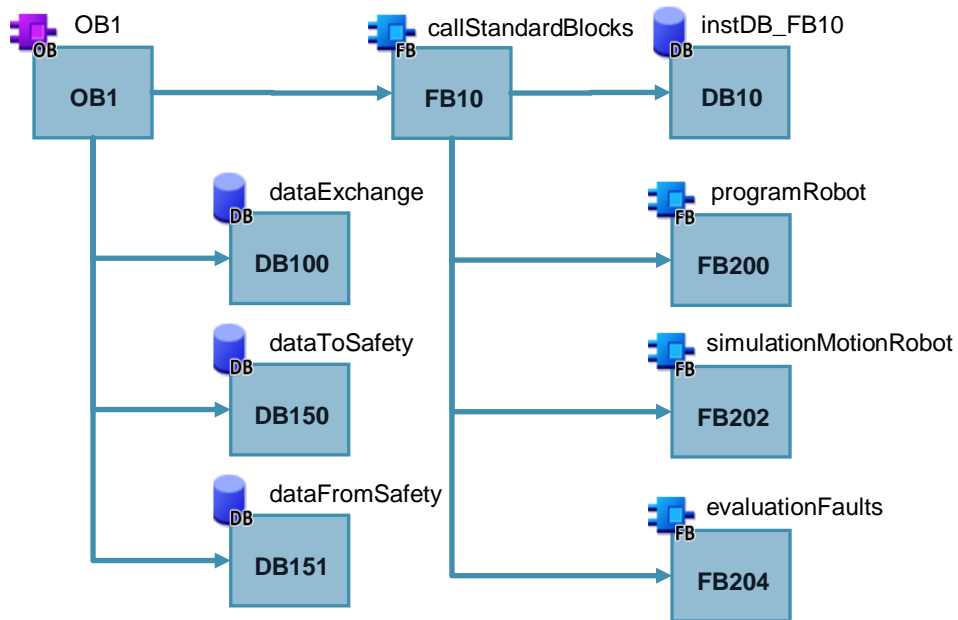


No.	Description
15.	<p data-bbox="327 309 639 338"><b>Assigning the IO controller</b></p>  <ul data-bbox="327 728 1377 913" style="list-style-type: none"> <li>• Go to the Network view.</li> <li>• Assign an IO controller to the ET 200SP and the connection box (in this application example: the configured F-CPU).             <ul style="list-style-type: none"> <li>- Left-click the text silhouetted in blue, "Not assigned".</li> <li>- In the dialog, select the IO controller.</li> <li>- The name of the assigned IO controller is displayed on the module.</li> </ul> </li> </ul> <p data-bbox="327 952 820 981">View of the completed hardware configuration</p> 
16.	<p data-bbox="327 1283 815 1312"><b>Customizing the I/O addresses (ET 200SP)</b></p> <p data-bbox="327 1350 1377 1404">If you want to change the default start addresses of the ET 200SP, the station must be assigned to an IO controller (in this case: the F-CPU). Otherwise, the input field is grayed out.</p>

### 4.3.2 STEP 7 user program

#### Program structure

Figure 4-9



#### Brief description of the blocks

Table 4-2

No.	Action
1.	<b>OB1</b> Via OB1, FB10 is called, which, in turn, is used to call the blocks listed in the program structure.
2.	<b>"PLC-Code_KTP Mobile" block group</b> For greater clarity, all of the following blocks are grouped into this block group.
3.	<b>FB10, callStandardBlocks</b> The "FB200, FB202 and FB204" blocks are called via FB10. "DB10" is a multi-instance DB and contains the instances of the called FBs.
4.	<b>FB200, programRobot</b> The FB contains the control program to control the robot drive.
5.	<b>FB202, simulationMotionRobot</b> The FB contains the program to simulate the robot's movements on the HMI operator panel.
6.	<b>FB204, evaluationFaults</b> The FB generates fault and warning messages that are output on the HMI operator panel.
7.	<b>DB100, dataExchange</b> DB100 contains the data for data exchange between <ul style="list-style-type: none"> <li>the HMI operator panel and the control program.</li> <li>the individual program blocks (not the F-program part).</li> </ul>
8.	<b>DB150, dataToSafety</b> For data exchange between "user program and safety program".

No.	Action
9.	<b>DB151, dataFromSafety</b> For data exchange between "safety program and user program".

**FB200, programRobot (program information)**

FB200 contains the essential program steps to control the robot drive.

Table 4-3

No.	Action
1.	<b>Network 4, Automatic mode</b>  To ensure that the function key for switching on the drive cannot be set to a "permanent hold-down", the signal is scanned using a positive edge.
2.	<b>Network 5, Manual mode</b> <ul style="list-style-type: none"> <li>• To ensure that the function key for switching on the drive cannot be set to a "permanent hold-down", the signal is scanned using a positive edge.</li> <li>• In "Manual mode", the drive is switched on/off using <b>one</b> function key (jog mode).</li> </ul>
3.	<b>Network 6, Service mode</b> <ul style="list-style-type: none"> <li>• To ensure that the function key for switching on the drive cannot be set to a "permanent hold-down", the signal is scanned using a positive edge.</li> <li>• In "Service mode", the drive is switched on/off using <b>one</b> function key (jog mode).</li> </ul>
4.	<b>Network 7, Drive on / off</b>  The enable from the standard program for controlling the robot drive is given using this network.
5.	<b>Network 8, Output of the selected operating mode</b>  A text list on the HMI operator panel outputs the current operating mode. The evaluation is performed in this network.
6.	<b>Network 9, Output of safety door open/closed</b>  An animation on the HMI operator panel indicates whether the safety door is open or closed. The evaluation is performed in this network.

**FB202, simulationMotionRobot (optional – program information)**

FB202 is used to simulate the robot movements and the elevator.

Using a graphic list, the simulation of the robot movements is displayed on the HMI operator panel. Depending on the selected operating mode, execution is displayed at different speeds.

The execution speed is specified using a clock memory.

Table 4-4

No.	Action
1.	<p><b>Network 1, Movement in "Automatic" mode</b></p> <p>The execution speed is "simulated" using a clock memory. In this example: M10.0 (5Hz, 0.1 seconds)</p>
2.	<p><b>Network 2, Movement in "Manual" mode</b></p> <p>The execution speed is "simulated" using a clock memory. In this example: M10.2 (2.5Hz, 0.4 seconds)</p>
3.	<p><b>Network 3, Movement in "Service" mode</b></p> <p>The execution speed is "simulated" using a clock memory. In this example: M10.3 (2Hz, 0.5 seconds)</p>

**FB204, evaluationFaults**

FB204 is used to evaluate fault and warning messages that are output on the HMI operator panel.

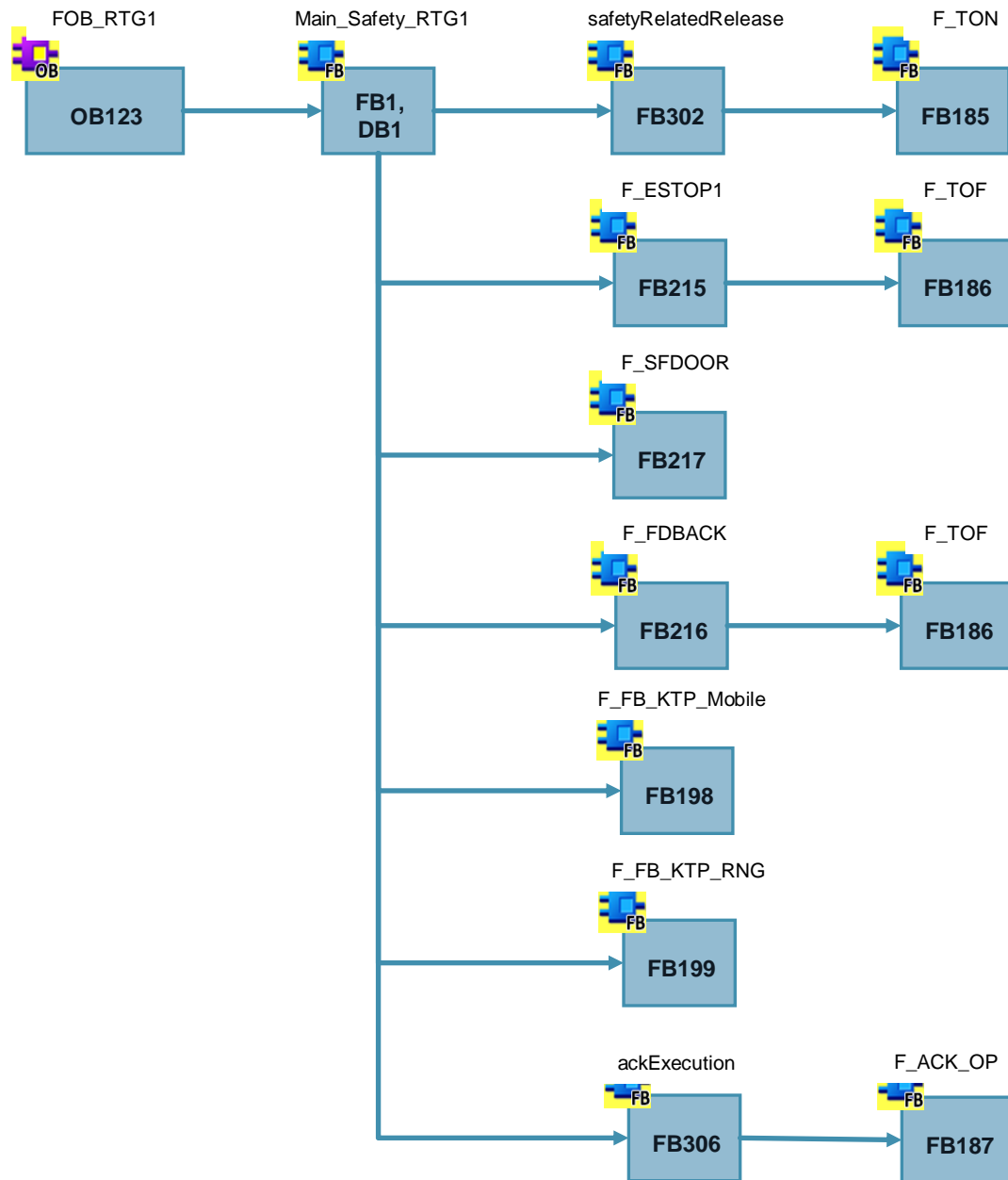
Special functions are not used.

The messages are acknowledged using the Mobile Panel or the hardware acknowledgment button.

### 4.3.3 STEP 7 safety program

#### Safety program structure

Figure 4-10



**NOTICE** Make sure that "F\_FDBACK" (FB216) is always called after "F\_ESTOP1"(FB215) and "F\_SFDOOR" (FB217).

## Brief description of the blocks

Table 4-5

No.	Action
1.	<b>FOB_RTG1</b>  F-runtime group. FB1 "Main_Safety_RTG1" is called using this OB.
2.	<b>FB1, DB1 (Main_Safety_RTG1)</b>  FB1 is used to coordinate the following F-block calls. All of the following FBs are called using this FB.
3.	<b>FB302 (safteyRelatedRelease)</b>  FB302 is used to evaluate <ul style="list-style-type: none"> <li>• whether the safety circuit is closed.               <ul style="list-style-type: none"> <li>- emergency stop OK.</li> <li>- safety door closed.</li> <li>- F-DI and F-DO modules OK.</li> </ul> </li> <li>• the enabling button has been pressed.</li> <li>• "Service mode" is activated.</li> </ul> FB185 is called to generate a switch-on delay.
4.	<b>FB215 (F_ESTOP1), emergency stop shutdown with acknowledgment</b>  FB215 is a protected function block from the F-library. The block implements an emergency stop shutdown with acknowledgment. Internally, the block requires FB186 "F_TOF" (switch-off delay).
5.	<b>FB217 (F_SFDOOR), safety door monitoring</b>  FB217 is a protected function block from the F-library. The block implements safety door monitoring.
6.	<b>FB216 (F_FDBACK), feedback circuit monitoring</b>  FB216 is a protected function block from the F-library. The block implements feedback circuit monitoring. Internally, the block requires FB186 "F_TOF" (switch-off delay).
7.	<b>FB198 (F_FB_KTP_Mobile)</b>  F_FB_KTP_Mobile is a protected function block from the F-library. The block monitors the assigned operator panel. One F_FB_KTP_Mobile is required for each Mobile Panel.
8.	<b>FB199 (F_FB_KTP_RNG)</b>  F_FB_KTP_RNG is a protected function block from the F-library. The block prepares the output user data. (Evaluation of enabling button and emergency stop button.) One F_FB_KTP_RNG is required for each connection box.

No.	Action
9.	<p><b>FB306 (ackExecution)</b>, acknowledgment</p> <p>FB306 evaluates the acknowledgment using</p> <ul style="list-style-type: none"> <li>the external acknowledgment button.</li> <li>the panel.</li> </ul> <p>Acknowledgment using the panel requires "ACK_OP" (FB187). FB187 is a protected standard function block from the F-library. The block implements fail-safe acknowledgment from a panel.</p> <p><b>Note</b> Make sure that the acknowledgment is always called at the end.</p>
10.	<p><b>OB83</b>    Insert/remove OB</p> <p><b>OB86</b>    Rack failure</p>

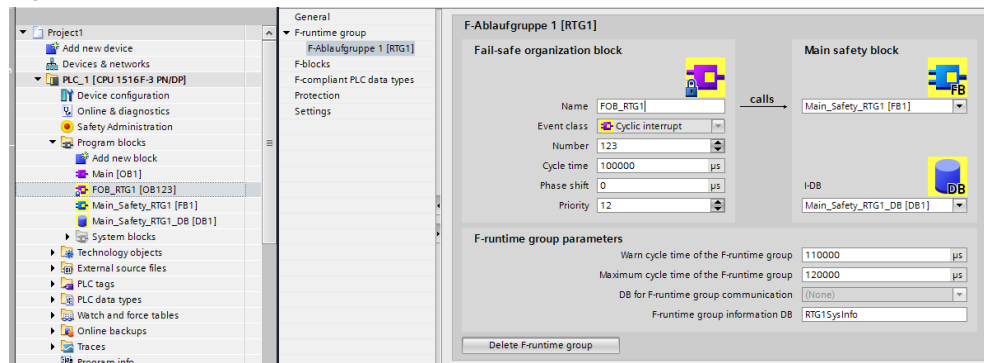
**Note** For details about the function blocks used, please refer to the online help.

### F-runtime group (FOB\_RTG1, OB123)

When inserting the F-CPU, STEP 7 Safety automatically inserts an F-runtime group.

For the F-runtime group, go to the project tree and select the "Safety Administration" project folder.

Figure 4-11



### FB1, Main\_Safety\_RTG1

FB1 calls all F-function blocks and parameterizes them according to the input/output parameters.

**FB302, safetyRelatedRelease (program information)**

FB302 connects the safety circuit signals and the enabling button signals.

Table 4-6

No.	Description
1.	<p><b>Network 1</b></p> <p><b>Evaluation of the safety circuit</b></p> <p>The network evaluates whether the safety circuit (emergency stop, etc.) is OK. It considers when the safety door may be open during operation and when it may not be open.</p>
2.	<p><b>Network 2 and 3</b></p> <p><b>Evaluation of the enabling button</b></p> <p>The time while the enabling button is kept pressed is monitored to avoid the risk of misuse by an unauthorized hold-down of the enabling button. This time value is transferred to the block as an "IN parameter". In this case, the enabling button must be released within 10 seconds (see the call of FB302 call in FB1, Network 1). This is monitored by the SFB4 "TON" switch-on delay.</p> <p><b>Note on the SFB4 "TON" switch-on delay</b></p> <p>SFB4 can be parameterized with an FB, DB call (instance DB) or, as in this example, with a multi-instance call (multi-instance DB).</p>

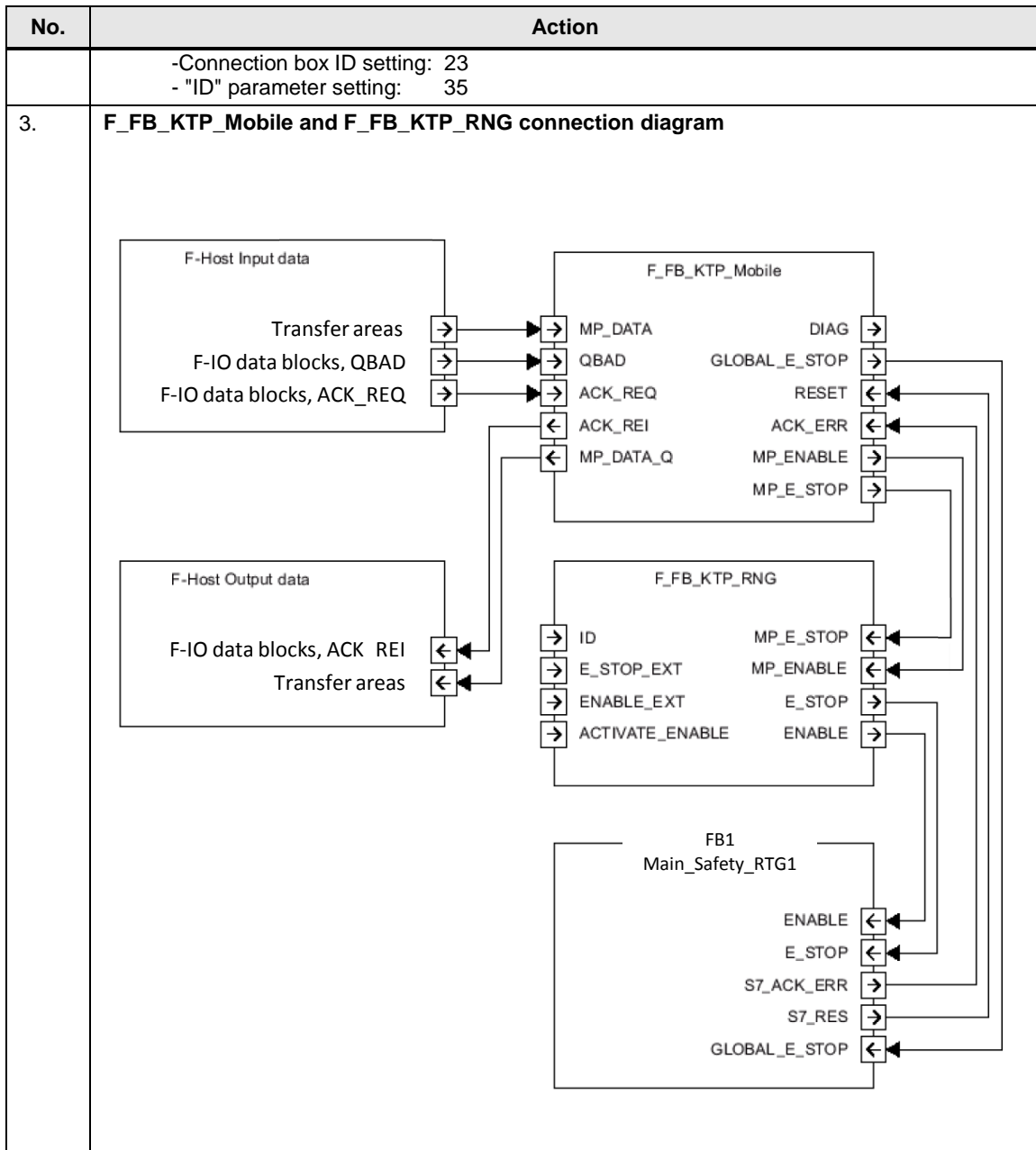


**FB198, F\_FB\_KTP\_Mobile / FB199, F\_FB\_KTP\_RNG (program information)**

**Note** Depending on the block version and F-CPU version used, it may be necessary to change the "safety system version" in the "Project tree > Safety Administration > Settings".  
After updating the version, select the "Clean up" button.

Table 4-7

No.	Action
1.	<p><b>Call of F_FB_KTP_Mobile</b></p> <p>You will find the FB in the "Instructions" task card. Select the "Communication" tab. For a detailed description of how to parameterize the FB, please refer to the online help.</p> <p><b>Notes on the parameters</b></p> <ul style="list-style-type: none"> <li>• Instance DB                     <ul style="list-style-type: none"> <li>- You can use a multi-instance DB for the instance DB to be created.</li> </ul> </li> <li>• QBAD / ACK_REQ /ACK_REI                     <ul style="list-style-type: none"> <li>- When the Mobile Panel was parameterized, a start address for IO failsafe was stored in Properties "General &gt; PROFINET interface [X1] &gt; Operating mode &gt; I-device communication" in the "Transfer areas" field (see <a href="#">link</a>). The system will create an F-I/O DB of this transfer area. You will find this DB in the project tree, "Program blocks &gt; System blocks &gt; STEP 7 Safety &gt; F-I/O DBs". The name is composed of: "F000""failsafe address"_"name of Mobile Panel""[F-I/O DB number]"</li> </ul> <p>For the sample project: <b>"F00006_MobilePanel_01 [DB30017]"</b>.</p> <p>Navigate to this DB and select the "QBAD" / "ACK_REI" tag.</p></li> </ul> <li>• MP_Data / MP_Data_Q                     <ul style="list-style-type: none"> <li>- Create a "PLC tag" of the "Integer" type for each parameter. Use the start address of the Mobile Panel's transfer area (IO failsafe address).</li> </ul> </li> <p><b>Note</b> "MP_Data / MP_Data_Q" parameters - For a SIMATIC S7-1500, use a tag of the "INTEGER" type. - For a SIMATIC S7-300, use a tag of the "WORD" type.</p>
2.	<p><b>Call of F_FB_KTP_RNG</b></p> <p>You will find the FB in the "Instructions" task card. Select the "Communication" tab. For a detailed description of how to parameterize the FB, please refer to the online help.</p> <p><b>Notes on the parameters</b></p> <ul style="list-style-type: none"> <li>• Instance DB                     <ul style="list-style-type: none"> <li>- You can use a multi-instance DB for the instance DB to be created.</li> </ul> </li> <li>• ID                     <ul style="list-style-type: none"> <li>- The connection box is uniquely identified by the connection box ID. The value is specified in "decimal" format. (In the connection box, the ID is set in "hex" format – see <a href="#">link</a>).</li> </ul> <p>For the sample project:</p> </li> </ul>



**FB306, AckExecution (program information)**

FB306 evaluates the acknowledgment.

Table 4-8

No.	Description
1.	<p><b>Network 1</b></p> <p><b>Acknowledgment using the panel</b></p> <p>The "FB187" function block (F_ACK_OP) from the F-library is used for safe acknowledgment using the panel. This requires two buttons on the HMI operator panel (see <a href="#">link</a>).</p> <p>A tag from a standard DB is used as an "IN parameter".</p> <p>For details about fail-safe acknowledgment, please refer to the STEP 7 Online Help.</p>
2.	<p><b>Network 2</b></p> <p><b>Evaluation and output of the acknowledgment</b></p> <p>The network combines the acknowledgment signal of the "external acknowledgment button" and the "acknowledgment" of the panel.</p> <p>Output is made to three outputs.</p>

### 4.3.4 Mobile Panel configuration

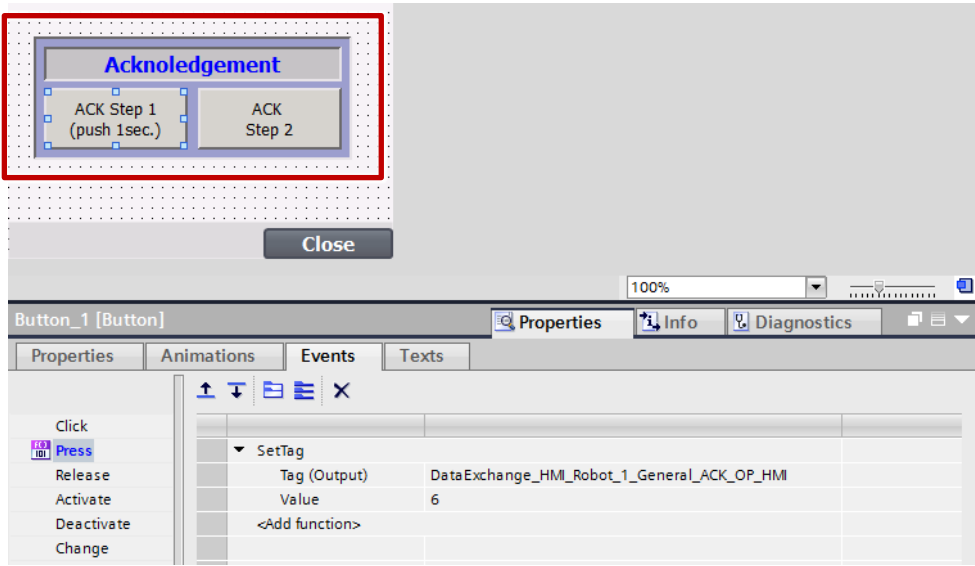
#### General

The Mobile Panel configuration does not include specifically configured functions. The safety-related functions of the Mobile Panel such as the

- emergency stop button
  - and the enabling button
- are evaluated using the safety program.

#### Acknowledgment using the Mobile Panel

Table 4-9

No.	Description				
1.	<p><b>Acknowledgment using the Mobile Panel</b></p> <p>In conjunction with FB187 (F_ACK_OP), the Mobile Panel is used for fail-safe acknowledgment. This requires two buttons.</p> <ul style="list-style-type: none"> <li>• Button 1                             <ul style="list-style-type: none"> <li>- In "Events &gt; Press", the "SetTag" function is assigned to the button.</li> <li>- The tag is from the "dataExchange" DB (DB100). In this application example, the value "6" is assigned to the "DB100.DBW6" tag using the button.</li> </ul> </li> <li>• Button 2                             <ul style="list-style-type: none"> <li>- In "Events &gt; Press", the "SetTag" function is assigned to the button.</li> <li>- The tag is from the "dataExchange" DB (DB100). In this example, the value "9" is assigned to the "DB100.DBW6" tag using the button.</li> </ul> </li> </ul> <p>The two buttons are evaluated in FB306 "ackExecution" (see <a href="#">link</a>).</p> <p>The acknowledgment buttons were configured in a "pop-up window".</p>  <p>The screenshot shows a 'pop-up window' titled 'Acknowledgement' with two buttons: 'ACK Step 1 (push 1sec.)' and 'ACK Step 2'. Below the window is a 'Close' button. The bottom part of the screenshot shows the 'Button_1 [Button]' configuration interface. The 'Events' tab is active, showing a 'Click' event with the 'Press' action selected. The 'SetTag' function is configured with the following details:</p> <table border="1"> <thead> <tr> <th>Tag (Output)</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>DataExchange_HMI_Robot_1_General_ACK_OP_HMI</td> <td>6</td> </tr> </tbody> </table>	Tag (Output)	Value	DataExchange_HMI_Robot_1_General_ACK_OP_HMI	6
Tag (Output)	Value				
DataExchange_HMI_Robot_1_General_ACK_OP_HMI	6				

## 4.4 Device settings

### General information

The following settings refer to the use of PROFIsafe for communication between the Mobile Panel and the F-CPU.

#### 4.4.1 Connection box

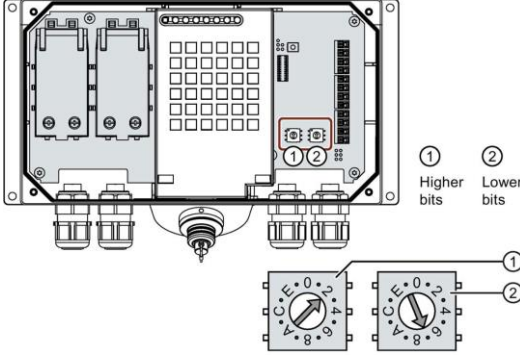
##### Connection box ID

The connection box is uniquely identified by the ID set on the connection box. The ID must be unique throughout the plant.

The ID must match the address stored in the Mobile Panel (see [link](#)) and the address assigned at the "F\_FB\_KTP\_RNG" F-block (see [link](#)).

##### Setting the box ID

Table 4-10

No.	Figure	Action
1.		<p>Rotate the arrows of the rotary coding switches to the required hexadecimal value using a suitable tool.</p> <p>In the example on the left, the box ID is set to "27h" (39 in decimal format).</p> <p><b>Notes</b></p> <ul style="list-style-type: none"> <li>• Values from "00" to "FF" (0 to 255 in decimal format) can be set using the rotary coding switches.</li> <li>• Use the value "00" for "Stop button evaluated by safety relay" mode only.</li> <li>• The value "FF" (255) is reserved and must not be used.</li> </ul>

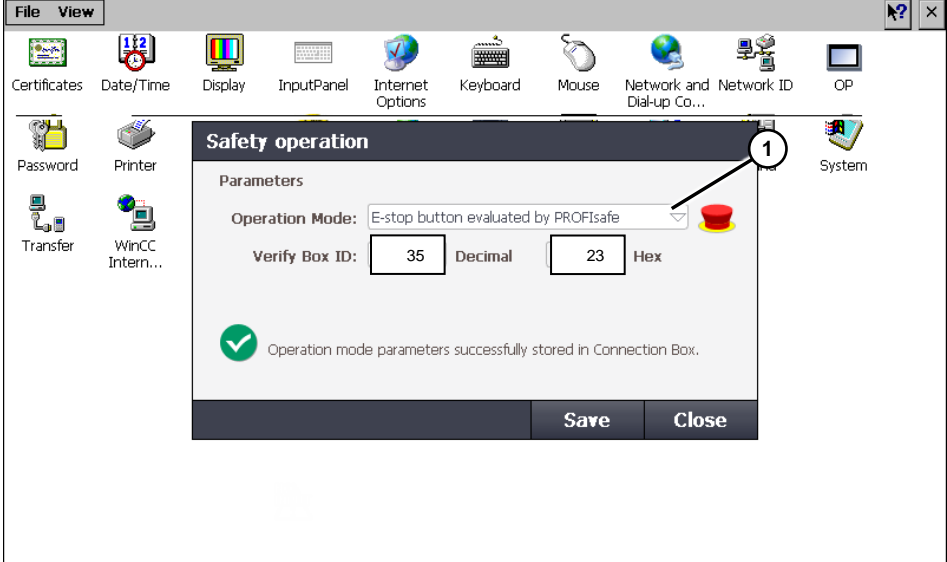
## 4.4.2 Mobile Panel

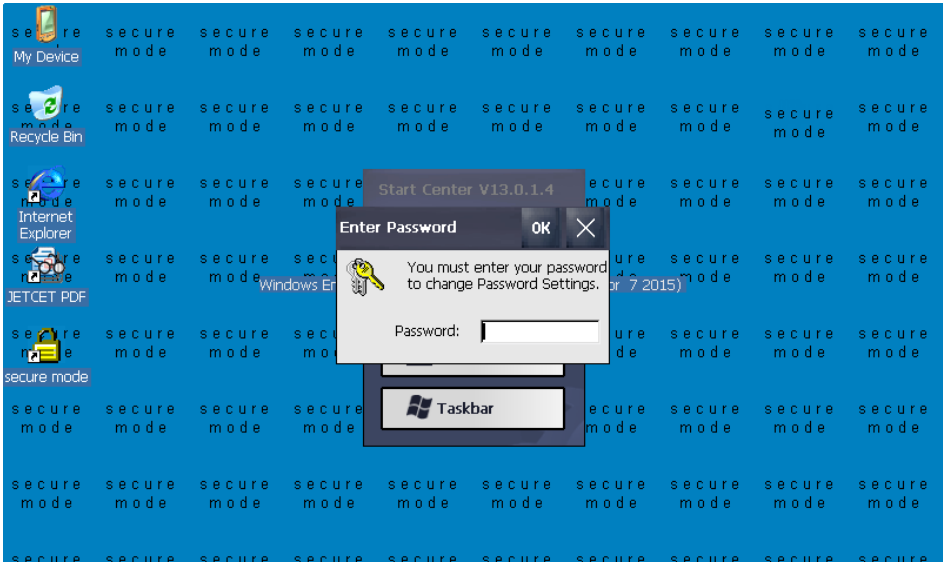
### General

It is assumed that the Mobile Panel is connected to the connection box and the box ID has been set.

Table 4-11

No.	Action
1.	<p><b>Opening the Control Panel</b></p> <p>Use the "Start Center" and the "Settings" button to open the Control Panel.</p>
2.	<p><b>Setting the Ethernet address</b></p> <ul style="list-style-type: none"> <li>• Open the "Network and Dial-Up Connections" dialog.</li> <li>• Enter the IP address.</li> </ul> <p>In this application example:    172.16.34.210  <span style="padding-left: 140px;">255.255.0.0</span></p>
3.	<p><b>Transfer settings</b></p> <ul style="list-style-type: none"> <li>• Open the "Transfer" dialog.</li> <li>• In "Transfer channel", select <b>PN/IE</b>.</li> </ul>
4.	<p><b>Assigning the password</b></p> <ul style="list-style-type: none"> <li>• Open the "Password" dialog.</li> <li>• Assign a password.</li> </ul> <p>The password is used for the "Safety Operation" function (see <a href="#">link</a>). In addition, it protects access to the Control Panel (see <a href="#">link</a>).</p> <p>In this application example:    100</p>
5.	<p><b>Entering the PROFINET name</b></p> <ul style="list-style-type: none"> <li>• Open the "PROFINET" dialog.</li> <li>• Check the "PROFINET IO enabled" check box.</li> <li>• Enter the PROFINET name. This name must match the name stored in the configuration (see <a href="#">link</a>).</li> </ul> <p>In this application example:    mobile</p>
6.	<p><b>Entering the PROFIsafe address</b></p> <ul style="list-style-type: none"> <li>• Open the "PROFIsafe" dialog.</li> <li>• Enter the PROFIsafe address. This address must match the address stored in the Mobile Panel's hardware configuration (see <a href="#">link</a>).</li> </ul> <p>In this application example:    33</p>

No.	Action
7.	<p><b>Safety Operation</b></p> <ul style="list-style-type: none"> <li>Open the "Safety Operation" dialog.</li> <li>From the drop-down list, select "E-Stop button evaluated by PROFIsafe" (1).</li> <li>In the "Decimal field", enter the connection box ID (in "decimal" format). The "hex value" is output automatically. The box ID must match the address stored in the connection box (see <a href="#">link</a>).</li> </ul> <p>In this application example: 23 (35 decimal)</p> <ul style="list-style-type: none"> <li>Select the "Save" button to confirm your entries. A password prompt window opens.</li> <li>Enter your stored password (see <a href="#">link</a>).</li> </ul> <p>In this application example: 100</p> <ul style="list-style-type: none"> <li>If the entered box ID and the password are correct, this is indicated by a green "check mark".</li> <li>Select the "Close" button to close the window.</li> </ul> 



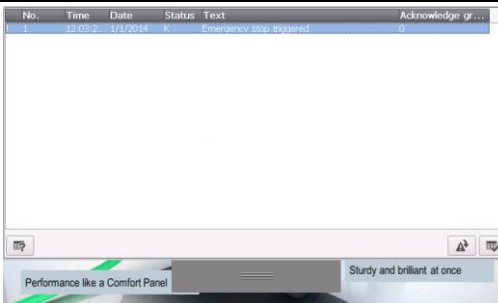
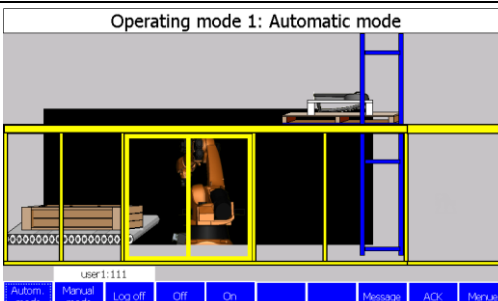
No.	Action
8.	<p>The hardware settings are now complete. Close the Control Panel.</p> <p><b>Note</b> After a password has been assigned, the "start screen" displays the text "secure mode". The "Settings" and "Taskbar" buttons can only be accessed after entering the password.</p> 



# 5 Operation of the Application Example

## 5.1 HMI user interface

Table 5-1

No.	Action	Screenshot
1.	<p><b>Start screen</b></p> <p>Start screen view</p>	
2.	<p><b>Right-hand slide-in screen</b></p> <p>Use this slide-in screen to navigate to the individual panel screens. The slide-in screen can be opened from any screen.</p>	
3.	<p><b>Top slide-in screen</b></p> <p>Use this slide-in screen to open the alarm window. The slide-in screen can be opened from any screen.</p>	
4.	<p><b>Plant screen</b></p> <p>Use the "Application" button to open the plant screen.</p> <p>Use this screen to operate the robot.</p>	

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## 5.2 Controlling the plant

### Basic information

- After switching on the control voltage for the plant, it is necessary to completely open and close the safety door once.
- Changing the operating mode during operation interrupts control of the drive.
- When "Service mode" is deselected, a new operating mode must be deliberately selected on the panel.

### Automatic mode

Table 5-2

No.	Description
1.	<p><b>Selecting Automatic mode</b></p> <p>Use the "Autom. mode" function key to select Automatic mode. This operating mode can only be selected when "Service mode" is <b>not</b> selected using the key-operated switch.</p>
2.	<p><b>Drive on/off</b></p> <p>Use the "On" function key to switch the drive on. Use the "Off" function key to switch the drive off.</p> <p>If the safety door is opened or an emergency stop is triggered during operation, the drive is immediately switched off using the contactors (-K10 / -K11).</p>

### Manual mode

Table 5-3

No.	Description
1.	<p><b>Selecting Manual mode</b></p> <p>Use the "Manual mode" function key to select Manual mode. This operating mode can only be selected when "Service mode" is <b>not</b> selected.</p> <p>This selection is protected by a password. After selecting the function key, a login dialog appears.</p> <ul style="list-style-type: none"> <li>• User: user1</li> <li>• Password: 111</li> </ul> <p>Enter the correct password and you can select the operating mode.</p>

No.	Description
2.	<p><b>Drive on/off</b></p> <p>In this operating mode, only jog mode is possible.</p> <ul style="list-style-type: none"> <li>Pressing the "On" function key switches the drive on.</li> <li>Releasing the "On" function key switches the drive off.</li> </ul> <p>The "Off" function key is not evaluated.</p> <p>If the safety door is opened or an emergency stop is triggered during operation, the drive is immediately switched off using the contactors (-K10 / -K11).</p>

**Service mode**

Table 5-4

No.	Description
1.	<p><b>Selecting Service mode</b></p> <p>This operating mode <b>cannot</b> be selected using the Mobile Panel. It is selected using a separate key-operated switch.</p> <p>The safety door may be opened in this operating mode. When the door has been opened once, it is displayed as open on the HMI operator panel – regardless of whether or not it has since been closed.</p> <p>"Resetting" the view requires acknowledgment using the "ACK" button.</p>
2.	<p><b>Drive on/off</b></p> <p>In this operating mode, only jog mode is possible.</p> <p>Before you switch on the drive using the "On" function key, <b>always</b> press the enabling button first and keep it pressed.</p> <ul style="list-style-type: none"> <li>Pressing the "On" function key switches the drive on.</li> <li>Releasing the "On" function key switches the drive off.</li> </ul> <p>Do not continuously hold down the enabling button for more than 10 seconds (specified by the F-program). If held down longer, the drive (-K10 / -K11) is immediately switched off.</p> <p>The same is the case when the enabling button is released during operation or when an emergency stop is triggered.</p>

**Error acknowledgment**

Table 5-5

	Description
1.	<p>If a fault occurs during operation, e.g. because an emergency stop was triggered, clear the cause of the fault (release the emergency stop button) and acknowledge the message before you switch the plant back on.</p> <p>Use the "ACK" button or the "Pop-up-ACK_HMI" pop-up screen to acknowledge the fault.</p> <p>A PROFIsafe communication error must be acknowledged twice.</p> <ul style="list-style-type: none"> <li>Error acknowledgment of PROFIsafe communication.</li> <li>Error acknowledgment of other messages.</li> </ul>

## 6 Debugging

The purpose of the following items is to support you in debugging.

- Why is the "PROFIsafe" function in the Mobile Panel configuration grayed out and cannot be activated?
  - To be able to activate the PROFIsafe option, the "IO device" check box in "Operating mode" must be checked (see [link](#)).
  
- Why is there no secure connection after replacing a device?
  - Check the PROFIsafe settings. After replacing a device, these settings need to be reparameterized.
  
- In which PII word can the emergency stop / enabling button be evaluated?
  - Word 0                    0010-0010 Emergency stop button
  - Word 1                    0010-0010 Enabling button
  - Word 2-5    Reserved
  
- Why is the entered box ID not applied to the Mobile Panel?
  - Check the settings of the rotary switches in the connection box. In the connection box, the box ID is set in "hexadecimal" format. At the F-FB and on the Mobile Panel, it is entered in "decimal" format.
  
- Problems with PROFIsafe communication
  - Check the PROFIsafe address in the configuration and on the Mobile Panel.
  - Check the PROFIsafe name in the configuration and on the Mobile Panel.
  - In the configuration, open the Device configuration and go to the Network view. Make sure that you have assigned the device names to the IO devices.
  - Make sure that the "IO device" check box is checked in "PROFINET" on the Mobile Panel.
  
- Problems when evaluating safety-relevant Mobile Panel functions
  - Check the F\_FB\_KTP\_Mobile parameter
  - Check the F-data block address
  - Check IW / OW at the F\_FB
  - View status information online

- Cannot find description of blocks in online help
  - Enter the complete F-FB name as the search term.  
For example, F\_FB\_KTP\_Mobile
  
- Why are the IO addresses of the ET200 SP modules (DI / DO modules) grayed out and cannot be changed?
  - If you want to change the default start addresses of the ET 200SP, the station must be assigned to an IO controller (in this case: the F-CPU). Otherwise, the input field is grayed out.
  
- Why are the robot movements not simulated?
  - In the F-CPU properties, select "System and clock memory" and make sure that the clock memory check box is checked / the correct byte is used.
  
- How can I set the box IDs of multiple connection boxes on the Mobile Panel?
  - Always use the same menu. Go to each connection box and plug in the Mobile Panel. Open the "Safety Operation" menu and enter the associated box ID.
  
- Is it possible to reactivate the PROFIsafe connection on the Mobile Panel using a system function if the PROFIsafe connection was deactivated using the "TerminatePROFIsafe" system function?
  - No. Activating the PROFIsafe connection requires that the panel's runtime be restarted.
  
- Why does the drive switch off when I remove the Mobile Panel from the connection box?
  - Make sure to disconnect the PROFIsafe connection before removing the panel. To do this, you can use the "TerminatePROFIsafe" system function; you can configure it, for example, to a button. Alternatively, stop the Mobile Panel runtime and confirm the PROFIsafe disconnection in the logoff dialog.

## 7 Links & Literature

Table 7-1

	Topic	Title
\1\	Siemens Industry Online Support	<a href="https://support.industry.siemens.com">https://support.industry.siemens.com</a>
\2\	Download page of the entry	<a href="https://support.industry.siemens.com/cs/ww/de/view/103497649">https://support.industry.siemens.com/cs/ww/de/view/103497649</a>
\3\	Manual	Overview of various Mobile Panel manuals <a href="https://support.industry.siemens.com/cs/ww/en/ps/14746/man">https://support.industry.siemens.com/cs/ww/en/ps/14746/man</a>
\4\	Manual	SIMATIC ET 200SP Manual Collection <a href="https://support.industry.siemens.com/cs/ww/en/view/84133942">https://support.industry.siemens.com/cs/ww/en/view/84133942</a>
\5\	Manual	SIMATIC Industrial Software SIMATIC Safety – Configuring and Programming <a href="https://support.industry.siemens.com/cs/ww/en/view/54110126">https://support.industry.siemens.com/cs/ww/en/view/54110126</a>
\6\	Manual	SIMATIC Industrial Software SIMATIC Safety V13 – Getting Started <a href="https://support.industry.siemens.com/cs/ww/en/view/101177693">https://support.industry.siemens.com/cs/ww/en/view/101177693</a>
\7\	Manual	SIMATIC Industrial Software SIMATIC Safety – Configuring and Programming <a href="https://support.industry.siemens.com/cs/ww/en/view/54110126">https://support.industry.siemens.com/cs/ww/en/view/54110126</a>
\8\	Safety	Safety Evaluation Tool <a href="https://www.industry.siemens.com/topics/global/en/safety-integrated/machine-safety/safety-evaluation-tool/Pages/default.aspx">https://www.industry.siemens.com/topics/global/en/safety-integrated/machine-safety/safety-evaluation-tool/Pages/default.aspx</a>

## 8 History

Table 8-1

Version	Date	Modifications
V1.0	06/2014	First version
V1.1	02/2016	S7 Distributed Safety -> STEP 7 Safety Advanced
V2.0	10/2017	Key-operated switch evaluation modified (2-pole -> 1-pole). Drive control modified (hardware plan / software).
V2.1	08/2018	Page 37: In the picture the specification of the high and low byte and the hex and decimal value adjusted.