

SIMATIC HMI

HMI devices IWP10F Mobile WebClient

Operating Instructions



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Legal information

Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

DANGER

indicates that death or severe personal injury **will** result if proper precautions are not taken.

WARNING

indicates that death or severe personal injury **may** result if proper precautions are not taken.

CAUTION

indicates that minor personal injury can result if proper precautions are not taken.

NOTICE

indicates that property damage can result if proper precautions are not taken.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

Proper use of Siemens products

Note the following:

WARNING

Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

Trademarks

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Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

Preface

Purpose of the operating instructions

These operating instructions contain information on place of use, transport, storage, mounting, use and maintenance of the device.

These operating instructions are intended for:

- Users
- Commissioning engineers
- Maintenance personnel

You can find more information such as operating instructions, examples and reference information in the Online Support.

Basic knowledge required

General knowledge of automation technology and process communication is needed to understand the operating instructions. Knowledge of personal computers and the Microsoft operating systems is required to understand this manual.

Scope of the document

The operating instructions are valid for the HMI device SIMATIC HMI IWP10F Mobile WebClient, article number 6AV2145-6KM00-0AA0.

You can find the corresponding connection boxes in the section "Connection boxes (Page 14)".

Note

This document is part of the system HMI device, connecting cable and connection box, and is also required for repeat commissioning. Store all supplied and supplementary documentation for the entire service life of the HMI device.

Provide any future owner or user with all the documents for the HMI device.

Make sure that every supplement to the documentation that you receive is stored together with the operating instructions.

Style conventions

Text markup	Example	Meaning
Text in quotation marks: "Text"	"Add screen"	<ul style="list-style-type: none">• Terminology that appears in the user interface, for example dialog names, tabs, buttons, menu commands• Required input, for example, limits, tag values.• Path information

Text markup	Example	Meaning
Texts in quotation marks, separated by a 'greater than' symbol: "Text > Text"	"File > Edit"	Operating sequences, for example, menu commands, shortcut menu commands.
Texts in angle brackets: <Text>	<F1>, <Alt+P>	Keyboard operation
	<ip>, <date>, <time>	Variable values in URLs, path information, folder names, file names or in the user interface

Please observe notes labeled as follows:

Note

A note contains important information about the product described in the document and its handling, or a specific section of the document to which you should pay particular attention.

Naming conventions

Term	Applies to
Control cabinet	Mounted cabinet, enclosure, terminal box, panel, control panel
Plant	System, machining center, one or more machines
F-system	Fail-safe automation system with fail-safe Mobile Panel
Connection box	<ul style="list-style-type: none"> • Connection box compact • Connection box standard • Connection box advanced
HMI device, Mobile Panel, fail-safe Mobile Panel	IWP10F Mobile WebClient
Device	All connection boxes and the HMI device
Safety-related operator control	<ul style="list-style-type: none"> • Emergency stop button • Enabling button
Storage medium	USB flash drive

The short form "Mobile WebClient" is also used instead of the full product name "SIMATIC HMI IWP10F Mobile WebClient".

Figures

This document contains figures of the devices described. The figures can deviate from the particularities of the delivered device.

Picture components are marked with black position numbers on a white background ①, ②, ③, etc.

Steps in the figures are identified with white process numbers on a black background according to the sequence in which they have to be executed: ❶, ❷, ❸, ...

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Overview

1.1 Product description

The Mobile WebClient is an HMI and display device in rugged design.

Equipped with a capacitive multi-touchscreen as well as hardwired safety elements and PROFINET, the HMI device is optimally designed for a variety of uses.



With the fail-safe Mobile WebClient, you operate the plant in fail-safe mode and thus achieve the requirements according to Safety Integrity Level 3 and Performance Level PL e.

Via the integrated browser, you operate your customer-specific WinCC Unified application on a SIMATIC IPC, an Open Controller or a Unified Comfort Panel.

1.1 Product description

The device is designed for industrial use:

- IP55 degree of protection all-round
- High fall resistance
- High shock resistance

Hardware equipment

- 10" display with capacitive multi-touchscreen
- Illuminated emergency stop button
- Enabling button
- Handwheel
- 7 function keys with LED and exchangeable caps
- USB 3.0 port

You can choose from three connection boxes each with a different range of functions. The connection box compact is designed for installation in control cabinets. The connection box standard and connection box advanced are approved for external mounting directly on the machine. The connecting cable is available in different lengths for a wide variety of use cases.

Software features

- WebClient with HTML5 browser in kiosk mode
- Flexible IWP software for customer-specific applications
- Function keys can be used as softkeys or PROFINET IO direct keys
- Handwheel can be used as PROFINET IO direct key

1.2 Structure of the IWP10F Mobile WebClient

Note

System components

To operate a Mobile Panel, you need:

- An HMI device
- A connecting cable (Page 13)
- At least one connection box (Page 14)
- A safety relay (Page 18)

You can find the ordering information for the system components on the Internet (<https://mall.industry.siemens.com/mall/en/de/Catalog/Products/10165537>).

The following figures show the structure of the IWP10F Mobile WebClient with mounting connecting cable and closed connection compartment cover.

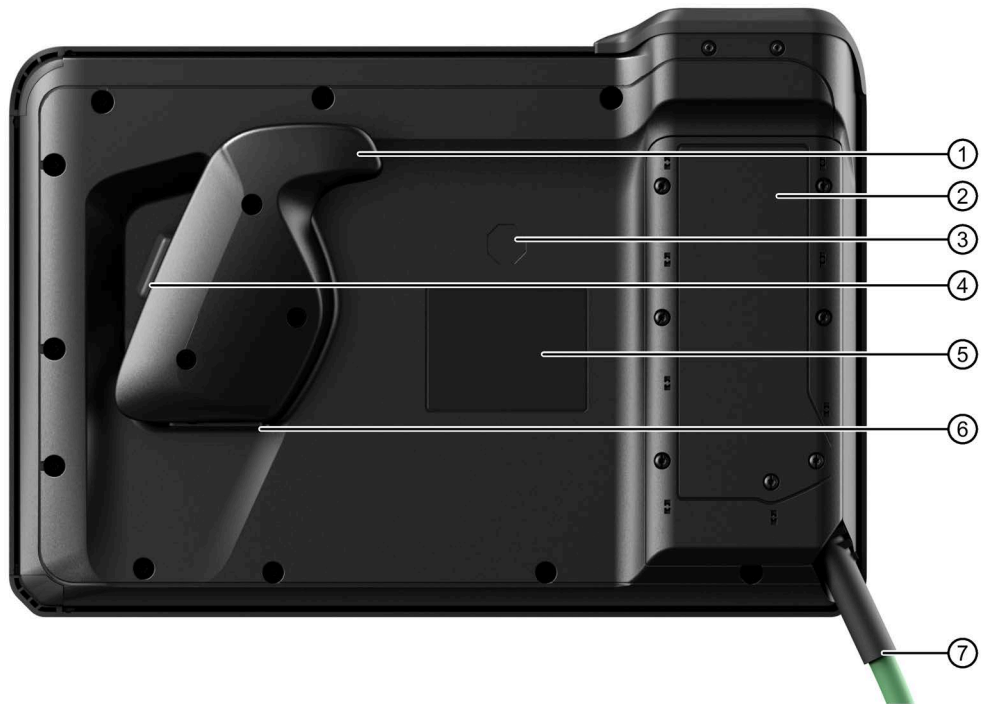
Front view



- ① Emergency stop button
- ② Handwheel
- ③ Display with touchscreen
- ④ Function key block F1 ... F7 with exchangeable key caps

The position of the emergency stop button makes it easily accessible, and its height means that it is an exposed part. A recess protects the emergency stop button against impact damage, for example, if it falls. The recess is dimensioned in such a way that the emergency stop button can be triggered in the event of an impact.

Rear view and interfaces



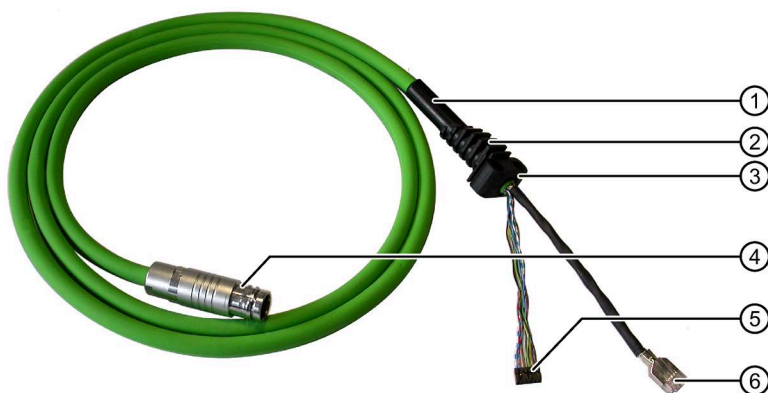
- ① Handle
- ② Connection compartment cover
- ③ Position of the TÜV test mark
- ④ Enabling button
- ⑤ Position of the nameplate
- ⑥ USB port with cover
- ⑦ Connecting cable

1.3 Connecting Cable

You connect the HMI device to the connection box using the rugged connecting cable. The tensile and flexural strength of the connecting cable is geared toward the actual usage conditions.

Functions of the connecting cable:

- Power supply of the HMI device
- Ethernet connection between HMI device and connection box
- Transmission of the signals for emergency stop button and enabling button
- Transmission of the box ID



- ① Anti-kink protection
- ② Fin seal
- ③ Strain relief
- ④ Metallic push-pull circular connector with red positioning mark
- ⑤ Plug-in connector, 12-pin
- ⑥ RJ45 connector

The connecting cable is available in the following lengths:

Product name and length	Article number
Connecting cable 2 m	6XV1440-4BH20
Connecting cable 5 m	6XV1440-4BH50
Connecting cable 8 m	6XV1440-4BH80
Connecting cable 10 m	6XV1440-4BN10
Connecting cable 15 m	6XV1440-4BN15
Connecting cable 20 m	6XV1440-4BN20
Connecting cable 25 m	6XV1440-4BN25

Spiral cable

A spiral cable is available as an alternative to the connecting cables listed in the table.

Length: 1.5 m, can be extended to 3.5 m

Article number: 6FC5348-0AA08-3AA0

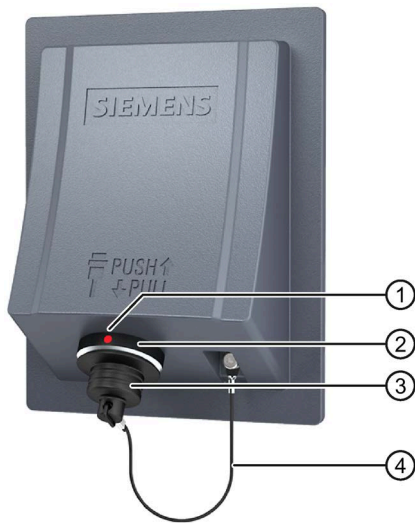
1.4 Connection boxes

The connection boxes are available in the following versions:

- Connection box compact, article number 6AV2125-2AE03-0AX0
- Connection box standard, article number 6AV2125-2AE13-0AX0
- Connection box advanced, article number 6AV2125-2AE23-0AX0

Connection box compact

The figure below shows the connection box compact.

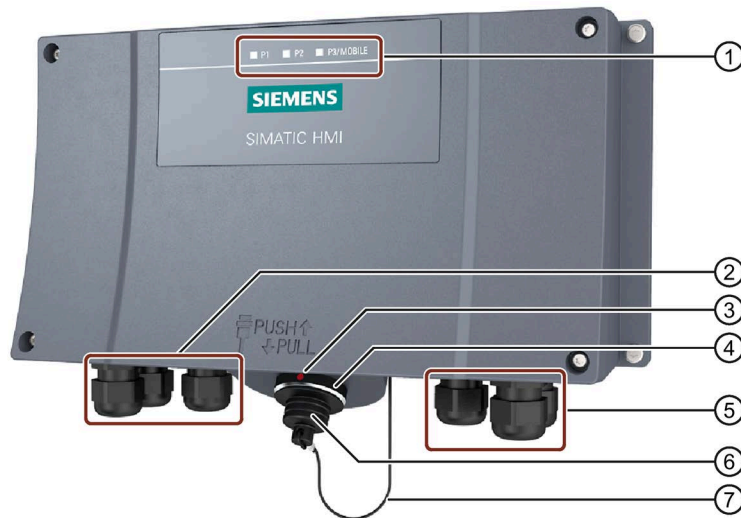


- ① Positioning mark
There is also a red positioning mark on the connecting cable. Align this mark with the positioning mark on the connection box when connecting.
- ② Connection socket for the connecting cable
- ③ Cover of the connection socket
- ④ Safety strap

Connection box standard and connection box advanced

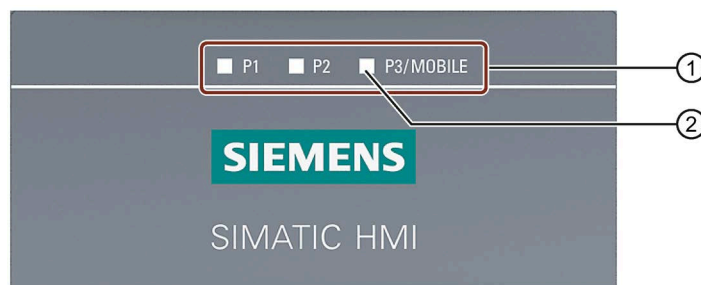
The figure below shows the connection box standard or the connection box advanced. The connection box advanced also features:

- Real-time Ethernet
- F-signal transmission



- ① LED display
- ② Screw glands for the data cables
- ③ Positioning mark
There is also a red positioning mark on the connecting cable. Align this mark with the positioning mark on the connection box when connecting.
- ④ Connection socket for the connecting cable
- ⑤ Screw glands for power supply cables and F-signal cables
- ⑥ Cover of the connection socket
- ⑦ Safety strap

There are three LEDs on the front of the connection box that indicate the status of communication.



- ① LED display of the three Ethernet ports:
 - P1: Fast Connector X1
 - P2: Fast Connector X2
 - P3: Connection socket for the Mobile Panel
- ② LED

Basic functions of the LEDs:

- LED lit green: Link established, no data transmission
- LED flashes green or amber: Link established, data transfer in progress

You can find information about other possible LED states in the following document:

Operating instructions "SCALANCE X-200"

(<https://support.industry.siemens.com/cs/ww/en/view/102051962>)

See also

Connecting the connection box (Page 39)

1.5 Scope of delivery

This section describes the system components in the scope of delivery that you need for operating a Mobile WebClient.

Mobile WebClient:

- 1 HMI device
- 1 accessory kit with connection compartment cover and 7 pre-mounted PT screws
- 1 Quick Install Guide

The scope of delivery may contain additional documents.

Connection box standard, connection box advanced, or connection box compact:

- 1 connection box
- 1 DVD with documentation and product information
- 1 Installation instruction
- With connection box compact: 1 accessory kit with mounting clips

The scope of delivery may contain additional documents.

Connecting cable:

- 1 connecting cable with circular connector, RJ45 connector and 12-pin plug-in connector

1.6 Accessories

The accessories are not included in the scope of delivery.

Note

This section contains a selection of accessories that is suitable for your HMI device. You can find additional variants of this selection and the complete accessories portfolio for HMI devices in the Industry Mall on the Internet (<https://mall.industry.siemens.com/mall/en/WW/Catalog/Products/10144445>). Details such as the delivery quantity and technical specifications of accessories can be found in the Industry Mall under the respective article numbers.

You can find an overview of the status and compatibility of the accessories portfolio in the "Cross-list" on the Internet (<https://support.industry.siemens.com/cs/ww/en/view/40466415>).

1.6.1 Wall-mounting bracket

The wall-mounting bracket holds the HMI device securely in place during stationary operation.



Article number: 6FC5348-0AA20-0AA0

1.6.2 Storage media

You can use a USB flash drive to back up data from the HMI device and to copy data onto the HMI device.

The USB flash drive must be suitable for industrial applications.

1.6.3 Fixing elements

Mounting clips for the connection box compact

The set with plastic mounting clips for the HMI device KTP400 Comfort is also suitable for mounting the connection box compact.

Article number: 6AV6671-8XK00-0AX2

1.6.4 SIRIUS safety relays

If you are using a fail-safe Mobile Panel in a hardwired F system, you must use a safety relay.

The Mobile WebClient has been tested and approved with the following safety relays:

- SIRIUS safety relay, standard, relay output
article number 3SK1111-1AB30
- SIRIUS safety relay, standard, electronic output
article number 3SK1112-1BB40
- SIRIUS safety relay, advanced, relay output
article number 3SK1121-1AB40
- SIRIUS safety relay, advanced, electronic output
article number 3SK1122-1AB40

You can find the complete portfolio of the SIRIUS 3SK safety relays on the Internet (<http://www.siemens.com/product?3SK>).

Note

Evaluation of the safety-related operator controls via F-DI modules

Instead of a SIRIUS safety relay, F-DI modules can be used for the evaluation.

The F-DI modules used must be appropriate for the required safety integrity level SIL/performance level and category. Depending on the safety integrity level SIL/performance level and category required, the following functions are, for example, to be used for the F-DI modules:

- Short- and cross-circuit monitoring
- Discrepancy monitoring
- Short-circuit detection
- Cross-circuit detection

The plant operator/system engineer is responsible for checking the proper functioning of the hardwired F-system with evaluation of the safety-related operator controls via one or more F-DI modules.

1.7 Terms for fail-safe operation

This section contains terms relevant for fail-safe operation of the HMI device.

Fail-safe automation system, F system

A fail-safe automation system is required in a plant with high safety requirements. An F-system is characterized by the following features:

- Safety-related shutdown behavior of the system after the triggering of an emergency stop via a safety-related operator control.
- The confirmation of machine movements entailing danger via an enabling mechanism.

A fail-safe Mobile WebClient is suitable for a hardwired F-system.

- Hardwired F-system: The safety-related operator controls are wired to a safety relay. If one of the safety-related operator controls is activated, the safety relay triggers the safe state or confirms a machine movement entailing danger in the F-system via the enabling button.

Safe operating state

If an unexpected event occurs during plant operation that poses a risk to persons or equipment, the plant must respond with a defined safety shutdown. Protection of personnel against physical injury can only be ensured if intervention in manufacturing processes, for example during retrofitting or troubleshooting, is safe and secure.

Based on the risk analysis, the safety shutdown and therefore the shutdown response of the plant must therefore be configured to ensure that the plant or plant area can be switched to a safe operating state in the event of a risk.

In addition to the qualitative risk analysis required, the machine operator also has an obligation to make a quantitative assessment of potential hazards. On this basis, the operator must then establish what risks could arise during plant or plant area operation and whether the relevant safety functions are sufficiently effective for the hazard in question.

The safe operating state is assigned to the fail-safe controller by a safety program. The plant constructor is responsible for the required configuration which should be described in the plant documentation.

Safety-related operator controls

A fail-safe Mobile WebClient comes equipped with the two safety-related operator controls "Emergency stop button" and "Enabling button". All other operator controls are not safety-related operator controls.

Fail-safe operation

In a hardwired F-system, you operate the plant or a plant section in fail-safe mode. In fail-safe mode, the safety-related operator controls emergency stop button and enabling button are active. Fail-safe mode runs via a fixed connection with a safety relay.

Emergency stop

The operator presses the emergency stop button to activate an emergency stop.

The emergency stop is an emergency action that is intended to stop a process or movement entailing danger. All machines that are assigned to the trigger are immediately brought to a safe state via the emergency stop.

Emergency stop bypass

The emergency stop bypass is a function of the connection box advanced for hardwired F-systems.

The function ensures that no emergency stop will be triggered in the plant when reconnecting the Mobile Panel to another connection box.

Connection point recognition

A box ID that can be read out via STEP 7 (TIA Portal) must be set for each connection box. With this, you can perform connection point recognition, i.e. determine which connection box the HMI device is connected to.

1.8 Organizational measures

If you are operating a fail-safe Mobile WebClient in a fail-safe system, you must consider the following organizational measures:

- Install stationary emergency stop or emergency off buttons in the plant that are effective independent of the Mobile WebClient.
- Perform a risk assessment of the plant.
- If the overall plant is not to be monitored from a single location, configure plant areas.
- Create a safety program.
- Run an acceptance test on the fail-safe automation system.

Safety instructions

2.1 General safety instructions

The device is designed for operation in industrial areas for operator control and monitoring of plant processes.

WARNING

Personal injury or material damage due to non-compliance with safety regulations

Failure to exactly comply with the safety regulations and procedures in this document can result in hazards and disable safety functions. This can result in personal injuries or material damage.

Closely follow the safety regulations and procedural instructions in each situation.

Observe the safety and accident prevention regulations applicable to your application in addition to the safety instructions given in this document.

Safety during configuration and operational safety of the plant

WARNING

Personal injury or material damage due to improper configuration of the plant

The configuration engineer for plant control must take precautions to ensure that an interrupted program will be correctly integrated again after communication failures, voltage dips or power outages.

A dangerous operating state must not be allowed to occur - not even temporarily - during the entire execution of the control program, even during a troubleshooting.


NOTICE

Exclusive operating right

Operating the plant with multiple HMI devices simultaneously can cause material damage.

Prevent simultaneous operation of the plant from multiple devices by configuring the assignment of operating rights to only one HMI device.

Operational safety in the plant

 WARNING
Short-term PROFINET IO interruptions possible when using protocols with alternative communication paths
The following applies when you use a protocol with alternative communication paths, for example, MRP, STP or RSTP, for PROFINET communication: When an interruption in the network occurs, for example, due to a cable break, PROFINET IO interruptions can occur during the switching time to the alternative communication path. This can result in personal injury or property damage.
Take appropriate protection measures to prevent physical injury or material damage.
You can find additional information in the following document: Configuration manual "SCALANCE X-200" (https://support.industry.siemens.com/cs/ww/de/view/109476763)


Note

Observe the Operational Safety and Product Monitoring newsletter.

Plants with safety-related characteristics are subject to special requirements for operational safety on the part of the operator. Vendors are also required to comply with certain measures for monitoring the product. We therefore provide a special newsletter about product development and properties to inform you about important safety aspects for the operation of plants. To ensure that you are always kept up-to-date in this regard and can make changes to your plant, you should subscribe to the appropriate newsletter.

Subscribe to the newsletter for fail-safe system components and the SIMATIC industrial software at the following link: Newsletter (<https://new.siemens.com/global/en/products/automation/topic-areas/safety-integrated.html>)

Safety during commissioning

 WARNING
The device may only be used in machines which comply with the Machinery Directive
The "Machinery Directive" governs, among other things, the precautions to be taken when commissioning and operating machines within the European Economic Area.
Failure to follow these precautions is a breach of the Machinery Directive. Such failure may also cause personal injury and damage depending on the machine operated.
The machine in which the HMI device is to be operated must conform to Directive 2006/42/EC.

Safety when working in and on electrical systems

Work in or on electrical systems may only be carried out by authorized persons. The following safety regulations apply for the prevention of electric shock and electrocution:

1. Switch off the system
2. Secure the system to prevent it switching back on
3. Check the system to ensure it is de-energized
4. Ground and short the system
5. Cover or shield adjacent live parts

Note

These safety steps must always be taken in the above order before any work on electrical systems. Once work on an electrical system is finished, cancel the safety steps starting with the last and finishing with the first.

Label the electrical system in accordance with the applicable safety provisions when work is to be carried out.

Always adhere to the safety provisions applicable in the country of use.

Safety of the plant or the system

NOTICE
Safety is the responsibility of the assembler
The safety of any plant or system incorporating the equipment is the responsibility of the assembler of the plant or system.

ESD



A device with electronic components is an electrostatic sensitive device. Due to their design, electronic components are sensitive to overvoltage and thus to the discharge of static electricity. Note the applicable regulations for ESD.

Safety during operation

 **WARNING**

Danger of injury

If the HMI device is to be used for manual movements in setup mode and the enabling button is not active, there is a serious risk for the operating personnel.

For a project used to set up a plant, make sure that each movement requires the operation of the enabling button. Only allow movements with the enabling button and at a reduced speed.

 **WARNING**

HMI device failure

A strong shock or impact can impede the functionality of the HMI device.

After a strong mechanical action, ensure that the HMI device and the safety-related parts are in working order.

Note

The emergency stop button can be triggered unintentionally when the HMI device is dropped. This can result in an unintended shutdown of the plant.

Note

The function of the emergency stop button and its LED must be checked periodically. See "Mobile WebClient maintenance (Page 78)".

Industrial Security

Siemens provides products and solutions with industrial security functions that support the secure operation of plants, systems, machines and networks.

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Siemens' products and solutions constitute one element of such a concept.

Customers are responsible for preventing unauthorized access to their plants, systems, machines and networks. Such systems, machines and components should only be connected to an enterprise network or the internet if and to the extent such a connection is necessary and only when appropriate security measures (e.g. firewalls and/or network segmentation) are in place.

For additional information on industrial security measures that may be implemented, please visit (<https://www.siemens.com/industrialsecurity>).

Siemens' products and solutions undergo continuous development to make them more secure. Siemens strongly recommends that product updates are applied as soon as they are available and that the latest product versions are used. Use of product versions that are no longer supported, and failure to apply latest updates may increase customer's exposure to cyber threats.

To stay informed about product updates, subscribe to the Siemens Industrial Security RSS Feed under (<https://www.siemens.com/cert>).

Disclaimer for third-party software updates

This product includes third-party software. Siemens AG only provides a warranty for updates/patches of the third-party software, if these have been distributed as part of a Siemens software update service contract or officially released by Siemens AG. Otherwise, updates/patches are undertaken at your own risk. You can find more information about our Software Update Service offer on the Internet at Software Update Service (<https://support.industry.siemens.com/cs/ww/en/view/109759444>).

Notes on protecting administrator accounts

A user with administrator privileges has extensive access and manipulation options in the system.

Therefore, ensure there are adequate safeguards for protecting the administrator accounts to prevent unauthorized changes. To do this, use secure passwords and a standard user account for normal operation. Other measures, such as the use of security policies, should be applied as needed.

2.2 Data protection

Siemens observes the data protection guidelines, especially the requirements regarding data minimization (privacy by design). This means the following for this SIMATIC product: The product does not process / save any personal information, but only technical functional data (e.g. time stamps). If the user links this data to other data (e.g. shift plans) or if the user saves personal information on the same medium (e.g. hard disk) and therefore creates a personal reference in the process, the user has to ensure meeting the guidelines regarding data protection.

2.3 Notes about usage

NOTICE
HMI device approved for indoor use only
The HMI device may be damaged if operated outdoors. Operate the HMI device indoors only.

Note

Operate the device only in a normal atmospheric environment

The technical characteristics of the device described in the operating instructions are guaranteed if you operate the device in normal ambient air conditions with usual air composition.

Note

The device is intended for operation in an SELV/PELV circuit according to IEC/EN 61131 or IEC/EN 61010-2-201 in a dry environment, which means a dry environment inside the building.

Additional information is available in the section "Operating Conditions (Page 87)".

Industrial applications

The HMI device is designed for industrial applications. It conforms to the following standards:

- Requirements on interference emission EN 61000-6-4:2019
- Requirements on immunity EN 61000-6-2:2019

Use in mixed-use zone

Under certain circumstances you can use the HMI device in a mixed-use zone. A mixed-use zone is used for housing and commercial operations that do not have a significant impact on residents.

When you use the HMI device in a mixed-use zone, you must ensure that the limits of the generic standard EN 61000-6-3 regarding emission of radio frequency interference are observed. Suitable measures for achieving these limits for use in a mixed area, for example, include the use of filters in power supply lines.

Individual acceptance is required.

Use in residential areas

Note

HMI device not intended for use in residential area

The HMI device is not intended for use in residential areas. Operation of an HMI device in residential areas can have a negative influence on radio or TV reception.

2.4 Risk assessment of the plant

Note

Risk assessment in an F-system is always required

A risk assessment must be performed for each F-system. The responsibility lies with the operator of the plant.

The following rules apply to the risk assessment of the plant:


- EN ISO 12100:2010, Safety of machinery – General principles for design of machinery – Risk assessment and risk reduction
- ISO 13849-1, Safety of machinery - Safety-related parts of control systems - General principles for design


The result of the risk assessment leads to the Performance Levels a to e in accordance with ISO 13849-1, which indicates how the safety-related system components must be designed if the emergency stop functions are needed locally in a plant segment or globally throughout the plant.

In this context, also note the section "Reaction times and safety characteristics for fail-safe operation (Page 96)". Take the plant configuration as a whole into consideration in the risk assessment and not just the individual areas. Additional information on risk assessment and risk reduction is available at:

"Safety Technology in SIMATIC S7" system manual
(<https://support.industry.siemens.com/cs/ww/en/view/12490443>)

2.5 Important notes on the emergency stop button

 WARNING
Emergency stop button disabled when HMI device is not connected When the fail-safe Mobile Panel is not connected to the connection box, an emergency stop cannot be triggered with the HMI device. Install a stationary emergency stop or stop button that will be available at all times on the F-system.

 WARNING
Do not modify the color of the emergency stop button The emergency stop button lights up in red as soon as the HMI device is supplied with power. Without power supply, the emergency stop button is not active and does not light up. This is a measure to avoid confusion between active and inactive emergency stop devices according to EN ISO 13850:2016. The emergency stop button thus meets the requirements of the applicable safety standards. It is not necessary to modify the color of the emergency stop button and this should not be done. Otherwise, it would not be possible to distinguish an active "Emergency stop" from an inactive "Emergency stop". This can result in personal injury or material damage. Do not change the color of the emergency stop button.

Emergency stop button and connection boxes

The signals of the emergency stop button are wired differently in the connection boxes:

- For connection box compact and connection box standard: When the Mobile WebClient is not connected, the safety circuit is open.
- For the connection box advanced: When the Mobile WebClient is not connected, the connection of the safety circuit is bypassed and thus closed.

NOTICE
Versions of the connection box If you install connection boxes with and without emergency stop bypass in your fail-safe automation system, there is a risk of an accidental shutdown being triggered when re-plugging an HMI device. In a fail-safe automation system, you should therefore only use "compact" and "standard" connection boxes together or "advanced" boxes only.

2.6 Important notes for the enabling mechanism

In a numerically controlled plant, "setup mode" requires an enabling mechanism. The enabling mechanism consists of the enabling button installed on the HMI device and the corresponding logic in the HMI device.

The operating modes relevant for the enabling mechanism are:

- Setup mode


In setup mode, safety has to be ensured in a different way than in automatic mode. During setup mode, personnel enter danger zones of the plant in which controlled movements must be possible.


Movements must be executed with reduced speed in setup mode in line with the risk assessment of the plant. Movement of plant parts should only be possible when the enabling mechanism is activated. Operators must have been trained accordingly and have detailed knowledge of the intended use.

- Process monitoring in manufacturing

This operation mode is used for processing complex workpieces, for example, or in cases when parts of the workpiece cannot be inspected. This operating mode allows additional manual intervention in line with ISO 16090-1. Unlike in automatic mode, the user is able to monitor and control the processing process with open separating protective devices.

Safety instructions

 WARNING
<p>Injury or material damage</p> <p>Enabling buttons should only be used when the following applies for the person activating the enabling button:</p> <ul style="list-style-type: none"> • The person can see the danger zone. • The person is capable of recognizing personal injury hazards in good time. • The person is capable of taking immediate measures to avoid danger. <p>The only person allowed to remain in the danger zone is the person who is activating the enabling button.</p>

 WARNING
<p>Injury or material damage</p> <p>If you trigger a command for a hazardous operating state with the enabling button only, there is a risk of injury or material damage.</p> <p>A hazardous operating state requires a second, specific operation with another key on the HMI device. Consider this during configuration.</p>

NOTICE

Enabling button must not be fixed

Fixing the enabling button in one of its positions can cause malfunctions in the fail-safe automation system.

Make sure that the enabling button is not being held permanently in any of its positions.

Note

The enabling button is effective when the HMI device is connected to a connection box and the emergency stop button lights up.

Note

Information on discrepancy errors

The enabling button has two channels. Both channels must be activated at the same time for the "enable" and "panic" switch positions. If only one channel is activated, a discrepancy error occurs and "enabling" is no longer possible. To reactivate "enabling", press the enabling button once completely into the "panic" position and then release it.

2.7 Important notes on the connection boxes

 **WARNING**

Mixed operation with Mobile Panels 2nd Generation

Depending on the HMI devices used in the plant, different safety modes can be set for the connection boxes.

In connection with a IWP10F Mobile WebClient, the operating mode for a hardwired F-system with emergency stop function ("E-stop button evaluated by safety relay") is used exclusively and automatically for the connection boxes. If the Mobile WebClient is connected to a connection box for which a different safety mode is set, fail-safe operation is not possible. This can result in personal injuries or material damage.

Only use IWP10F Mobile WebClient HMI devices in your plant or make sure that all connection boxes are only used in "E-stop button evaluated by safety relay" operating mode. You can find detailed information on the operating modes in the "Mobile Panels 2nd Generation" operating instructions

(<https://support.industry.siemens.com/cs/ww/en/view/109477845>).

Installing system components

3.1 Checking the delivery

Check the scope of delivery for visible signs of shipping damage and make sure that it is complete, see section "Scope of delivery (Page 16)".

Note

Do not install parts damaged during shipment. In the case of damaged parts, contact your Siemens representative. See section "Service and support (Page 109)".

3.2 Mounting the connection box compact

3.2.1 Mounting position, mounting cutout and clearance

Mounting position

The connection box is designed for installation in the following types of fixed enclosure:

- Mounting cabinets
- Control cabinets
- Control panels
- Consoles

The connection box compact can be installed in any mounting position.

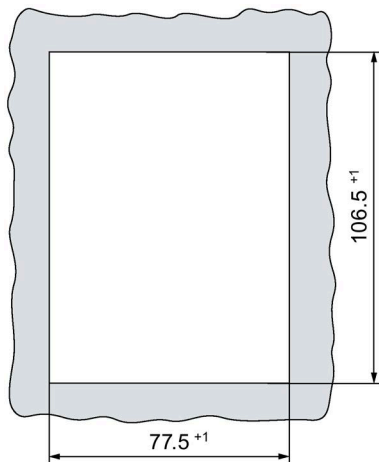
Mounting cutout

The degree of protection is guaranteed if the following conditions are met:

Material thickness at the mounting cutout	2 to 6 mm
Deviation from plane at the mounting cutout	≤ 0.5 mm This condition also applies for the installed connection box.
Surface roughness in the area of the mounting seal	≤ 120 μm (Rz 120)

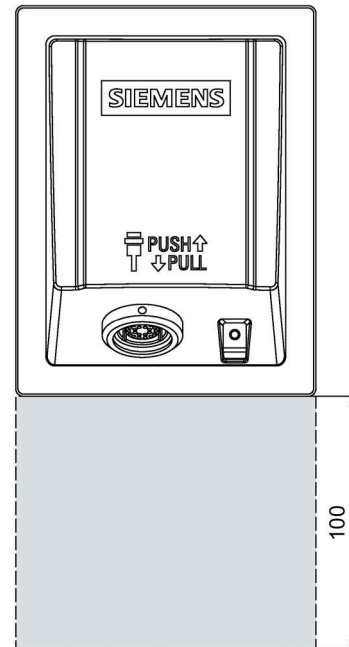
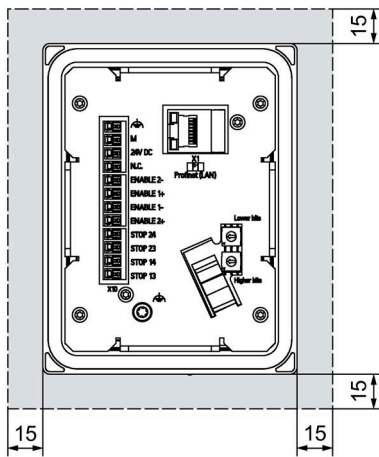
3.2 Mounting the connection box compact

The following illustration shows the dimensions for the mounting cut-out, all dimensions in mm:



Clearance

The connection box is self-ventilated. To ensure self ventilation in the control cabinet and be able to connect the connecting cable without any problems, you need the clearance indicated in the figures below, all dimensions in mm:



Note that in addition to the mounting depth of the connection box, a rear clearance is required based on the leads and plugs used.

Note

Ensure that the maximum ambient temperature as detailed in "Operating Conditions (Page 87)" is not exceeded when installing the device in closed enclosure.

Allow for 100 mm of clearance below the connection box to enable you to easily plug in the connecting cable.

3.2.2 Fastening the connection box compact

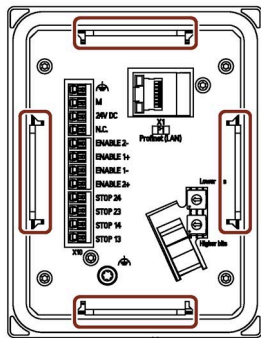
Read the instructions for work in and on electrical systems and on ESD in "General safety instructions (Page 21)".

Requirement

- 4 mounting clips
- 1 torque screwdriver with slot insert size 2

Procedure

1. Check for damage to the mounting seal on the connection box.
Do not install a connection box with a damaged mounting seal.
2. Insert the connection box in the mounting cutout.
Secure the connection box to prevent it from falling out.
3. Place one mounting clip into each of the four cutouts marked.



4. Fasten the mounting clips.

The permitted torque is 0.2 Nm.

You can find information on the electrical connection of the connection box in the section "Connecting the connection box (Page 39)".

3.3 Installing the connection box standard and connection box advanced

3.3.1 Mounting position and clearance

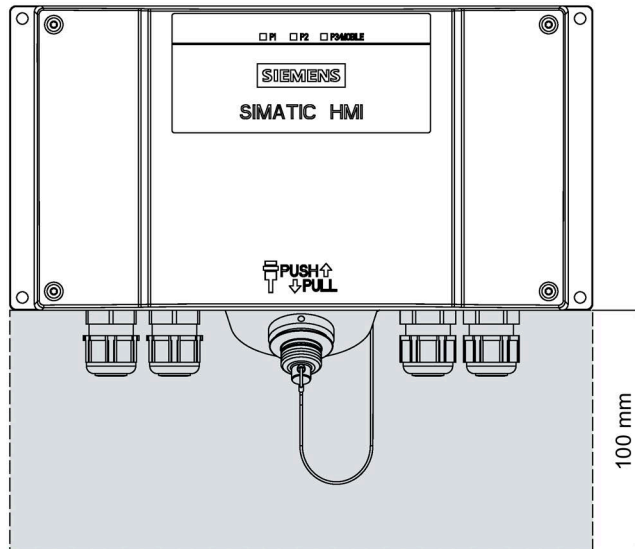
Mounting position

The connection box is designed to be mounted on a vertical surface of a stationary enclosure.

The connection box standard and connection box advanced can be installed in any mounting position.

Clearance

To ensure unhindered access to the interfaces, the clearance indicated in the figure below is required:



3.3.2 Fastening the connection box standard and connection box advanced

This section describes the mounting of the Anschluss box standard and the connection box advanced on a flat metal surface, such as a control cabinet wall.

Requirement

- 4 M5 cylinder head screws
- 1 suitable screwdriver

Procedure

In this example, the fastening described is outside of a control cabinet wall.

1. Hold the connection box on the area where you want to mount it.
2. Mark locations for the mounting holes.
3. Drill holes or threaded holes for the 4 cylinder head screws according to your requirements.
4. Attach the connection box.

See also

Dimension drawing for connection box standard and connection box advanced (Page 90)

3.4 Mounting the Mobile WebClient wall-mounting bracket

3.4.1 Mounting position and clearance

Mounting position

The Mobile WebClient wall-mounting bracket is designed for vertical walls or one of the following types of enclosures:

- Mounting cabinets
- Control cabinets
- Control panels
- Consoles

The wall-mounting bracket can be installed vertically or tilted slightly backwards.



CAUTION

The wall-mounting bracket must be mounted securely

If the wall-mounting bracket is not mounted securely, it can fall off together with the HMI device and the connecting cable. This can result in personal injury or material damage.

Select a mounting location with sufficient load-carrying capacity for the total weight of the wall-mounting bracket, HMI device and connecting cable. Choose the corresponding fixing material.

Weight information is available in section "Technical specifications (Page 91)".

NOTICE

Do not attach the wall-mounting bracket to a moving or vibrating enclosure

If the wall-mounting bracket is attached to a moving or vibrating enclosure, the Mobile WebClient can fall out of the wall-mounting bracket.

Only attach the wall-mounting bracket on a motionless and vibration-free enclosure.

Note

When the Mobile WebClient is mounted in the wall-mounting bracket, positioning it at eye level facilitates operation.

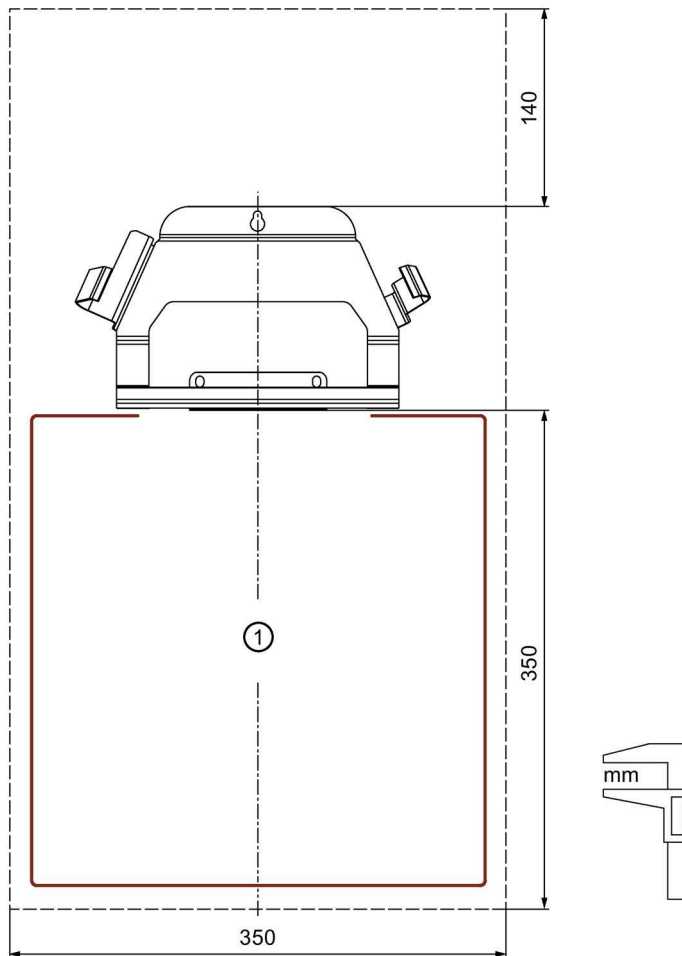
If you want to operate the HMI device in a stationary position, note the length of the connecting cable to the connection box when selecting the location for the wall-mounting bracket.

Clearance

Consider the space required for the connecting cable used and the height that the HMI device extends up and over the wall-mounting bracket.

A holding device for the connecting cable must be installed independently of the wall-mounting bracket.

The figure below shows the minimum clearance required around the wall bracket.



① Space requirements for connecting cable

3.4.2 Securing the Mobile WebClient wall-mounting bracket

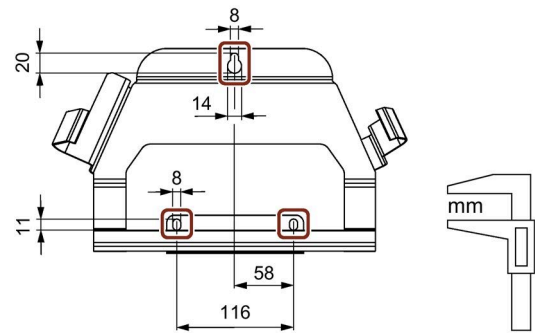
Requirement

The requirements refer to the installation of the wall-mounting bracket to a control cabinet.

- A level bolting surface
- 3 M6 ... M7 screws and a suitable screwdriver
- 3 M6 ... M7 nuts and a suitable wrench

Procedure

1. Place the wall-mounting bracket level on the mounting surface.
2. Mark the drill holes at the indicated locations in the figure on the right.
3. Drill 3 holes for the screws based on your mounting requirements.
4. Fasten the wall-mounting bracket with the bolts and nuts.



See also

Mobile WebClient wall-mounting bracket dimension drawing (Page 88)

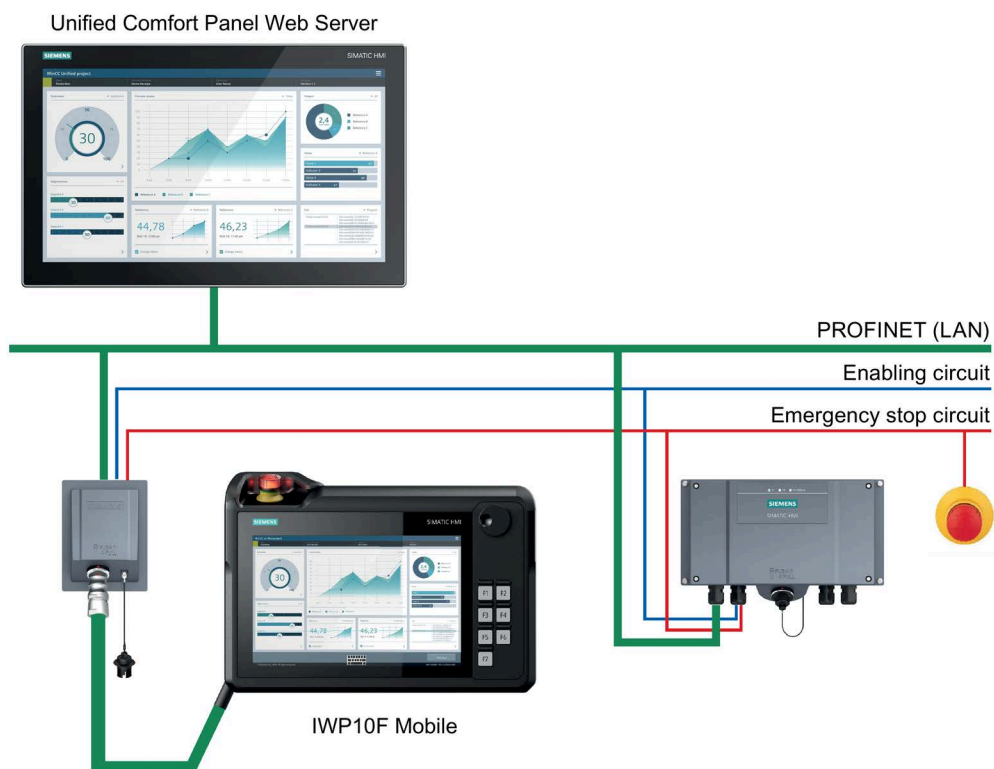
3.5 Connecting the system components

3.5.1 Overview

The following figure shows how the system components are wired and connected to the server.

A SIMATIC industrial PC, Open Controller, or Unified Comfort Panel can act as server, for example.

The safety signals at the outputs of the connection box are looped into the enable circuit and emergency stop circuit of the plant.



Connection sequence

NOTICE

Potential damage to property with incorrect connection sequence

If you do not adhere to the connection sequence of the system components, they could be damaged.


Connect the system components in the following sequence:

1. Connection box (Page 39)
2. Mobile WebClient (Page 52)

You can connect the server to the LAN before or after connecting the system components.

3.5.2 Connecting the connection box

3.5.2.1 Connection information

 CAUTION
Properties of cables to be used Use cables with a maximum permissible operating temperature that is at least 20 °C higher than the maximum ambient temperature. The insulation of the cables must be suitable for the operating voltage. Note the Specification of cables to be used (Page 97) before you start connecting. Use only cables that meet the specification. Use shielded standard cables for all remaining data cables. You can find information on standard cables and additional information at: Industry Mall (https://mall.industry.siemens.com)

NOTICE
Foreign objects or liquids Foreign objects or liquids can cause a short-circuit inside the connection box and damage the connection box or HMI device accordingly. Pay attention to cleanliness. Keep foreign objects and liquids away while working on the connection box. Take care when working on the connection box that conducting materials, such as bare cable leads, do not come into contact with the electrical circuits.

NOTICE
Observe local installation regulations Observe the local installation regulations and the local installation conditions, such as protective wiring for power supply cables, when connecting the cables.

NOTICE
Short-circuit and overload protection Different measures for short-circuit and overload protection are required when setting up an entire plant. The type of components and the level of obligation for the protective measures depends on the regulation that applies to your plant configuration.

Connection sequence

NOTICE
Potential damage to property with incorrect connection sequence Failure to adhere to the connection sequence can damage the connection box.

Connect the connection box in the following sequence:

1. Functional grounding and power supply (Page 44)
2. Cables for the hardwired F-system (Page 46)
3. Ethernet (Page 47)

3.5.2.2 Opening and closing connection box standard and connection box advanced

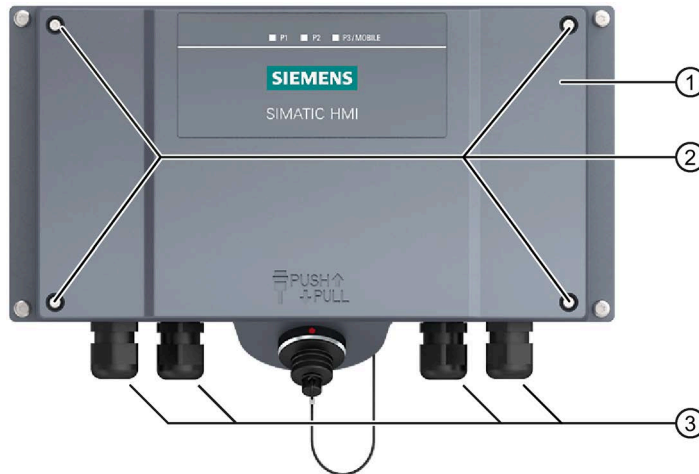
The connection boxes standard and advanced must be opened for connecting and setting the box ID. To avoid damage to the connection box, read the information in the section "General safety instructions (Page 21)" about working in and on electrical systems and about ESD.

Requirement

- The connection box is de-energized.
- Torque screwdriver with T10 insert

Procedure

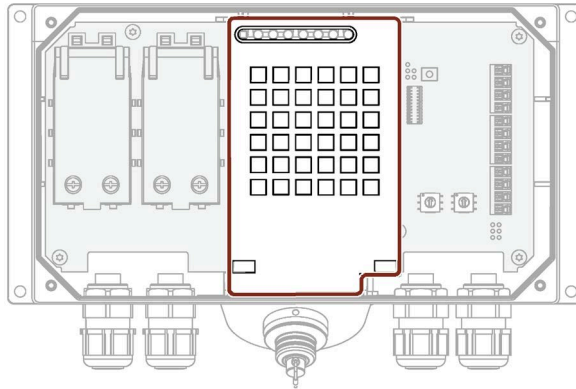
Open



- ① Cover
- ② Screws
- ③ Screw glands M16x1.5 for cable diameters 5 to 10 mm

1. Loosen the 4 screws ②.
2. Lift the cover ① carefully, because the seal may stick to the lid and can be pulled out.
3. Remove the screws and the cover.

The following protective cover is visible:



NOTICE

Damage to the connection box

Without a protective cover, there is a risk that the electronics of the connection box are damaged or destroyed.

Do not remove the protective cover.

Close

Follow the steps for opening in reverse order.

NOTICE

Permissible torque

The connection box enclosure is made of plastic. Therefore, the mounting hole threads cannot handle the same amount of stress as a comparable metallic enclosure. If the screws are tightened with too great a torque or more than 20 times, there is risk of damage to the thread.

Do not exceed 0.4 to 0.5 Nm of torque when tightening the screws.

Note

During assembly, make sure that the seal for the cover is inserted and not damaged. Otherwise the specified degrees of protection cannot be guaranteed.

3.5.2.3 Equipotential bonding of connection boxes

Potential differences

Differences in potential between separated plant components can lead to high equalizing currents over the data cables, destroying the circuits. This situation may arise if the cable shielding is terminated at both ends and grounded at different system parts.

Differences in potential can also be caused by different mains supplies.

General requirements for equipotential bonding

Differences in potential must be reduced far enough with equipotential bonding conductors to ensure error-free operation of the relevant electronic components. The following information must therefore be observed when installing the equipotential bonding:

- The effectiveness of equipotential bonding increases as the impedance of the equipotential bonding conductor decreases or as its cross-section increases.
- If two plant sections are interconnected by means of shielded data cables and their shielding is connected at both ends to the grounding/protective conductor, the impedance of the additionally installed equipotential bonding conductor must not exceed 10% of the shielding impedance.
- The cross-section of a selected equipotential bonding conductor must be capable of handling the maximum equalizing current.

Equipotential bonding cables are required between two control cabinets with a minimum conductor cross-section of 16 mm².

- Use equipotential bonding conductors made of copper or galvanized steel. Connect the equipotential bonding conductors to the ground / protective conductor over a wide area. Protect the equipotential bonding conductors against corrosion.
- Clamp the shielding of the data cable on the HMI device flush and near the equipotential busbar using suitable cable clamps.
- Route the equipotential bonding conductor and data cables in parallel with minimum clearance between them.

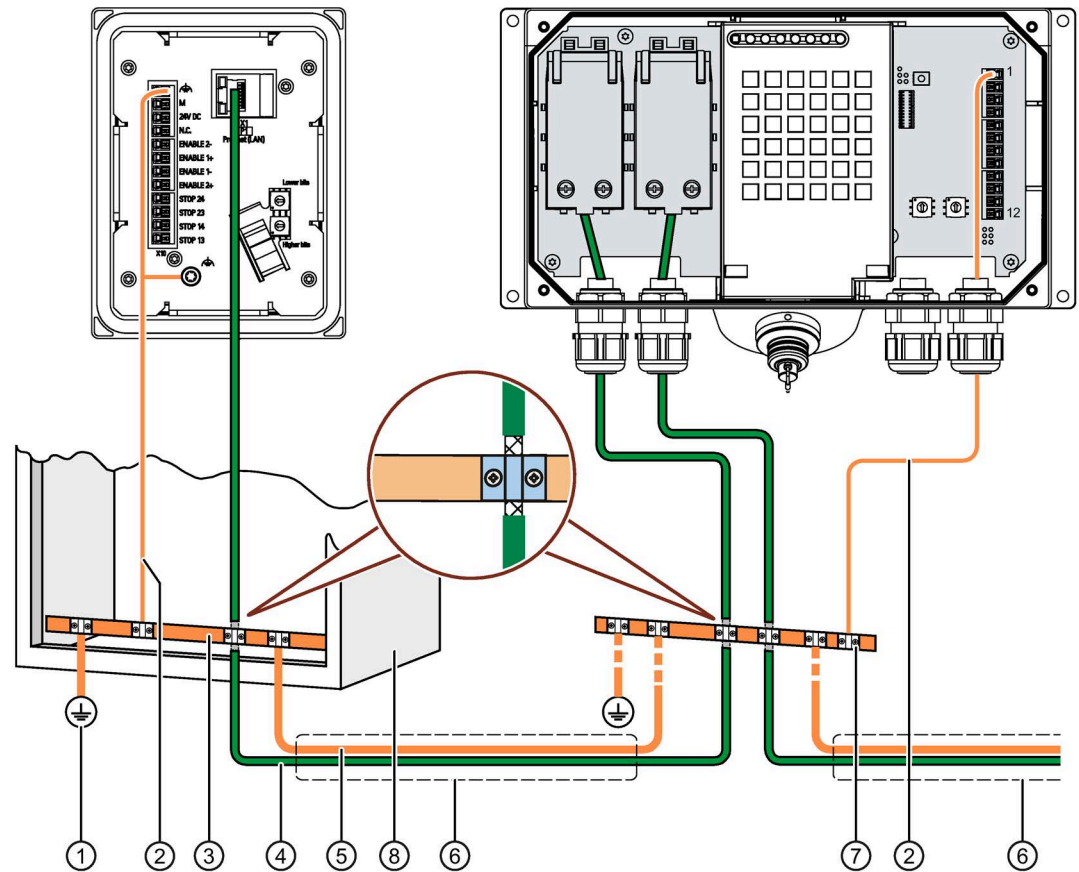
Note

Cable shielding is not suitable for equipotential bonding. Always use the prescribed equipotential bonding conductors. When installing PROFINET networks, always use cables with a sufficient cross-section. Otherwise, there is a risk that interface components will be damaged or destroyed.

Connection graphic

The figure below shows how to connect the equipotential bonding of the connection boxes to the equipotential busbars.

The connection box compact is displayed on the left, and the connection box standard/advanced on the right.



- ① Ground connection
- ② Equipotential bonding conductor, cross-section 1.5 mm²
- ③ Equipotential busbar for equipotential bonding cables, grounding connection and shield support of the data cables
- ④ Ethernet cable
- ⑤ Equipotential bonding conductor, cross-section ≥ 16 mm²
- ⑥ Parallel routing of the equipotential bonding conductor and data cable
- ⑦ Cable clip
- ⑧ Control cabinet

3.5.2.4 Connecting the functional grounding and power supply to the connection box

The power supply for the HMI device is connected to a terminal strip in the connection box. The connection box has reverse polarity protection.

 **WARNING**

24 V DC power supply

If the supply voltage is outside the specified range, it may cause the HMI device to malfunction. This can result in personal injury or material damage.

Use a 24 V DC power supply with the following properties for the connection box:

- Safe electrical isolation according to IEC 60364-4-41 or VDE 0100, Part 410.
- The power supply provides safety extra-low voltage according to SELV/PELV up to a maximum of 36 V DC and also does not exceed $u_m = 36$ V DC in case of fault. Refer to the information in the data sheet for overvoltage protection in the event of an internal error or take appropriate voltage-limiting measures, such as the use of a surge protection device.

NOTICE

External protective circuit

An external protective circuit is required for operation with 24 V DC; please refer to section 7 "Lightning protection and overvoltage protection" in the following function manual:

"Designing interference-free SIMATIC S7-1500, ET 200MP, ET 200SP, ET 200AL controllers (<https://support.industry.siemens.com/cs/ww/en/view/59193566>)".

Requirement

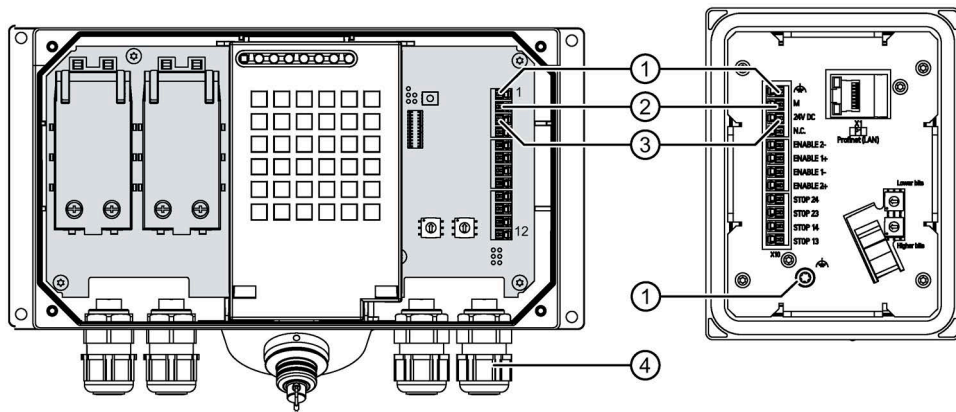
- The power supply meets the requirements set out in "Technical specifications (Page 91)".
- The connection box standard or advanced is open.
- Read the information on power supply cables and equipotential bonding cable in the section "Specification of cables to be used (Page 97)".
- The wires of the power supply cable have been stripped by 8 mm.
- Matching ferrules when using flexible cables

Procedure

1. For connection box standard and connection box advanced: Thread the cables through the corresponding screw glands.
2. When you use flexible cables, place a wire end ferrule on each wire to be connected.
3. Insert the wire ends into the associated spring-loaded terminal as shown in the figures below.

The figure below shows the contacts to be connected to the X10 terminal of the connection boxes and the cable glands for cable entry for the connection box standard/advanced.

The connection box standard/advanced is displayed on the left, and the connection box compact on the right.



- ① Connection for functional ground
 - ② M24
 - ③ P24
 - ④ Screw gland
4. Connect the equipotential bonding conductor to the equipotential busbar.
 5. Connect the equipotential bonding conductor to the terminal for the functional ground of the connection box.

Connect the equipotential bonding conductor of the connection box as described in the section "Equipotential bonding of connection boxes (Page 42)".

Note

Applies to floating system design:

Connect the terminal for GND 24 V from the 24 V power supply output to equipotential bonding for uniform reference potential.

6. For connection box standard and connection box advanced:
When all the required work has been completed in the connection box, close it.

3.5.2.5 Connecting cables for the hardwired F-system

The signals for the emergency stop button and the enabling button must be wired for a hardwired F-system.

NOTICE

Length of the data cables to the connection box

If the permissible length of the data cables and signal cables between a connection box and the plant is exceeded, malfunctions may occur. Keep the permissible length of ≤ 30 m for cables between the connection box and the evaluation unit.

Requirement

- The connection box standard or advanced is open.
- Read the information on the number of connecting cables required in the section "Specification of cables to be used (Page 97)".
- The wires of the connection cables have been stripped by 8 mm.
- Matching ferrules when using flexible cables

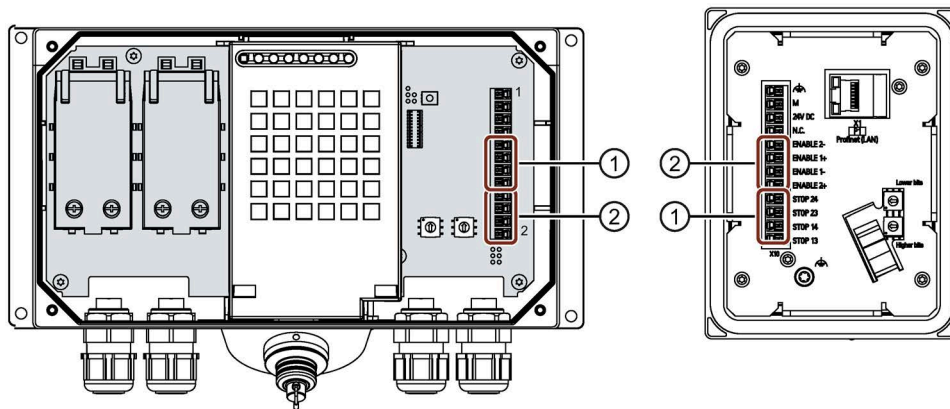
Procedure

1. Connection boxes standard and advanced:

Thread the cables through the corresponding screw glands.
2. When you use flexible cables, place a wire end ferrule on each wire to be connected.
3. Insert the wire ends into the associated spring-loaded terminal as shown in the figures below.

The figure below shows the terminals to be connected to the connection box.

The connection box standard/advanced is displayed on the left, and the connection box compact on the right.



- ① Terminal for the emergency stop button
- ② Terminal for the enabling button

4. Connect the cables. Depending on the connection box, observe the pin assignment of interface X10:
 - Connection box standard and connection box advanced (Page 104)
 - Connection box compact (Page 100)
5. For connection box standard and connection box advanced:
When all the required work has been completed in the connection box, close it.

3.5.2.6 Connecting Ethernet to the connection box

You can connect a controller or other Ethernet devices to the connection box.

Note

- Only use a switch or comparable device to connect the connection box to public Ethernet networks.
 - Follow the information in the "SIMATIC PROFINET system description (<https://support.industry.siemens.com/cs/us/en/view/19292127>)" manual for setting up a PROFINET network.
-

Note

Using an Ethernet data transmission rate of 100 Mbps

The Ethernet data transfer rate of 10 Mbps is not supported by the Mobile Panel.

Use a data transmission rate of 100 Mbps for communication with the Mobile Panel.

Maximum cable lengths

Ethernet cable	Connection box used	Maximum cable length including connecting cable
Between Mobile Panel and connection box	<ul style="list-style-type: none"> • Connection box compact • Connection box standard • Connection box advanced 	25 m
Between Mobile Panel and PROFINET station	• Connection box compact	100 m
	<ul style="list-style-type: none"> • Connection box standard • Connection box advanced 	125 m

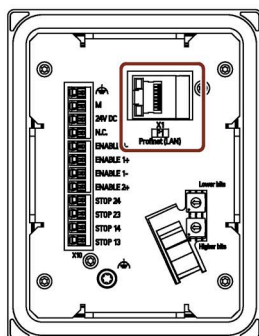
Requirement

- The connection box is mounted.
- Connection box compact:
 - 1 preassembled Ethernet cable including Ethernet connector.
Recommendation: Use an angled connector, for example, an RJ45 connector with article number 6GK1901-1BB20-2Ax0.
x stands for the variant key of the article number.
- Connection boxes standard and advanced:
 - The connection box is open.
 - 1 Ethernet cable (not preassembled)
 - 1 screwdriver, PZ 2
 - 1 stripping tool
See the online catalog at "Industry Mall (<https://mall.industry.siemens.com>)".

Procedure

Connection box compact

1. Connect the RJ45 connector of the Ethernet cable with the RJ45 socket marked in the figure below.



Note

LEDs on the RJ45 socket not active

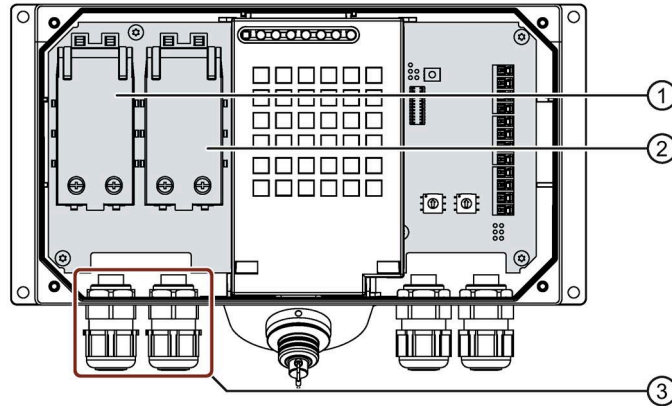
The two LEDs at the RJ45 socket of the connection box compact are not supported by the hardware and do not light up during operation.

Connection boxes standard and advanced

1. Strip the insulation on the Ethernet cable as shown in the figure below.



2. Open fast connector 1.



- ① Fast connector 1
- ② Fast connector 2
- ③ Screw gland

3. Push the Ethernet cable through the screw gland and connect the wires as detailed in the interface description in "Fast Connector X1 and X2 (Page 104)".
4. Close the fast connector.
Closing the fast connector establishes the contact to the wires in the Ethernet cable.
5. Tighten the screw cap on the screw gland.
The specified degrees of protection are only met when the screw cap has been tightened.
6. Once all the required work in the connection box has been completed, close it.

3.5.2.7 Setting the box ID of the connection box

You need to set a box ID for each connection box. If configured, the box ID can be read by the HMI device and transmitted to the PLC.

The box ID allows connection point detection. The procedure is described in the section "Using connection point detection (Page 73)".

Note

You need to set a box ID for each connection box. Do not assign the same box ID twice.

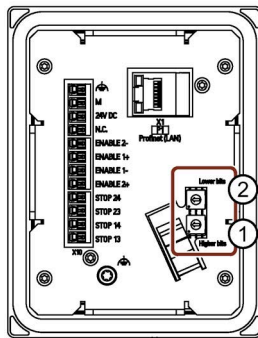
Note

Changing the box ID of a connection box

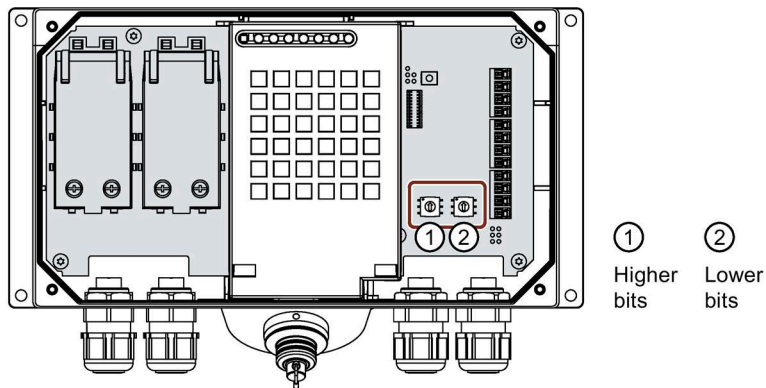
If you want to change the box ID of a connection box, remove the connection box from its power supply before you set the box ID with the rotary coding switch.

Rotary encoder switch

- Position of the rotary coding switch in the connection box compact



- Position of the rotary coding switch in the connection boxes standard and advanced



Requirement

- For connection box standard and connection box advanced: The connection box is open.
- The connection box is disconnected from its power supply.
- A suitable tool made of plastic

Procedure

1. Rotate the arrows of the rotary coding switch to the required hexadecimal value using a suitable tool.

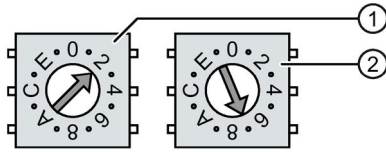
Values from "00" to "FF" (0 to 255 in decimal form) can be set with the rotary coding switches.

The values "00" and "FF" are reserved and must not be used.

Set a value higher than "00" and lower than "FF".

Example:

The figure below shows an example of the rotary coding switch for a connection box standard. "27H" (39 in decimal form) is set for the box ID as an example.



- ① Rotary encoding switch for more significant bits
This is the lower rotary coding switch in the connection box compact and the left rotary coding switch in the connection boxes standard and advanced.
 - ② Rotary encoding switch for less significant bits
2. For connection box standard and connection box advanced:
When all the required work has been completed in the connection box, close it.

3.5.2.8 Secure cables and seal screw glands

Once all cables are connected to the connection box, the following final steps should be carried out:

- Connection box compact: Strain relief for cables on the back of the connection box
- Connection box standard and connection box advanced: Seal and secure screw glands

Requirement

For the connection box compact:

- 1 cable tie
- 1 diagonal cutter

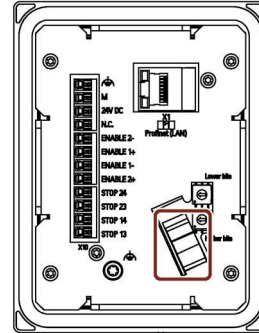
For connection box standard and connection box advanced:

- The connection box is closed.

Procedure

Connection box compact

- Secure all connected cables with a cable tie on the fastening element, which is labeled in the figure on the right.



Connection box standard and connection box advanced

1. Check whether the cover is located in the cable glands that are not in use.
2. If a cover is missing, replace it.
3. Tighten the screw cap.



This will ensure IP65 degree of protection for the connection box standard or the connection box advanced.

3.5.3 Connecting the Mobile WebClient

3.5.3.1 Connection information

The Mobile WebClient is supplied with an open connection compartment. During first commissioning or when replacing the connecting cable, you will be working with an open connection compartment. To avoid damage to the HMI device, read the information in the section "General safety instructions (Page 21)" about working in and on electrical systems and about ESD.

NOTICE

Foreign objects and liquids

Foreign objects or liquids can cause a short-circuit inside the HMI device and damage the HMI device accordingly.

Pay attention to cleanliness. Keep foreign objects and liquids away while working on the terminal compartment of the HMI device.

Connection sequence

Keep to the following connection sequence:

- Connecting the connecting cable to the HMI device (Page 53)
- Connecting the connecting cable to the connection box (Page 55)
- Optional: Connecting USB stick (Page 57)

3.5.3.2 Connecting the connecting cable to the HMI device

The connecting cable is a system component and is required for the operation of the Mobile WebClient.

Use one of the permissible cables; see section "Connecting Cable (Page 13)".

Requirement

- You have taken precautions to protect your device, see section "Connection information (Page 52)".
- A torque screwdriver with T10 insert.

Procedure

1. If necessary, open the connection compartment. Loosen the seven marked PT screws until you can remove the connection compartment cover.

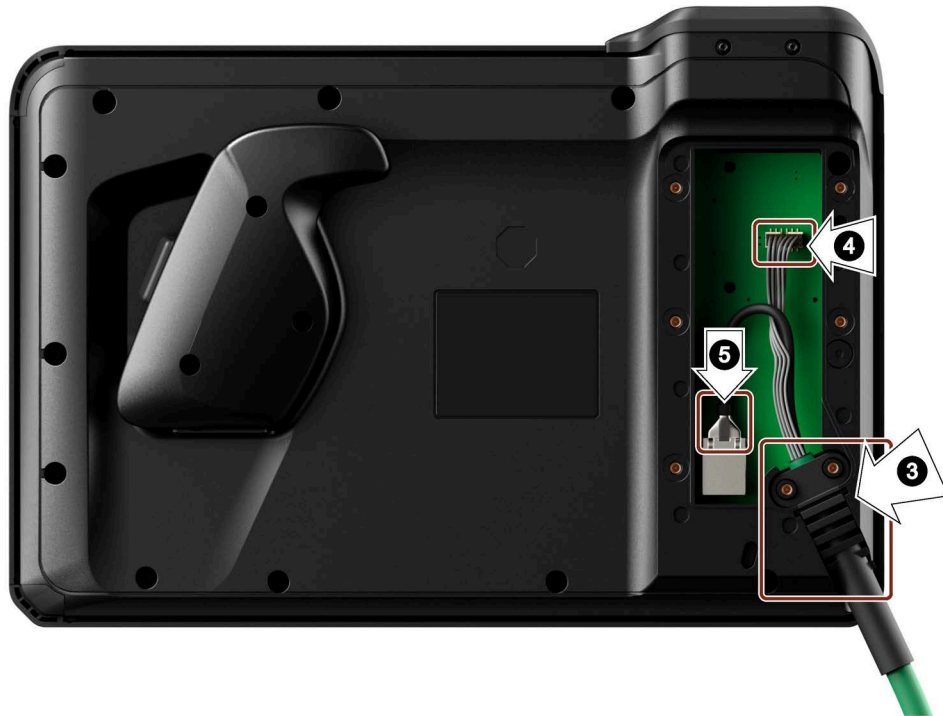


2. Remove the connection compartment cover.

3. Grease the fin seal of the connecting cable, e.g. with Vaseline, and insert the connecting cable into the corresponding guide as illustrated.

Note

Make sure that the fin seal is aligned correctly. The longer, flat side of the fin seal must be in the enclosure. The curved side of the fin seal must point in the direction of the connection compartment cover.

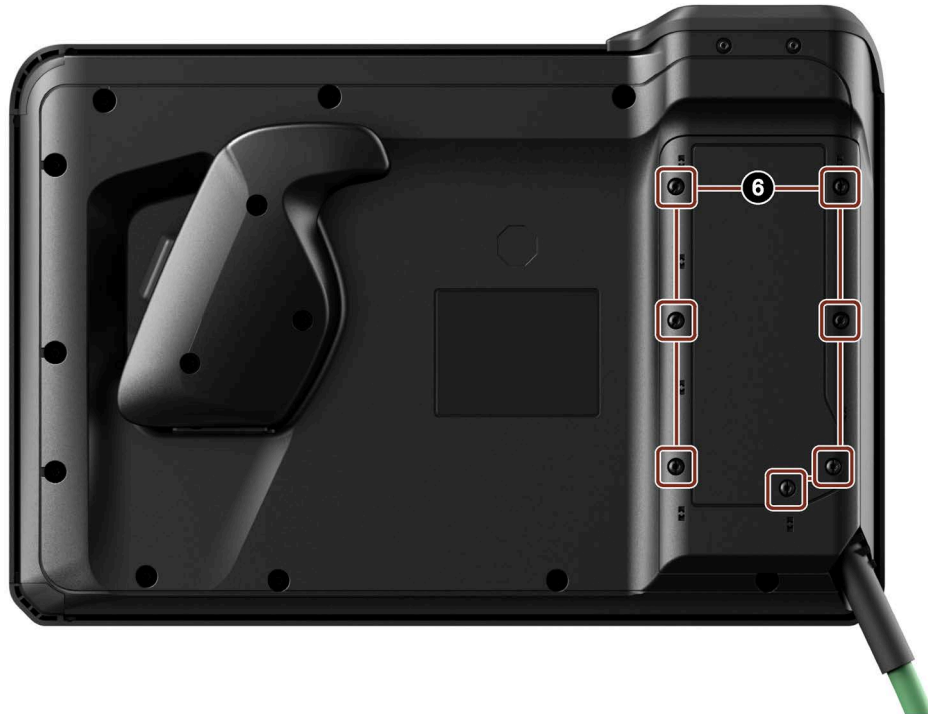


4. Connect the 12-pin plug-in connector to the X51 interface. Observe the mechanical coding of the connector.
5. Connect the RJ45 connector to the X3 interface. Make sure that the RJ45 connector audibly engages.

Note

Make sure that the cables in the connection compartment are bent as little as possible and do not protrude from the connection compartment.

6. Close the connection compartment. Place the connection compartment cover onto the connection compartment and tighten the screws of the connection compartment cover with a torque of 0.8 Nm.



3.5.3.3 Connecting the connecting cable to the connection box

The connecting cable can be connected to the connection box using the connector. The connector is coded to prevent faulty insertion. The connecting cable is described in the section "Connecting Cable (Page 13)".



Procedure

Connecting

NOTICE

The status of PROFINET IO direct keys is evaluated immediately after connection

When you connect an HMI device to the connection box and evaluate operator controls over PROFINET IO as direct buttons:

The status of the handwheel and the function keys with LEDs is evaluated immediately. This can cause unintentional responses.

Do not operate the handwheel or the function keys before or during connection.

1. Align the positioning mark of the connector with the positioning mark on the socket of the connection box.
2. Connect the plug to the connection socket of the connection box.

Additional characteristics of the Mobile Panel are described in the section "Connecting the connecting cable (Page 77)".

Unplugging

NOTICE

No automatic emergency stop bypass for connection box compact and connection box standard

When unplugging the connecting cable from the connection box compact or a connection box standard, there is no automatic bypass of the emergency stop circuit. Without further actions, an emergency stop is triggered in the plant and the plant switches to a safe state.

Take appropriate circuitry measures to prevent an undesired emergency stop of the plant.

Note the information provided in section "Fail-safe operation > Unplug connecting cable (Page 77)".

To unplug the cable, follow these steps:

1. Pull the outer bushing of the connector. Make sure that you do not tilt the connector when you unplug it.
2. If you do not intend to use the HMI device with a different connection box, place the HMI device in its wall-mounting bracket.

Note

- Wait for about 1 second after you have unplugged the connecting cable from the connection box before you plug in the connecting cable again.
 - The specified degrees of protection are met at the connection socket of the connection box when the connecting cable or the cover of the connection socket is inserted.
-

3.5.3.4 Connecting USB stick

The USB port is used to transfer data and save specific HMI device data.

NOTICE

USB port only enabled for USB flash drive.

The USB port is only enabled for use with an industrial-grade USB flash drive for commissioning and maintenance purposes.

Degrees of protection not guaranteed with USB flash drive

When a USB flash drive is connected to the USB port, the degrees of protection specified for the Mobile Panel are not guaranteed.

Do not connect a USB device if dust or moisture is present at the location of use that can enter the HMI device.

Requirement

- An industrial-grade USB flash drive

Procedure

1. Open the cover of the USB port.



2. Insert the USB flash drive into the USB port.

3.6 Selecting the connection box

The connection box is generally removed in the reverse order used for installing and connecting.

Requirements

- No Mobile Panel is connected to the connection box.
- The cover of the connection socket for the connecting cable is located on the connection box.

Procedure

Connection box compact

1. Switch off power supply to the connection box.
2. Remove all cable ties on the connection box used for strain relief of the connecting cables on the associated fixing element.
3. Disconnect the following cables from the connection box:
 - Equipotential bonding cable at the equipotential bonding screw
 - All cables at the port X10
 - The Ethernet cable at the port X1
4. Loosen the screws of the mounting clips and remove all mounting clips.
5. Remove the connection box from the mounting cutout.

Connection box standard and connection box advanced

1. Switch off power supply to the connection box.
2. Open the connection box.
3. Disconnect the following cables from the connection box:
 - All cables at the port X10
 - The Ethernet cables at Fast Connector X1 and Fast Connector X2
4. Thread all connecting cables through the associated cable glands out of the connection box.
5. Close the connection box.
6. Close off all cable glands with a cover.
7. Remove the four outermost screws used to fasten the connection box.
8. Remove the connection box from its mounting location.

See also

Connecting the connection box (Page 39)

Installing system components (Page 31)

Handling and operating the Mobile WebClient

4.1 Holding the Mobile Panel and attaching it to the wall-mounting bracket

Holding the HMI device

The figure below shows the IWP10F Mobile WebClient HMI device being held on the forearm.



When holding the Mobile Panel as shown, you can, for example, perform movements in the fail-safe automation system during setup mode.

The HMI device is easy to operate when held on the forearm as shown. With your free hand, you can operate all operator controls on the front of the device and the emergency stop button. You can activate the enabling button with the hand holding the HMI device. The enabling button is optimally accessible.

NOTICE

Holding the HMI device during setup mode

Potentially dangerous movements can be controlled manually if setup mode is activated.

To ensure that the emergency stop button and enabling button can be operated quickly in a dangerous situation, the HMI device must be held on your forearm as shown during setup mode.

If you are only entering data and are not controlling potentially dangerous movements, you can hold the HMI device with both hands on the left and right instead of on your forearm.

Using the HMI device in a fixed position

A wall-mounting bracket is available for securely fixing the HMI device in position. You can place the HMI in the wall-mounting bracket and operate it as a stationary device. Observe the necessary organizational measures as described in the section "Organizational measures (Page 20)".

NOTICE

Operability of the emergency stop button

Placing the HMI device into an unsuitable wall-mounting bracket can impair the operability of the emergency stop button.

Only use the wall-mounting bracket from section "Wall-mounting bracket (Page 17)".

Note

If the HMI device is not connected to the connection box with the connecting cable, the emergency stop button has no function. Potentially dangerous movements cannot be stopped.

Note

Enabling button and USB interface not accessible in the wall-mounting bracket

If the HMI device is mounted in the wall-mounting bracket, the enabling button and USB interface cannot be used.

The following figure shows the Mobile WebClient in the wall-mounting bracket.



4.2 Operating the enabling button

The enabling mechanism comprises one integrated enabling button with three settings.

The signals of the enabling button are evaluated internally and sent to the connection box over the connecting cable. For setup mode, these signals must be wired dual-channel from the connection box to the F-system.



① Enabling button

For a hardwired F-system: When a SIRIUS safety relay is used, the enabling button meets the requirements of Safety Category 3 in accordance with EN ISO 13849-1.

Requirement

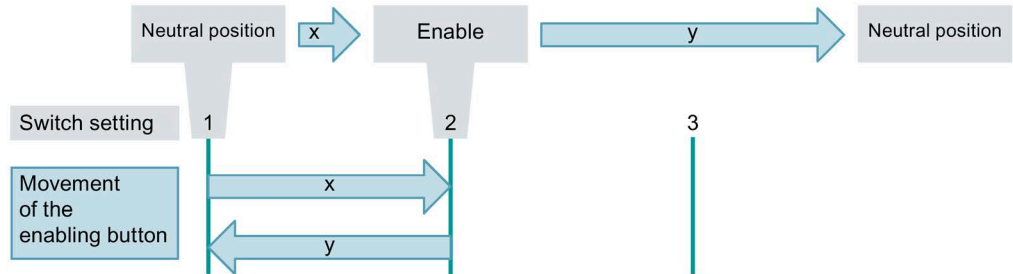
- The HMI device is connected to a correctly installed connection box.

Procedure

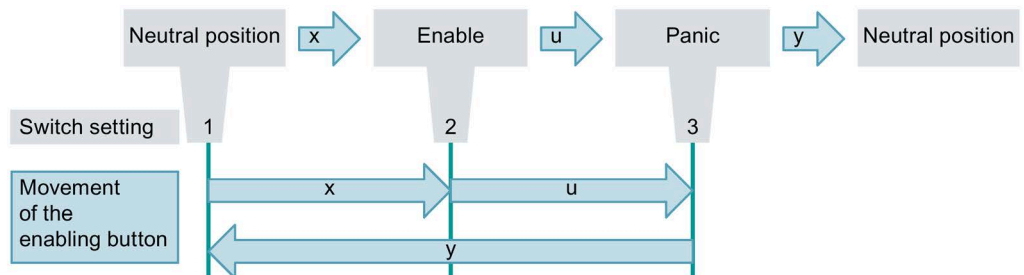
1. Press the enabling key to switch position 2 or 3.

Switch position	Function	Enabling button switch status
1	Neutral position	Opened
2	Enable	Closed
3	Panic	Opened

- The figure below shows the switching sequence for normal operation.



- The figure below shows the switching sequence for panic operation.



2. Release the enabling button.

If the enabling button is in switch position "3", the "Enable" setting is skipped when the button is released.

Note

Releasing the enabling button and the "Panic" switch position do not require acknowledgement of the safety shutdown.

4.3 Operating the emergency stop button

The emergency stop button is designed with two circuits and enables a safety-related emergency stop of the fail-safe automation system.

Note

- An emergency stop can only be triggered when the fail-safe HMI device is connected to a correctly installed and wired connection box via the connecting cable.
- The emergency stop button lights up as soon as the HMI device is supplied with power via the connection box.



- ① Emergency stop button

The following applies to the "emergency stop" function:

- When a SIRIUS safety relay is used, the emergency stop button meets the requirements of Safety Category 3 in accordance with EN ISO 13849--1.
- When you unplug the connecting cable from the connection box, the emergency stop circuit is either opened or automatically bypassed, depending on the connection box used.

Procedure

Note

Only press the emergency stop button to avoid imminent danger. If you want to activate the emergency stop button for test purposes, consult those responsible for the plant in advance.

1. Press the emergency stop button. The system responds with an emergency stop.
2. Release:

! WARNING
Release requirements
If you have operated the emergency stop button and thereby brought the fail-safe automation system into a safe state, the dangerous situation may still remain.
You may only release the emergency stop button when both of the following conditions are met:
<ul style="list-style-type: none">• The causes of the emergency stop have been eliminated• A safe hot restart of the fail-safe automation system is possible.

Turn the emergency stop button to release it. The button jumps back to its initial position.

4.4 Using function keys

The Mobile WebClient has seven function keys:



You have the following possibilities for using the function keys. The corresponding settings are made via the IWP software:

- Using function keys via the IWP software as operator controls.
The IWP software offers a separate page to assign parameters to the function keys.
- Using function keys as PROFINET IO direct keys.
Activate PROFINET in the network settings of the IWP software.

Note**Function keys can be used either as direct keys or as operator controls**

The selected setting applies to the entire function key block.

As soon as PROFINET is activated in the network settings of the IWP software, the function keys can no longer be used as operator controls.

More information is available in the section "The IWP software (Page 69)".

Function keys as direct keys

Direct keys on the HMI device set bits directly in the I/O area of a SIMATIC S7 controller. A direct key enables operation with a short response time, for example, as required for setup mode.

To use the function keys as direct keys, activate PROFINET in the network settings of the IWP software.

Read "Evaluating operator controls as direct keys (Page 73)".

Note

- You can only use direct keys when there is a connection over PROFINET IO.
 - The direct key function is active as soon as the HMI device is connected via PROFINET IO to a server on which a corresponding project is started.
 - If you operate a function key with direct key functionality when a project is running, the direct key function is always executed, regardless of the current display content.
-

Note**Direct key LEDs**

If keys of the HMI device that are equipped with an LED are used as direct keys over PROFINET IO, the following applies:

- After the device is switched on, the LEDs of the direct keys light up briefly.
 - If no direct key communication exists or a PROFINET IO communication error occurs, e.g. due to faulty check bits, the LEDs of the direct keys are no longer lit.
-

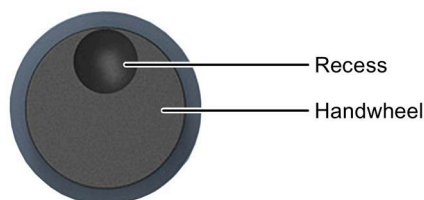
Function keys as operator controls

You can use the function keys as operator controls. A fixed function, e.g. increase or decrease brightness, or open a specific web page, can be assigned to a function key via the IWP software.

Assign the desired functions to the function keys via the IWP software. Make sure that the function keys are not used as direct keys.

4.5 Using the handwheel

The handwheel can be turned without a stop and does not have a zero position. To facilitate operation, the handwheel has a small recess.



The handwheel can only be used as a PROFINET IO direct key.

Handwheel as direct key

Read "Evaluating operator controls as direct keys (Page 73)".

Note

- The direct key function is active as soon as the HMI device is connected via PROFINET IO to an IO controller on which a corresponding project has been started.
 - If you operate a handwheel with direct key functionality when a project is running, the direct key function is always executed, regardless of the current display content.
-

4.6 Important notes on touch screen

You can operate the capacitive multi-touch screen with one finger, or with up to five fingers using gestures.

Only use gestures that are supported by the server operating system and software used.

WARNING

Personal injury or property damage due to no earth connection

A faulty or non-existent grounding connection can cause the capacitive multi-touch screen to malfunction. Functions may not work properly. This can result in personal injury or property damage.

- Always connect the connection box of the HMI device to a ground conductor.
- The ground conductor of the connection box must be connected directly to ground with a low impedance (short connection, observe minimum conductor cross-section).

You can find more information on connecting the ground conductor in the section "Connecting the functional grounding and power supply to the connection box (Page 44)".

WARNING

Personal injury or property damage due to maloperation

Incorrect operation cannot be ruled out for HMI devices with touch screens. This can result in personal injury or property damage.

Take the following precautions:

- Configure the plant so that safety-related functions are not operated with the touch screen.
- Only carry out an operator action if a plant screen is shown on the HMI device screen.
- Switch off the HMI device for cleaning and maintenance.

NOTICE

Damage to the touch screen

The following operation significantly reduces the service life of the touch screen and can lead to total failure:

- Touching with pointed or sharp objects
- Shock contact with hard objects.

Only touch the touch screen with a finger or a touch pen.

 **WARNING**

Danger of malfunctions due to incorrect execution of gestures on the touch screen

If gestures are executed incorrectly on the touch screen with multi-touch function, these gestures may not be recognized or could be recognized incorrectly. The entries made are then not implemented by the HMI device, or are implemented incorrectly or in an unintended manner.

Incorrect execution of multi-touch functions can lead to errors in the operation of the plant and thus to physical injury.

Observe when operating the capacitive multi-touch screen:

- The touch screen reacts to contact on its surface, not to pressure.
- When using a touch pen: Operate the touch screen only with a touch pen for capacitive touch.
- Avoid unintended multiple touches, for example, with your knuckles.

Before using the HMI device, familiarize yourself with the supported multi-touch functions of the operating system and the applications. Ensure that the gestures which the user executes on the multi-touch screen are recognized by the application. It is possible that certain gestures need to be trained beforehand.

Notes on operation

Note

Do not touch the capacitive multi-touch screen during startup

The HMI device automatically calibrates the capacitive multi-touch screen during startup. The touch screen is locked during calibration.

Do **not** touch the touch screen during startup. Make sure that you do **not** rest on the touch screen with the palm of your hand during startup.

Make sure that there are **no** conductive liquids on the touch screen during startup.

Note when operating the capacitive multi-touch screen:

- Surface contact with a diameter of about 5 to 20 mm is required for an operator action to be detected.
- An operation with gloves with a material thickness of < 2 mm is detected in most cases. However, check the usefulness of the gloves you are using.
- To avoid incorrect operation, certain inputs are ignored and blocked from further entry:
 - Simultaneous operation with more than 5 fingers.
 - Surface contact with a diameter of > 3 cm, for example, resting the palm of the hand on the touch screen
 - As soon as the touch screen is no longer touched, input is possible again.

Assigning the parameters of the Mobile WebClient

5

5.1 The IWP software

The IWP software provides an interface with which you can conveniently assign parameters to SIMATIC Industrial Web Panels (IWP).

Parameter assignment includes settings for:

- The display and screen keyboard of the device
- Network access
- The web browser
- The function keys

You can find the documentation for the IWP software on the Internet at the following address:

"IWP software" Operating Manual

(<https://support.industry.siemens.com/cs/ww/en/view/109779548>)

5.2 Assigning parameters to the HMI device in STEP 7 (TIA Portal)

5.2.1 Showing the Mobile WebClient in the hardware catalog

Requirement

- A TIA Portal project is open
- You are in the project view under "Devices and networks"

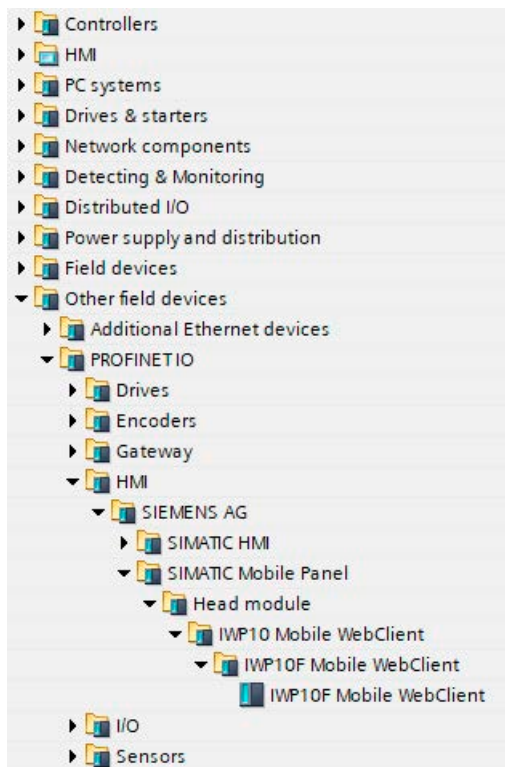
Integrating the GSD file in the hardware catalog

Proceed as follows to integrate the GSD file for the Mobile WebClient in the hardware catalog.

1. Download the GSD file for the Mobile WebClient. You can find the GSD on the Internet (<https://support.industry.siemens.com>) by specifying the MLFB for your device. Filter the entries for the entry type "Download".
2. Install the GSD file in line with the following description: Integrating the GSD file in TIA (<https://support.industry.siemens.com/cs/ww/en/view/109738401>)

Showing HMI devices in the hardware catalog

After installing the GSD file, you will find the Mobile WebClient in the following folder of the hardware catalog if the filter option is disabled:



5.2.2 Networking the Mobile WebClient

The section describes, based on the example of a CPU 1518-4 PN/DP, how you network the HMI device and set the corresponding IP addresses.

Requirement

- A project is open in STEP 7 (TIA Portal).

Networking a HMI device and controller

1. Open the "Devices & networks" editor.
2. Place a Mobile WebClient and a controller in the editor.
3. Ensure that "Network" mode is selected.

4. Select the Mobile WebClient.

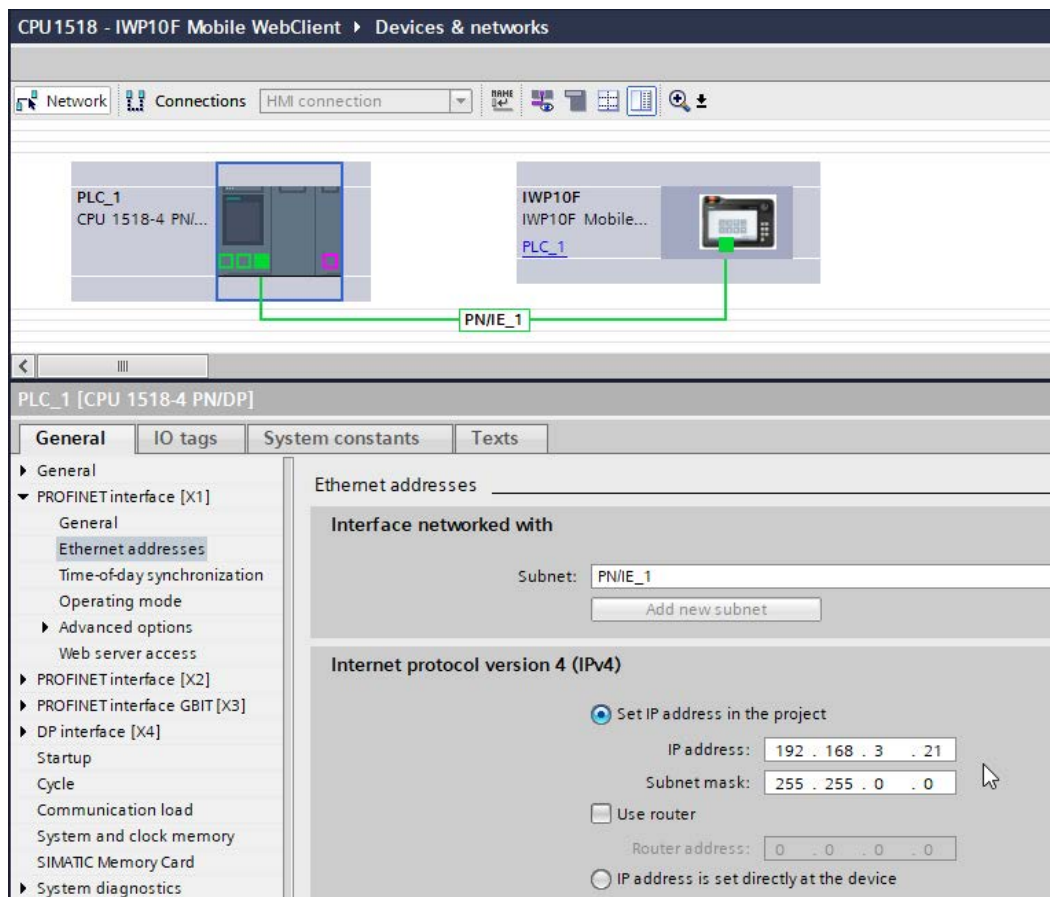


5. Click "Not assigned" to the left of the PROFINET interface.
6. Select a PROFINET interface of the controller.

Check IP addresses

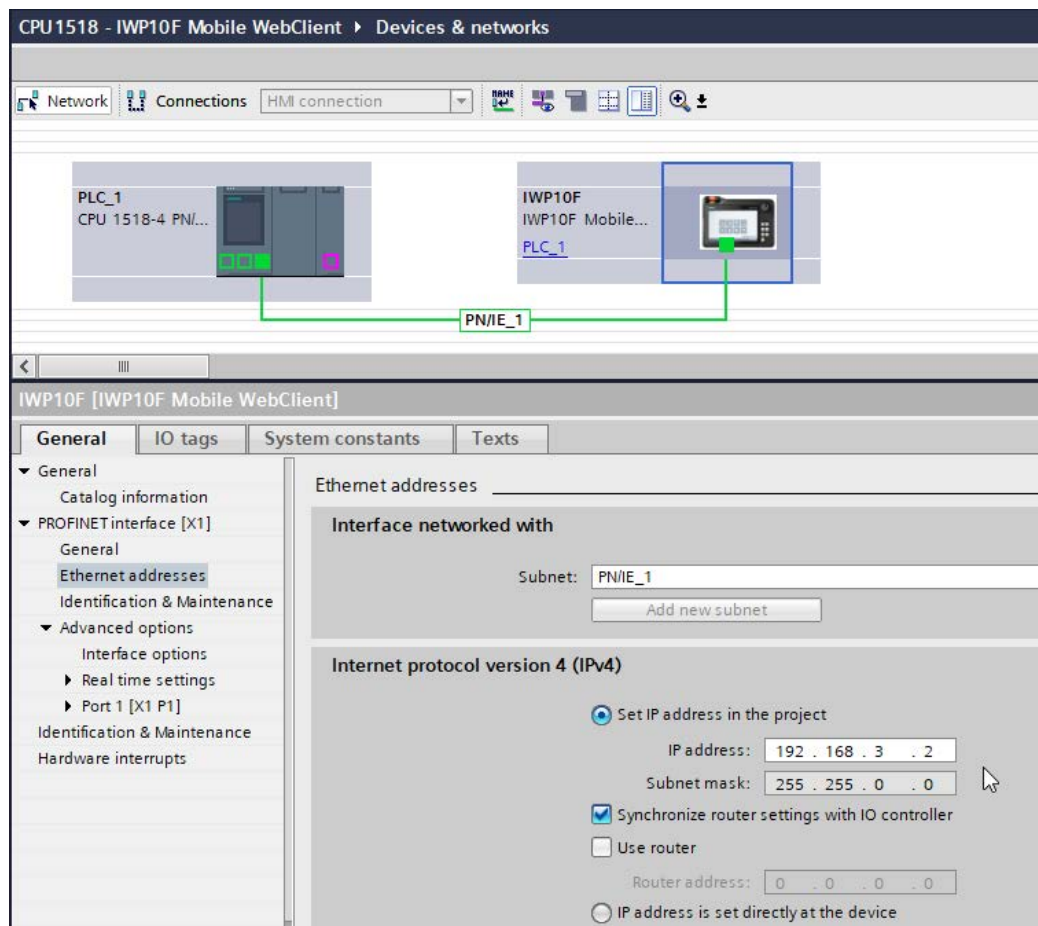
To ensure that the HMI device and controller can communicate with each other, check the IP addresses after the networking. Proceed as follows:

1. In the "Devices & networks" editor, click the controller icon.



2. In the properties of the PROFINET interface connected to the Mobile WebClient, select the entry "Ethernet addresses".

3. If required, change the entries for IP address and subnet mask.
4. Make a note of the settings.
5. In the "Devices & networks" editor, click on the icon of the Mobile WebClient.



6. In the properties of the PROFINET interface, select the entry "Ethernet addresses".
7. Make sure that the IP address and subnet mask are set so that the HMI device is assigned to the IP subnet of the controller.
8. Correct the settings if required.

5.2.3 Using connection point detection

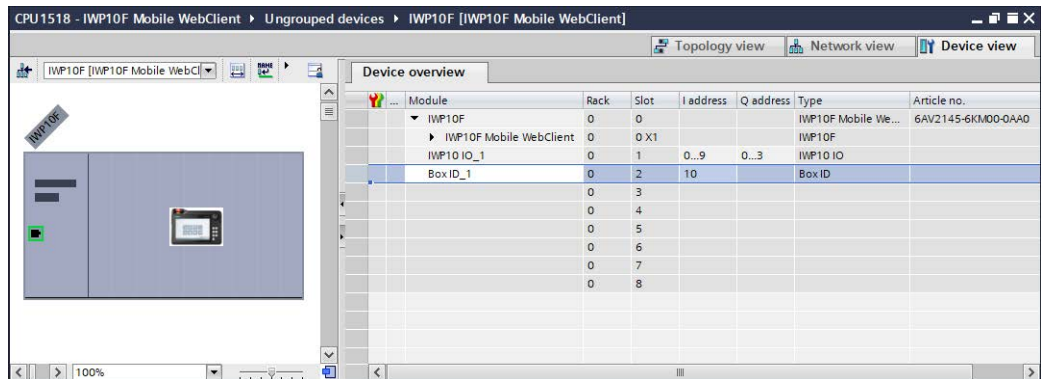
You can read out the box ID of the connection box to which the Mobile Panel is connected from the project. This section describes the associated configuration steps.

Requirement

- The box ID is set via the rotary coding switch of the connection box, see section "Setting the box ID of the connection box (Page 50)".
- The corresponding project has been opened in the TIA Portal.
- A Mobile WebClient is available in the project.

Procedure

1. Open the properties of the Mobile WebClient, e.g. by double-clicking on the icon of the Mobile WebClient in the "Devices & networks" editor.
2. Change to the device view.



3. To evaluate the box ID of the connection box, read out the input address of the submodule "Box ID" _1".

5.3 Evaluating operator controls as direct keys

You can use the operator controls of the HMI device as direct keys.

The states of the following operator controls are available directly in the I/O area of the PLC:

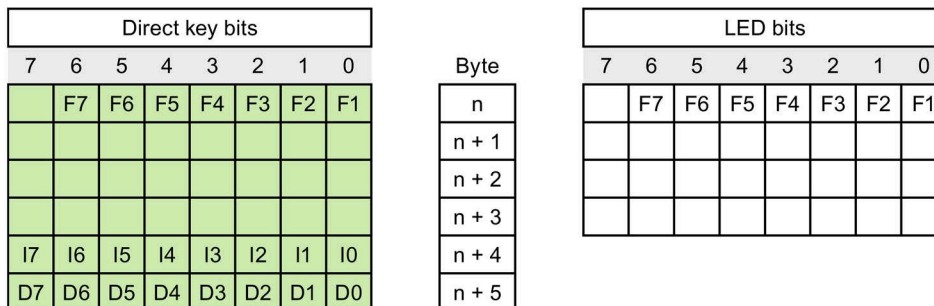
- Status of the function keys and their LEDs
- Direction pulses of the handwheel

Requirement

- PROFINET is activated in the network settings of the IWP software; see section "Using function keys (Page 64)".

Byte assignment

The following figure shows the assignment of the keys (inputs) and LEDs (outputs) to the bytes in the PLC process image:



- F Function key
- I Handwheel pulses, forwards
- D Handwheel pulses, backwards

Bit assignment

The following tables show the bit assignment for function keys and handwheel:

- Bit assignment of function keys

State	Function key bits F1 to F6
Not pressed	0
Pressed	1

- Bit assignment of function key LEDs

State	LED bits F1 to F6
LED not illuminated	0
LED is illuminated	1

- Bit assignment of the handwheel

- A setpoint is not specified for the handwheel.
- After start-up of the HMI device, the bytes "n+4" to "n+5" are set to zero.
Turning the handwheel triggers positive or negative pulses, depending on the direction of rotation. The number of positive pulses are stored in bits I0 to I7. The number of negative pulses are stored in bits D0 to D7. The values are entered in binary format, where bit 0 is the lowest and bit 7 is the highest valued bit.
A complete handwheel revolution yields 50 pulses.
- Every pulse of the handwheel is added to byte "n+4" or "n+5", depending on the direction of rotation. There are no negative values. When the possible value range is exceeded, there is an overflow:
If a value of 255 is increased by one pulse, a value of 0 results.

Example for the bit assignment of the handwheel

The following table includes an example for rotation direction determination. The pulses are stored in bytes "n+4" and "n+5" and are measured during the points in time t_1 to t_4 .

The numbers in the following table represent a byte in the PLC.

Evaluation time	Handwheel		Evaluation
	Pulses, forwards	Pulses, backwards	
t_1	255 ($\triangleq -1$)	245 ($\triangleq -11$)	--
t_2	10	245 ($\triangleq -11$)	Pulses, forwards: 11 Pulses, backwards: 0 Resulting value: +11
t_3	10	4	Pulses, forwards: 0 Pulses, backwards: 15 Resulting value: -15
t_4	15	5	Pulses, forwards: 5 Pulses, backwards: 1 Resulting value: +4

The difference in pulses at times t_n and t_{n+1} allows you to determine the resulting value and thus the direction of rotation.

Establish the following values:

- Number of pulses, forwards
 - At time t_n
 - At time t_{n+1}
- Number of pulses, backwards
 - At time t_n
 - At time t_{n+1}

From this, you determine the resulting value, which is calculated as follows:

- Pulses, forwards, t_{n+1}
- Pulses, forwards, t_n
- Pulses, backwards, t_{n+1}
- + Pulses, backwards, t_n
- = Resulting value

Consider the response time

Note

Sample cycle time

If the scan cycle is large, the entered impulses will not immediately have an effect on the PLC. A reaction in the system is not caused.

In the PLC, set a scan cycle ≤ 100 ms.

The bytes "n+4" and "n+5" must be retrieved on the PLC side within a second and cyclically. This setting ensures that no more than 256 pulses can be added between two scans of the handwheel. You need to turn the handwheel approximately 4.5 turns to generate 256 pulses.

The rotary pulse encoder supplies a maximum of 200 pulses per second.

Fail-safe operation

6.1 Connecting the connecting cable

Requirement

- The Mobile WebClient is ready to operate

Procedure

- Plug the connecting cable of the Mobile WebClient into a connection box.
The emergency stop button is active and lights up. The box ID of the connection box is transmitted to the Mobile WebClient.

6.2 Unplugging the connecting cable

Procedure

NOTICE**Connection box compact and connection box standard**

When unplugging the connecting cable from the connection box compact or a connection box standard, there is no automatic bypass of the emergency stop circuit. Without further actions, an emergency stop is triggered in the plant and the plant switches to a safe state. Take appropriate circuitry measures to prevent an undesired emergency stop of the plant.

- Unplug the connecting cable.
The emergency stop button is no longer active and no longer lights up.

Maintenance and care

7.1 General information on maintenance and servicing

Observe the following when servicing and repairing protective equipment e.g. such as ground circuits or overvoltage protection components:

- Observe the maintenance and replacement intervals.
- Replace system components, including external cables, fuses and batteries only with equivalent components approved by the respective manufacturer.

7.2 Mobile WebClient maintenance

The HMI device is designed for low-maintenance operation. Also take into account the system components and accessories when carrying out maintenance.

The scope of maintenance includes the following function tests:

- Function test of enabling button
- Function test of emergency stop button

Depending on the Safety Integrity Level SIL of your application, the function tests are performed at the following intervals.

- SIL2: 1 x annually
- SIL3: 1 x monthly

Performing function tests

Connect the HMI device to a correctly installed and wired connection box before the function tests.

Function test of enabling button

1. Press the enabling button to switch position 2 "Enable".
2. Check whether the plant reacts to the "Enabling" switch position as defined.
3. Press the enabling button to switch position 3 "Panic".
4. Check whether the plant reacts to the "Panic" switch position as defined.

Function test of emergency stop button

1. Check whether the emergency stop button is lit up.
2. Press the emergency stop button.
3. Check whether the plant reacts as defined.
4. Release the locking mechanism of the emergency stop button.
5. Check whether the plant starts up again as defined.

Result

If the function tests were completed successfully, you can continue using the HMI device.
If one of the function tests was not completed successfully, you must replace the HMI device.

See also

Reaction times and safety characteristics for fail-safe operation (Page 96)

7.3 Cleaning the Mobile WebClient

The HMI device is designed for maintenance-free operation. You should still clean the HMI device regularly.

Cleaning agents

NOTICE**Damage to the HMI device caused by impermissible cleaning agents**

Impermissible and unsuitable cleaning agents may cause damage to the HMI device.

Use dish soap or foaming screen cleaner only as cleaning agents. Do not use the following cleaning agents:

- Aggressive solvents or scouring powder
- Steam jets
- Compressed air

Requirements

- The cover of the USB port and the connection compartment cover are closed.
- Cleaning cloth
- Dishwashing liquid or foaming screen cleaning agent

Procedure

1. Disconnect the HMI device from the connection box; see section "Unplugging the connecting cable (Page 77)".
2. Spray cleaning agent onto a cleaning cloth.
Do not spray cleaning agent directly onto the HMI device.
3. Clean the HMI device.
When cleaning the display, wipe inwards from the edge of screen.

7.4 Resetting the Mobile WebClient to factory settings

This section describes how you can reset the HMI device to factory settings.

Procedure

1. Disconnect the HMI device from the connection box; see section "Unplugging the connecting cable (Page 77)".
2. Wait a few seconds.
3. Connect the HMI device to the connection box again and press the F3 key.
4. Hold down the F3 key during the startup procedure until the "Resetting to factory defaults ..." dialog appears.

The HMI device is reset to factory settings and behaves as follows:

- The "Resetting to factory defaults ..." dialog is shown for approximately 10 seconds.
- Afterwards, the display goes black for about 5 seconds and white for a further 5 seconds.
- After successful completion of the procedure, the "Maintenance" page is displayed.

The HMI device has been reset to factory settings.

7.5 Spare parts and repairs

Repairs

Contact your Siemens representative (<https://www.siemens.com/aspa>). Filter by expertise, product and region.

Your contact person will let you know if a product can be repaired and how to return it.

Contact your representative before returning a product, including when you would like to request prioritized handling of your repair, a cost estimate, a repair report or an examination report.

The representative can also provide information about spare parts, if available.

Spare parts

Spare parts and accessories for the HMI device can be found in section "Accessories (Page 17)".

7.6 Recycling and disposal

Due to the low levels of pollutants in the HMI devices described in these operating instructions, they can be recycled.

Contact a certified disposal service company for electronic scrap for environmentally sustainable recycling and disposal of your old devices and dispose of the device according to the relevant regulations in your country.

Technical specifications

8.1 Software license agreements

Open Source Software

Observe the software license agreements for Open Source Software under "Device-/License-Info" in the IWP software.

8.2 Certificates and approvals

Approvals

Note

The following overview shows the possible approvals for the HMI device and the connection boxes. The only valid approvals for the HMI device and the connection boxes themselves are those shown on the nameplate.

CE approval



The Mobile Panel and the connection boxes meet the general and safety-related requirements of the following EU directives and conform to the harmonized European standards for these devices published in the official gazettes of the European Community and in the EU Declarations of Conformity:

- 2014/30/EU "Electromagnetic Compatibility Directive" (EMC Directive)
- 2011/65/EU "Directive of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment" (RoHS Directive)
- The following also applies for fail-safe Mobile Panels: 2006/42/EC "Machinery Directive"

EU Declaration of Conformity

The EU Declaration of Conformity is available to the relevant authorities at the following address:

Siemens AG
 Digital Industries
 Factory Automation
 DI FA HMI
 Breslauer Str. 5
 90766 Fürth
 Germany

You can also find the Declaration of Conformity for download on the Internet (<https://support.industry.siemens.com>) by entering the MLFB. Filter the entries for the entry type "Certificates".

UKCA marking



The devices fulfil the general and safety-related requirements of the following regulations and related amendments and comply with the designated British Standards (BS) published in the official consolidated list of the British Government.

- Electromagnetic Compatibility Regulations 2016 (EMC)
- Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012 (RoHS)

UK Declarations of Conformity

The UK Declarations of Conformity are available to the relevant authorities at the following address:

Siemens AG
Digital Industries
Factory Automation
DI FA HMI
Breslauer Str. 5
90766 Fürth
Germany

You can also find the Declaration of Conformity for download on the Internet (<https://support.industry.siemens.com>) by entering the MLFB. Filter the entries for the entry type "Certificates".

UL approval



Underwriters Laboratories Inc. (E120869) in accordance with

- UL 61010-1 and UL 61010-2-201
- CAN/CSA C22.2 No. 61010-1 and 61010-2-201

IEC 61010-2-201/IEC 61131-2

The devices meet the requirements and criteria of the IEC 61010-2-201 and/or IEC 61131-2 standard.

- IEC 61010-2-201, Safety regulations for electrical equipment for measurement, control, and laboratory use: Special requirements for control equipment
- IEC 61131-2, Programmable controllers: Equipment requirements and testing

RCM AUSTRALIA/NEW ZEALAND



This product meets the requirements of EN 61000-6-4 Generic standards – Emission standard for industrial environments.

This product meets the requirements of the standard EN 61000-6-4 Generic standards – Emission standard for industrial environments.

Identification for Eurasian Customs Union



- EAC (Eurasian Conformity)
- Customs union of Russia, Belarus and Kazakhstan
- Declaration of conformity according to Technical Regulations of the Customs Union (TR CU)

WEEE label (European Union)



Disposal instructions, observe the local regulations and the section "Recycling and disposal (Page 80)".

8.3 Standards on operating safety

Plant-related standards

The Mobile Panel and the connection box meet the following standards for use in a plant:

Standard	Title
EN 61000-6-2:2019	Electromagnetic compatibility (EMC) – Part 6-2: Generic standards - Immunity for industrial environments
EN 61000-6-4:2019	Electromagnetic compatibility (EMC) – Part 6-4: Generic standard - Emission standard for industrial environments
IEC 61131-2:2017	The HMI device meets the requirements and criteria according to IEC 61131-2, Programmable Controllers, Part 2: Equipment requirements and testing

TÜV

The TÜV confirms that the Mobile Panel and the connection box satisfy the requirements of the following standards with regard to their safety functions:

Standard	Title
EN 60204-1:2018	Safety of machinery – Electrical equipment of machines – Part 1: General Requirements
DIN IEC 62061:2005 + A1:2012 +A2:2015	Safety of machinery – Functional safety of electrical, electronic and programmable control systems for machinery
IEC 61508-1 to 4:2010	Safety Integrity Level 3
ISO 13850:2015	Safety of machinery - EMERGENCY STOP - Principles for design
EN ISO 13849-1:2015	Performance Level e and Category 4

8.4 Electromagnetic compatibility

The Mobile Panel and connection box satisfy, among other requirements, the requirements of the German EMC Act relating to the European internal market.

EMC-compliant installation

EMC-compliant use of the Mobile Panel and connection box and the use of interference-proof cables are prerequisites for error-free operation. Observe the following manuals in addition to these operating instructions:

- Designing interference-free SIMATIC S7-1500, ET 200MP, ET 200SP, ET 200AL controllers (<https://support.industry.siemens.com/cs/ww/en/view/59193566>)
- Industrial Ethernet / PROFINET - Passive network components (<https://support.industry.siemens.com/cs/ww/en/view/84922825>)

Disturbance variables

Electromagnetic compatibility applies for the following types of disturbance variables:

- Pulse-shaped disturbance variables

The table below shows the electromagnetic compatibility of the Mobile Panel and the connection boxes with regard to pulse-shaped disturbance variables.

Pulse-shaped disturbance	Tested with	Test level equivalence
Electrostatic discharge in accordance with IEC 61000-4-2	Air discharge: 8 kV Contact discharge: 6 kV	3
Burst pulses (high-speed transient interference) in accordance with IEC 61000-4-4	2 kV supply line	3

An external safety circuit is required for the "Surge immunity test according to IEC 61000-4-5", see Function Manual "Designing interference-free SIMATIC S7-1500, ET 200MP, ET 200SP, ET 200AL controllers (<https://support.industry.siemens.com/cs/ww/en/view/59193566>)", section 7 "Lightning protection and overvoltage protection"

Pulse-shaped disturbance	Tested with	Test level equivalence
Asymmetrical coupling (line to ground)	2 kV power cable DC voltage with protective elements	3
Symmetrical coupling (line to line)	1 kV power cable DC voltage with protective elements	3

- Sinusoidal interference

The table below shows the electromagnetic compatibility of the Mobile Panel and the connection boxes with regard to sinusoidal interference.

Sinusoidal interference	Tested with	Test level equivalence
HF radiation (in electromagnetic fields) in accordance with IEC 61000-4-3	80% amplitude modulation at 1 kHz	
	• Up to 10 V/m in the 80 MHz to 1 GHz range	3
	• Up to 3 V/m in the 1.4 GHz to 6 GHz range	2
RF interference current on cables and cable shielding conforming to IEC 61000-4-6	Test voltage 10 V, with 80% amplitude modulation of 1 kHz in the 150 kHz to 80 MHz range	3

The following table shows the unwanted emissions from electromagnetic fields in accordance with EN 55016, Limit Value Class A, Group 1, measured at a distance of 10 m.

Frequency range	Tested with
30 to 230 MHz	< 40 dB (µV/m) quasi-peak
230 GHz to 1 GHz	< 47 dB (µV/m) quasi-peak
1 GHz to 3 GHz	< 66 dB (µV/m) peak
3 GHz to 6 GHz	< 70 dB (µV/m) peak

See also

EMC information in section "Notes about usage (Page 26)".

8.5 Mechanical ambient conditions

8.5.1 Storage conditions

The following information applies to an HMI device and connection box transported and stored in its original packaging. The devices were tested based on IEC 60721-3-2:2018 Class 2M4 with the following amendments and limitations:

Type of condition	Permitted range
Free fall	≤ 0.3 m
Vibration to IEC 60068-2-6	5 ... 8.4 Hz, deflection 3.5 mm 8.4 ... 500 Hz, acceleration 1 g
Shock to IEC 60068-2-27	250 m/s ² , 6 ms, 1000 shocks

8.5.2 Operating Conditions

The following information applies to the HMI device and to the connection box. The devices are designed for operation in a location protected from the effects of the weather. The devices were tested based on IEC 60721-3-3:2002 Class 3M3 with the following amendments and limitations:

Type of condition	Permitted range
Vibration to IEC 60068-2-6	5 ... 8.4 Hz, deflection 3.5 mm 8.4 ... 200 Hz, acceleration 1 g
Shock to IEC 60068-2-27	150 m/s ² , 11 ms, 3 shocks

8.6 Climatic ambient conditions

8.6.1 Long-term storage

The following information applies to a device that is stored in its original packaging for longer than two weeks.

The device meets the requirements of IEC 60721-3-1:2018 Class 1K21.

8.6.2 Transport and short-term storage

The following information applies to an HMI device and connection box transported and stored in its original packaging.

The device was tested based on IEC 60721-3-2:2018 Class 2K11 with the following amendments and limitations:

Type of condition	Permitted range
Temperature, HMI device	-20 ... +55 °C
Temperature, connection boxes	-20 ... +60 °C
Atmospheric pressure	1140 ... 660 hPa, corresponds to an elevation of -1000 to 3500 m
Relative humidity	10 ... 90%
Pollutant concentration	According to ANSI/ISA-71.04-2013 severity level G3

Note

If dewing has developed, wait until the device has dried completely before switching it on.
Do not expose it to direct heat radiation from a heating device.

8.6.3 Operating Conditions

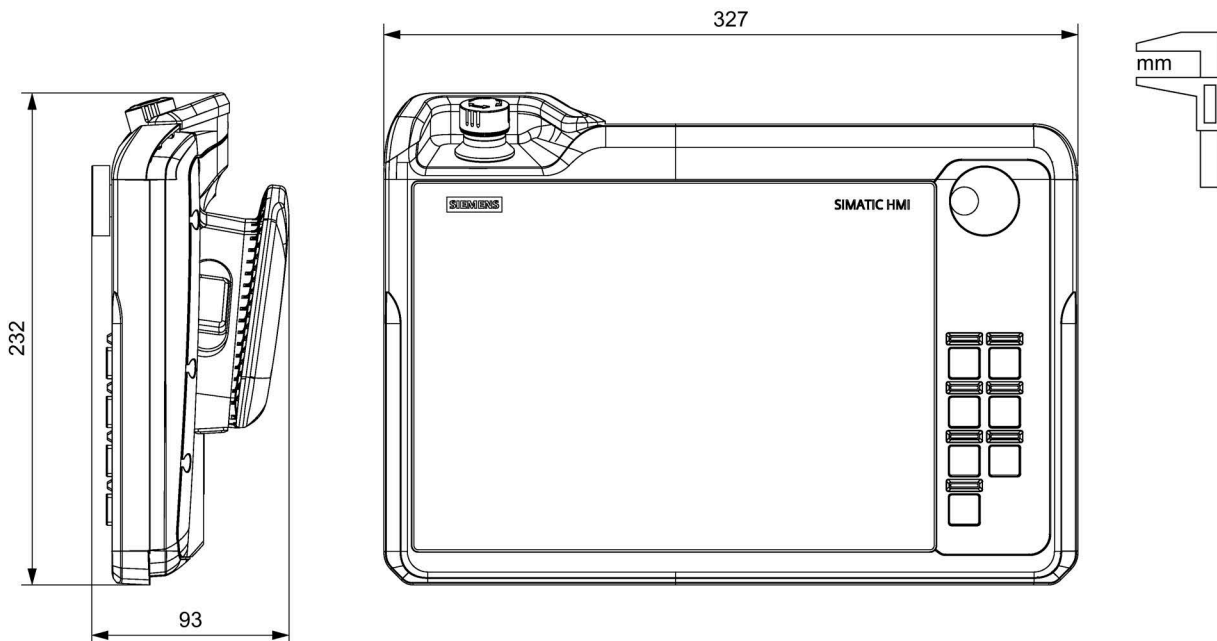
The following information applies to the HMI device and to the connection box. The devices are designed for operation in a location protected from the effects of the weather. The devices were tested based on IEC 60721-3-3:2019 Class 3K22 with the following amendments and limitations:

Type of condition	Permitted range
Temperature, HMI device	0 ... 45 °C
Temperature, connection boxes	0 ... 55 °C
Atmospheric pressure	1140 ... 795 hPa, corresponds to an elevation of -1000 to 2000 m
Relative humidity	10 ... 95%, no condensation *
Pollutant concentration	According to ANSI/ISA-71.04-2013 severity level G3

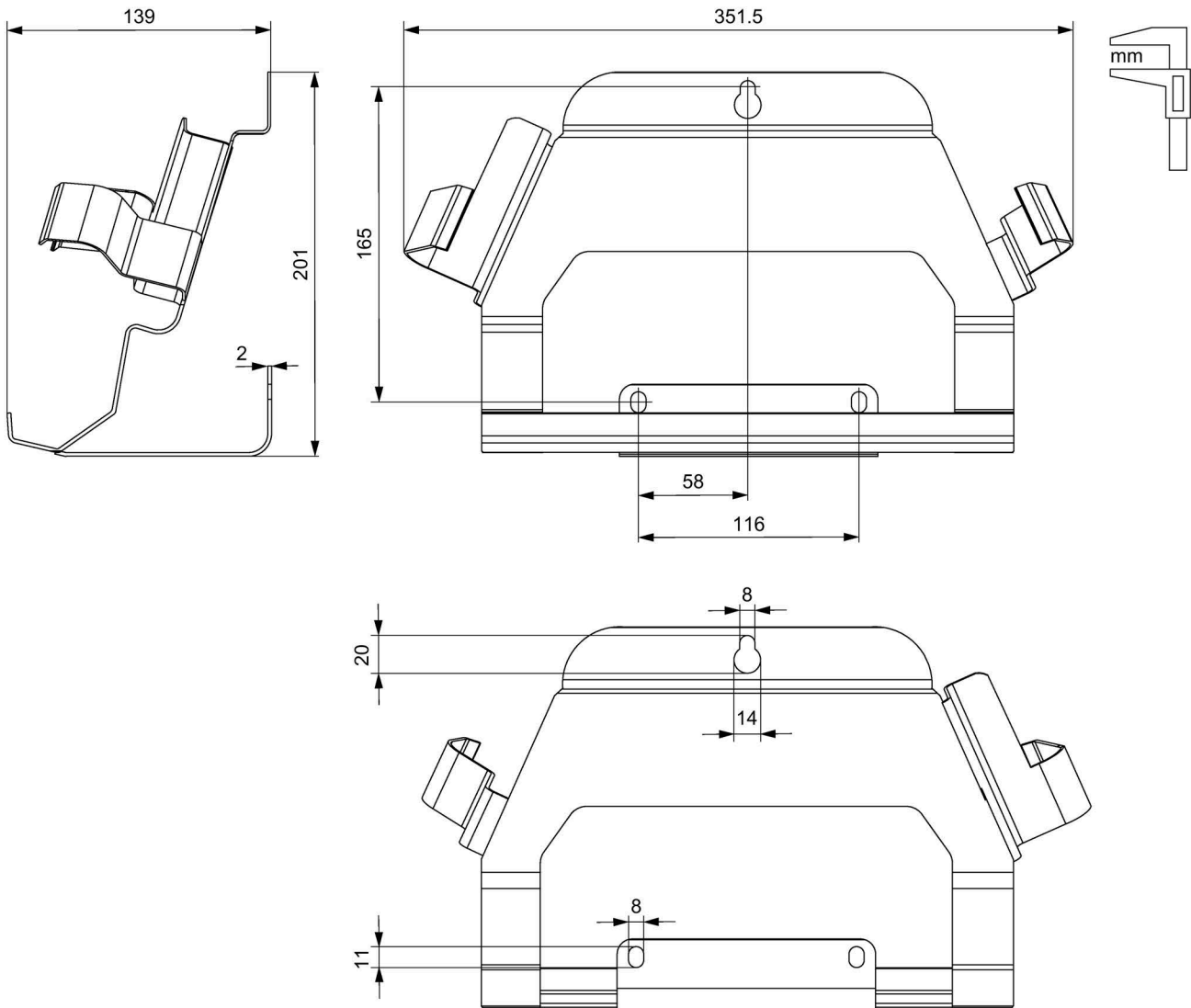
* Mobile Panel, connection box standard and connection box advanced: No condensation inside the housing
 connection box compact: None condensation on the back

8.7 Dimension drawings

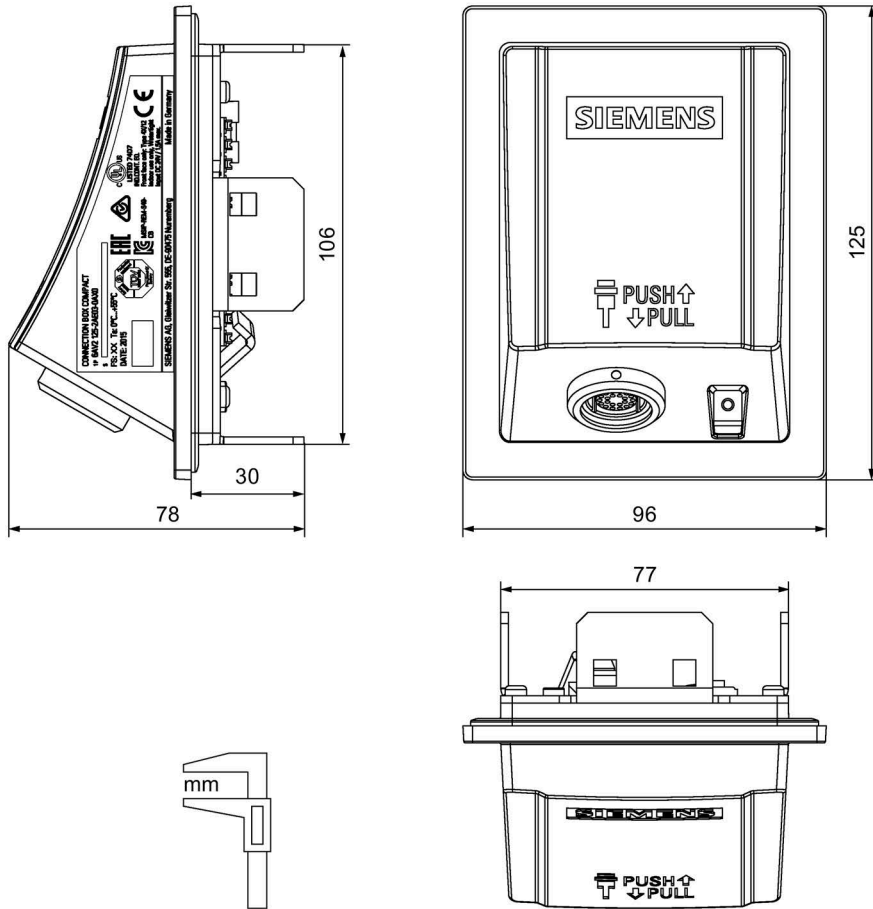
8.7.1 IWP10F Mobile WebClient dimension drawing



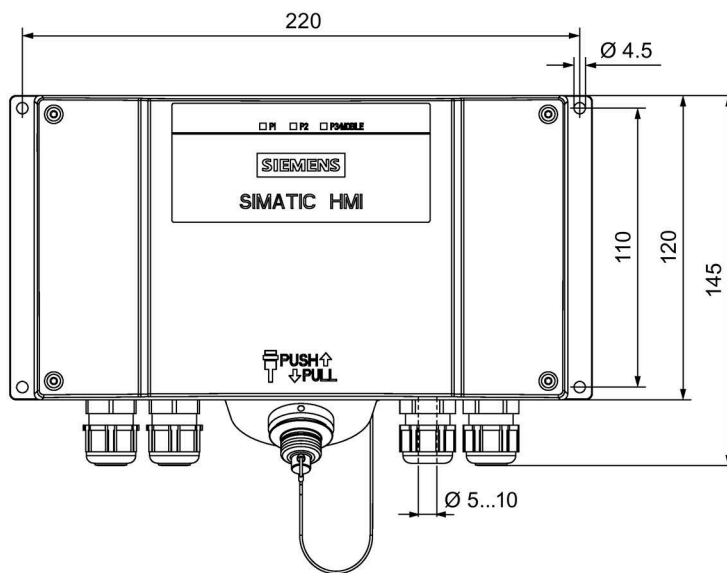
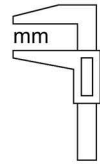
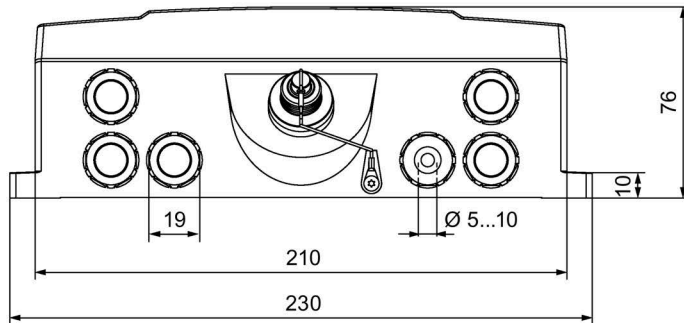
8.7.2 Mobile WebClient wall-mounting bracket dimension drawing



8.7.3 Connection box compact dimension drawing



8.7.4 Dimension drawing for connection box standard and connection box advanced



8.8 Technical specifications

8.8.1 Mobile WebClient

Mechanics

	IWP10F Mobile WebClient
Weight without packaging	Approx. 1500 g
Fall height	1.2 m
Weight of the wall-mounting bracket without packaging	Approx. 1200 g

Display

	IWP10F Mobile WebClient
Type	LCD TFT
Display diagonal	10.1 "
Active display area	217 mm x 136 mm
Resolution	1280 × 800 pixels
Colors that can be displayed	Up to 16 million
Brightness control	Yes, value range 0 to 100
Backlighting	LED
Half Brightness Life Time (MTBF ¹)	50,000 h
Pixel error class in accordance with EN ISO 9241-307	II

- ¹ Operating hours after which the maximum brightness is reduced by half compared to the original value. MTBF is increased by using the integrated dimming function, for example, time-controlled via screen saver or centrally via PROFlenergy.

Input device

	IWP10F Mobile WebClient
Touchscreen	Yes, projective capacitive
Function keys	7, with LED, can be used as direct keys
Handwheel	Yes
Enabling button	2-channel, 3-level
Emergency stop button	2 channel, normally closed contacts

Interfaces

	IWP10F Mobile WebClient
1 × Ethernet RJ45	10/100 Mbps
1 × USB 3.0	Type A, max. 900 mA

Power supply, via connection box

	IWP10F Mobile WebClient
Rated voltage	+24 V DC
Permitted voltage range	20.4 ... 28.8 V (24 V -15/+20%)
Transients, maximum permitted	35 V (500 ms)
Time between two transients	≥ 50 s
Rated current, typical	0.63 A
Rated current (min. ... max.), load-dependent	0.52 ... 0.98 A
Inrush current I ² t	Approx. 0.2 A ² s
Fuse, internal	Electronic

Insulation testing, protection class and degree of protection

Insulation testing

The insulation strength is demonstrated in the type test with the following test voltages in accordance with IEC 61131-2:

Circuit	Insulation tested with (type test)
Rated voltage U _e 24 V	707 V DC to other circuits / to ground
Ethernet connector	1500 V AC

Protection class

Protection class III according to IEC 61131-2

Protection against foreign objects and water

The HMI device meets the following degrees of protection according to IEC 60529 or UL50 under the following conditions:

- The terminal compartment cover is closed.
- The USB port is closed using a cover.

Device side	Degree of protection
All-round	<ul style="list-style-type: none"> • IP55 according to IEC 60529 • Enclosure Rating Type 1 (indoor use only) according to UL50

Degree of pollution and overvoltage category

The HMI device meets the following requirements according to IEC 61131-2:2007:

Pollution level	2
Overvoltage category	II

8.8.2 Connecting cable

Weight	You can find the information based on length on the Internet at: HMI accessories (https://mall.industry.siemens.com/mall/en/WW/Catalog/Products/10144445) *
Bending radius, minimum	≥ 4-times the outside diameter of the line
Rated condition, temperature	0 to 55 °C

* To navigate directly to the information about the connecting cable, enter the article number of the connecting cable in the "Site Explorer" text box.

8.8.3 Connection boxes

Mechanics

Weight without packaging	Connection box compact	Approx. 250 g
	Connection box standard, connection box advanced	Approx. 750 g

Power supply

The information in the following table applies to the connection box compact, the connection box standard and the connection box advanced.

Rated voltage	+24 V DC	
Permitted voltage range	20.4 ... 28.8 V (24 V -15/+20%)	
Transients, maximum permitted	35 V (500 ms)	
Time between two transients	≥ 50 s	
Enabling button ¹	Supply voltage	24 V DC
	Amperage, max. ²	300 mA
	Amperage, min.:	10 mA
Emergency stop button ¹	Supply voltage	24 V DC
	Amperage, max.:	500 mA
	Amperage, min.:	10 mA
Cable length between connection box and PLC	≤ 30 m	
Fuse, internal	Electronic	
Current load PLC-accompanying signals	< 100 mA	
Recovery time	≥ 1 s	

¹ For fail-safe Mobile Panel

² Also applies when using the connection box PN Basic or the connection box PN Plus

Current consumption of the connection box compact

Current consumption without Mobile Panel	Typical	Approx. 20 mA
	Continuous current, maximum	Approx. 50 mA
	Inrush current I^2t	Approx. 0.1 A ² s
Current consumption with Mobile Panel	Typical	Approx. 550 mA
	Continuous current, maximum	Approx. 700 mA
	Inrush current I^2t	Approx. 0.6 A ² s

Current consumption of the connection box standard and connection box advanced

Current consumption without Mobile Panel	Typical	Approx. 100 mA
	Continuous current, maximum	Approx. 150 mA
	Inrush current I^2t	Approx. 0.5 A ² s
Current consumption with Mobile Panel	Typical	Approx. 600 mA
	Continuous current, maximum	Approx. 750 mA
	Inrush current I^2t	Approx. 0.6 A ² s

Internal switches of the connection box standard and connection box advanced

Industrial Ethernet switch of the connection box standard	Designation	SCALANCE XF208
	Article number	6GK5208-0BA00-2AF2

Industrial Ethernet switch of the connection box advanced	Designation	SCALANCE XF204 IRT
	Article number	6GK5204-0BA00-2BF2

A detailed description of the internal SCALANCE switches of both connection boxes is available in the following documents:

- Operating instructions "SCALANCE X-200"
(<https://support.industry.siemens.com/cs/ww/en/view/102051962>)
- Configuration manual "SCALANCE X-200"
(<https://support.industry.siemens.com/cs/ww/de/view/109476763>)

Insulation testing, protection class and degree of protection

Insulation testing

The insulation strength is demonstrated in the type test with the following test voltages in accordance with IEC 61131-2:

Circuit	Insulation tested with (type test)
Rated voltage U_e 24 V	707 V DC to other circuits / to ground
Ethernet connector	1500 V AC

Protection class

Protection class III according to IEC 61131-2

Protection against foreign objects and water

The connection boxes meet the following degrees of protection according to IEC 60529 or UL 50 under the following conditions.

- Connection box compact: The connection box has been installed as described in this document.

Device side	Degree of protection
Front	When mounted: <ul style="list-style-type: none"> • IP65 according to IEC 60529 • Type 4X (indoor use only) according to UL50
Rear	IP20 according to IEC 60529 Protection from contact with standard test fingers. There is no protection against the ingress of water, dust and noxious gas.

- Connection boxes standard and advanced: Any screw glands not used are fitted with a cover.

Device side	Degree of protection
All-round	<ul style="list-style-type: none"> • IP65 according to IEC 60529 • Type 4X (indoor use only) according to UL50

8.8.4 Power consumption specifications

The connection box and Mobile Panel must be taken into consideration when calculating the power consumption. The tables below show typical values for the power consumption.

Note

The actual power consumption may deviate from the specified values depending on the parameter assignment and the load at the interfaces of the Mobile WebClient. The following factors affect the power consumption, for example:

- The display brightness set on the Mobile WebClient
- The load on the USB interface of the Mobile WebClient
- The length of the connecting cable

Connection box	Power consumption ¹
Connection box compact	0.5 W
Connection box standard	2.4 W
Connection box advanced	2.8 W

¹ The power loss generally corresponds to the specified value for power consumption.

Mobile Panel	Power consumption ¹
Mobile WebClient	15 W

¹ The power loss generally corresponds to the specified value for power consumption.

The total power consumption for the HMI device is calculated as follows:

Total power consumption = power consumption connection box + power consumption Mobile Panel

8.8.5 Reaction times and safety characteristics for fail-safe operation

This section applies to fail-safe operation with fail-safe Mobile Panels.

Note

Proof-test intervals

Proof test interval of the HMI device (Lifetime): 20 years. The HMI device must be replaced after this time, at the latest.

Proof-test interval for safety-related operator controls dependent on the Safety Integrity Level SIL:

- SIL2: Function test 1 × per year
- SIL3: Function test 1 × per month

Reaction times of emergency stop button and enabling button

Note

Reaction times, discrepancy times and acknowledgment times

The values of the safety relay used apply to the reaction times, discrepancy times and acknowledgment times of emergency stop buttons and enabling buttons.

Safety characteristics for HMI device and connection boxes

- In accordance with IEC 61508

Maximal attainable safety integrity level	SIL2 (Proof Test Interval 1 year) SIL3 (Proof Test Interval 1 month)
Mode of operation	High and low demand mode
Hardware fault tolerance (HFT)	1
Classification	B
Repair Time	100 h
Probability of a dangerous failure per hour (PFHd)	$< 1 \times 10^{-8}$ 1/h
Probability of a dangerous failure on demand (PFDavg)	$< 8 \times 10^{-5}$
Mission Time	20 years

- In accordance with ISO 13849-1

Meantime to Failure (MTTFd)	High
Diagnostic Coverage (DCavg)	High
Performance Level	d (Proof Test Interval 1 year) e (Proof Test Interval 1 month)
Category	3 (Proof Test Interval 1 year) 4 (Proof Test Interval 1 month)

The safety characteristics according to IEC 61508 and ISO 13849-1 in the table above are based on the SN 29500 and an ambient temperature of 60 °C.

8.8.6 Specification of cables to be used

Cables for 24 V DC and functional grounding		Connection box advanced	Connection box standard	Connection box compact
Connectable cable cross-sections for single-core/solid cables H05(07) V-U		0.5 ... 1.5 mm ² ; AWG 21 ... AWG 16		
Connectable cable cross-sections for flexible/stranded cables H05(07) V-K	Without ferrule	0.5 ... 1.5 mm ² AWG 21 ... AWG 16		
	With ferrule according to DIN 46 228/1	0.5 ... 1.5 mm ²		
	With ferrule according to DIN 46 228/4	0.5 ... 0.75 mm ²		
Number of cables per connection		1		
Cable material		Copper (Cu)		
Stripped length of the cables		8 mm		
Connection technology		Push-in terminal		

Connections for emergency stop button and enabling button		Connection box advanced	Connection box standard	Connection box compact
Connectable cable cross-sections for single-core/solid cables H05(07) V-U		0.2 ... 1.5 mm ² ; AWG 24 ... AWG 16		
Connectable cable cross-sections for flexible/stranded cables H05(07) V-K	Without ferrule	0.2 ... 1.5 mm ² AWG 24 ... AWG 16		
	With ferrule according to DIN 46 228/1	0.25 ... 1.5 mm ²		
	With ferrule according to DIN 46 228/4	0.25 ... 0.75 mm ²		
Number of cables per connection		1		
Cable material		Copper (Cu)		
Stripped length of the cables		8 mm		
Connection technology		Push-in terminal		

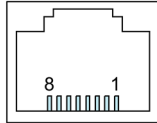
Ethernet cables	Connection box advanced	Connection box standard	Connection box compact
Connectable cable	6XV1840-2AH10 or comparable		6XV1840-2AH10 or comparable, Industrial Ethernet FastConnect Cable 2x2 *
Connection technology	Fast connect		RJ45

* Available on the Internet at: Industrial Ethernet FastConnect Cable 2x2
(<https://mall.industry.siemens.com/mall/en/de/Catalog/Product/6XV1840-2AH10>)

8.9 Mobile WebClient interface description

8.9.1 Internal interface X3

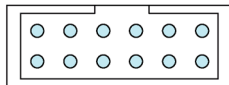
PROFINET (LAN), RJ45 socket



Pin	Name	Meaning
1	Tx+	Data output +
2	Tx-	Data output -
3	Rx+	Data input +
4	NC	Not assigned
5	NC	Not assigned
6	Rx-	Data input -
7	NC	Not assigned
8	NC	Not assigned

8.9.2 Internal interface X51

12-pin post connector

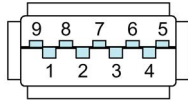


The post connector has connections for:

- Power supply
- Emergency stop circuit
- Enable circuit
- Signals for transmitting the box ID

8.9.3 External interface (X61)

USB Type A

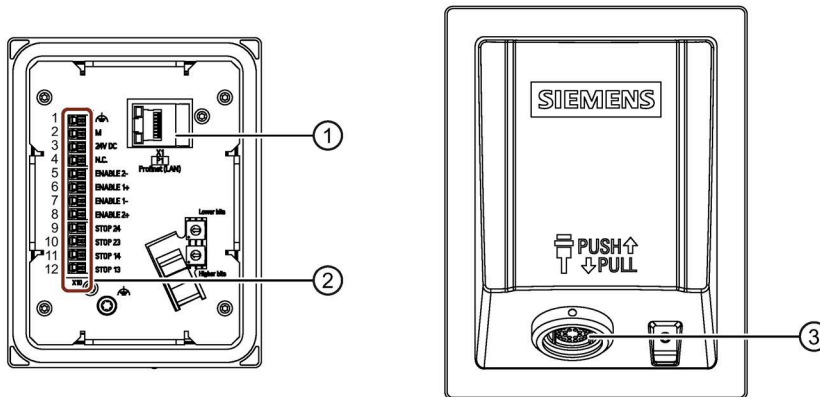


Pin	Name	Meaning
1	VBUS	+5 V, fused
2	D-	Data channel USB 2.0, bidirectional
3	D+	Data channel USB 2.0, bidirectional
4	GND	Ground
5	RX-	Data input USB 3.0
6	RX+	Data input USB 3.0
7	GND	Ground
8	TX-	Data output USB 3.0
9	TX+	Data output USB 3.0

8.10 Connection box compact interfaces

8.10.1 Position of the interfaces

The figure below shows the interfaces of the connection box compact that are relevant for connecting the data and power supply cables.

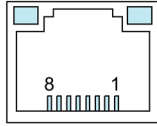


- ① Interface X1
- ② Interface X10

- ③ Connection socket (X300)

8.10.2 Interface X1

PROFINET (LAN), RJ45 socket



Pin	Name	Meaning
1	Tx+	Data output +
2	Tx-	Data output -
3	Rx+	Data input +
4	NC	Not assigned
5	NC	Not assigned
6	Rx-	Data input -
7	NC	Not assigned
8	NC	Not assigned

Note

LEDs on the RJ45 socket not active

The two LEDs at the RJ45 socket of the connection box compact are not supported by the hardware and do not light up during operation.

8.10.3 Plug-in terminal strip X10

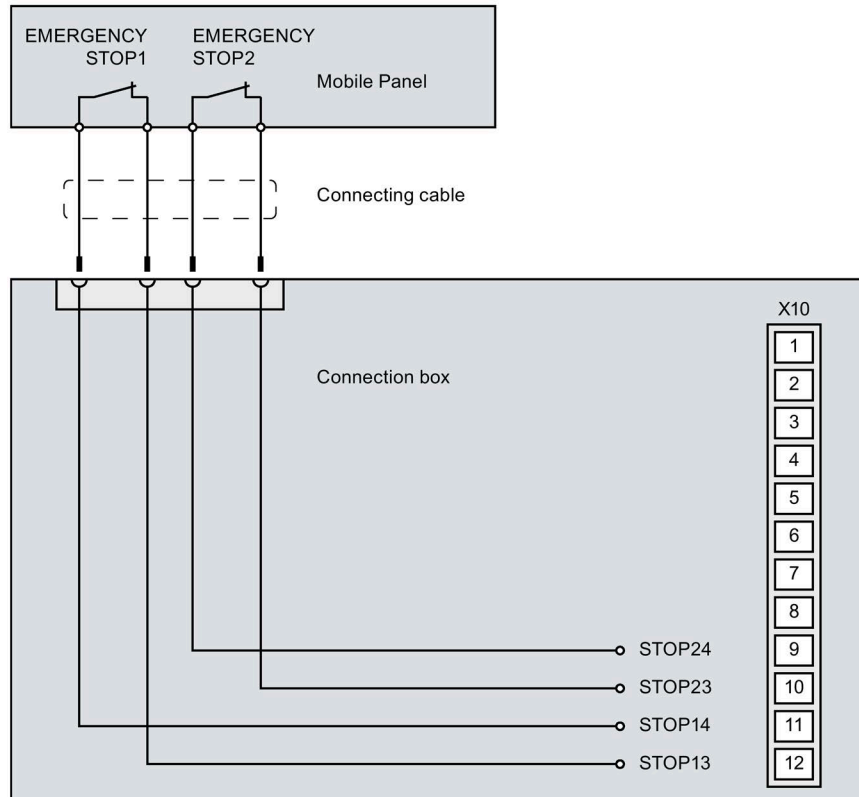
Plug-in terminal strip, 12-pin

Contact	Assignment	Associated circuits and reference information
1	Functional grounding	Ground and power supply See "Connecting the functional grounding and power supply to the connection box (Page 44)."
2	M	
3	P24	
4	Not connected	
5	ENABLE2-	Enabling button See section "Operating the enabling button (Page 61)" and wiring information in the following section
6	ENABLE1+	
7	ENABLE1-	
8	ENABLE2+	
9	STOP 24	Emergency stop button See section "Operating the emergency stop button (Page 63)" and wiring information in the following section
10	STOP 23	
11	STOP 14	
12	STOP 13	

8.10.4 Wiring of safety-related operator controls

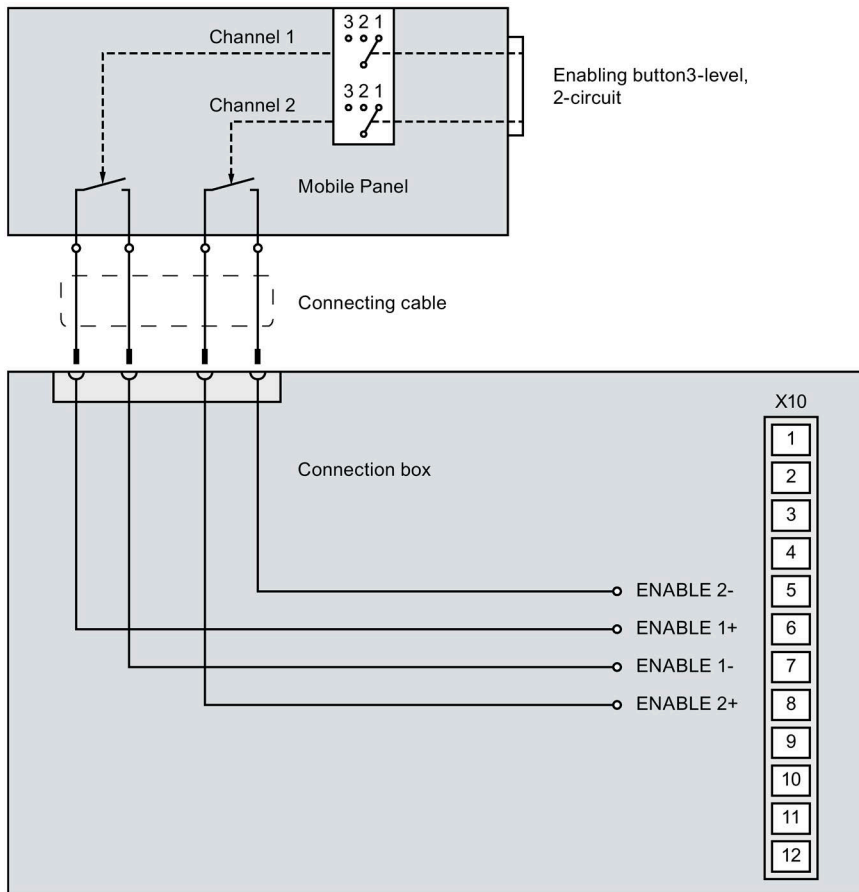
Emergency stop button

The figure below shows the wiring of the emergency stop button in the connection box compact.



Enabling button

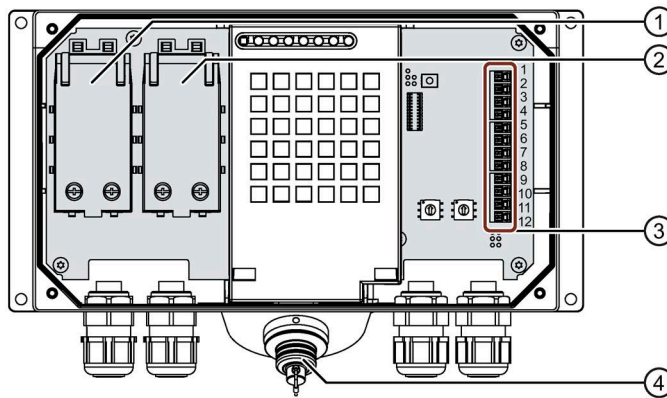
The figure below shows the wiring of the enabling button in the connection box compact.



8.11 Interfaces of the connection box standard and connection box advanced

8.11.1 Position of the interfaces

The figure below shows the position of the interfaces in the connection box standard and in the connection box advanced that are relevant for connecting the data and power supply cables.

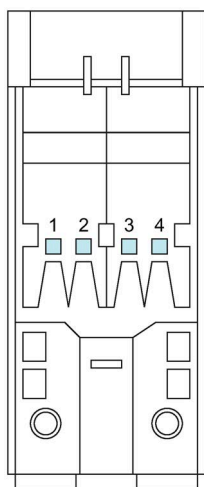


- ① Fast Connector X1
- ② Fast Connector X2
- ③ Interface X10
- ④ Connection socket (X300)

8.11.2 Fast Connector X1 and X2

Fast Connector, 4-pin

The connection box contains two fast connectors for connecting the Ethernet data cables.



Contact	Color	Assignment in the connection box	Assignment in the PLC ¹
1	Yellow	RD+	TD+
2	White	TD+	RD+
3	Orange	RD-	TD-
4	Blue	TD-	RD-

¹ Only relevant if the PLC is connected directly to the connection box.

8.11.3 Plug-in terminal strip X10

Plug-in terminal strip, 12-pin

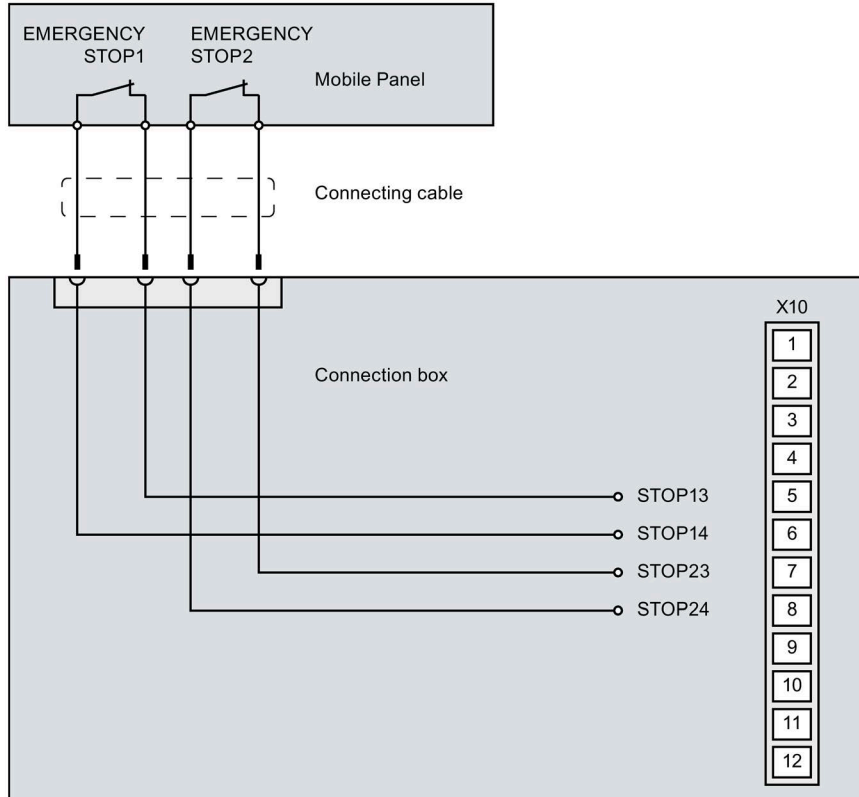
Contact	Assignment	Associated circuits and reference information
1	Functional grounding	Ground and power supply See "Connecting the functional grounding and power supply to the connection box (Page 44)."
2	M	
3	P24	
4	Not connected	
5	STOP 13	Emergency stop button See section "Operating the emergency stop button (Page 63)" and wiring information in the following section
6	STOP 14	
7	STOP 23	
8	STOP 24	
9	ENABLE2+	Enabling button See section "Operating the enabling button (Page 61)" and wiring information in the following section
10	ENABLE1-	
11	ENABLE1+	
12	ENABLE2-	

8.11.4 Wiring of safety-related operator controls

Emergency stop button

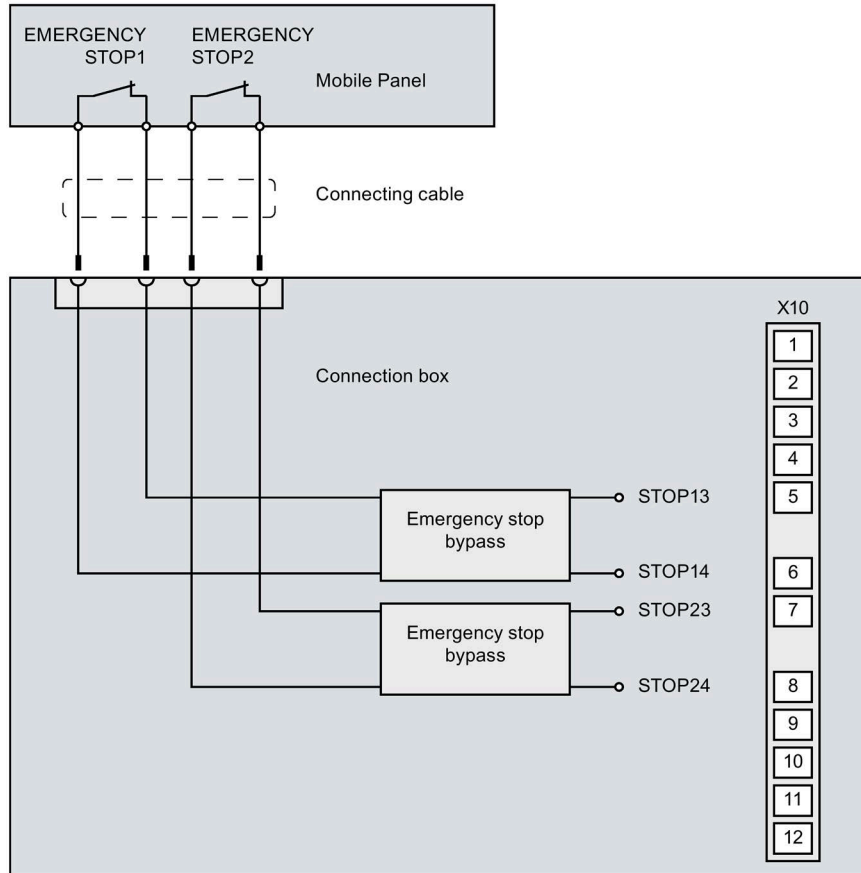
Connection box standard

The figure below shows the wiring of the emergency stop button in the connection box standard.



Connection box advanced

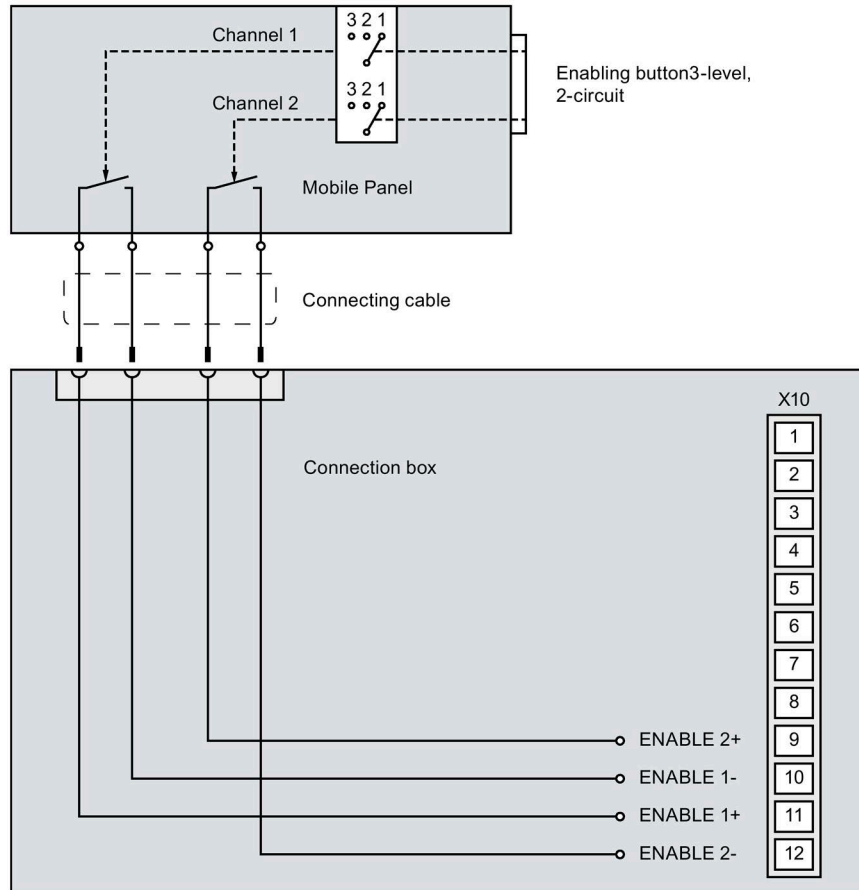
The figure below shows the wiring of the emergency stop button in the connection box advanced.



The emergency stop bypass only works if the connection box is supplied with power.

Enabling button

The figure below shows the wiring of the enabling button in the connection box standard and in the connection box advanced.



A.1 Troubleshooting

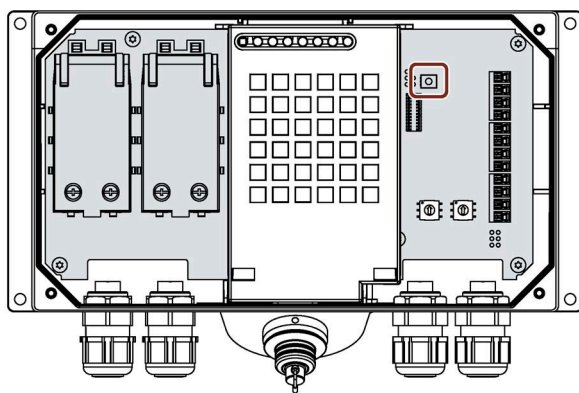
During fail-safe operation, you must be aware that the following error cases may arise:

- HMI does not start

If the HMI device does not start, the wires at interface X10 in the connection box may have been crossed. Check the connected wires and change the connections if necessary.

- SCALANCE firmware error in the connection box

If a SCALANCE firmware error occurs in the standard or advanced connection box, press the SET button shown in the figure below for at least 15 seconds.



The SET button resets the firmware of the internal SCALANCE switch to the factory settings.

Note

The setting for safety-related operating mode of the connection box is retained.

You can find additional information about the SET button in the following document:

Operating instructions "SCALANCE X-200"

(<https://support.industry.siemens.com/cs/ww/en/view/102051962>)

A.2 Service and support

You can find additional information and support for the products described on the Internet at the following addresses:

- Technical support (<https://support.industry.siemens.com>)
- Support request form (<https://www.siemens.com/supportrequest>)
- After Sales Information System SIMATIC IPC/PG (<https://www.siemens.com/asis>)
- SIMATIC Documentation Collection (<https://www.siemens.com/simatic-tech-doku-portal>)
- Your local representative (https://www.automation.siemens.com/aspa_app)
- Training center (<https://siemens.com/sitrain>)
- Industry Mall (<https://mall.industry.siemens.com>)

When contacting your local representative or Technical Support, please have the following information at hand:

- MLFB of the device
- BIOS version for industrial PC or image version of the device
- Other installed hardware
- Other installed software

Current documentation

Always use the current documentation available for your product. You can find the latest edition of this manual and other important documents by entering the article number of your device on the Internet (<https://support.industry.siemens.com>). If necessary, filter the comments for the entry type "Manual".

Tools & downloads

Please check regularly if updates and hotfixes are available for download to your device. The download area is available on the Internet at the following link:

After Sales Information System SIMATIC IPC/PG (<https://www.siemens.com/asis>)

A.3 Parameterization of the connection box standard and connection box advanced

The connection box standard and the connection box advanced have an internal SCALANCE switch. You parameterize the two connection boxes using the "Web Based Management" WBM of the respective SCALANCE switch as described in the following document:

Configuration manual "SCALANCE X-200"

(<https://support.industry.siemens.com/cs/ww/de/view/109476763>)











The description in the manual includes the following topics, among others:

- WBM login, that is login for parameter assignment of the connection box
- Firmware update
- Diagnostics
- Additional configuration options





Markings and symbols

B.1 Safety-relevant symbols

The following table describes symbols that can be added to your SIMATIC device, to its packaging or to an enclosed document in addition to the symbols described in the manuals.

Symbol	Meaning	Reference
	General danger sign Caution / Attention You must following the operating instructions. The operating instructions contain information on the type of the potential hazard and enable you to identify risks and implement countermeasures.	ISO 7000 No. 0434B, DIN ISO 7000 No. 0434B
 ONLY EX MODULES	Attention, only relevant for modules with Ex approval	
	Follow the instructions	ISO 7010 M002
	May be installed by qualified electricians only	IEC 60417 No. 6182
 F<2N DISPLAY F<4N HOUSING	Mechanical load for HMI devices	
 CABLE SPEC.	Connection cables must be designed for the ambient temperature	
 EMC	EMC-compliant installation	
 U = 0V	No mounting or pulling & plugging under voltage	
 230V MODULES	Dangerous electrical voltage for 230V modules	ANSI Z535.2
 24V MODULES	Protection class III, supply only with protective low voltage (SELV/PELV)	IEC 60417-1-5180 "Class III equipment"

B.1 Safety-relevant symbols

Symbol	Meaning	Reference
 <p data-bbox="145 359 328 402">INDOOR USE ONLY INDUSTRIAL USE ONLY</p>	<p data-bbox="360 283 1050 310">Only for industrial applications and indoor areas (control cabinet)</p>	
	<p data-bbox="360 414 963 442">Device is to be integrated or installed in a control cabinet</p>	
 <p data-bbox="161 578 312 621">ZONE 2 USE CABINET IP54</p>	<p data-bbox="360 502 1102 555">Integrate or install devices approved for Ex Zone 2 in a control cabinet with at least IP54</p>	
 <p data-bbox="161 710 312 753">ZONE 22 USE CABINET IP6x</p>	<p data-bbox="360 634 1115 687">Integrate or install devices approved for Ex Zone 22 in a control cabinet with at least IP6x</p>	

List of abbreviations

AC	Alternating Current
DC	Direct Current
DI	Digital Input
DIN	German Institute for Standardization (Deutsches Institut für Normung)
ESD	Components and modules endangered by electrostatic discharge
EMC	Electromagnetic compatibility
EN	European standards (Europanorm)
EC	European Community
GND	Ground
GSD	Generic Station Description
HF	High Frequency
HMI	Human Machine Interface
HTML	Hypertext Mark-up Language
ID	Identification
IEC	International Electronic Commission
IP	Internet Protocol (in relation to Internet addresses)
IP	Ingress protection (in relation to degrees of protection)
ISO	International Standard Organization
IWP	Industrial Web Panel
LAN	Local Area Network
LCD	Liquid Crystal Display
LED	Light Emitting Diode
MLFB	Machine-Readable Product Designation (Maschinenlesbare Fabrikatebezeichnung)
MRP	Media Redundancy Protocol
MTBF	Mean Time Between Failures
NC	Not Connected
PC	Personal Computer
PELV	Protective Extra Low Voltage
PL	Performance Level
RD	Receive Data
RJ	Registered Jack
RSTP	Rapid Spanning Tree Protocol
Rx/RX	Receiver Cross
Rz	Average surface roughness (Gemittelte Rautiefe)
SELV	Safety Extra Low Voltage
SIL	Safety Integrity Level
STP	Spanning Tree Protocol
TD	Transmit Data

TFT	Thin Film Transistor
TIA	Totally Integrated Automation
Tx/TX	Transmitter Cross
USB	Universal Serial Bus
VDE	Association of German Electrical Engineers (Verband Deutscher Elektrotechniker)

Glossary

"Automatic mode" and "setup mode"

Program-controlled plants pose a significant safety risk for operators. EN 12417 "Machine tools. Safety. Machining centers" and DIN EN 13128 "Safety of machine tools - Milling and boring machines" define operating modes to ensure staff safety. A "setup mode" is required for correct plant setup for "automatic mode". Plant functions in this mode are limited compared to automatic mode. Devices have to be moved with the handwheel or in jog mode.

Automation system

An automation system is used for closed-loop and open-loop control of technical processes in machines or plants. The automation system consists of different components and integrated system functions, depending on the automation task.

EMC

Electromagnetic compatibility is the ability of electrical equipment to function properly in its electromagnetic environment without influencing this environment.

HMI device

An HMI device is a device used for the operation and monitoring of machines and plants. The statuses of the machine or plant are indicated by means of graphic elements or by indicator lamps on the HMI device. The operator controls of the HMI device allow the operator to interact with the processes of the machine or plant.

Plant

General term referring to machines, processing centers, systems, plants and processes which are operated and monitored on an HMI device.

PLC

A PLC is a general term for devices and systems with which the HMI device communicates, e.g. SIMATIC S7.

PROFINET

Within the framework of Totally Integrated Automation, PROFINET represents the systematic further development of the following bus systems:

- PROFIBUS DP as well-established fieldbus
- Industrial Ethernet as the communications bus for the cell level

The experience gained from both systems has been and continues to be integrated in PROFINET. PROFINET is an Ethernet-based automation standard from PROFIBUS International and defines a vendor-neutral communication and engineering model.

PROFINET IO

As part of PROFINET, PROFINET IO is a communication concept that is used to implement modular, distributed applications.

Proof-test interval

Recurring test for detecting hidden dangerous failures in a safety-related system so that a repair, if needed, can restore the system to an "as new" condition or as close to this condition as is practically possible.

Real-time Ethernet

Ethernet for isochronous cycle times of < 1 ms, for example, to meet the high real-time requirements of drive technology.

Screen

A screen is a form of visualization of all logically related process data of a plant. The visualization of the process data can be supported by graphic objects.

STEP 7

STEP 7 is the configuration software for SIMATIC systems.