

SIMATIC HMI

HMI devices Basic Panels 2nd Generation

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

All names identified by ® are registered trademarks of Siemens AG. The remaining trademarks in this publication may be trademarks whose use by third parties for their own purposes could violate the rights of the owner.

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 provide information based on the requirements derived from the mechanical engineering documentation for manuals. This information relates to the HMI device, its storage, transportation, place of use, installation, use and maintenance.

These operating instructions are intended for a variety of target groups. The following table shows the sections of these operating instructions that are of particular importance for the respective target group.

Target group	Section
All	"Safety instructions"
Operators The operator operates and monitors the system during the process control phase.	"Overview" "Operating the device"
Commissioning engineers The commissioning engineer integrates the HMI device into the system and ensures the operating capability of the HMI device for the process control phase.	All sections. Depending on the use of the HMI device, certain sections may not be of relevance to the commissioning engineer, e.g. the section "Maintenance and servicing."
Service technicians Service technicians rectify faults that occur during the process control phase.	All sections. Depending on the use of the HMI device, certain sections may not be of relevance to the service technicians, e.g. the section "Maintenance and servicing."
Maintenance technicians Maintenance technicians carry out servicing and maintenance work during the process control phase.	Maintenance and care

The information system of WinCC contains additional information. The information system is integrated as online help in WinCC and contains instructions, examples and reference information in electronic form.

Scope

These operating instructions are valid for all versions of the SIMATIC HMI Basic Panels. The following naming conventions apply:

Device designation SIMATIC HMI	Device type	Interface type	Can be configured with
KTP400 Basic	Touch device with function keys	PROFINET	WinCC (TIA Portal) as of V13 ¹
KTP700 Basic		PROFINET	
KTP700 Basic DP		PROFIBUS	
KTP900 Basic		PROFINET	
KTP1200 Basic		PROFINET	
KTP1200 Basic DP		PROFIBUS	

¹ Devices are configurable as of WinCC V13. The description in this manual relates to V14 or higher.

Basic knowledge required

Knowledge of automation technology and process communication is necessary to understand the operating instructions.

An understanding of the use of computers and operating systems is also required.

Illustrations and text highlighting

This manual contains figures of the described devices. The figures may deviate from the supplied device in certain details.

Note information highlighted as follows:

Note

A note contains important information on described products and their handling or on a section of this documentation.

Names of the software

Configuration and runtime software have different names as follows:

- "WinCC (TIA Portal)", for example, refers to the configuration software. The term "WinCC" is used in a general context. The full name is always used when it is necessary to differentiate between different versions of the configuration software.
- "WinCC Runtime" refers to the runtime software that can run on HMI devices.

Names of the hardware

These operating instructions describe the "Basic Panels 2nd Generation". The term "Basic Panel" is used synonymously for a "Basic Panel 2nd Generation" in these instructions.

Trademarks

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- HMI®
- SIMATIC®
- SIMATIC HMI®
- WinCC®

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Overview

1.1 Product overview

The beauty of simplicity

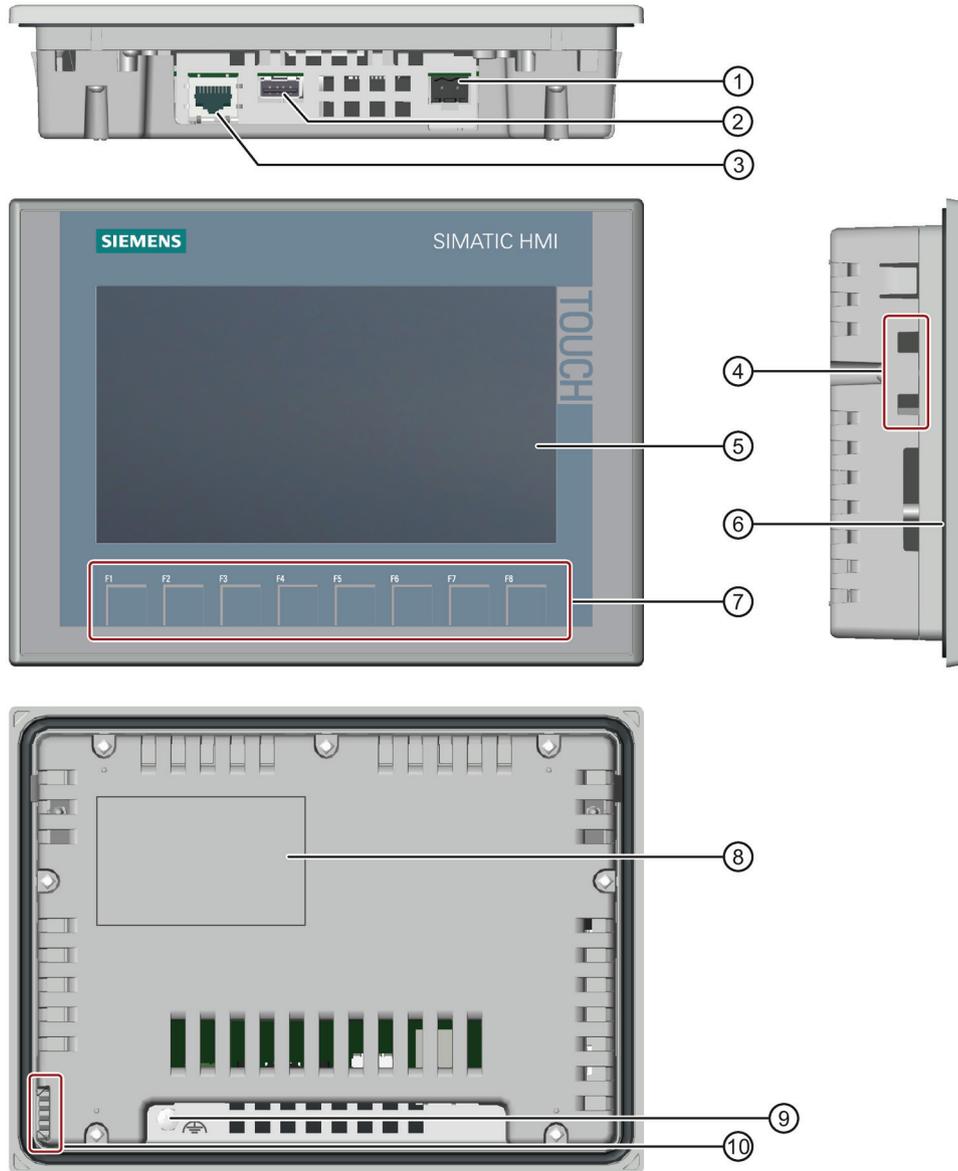
New, cost-efficient HMI generation meets the trend for high-quality visualization even in small machines and plants

Siemens meets the requirements of users for high-quality visualization and operation even in small and medium-size machines and plants with the second generation of SIMATIC HMI Basic Panels. While the price of the new devices is based on the current panels, their scope of performance has been expanded tremendously. The high resolution and a color depth of up to 65,500 colors are major factors contributing to the increased performance.

Even the connectivity either by PROFINET or PROFIBUS interface plus USB port could be significantly improved. Configuration and operation of the new panels has become easier in connection with simplified programming by means of the new WinCC software version in the TIA Portal.

1.2 Design of the PROFINET devices

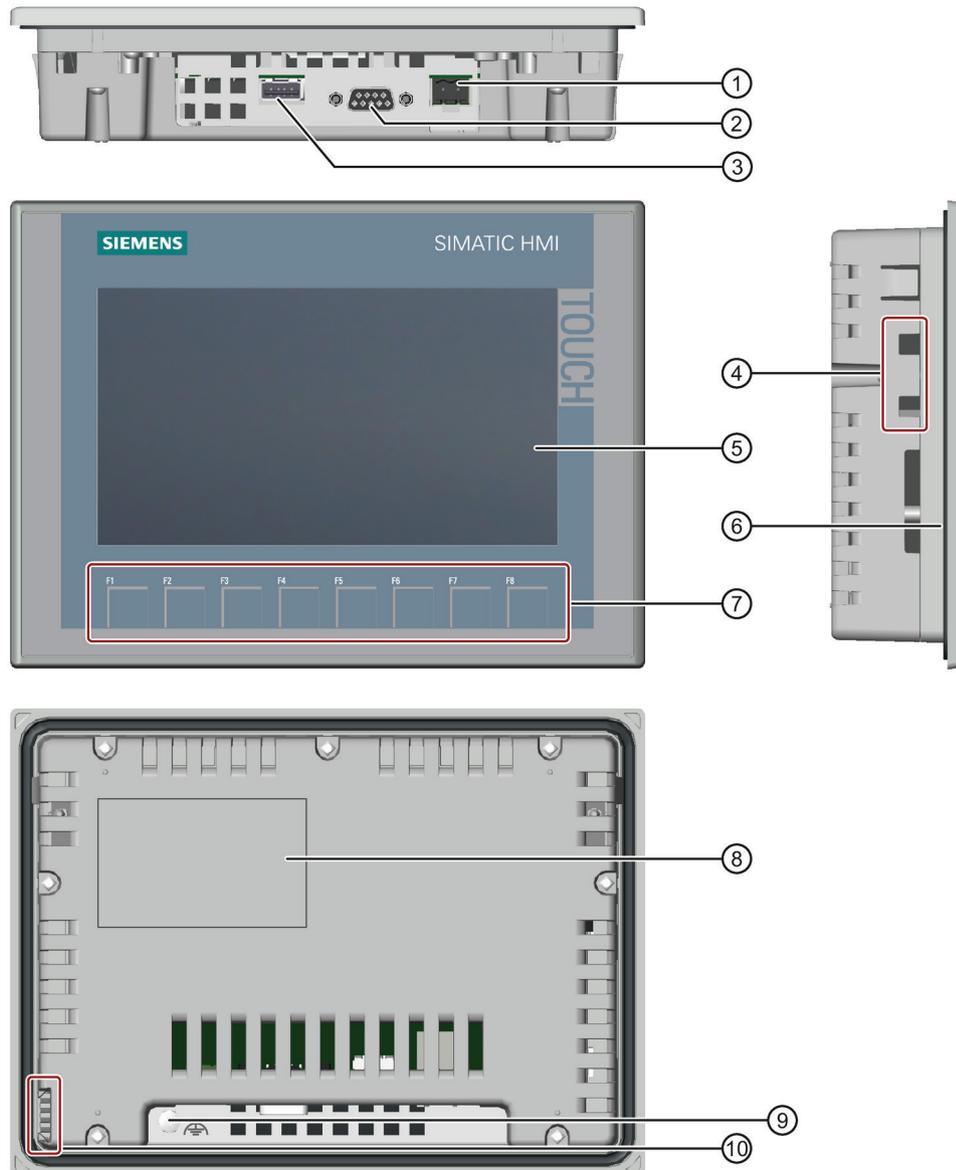
The figure below shows the design of the PROFINET devices using KTP700 Basic as an example.



- ① Power supply connection
- ② USB port
- ③ PROFINET interface
- ④ Recesses for a mounting clip
- ⑤ Display/touch screen
- ⑥ Mounting seal
- ⑦ Function keys
- ⑧ Rating plate
- ⑨ Connection for functional ground
- ⑩ Guide for labeling strips

1.3 Design of the PROFIBUS devices

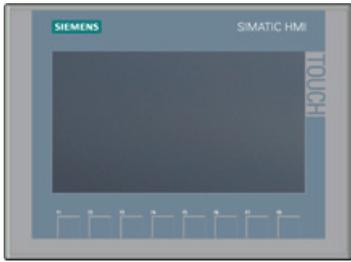
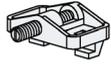
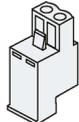
The figure below shows the design of the PROFIBUS devices using KTP700 Basic DP as an example.



- | | |
|--------------------------------|-------------------------------|
| ① Power supply connection | ⑥ Mounting seal |
| ② RS 422/RS 485 port | ⑦ Function keys |
| ③ USB port | ⑧ Rating plate |
| ④ Recesses for a mounting clip | ⑨ Functional earth connection |
| ⑤ Display/touch screen | ⑩ Guides for labeling strips |

1.4 Scope of delivery

The scope of delivery of the HMI device includes the following components:

Name	Figure	Quantity
HMI device		1
Quick Installation Guide		1
Mounting clips with grub screw		According to the quantity required for mounting, in accessory kit
Power supply connector		1, in accessory kit

1.5 Accessories

An accessory kit with the necessary accessories is included with the HMI device.

Note

This section contains a selection of accessories that is suitable for your HMI device. You can find additional versions of this selection and the complete accessories portfolio 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.

HMI I/O components

Name	Article number
Converter RS 422 to RS 232 for connecting third-party controllers	6AV6671-8XE00-....
90° elbow adapter for RS422/RS485 interface	6AV6671-8XD00-....
PROFIBUS FC RS 485 Plug 180 PROFIBUS plug with FastConnect connection plug and axial cable outlet	6GK1500-0FC10
Plug for the power supply of the HMI device, 2-pin, screw technology	6AV6671-8XA00-....
Plug for the power supply of the HMI device, 2x2-pin, spring-loaded terminal technology	6ES7193-4JB00-....

"...." stands for the variant key of the article number.

Protective films

Name	Article number
Protective film 4" widescreen for KTP400 Basic	6AV2124-6DJ00-....
Protective film 7" widescreen for KTP700 Basic	6AV2124-6GJ00-....
Protective film 9" widescreen for KTP900 Basic	6AV2181-3JJ20-....
Protective film 12" widescreen for KTP1200 Basic	6AV2181-3MJ20-....

"...." stands for the variant key of the article number.

Memory media

Name	Article number
SIMATIC HMI USB stick	6AV2181-8AS20-....

"...." stands for the variant key of the article number.

Fasteners

Name	Article number
Plastic set with mounting clips	6AV6671-8XK00-....

"...." stands for the variant key of the article number.

Input help

Name	Article number
Touch pen system for resistive and capacitive touch systems	6AV2181-0AS42-...

"...." stands for the variant key of the article number.

Additional USB accessories

Additional USB accessories can be found on the Internet in the following entry:
FAQ 19188460 (<https://support.industry.siemens.com/cs/ww/en/view/19188460>)

Other accessories

You can find additional accessories for SIMATIC HMI devices on the Internet at the following link:

Accessories (<https://mall.industry.siemens.com/mall/en/WW/Catalog/Products/10144445>)

Safety instructions

2.1 General safety instructions

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

Open equipment and the Machinery Directive

 WARNING
The device constitutes open equipment on the back side The device constitutes open equipment on the back side. This means that the device may only be integrated in an enclosure or cabinet which provides front access for operating the device. The enclosure, the cabinet or the electrical operating rooms must provide protection against electric shock and the spread of fire. The requirements regarding the mechanical strength must also be considered. Access to the enclosure or cabinet in which the device is installed should only be possible by means of a key or tool and for trained and qualified personnel.
Electrocution risk when control cabinet is open When you open the control cabinet, there may be a dangerous voltage at certain areas or components. Touching these areas or components can cause electrocution. De-energize the control cabinet before opening it. Do not install or remove system components during operation.
The device may only be used in machines which comply with the Machinery Directive The Machinery Directive specifies precautions to be taken when commissioning and operating machinery 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.

Observe the safety and accident prevention instructions applicable to your application in addition to the safety instructions given in the device documentation.

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



An electrostatically sensitive device is equipped with electronic components. Due to their design, electronic components are sensitive to overvoltage and thus to the discharge of static electricity. Note the corresponding regulations when handling ESD.

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/industrialsecurity>).

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 Security management for HMI devices

You can find additional information on security management of HMI devices on the Internet at the following address:

Panel Security Guidelines (<https://support.industry.siemens.com/cs/de/en/view/109481300>)

2.3 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.

2.4 Notes about usage

NOTICE
The HMI device is approved for indoor use only.
The HMI device may be damaged if it is 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 on the rear of the device.

You can find additional information in the section "Operating conditions (Page 106)".

Industrial applications

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

- Requirements for interference emissions EN IEC 61000-6-4:2019
- Requirements for interference immunity EN IEC 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-use zone include:

- Installation of the HMI device in grounded control cabinets
- Use of filters in electrical 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.

Use with additional measures

The HMI device should not be used at the following locations unless additional measures are taken:

- In locations with a high degree of ionizing radiation
- In locations with severe operating conditions, for example, due to:
 - Corrosive vapors, gases, oils or chemicals
 - Strong electrical or magnetic fields of high intensity
- In systems that require special monitoring, for example, in:
 - Elevators
 - Systems in especially hazardous areas

2.5 Notes on communication

Note

Communication errors caused by address conflict

Communication errors can occur if several devices in a network share the same bus address or IP address.

Make sure that your HMI device is assigned a unique address in the network.

Note

Updating tag values following a communication error

If communication between an HMI device and controller is interrupted, all tag values displayed on the HMI device will be replaced by a hash mark ("#").

When the communication between the HMI device and controller is restored, all tag values will be updated immediately. The cycle time for updating the tag values begins again at "0".

Ethernet communication with Basic Panels with PROFINET interface

Basic Panels with PROFINET interface support the following types of communication:

- PROFINET basic function for commissioning and diagnostics
 - Standard Ethernet communication
-

Mounting and connecting the device

3.1 Preparing for mounting

3.1.1 Selecting installation location

Points to observe when selecting the mounting location:

- Position the HMI device so that it is not subjected to direct sunlight.
- Position the HMI device such that it is ergonomically accessible for the operator.
Choose a suitable mounting height.
- Ensure that the HMI device air vents are not covered as a result of installation.
- Note the permitted mounting positions.

3.1.2 Checking the delivery

Check the package content for visible signs of transport damage and for completeness.

Note**Damaged parts**

A damaged part will cause the HMI device to malfunction.

Do not install parts damaged during shipment. In the case of damaged parts, contact your Siemens representative.

Check the scope of supply of the HMI device, see section "Scope of delivery (Page 14)".

Additional documents may be included in the delivery.

The documentation is part of the HMI device and is required for subsequent commissioning. Keep all enclosed documentation for the entire service life of the HMI device. You must pass along the enclosed documentation to any subsequent owner or user of the HMI device. Make sure that every supplement to the documentation that you receive is stored together with the operating instructions.

3.1.3 Checking the operating conditions

Note the information in the following sections of these operating instructions before installing the HMI device:

- Certificates and approvals (Page 101)
- Electromagnetic compatibility (Page 103)
- Mechanical ambient conditions (Page 105)
- Climatic ambient conditions (Page 105)
- Information on insulation tests, protection class and degree of protection (Page 107)
- Technical specifications (Page 114)

3.1.4 Permitted mounting positions

The HMI device is suitable for installation in:

- Mounting cabinets
- Control cabinets
- Switchboards
- Consoles

In the following, all of these mounting options are referred to by the general term "cabinet".

The device is self-ventilated and approved for inclined mounting at angles up to $\pm 35^\circ$ from the vertical.

NOTICE
Damage due to overheating
An inclined installation reduces the convection by the HMI device and therefore the maximum permitted ambient temperature for operation.
If there is sufficient convection from forced ventilation, the HMI device can also be operated in the inclined mounting position up to the maximum permitted ambient temperature for vertical mounting. The HMI device may otherwise be damaged and its certifications and warranty will be void.
The ambient temperature ranges listed in this section apply to the rear and the front of the HMI device.

For detailed information regarding the permitted ambient temperatures, refer to section "Climatic ambient conditions (Page 105)".

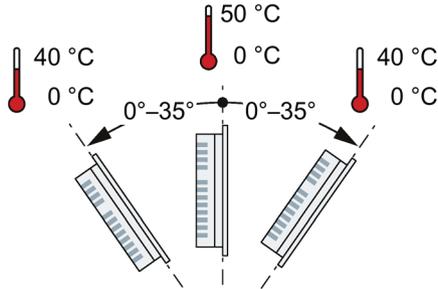
Mounting position

Select one of the approved mounting positions for your device. The approved mounting positions are described in the following sections.

Mounting in landscape format

Ambient temperature in the cabinet with landscape mounting:

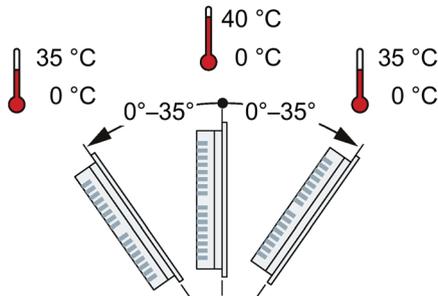
- Vertical mounting (0° inclined): Maximum +50 °C
- Inclined mounting (inclined up to 35°): Maximum +40 °C



Mounting in portrait format

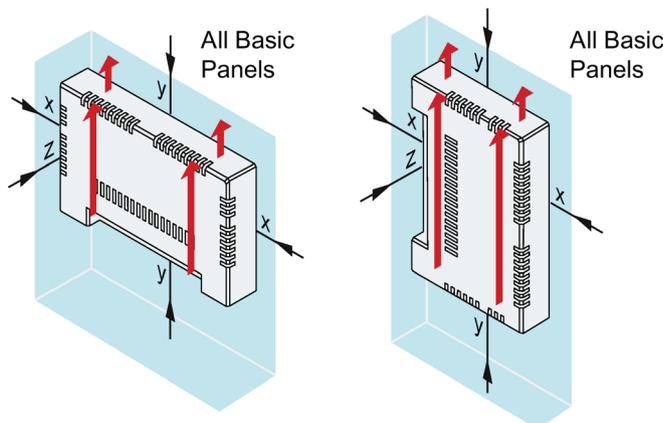
Ambient temperature in the cabinet with portrait format:

- Vertical mounting (0° inclined): Maximum +40 °C
- Inclined mounting (inclined up to 35°): Maximum +35 °C



3.1.5 Checking clearances

The following clearances are required around the HMI device to ensure sufficient self-ventilation:



Required clearance around the HMI devices.

	x	y	z
Basic Panels	15	50	10

All dimensions in mm.

3.1.6 Making the mounting cutout

Note

Stability of the mounting cutout

The material in the area of the mounting cutout must provide sufficient strength to guarantee lasting and safe mounting of the HMI device.

To achieve the degrees of protection described below, it must be ensured that deformation of the material cannot occur due to the force of the mounting clips or operation of the device.

Degrees of protection

The degrees of protection of the HMI device can only be guaranteed if the following requirements are met:

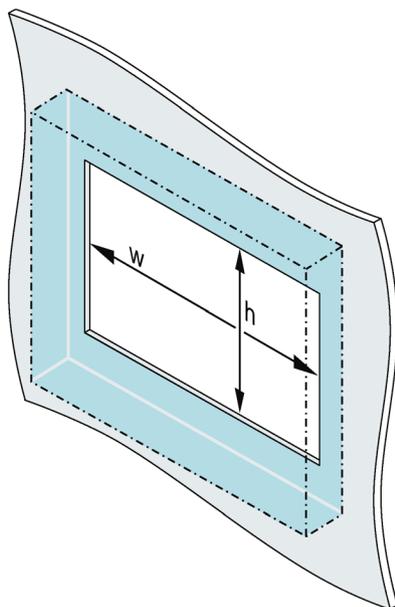
- Material thickness at the mounting cutout for a protection rating of IP65 or Front face only Type 4X/Type 12 (indoor use only): 2 mm to 6 mm.
- Permitted deviation from plane at the mounting cutout: ≤ 0.5 mm
This condition must be met for the mounted HMI device.
- Permissible surface roughness in the area of the seal: ≤ 120 μm (R_z 120)

Mounting compatibility

The mounting cutouts of the Basic panels are compatible with the mounting cutouts of the following SIMATIC HMI devices:

Mounting cutout Basic Panel	Compatible with the mounting cutouts of the HMI device
KTP400 Basic	KTP400 Basic color PN
KTP700 Basic, KTP700 Basic DP	KTP600 Basic color PN; TP700 Comfort
KTP900 Basic	TP900 Comfort
KTP1200 Basic, KTP1200 Basic DP	TP1200 Comfort

Dimensions of the mounting cutout



Dimensions of the mounting cutout for the Basic HMI devices in landscape mounting position:

	w_0^{+1}	h_0^{+1}
KTP400	123	99
KTP700	197	141
KTP900	251	166
KTP1200	310	221

All dimensions in mm

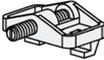
Dimensions of the mounting cutout for the Basic HMI devices in portrait mounting position:

	w_0^{+1}	h_0^{+1}
KTP400	99	123
KTP700	141	197
KTP900	166	251
KTP1200	221	310

All dimensions in mm

3.2 Mounting the device

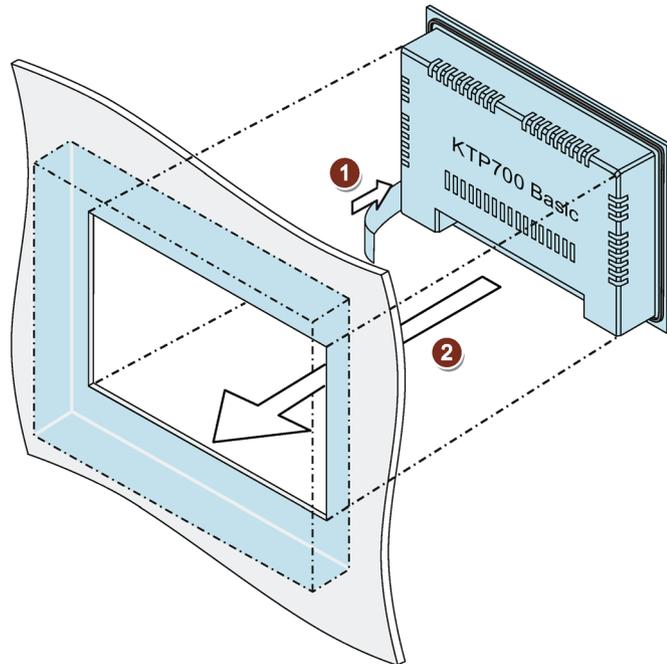
Required tools and accessories

	Torque screwdriver with slot insert size 2		
	Mounting clips	for HMI device	Required quantity
		KTP400 Basic	4
		KTP700 Basic	7
		KTP700 Basic DP	7
		KTP900 Basic	10
		KTP1200 Basic	12
KTP1200 Basic DP	12		

Inserting the HMI device

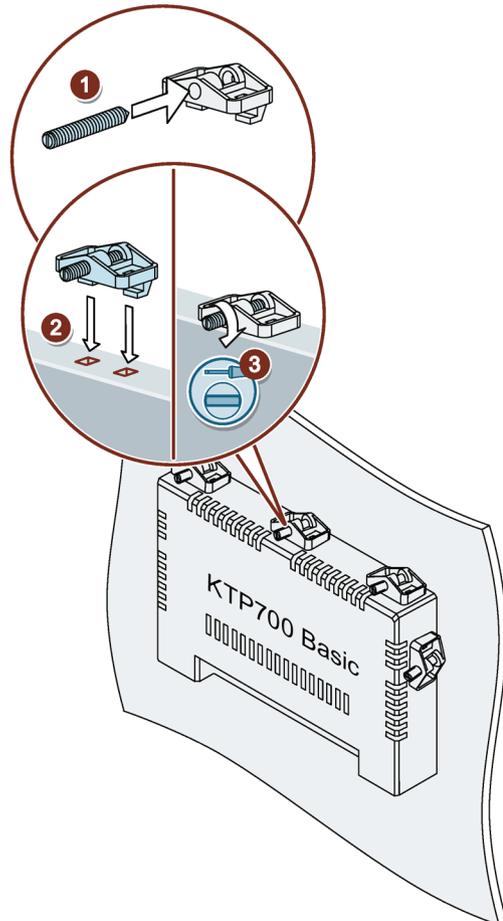
1. Slide the labeling strip into the device using the guide, if available.
2. Insert the HMI device into the mounting cutout from the front.

Make sure that protruding labeling strips are not caught between the mounting cutout and HMI device.



Securing the HMI device with mounting clips

1. If mounting clips and grub screws are available separately in the accessory kit, insert a grub screw into the mounting clip bore hole and turn it several times.
2. Place the first mounting clip into the corresponding cutout.
3. Fasten the mounting clip with a size 2 screwdriver. The maximum permitted torque is 0.2 Nm.
4. Repeat steps 1 to 3 for all mounting clips required to secure your HMI device.



3.3 Connecting the device

3.3.1 Connection information

Requirement

- The HMI device must be mounted according to the specifications of these operating instructions.

Connecting cables

Use only shielded standard cables as data connecting cables, order information is available on the Internet (<https://mall.industry.siemens.com>).

Note

Separate SELV/PELV circuits from other electric circuits or insulate the cables

The wiring of SELV/PELV circuits must either be separated from the wiring of other non-SELV/PELV electric circuits, or the insulation of all conductors must be rated for the higher voltage. Alternatively, a grounded shielding or additional insulation must be installed around the wiring for SELV/PELV circuits or the other electric circuits, based on IEC 60364-4-41.

Note for using the HMI device within the scope of UL approval:

Note

Use copper cables at connectors with terminal connections

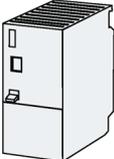
Use copper (Cu) cables for all supply lines that are connected to the device with terminals, e.g. 24 V DC power supply cables to the 24 V DC power supply connectors.

Utiliser des câbles en cuivre sur les connexions à bornes

Utilisez des câbles en cuivre (Cu) pour tous les câbles d'alimentation qui sont raccordés à l'appareil par des bornes, par exemple les câbles d'alimentation 24 V CC sur le connecteur d'alimentation 24 V CC.

Required tools and accessories

Before you start connecting the HMI device, have the following tools and accessories at hand:

	Torque screwdriver with slot insert size 2
	Torque screwdriver with cross-tip insert size 3
	Crimp pliers
	Power supply connector
	24 V DC with sufficient amperage. See Technical specifications (Page 114)

Connection sequence

NOTICE
Damage to the HMI device
If you do not keep to the connection sequence you could damage the HMI device. It is crucial that you connect the HMI device in the following order.

1. Connecting the equipotential bonding circuit (Page 31)
2. Connecting the power supply (Page 33)
3. Connecting the configuration PC (Page 36)
4. Connecting the controller (Page 37)

Disconnect the HMI device by completing the above steps in reverse order.

Connecting the cables

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.

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.

- When connecting the cables, make sure that you do not bend the contact pins.
- Secure the cable connectors by fastening the connector to the socket with screws.
- Provide adequate strain relief for all cables.
- The pin assignment of the ports is described in the technical specifications.

See also

Securing the cables (Page 42)

3.3.2 Connecting the equipotential bonding circuit

Differences in electrical potential

Differences in electrical potential can develop between spatially separated system components. Such electrical potential differences can lead to high equalizing currents on the data cables and therefore to the destruction of their interfaces. Equalizing currents can develop if the cable shielding is terminated at both ends and grounded to different system parts.

Differences in potential may develop when a system is connected to different mains supplies.

General requirements for equipotential bonding

Differences in potential must be reduced by means of equipotential bonding conductors to ensure trouble-free operation of the relevant components of the electronic system. The following must therefore be observed when installing the equipotential bonding circuit:

- The effectiveness of equipotential bonding increases as the impedance of the equipotential bonding conductor decreases or as its cross-section increases.
- If two system parts are interconnected by means of shielded data cables and their shielding is bonded 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 an 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.

3.3 Connecting the device

- Use equipotential bonding conductors made of copper or galvanized steel. Establish a large surface contact between the equipotential bonding conductors and the grounding/protective conductor and protect them from corrosion.
- Clamp the shielding of the data cable from the HMI device flush at the equipotential rail using suitable cable clamps. The equipotential rail should be very close to the HMI device.
- Route the equipotential bonding conductor and data cables in parallel and with minimum clearance between them.

Note

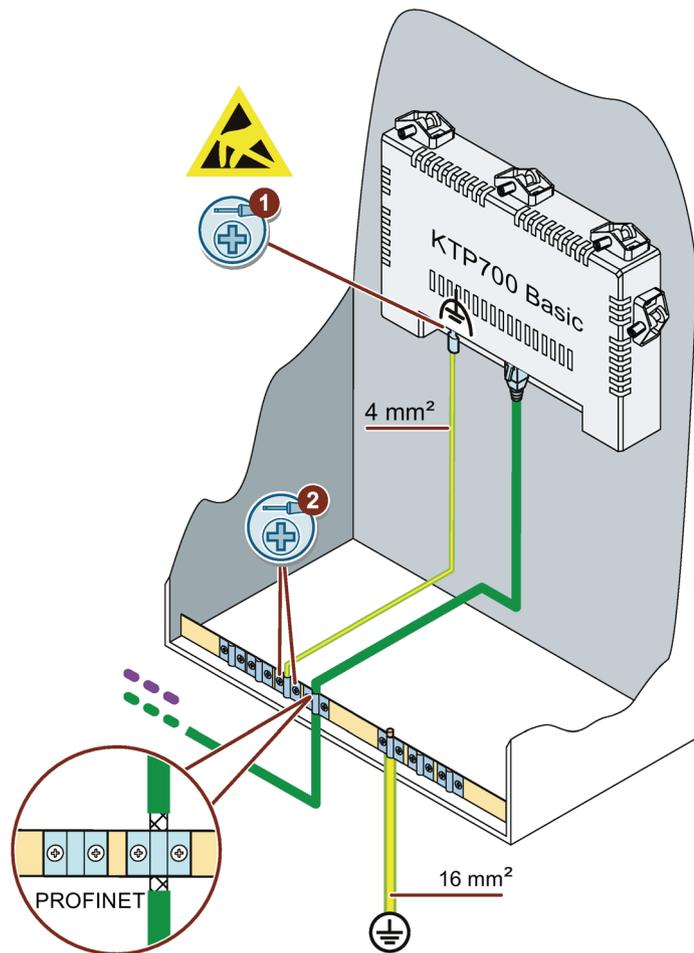
Equipotential bonding conductor

Cable shielding is not suitable for equipotential bonding. Always use the prescribed equipotential bonding conductors. The cross-section of the equipotential bonding conductor must not be less than 16 mm². Always use cables with an adequate cross-section when installing MPI and PROFIBUS DP networks. The interface modules may otherwise be damaged or destroyed.

Procedure

1. Interconnect the functional earth connection of the HMI device with an equipotential bonding conductor, cross-section 4 mm².
2. Connect the equipotential bonding conductor to the equipotential bonding rail.

Use the equipotential busbar for equipotential bonding cables, grounding connection and shield support of the data cables.

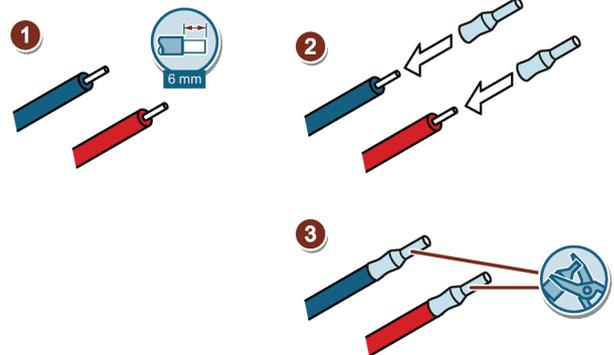


3.3.3 Connecting the power supply

Stripping the cable

Use power supply cables with a maximum cross-section of 1.5 mm².

1. Strip the ends of two power supply cables to a length of 6 mm.
2. Attach cable sleeves to the bare cable ends.
3. Install the end sleeves on the cable ends using the crimp pliers.



Procedure

NOTICE

24 V DC only

An incorrectly dimensioned power supply can destroy the HMI device.

Use a 24 V DC power supply with adequate amperage; see section "Technical specifications (Page 114)".

NOTICE

Safe electrical isolation

For the 24 V DC supply, use only power supply units with safe electrical isolation in accordance with IEC 60364-4-41 or HD 384.04.41 (VDE 0100, Part 410), e.g. conforming to the SELV/PELV standard.

The supply voltage must be within the specified voltage range. Otherwise, malfunctions at the HMI device cannot be ruled out.

Applies to non-isolated system configurations:

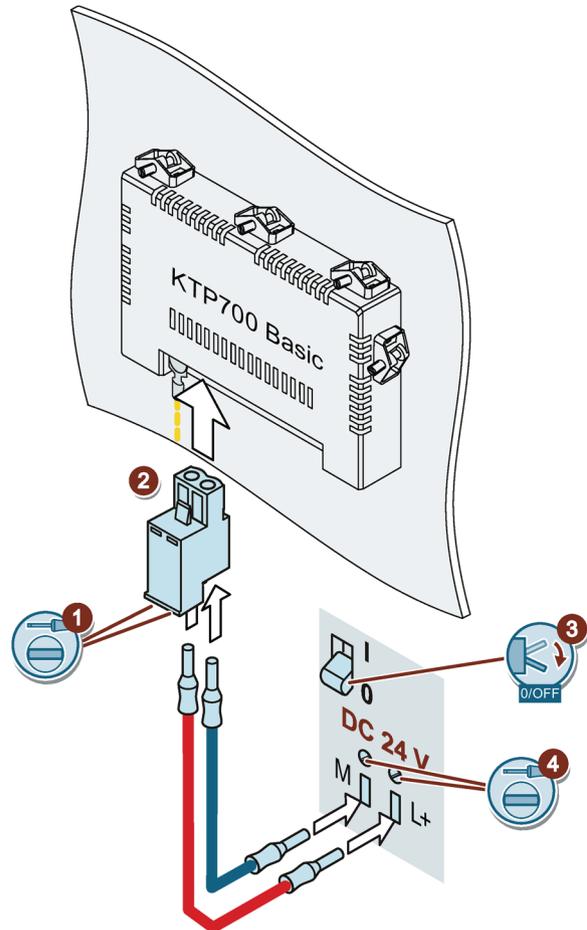
Connect the GND 24 V connection from the 24 V power supply output to equipotential bonding for uniform reference potential. You should always select a central point of termination.

NOTICE

External protective circuit

An external protective circuit is required for operation with 24 V DC, see section 7 "Lightning protection and overvoltage protection" in the Function Manual "Designing interference-free controllers (<https://support.industry.siemens.com/cs/ww/en/view/59193566>)".

1. Connect the two power supply cables to the power supply connector as shown. Secure the power supply cables with a slotted screwdriver.
 2. Connect the power supply connector to the HMI device. Check the correct polarity of the cables using the interface marking on the back of the HMI device.
 3. Switch off the power supply.
 4. Insert the two remaining cable ends into the power supply terminals and secure them with the slotted screwdriver.
- Ensure correct polarity.



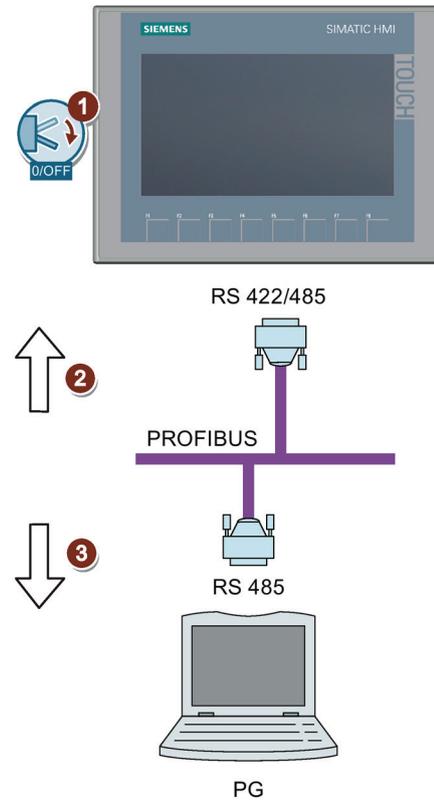
3.3.4 Connecting a programming device

A programming device gives you the following options:

- Transfer a project
- Transfer an HIM device image

Connecting a programming device to a Basic Panel DP

1. Switch off the HMI device.
2. Connect an RS 485 PROFIBUS connector to the HMI device.
3. Connect an RS 485 PROFIBUS connector to the programming device.



3.3.5 Connecting the configuration PC

A configuration PC gives you the following options:

- Transfer a project
- Transfer an HMI device image
- Reset the HMI device to factory settings

Connecting a configuration PC to a Basic Panel with PROFINET interface

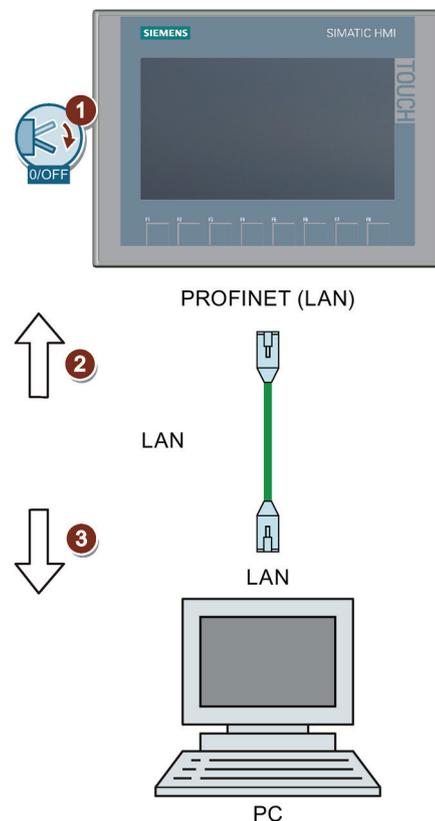
NOTICE

Data network security for communication via Ethernet

With Ethernet-based communication via PROFINET, the end user is responsible for the security of the data network; proper functioning of the data network cannot be guaranteed under all circumstances, for example, in case of targeted attacks that result in an overload of the device.

Use a CAT5 Ethernet cable or higher to connect the configuration PC.

1. Shut down the HMI device.
2. Connect one RJ45 connector of the LAN cable to the HMI device.
3. Connect the other RJ45 connector of the LAN cable to the configuration PC.



See also

Data transmission options (Page 79)

Accessories (Page 15)

3.3.6 Connecting the controller

If the HMI device contains an operating system and an executable project, connect the HMI device to the controller.

Note

Observe when connecting the controller to the HMI:

- Route the data lines parallel to the equipotential bonding conductors
- Connect the shields of the data lines to ground.
- You can operate up to 4 controllers on an HMI device at the same time.

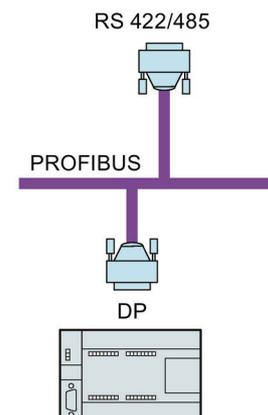
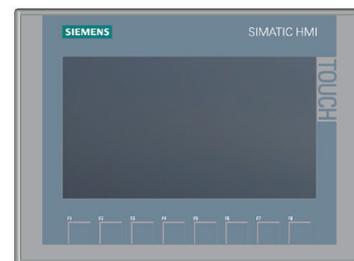
Connecting a controller to a Basic Panel DP

You can connect Basic Panels DP via the RS 422/RS 485 interface to the following SIMATIC controllers:

- SIMATIC S7-200
- SIMATIC S7-300/400
- SIMATIC S7-1200
- SIMATIC S7-1500
- WinAC
- SIMOTION

You can connect Basic Panels DP to the following controllers:

- Modicon Modbus RTU
- Allen Bradley DF1
- Mitsubishi FX
- Omron Host Link



SIMATIC S7-200
SIMATIC S7-300/400
SIMATIC S7-1200
SIMATIC S7-1500

Connecting a controller to a Basic Panel with PROFINET interface

NOTICE

Data network security for communication via Ethernet

In the case of Ethernet-based communication via PROFINET the end user is responsible for the security of the data network since proper functioning of the data network cannot be guaranteed, for example, in case of targeted attacks that result in an overload of the device.

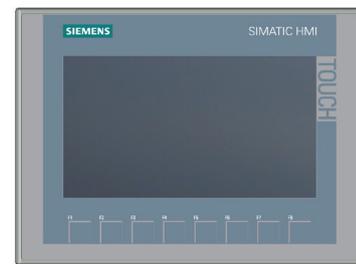
You can connect Basic Panels with PROFINET interface to the following SIMATIC controllers:

- SIMATIC S7-200
- SIMATIC S7-300/400
- SIMATIC S7-1200
- SIMATIC S7-1500
- WinAC
- SIMOTION
- LOGO!

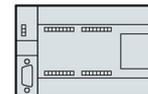
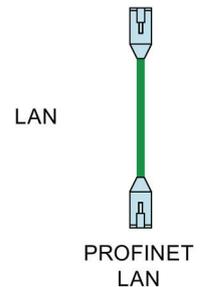
You can connect Basic Panels with PROFINET interface to the following controllers:

- Modicon Modbus TCP/IP
- Allen Bradley EtherNet/IP
- Mitsubishi MC TCP/IP

The connection is set up via PROFINET/LAN.



PROFINET (LAN)



SIMATIC S7-200
SIMATIC S7-300/400
SIMATIC S7-1200
SIMATIC S7-1500

Using Secure HMI Communication

As of TIA Portal V17, the HMI devices support Secure HMI Communication in conjunction with a controller that also supports Secure HMI Communication.

You can find detailed information on secure HMI communication in the:

- TIA Information System under "Editing devices and networks > Configuring devices and networks > Configuring networks > Secure communication"
- S7-1500, ET200 Communication Manual
(<https://support.industry.siemens.com/cs/ww/en/view/59192925>)

The following sections describe the most important steps to use Secure HMI Communication on the HMI device.

Configuring HMI communication

1. Configure the HMI device with an alarm view.

Note

You cannot detect errors when establishing a connection without the alarm view.

2. Configure the CPU with the necessary security settings. Select a PLC communication certificate to secure the HMI connection or have a PLC communication certificate generated by the TIA Portal.
3. Configure the HMI connection between CPU and HMI device.
4. Load the project onto the CPU and the HMI device. During the project transfer, the PLC communication certificate and if necessary a required CA certificate (certification authority) as well is transferred to the CPU and to the HMI device.

Trusting the PLC communication certificate

During the connection setup, the CPU transfers the PLC communication certificate to the HMI device. Distinguish between the following cases:

- If the PLC communication certificate on the HMI device already has the "trusted" status, Secure HMI Communication between CPU and HMI device is automatically established.
- If the PLC communication certificate on the HMI device is not yet available with "trusted" status, the alarm view of the HMI device shows a message indicating that the CPU is not trusted along with an error code.

In this case, you have to mark the PLC communication certificate on the HMI device as "trusted".

To mark the PLC communication certificate as "trusted", do the following.

1. In the Start Center, select "Settings > Internet Settings > Certificate store".
2. Select the PLC communication certificate of the CPU in the "Available certificates in Device" list.
3. Press the "Trust" button.
4. Start the HMI runtime software again.

If the PLC communication certificate on the HMI device has the "trusted" status, Secure HMI Communication can be established.

Note

Changing a connection

In the Start Center, you can close the active controller connection and establish a new connection to a controller with a different IP address. The newly connected controller must belong to the same device class (S7-1200, S7-1500, etc.) and support the same communication security level.

It is not possible to switch alternately between controller connections with and without Secure HMI Communication.

3.3 Connecting the device

See also

Connecting the equipotential bonding circuit (Page 31)

Accessories (Page 15)

Managing certificates (Page 73)

Editing communication connections (Page 61)

3.3.7 Connecting a USB device

Below are examples of devices designed for industrial use you can connect to the USB type A interfaces of the HMI device:

- External mouse
- External keyboard
- USB stick, FAT32 formatted
- Industrial USB Hub 4

Additional information is available in the section "Accessories (Page 15)".

Note when connecting

Note

Connect a USB mouse or USB keyboard only for commissioning and servicing purposes to the USB port.

Note

USB 2.0 certified cable required

If you use a USB cable which is not USB 2.0 certified, errors may occur during data transfer.

Use only USB cables that are labeled "Certified HI-SPEED USB 2.0".

Note

USB cable length maximum 1.5 m

USB cables with lengths of more than 1.5 m do not ensure secure data transfer.

The cable may not be longer than 1.5 m.

Note

Functional problem with USB port

If you connect an external device with a 230 V power supply to the USB port without using a non-insulated installation, you may experience functional problems.

Use a non-insulated system design.

Note**Excessive rated load on port**

A USB device with too high a power load may possibly cause functional problems.

Observe the values for the maximum load of the USB interface. You can find the values in the section "USB X60 (Page 119)".

Note**Remedy when USB stick is not detected**

Depending on the type of USB stick you use, it may happen that the operating system does not detect the USB stick. In this case use a FAT32 formatted USB 2.0 stick of another brand or the SIMATIC HMI USB stick, see section "Accessories (Page 15)".

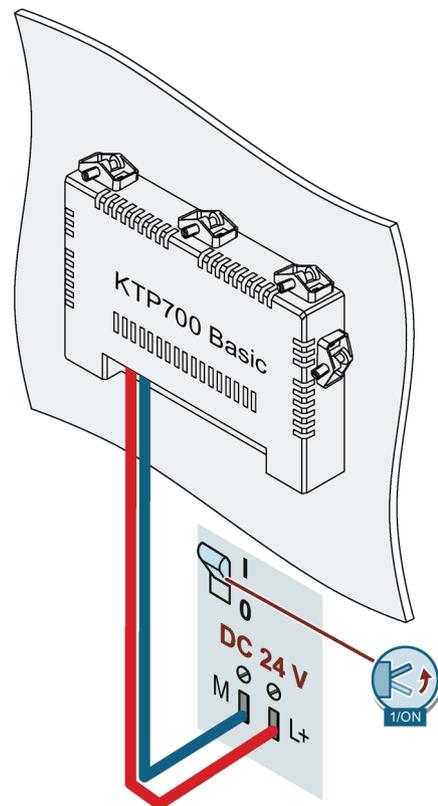
3.3.8 Switching on and testing the HMI device

Switching on the HMI device

Switching on the power supply.

The screen lights up shortly after power is switched on.

If the HMI device fails to start, you may have crossed the cables on the power supply connector. Check the connected cables and change their connection.



The Start Center opens after the operating system has started.

3.3 Connecting the device

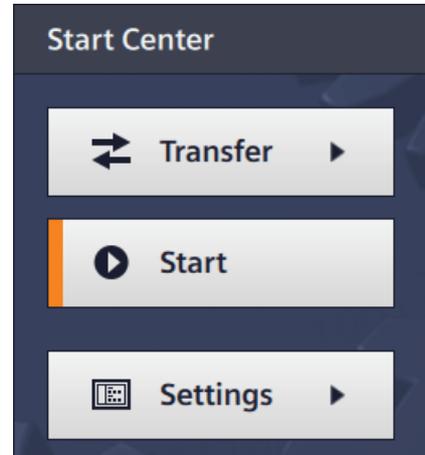
You operate the Start Center using the buttons on the touch screen or a connected mouse or keyboard.

- Press the "Transfer" button to set the HMI device to "Transfer" mode.

The "Transfer" mode can only be activated when at least one data channel has been enabled for the transfer.

- Press the "Start" button to start the project on the HMI device.
- Press the "Settings" button to start the "Settings" page of the Start Center.

You can change various settings on this page, for example, the transfer settings.



Switching off the HMI device

1. Terminate the project on the HMI device.
2. Switch off the power supply.

3.3.9 Securing the cables

NOTICE

Strain relief

Contacts can be broken or wires can be torn off if cables are not provided adequate strain relief.

Provide adequate strain relief for all cables.

The following HMI devices come equipped with a fixing element on the back for strain relief:

- KTP900 Basic
- KTP1200 Basic



After the power-on test, use a cable tie to secure the connected cables to the marked fixing element in order to provide strain relief.

3.4 Removing the device

The HMI device is generally removed in the reverse order used for installing and connecting.

Procedure

Proceed as follows:

1. If a project is running on the HMI device, close the project with the HMI device configured for this purpose. Wait for the Start Center to be displayed.
2. Switch off power to the HMI device.
3. Remove all cable ties on the HMI device used for strain relief.
4. Remove all plug-in connectors and the equipotential bonding cable from the HMI device.
5. Secure the HMI device so that it cannot fall out of the mounting cutout.
6. Loosen the screws of the mounting clips and remove all mounting clips.
7. Take the HMI device out of the mounting cutout.

See also

Mounting the device (Page 27)

Connecting the device (Page 29)

3.4 Removing the device

Operating the device

4.1 Overview

All Basic Panels 2nd Generation come equipped with a touch screen and function keys. You use the touch screen to operate the Start Center or the project which is running on your HMI device. You use the function keys to trigger the associated configured functions within a project.

 WARNING
Incorrect operation
A project can contain certain operations that require in-depth knowledge about the specific system on the part of the operator. Incorrect operation can trigger malfunctions in the plant that can result in malfunctions and therefore injuries or damages.
Ensure that only trained professional personnel operate the system.

Operating the touch screen

NOTICE
Damage to the touch screen
Pointed or sharp objects, abrupt contact, and continuous gesture operation can significantly reduce the life of the touch screen or lead to total failure of the touch screen.
<ul style="list-style-type: none"> • Do not touch the touch screen with pointed or sharp objects. • Avoid contacting the touch screen abruptly with hard objects. • Avoid continuous operation of the touch screen with gestures.
Triggering unintended actions
Touching several operating elements at the same time can trigger unintended actions.
Touch only one operating element on the screen at a time.

Operating elements are touch-sensitive symbols on the screen of the HMI device.

They are basically operated in the same way as mechanical keys. You activate operating elements by touching them with your finger.

Note

The HMI device returns a visual feedback as soon as it detects that an operating element has been touched.

The visual feedback is independent of any communication with the controller. The visual feedback signal therefore does not indicate whether or not the relevant action is actually executed.

Examples:

- **Buttons**

Buttons can assume the following states:

"Untouched"



Shading below

"Touched"



Shading on top

- **Invisible buttons**

By default, the focus on invisible buttons is not indicated after they are selected. No optical operation feedback is provided in this case.

The configuration engineer may, however, configure invisible buttons so that their outline appears as lines when touched. This outline remains visible until you select another operating element.

- **I/O fields**

When you touch an I/O field, the screen keyboard is displayed, e.g. for entry of a password. The type of keyboard depends on the mounting position and the touched operating element.

The screen keyboard is automatically hidden again when input is complete.

Note

Description of all operating elements

A comprehensive description of all operating elements for your HMI device is provided in "Display and operating elements" section of the WinCC Online Help.

Operating function keys

The function keys can be assigned global or local functions:

- **Function keys with global function assignment**

A function key with global function assignment always triggers the same action on the HMI device or in the controller, regardless of the currently displayed screen. An example of such an action is the activation of a screen, or the closing of an alarm window.

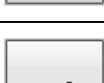
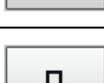
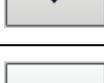
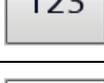
- **Function keys with local function assignment**

A function key with local function assignment is screen-specific and is therefore only effective within the active screen. The function assigned to such a function key can vary from screen to screen.

The function key can be assigned only a single function, either global or local, within a screen. Local function assignments override global function assignments.

4.2 General functions of the screen keyboard

The following keys are available on the screen keyboard of all Basic HMI devices with touch functionality:

	Cursor left
	Cursor right
	Delete character on left
	Cancel input
	Delete character on right
	Confirm input
	Shift to upper case for the next character to be entered
	Permanent shift to upper case, corresponds to the "CAPS LOCK" function.
	Switchover to numeric keypad
	Switchover to alphanumeric keypad
	Display infotext The infotext configured for the operating element is displayed.

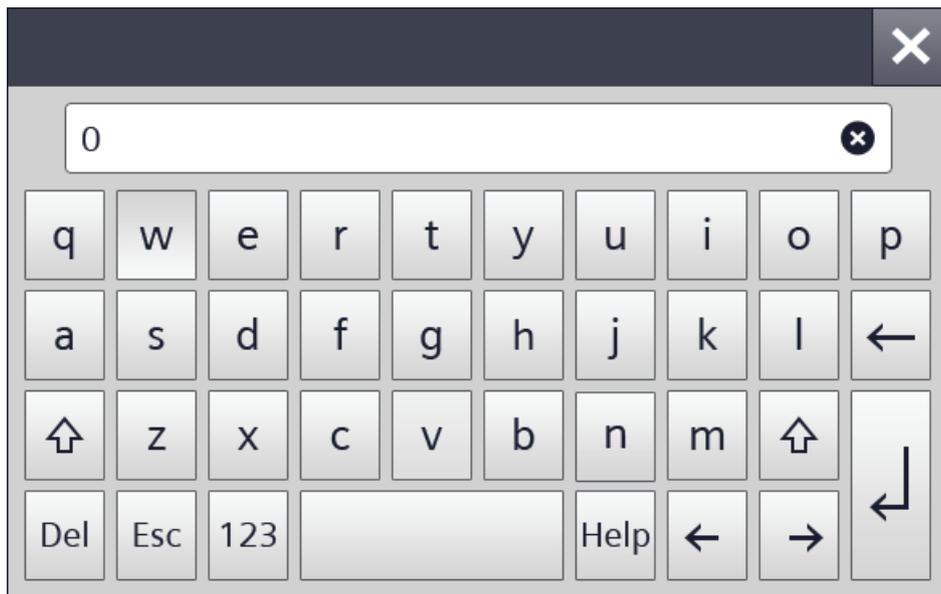
4.3 The screen keyboards

A screen keyboard appears on the HMI device touch screen when you touch an operating element that requires input. Depending on the type of operating element and the required input, this may be an alphanumerical or a numerical keyboard.

Both keyboards are available in landscape and in portrait.

Alphanumerical screen keyboard

For HMI devices in landscape, the alphanumerical keyboard has the assignment of a computer keyboard in US layout ("QWERTY"). You can set the keyboard to capital letters.



For HMI devices in portrait format, the letters are sorted alphabetically.



Note

Job mailbox has no effect

Job mailbox 51 "Select screen" has no effect while the screen keyboard is open.

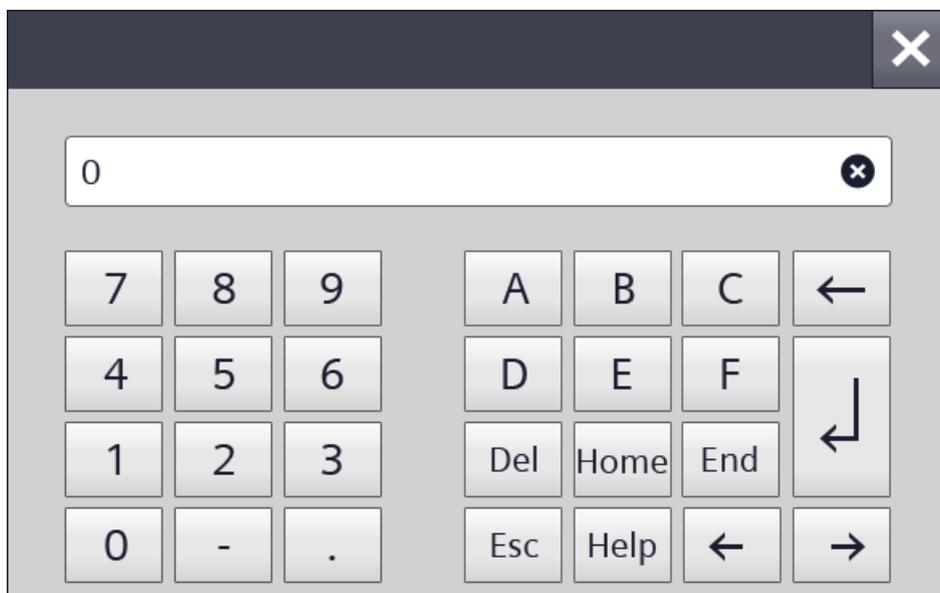
Key assignment

The alphanumerical screen keyboard layout is monolingual.

A language change within the project has no effect on the layout of the alphanumerical screen keyboard.

Numerical screen keyboard

The numerical keyboard only offers numbers and the letters A to F for hexadecimal inputs.



The layout changes accordingly for HMI devices in portrait format.



Checking numerical value limits

Tags can be assigned limit values. Any entry of a value outside this limit is rejected. If an alarm view is configured, a system alarm is triggered and the original value is displayed again.

Decimal places of numerical values

The configuration engineer can define the number of decimal places for a numerical text box. The number of decimal places is checked when you enter a value in this type of I/O field.

- Decimal places that exceed the limit are ignored.
- Unused decimal places are padded with "0" entries.

4.4 Entering data

You make all entries using the screen keyboard.

Procedure

1. Touch the desired operating element on the screen.
The alphanumerical or the numerical screen keyboard opens.
A value existing in the operating element is applied to the display line of the keyboard.
2. Change or overwrite the value.
Depending on the settings, the HMI device outputs an audible signal.
On the alphanumerical keyboard use the <Shift> key to enter upper-case letters.
3. Press <123> on the alphanumerical screen keyboard to switch to numbers and special characters.
You return with <ABC>.
4. Press <Return> key to confirm your entries, or cancel them with <ESC>.
Either action closes the screen keyboard.



Parameterizing the device

5.1 Opening the settings

The Start Center opens after the HMI device has been switched on.

Use the "Settings" button to open the settings for parameter assignment of the device.

You can make the following settings:

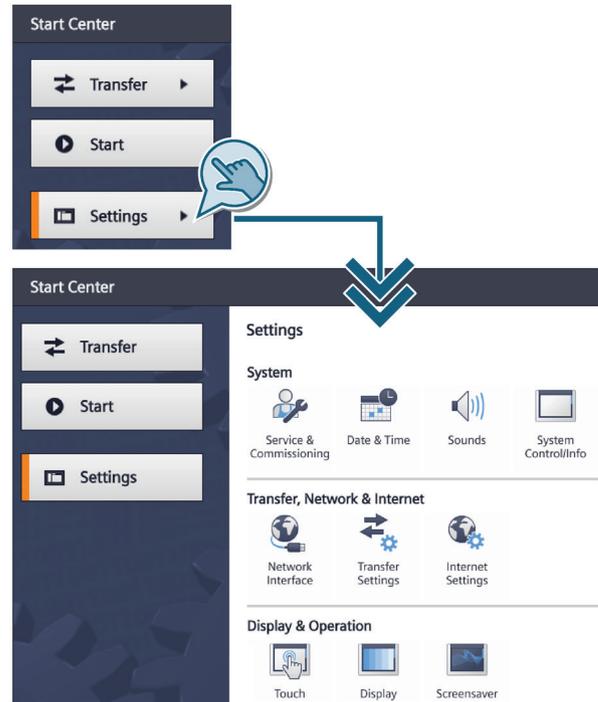
- Settings for operation
- Communication settings
- Password protection
- Transfer settings
- Screen saver
- Acoustic signals

The Start Center is divided into a navigation area and a work area.

If the device is configured in landscape, the navigation area is on the left and the work area on the right in the display.

If the device is configured in portrait format, the navigation area is on the top and the work area on the bottom in the display.

When the display space in the navigation area or work area is not sufficient to display all buttons or icons, scroll bars will be displayed. You can scroll on the navigation area or work area using a swipe gesture; see example on the right.



Scroll within the outlined area and not on the scroll bar.

In most entry fields, the entered value is checked, and, if invalid, it is outlined in red and the value itself is red. The settings are applied and saved when you change to another tab or window. Invalid input values are not applied.

5.1 Opening the settings

Some settings involve multiple windows similar to a wizard. In this case, the text "Step x/y" is displayed at the bottom in the center of the work area. With the ">" key at the bottom right, you advance to the next input window. With the "<" key at the bottom left, you return to the previous input window.

Note

Start Center of the 4" device

The buttons "Transfer", "Start" and "Settings" are displayed in a space-saving manner in the Start Center of the 4" device. The following button for minimizing and maximizing the navigation area is located between the navigation area and work area: 

Protecting the Start Center with a password

You can protect the Start Center against unauthorized operation. You can read the settings in the Start Center without having entered a password, however, you are not permitted to edit the settings.

This prevents inadvertent operations and increases security for the system or machine because the settings cannot be edited.

Note

If the password is no longer available for the Start Center, you first have to update the operating system before you can make any changes in the Start Center.

All data on the HMI device is overwritten when you update the operating system.

5.2 Overview of functions

The following table shows the functions available in the Start Center for configuring your HMI device. Individual functions may be hidden, depending on the device type and device configuration.

Icon	Function
	Save to external storage medium – Backup (Page 56) Restore from external storage medium – Restore (Page 57) Load project from external storage medium (Page 58) ¹ Update operating system from external storage medium (Page 59) Changing the IP address and device name of a controller (Page 60) Editing communication connections (Page 61)
	Configuring the time server (Page 62) Enter time and date (Page 63)
	Activating the acoustic signal (Page 63)
	Configuring Autostart or wait time (Page 64) Changing the password settings (Page 65) Displaying licensing information for the HMI device (Page 66) Displaying information about the HMI device (Page 67)
	Change network settings of PROFINET devices (Page 68) Change network settings of PROFIBUS devices (Page 69)
	Assigning transfer parameters (Page 70)
	Configure Sm@rt Server (Page 71) ^{1 2} Importing a certificate via USB (Page 72) ^{1 2} Managing certificates (Page 73) ^{1 2}
	Calibrating the touch screen (Page 74)
	Changing the monitor settings (Page 75)
	Setting the screen saver (Page 76)

¹ Available in connection with an HMI device image that is compatible with WinCC (TIA Portal) V14 or higher.

² Available for devices with PROFINET interface

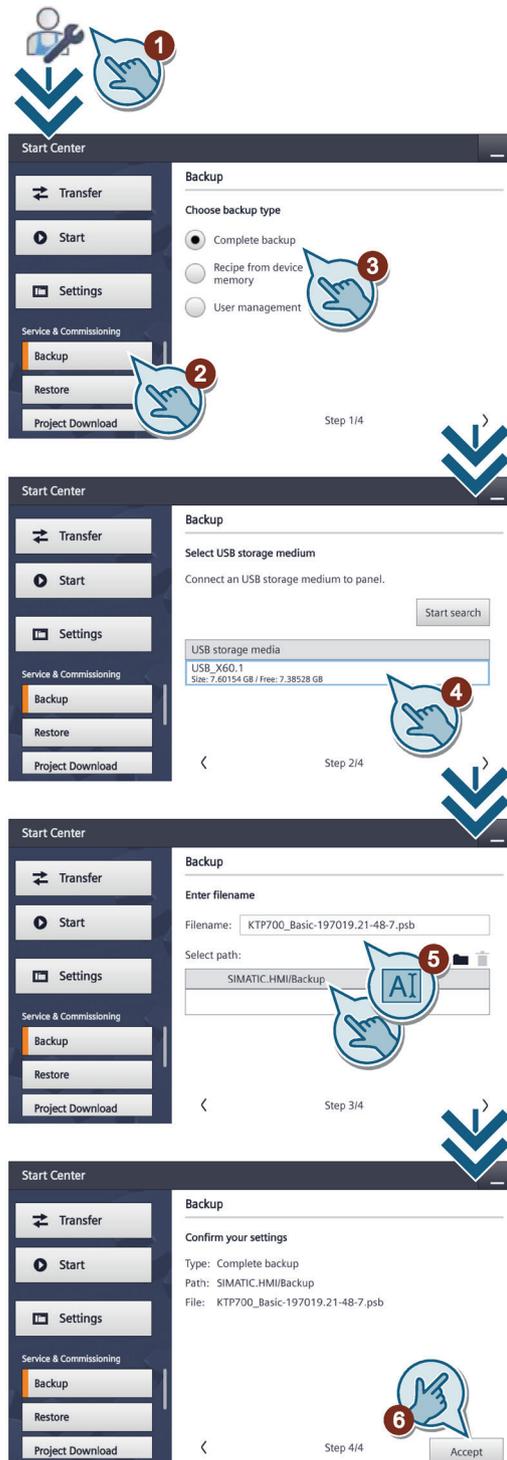
5.3 Save to external storage medium – Backup

1. Touch the "Service & Commissioning" icon.
2. Press the "Backup" button.
With "Backup", you back up the data to a formatted USB storage medium.
3. Select the scope of the backup:
 - "Complete backup": Complete backup
 - "Recipe from device memory": Recipes only
 - "User management": User management data only
4. Select the storage medium on which the data is backed up.
5. Specify the file name of the backup file and the path.
6. Use the "Accept" button to confirm.

If no storage medium is inserted into the HMI device, the File name and Path fields are empty.

If not enough memory space is available on the storage medium, an error message appears.

The backup starts and the Transfer screen is displayed.



5.4 Restore from external storage medium – Restore

NOTICE

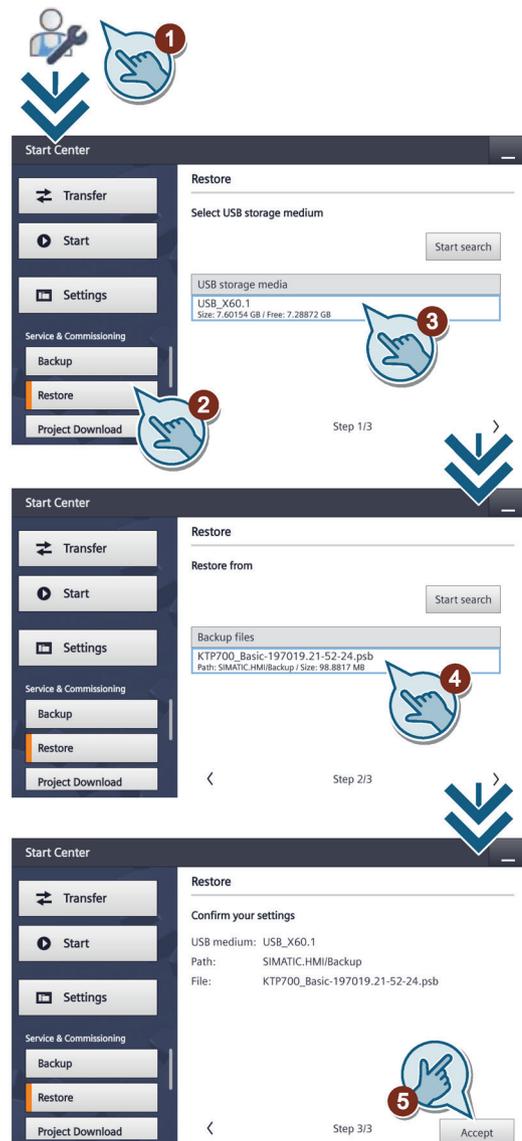
Data loss

All data on the HMI device, including the project and HMI device password, is deleted during a restore operation. License keys are only deleted after a security prompt.

Back up your data before the restore operation, if necessary.

1. Touch the "Service & Commissioning" icon.
2. Press the "Restore" button.
With "Restore", you restore data that was backed up to an external USB storage medium on the HMI device.
3. Select the storage medium on which the data is backed up.
4. Select the backup file. The path is displayed.
If no storage medium is inserted into the HMI device, the File name and Path fields are empty.
5. Use the "Accept" button to confirm.

The restore operation starts and the Transfer screen is displayed.



5.5 Load project from external storage medium

This function is available in connection with an HMI device image that is compatible with WinCC (TIA Portal) V14 or higher.

NOTICE

Data loss

When you load a project with the "Upgrade or downgrade Firmware" option, the operating system of the HMI device is updated. All data on the HMI device, including the HMI device password, is deleted in the process. Settings in the Start Center are retained. License keys are backed up to the external storage medium before the operating system update.

Back up your data before the load operation, if necessary.

1. Touch the "Service & Commissioning" icon.

2. Press the "Project Download" button.

With "Project Download", you have the option of loading an individual project from an external storage medium into the HMI device.

3. Select the storage medium on which the data is backed up.

4. Select the project file.

If no storage medium is inserted into the HMI device, the "Projects" list is empty.

5. Select the options for the project download:

- "User administration:"
Overwrite the user administration on the HMI device with the user administration of the project
- "Recipe data:"
Overwrite recipes of the HMI device with the recipes of the project
- "Upgrade or downgrade Firmware:"
Update firmware on the HMI device if the firmware version of the HMI device is incompatible with the firmware version of the project

6. Use the "Accept" button to confirm.

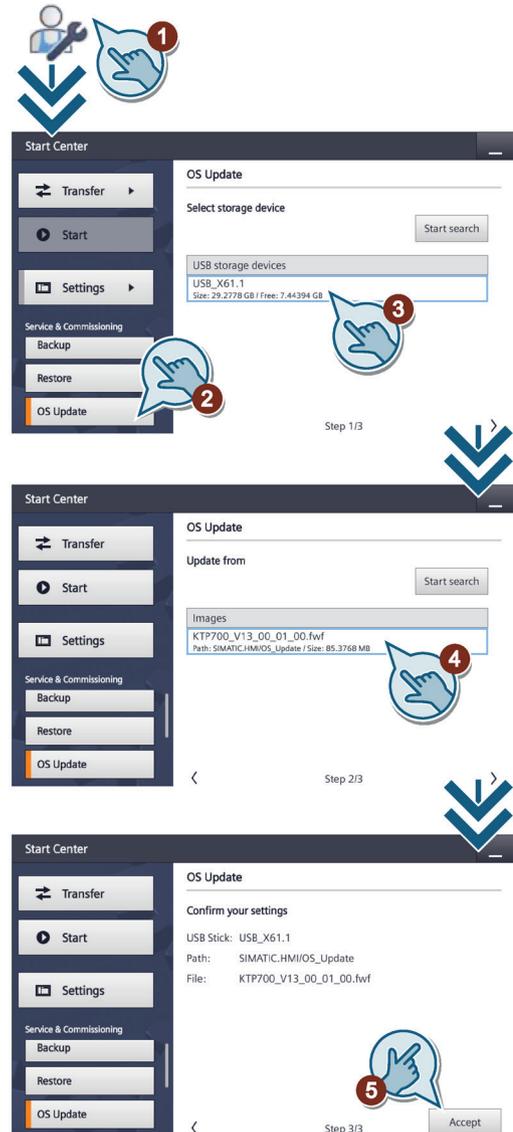
The project is loaded into the HMI device.



5.6 Update operating system from external storage medium

1. Touch the "Service & Commissioning" icon.
2. Press the "OS Update" button.
With "OS Update", you update the operating system of the HMI device that is present as an image on an external storage medium.
3. Select the storage medium on which the image is stored.
4. Select the image file. The path is displayed.
If no storage medium is inserted into the HMI device, the File name and Path fields are empty.
5. Use the "Accept" button to confirm.

The operating system is updated and the Transfer screen is displayed.



5.7 Changing the IP address and device name of a controller

1. Touch the "Service & Commissioning" icon.

2. Press the "Assign PLC Address" button.

With "Assign PLC Address" you can assign configuration-independent IP addresses and device names to controllers that are connected to the HMI device.

The address assignment is available only for controllers of type S7-1200 (> V2.0) and S7-1500.

The "IP address is set directly at the device" option must be enabled in the configuration of the controller.

3. Specify the MAC address of a controller or select automatic search:

- "MAC Address": Indicate a specific controller
- "Accessible devices in target subnet": Find all accessible controllers in the subnet of the HMI device

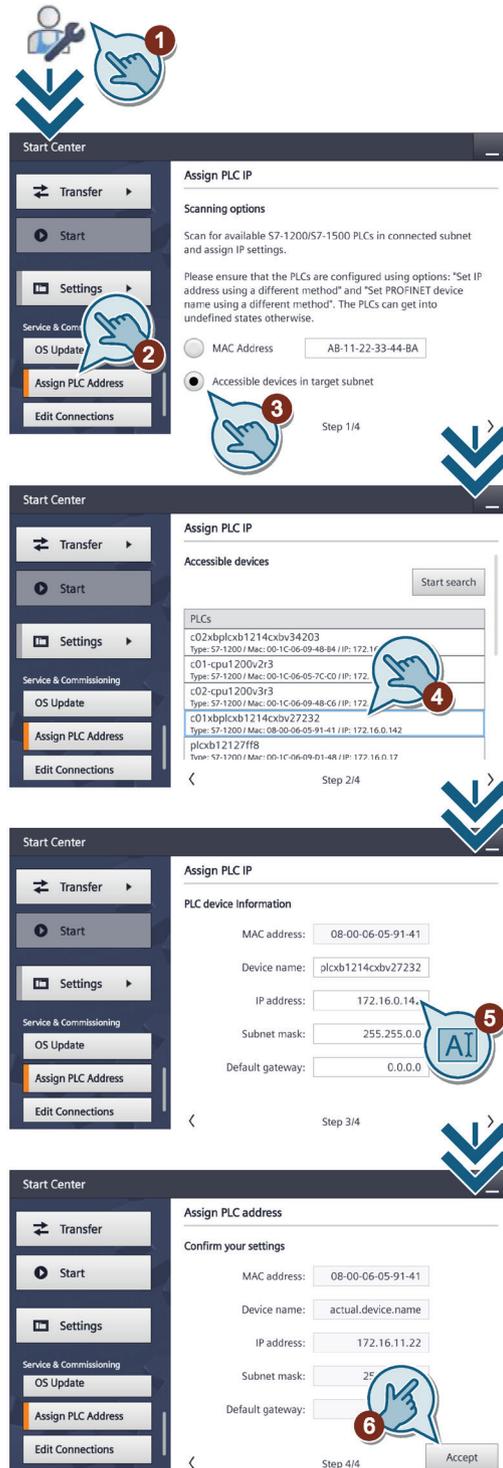
4. If you have selected automatic search, all controllers that were found are displayed in a list in the next window.

Select a controller from the list.

5. Change the IP address and device name of the selected controller.

6. Use the "Accept" button to confirm.

The displayed IP address and device name are assigned to the controller.



5.8 Editing communication connections

1. Touch the "Service & Commissioning" icon.
2. Press the "Edit Connections" button.
With "Edit Connections", you overwrite the parameters of configured controller connections in the current project.
3. A list shows all communication connections to controllers.
Select a communication connection from the list.
4. The configured name and IP address are displayed.
You can enter a new IP address.
5. Set the "Override" switch to "ON".
The connection parameters will only be overwritten if "Override" is enabled.
6. Use the "Accept" button to confirm.
The configured IP address is overwritten.



See also

Connecting the controller (Page 37)

5.9 Configuring the time server

The HMI device has a buffered realtime clock. The realtime clock is set by using the configuration or by using a time server.

To obtain the time of the HMI device from a time server (only for PROFINET devices), you can specify up to four different time servers. The time-of-day is synchronized via the "Network Time Protocol" (NTP). The availability of the time server is displayed.

Also specify the update cycle of the time-of-day and, if necessary, a time shift. Update cycle and time shift are valid for all configured time servers.

Note

A time shift is configured in another window; see section "Enter time and date (Page 63)".

1. Touch the "Date & Time" icon.
2. Set the "Use NTP" switch to "ON" in order to enable time-of-day synchronization.
3. Under "Update Rate", specify the time interval at which the time of day will be synchronized.

Value range:

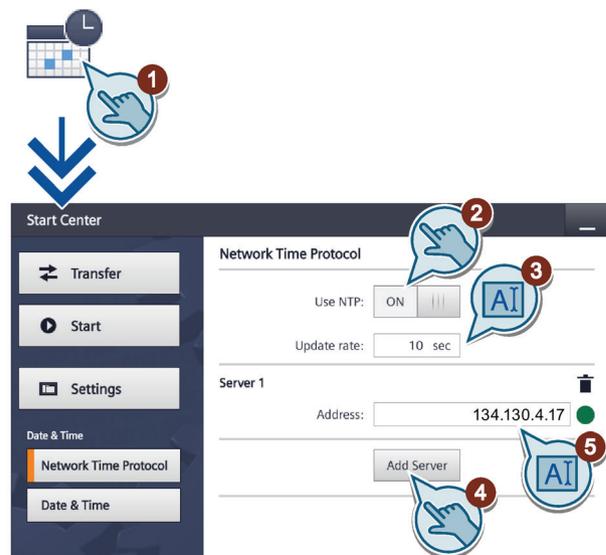
10 ... 86400 sec. (1 day)

4. Add a time server using the "Add Server" button.
5. Enter the IP address of the time server under "Address".

The connection to the server is established.

You can detect the availability of the server by the green or red symbol.

With the  button, you remove the corresponding time server from the configuration.

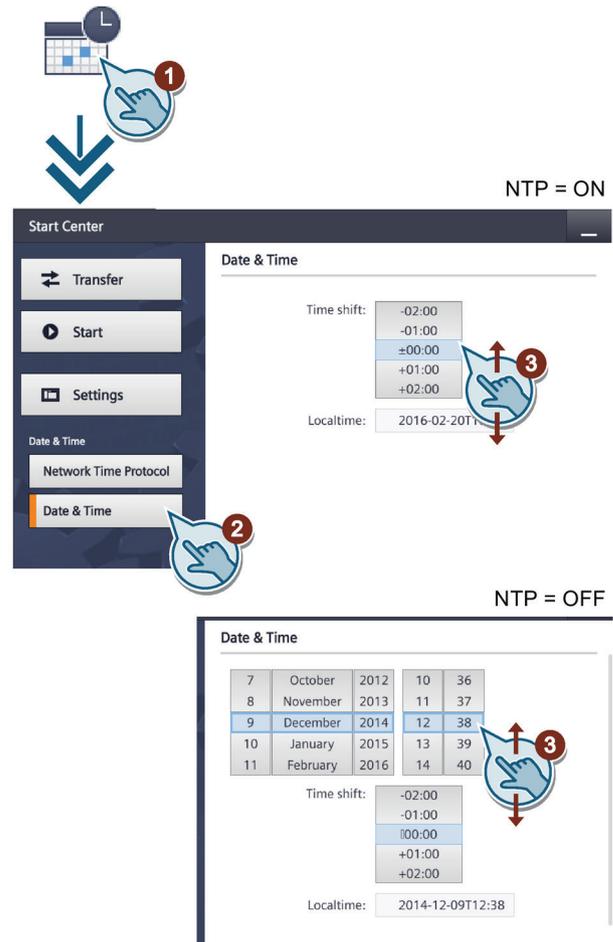


5.10 Enter time and date

1. Touch the "Date & Time" icon.
2. Press the "Date & Time" button.
3. If you are using a time server (NTP=ON), set a time shift with the selection wheel under "Time shift", if required.

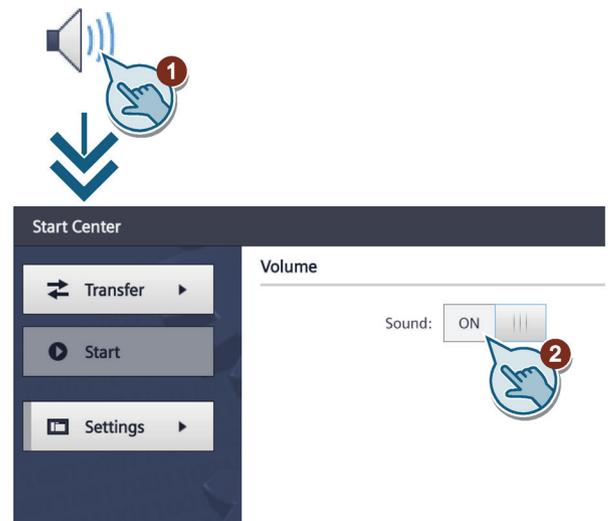
If you are not using a time server (NTP=OFF), set the desired time and the desired time shift with the selection wheel.

The resulting local time is displayed under "Localtime".



5.11 Activating the acoustic signal

1. Touch the "Sounds" icon.
 2. Set the "Sound" switch to "ON".
- Once you have set "Sound" to "ON", you receive acoustic feedback when you touch the touch screen in the active project.



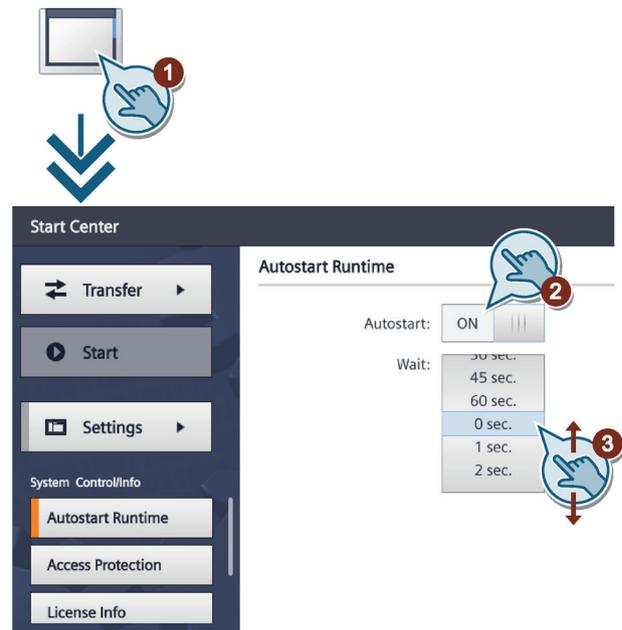
5.12 Configuring Autostart or wait time

You specify in the "System Control/Info" dialog whether the project starts immediately after the device powers up or after a wait time.

1. Touch the "System Control/Info" icon.
2. Set the "Autostart" switch to "ON".
3. Set the wait time with the selection wheel under "Wait".

The wait time is the time in seconds between the appearance of the Start Center and the automatic start of the project.

Value range: 0 ... 60 sec.



Note

Immediate start of the project with a delay time of 0 seconds

The project starts immediately if a delay time of 0 seconds is set. It is now no longer possible to call the Start Center after switching on the HMI device. To handle this situation, you need to configure an operating element with the "Close project" function.

5.13 Changing the password settings

Password protection prevents unauthorized access to the Start Center.

Note

The password must not contain spaces or the following special characters:

* ? . % / \ ' " .

If the password is no longer available for the Start Center, you first have to update the operating system before you can make any changes in the Start Center. All data on the HMI device will be overwritten when you update the operating system.

Enabling password protection

1. Touch the "System Control/Info" icon.
2. Press the "Access Protection" button.
3. Enter a password in the "Password" text box. Touch the text box. The alphanumerical screen keyboard is displayed.
4. Confirm the password in the "Confirm Password" text box.



Disabling password protection

1. Touch the "System Control/Info" icon.
2. Press the "Access Protection" button.
3. Delete the entries in the "Password" text box.
4. Delete the entries in the "Confirm Password" text box.



5.14 Displaying licensing information for the HMI device

1. Touch the "System Control/Info" icon.
2. Press the "License Info" button to display license information for the HMI device software.

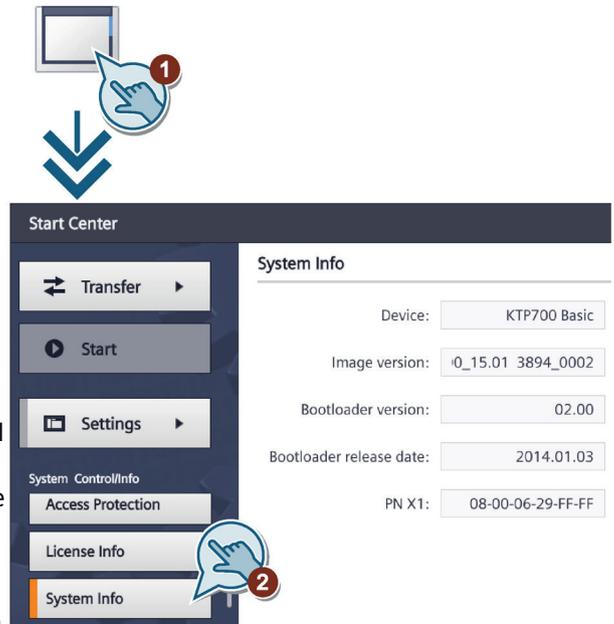


5.15 Displaying information about the HMI device

1. Touch the "System Control/Info" icon.
2. If required, shift the bookmarks up in the navigation area and change to the "System Info" tab.

The "System Info" tab is used to display specific information on the HMI device. You will need this information when contacting Technical Support.

- "Device": HMI device name
- "Image version": Version of the HMI device image
- "Bootloader version": Version of the bootloader
- "Bootloader release date": Release date of the boot loader
- "PN X1": MAC address, only for HMI devices with PROFINET interface



5.16 Change network settings of PROFINET devices

Note

Communication errors caused by IP address conflicts

Communication errors can occur if several devices in a network share the same IP address. Assign a unique IP address to every HMI device in the network.

If the IP settings are changed, the HMI device checks when the settings are applied whether the IP address is unique in the network. If not, an error message is displayed.

1. Touch the "Network Interface" icon.
2. Choose either automatic address assignment via "DHCP", or user-specific address assignment.
3. If you assign the address yourself, enter valid values with the screen keyboard in the entry fields "IP address", "Subnet mask" and possibly "Default gateway".
4. Select the transmission mode and speed in the PROFINET network in the "Mode and speed" selection box under "Ethernet parameters".
Valid values are 10 Mbps or 100 Mbps and "HDX" (half duplex) or "FDX" (full duplex).
If you select the "Auto Negotiation" entry, the transmission mode and speed in the PROFINET network will be automatically detected and set.
5. If the "LLDP" switch is selected, the HMI device exchanges information with other HMI devices.
6. Enter a network name for your HMI device in the "Device name" field under "Profinet".



The PROFINET device name must meet the following conditions:

- A maximum of four blocks with up to 63 characters each. Example: "Press1.Fender.Bodywork.Hall3"
- Characters "a" to "z", numbers "0" to "9"; special characters "-" and "."

5.17 Change network settings of PROFIBUS devices

Note

The settings for MPI or PROFIBUS DP communication are defined in the HMI device project. Edit the transfer settings only in the following situations:

- Initial transfer of a project.
- If changes are made to the project but are only applied later

1. Touch the "Network Interface" icon.
2. Enter the bus address for the HMI device in the "Address" text box. The bus address must be unique within the MPI/PROFIBUS DP network.
3. Enter the time limit for the PROFIBUS communication in the "Time-out" text box.
Valid values are 1 s, 10 s, 100 s.
4. Select the profile from the "Profile" selection box.
5. Select the transmission rate from the "Transmission rate" text box.
6. Enter the highest station address on the bus in the "Highest station address" text box. Valid range of values: 1 to 126.
7. The PROFIBUS profile data is displayed under "Bus parameters..."

Profibus

Station Parameters

Address: 1

Time-out: 10 s

Network Parameters

Profile: DP

Transmission rate: 1,5 Mbits/s

Highest station address: 126

Bus Parameters

Tslot:	300 tBit	Trdy:	11 tBit
Min Tsdr:	11 tBit	Tid1:	37 tBit
Max Tsdr:	150 tBit	Tid2:	150 tBit
Tset:	1 Tbit		
Tqui:	0 Tbit		
Gap factor:	10		
Retry limit:	1		

5.18 Assigning transfer parameters

You must enable one data channel to transfer a project to the HMI device.

Note

After the project transfer, you can protect the HMI device against unintentional overwriting of the project data and HMI device image by locking the data channel again ("Enable transfer = OFF").

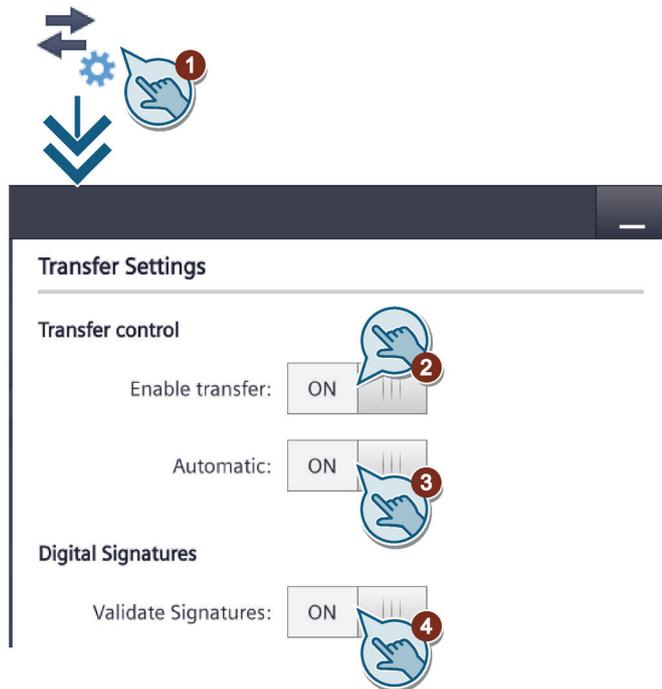
1. Touch the "Transfer Settings" icon.

2. Set the "Enable transfer" switch to "ON".

3. To enable automatic transfer, switch "Automatic" to "ON".

When the automatic transfer is activated, you can start a transfer from the configuring PC while the project is running. The running project is closed in this case and the new project is transferred.

The new project starts after it is transferred.



4. To select the check of the signature during transfer of an HMI device image, select "Validate Signatures" = "ON".

This function is available in connection with an HMI device image that is compatible with WinCC (TIA Portal) V14 or higher. Image signatures are checked starting with V14. If you transfer an image that is compatible with a version before V14, an error message is displayed.

To transfer an unsigned image that is compatible with a version before V14, select "Validate Signatures" = "OFF".

See also

Change network settings of PROFIBUS devices (Page 69)

Change network settings of PROFINET devices (Page 68)

5.19 Configure Sm@rt Server

Requirement

- A Basic Panel with PROFINET interface and an HMI device image compatible with WinCC (TIA Portal) V14 or higher.
- The HMI device has a Sm@rt Server license that was transferred to the HMI device via the Automation License Manager. As of WinCC (TIA Portal) V17, a Sm@rt Server license is no longer required.
- The HMI device has a project that was compiled with option "Runtime settings > Services > Remote control > Start Sm@rtServer".

Procedure

1. Touch the "Internet Settings" icon.

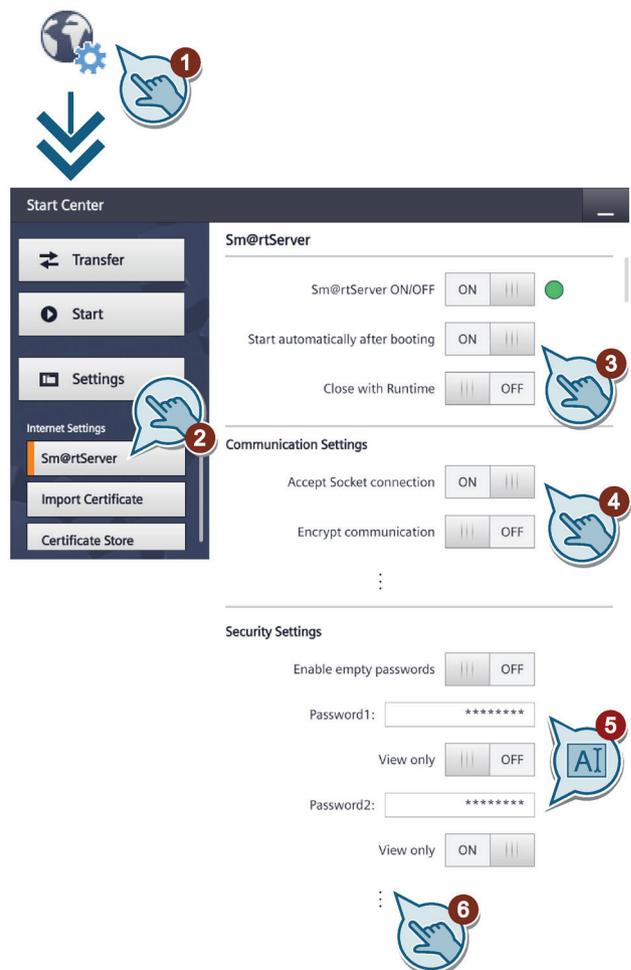
2. Press the "Sm@rtServer" button.

3. Select "Start automatically after booting" if the Sm@rtServer is to be started together with the HMI device instead of later with the project. Select "Close with Runtime" if the Sm@rtServer is to be closed together with the project.

4. Make sure that the "Accept Socket connection" switch is in the "ON" position. Otherwise, a client connection to the Sm@rtServer is not possible.

5. Assign secure passwords for Password 1 and Password 2 for access of the Sm@rtClients and select the "View only" checkbox if a Sm@rtClient is only permitted to observe the HMI device with this password. Always change the default passwords.

6. Make other settings, if necessary, such as the ports. You can find additional information on the settings in manual "WinCC Advanced > Visualize processes > Options > WinCC Sm@rtServer > Basics > Settings for Sm@rt options > Configurations on the HMI device > 'Sm@rtServer: Current User Properties' dialog".



5.20 Importing a certificate via USB

The use of certificates increases the information security of web-based communication, e.g. communication between a Sm@rtClient and the Sm@rtServer.

Requirement

- A Basic Panel with PROFINET interface and an HMI device image compatible with WinCC (TIA Portal) V14 or higher.
- A USB memory device with a valid certificate is connected to the Basic Panel.

Procedure

1. Touch the "Internet Settings" icon.
2. Press the "Import Certificate" button.
3. Select the desired certificate.
4. If the certificate is password-protected, enter the password for the certificate under "Password".
5. Press the "Import" button.



5.21 Managing certificates

Requirement

- A Basic Panel with PROFINET interface and an HMI device image compatible with WinCC (TIA Portal) V14 or higher.
The "Trust" button is available with an HMI device image compatible with WinCC (TIA Portal) V17 or higher.
- A USB memory device is connected to the Basic Panel.

Procedure

1. Touch the "Internet Settings" icon.
2. Press the "Certificate Store" button.
3. Select the desired certificate.
4. If you want to display information about the selected certificate, press the "Details" button.
Use the "Trust" button (*) to mark the certificate as "trusted".
You can delete the selected certificate on the HMI device using the "Delete" button.
5. To close the detailed view of the certificate, press the "Back" button.
You can delete the selected certificate on the HMI device using the "Delete" button.

(*) The "Trust" button is available in connection with an HMI device image that is compatible with WinCC (TIA Portal) V17 or higher.



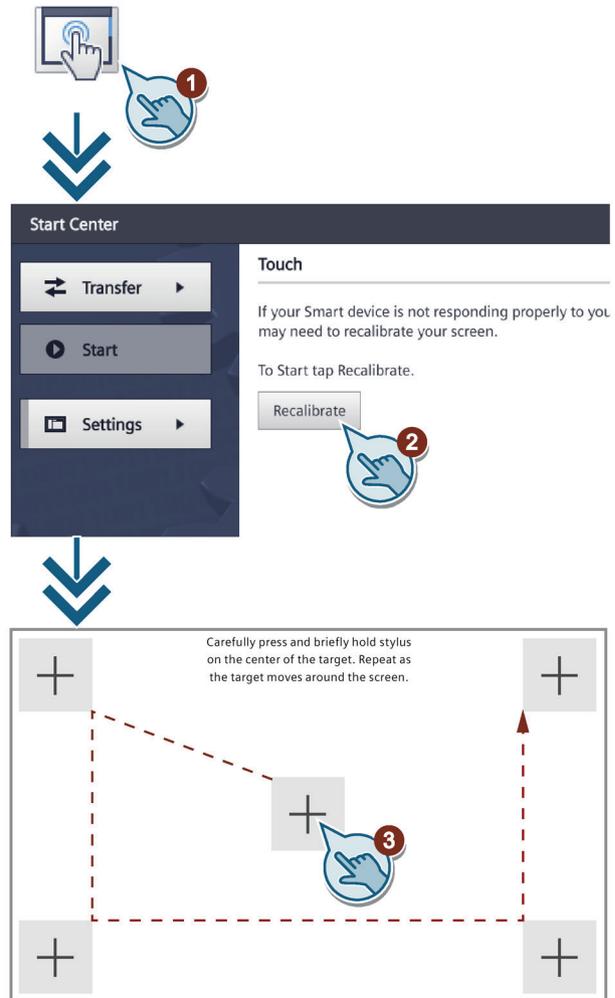
5.22 Calibrating the touch screen

1. Touch the "Touch" icon.
2. Press the "Recalibrate" button and then press any spot on the touch screen within the next 15 seconds.

3. Touch the five calibration crosses one after the other.

If you have not touched a calibration cross within the expected range, calibration will start once again.

If you have touched all calibration crosses within the expected range, calibration is complete and will be saved.



5.23 Changing the monitor settings

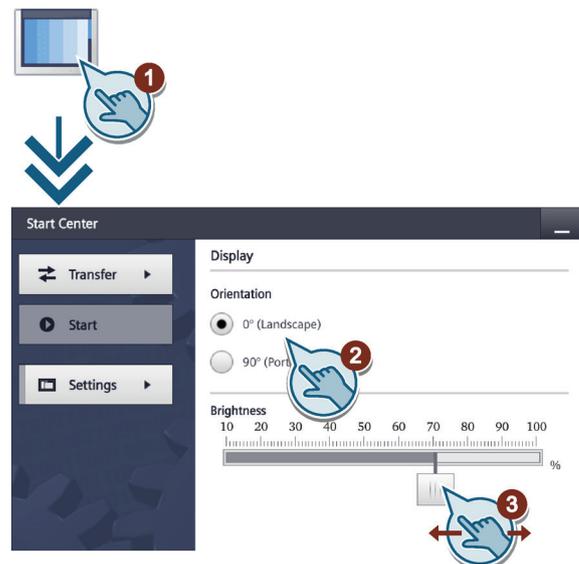
Note

Orientation of the screen in landscape or portrait

The screen orientation is defined by the configuration engineer in the course of project creation. The appropriate screen orientation is set automatically when you transfer the project to the HMI device.

Do not make any changes to the screen orientation if a project exists on the HMI device with a different orientation. The screen content may otherwise be truncated.

1. Touch the "Display" icon.
2. Select the screen orientation:
 - "0° (Landscape)" for landscape
 - "90° (Portrait)" for portrait format
3. Use the "Brightness" slider to set the screen brightness. Value range: 10 ... 100%



You can set the display brightness of the HMI device to a value between 0% and 100% with the "SetBrightness" system function. If the brightness is set to 0% and the screen saver switches on, touching the display or a key will switch off the screen saver. The brightness then changes back to the value that was set before the system function was called.

If the "Display" dialog is opened in the Start Center after use of the "Set Brightness" function, a brightness between 1 and 10% is set to 10%. Otherwise, the brightness is set to the value stored in the Start Center.

5.24 Setting the screen saver

Note

Burn-in effect

The screen contents may leave a faint version (ghost) of the image in the background if they appear for too long.

The "ghost" will disappear automatically after some time. The longer the same content is displayed on the screen, the longer it will take for the burn-in effect to disappear.

The screen saver helps to prevent burn-in.

Always use the screen saver.

1. Touch the "Screensaver" icon.

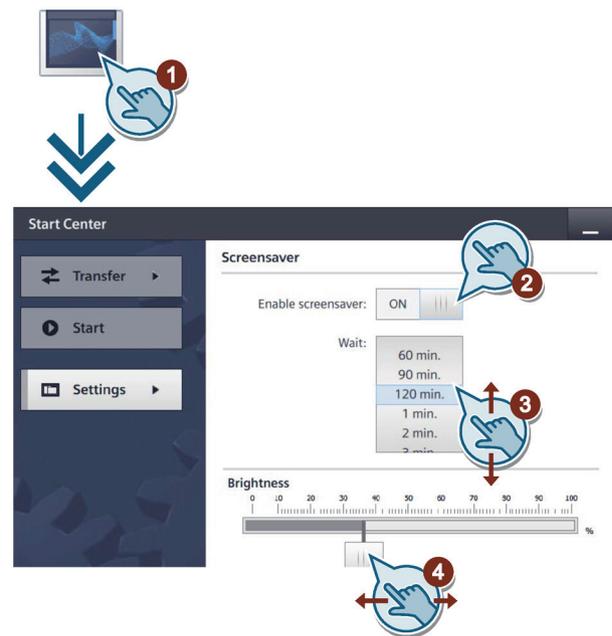
2. Switch on the screensaver with "Enable screensaver".

3. Enter the number of minutes with the selection wheel before the screen saver is to be activated under "Wait".

You may select values between 1 and 120 minutes.

4. Use the "Brightness" slider to set the screen brightness for when the screensaver is active.

Possible values: 0% (black screen), integer value between 10% and 100%.



Commissioning a project

6.1 Overview

Configuration phase

A project – the process image of the working process – is created during configuration to visualize automated working processes. The process displays for the project contain displays for values and messages which provide information about process statuses. The process control phase follows the configuration phase.

Process control phase

The project must be transferred to the HMI device if it is to be used in process control. Another prerequisite for process control is that the HMI device is connected online to a controller. Current working processes - operating and observing - can then be subject to process control.

Transferring the project to the HMI device

You can transfer a project to an HMI device as follows:

- Transfer from the configuration PC
- Restore from a PC using ProSave

In this case, an archived project is transferred from a PC to the HMI device. The configuration software does not need to be installed on the PC.

ProSave is a service tool that enables you to manage data on your HMI device. With ProSave, you can update the operating system of the HMI device, for example, or backup its data.

- Pack & Go

A project is transferred by means of a storage medium to the HMI device using a PC with ProSave. The configuration software does not need to be installed on the PC.

Commissioning and recommissioning

Initial startup and recommissioning differ in the following respects:

- With initial startup, there is not project on the HMI device.
The HMI device is also in this state after the operating system has been updated.
- When recommissioning, any project already on the HMI device is replaced.

6.2 Operating modes

Operating modes

The HMI device may be in the following operating modes:

- Offline
- Online
- Transfer

"Offline mode" and "Online mode" can be set on both the configuration PC and the HMI device. To set these modes on the HMI device, use a corresponding operating element of the project.

Changing the operating mode

The configuration engineer must have configured an appropriate operating element to allow a change of the operating mode on the HMI device during ongoing operation.

Additional information may be available in your system documentation.

"Offline" operating mode

In this mode, there is no communication between the HMI device and the controller. Even though the HMI device can be operated, it cannot exchange data with the controller.

"Online" operating mode

In this mode, the HMI device and the controller communicate with each other. You can operate the system on the HMI device according to your system configuration.

"Transfer" mode

In this mode, you can transfer a project from the configuration PC to the HMI device, for example, or backup and restore HMI device data.

The following options are available for setting "Transfer" mode on the HMI device:

- When the HMI device starts up
Start "Transfer" mode manually in the HMI device Loader.

- During ongoing operation

Start the "Transfer" mode manually within the project using an operating element. The HMI device toggles to "Transfer" mode when automatic mode is set and a transfer is initiated on the configuration PC.

6.3 Data transmission options

Overview

The following table shows the options for data transfer between the HMI device and the configuration PC.

Action	Data channel	Basic Panels DP	Basic Panels with PROFINET interface
Backup/restore, Update operating system, Transfer project	MPI/PROFIBUS DP	Yes	-
	PROFINET	-	Yes
	USB	Yes	Yes
Update operating system with "Reset to factory settings"	MPI/PROFIBUS DP	-	-
	PROFINET	-	Yes
	USB	Yes	Yes
Assign IP address and device name, edit communication connections	PROFINET	-	Yes

6.4 Transfer

6.4.1 Overview

Transfer the executable project from the configuration PC to the HMI device.

You can start the "Transfer" mode manually or automatically on the HMI device.

Transferred data is written directly to internal flash memory of the HMI device. Assign parameters of a corresponding data channel before you start the transfer.

6.4.2 Starting the manual transfer

Introduction

You can manually switch the HMI device to "Transfer" mode as follows:

- At runtime, using a configured operating element.
- In the Start Center of the HMI device.

Requirements

- The project is open in WinCC.
- The project is compiled.
- The HMI device is connected to a configuration PC.
- The data channel parameters are assigned on the HMI device.
- The HMI device is in "Transfer" mode.

Procedure

If you are loading a project to an HMI device for the first time, the "Advanced loading" dialog is automatically opened. You configure the appropriate interface parameters in this dialog.

For further information, refer to the WinCC documentation.

Proceed as follows:

1. If you want to load a project simultaneously to several HMI devices, use multiple selection to select all the desired HMI devices in the project tree.
2. Select the "Load to device > Software" command in the shortcut menu of an HMI device.
3. When the "Advanced loading" dialog appears, configure the "Settings for loading":
 - Select the interface via which the project will be loaded.
 - Configure the corresponding interface parameters.
 - Click on "Load".

You can open the "Advanced loading" dialog at any time with the menu command "Online > Advanced loading to device...".

The "Load Preview" dialog opens. The project is compiled at the same time. The result is displayed in the "Load Preview" dialog.

4. Check the displayed default settings and edit them, if necessary.
5. Click on "Load".

Result

The project is available on the HMI device following successful transfer. If the "Autostart" function is activated in the Start Center, the transferred project is started automatically.

6.4.3 Starting the transfer automatically

Introduction

If automatic transfer is activated, the HMI device automatically changes to "Transfer" mode at runtime as soon as a transfer is started on the connected configuration PC.

Automatic transfer is particularly suited for the test phase of a new project because transfer is completed without interfering with the HMI device.

Note

If automatic transfer is activated on the HMI device and a transfer is initiated on the configuration PC, the project currently running is automatically stopped. The HMI device then automatically switches to "Transfer" mode.

After the commissioning phase, deactivate the automatic transfer so that the HMI device cannot be inadvertently switched to transfer mode. Transfer mode can trigger unintentional actions in the system.

You can issue a password in the Start Center to restrict access to the transfer settings and thus avoid unauthorized modifications.

Requirements

- The project is open in WinCC.
- The project is compiled.
- The HMI device is connected to a configuration PC.
- The data channel parameters are assigned on the HMI device.
- The automatic transfer is enabled in the Start Center.

Procedure

If you are loading a project to an HMI device for the first time, the "Advanced loading" dialog is automatically opened. You configure the appropriate interface parameters in this dialog.

For further information, refer to the WinCC documentation.

Proceed as follows:

1. If you want to load a project simultaneously to several HMI devices, use multiple selection to select all the desired HMI devices in the project tree.
2. Select the "Load to device > Software" command in the shortcut menu of an HMI device.

3. When the "Advanced loading" dialog appears, configure the "Settings for loading":
 - Select the interface via which the project will be loaded.
 - Configure the corresponding interface parameters.
 - Click on "Load".

You can open the "Advanced loading" dialog at any time with the menu command "Online > Advanced loading to device...".

The "Load Preview" dialog opens. The project is compiled at the same time. The result is displayed in the "Load Preview" dialog.

4. Check the displayed default settings and edit them, if necessary.
5. Click on "Load".

Result

The configuration PC checks the connection to the HMI device. The HMI device shuts down the current project and automatically changes to "Transfer" mode. The project is transferred to the HMI device. An error message is displayed on the configuration PC if the connection is not available or disrupted.

The project is available on the HMI device following successful transfer. The transferred project is started automatically.

6.4.4 Testing a project

Introduction

You have the following options to test a project:

- Test the project on the configuration PC

You can test a project on a configuration PC, using a simulator. You can find more detailed information on this in the WinCC online help.

- Offline testing of the project on the HMI device

Offline testing means that communication between the HMI device and controller is down while the test is being carried out.

- Online testing of the project on the HMI device

Online testing means that the HMI device and the controller communicate with each other during testing.

Perform the tests, starting with the "Offline test", followed by the "Online test".

Note

You should always test the project on the HMI device on which the project will be used.

Check the following:

1. Check the correct layout of the screens.
2. Check the screen navigation.
3. Check the input objects.
4. Enter the tag values.

The test ensures that the project will run as you intended on the HMI device.

Requirement for offline testing

- The project has been transferred to the HMI device.
- The HMI device is in "Offline" mode.

Procedure

In "Offline" mode, you can test individual project functions on the HMI device without them being affected by the controller. Controller tags, therefore, are not updated.

Test the operating elements and visualization of the project as far as possible without connecting to the controller.

Requirement for online testing

- The project has been transferred to the HMI device.
- The HMI device is in "Online" mode.

Procedure

In "Online" mode, you can test individual project functions on the HMI device without them being affected by the controller. Controller tags are updated in this case.

You have the option to test all communication-dependent functions, for example alarms, etc.

Test the operating elements and views of the project.

6.5 Backup and restore

6.5.1 Overview

Backup and restore

You can back up and restore the following data in the internal flash memory of the HMI device with a PC:

- Project and HMI device image
- Password list
- Recipe data

Use one of the following tools for backup and restore:

- WinCC
- ProSave

General information

Note

Power failure

If a complete restore operation is interrupted due to power failure on the HMI device, the operating system of the HMI device may be deleted. In this case, you have to reset the HMI device to its factory settings.

Compatibility conflict

If an alarm is output on the HMI device warning of a compatibility conflict during the restore operation, the operating system must be updated.

Note

A data transfer can take several minutes, depending on data volume and transmission rate. Observe the status display. Do not interrupt the data transfer.

See also

Data transmission options (Page 79)

Save to external storage medium – Backup (Page 56)

Restore from external storage medium – Restore (Page 57)

6.5.2 Backup and restore using ProSave

Requirement

- The HMI device is connected to a PC on which ProSave is installed.
- The data channel parameters are assigned on the HMI device.

Procedure – Backup

1. From the Windows start menu, start ProSave on the PC.
2. Select the HMI device type in the "General" tab.
3. Select the type of interconnection for the HMI device and the PC.
Set the connection parameters.
4. Select the data to be backed up in the "Backup" tab.
 - "Complete backup" generates a backup copy of configuration data, recipe data and the HMI device image to a file in PSB format.
 - "Recipes" generates a backup copy of the HMI device's recipe data records in PSB format.
 - "User management" generates a backup copy of the HMI device's user data in PSB format.
5. Select a destination folder and a file name for the "*.psb" backup file.
6. Set "Transfer" mode on the HMI device.
If automatic transfer mode is enabled on the HMI device, the HMI device automatically sets "Transfer" mode when a backup is initiated.
7. Start the backup operation in ProSave with "Start Backup".
Follow the instructions in ProSave.
A progress bar opens to indicate the progress of the operation.

Result

The system outputs a message when the backup is completed.
A backup copy of the data is now available on the PC.

Procedure – Restore

1. From the Windows start menu, start ProSave on the PC.
2. Select the HMI device type in the "General" tab.
3. Select the type of interconnection for the HMI device and the PC.
4. Set the connection parameters.

5. Select the "*.psb" backup file to be restored from the "Restore" tab.

You can see the HMI device for which the backup file was created and the type of backup data the file contains.

6. Set "Transfer" mode on the HMI device.

If automatic transfer mode is enabled on the HMI device, the device automatically sets "Transfer" mode when a restore operation is initiated.

7. Start the restore operation in ProSave on the PC with "Start Restore".

8. Follow the instructions in ProSave.

A progress bar indicates the progress of the operation.

Result

When the restore is successfully completed, the data backed up on the PC is now on the HMI device.

6.5.3 Backup and restore using WinCC

Requirement

- The HMI device is connected to the configuration PC or the PC with ProSave.
- The HMI device is selected in the project navigation.
- If a server is used for data backup: The HMI device has access to the server.

Backup of the data of the HMI device

1. Select the "Backup" command from the "Online > HMI device maintenance" menu.
The "SIMATIC ProSave" dialog box opens.
2. Select the data to backup for the HMI device under "Data type".
3. Enter the name of the backup file under "Save as".
4. Click "Start Backup".

This starts the data backup. The backup operation takes some time, depending on the connection selected.

Restoring the data of the HMI device

1. Select the "Restore" command from the "Online > HMI device maintenance" menu.
2. Enter the name of the backup file under "Save as".
Information about the selected backup file is displayed under "Content".
3. Click "Start Restore".

This starts the restoration. This operation takes some time, depending on the connection selected.

6.6 Updating the operating system - Basic Panel DP

6.6.1 Overview

Updating the operating system

A compatibility conflict may occur when transferring a project to the HMI device. This is caused by different versions of the configuration software used and the HMI device image available on the HMI device. If there are different versions, the transfer is aborted. A message indicating a compatibility conflict is displayed on the configuration PC.

There are two ways to match the versions:

- Update the HMI device image if the project was created with the most recent version of the configuration software.
- Transfer a matching version of the HMI device image if you do not want to adapt the project for the HMI device to the most recent version of the configuration software for the project.

Note**Data loss**

All data on the HMI device, such as the project and licenses, will be deleted when you update the operating system.

Note**Calibrating the touch screen**

After the update, you may have to recalibrate the touch screen.

See also

Update operating system from external storage medium (Page 59)

6.6.2 Resetting the factory settings

In ProSave or WinCC, you can update the operating system with or without resetting to factory settings.

- Updating the operating system without reset to factory settings

First, switch into "Transfer" mode on the HMI device or use the automatic transfer function if the project is active. Then start the operating system update in ProSave or WinCC.

- Updating the operating system with reset to factory setting

Note

Data channel

When resetting to factory settings, all data channel parameters used are reset. The transfer can only be started following reconfiguration of the data channel.

See also

Data transmission options (Page 79)

6.6.3 Updating the operating system using ProSave

Requirement

- The HMI device is connected to a PC on which ProSave is installed.
- The data channel parameters are assigned on the HMI device.

Procedure

1. From the Windows start menu, start ProSave on the PC.
2. Select the HMI device type in the "General" tab.
3. Select the type of connection between the HMI device and the PC, then set the connection parameters.
4. Select the "OS Update" tab.
5. Select whether to update the operating system with or without restoring the factory settings by setting the "Reset to factory settings" check box accordingly.
6. Select the HMI device image file (file type "*.fwf") under "Image path".

The HMI device image files are available under
"Programs\Siemens\Automation\Portal V<TIA version>\Data\Hmi\Transfer\<TIA version>\Images".

The output area provides information on the version of the successfully opened HMI device image file.

7. Set "Transfer" mode on the HMI device.

If automatic transfer mode is enabled on the HMI device, the device automatically sets "Transfer" mode when an update is initiated.

8. Select "Update OS" on the PC to run the operating system update.

9. Follow the instructions in ProSave.

A progress bar indicates the progress of the operating system update.

A message is displayed when the operating system update is successfully completed and the HMI device is restarted.

Result

The transferred image is available on the HMI device.

6.7 Updating the operating system - Basic Panel with PROFINET interface

6.7.1 Overview

Updating the operating system

A compatibility conflict may occur when transferring a project to the HMI device. This is caused by different versions of the configuration software used and the HMI device image available on the HMI device. If there are different versions, the transfer is aborted. A message indicating a compatibility conflict is displayed on the configuration PC.

There are two ways to match the versions:

- Update the HMI device image if the project was created with the most recent version of the configuration software.
- Transfer a matching version of the HMI device image if you do not want to adapt the project for the HMI device to the most recent version of the configuration software for the project.

Note

Data loss

All data on the HMI device, such as the project and licenses, will be deleted when you update the operating system.

Note

Calibrating the touch screen

After the update, you may have to recalibrate the touch screen.

See also

Update operating system from external storage medium (Page 59)

6.7.2 Resetting the factory settings

In ProSave or WinCC, you can update the operating system with or without resetting to factory settings.

- Updating the operating system without reset to factory settings
First, switch into "Transfer" mode on the HMI device or use the automatic transfer function if the project is active. Then start the operating system update in ProSave or WinCC.
- Updating the operating system with reset to factory setting

Note

Data channel

When resetting to factory settings, all data channel parameters used are reset. The transfer can only be started following reconfiguration of the data channel.

See also

Data transmission options (Page 79)

6.7.3 Updating the operating system using ProSave

Requirement

- The HMI device is connected to a PC on which ProSave is installed.
- The data channel parameters are assigned on the HMI device.

Procedure

1. From the Windows start menu, start ProSave on the PC.
2. Select the HMI device type in the "General" tab.
3. Select the type of connection between the HMI device and the PC.
4. Set the connection parameters.
5. Select the "OS-Update" tab.
6. Select the HMI device image file (file type "*.fwf") under "Image path".

The HMI device image files are available under "Programs\Siemens\Automation\Portal V<TIA version>\Data\Hmi\Transfer\<TIA version>\Images".

The output area provides information on the version of the successfully opened HMI device image file.

7. Switch to "Transfer" mode on the HMI device.
If automatic transfer mode is enabled on the HMI device, the device automatically sets Transfer mode when an update is initiated.
8. Select "Update OS" on the PC to run the operating system update.
9. Follow the instructions in ProSave.
A progress bar indicates the progress of the operating system update.
A message is displayed when the operating system update is successfully completed and the HMI device is restarted.

Result

The transferred image is available on the HMI device.

6.7.4 Updating the operating system using WinCC

If possible, you should use the interface with the highest bandwidth for this connection, such as Ethernet. Updating the operating system via a serial connection can take up to an hour.

NOTICE

Updating the operating system deletes all data on the HMI device

When you update the operating system you delete data on the target system. For this reason, it is advisable to back up the following data:

- User administration
- Recipes

Resetting to factory settings also deletes the License Keys. You should also back up the License Keys before resetting to factory settings.

Requirement

- The HMI device is connected to the configuration PC.
- The appropriate data channel is configured on the HMI device.
- The HMI device is selected in the project navigation.

Procedure

1. Select the "Update operating system" command from the menu under "Online > HMI device maintenance" on the configuration PC in WinCC.

The "SIMATIC ProSave [OS-Update]" dialog opens. The path to the image of the operating system has been preset.

2. If necessary, select another path to the operating system image you want to transfer to the HMI device.
3. Click "Update OS".

This starts the update. The update operation can take time, depending on the connection selected.

The HMI device is restarted when the operating system update is successfully completed.

Result

The transferred image is available on the HMI device.

6.7.5 Resetting to factory settings with ProSave

Requirement

- The HMI device is connected with a standard Ethernet cable to a PC on which ProSave is installed.

Procedure for setting the PC interface

1. Select "Start > Control Panel > Set PG / PC interface" on the configuration PC.
2. Select "S7ONLINE (STEP7) -> TCP / IP" from the "Application access point" area.
3. Select the interface which is connected to the HMI device from the "Interface parameter assignment used" area.
4. Confirm your entries.

Procedure for resetting factory settings

1. From the Windows start menu, start ProSave on the PC.
2. Select the HMI device type from the "General" tab, and select "Ethernet" from the Connection area.
3. Enter an IP address.

Note

Possible address conflicts with incorrect IP address

Do not use a dynamic IP configuration for "Reset to factory settings".

Specify a unique IP address of the subnet in which the configuration PC is located. For the duration of the update process, the HMI device is automatically assigned to the specified address of ProSave.

If the HMI device has already been used with WinCC or ProSave use the existing IP address for "Reset to factory settings".

4. Change to the "OS-Update" tab.
5. Select the "Reset to factory settings" check box.
6. Select the HMI device image file (file type "*.fwf") under "Image path".

The HMI device image files are available in the WinCC installation folder under "Programs\Siemens\Automation\Portal V<TIA version>\Data\Hmi\Transfer\<TIA version>\Images" or on the WinCC installation DVD.

The output area provides information on the version of the successfully opened HMI device image file.

7. Select "Update OS" on the PC to start the "Reset to factory settings" process.
8. Follow the instructions in ProSave.

A progress bar indicates the progress of the operating system update.

A message is displayed when the operating system update is successfully completed and the HMI device is restarted.

Result

The transferred image is available on the HMI device. The factory settings are reset.

Note

If you can no longer open the Start Center on the HMI device because the operating system is missing, carry out the steps described above to reset the device to the factory settings and try again.

Note

Calibrating the touch screen

When the restore operation has been completed, you may have to recalibrate the touch screen.

6.7.6 Resetting to factory settings with WinCC

NOTICE
Updating the operating system deletes all data on the HMI device
When you update the operating system you delete data on the target system. For this reason, it is advisable to back up the following data:
<ul style="list-style-type: none">• User administration• Recipes

Note

The following is required to restore factory settings using Ethernet:

- Available IP address
- PG/PC interface of the configuration PC that is set to Ethernet TCP/IP

You configure the PG/PC interface using the Control Panel of the configuration PC. Select "S7ONLINE (STEP7) -> TCP/IP" under "Application access point".

Requirement

- The HMI device is connected to the configuration PC.
- The HMI device is selected in the project navigation.

Resetting the HMI device to factory settings

1. Select the "Update operating system" command from the menu under "Online > HMI device maintenance" on the configuration PC in WinCC.

The "SIMATIC ProSave [OS-Update]" dialog opens. The path to the image of the operating system has been preset.

2. If necessary, select another path to the operating system image you want to transfer to the HMI device.
3. Enable "Restore factory settings".
4. Click "Update OS".

This starts the update. The update operation can take time, depending on the connection selected.

The HMI device is restarted when the operating system update is successfully completed.

Result

The transferred image is available on the HMI device. The factory settings are reset.

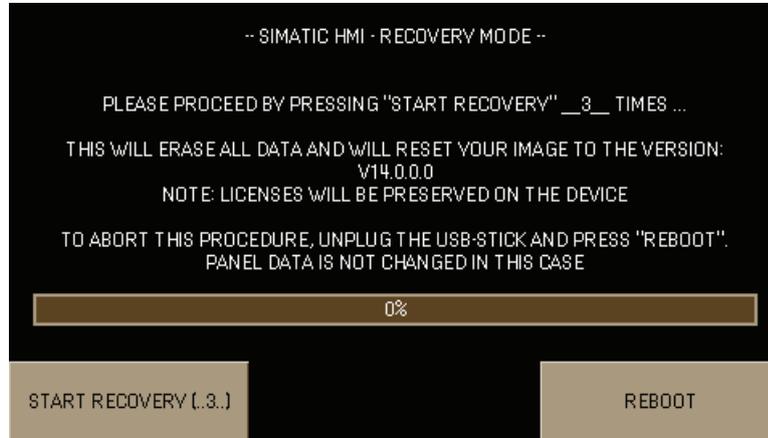
6.8 Reset to factory settings via USB

Procedure

1. Download the Recovery Software for Basic Panels from the Internet at the following address:
Recovery USB stick (<https://support.industry.siemens.com/cs/ww/en/view/109744950>)
2. Copy the Recovery Software to the main directory of a FAT32 formatted USB memory stick.
3. Switch off the HMI device.
4. Insert the USB stick into the USB port of the HMI device.

5. Switch on the HMI device.

The HMI device detects the USB stick containing the Recovery Software. The "Recovery Mode" dialog is displayed.



6. To reset the HMI device to factory settings, press the "START RECOVERY (...)" button three times in a row and follow the instructions on the display. At the end of the recovery operation, remove the USB stick and press the "REBOOT" button.

6.9 Managing WinCC options

You can install the following WinCC options on an HMI device:

- WinCC options supplied with WinCC for the Engineering System and Runtime
- WinCC options purchased in addition to WinCC for the Engineering System and Runtime

The HMI device type determines which WinCC options can be installed.

For an overview of available WinCC options, refer to "Introduction to WinCC".

Requirement

- The HMI device is connected to the configuration PC.
- The PG/PC interface is set.
- The HMI device is selected in the project tree.
- The HMI device is switched on.

Procedure

1. Select the "Options" command in the "Online > HMI device maintenance" menu.
All available WinCC options and those already installed are shown.
2. Click "Device status" to display the WinCC options installed on the HMI device.
3. To install a WinCC option on the HMI device, select the WinCC option with ">>" from the list of installed WinCC options.
4. Click "<<" to remove a WinCC option from the HMI device.
5. To start the installation or removal, click "OK".

The selected WinCC options have been installed on or removed from the HMI device.

6.10 Transferring a license key

You need a license key for WinCC options to use them on an HMI device. The required license keys are usually supplied on a storage medium, for example, on a USB stick. You can also obtain a license key from a license server.

Requirement

- The HMI device is connected to a configuration PC or a PC with the "Automation License Manager".
The "Automation License Manager" is installed automatically with WinCC.
- If you use a configuration PC:
The HMI device is selected in the project tree.

Procedure

1. Open the "Automation License Manager".
2. Start the "Automation License Manager".
 - PC without WinCC installation
Open the "Automation License Manager" from the Windows start menu
 - PC with WinCC installation
Open the "Automation License Manager" from WinCC as follows:
Select the "Authorize/License" command in the "Online > HMI device maintenance" menu.

The "Automation License Manager" starts.

3. Select the "Connect HMI device" command in the "Edit > Connect Target System" menu.
The "Connect Target System" dialog is displayed.
4. Select the "device type" of your HMI device.
5. Select the "connection".
6. Configure the corresponding "connection parameters" in line with the selected connection in the window of the same name.
7. Click "OK".

The connection to the HMI device is established. The connected HMI device is displayed in the left area of the "Automation License Manager".

8. On the left, select the drive on which the license keys are located.
The license keys are shown on the right.
9. Select the required license keys.
10. Drag-and-drop the license keys to the HMI device.

The license keys are transferred to the HMI device.

To back up the HMI device license keys, drag-and-drop the license keys from the HMI device to an available drive. License keys can also be removed from the HMI device with drag-and-drop.

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 Maintenance and care

Introduction

The HMI device is designed for maintenance-free operation. Make sure you keep the touch screen and keyboard membrane clean.

Requirement

Use a cleaning cloth dampened with a cleaning agent to clean the equipment. Only use water with a little liquid soap or a screen cleaning foam.

Note

Unintentional response

When cleaning the touch screen, an unintentional response in the controller can be triggered by touching keys.

Switch the HMI device off before cleaning to prevent unintentional responses.

Note

Damage caused by unauthorized cleaning products

The HMI device may be damaged if compressed air, steam jet blowers, aggressive solvents or scouring powders are used for cleaning purposes.

Do not clean the HMI device with compressed air or steam jet blowers. Do not use aggressive solvents or scouring powder.

Procedure

Proceed as follows:

1. Shut down the HMI device.
2. Spray the cleaning solution onto a cleaning cloth.

Do not spray directly onto the HMI device.

3. Clean the HMI device.

When cleaning the display wipe from the screen edge inwards.

7.3 Spare parts and repairs

If the HMI device needs to be repaired, ship it to the Return Center in Erlangen.
The address is:

Siemens AG
Digital Factory Retouren-Center
c/o Geis Service GmbH, Tor 1-4
Kraftwerkstraße 25a
91056 Erlangen
Deutschland

You can find more detailed information on the Internet at "Spare parts and repairs (<https://support.industry.siemens.com/cs/ww/en/sc/2110>)".

7.4 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 sound recycling and disposal of your old devices, and dispose of the device according to the relevant regulations in your country.

Technical information

8.1 Certificates and approvals

Approvals

Note

The following overview shows possible approvals.

The HMI device itself is approved as shown on the rear panel labels.

IEC 61131

The devices meet the requirements and criteria of IEC 61131-2, Programmable Logic Controllers, Part 2: Operating resource requirements and tests.

CE approval



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

- 2014/30/EU "Electromagnetic Compatibility" (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)

EU Declaration of Conformity

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

Siemens AG
 Digital Industries
 Factory Automation
 DI FA TI COS
 Postfach 1963
 D-92209 Amberg

The Declaration of Conformity and other certificates are also available at the following Internet address:

Certificates for Basic Panels 2nd Generation
<https://support.industry.siemens.com/cs/ww/en/ps/14738/cert>

UL approval



Underwriters Laboratories Inc., to

- UL 508 (Industrial Control Equipment)
- CSA C22.2 No. 142 (Process Control Equipment)

RCM AUSTRALIA/NEW ZEALAND



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

KOREA



This product satisfies the requirement of the Korean Certification (KC Mark).

이 기기는 업무용(A급) 전자파 적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며 가정 외의 지역에서 사용하는 것을 목적으로 합니다.

Note that this device conforms to Limit Class A for emission of radio interference. This device can be used in all areas except the residential area.

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 100)".

Marine approvals

The following marine approvals are provided for the device. After acceptance, the certificates will be made available under the following address on the Internet: Certificates for Basic Panels 2nd Generation (<https://support.industry.siemens.com/cs/ww/en/ps/14738/cert>)

- ABS American Bureau of Shipping (USA)
- BV Bureau Veritas (France)
- CCS (China Classification Society)
- DNV Det Norske Veritas (Norway)
- KR (Korean Register of Shipping)
- LR Lloyds Register
- NK Nippon Kaiji Kyokai (Japan)

8.2 Electromagnetic compatibility

The HMI device satisfies, among other things, the requirements of the EMC guidelines of the European domestic market.

EMC-compatible installation of the HMI device

The EMC-compliant installation of the HMI device and the application of interference-proof cable is the basis for interference-free operation.

Observed the following manuals in addition to these operating instructions:

- Designing interference-free 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>)
- PROFIBUS networks (<https://support.industry.siemens.com/cs/ww/en/view/1971286>)

Pulse-shaped disturbance

The following table shows the electromagnetic compatibility of modules with regard to pulse-shaped interference. The precondition for electromagnetic compatibility is that the HMI device meets the specifications and guidelines for electrical installation.

Pulse-shaped interference	Tested with	Degree of severity
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 signal cable with 24 V DC 2 kV signal/data cable > 30 m 1 kV signal cable < 30 m	3
High-energy single pulse (surge) in accordance with IEC 61000-4-5 ¹	Asymmetrical coupling: <ul style="list-style-type: none"> • 2 kV power cable DC voltage with protective elements • 2 kV signal cable/data cable > 30 m, with protective elements as required Symmetrical coupling: <ul style="list-style-type: none"> • 1 kV power cable DC voltage with protective elements • 1 kV signal cable > 30 m, with protective elements as required 	3

¹ External protective circuit required, see Function Manual "Designing Interference-free Controllers", section 7 "Lightning and overvoltage protection"

You can find the Function Manual "Designing interference-free controllers" for download on the Internet (<https://support.industry.siemens.com/cs/ww/en/view/59193566>).

Sinusoidal interference

The following table shows the EMC behavior of the modules with respect to sinusoidal interference. This requires the HMI device to meet the specifications and directives for electrical installation.

Sinusoidal interference	Test values
HF radiation (electromagnetic fields) according to IEC 61000-4-3	80% amplitude modulation at 1 kHz <ul style="list-style-type: none"> • To 10 V/m in the range 80 MHz to 1 GHz • To 3 V/m in the range 1.4 GHz to 6 GHz
HF current feed on cables and cable shields according to IEC 61000-4-6	Test voltage 10 V with 80% amplitude modulation at 1 KHz in the 10 KHz to 80 MHz range
Magnetic field intensity	50/60 Hz; 100 A/m RMS

Emission of radio interference

The following table shows the emitted interference from electromagnetic fields according to EN 61000-6-4, measured at a distance of 10 m.

Frequency range	Interference emission
From 30 to 230 MHz	< 40 dB (μV/m) quasi-peak
from 230 bis 1 GHz	< 47 dB (μV/m) quasi-peak
From 1 GHz to 3 GHz	< 66 dB (μV/m) peak
From 3 GHz to 6 GHz	< 70 dB (μV/m) peak

See also

EMC information in section "Notes about usage (Page 19)".

8.3 Mechanical ambient conditions

8.3.1 Transport and storage conditions

The following information is for a device that is transported and stored in its original packaging.

The device meets the requirements according to IEC 60721-3-2:2018, Class 2M4 with the following amendments and limitations:

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

8.3.2 Operating Conditions

The following information applies to a device installed according to the specifications in these operating instructions.

The HMI device is designed for stationary operation in a location protected from the effects of the weather.

The device meets the requirements according to IEC 60721-3-3:2002, Class 3M3 with the following amendments and limitations:

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

8.4 Climatic ambient conditions

8.4.1 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.

8.4.2 Transport and short-term storage

The following information applies to a device that is transported in the original packaging and weather-proof packaging, and stored from some time.

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

Type of condition	Permitted range
Temperature	-20 ... 60 °C
Atmospheric pressure	1140 ... 660 hPa, corresponds to an elevation of -1000 to 3500 m
Relative humidity	10 ... 90 %
Pollutant concentration	SO ₂ : < 0.5 ppm; relative humidity < 60% no condensation H ₂ S: < 0.1 ppm; relative humidity < 60 %, no condensation

Note

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

8.4.3 Operating conditions

The following information applies to a device installed according to the specifications in these operating instructions.

The HMI device is designed for weatherproof and stationary operation according to IEC 60721-3-3.

The device meets the requirements according to IEC 60721-3-3:2019 Class 3K22 with the following amendments and limitations:

Type of condition	Mounting position	Permitted range
Temperature, Mounting in landscape format	Vertical	0 °C to 50 °C
	Inclined, maximum inclination 35°	0 ... 40 °C
Temperature, Mounting in portrait format	Vertical	0 ... 40 °C
	Inclined, maximum inclination 35°	0 ... 35 °C
Atmospheric pressure ¹ , operation elevation	1140 ... 795 hPa, corresponds to an elevation of -1000 to 2000 m	
Relative humidity	From 10 ... 90%, no condensation at the rear of the device	
Pollutant concentration	SO ₂ : < 0.5 ppm; relative humidity < 60%, no condensation at the rear of the device	
	H ₂ S: < 0.1 ppm; relative humidity < 60%, no condensation at the rear of the device	

¹ No pressure difference is allowed inside and outside the enclosure / control cabinet

Read the Notes on use (Page 19).

Also observe the climate diagram in the following section.

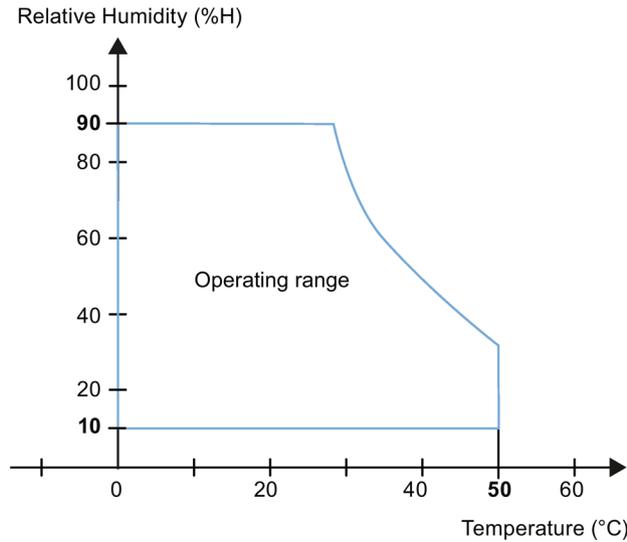
Note

The system components connected to the HMI device, the power supply for example, must also be suited to the respective operating conditions.

8.4.4 Climate diagram

The diagram below shows the extended range for temperature and humidity during continuous operation based on IEC 60721-3-3 Class 3K3.

The information applies to a device installed in landscape without inclination.



8.5 Information on insulation tests, protection class and degree of protection

Insulation test

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

Degree of pollution and overvoltage category

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

Degree of pollution	2
Overtoltage category	II

Protection class

Protection class III according to IEC 61131-2

Protection against foreign objects and water

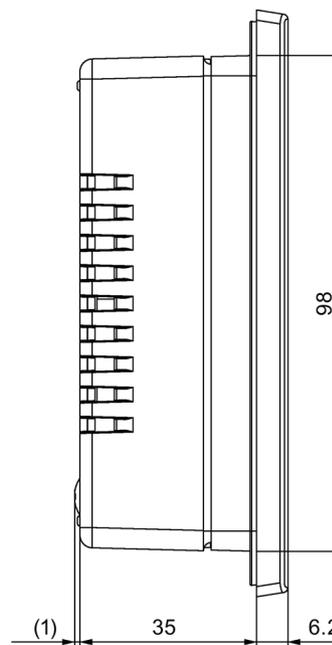
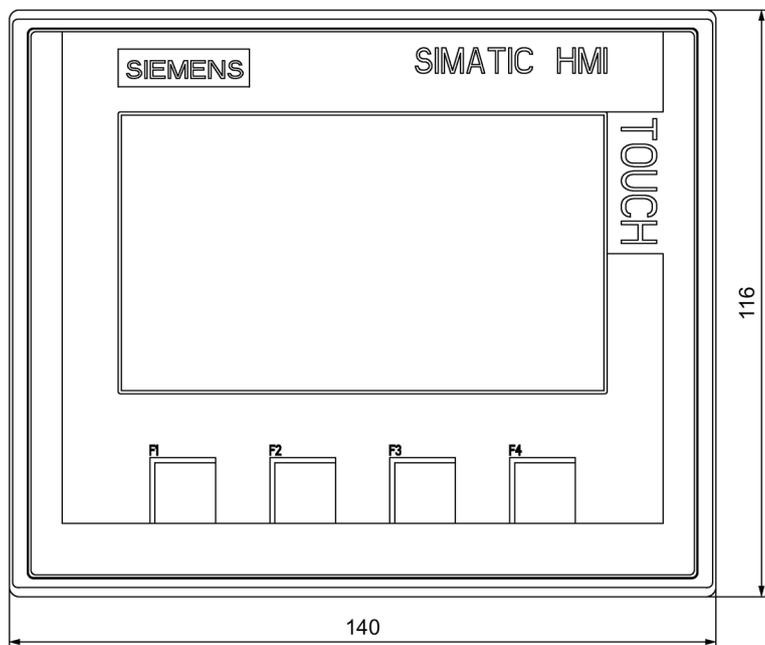
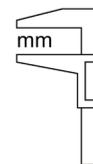
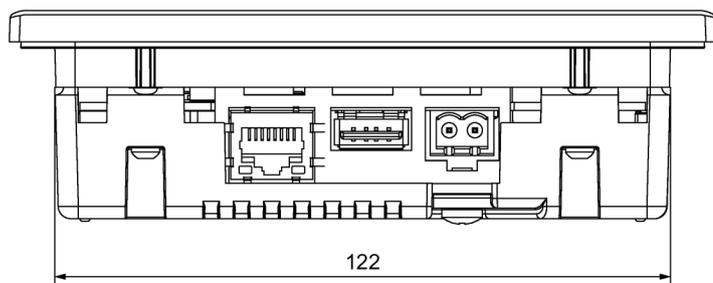
The device meets the requirements according to IEC 60529 and UL50.

Device side	Degree of protection
Front	When mounted: <ul style="list-style-type: none"> • IP65 according to IEC 60529 • Type 4X/Type 12 (indoor use only) according to UL50
Rear panel	IP20 Protection against contact with standard test probes. There is no protection against the ingress of water, dust and noxious gas.

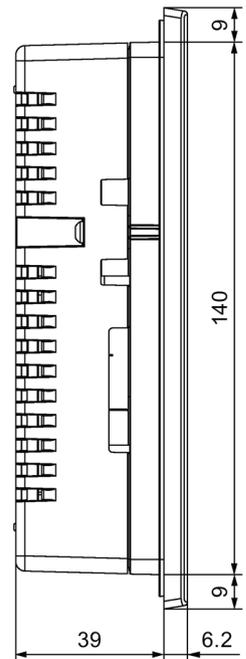
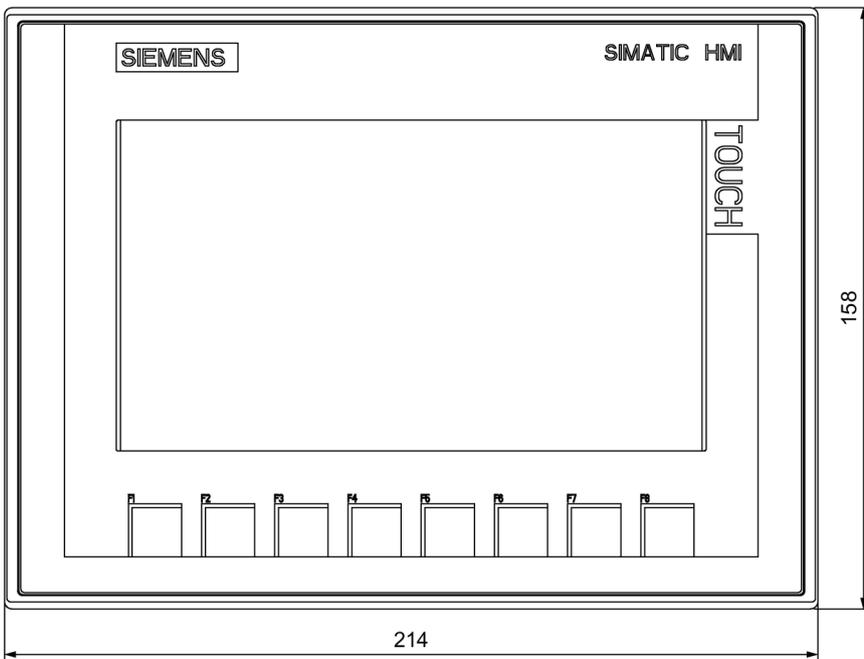
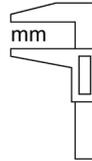
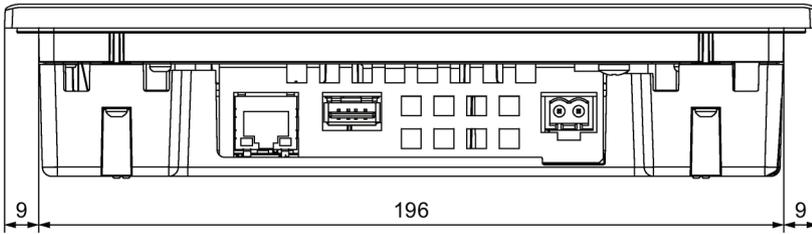
The front protection rating can only be guaranteed if the mounting seal lies flush against the mounting cutout. Read the corresponding information in section "Making the mounting cutout (Page 26)".

8.6 Dimension drawings

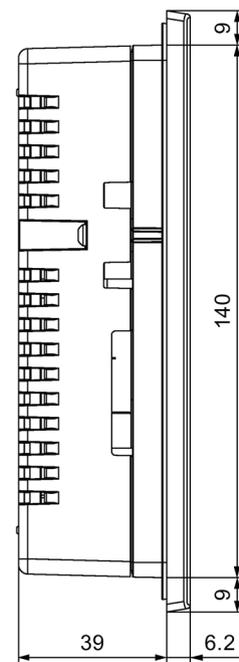
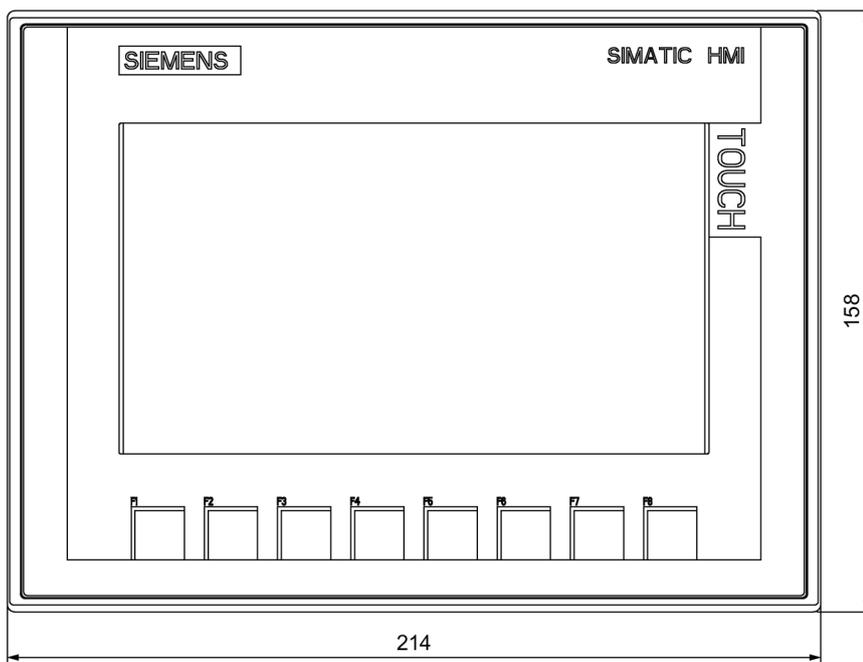
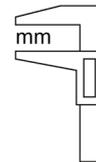
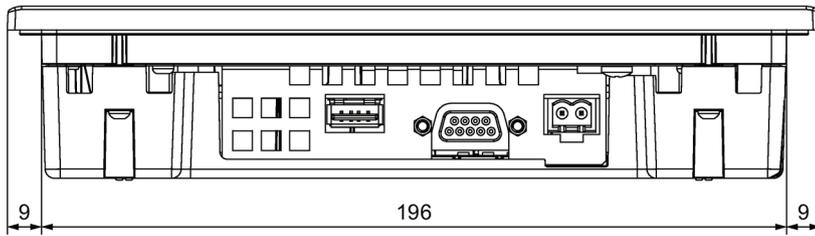
8.6.1 Dimensional drawing of KTP400 Basic



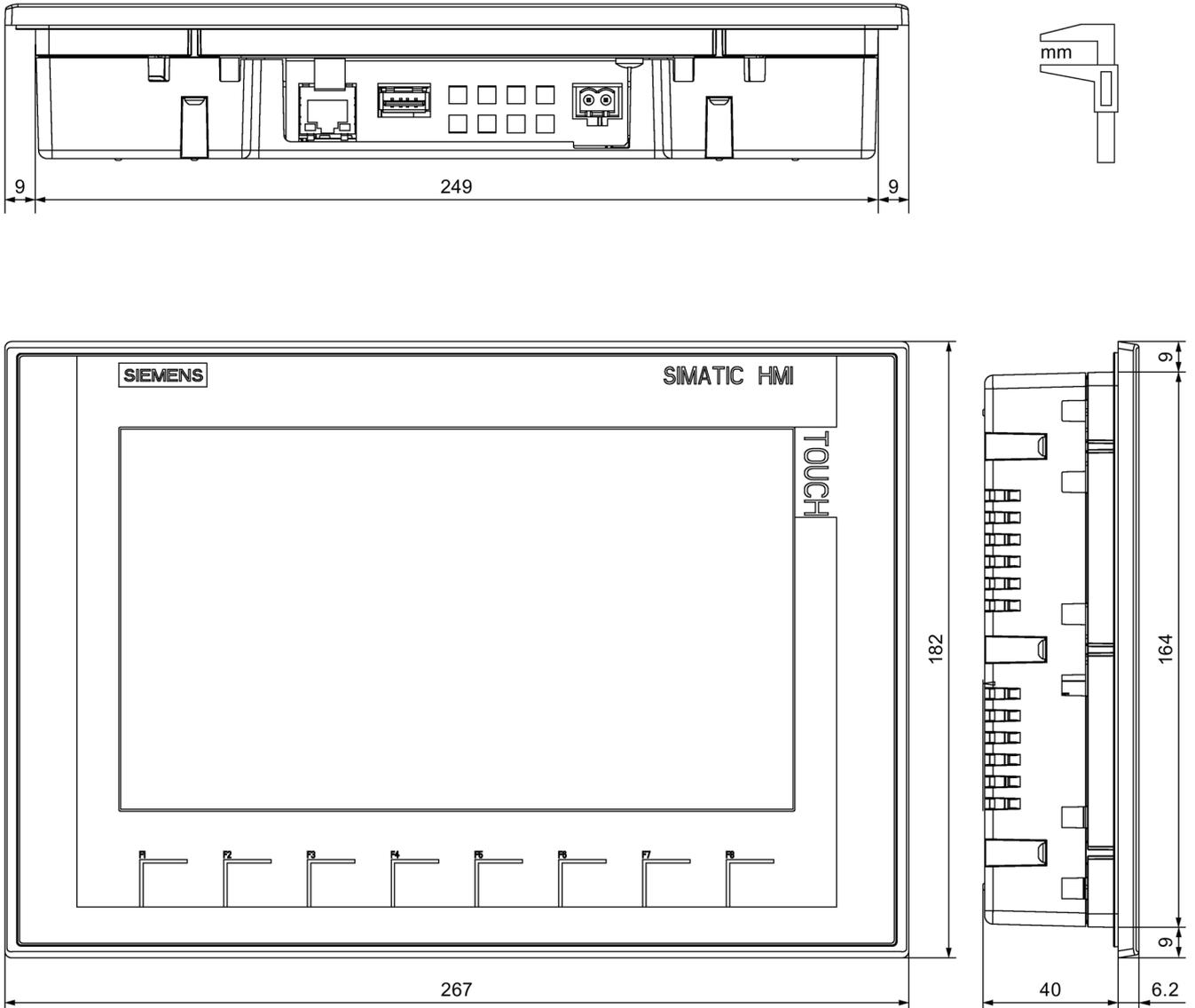
8.6.2 Dimensional drawing of KTP700 Basic



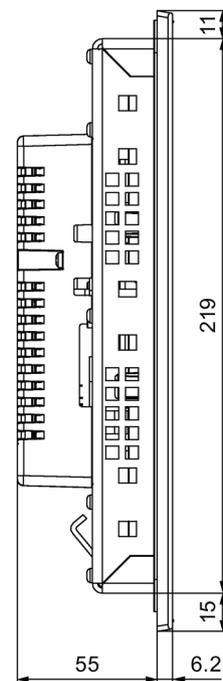
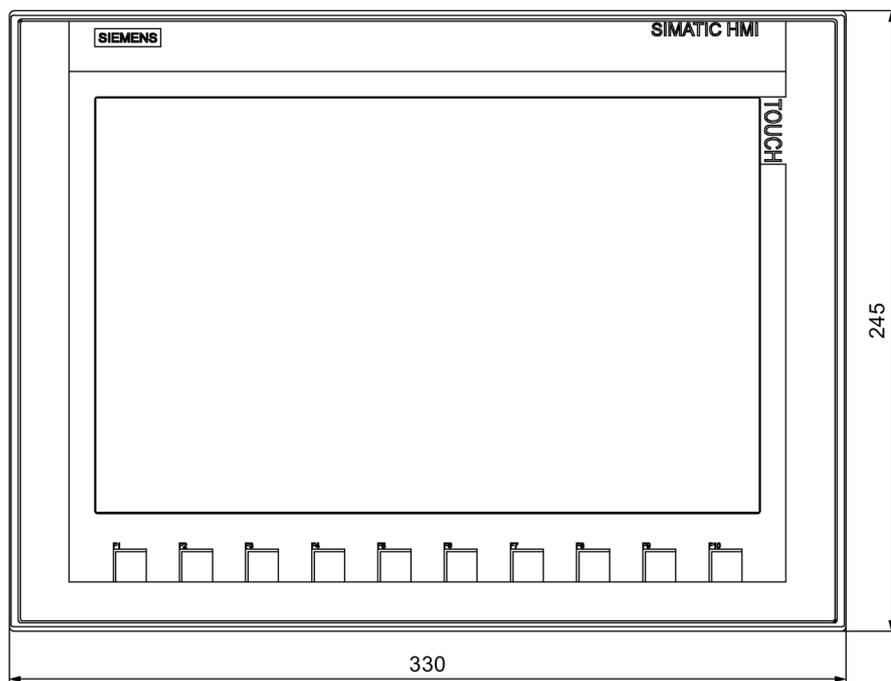
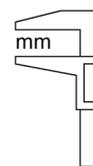
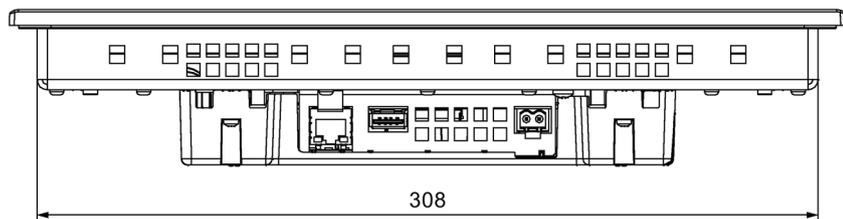
8.6.3 Dimensional drawing of KTP700 Basic DP



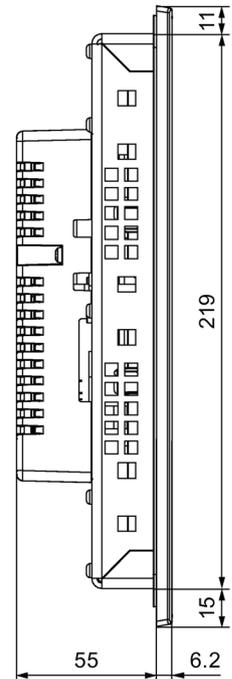
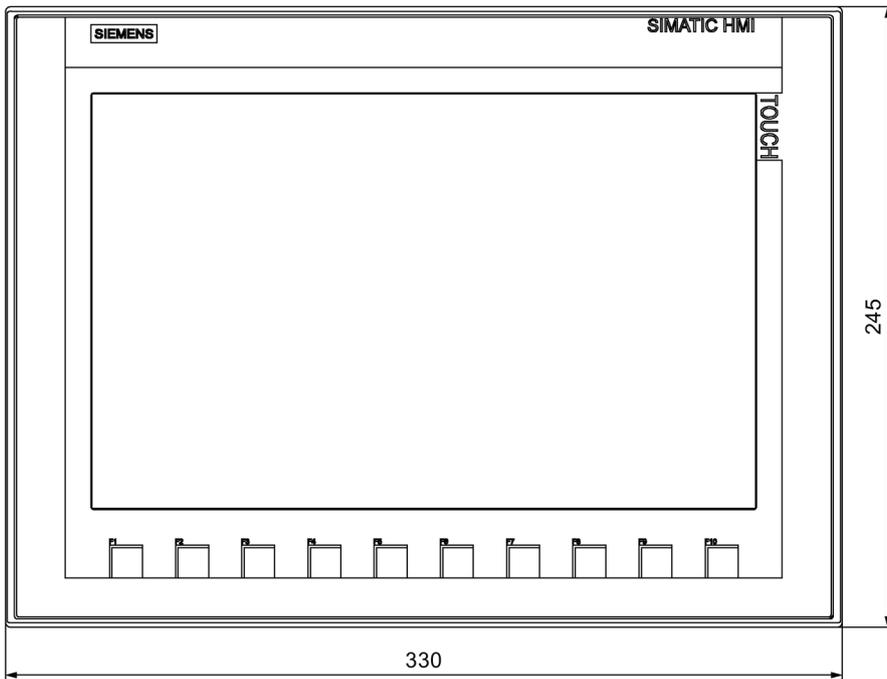
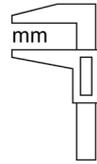
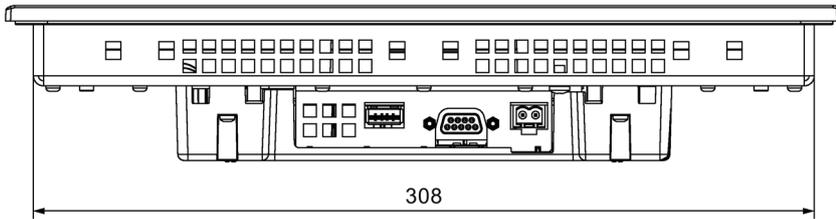
8.6.4 Dimensional drawing of KTP900 Basic



8.6.5 Dimension drawings of KTP1200 Basic



8.6.6 Dimensional drawing of KTP1200 Basic DP



8.7 Technical specifications

8.7.1 KTP400 Basic, KTP700 Basic and KTP700 Basic DP

Weight

	KTP400 Basic	KTP700 Basic	KTP700 Basic DP
Weight without packaging	Approx. 360 g	Approx. 780 g	Approx. 800 g

Display

	KTP400 Basic	KTP700 Basic	KTP700 Basic DP
Type	LCD TFT		
Active display area	95 x 53.9 mm (4.3")	154.1 x 85.9 mm (7")	
Resolution	480 x 272 pixels	800 x 480 pixels	
Possible colors	16-bit (65536 colors)		
Brightness control	Yes		
Backlighting	LED		
Half Brightness Life Time (MTBF ¹)	20,000 h		
Pixel error class in accordance with EN ISO 9241-307	II		

¹ MTBF: 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-driven dimming using the screen saver or central dimming by the controller.

Input device

	KTP400 Basic	KTP700 Basic	KTP700 Basic DP
Type	Touch screen, analog resistive		
Function keys	4	8	
Labeling strips	Yes		

Memory

	KTP400 Basic	KTP700 Basic	KTP700 Basic DP
Data memory	256 MB		
Program memory	512 MB		

Interfaces

	KTP400 Basic	KTP700 Basic	KTP700 Basic DP
1 x RS 422/RS 485	-		Max. 12 Mbps
1 x Ethernet RJ45	10/100 Mbps		-
USB 2.0	Yes		

Power supply

		KTP400 Basic	KTP700 Basic	KTP700 Basic DP
Rated voltage		+24 V DC		
Permitted voltage range		19.2 to 28.8 V (–20%, +20%)		
Transients, maximum permitted		35 V (500 ms)		
Time between two transients, minimum		50 s		
Current consumption	Typical	Approx. 125 mA	Approx. 230 mA	Approx. 230 mA
	Constant current, maximum	Approx. 310 mA	Approx. 440 mA	Approx. 500 mA
	Inrush current I ² t	Approx. 0.2 A ² s		
Power consumption ¹		3 W	5.5 W	5.5 W
Fuse, internal		Electronic		

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

Miscellaneous

	KTP400 Basic	KTP700 Basic	KTP700 Basic DP
Buffered real-time clock ¹ , can be synchronized	Yes		
Acoustic feedback	Yes		

¹ Typical buffer time: 3 weeks

8.7.2 KTP900 Basic, KTP1200 Basic and KTP1200 Basic DP

HMI device

	KTP900 Basic	KTP1200 Basic	KTP1200 Basic DP
Weight without packaging	Approx. 1130 g	Approx. 1710 g	Approx. 1710 g

Display

	KTP900 Basic	KTP1200 Basic	KTP1200 Basic DP
Type	LCD TFT		
Display area, active	198.0 mm x 111.7 mm (9")	261.1 mm x 163.2 mm (12")	
Resolution, pixels	800 x 480	1280 x 800	
Colors, displayable	16-bit (65536 colors)		
Brightness control	Yes		
Pixel error class in accordance with EN ISO 9241-307	II		
Backlighting	LED		
Half Brightness Life Time (MTBF ¹)	20,000 h		

¹ MTBF: 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-driven dimming using the screen saver or central dimming by the controller.

Input device

	KTP900 Basic	KTP1200 Basic	KTP1200 Basic DP
Type	Touch screen, analog resistive		
Function keys	8	10	
Labeling strips	Yes		

Memory

	KTP900 Basic	KTP1200 Basic	KTP1200 Basic DP
Data memory	256 MB		
Program memory	512 MB		

Interfaces

	KTP900 Basic	KTP1200 Basic	KTP1200 Basic DP
1 x RS 422/RS 485	-		Max. 12 Mbps
1 x Ethernet RJ45	10/100 Mbps		-
USB 2.0	Yes		

Power supply

		KTP900 Basic	KTP1200 Basic	KTP1200 Basic DP
Rated voltage		+24 V DC		
Permitted voltage range		19.2 .. 28.8 V (-20%, +20%)		
Transients, maximum permitted		35 V (500 ms)		
Time between two transients, minimum		50 s		
Current consumption	Typical	Approx. 230 mA	Approx. 510 mA	Approx. 550 mA
	Constant current, maximum	Approx. 440 mA	Approx. 650 mA	Approx. 800 mA
	Inrush current I ² t	Approx. 0.2 A ² s		
Power consumption ¹		5.5 W	12.2 W	13.2 W
Fuse, internal		Electronic		

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

Miscellaneous

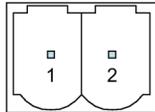
	KTP900 Basic	KTP1200 Basic	KTP1200 Basic DP
Buffered real-time clock ¹ , can be synchronized	Yes		
Acoustic feedback	Yes		

¹ Typical buffer time: 3 weeks

8.8 Description of the interfaces

8.8.1 DC24V X80

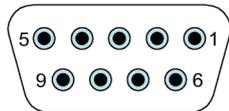
Power supply 24 V DC 2-pin



Pin	Meaning
1	+24 V DC
2	Ground

8.8.2 PROFIBUS DP X2

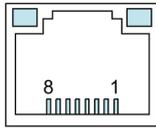
Serial interface, 9-pin sub-D socket, female



Pin	Assignment for the RS422	Assignment for the RS485
1	NC	NC
2	GND 24 V	GND 24 V
3	TxD+	Data signal B (+)
4	RxD+	RTS
5	GND 5 V, floating	GND 5 V, floating
6	+5 VDC, floating	+5 VDC, floating
7	+24 VDC, out (max. 100 mA)	+24 VDC, out (max. 100 mA)
8	TxD-	Data signal A (-)
9	RxD-	NC

8.8.3 PROFINET (LAN) X1

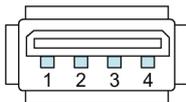
PROFINET (LAN) 10/100 Mbps, RJ45 socket



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

8.8.4 USB X60

USB Type A



Pin	Name	Meaning
1	VBUS	+5 V, out, max. 500 mA
2	D-	Data channel, bidirectional
3	D+	Data channel, bidirectional
4	GND	Ground

8.9 Scope of functions with WinCC

The following tables show the objects that can be integrated in a project for a Basic Panel. The following tables support you in estimating whether your project is still within the performance features of the HMI device.

The specified maximum values are not additive. We cannot guarantee proper functioning of configurations on devices in which all system limits are exploited.

In addition to the limitations specified, allowances must also be made for restrictions in configuration memory resources.

Tags, values and lists

Object	Specification	Quantity
Tags	Quantity	800
<i>Limit value monitoring</i>	<i>Input/output</i>	Yes
<i>Linear scaling</i>	<i>Input/output</i>	Yes
Elements per array	Quantity	100
Text lists	Quantity	300
Graphics lists	Quantity	100

Alarms

Object	Specification	Quantity
Alarms	Number of alarm classes	32
	Number of discrete alarms	1000
	Number of analog alarms	25
	Length of the alarm text	80 characters
	Number of tags in an alarm	Max. 8
	<i>Display</i>	<i>Alarm window, alarm view</i>
	<i>Acknowledge error alarm individually</i>	Yes
	<i>Acknowledge multiple error alarms simultaneously (group acknowledgement)</i>	16 acknowledgment groups
	<i>Edit alarm</i>	Yes
Alarm buffer ¹	<i>Alarm indicator</i>	Yes
	Alarm buffer capacity	256 alarms
	Simultaneously queued alarm events	Max. 64
	<i>View alarm</i>	Yes
	<i>Delete alarm buffer</i>	Yes

¹ As of WinCC V15.1 the retentivity of the alarm buffer can be activated or deactivated by using the option "Persistent alarm buffer" under "Runtime settings > Alarms > General". The default setting is "Activated".

Screens

Object	Specification	Quantity
Screens	Quantity	250
	Fields per screen	100
	Tags per screen	100
	Template	Yes
Objects per screen	Complex objects ¹	150
	Recipe views	10
	Trend views	8
	User view	1
	Alarm view	20
	Diagnostics view	5
	System diagnostics view	150
	Multiple tags (array elements) ²	100

¹ Complex objects include: bars, sliders, symbol library, clock and all objects from the Controls area.

² This includes array elements contained in recipes.

Recipes

The specified values are maximum values and should not be used additive.

Object	Specification	Quantity
Recipes	Quantity	50
	Elements per recipe ¹	100
	Data records per recipe	100
	User data length in KB per data record	32
	Reserved memory for data records in the internal Flash	256 KB

¹ When arrays are used, each array element represents a recipe element.

Logging

Object	Specification	Quantity
Logs	Number of logs	2
	Number of tags	10
	Number of log entries ¹	10,000
	Number of segmented circular logs	400
	Logging cycle	1 s

¹ For the "segmented circular log" logging method, the number of entries applies to all sequential logs. The product derived from the number of circular logs times the number of data records in this log may not be exceeded.

Trends

Object	Specification	Basic Panels
Trends	Quantity	25

Text lists and graphics lists

Object	Specification	Basic Panels
Lists	Number of graphics lists	100
	Number of text lists	300
	Number of entries per text or graphics list	100
	Number of graphic objects	1000
	Number of text elements	2500

Safety

Object	Specification	Basic Panels
Safety	Number of user groups	50
	Number of users	50
	Number of authorizations	32

Infotexts

Object	Specification	Basic Panels
Infotexts	Length (no. of characters)	500
	For alarms	Yes
	For screens	Yes
	For screen objects (for example, for I/O field, switch, button, invisible button)	Yes

Additional functions

Object	Specification	Basic Panels
Screen settings	Touch screen calibration	Yes
	Brightness setting	Yes
Language change	Number of runtime languages	10
Graphic objects	Vector and pixel graphics	Yes

Project

Object	Specification	Basic Panels
Project file "*.srt"	Size	10 MB

Technical Support

A.1 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/automation/support-request>)
- 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>)
- TIA Selection Tool (<https://www.siemens.com/tia-selection-tool>)

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.2 System alarms

System alarms on the HMI device provide information about internal states of the HMI device and the controller.

Note

System alarms are only indicated if an alarm window was configured. System alarms are output in the language currently set on your HMI device.

System alarm parameters

System alarms may contain encrypted parameters which are relevant to troubleshooting because they provide a reference to the source code of the runtime software. These parameters are output after the text "Error code:".

Description of the system alarms

A listing of all system alarms for your HMI device is provided in the online help of your configuration software.

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
	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="142 357 328 402">INDOOR USE ONLY INDUSTRIAL USE ONLY</p>	<p data-bbox="360 283 1051 310">Only for industrial applications and indoor areas (control cabinet)</p>	
	<p data-bbox="360 414 965 442">Device is to be integrated or installed in a control cabinet</p>	
 <p data-bbox="161 576 312 621">ZONE 2 USE CABINET IP54</p>	<p data-bbox="360 500 1102 555">Integrate or install devices approved for Ex Zone 2 in a control cabinet with at least IP54</p>	
 <p data-bbox="161 708 312 753">ZONE 22 USE CABINET IP6x</p>	<p data-bbox="360 632 1117 687">Integrate or install devices approved for Ex Zone 22 in a control cabinet with at least IP6x</p>	

Abbreviations

C

ANSI	American National Standards Institution
CPU	Central Processing Unit
CTS	Clear To Send
DC	Direct Current
DCD	Data Carrier Detect
DHCP	Dynamic Host Configuration Protocol
DIL	Dual-in-Line (electronic chip housing design)
DNS	Domain Name System
DP	Distributed I/O
DSN	Data Source Name
DSR	Data Set Ready
DTR	Data Terminal Ready
IO	Input and Output
ESD	Components and modules endangered by electrostatic discharge
EMC	Electromagnetic Compatibility
EN	European standard
ES	Engineering System
ESD	Components and modules endangered by electrostatic discharge
GND	Ground
HF	High Frequency
HMI	Human Machine Interface
IEC	International Electronic Commission
IF	Interface
IP	Internet Protocol
LED	Light Emitting Diode
MAC	Media Access Control
MOS	Metal Oxide Semiconductor
MPI	Multipoint Interface (SIMATIC S7)
MS	Microsoft
MTBF	Mean Time Between Failures
n. c.	Not connected
NTP	Network Time Protocol
OP	Operator Panel
PC	Personal Computer
PG	Programming device
PPI	Point-to-Point Interface (SIMATIC S7)
RAM	Random Access Memory
PELV	Protective Extra Low Voltage
RJ45	Registered Jack Type 45
RTS	Request to send
RxD	Receive Data

SD Card	Security Digital Card
SELV	Safety Extra Low Voltage
SP	Service Pack
PLC	Programmable Logic Controller
STN	Super Twisted Nematic
Sub-D	Subminiature D (plug)
TAB	Tabulator
TCP/IP	Transmission Control Protocol/Internet Protocol
TFT	Thin Film Transistor
TTY	Teletype
TxD	Transmit Data
UL	Underwriter's Laboratory
USB	Universal Serial Bus
UPS	Uninterruptible power supply
WINS	Windows Internet Naming Service

Glossary

"Transfer" mode

The "Transfer" operating mode is an operating mode of the HMI device in which an executable project is transferred from the configuration PC to an HMI device.

Acknowledge

Acknowledgment of an alarm confirms that it has been noted.

Alarm logging

Output of user-specific alarms to a printer, in parallel to their output to the HMI device screen.

Alarm, "Incoming" event

Moment at which an alarm is triggered by the controller or HMI device.

Alarm, "Outgoing" event

Moment at which the initiation of an alarm is reset by the controller.

Alarm, acknowledgment

Acknowledgment of an alarm confirms that it has been noted.

Alarm, user-specific

A user-specific alarm report specific operating states of a system interconnected to the HMI device via the controller.

Automation system

An automation system is a controller of the SIMATIC S7 series, for example SIMATIC S7-1500.

Boot loader

The boot loader is used to start the operating system and is started automatically after power on of the HMI device. The Start Center opens after the operating system has loaded.

Commercial goods

In addition to their own accessories, Siemens AG is also offering high-quality accessories from well-known manufacturers as commercial goods. Commercial goods are qualified in a brief power-up test but do not go through the system test of the Siemens AG. The technical properties of commercial goods can deviate from the properties guaranteed by comparable products of the Siemens AG. Commercial goods are identified as such in the online catalog of the Siemens AG. Technical specifications, drivers, certificates, test verification documents, etc. are supplied by the respective manufacturer to Siemens AG and are also available for download in the online catalog or technical support of the Siemens AG.

configuration PC

A configuration PC is a programming device or PC on which system projects are created using engineering software.

Configuration software

Configuration software is used to create projects used for the purpose of process visualization. WinCC represents such configuration software, for example.

Controller

Controller is a general term for devices and systems with which the HMI device communicates, for example SIMATIC S7.

Degree of protection

The degree of protection specifies a standard of electronic equipment for a variety of ambient conditions – and the protection of humans against potential danger when using this equipment.

The degree of protection classified by IP differs from the protection class. But both involve protection against touching dangerous electric voltage. The degree of protection also classifies the protection of equipment against dirt and moisture.

Display duration

Defines whether a system alarm is displayed on the HMI device and the duration of the display.

EMC

Electromagnetic compatibility (EMC) refers to a usually desirable state, in which technical equipment does not disturb one another with unwanted electrical or electromagnetic effects. Electromagnetic compatibility deals with technical and regulatory questions of undesired, mutual influence in electrical engineering.

Event

Functions are triggered by defined incoming events. Events can be configured. Events which can be assigned to a button include "Press" and "Release", for example.

Field

Area reserved in configured screens for the input and output of values.

Flash memory

Flash memory is a non-volatile memory with EEPROM chips that is implemented either as mobile storage medium, or as permanently installed memory module on the motherboard.

Function key

Function keys on the HMI device can be assigned user-specific functions. The functions assigned to these keys are defined during configuration. The assignment of the function keys may be specific to an active screen or independent of it.

Half Brightness Life Time

Time period after which brightness is reduced to 50% of the original value. The specified value depends on the operating temperature.

Hardcopy

Output of the screen content to a printer.

HMI device

An HMI device is a device used for the operation and monitoring of machines and systems. The machine or system states are visualized on the HMI device by means of graphic objects or signal lamps. The operator controls of the HMI device allow the operator to interact with the processes of the machine or system.

HMI device image

The HMI device image is a file that can be transferred from the configuration PC to the HMI device. The HMI device image contains the operating system for the HMI device and the elements of the runtime software required to run a project.

I/O field

An I/O field enables the input or output of values on the HMI device which are transferred to the controller.

Infotext

An infotext is a configured information on objects within a project. Infotext for an alarm, for example, may contain information on the cause of the fault and troubleshooting routines.

Job mail

A job mail triggers a function for the controller on the HMI device.

Object

An object is a project element such as a screen or an alarm. Objects are used to view or enter texts and values on the HMI device.

Operating element

An operating element is a component of a project used to enter values and trigger functions. A button, for example, is an operating element.

Process visualization

Process visualization is the representation of technical processes by means of text and graphic elements. Configured system screens allow operator intervention in active system processes using the input and output data.

Project

A project is the result of a configuration using a configuration software. The project normally contains several screens with embedded system-specific objects, basic settings and alarms. A project configured with WinCC is saved in a file with extension "*.ap1x", where "x" stands for the version key. Example: "MyProject.ap14" for a WinCC V14 project.

Project file, executable

An executable project file is the file generated for a particular HMI device within the scope of configuration. The executable project file is transferred to the associated HMI device where it is used to operate and monitor systems. The executable project file is always stored on the HMI device under "\Flash\Simatic".

The file extension of an executable project file is "*.fwf".

Protection class

The protection class is used in electrical engineering to classify and identify electrical equipment in relation to existing safety measures designed to prevent electric shock. There are three protection classes for electrical equipment.

Recipe

A recipe is a combination of tags that form a fixed data structure. The configured data structure can be assigned data in the configuration software or on the HMI device and is then referred to as a record. The use of recipes ensures that all data assigned to a data record is transferred synchronously to the controller.

Runtime software

The runtime software is a process visualization software used to test a project on a configuration PC.

Screen

A screen is a form of visualization for all logically related process data in a system. The representation of the process data can be visually supported by graphic objects.

Screen object

A screen object refers to objects such as rectangles, I/O fields or alarm views which are configured for visualization or operation of the system.

System

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

System alarm

A system alarm is assigned to the "System" alarm class. A system alarm refers to internal states on the HMI device and the controller.

Tab order

The tab order defined in the course of project engineering determines the sequence for activating objects by pressing the <TAB> key.

Tag

A tag is a defined memory location to which values can be written and from which values can be read. This can be done from the controller or the HMI device. We distinguish between external tags (process tags) and internal tags, depending on whether or not the tag is interconnected with the controller.

Transfer

Transfer of a runtime project from the configuration PC to the HMI device.

WinCC

WinCC (TIA Portal) is the engineering software for configuring SIMATIC Panels, SIMATIC Industrial PCs and standard PCs with WinCC Runtime Advanced visualization software or the WinCC Runtime Professional SCADA system.