

SIEMENS

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 defined by IEC 62079 for documentation. 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 chapters of these operating instructions that are of particular importance for the respective target group.

Target group	Chapter
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 chapters. Depending on the use of the HMI device, certain chapters 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 chapters. Depending on the use of the HMI device, certain chapters 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
KTP700 Basic		PROFINET	
KTP700 Basic DP		PROFIBUS	
KTP900 Basic		PROFINET	
KTP1200 Basic		PROFINET	
KTP1200 Basic DP		PROFIBUS	

Basic knowledge required

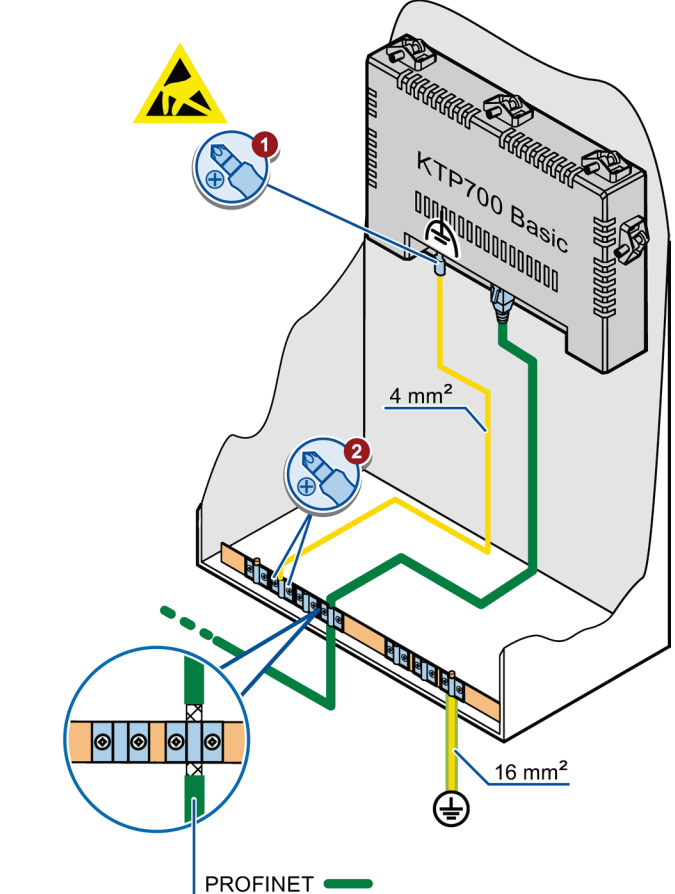
Knowledge of automation technology and process communication is necessary to understand the operating instructions.

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.

The following graphical highlighting facilitates reading these operating instructions:

Graphical highlighting	Description
	<p>If the instructions involve several tasks, the individual tasks are highlighted by a red number circle.</p> <p>A light blue highlight indicates components and tools that are required in the course of a task.</p> <p>KTP700 Basic is sometimes shown in the figures as a representation of all Basic Panels.</p>

The following text highlighting facilitates reading these operating instructions:

Text highlighting	Scope
"Add screen"	<ul style="list-style-type: none"> • Terms that appear in the user interface, for example, dialog names, tabs, buttons, menu commands • Input values, for example, limits, tag values • Path information
"File > Edit"	Operational sequences, for example, menu commands, shortcut menu commands
<F1>	Keyboard operation

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) V13", 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 new "Basic Panels 2nd Generation" which replaces the current Basic Panels. 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

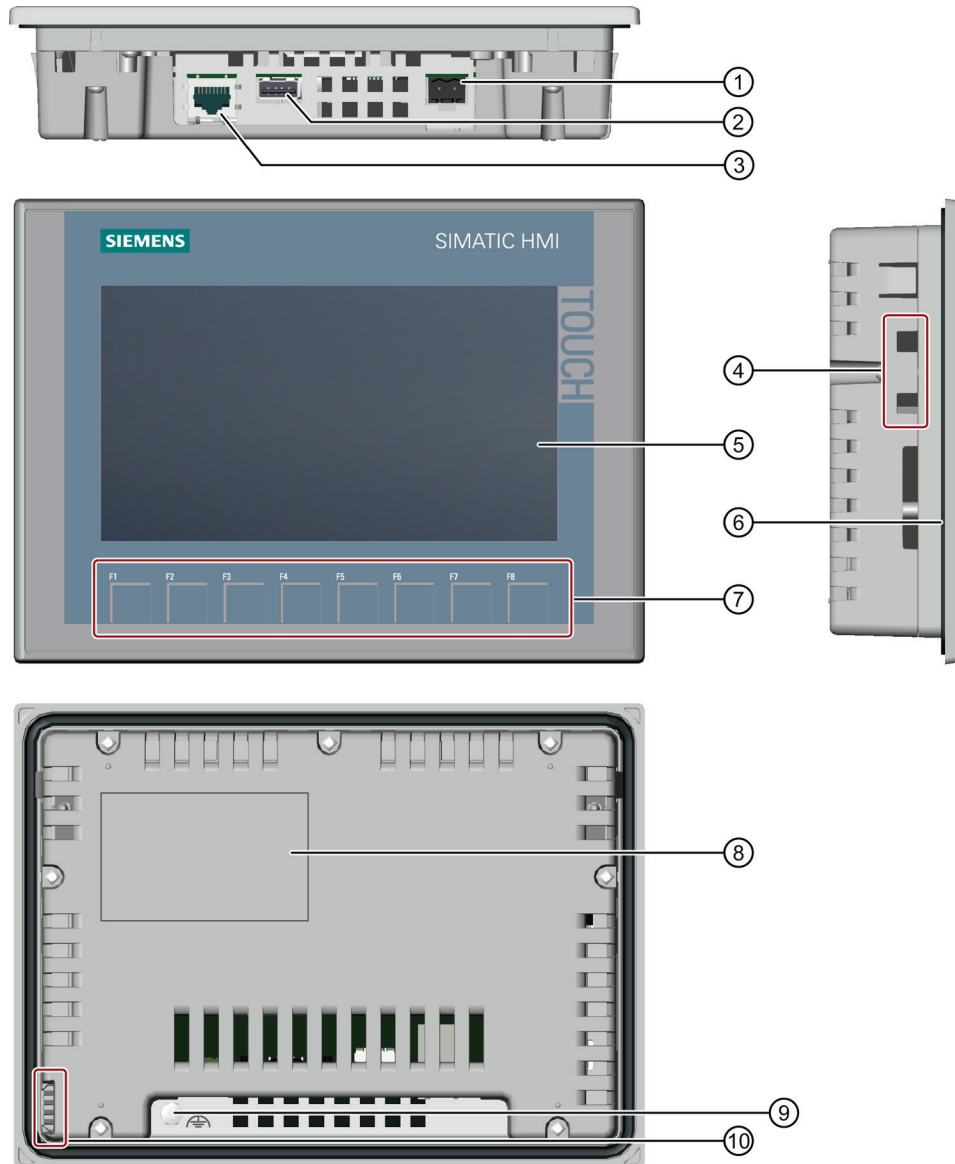
New, cost-efficient HMI generation meets the trend for high-quality visualization even in small machines and plants

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

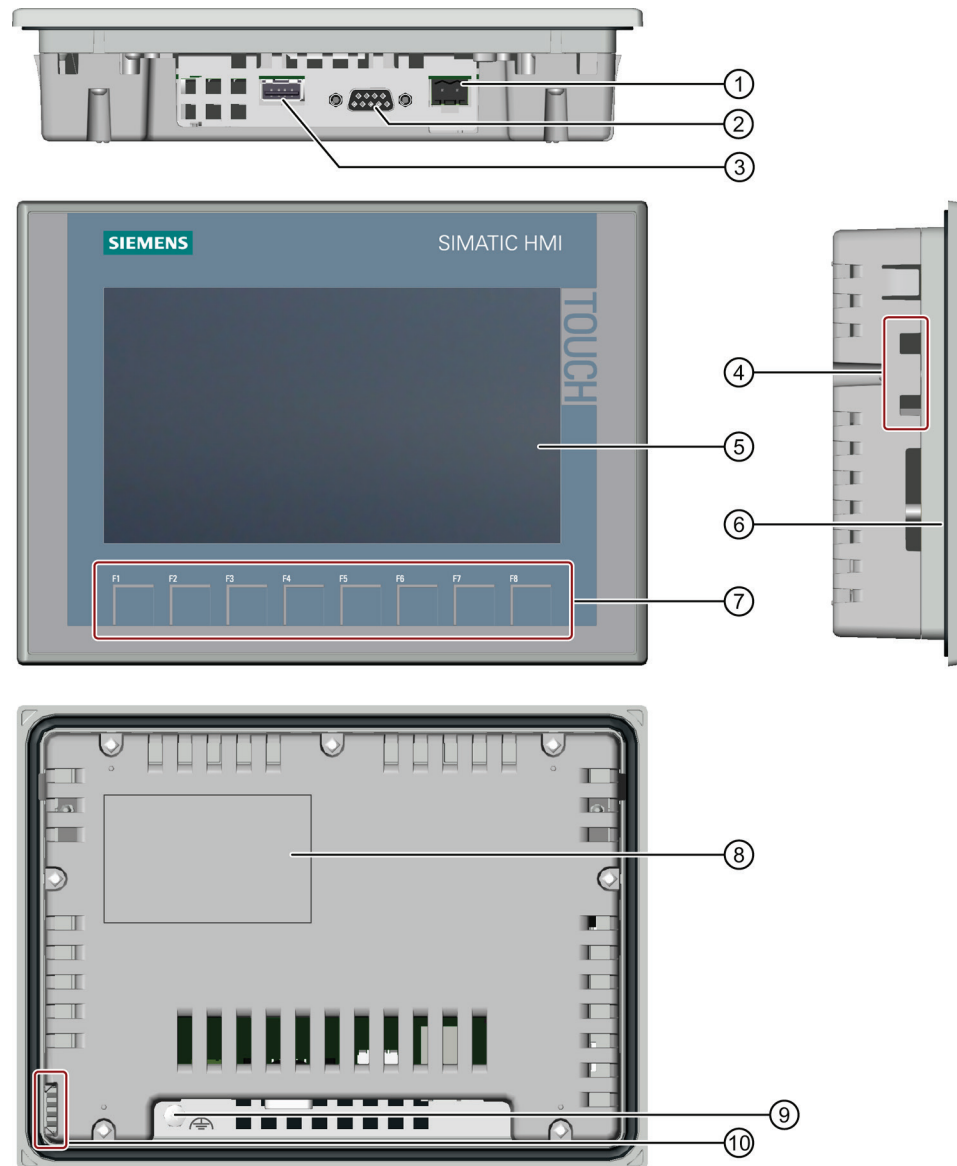
The figure below shows the design of the PROFINET devices using KTP700 Basic as an example.



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

1.3 Design of the PROFIBUS devices

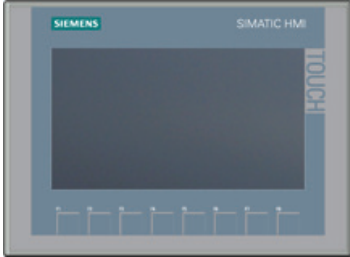
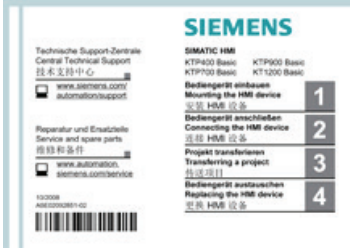
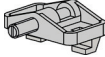
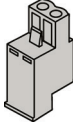
The figure below shows the design of the PROFIBUS devices using KTP700 Basic DP as an example.



- | | |
|--------------------------------|-------------------------------|
| 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 terminal		1, in accessory kit

1.5 Accessories

Accessories are not included in the HMI device scope of delivery, but can be ordered on the Internet under Industry Mall (<http://mall.automation.siemens.com>).

This section contains the number of accessories available at the time of publication of the operating instructions.

Storage media and I/O devices

Name	Article number
USB memory stick 8 GB	6ES7648-0DC50-0AA0
Industrial USB Hub 4	6AV6671-3AH00-0AX0

Converters, adapters and connectors

Name	Purpose	Article number
RS 422 to RS 232 converter	Connection of third-party controllers to Basic Panels DP	6AV6671-8XE00-0AX0
90 degree elbow adapter	For RS 422/RS 485 port, cable outlet to rear	6AV6671-8XD00-0AX0
PROFIBUS connector	Recommended PROFIBUS connector with straight cable outlet	6GK1500-0FC10
PROFINET RJ45 connector "IE FC RJ45 Plug 2x2"	Required for connection of Basic Panels with PROFINET interface to PROFINET	6GK1901-1BB10-2AA0

Protective foil

Name	Purpose	Article number
Protective film 4"	Protective film set for KTP400 Basic	6AV2124-6DJ00-0AX0
Protective film 7"	Protective film set for KTP700 Basic and KTP700 Basic DP	6AV2124-6GJ00-0AX0
Protective film 9"	Protective film set for KTP900 Basic	6AV2181-3JJ20-0AX0
Protective film 12"	Protective film set for KTP1200 Basic and KTP1200 Basic DP	6AV2181-3MJ20-0AX0


Service packages

Name	Article number
Set of 20 mounting clips	6AV6671-8KX00-0AX2
Set of 10 power supply terminals	6AV6671-8XA00-0AX0

Safety instructions

2.1 General safety instructions


Working on the control cabinet

 WARNING
Open equipment The HMI device is an open equipment. This means the HMI device may only be installed in cubicles or cabinets that provide front panel access for operating the device. The cubicle or cabinet in which the HMI device is installed may only be accessed with a key or tool and only by trained, authorized personnel.
Dangerous voltage Opening the cabinet will expose high voltage parts. Contact with these parts could be fatal. Always disconnect the cabinet from the mains before opening it.

High frequency radiation

Note
Unwanted operating states
High-frequency radiation, for example, from cellular phones, can trigger unwanted operating states.

Installation as intended

 WARNING
Installation only in machinery that conforms to the machinery directive You are not permitted to commission the HMI device unless it has been verified that the machine in which the HMI device is to be installed complies with directive 2006/42/EC.

ESD



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

Industrial Security

Siemens offers products and solutions with Industrial Security functions that support the safe operation of equipment, solutions, machines, devices and/or networks. They are important components in a comprehensive Industrial Security concept. As a result the products and solutions from Siemens are constantly evolving. Siemens recommends obtaining regular information regarding product updates.

For safe operation of Siemens products and solutions appropriate protective measures (e.g., cell protection concept) must be taken and each component must be integrated in a comprehensive Industrial Security concept, which corresponds with the current state of technology. The products of other manufacturers need to be taken into consideration if they are also used. You can find addition information on Industrial Security under (<http://www.siemens.com/industrialsecurity>).

Sign up for our product-specific newsletter to receive the latest information on product updates. For more information, see under (http://www.siemens.de/automation/csi_en_WW).

2.2 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.

Industrial applications

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

- Requirements of the emission standard for industrial environments, EN 61000-6-4: 2007 + A1:2011
- ESD immunity requirements to DIN EN 61000-6-2:2005

Use in residential areas

Note

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/TV reception.

If the HMI device is used in a residential area, you must take measures to achieve Limit Class B conforming to EN 55011 for RF interference.

Individual acceptance is required.

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
 - Electrical or magnetic fields of high intensity
- In systems that require special monitoring, for example, in:
 - Elevators
 - Systems in especially hazardous rooms

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

3.1 Preparations

3.1.1 Checking the package contents

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

Note**Damaged parts**

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

The package content is described in section Scope of delivery (Page 14).

Keep the provided documentation in a safe place. The documentation is part of the HMI device and is required for subsequent commissioning.

3.1.2 Checking the operating conditions

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

- Certificates and approvals (Page 83)
- Electromagnetic compatibility (Page 84)
- Mechanical ambient conditions (Page 84)
- Climatic ambient conditions (Page 85)
- Protection classes (Page 86)
- Technical specifications (Page 93)

3.1.3 Selecting a mounting position

The 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 in stationary cabinets.

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

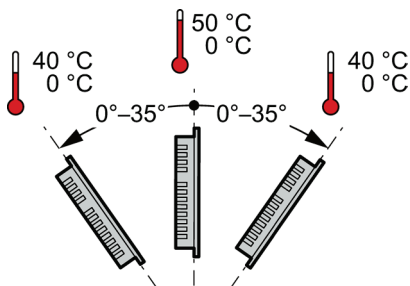
Mounting position

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

Mounting in horizontal format

Ambient temperature in the cabinet with horizontal mounting:

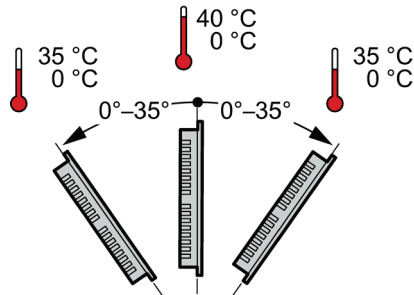
- Vertical mounting (0° inclined): Maximum $+50^\circ\text{C}$
- Inclined mounting (inclined up to 35°): Maximum $+40^\circ\text{C}$



Mounting in vertical format

Ambient temperature in the cabinet with vertical mounting:

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



See also

Operating Conditions (Page 85)

3.1.4 Checking clearances

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

Required clearance around the HMI devices.			
All dimensions in mm			
	x	y	z
Basic Panels	15	50	10

All Basic Panels

All Basic Panels

3.1.5 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 the lasting and safe mounting of the HMI device.

The force of the mounting clips or operation of the device may not lead to deformation of the material in order to achieve the degrees of protection described below.

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.
- Permitted surface roughness in the area of the seal: $\leq 120 \mu\text{m}$ ($R_z 120$)

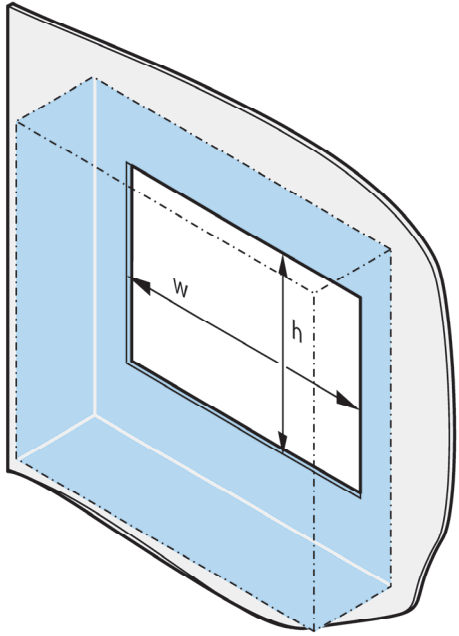
Mounting compatibility

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 horizontal mounting position:		
	w_0^{+1}	h_0^{+1}
KTP400	123	99
KTP700	197	141
KTP900	251	166
KTP1200	310	221
Dimensions of the mounting cutout for the Basic HMI devices in vertical mounting position:		
	w_0^{+1}	h_0^{+1}
KTP400	99	123
KTP700	141	197
KTP900	166	251
KTP1200	221	310
All dimensions in mm		


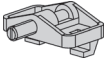


See also

Accessories (Page 15)

3.2 Mounting the HMI device

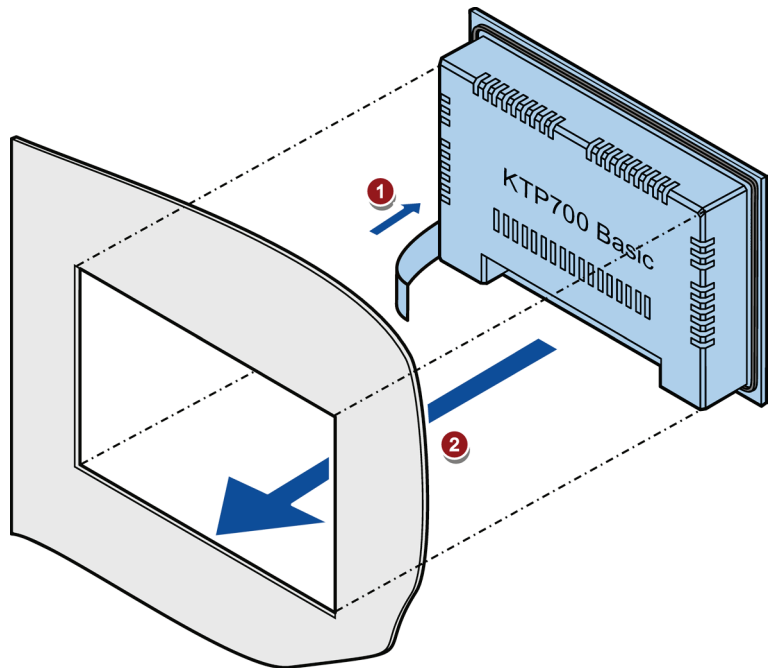
Required tools and accessories

	Slotted screwdriver, 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

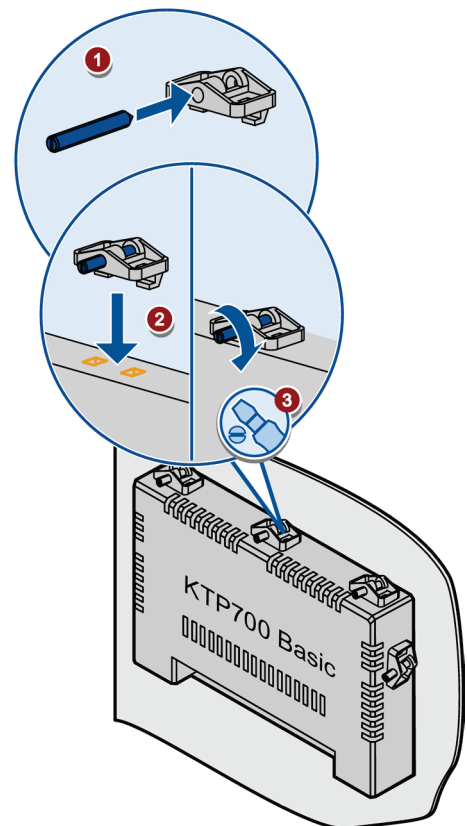
1. Slide the labeling strip into the device using the guide, if available.
2. Insert the HMI device into the mounting cutout from the front.

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.





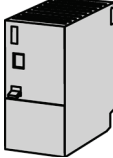


3.3 Connecting the HMI device

3.3.1 Connection sequence

Required tools and accessories

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

	Slotted screwdriver, size 2
	Phillips screwdriver, size 3
	Crimp pliers
	Power supply terminal
	24 V DC with sufficient amperage. See Technical specifications (Page 93)

Procedure

Keep to the following sequence of tasks when connecting the HMI device:

1. Connecting the equipotential bonding circuit (Page 27)
2. Connecting the power supply (Page 29)
3. Connecting the configuration PC (Page 31)
4. Connecting the controller (Page 33)

Note

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.

See also

Securing the cables (Page 37)

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. The best practical results for equipotential bonding between two cabinets have been achieved with a minimum conductor cross-section of 16 mm².
- 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.

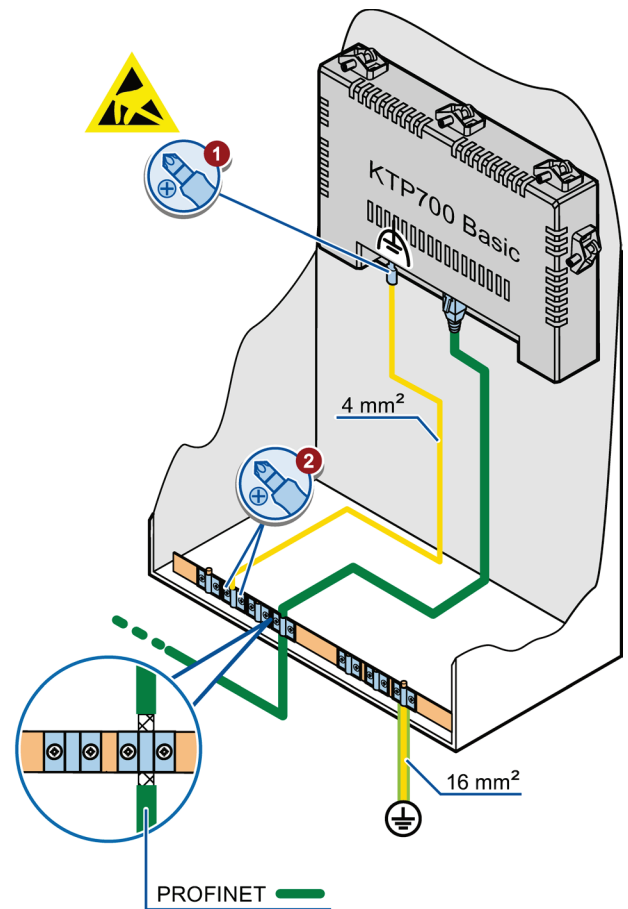
Note

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 mm^2 .
2. Connect the equipotential bonding conductor to the equipotential bonding rail.

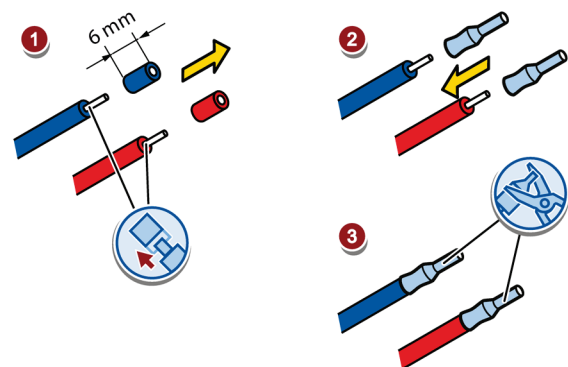


3.3.3 Connecting the power supply

Stripping the cable

Use power supply cables with a maximum cross-section of 1.5 mm^2 .

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 Technical specifications (Page 93).

NOTICE

Safe electrical isolation

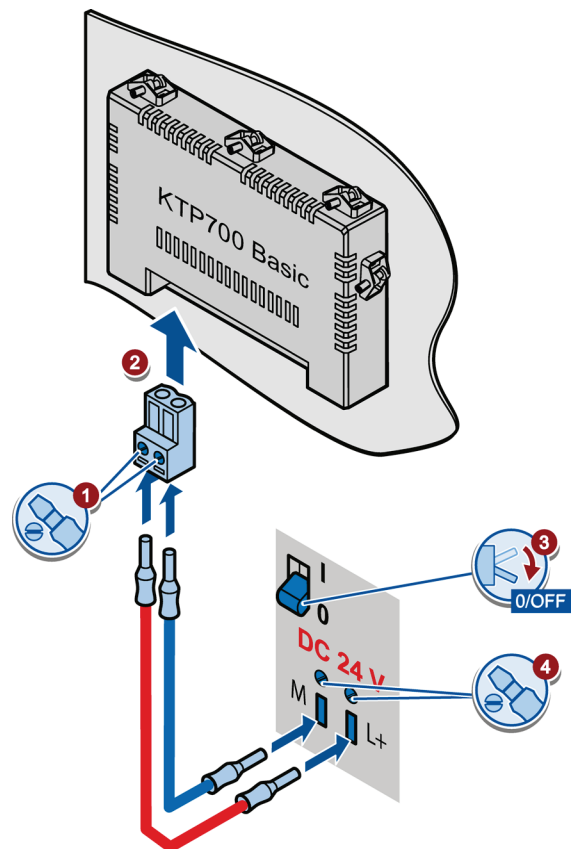
Use only 24 V DC power supply units with safe electrical isolation in accordance with IEC 60364-4-41 or HD 384.04.41 (VDE 0100, Part 410), for example, to PELV standard.

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

1. Insert the two power cables into the mains terminal and secure them with a slotted screwdriver.
 2. Connect the mains terminal to 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.



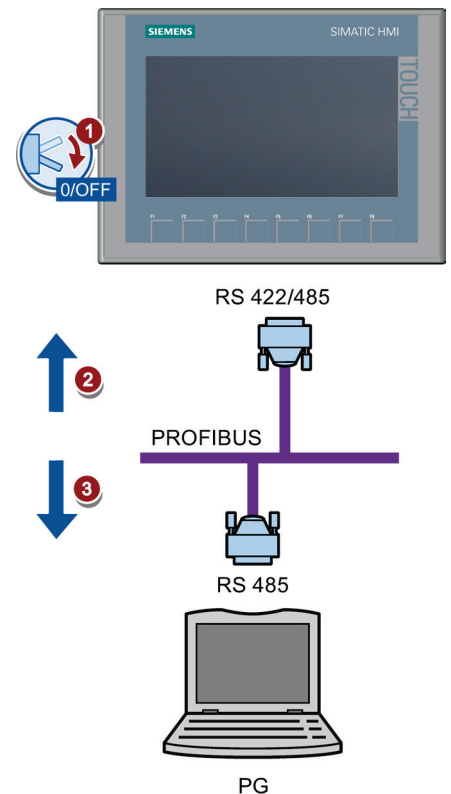
3.3.4 Connecting a programming device

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. Shut down 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 HIM device image
- Reset the HMI device to factory settings

Connecting a configuration PC to a Basic Panel with PROFINET interface

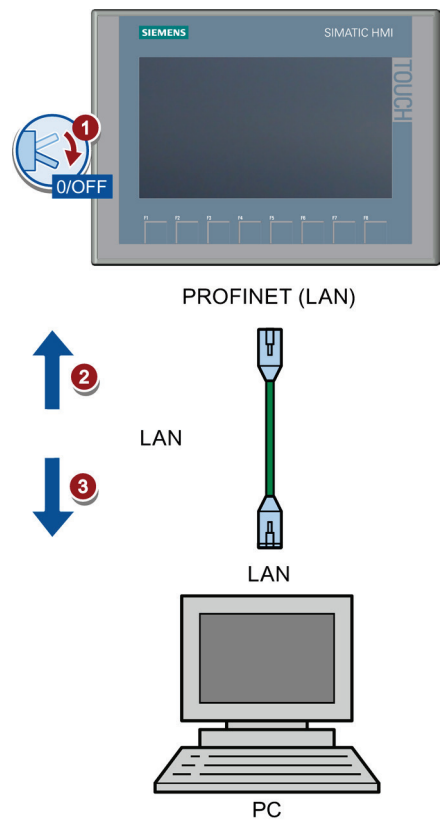
NOTICE

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 65)

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

Note the following when connecting the controller to a panel:

- Route the data lines parallel to the equipotential bonding conductors
- Connect the shields of the data lines to the ground

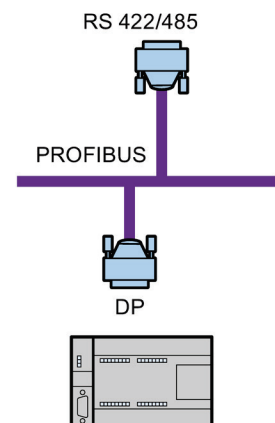
Connecting a controller to a Basic Panel DP

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

You can connect Basic Panels DP to the following controllers:

- Modicon Modbus
- Allen Bradley DF1
- Mitsubishi
- Omron



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

Connecting a controller to a Basic Panel with PROFINET interface

NOTICE

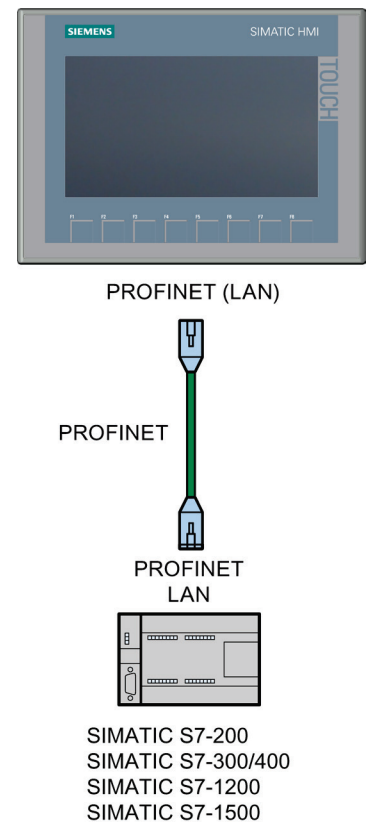
Data network security for communication via Ethernet

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.

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

- SIMATIC S7-200
- SIMATIC S7-300/400
- SIMATIC S7 with PROFINET interface
- SIMATIC S7-1200
- SIMATIC S7-1500

The connection is set up via PROFINET/LAN.



See also

Accessories (Page 15)

Connecting the equipotential bonding circuit (Page 27)

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 memory stick
- 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 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 an 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 chapter "USB (Page 99)".

Note

USB memory stick is not detected.

Depending on the USB memory stick you use, it may happen that the operating system does not detect the USB memory stick. In this case, use a different USB stick.

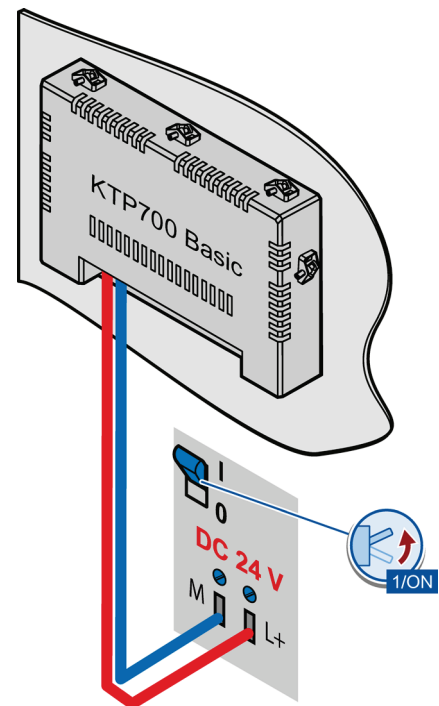
3.4 Switching on and testing the HMI device

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 have probably crossed the cables on the power supply terminal. Check the connected cables and change their connection.



The Start Center opens after the operating system has started.

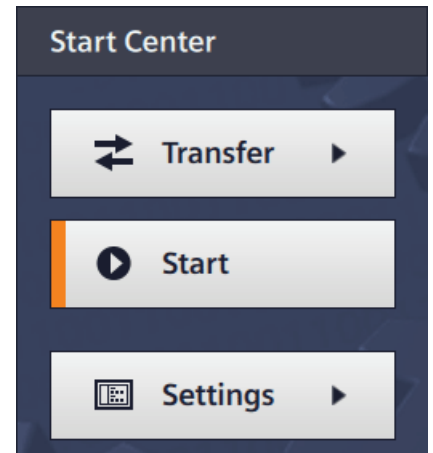
You operate the Start Center using the buttons on the touch screen or a connected mouse or keyboard.

- 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.



Shutting down the HMI Device

1. Close any active projects on the HMI device.
2. Shut down the HMI device. You have the following shutdown options:
 - Switch off the power supply.
 - Remove the power supply terminal from the HMI device.

3.5 Securing the cables

NOTICE

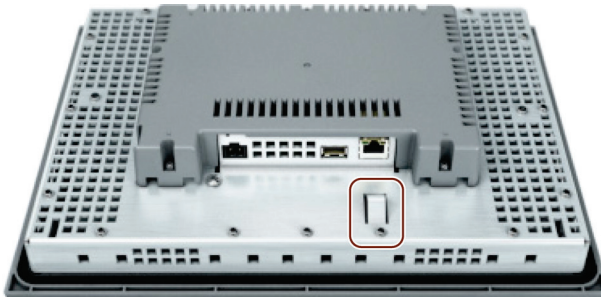
Strain relief

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.

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 running on your HMI device. You use the function keys to trigger the associated configured functions within a project.

 DANGER
<p>Incorrect operation</p> <p>A project can contain certain operations that require in-depth knowledge about the specific system on the part of the operator.</p> <p>Ensure that only trained professional personnel operate the system.</p>

Operating the touch screen

NOTICE
<p>Damage to the touch screen</p> <p>Pointed or sharp objects can damage the plastic surface of the touch screen.</p> <p>Operate the touch screen only with your fingers or with a touch pen.</p> <p>Triggering unintended actions</p> <p>Touching several operating elements at the same time can trigger unintended actions.</p> <p>Touch only one operating element on the screen at a time.</p>

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

The focus of invisible buttons is by default not indicated following selection. 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

A screen keyboard appears as visual feedback after you touch an I/O field, for example, to enter 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.




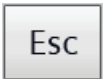




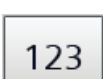

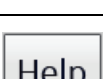
- Function keys with local function assignment

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 characters left
	Cancel input
	Delete characters right
	Confirm input
	Shift to capital letters for the next character to be entered
	Permanently switching to capital letters, corresponds to the "CAPS LOCK" function.
	Switching to numerical keyboard
	Switching to alphanumerical keyboard
	Displaying infotext. This key only appears when an infotext has been configured for the operating element.

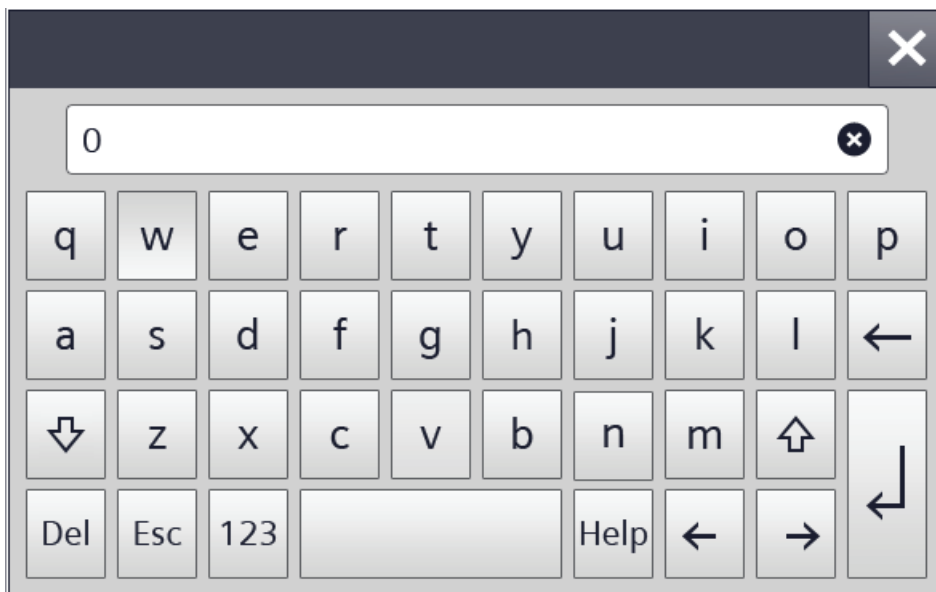
4.3 The screen keyboards

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, 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.

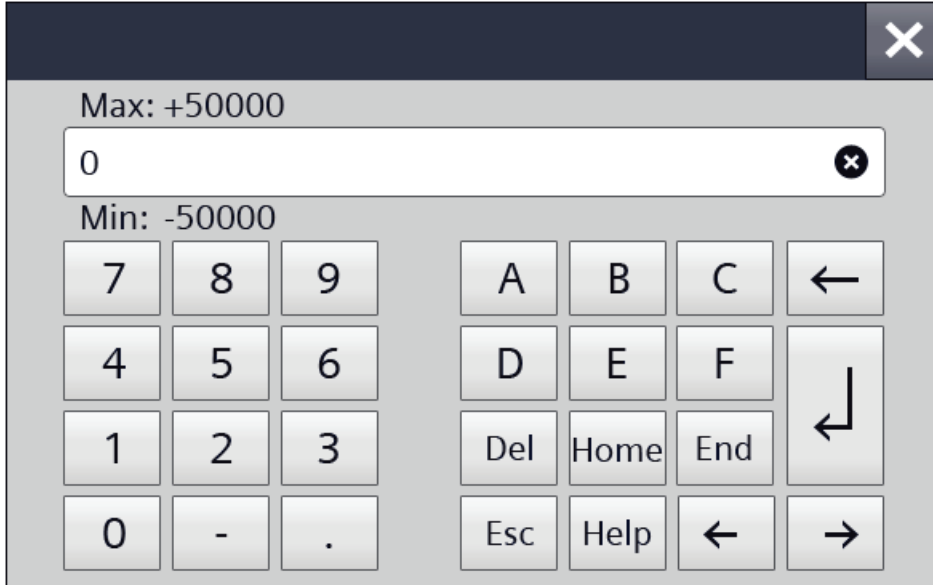
Key assignment

The alphanumerical screen keyboard layout is monolingual.

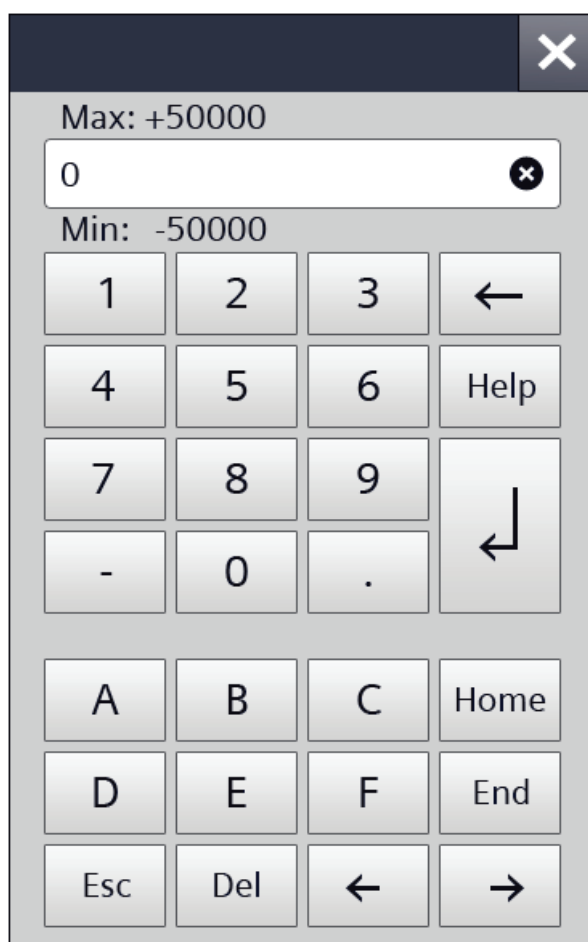
A language change within the project has no effect on the layout of the alphanumerical screen keyboard.

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 event 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.



Configuring 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.

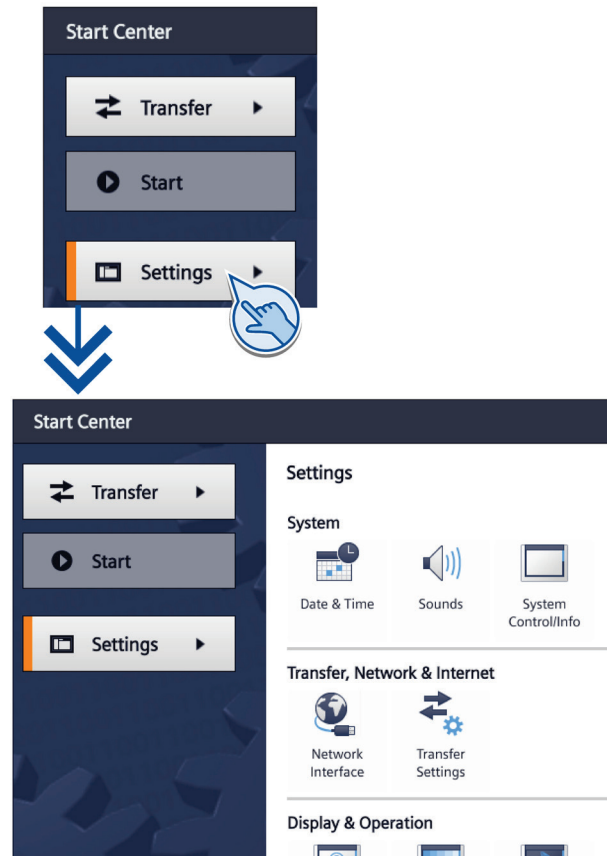
You can make the following settings:

- 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, the navigation area is on the top and the work area on the bottom in the display.



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  button is located between the navigation area and the work area to minimize or maximize the navigation 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

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.

Symbol	Function
	Configuring the time server (Page 49) Enter time and date (Page 50)
	Activating the acoustic signal (Page 51)
	Configuring Autostart or wait time (Page 52) Changing the password settings (Page 52) Displaying licensing information for the HMI device (Page 55) Displaying information about the HMI device (Page 56)
	Changing the network configuration (Page 57) Changing the MPI/DP settings (Page 58)
	Enabling a data channel (Page 59)
	Calibrating the touch screen (Page 60)
	Changing the monitor settings (Page 61)
	Setting the screen saver (Page 62)

5.3 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.

If you are not using a time server, you can also set the time manually.

To fetch the time-of-day of the HMI device from a time server, 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.

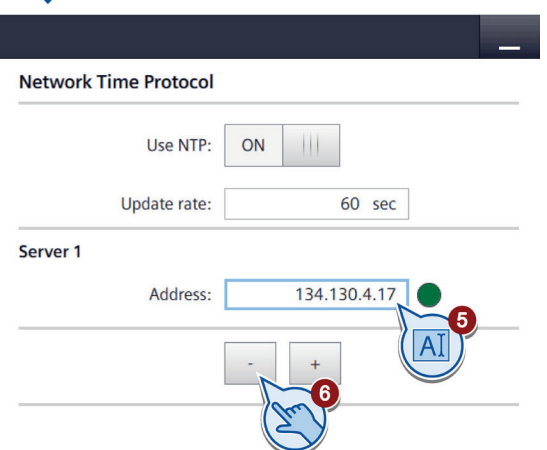
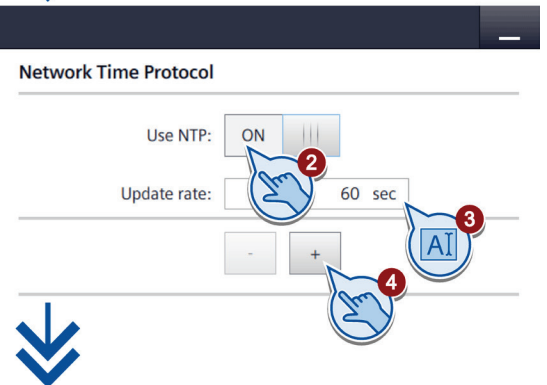
Note

Do not enter any additional time shift here, but in the "Date & Time" tab.

1. Press "Date & Time" to open the "Date, Time & Timezone Settings" dialog.
2. Activate the time-of-day synchronization.
3. At "Update Rate", enter the time duration in seconds according to which the time-of-day will be synchronized.
Value range: 10 to 86400 (1 day)
4. Use the "+" button to enter an additional time server.
5. Enter the IP address of the time server under "Address".

The connection is established. If the connection was successfully established, date and time are displayed.

You can detect the availability of the server by the green or red symbol.
6. Use the "-" button to remove the time server added last from the configuration.



5.4 Enter time and date

You can enter the time and date as well as a time shift in the Start Center.

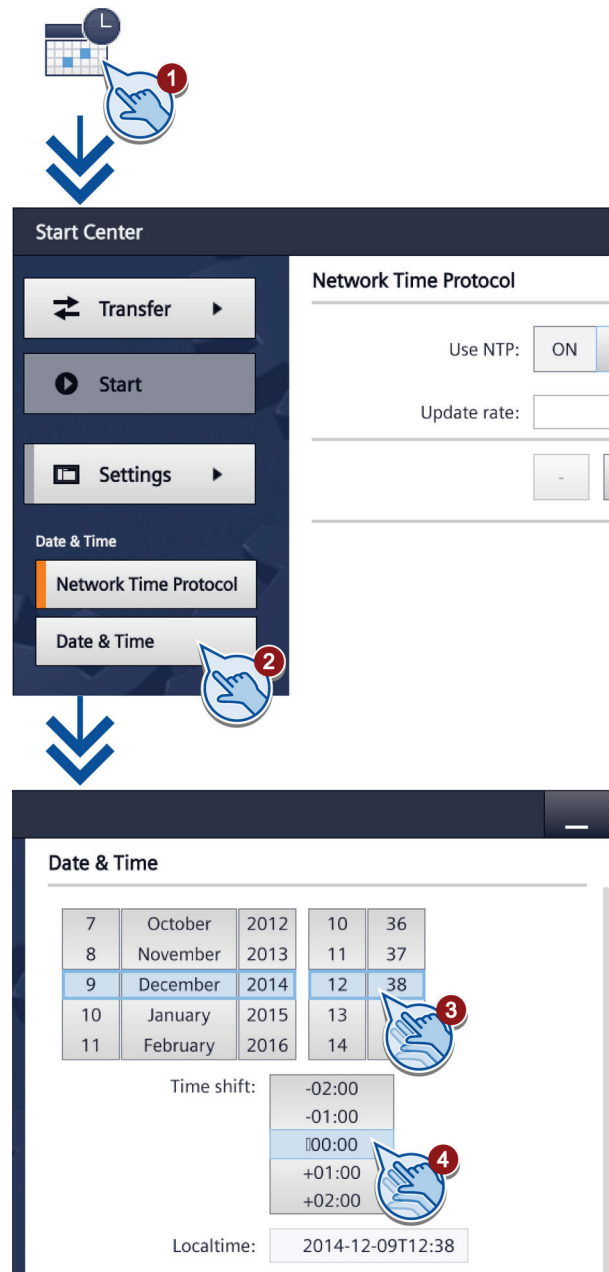
This time becomes valid when you have switched off "NTP", which means when you do not fetch the time-of-day from a server.

The time shift also applies for the time fetched by a time server.

1. Press "Date & Time" to open the "Date & Time" dialog.
2. Open the "Date & Time" tab.
3. Select the date and the required time in the drop-down lists.
4. If necessary, enter a time shift with the selection wheel under "Time shift".

The set time shift applies even if you fetch the time-of-day from a time server.

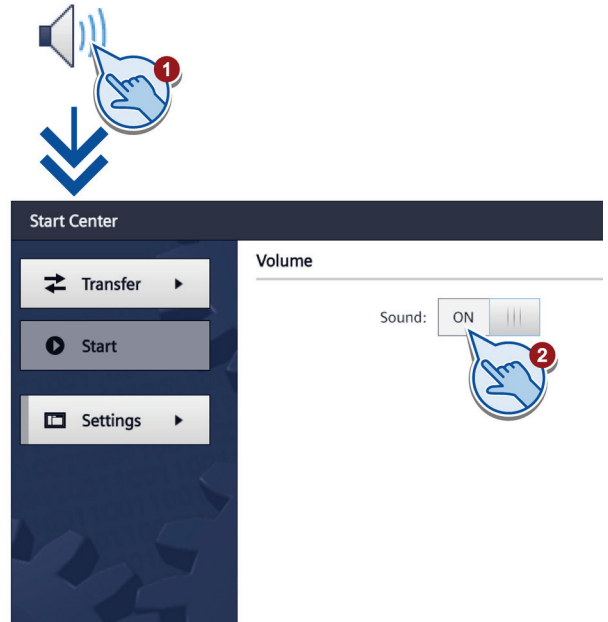
The resulting time is displayed under "Localtime".



5.5 Activating the acoustic signal

1. Press "Sounds" to open the "Volume" dialog.
2. Set the "Sound" to "ON".

Once you have set the "Sound" to "ON" you receive an acoustic feedback in the running project each time you touch the touch screen.



5.6 Configuring Autostart or wait time

You specify in the "System Control/Info" dialog if the project starts immediately after switching on the device or after a wait time.

1. Press "System Control/Info" to open the "System Control/Info" dialog.

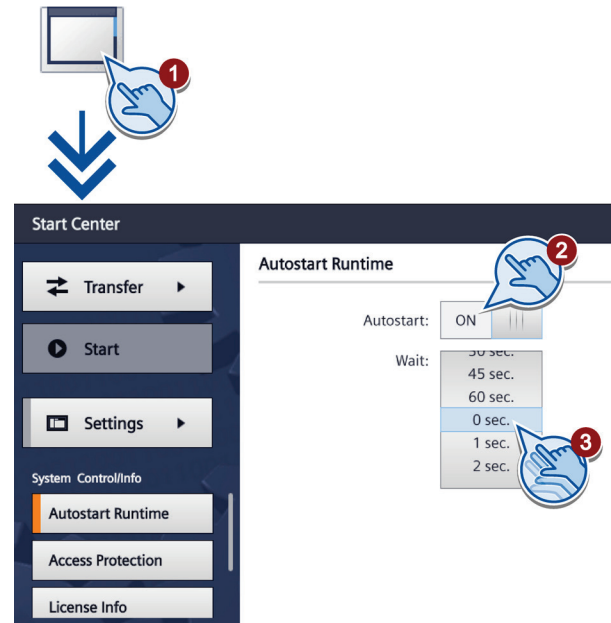
The "Autostart Runtime" tab is open.

2. Switch on the "Autostart" function.

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 automatic start of the project.

Value range: 0 ... 60 s



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.

5.7 Changing the password settings

Password protection prevents unauthorized access to the Start Center.

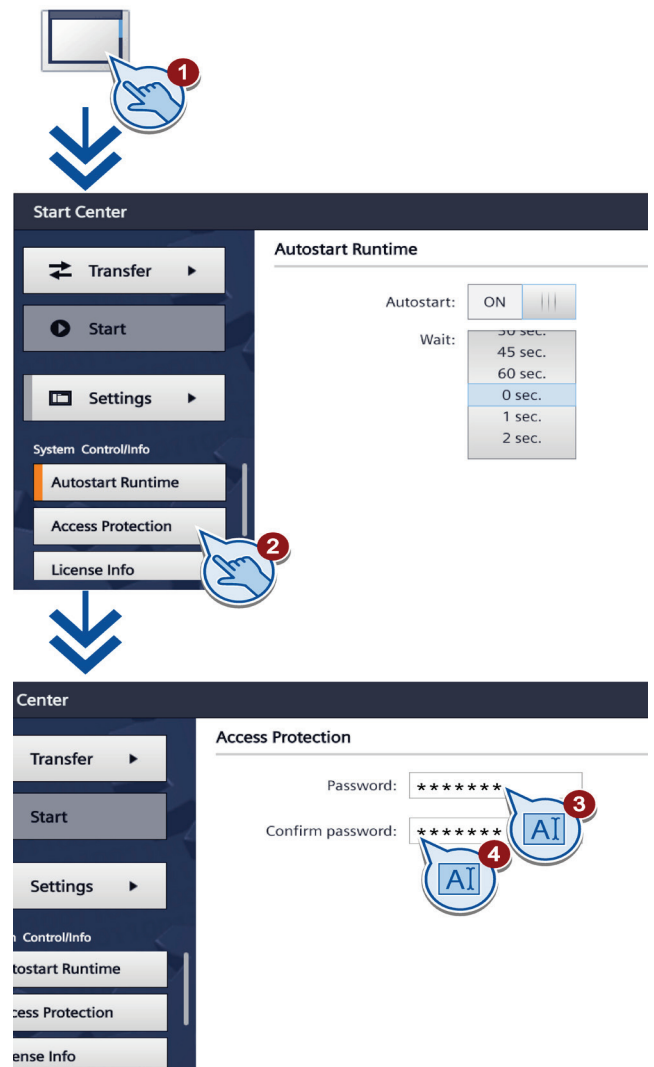
Note

The password cannot contain spaces or 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.

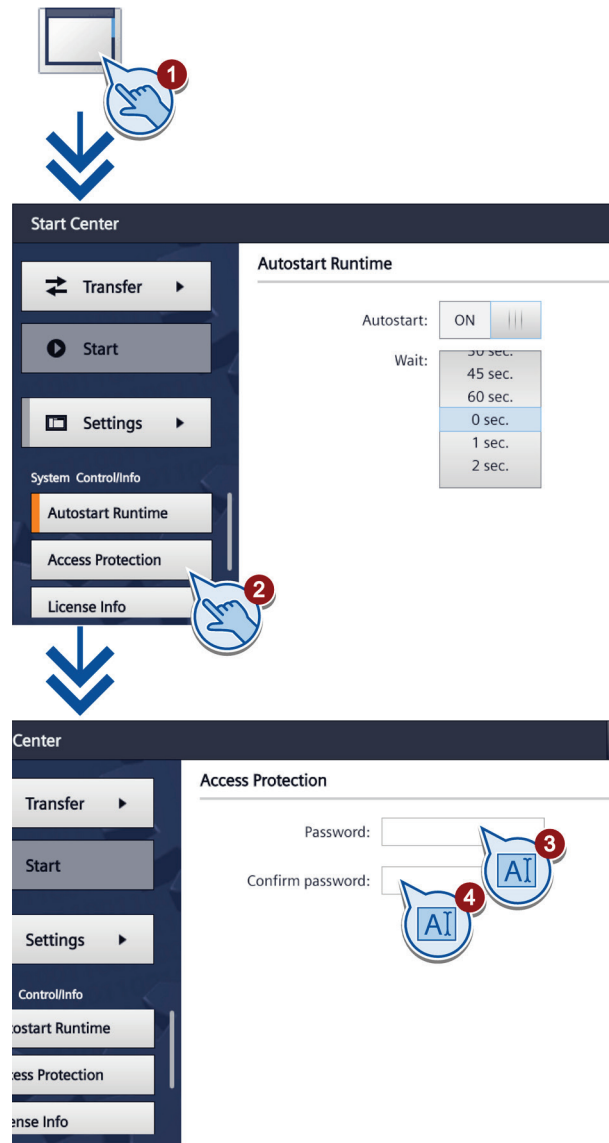
Activating password protection

1. Press "System Control/Info" to open the "System Control/Info" dialog.
2. Switch to the "Access Protection" tab.
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.



Deactivating password protection

1. Press "System Control/Info" to open the "System Control/Info" dialog.
2. Switch to the "Access Protection" tab.
3. Delete the entries in the "Password" text box.
4. Delete the entries in the "Confirm Password" text box.



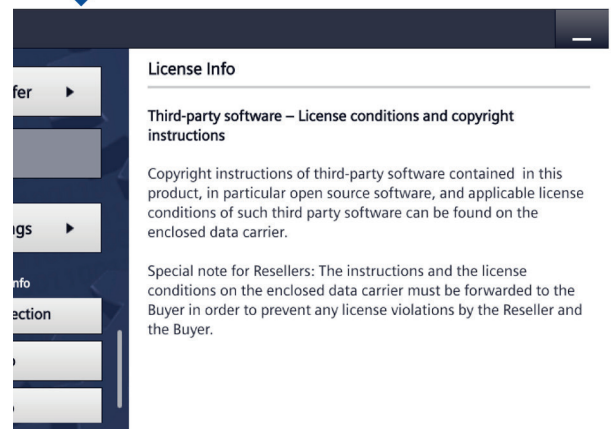
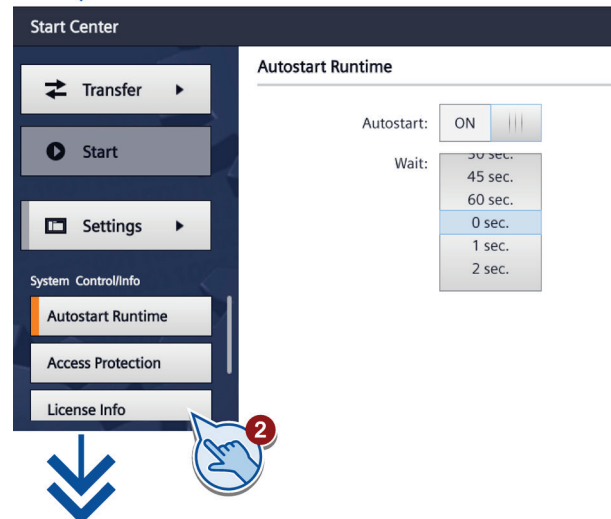
5.8 Displaying licensing information for the HMI device

1. Press "System Control/Info" to open the "System Control/Info" dialog.



2. Change to the "License Info" tab.

The "License Info" tab is used to display the licensing information for the software of the HMI device.



5.9 Displaying information about the HMI device

1. Press "System Control/Info" to open the "System Control/Info" dialog.
2. Shift the bookmarks up in the navigation area.
3. 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": Boot loader version
- "Bootloader release date": Release date of the boot loader
- "PN X1": MAC address, only for HMI devices with PROFINET interface



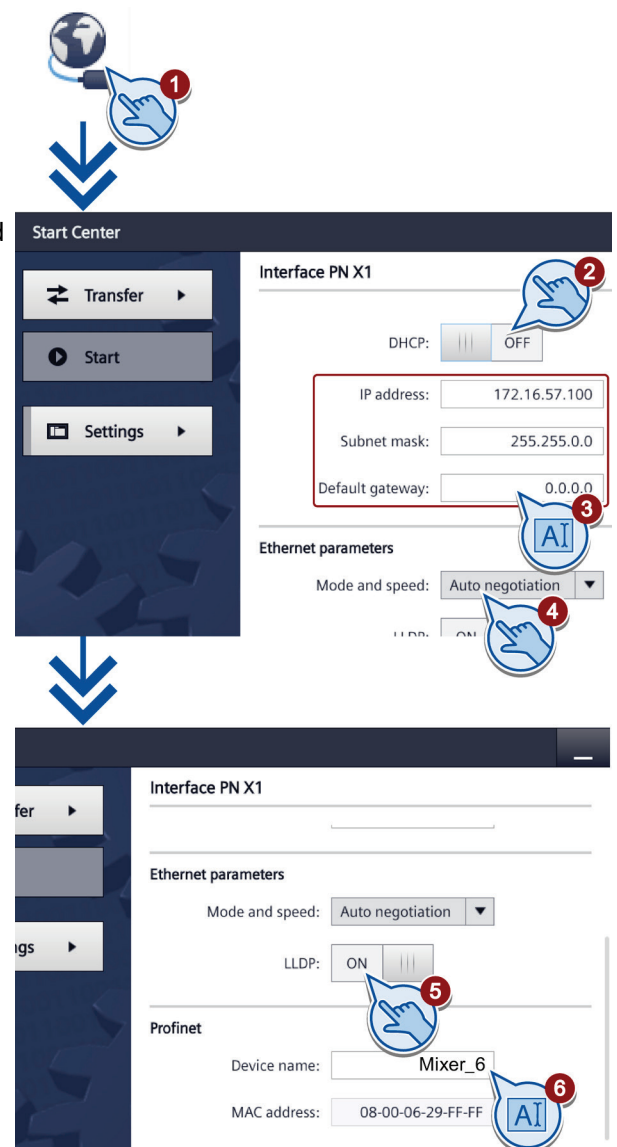
5.10 Changing the network configuration

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.

1. Press "Network Interface" to open the "Interface PN X1" dialog.
2. Choose either automatic address assignment via "DHCP", or user-specific address assignment.
3. If assigning a user-specific address, use the screen keyboard to enter valid values in the "IP address", "Subnet mask" text boxes and if applicable in the "Default gateway" text box.
4. Select the transmission rate in the PROFINET network and the transmission type 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).
5. If the "Auto Negotiation" entry is selected, the transmission type and transmission rate in the PROFINET network will be automatically detected and set.
6. If the "LLDP" switch is selected, the HMI device exchanges information with other HMI devices.
7. Enter a network name for your HMI device in the "Device name" field under "Profinet".
The 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 "."



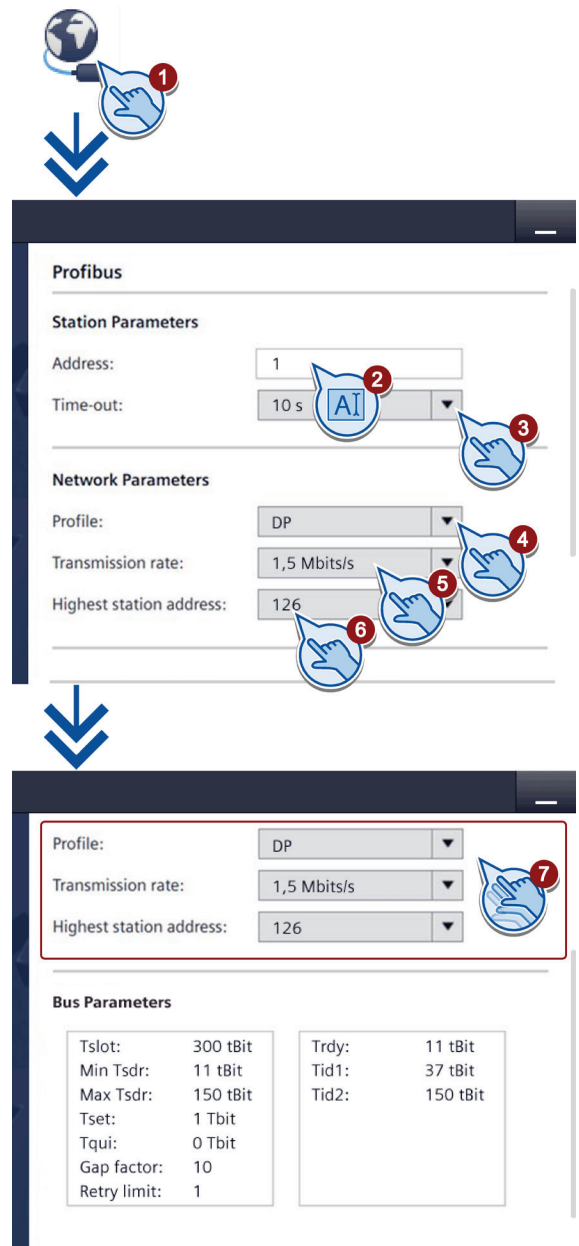
5.11 Changing the MPI/DP settings

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.
- Changes made to the project are activated at a later time.

1. Press "Network Interface" to open the "Profibus" dialog.
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...".



5.12 Enabling a data channel

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

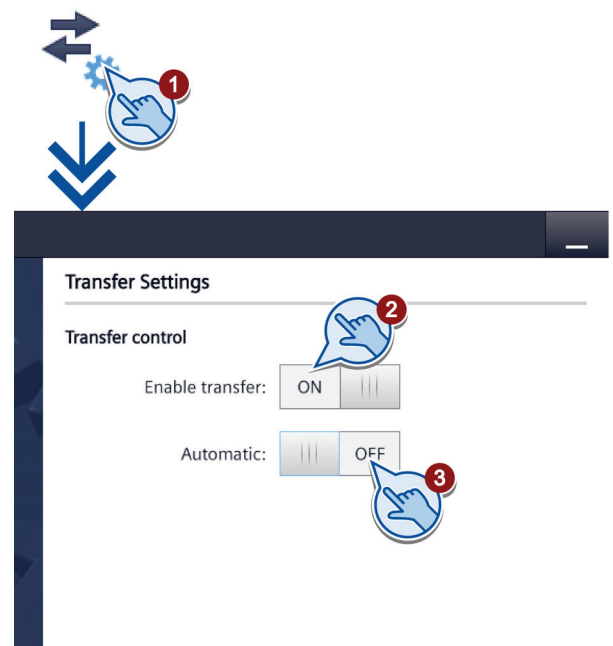
Note

After having completed the project transfer, you can protect the HMI device against unintentional overwriting of project data and of the HMI device image by locking all data channels.

1. Press "Transfer Settings" to open the "Transfer Settings" dialog.
2. Switch on "Enable transfer".
3. To enable automatic transfer, switch on "Automatic".

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.



See also

Changing the MPI/DP settings (Page 58)

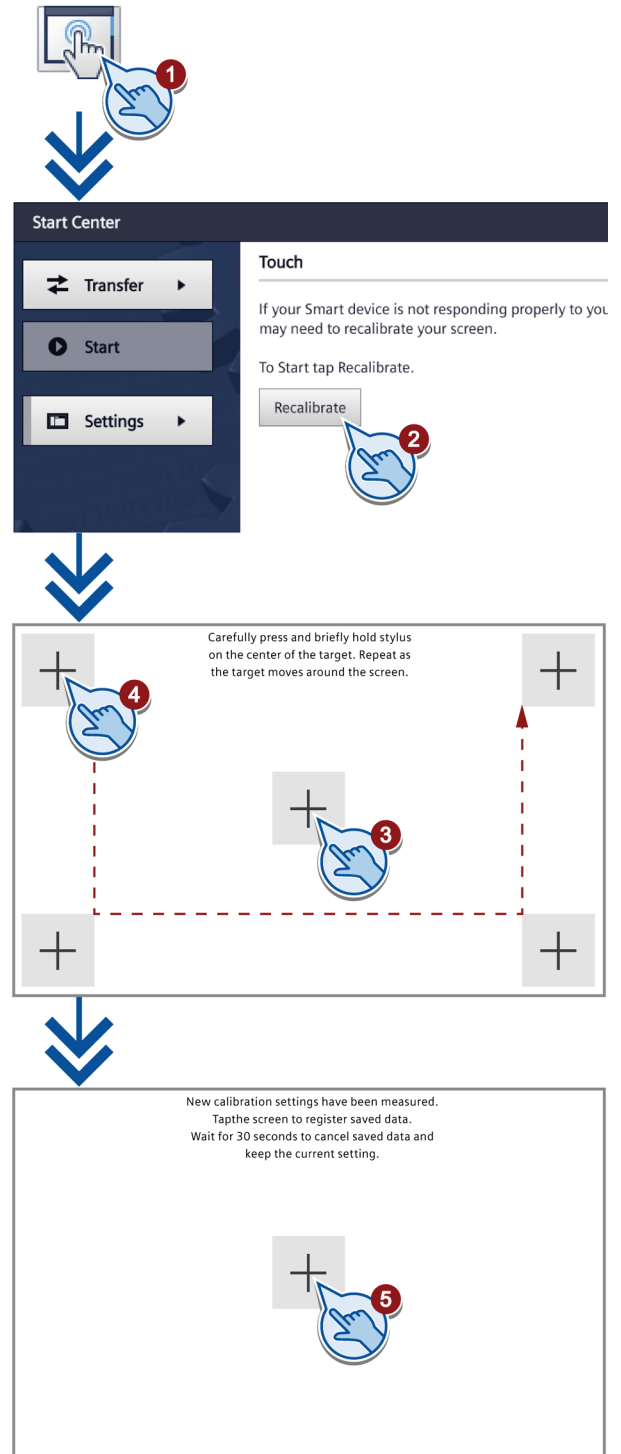
Changing the network configuration (Page 57)

5.13 Calibrating the touch screen

1. Press "Touch" to open the "Touch" dialog.
2. Click the "Recalibrate" button.
3. Press any spot on the touch screen within the next 15 seconds.
4. 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.



5.14 Changing the monitor settings

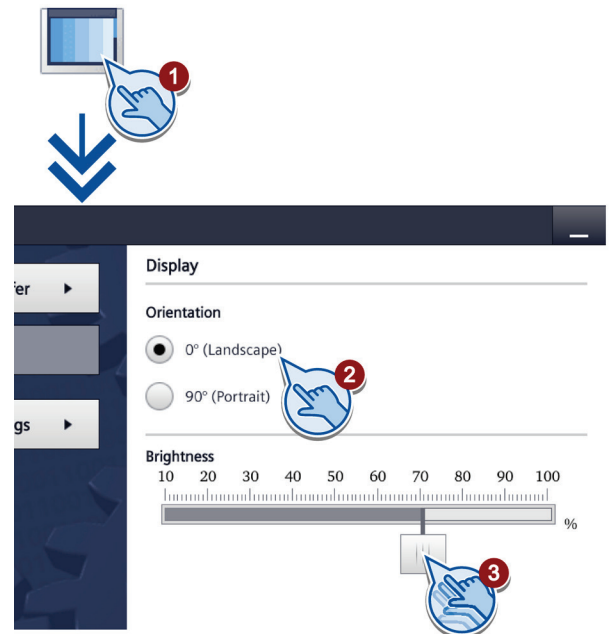
Note

Orientation of the screen (portrait or landscape)

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. Press "Display" to open the "Display" dialog.
2. Select the screen orientation:
 - "0° (Landscape)" for landscape
 - "90° (Portrait)" for portrait
3. Use the "Brightness" slider to set the screen brightness.



5.15 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.

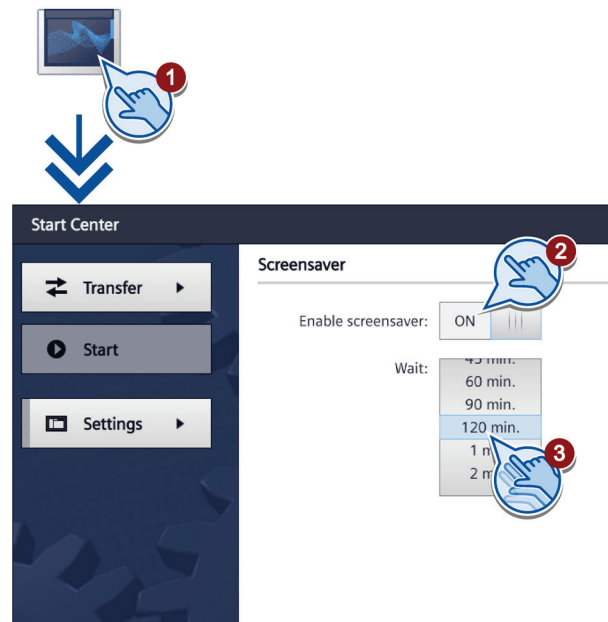
The "ghost" will disappear automatically after some time. The longer the same content is displayed on the screen, the longer it will take for the burn-in effect to disappear.

The screen saver helps to prevent burn-in.

Always use the screen saver.

1. Press "Screensaver" to open the "Screensaver" dialog.
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.



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.

Project	Data channel	Basic Panels DP	Basic Panels with PROFINET interface
Backup/restore	MPI/PROFIBUS DP	Yes	-
Operating system update	PROFINET	-	Yes
Project transfers			
Updating the operating system with "Reset to factory settings"	MPI/PROFIBUS DP	-	-
	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 a message is output on the HMI device warning you 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 65)

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.

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 65)

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.

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 65)

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
<p>Updating the operating system deletes all data on the HMI device</p> <p>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:</p> <ul style="list-style-type: none">• User administration• Recipes <p>Resetting to factory settings also deletes the License Keys. You should also back up the License Keys before resetting to factory settings.</p>

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:

- 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.

Maintenance and care

7.1 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.

7.2 Recycling

Recycling and disposal

The HMI devices described in these operating instructions can be recycled due to the low levels of pollutants. Contact a certified disposal service company for environmentally sound recycling and disposal of your old devices.

Technical specifications

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 HMI device fulfills requirements and criteria to IEC 61131-2, Programmable Logic Controllers, Part 2: Operating resource requirements and tests.

CE approval



The HMI device meets the general and safety-related requirements of the following EC directives and conforms to the harmonized European standards (EN) for programmable logic controllers published in the official gazettes of the European Union:

- 2004/108/EC "Electromagnetic Compatibility" (EMC Directive)

EC Declaration of Conformity

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

Siemens AG
 Industry Sector
 I IA AS FA DH AMB
 PO Box 1963
 D-92209 Amberg, Germany

UL approval



Underwriters Laboratories Inc., to

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

Marking for Australia



The HMI device fulfills the requirements of standard AS/NZS 4665.1-2005 +A1:2009 (Class A).

8.2 Electromagnetic compatibility

The device is designed for industrial use.

8.2.1 Emitted interference

The device meets the requirements according to EN 61000-6-4. The device corresponds to limit class A.

Note

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/TV reception.

8.2.2 Immunity to interferences

The device meets the requirements according to EN 61000-6-2.

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, Class 2M2 with the following amendments and limitations:

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

8.3.2 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, Class 3M3 with the following amendments and limitations:

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

8.4 Climatic ambient conditions

8.4.1 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, Class 2K2 with the following amendments and limitations:

Type of condition	Permitted range
Temperature	-20 ... +60 °C
Atmospheric pressure	1080 ... 660 hPa, corresponds to an elevation of 1000 m to 3500 m
Relative humidity	10 ... 90%, without condensation
Pollutant concentration	SO ₂ : < 0.5 ppm; Relative humidity < 60%, no condensation H ₂ S: < 0.1 ppm; Relative humidity < 60%, no condensation

Note

Ensure that no condensation (dewing) develops on or inside the HMI device after transporting it at low temperatures or after it has been exposed to extreme temperature fluctuations.

The HMI device must have acquired room temperature before it is put into operation. Do not expose the HMI device to direct radiation from a heater in order to warm it up. If dewing has developed, wait approximately 4 hours until the HMI device has dried completely before switching it on.

8.4.2 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.

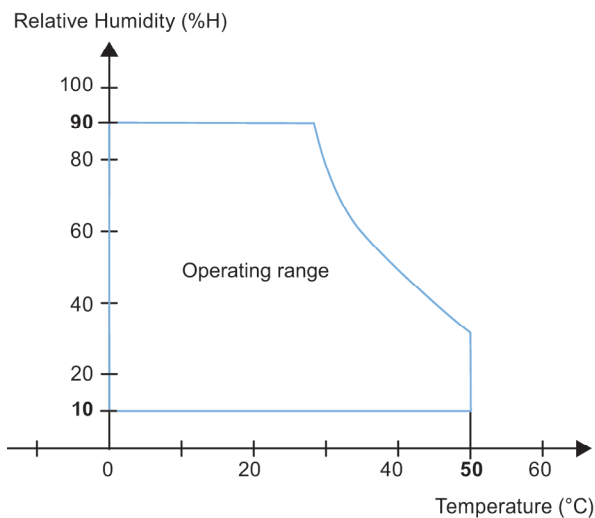
The device meets the requirements according to IEC 60721-3-3, Class 3K3 with the following amendments and limitations:

Type of condition	Permitted range
Temperature, device in landscape <ul style="list-style-type: none"> Vertical mounting Inclined installation, inclination up to 35° 	0 ... 50 °C 0 ... 40 °C
Temperature, device in portrait <ul style="list-style-type: none"> Vertical mounting Inclined installation, inclination up to 35° 	0 ... 40 °C 0 ... 35 °C
Atmospheric pressure	1080 ... 795 hPa, corresponds to an elevation of 1000 m to 2000 m
Relative humidity	From 10 to 90%, without condensation
Pollutant concentration	SO ₂ : < 0.5 ppm; Relative humidity < 60%, no condensation H ₂ S: < 0.1 ppm; Relative humidity < 60%, no condensation

8.4.3 Climate diagram

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

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



8.5 Protection classes

8.5.1 Insulation test

The device meets the requirements according to EN 61131-2.

Circuits with a nominal voltage of U_n to other circuits or ground	Test voltage
< 50 V	500 V AC

8.5.2 Protection against foreign objects and water

The device meets the requirements according to EN 60529.

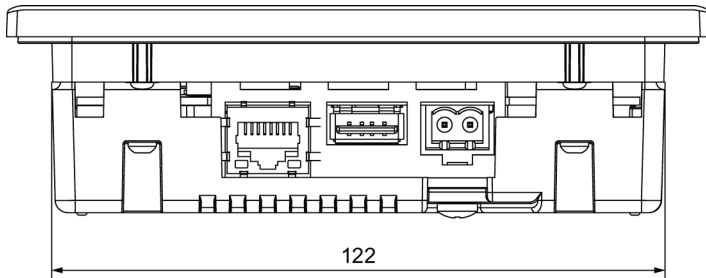
Device side	Degree of protection
Front	When mounted: <ul style="list-style-type: none"> • IP65 • Type 4X/Type 12 (indoor use only) ¹
Rear panel	<ul style="list-style-type: none"> • IP20 Touch protection test with standard test probes. There is no protection against ingress by water.

¹ Met if specified on the back of the device

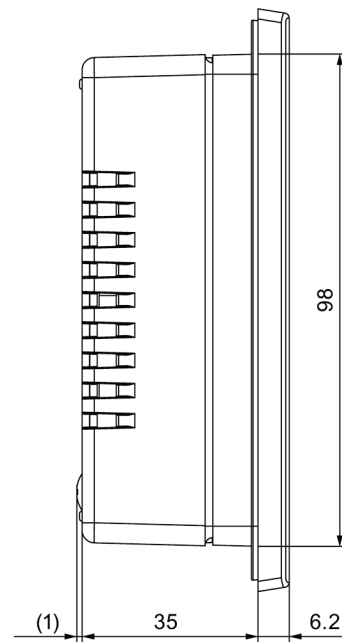
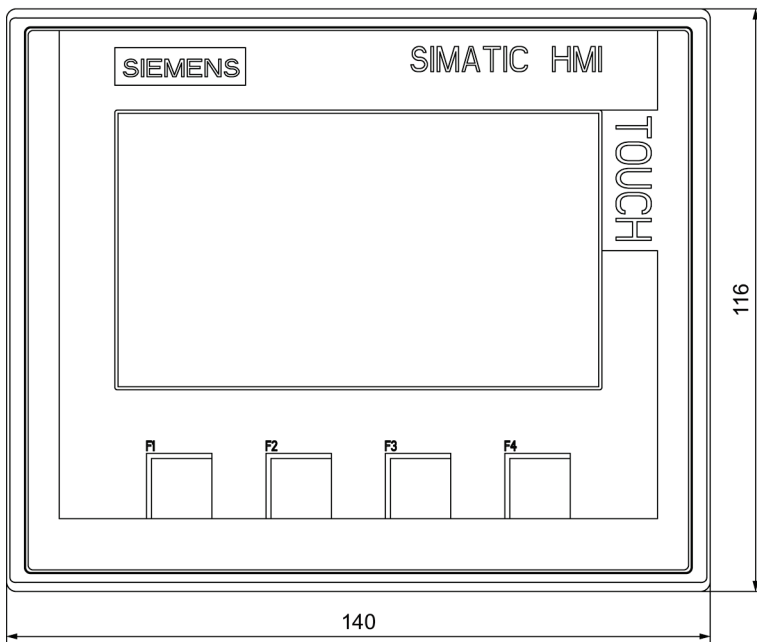
The degree of protection of the device front can only be guaranteed if the mounting seal lies flush against the mounting cutout. Read the corresponding information in section "Making the mounting cutout".

8.6 Dimension drawings

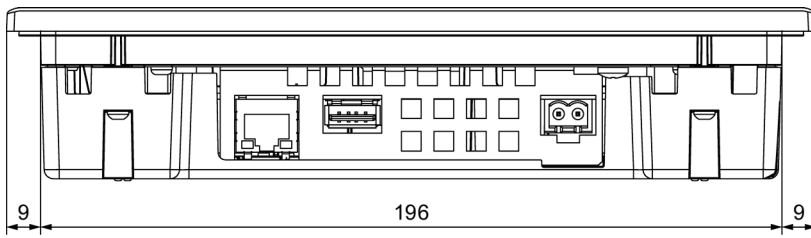
8.6.1 Dimensional drawing of KTP400 Basic



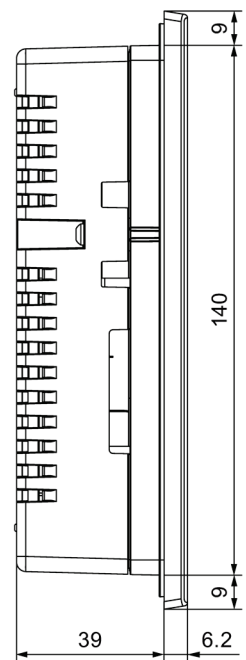
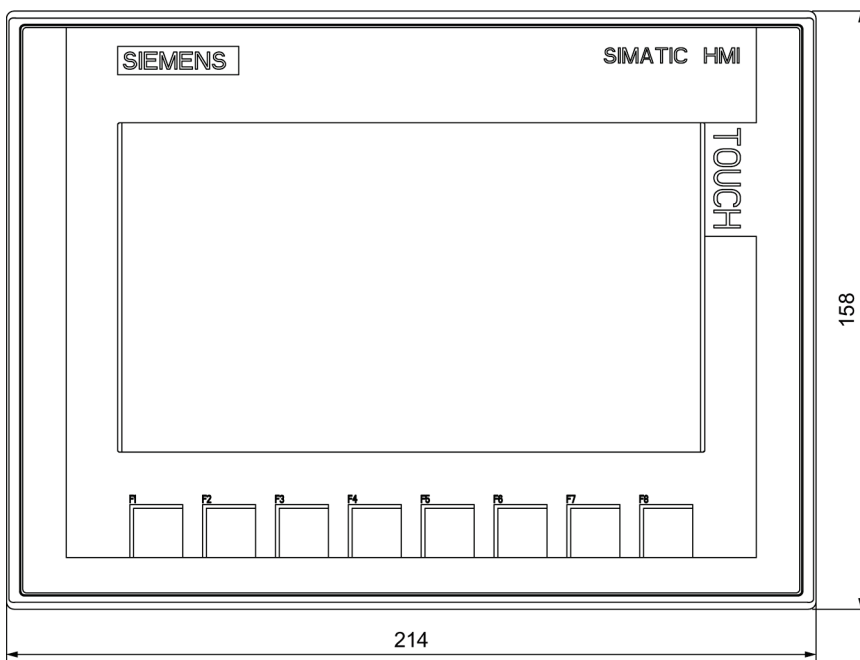
All dimensions in mm



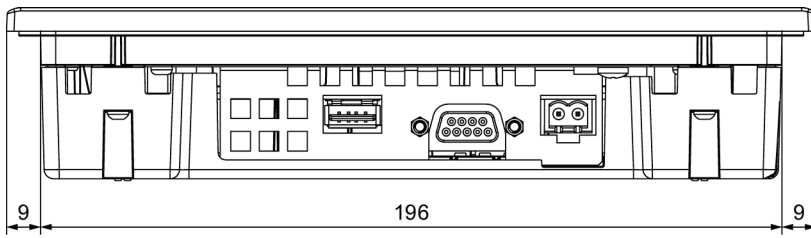
8.6.2 Dimensional drawing of KTP700 Basic



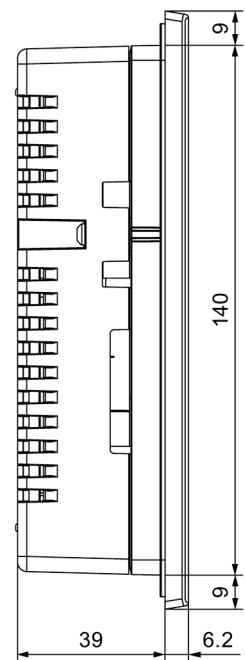
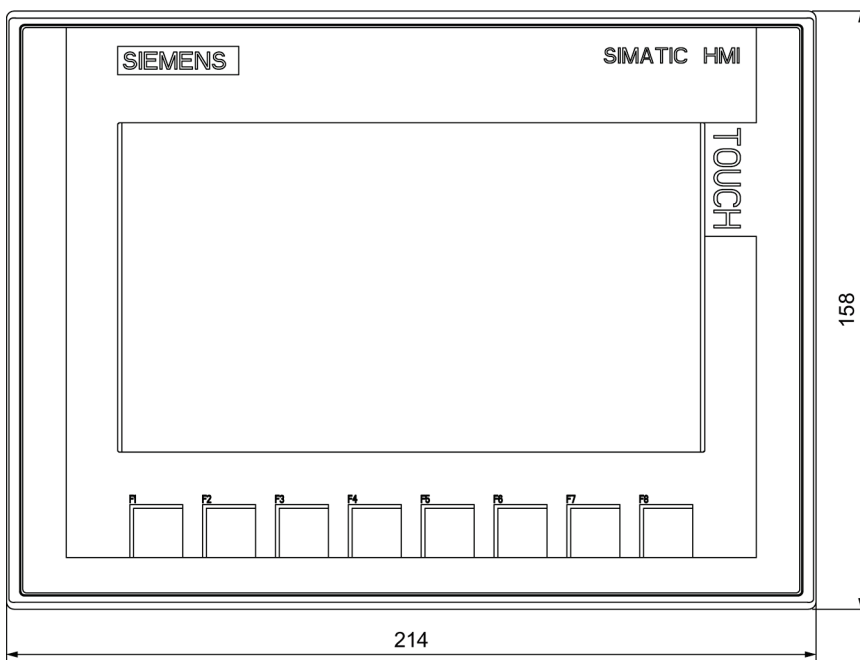
All dimensions in mm



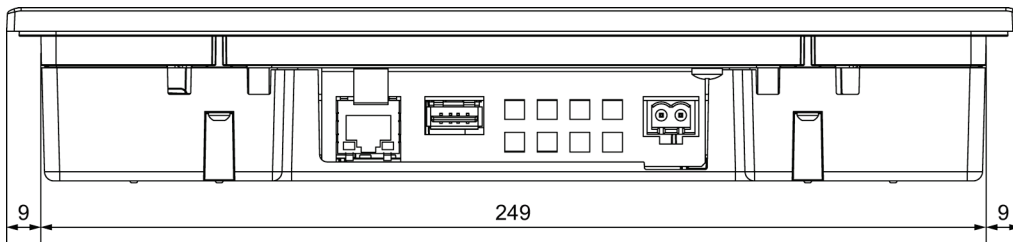
8.6.3 Dimensional drawing of KTP700 Basic DP



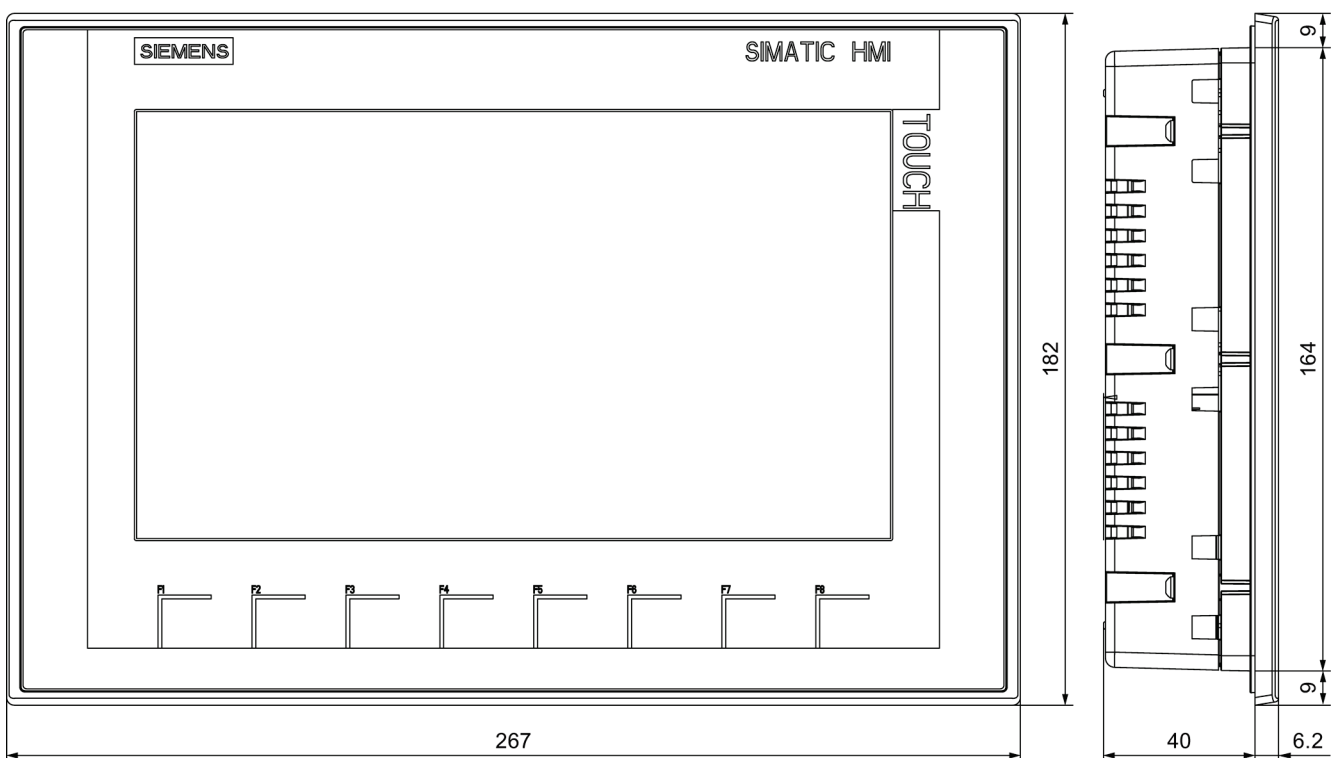
All dimensions in mm



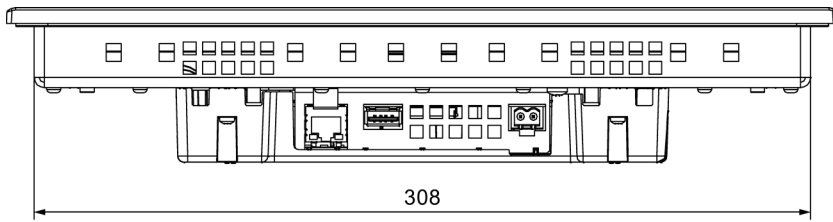
8.6.4 Dimensional drawing of KTP900 Basic



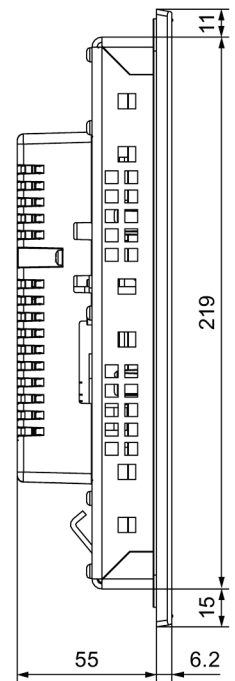
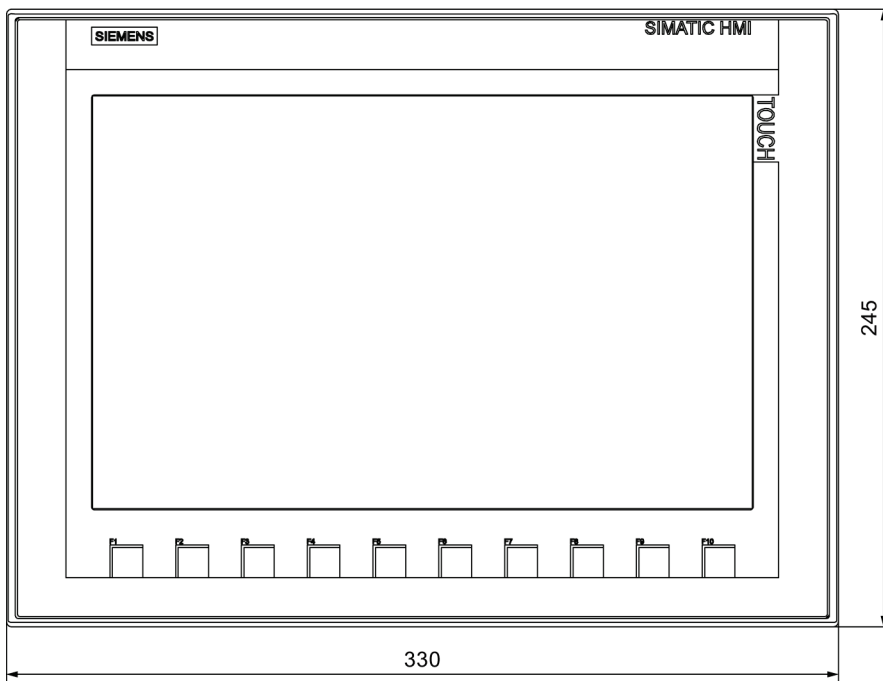
All dimensions in mm



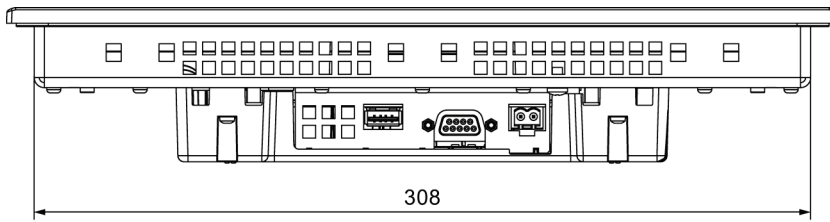
8.6.5 Dimension drawings of KTP1200 Basic



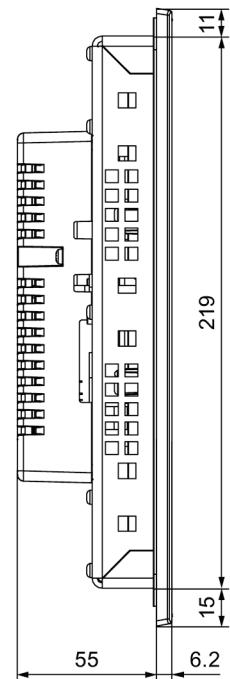
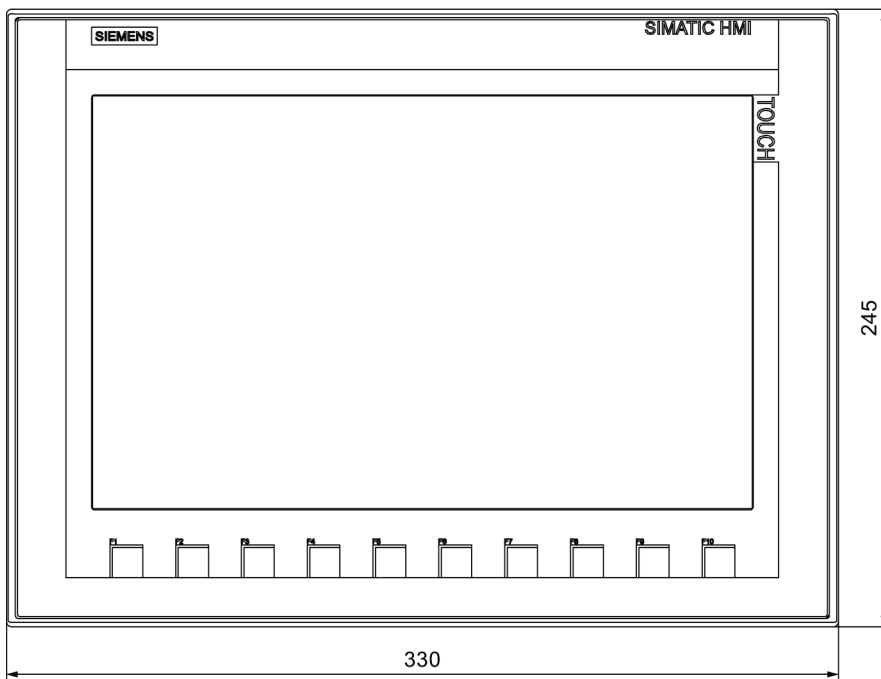
All dimensions in mm



8.6.6 Dimensional drawing of KTP1200 Basic DP



All dimensions in mm



8.7 Technical specifications

8.7.1 Power supply

The following table shows the permitted rated voltage and the corresponding tolerance range.

Rated voltage	Tolerance range
+24 V DC	19.2 ... 28.8 V (-20%, +20%)

8.7.2 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-controlled via screen saver or centrally via PROfenergy.

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		

Supply voltage

	KTP400 Basic	KTP700 Basic	KTP700 Basic DP
Rated voltage	+24 V DC		
Range, permitted	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 _{2t}	Approx. 0.2 A ² s	Approx. 0.2 A ² s	Approx. 0.2 A ² s
Fuse, internal	Electronic		

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

8.7.3 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 Half Brightness Life Time (MTBF ¹)	LED 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-controlled via screen saver or centrally via PROFlenergy.

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		

Supply voltage

	KTP900 Basic	KTP1200 Basic	KTP1200 Basic DP
Rated voltage	+24 V DC		
Range, permitted	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. 230 mA	Approx. 510 mA	Approx. 550 mA
• Constant current, maximum	Approx. 440 mA	Approx. 650 mA	Approx. 800 mA
• Inrush current $I_{\Delta t}$	Approx. 0.2 A ² s	Approx. 0.2 A ² s	Approx. 0.2 A ² s
Fuse, internal	Electronic		

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 Interface description

8.8.1 Power supply

Name of interface on HMI device: DC24V X80

Plug connector, 2-pin

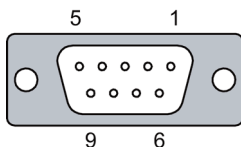


Pin number	Assignment
1	+24 V DC (L+)
2	GND 24 V (M)

8.8.2 PROFIBUS (Sub-D RS422/485)

Name of interface on HMI device: PROFIBUS DP X2

Sub-D socket, 9-pin, with screw lock

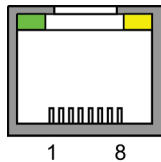


Pin	Assignment for the RS 422	Assignment for the RS 485
1	n. c.	n. c.
2	GND 24 V	GND 24 V
3	TxD+	Data channel B (+)
4	RxD+	RTS
5	GND 5 V, floating	GND 5 V, floating
6	+5 V DC, floating	+5 V DC, floating
7	+24 V DC, out (max. 100 mA)	+24 V DC, out (max. 100 mA)
8	TxD-	Data channel A (-)
9	RxD-	NC

8.8.3 PROFINET (Ethernet)

Name of interface on HMI device: PROFINET (LAN) X1

RJ45 plug connector



Pin	Assignment
1	Tx+
2	Tx-
3	Rx+
4	n. c.
5	n. c.
6	Rx-
7	n. c.
8	n. c.

Meaning of LEDs

There is no connection if both LEDs are off.

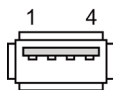
The green "Link" LED lights up as soon as there is a physical connection.

The yellow "Activity" LED lights up during the data transfer.

8.8.4 USB

Name of interface on HMI device: USB X60

USB socket



The following table shows the pin assignment of the USB port.

Pin	Assignment
1	+5 V DC, out, max. 500 mA
2	USB-DN
3	USB-DP
4	GND

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>	<i>Yes</i>
<i>Linear scaling</i>	<i>Input/output</i>	<i>Yes</i>
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>	<i>Yes</i>
	<i>Acknowledge multiple error alarms simultaneously (group acknowledgement)</i>	<i>16 acknowledgment groups</i>
	<i>Edit alarm</i>	<i>Yes</i>
	<i>Alarm indicator</i>	<i>Yes</i>
Alarm buffer	Alarm buffer capacity	256 alarms
	Simultaneously queued alarm events	Max. 64
	<i>View alarm</i>	<i>Yes</i>
	<i>Delete alarm buffer</i>	<i>Yes</i>

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 are: bars, sliders, symbol library, clock and all objects from the Controls area. 2) This includes array elements included 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) Each element used in arrays represents a recipe element.		

Logging

Object	Specification	Quantity
Logs	Number of logs	2
	Number of tags per log	10
	Number of log entries ¹⁾	10,000
	Number of segmented circular logs	400
	Logging cycle	1 s
1) The number of entries for all segmented circular logs is valid for the "segmented circular log" logging method. 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 (http://www.siemens.de/automation/csi_en_WW)
- Support request form (<http://www.siemens.com/automation/support-request>)
- After-sales information system for SIMATIC PC / PG (<http://www.siemens.com/asis>)
- SIMATIC Documentation Collection (<http://www.siemens.com/simatic-tech-doku-portal>)
- Your local representative
(<http://www.automation.siemens.com/mcms/aspa-db/en/Pages/default.aspx>)
- Training center (<http://sitrain.automation.siemens.com/sitrainworld/?AppLang=en>)
- Industry Mall (<http://mall.automation.siemens.com>)

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

- Article number of the device (MLFB)
- BIOS version (industry PC) or image version (HMI device)
- Installed additional hardware
- Installed additional software

Tools & downloads

Please check regularly if updates and hotfixes are available for download to your device. The downloads are available on the Internet under "After Sales Information System SIMATIC PC/PG" (see above).

A.2 System events

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

Note

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

System event parameters

System events 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 events

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

B

Abbreviations

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

Abbreviations

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

HMI device operating mode for transferring an executable project from the configuring PC to an HMI device.

Acknowledge

Acknowledgment of an alarm confirms that it has been noted.

Alarm, acknowledgment

Acknowledgment of an alarm confirms that it has been noted.

Alarm, activated

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

Alarm, deactivated

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

Alarm, user-specific

User-specific alarms report specific states of a plant that is interconnected with the HMI device via the PLC.

Automation system

An automation system is a PLC of the SIMATIC S7 product line, e.g. SIMATIC S7-300

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 screen of the Start Center is displayed after the operating system has loaded.

Configuration software

The configuration software is used to create projects for process visualization. WinCC is an example of this type of configuration software.

Configuring PC

A configuring PC is a programming device or PC on which plant projects are created using an engineering software.

Display duration

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

EMC

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

Event

Incoming events trigger defined functions. 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 those keys are defined in the engineering phase. The function key assignment can be specific to an active screen or not.

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.

HMI device

HMI devices are used to operate and monitor machinery and plants. The machine or plant states are visualized on the HMI device by means of graphic objects or signal lamps. The operator controls of the HMI device enable intervention in machine or plant processes and sequences.

HMI device image

The HMI device image is a file that can be transferred from the configuring PC to the HMI device. The HMI device image contains the operating system of the HMI device, including the elements of the Runtime software required for the executable project file.

I/O field

Enables the input or output of values on the HMI device and their transfer to the PLC.

Infotext

A configured infotext provides information about objects within a project. An alarm infotext, for example, can contain information on the cause and troubleshooting of faults.

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

Plant

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

PLC

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

PLC job

A PLC job triggers a function at the HMI device.

Process visualization

Denotes visualization of technical processes by means of text and graphic elements. Configured plant screens enable intervention in runtime plant processes by means of data input and output.

Project

A project is the result of a configuration using an engineering software. The project usually contains several screens with embedded system-specific objects, basic settings and alarms. The project is saved in the project file.

There is a difference between an offline project on a configuring PC and an online executable project on an HMI device. A project can be available in more languages on the configuring PC than can be managed on the HMI device. The project on the configuring PC can also be set up for different HMI devices. However, on the HMI device you can only transfer the executable project which has been generated specifically for this HMI device.

Project file

Source file from which the executable project file for the HMI device is generated. The project file is usually not transferred and is retained on the configuring PC.

Project file, compressed

Compressed format of the project file. The compressed project file can be transferred in addition to the executable project file to the corresponding HMI device. The upload function must be activated accordingly on the configuring PC at the time of the transfer. The compressed project file is usually saved to an external memory card.

A compressed project file has the extension *.pdz.

Project file, executable

An executable project file is generated from the project file for a specific HMI device in the course of engineering. The executable project file is transferred to the associated HMI device where it is used to operate and monitor plants.

ProSave

ProSave provides all functions which are necessary to transfer data between the configuration PC and the HMI device, for example, backup and restoring data or managing license keys and options.

ProSave is installed by default together with WinCC. The standalone version of ProSave can also be used for service purposes on a PC without WinCC installation. The standalone version is available on the installation DVD of WinCC.

Recipe

A recipe represent 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 data record. The use of recipes ensures that all data assigned to a data record is transferred synchronously to the PLC.

Runtime software

The Runtime software is a process visualization software which can be used to test projects on a configuring PC.

Screen

Mode of visualization of all logically associated process data of a plant. Visualization of the process data can be supported by means of graphic objects.

Screen object

Refers to objects such as rectangles, I/O fields, or alarm views which are configured for visualization or operation of the plant.

STEP 7

STEP 7 is the programming software for SIMATIC S7, SIMATIC C7 and SIMATIC WinAC PLCs.

STEP 7 Micro/WIN

STEP 7 Micro/WIN is the programming software for SIMATIC S7-200 PLCs.

Symbolic I/O field

Symbolic I/O fields are used for the input and output of values. A field contains a list of default entries from which one can be selected.

System alarms

System alarms are assigned the "System" alarm class. A system alarm reports internal states of the HMI device and of the PLC.

Tab order

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

Tags

A tag is a defined memory area that is used to read and write values. Those tags can be accessed from the PLC or using the HMI device. We distinguish between external tags (process tags) and internal tags, depending on whether or not the tag is interconnected with the PLC.

Transfer

Transfer of an executable project from the configuring PC to the HMI device.

WinCC

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

A project created with WinCC V13 has the file extension ".ap13". An executable project file on a HMI device has the extension ".fwx".

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