SIEMENS

SIMATIC HMI

Industrial Thin Clients ITC V3, ITC V3 PRO

Operating Instructions

Firmware Version V3.1

09/2018

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Legal information

Warning notice system

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

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

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

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

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

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

Qualified Personnel

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

Proper use of Siemens products

Note the following:

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

Trademarks

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Disclaimer of Liability

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

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Preface

Purpose of the operating instructions

These operating instructions provide information based on the requirements defined by mechanical engineering documentation for manuals. This information relates to the place of use, transport, storage, mounting, use and maintenance.

These operating instructions are intended for the following user groups:

- Operators

  The following chapters are of relevance:

  – Overview (Page 11)

  – Operating the device (Page 59)

- Administrator

  The following chapters are of relevance:

  – Overview (Page 11)

  – Assigning device parameters (Page 71)

  – Configuring the server (Page 104)

- Commissioning engineers

  The following chapters are of relevance:

  – Overview (Page 11)

  – Installing and connecting the device (Page 33)

  – Configuring the server (Page 104)

- Maintenance personnel

  The following chapters are of relevance:

  – Overview (Page 11)

  – Device maintenance and repair (Page 159)

Chapter Safety instructions (Page 27) must be particularly observed by all user groups.

Basic knowledge required

General knowledge of automation technology and process communication is needed to understand the operating instructions.

Specialist knowledge of SINUMERIK systems are required for the "SINUMERIK" operating mode.

It is also assumed that those using the manual have experience in using personal computers and knowledge of Microsoft operating systems.

Scope of the operating instructions

The following operating instructions apply to the following ITC (Industrial Thin Client) V3 devices in connection with firmware version V3.1:

ITC V3 devices 15"

Designation	Type	Article number, device with Siemens logo	Article number, device without Siemens logo
ITC1500 V3	Built-in unit	6AV6646-1BA15-0AA0	6AV6646-1BA15-0NA0
ITC1500 V3 PRO	PRO device for pedestal (extendable, flange bottom)	6AV6646-1BB15-0AA0	6AV6646-1BB15-0NA0
ITC1500 V3 PRO	PRO device for support arm (not extendable, flange top)	6AV6646-1BC15-0AA0	6AV6646-1BC15-0NA0
ITC1500 V3 PRO	PRO device for support arm (extendable, round tube)	6AV6646-1BD15-0AA0	6AV6646-1BD15-0NA0

ITC V3 devices 19"

Designation	Type	Article number, device with Siemens logo	Article number, device without Siemens logo
ITC1900 V3	Built-in unit	6AV6646-1BA18-0AA0	6AV6646-1BA18-0NA0
ITC1900 V3 PRO	PRO device for pedestal (extendable, flange bottom)	6AV6646-1BB18-0AA0	6AV6646-1BB18-0NA0
ITC1900 V3 PRO	PRO device for support arm (not extendable, flange top)	6AV6646-1BC18-0AA0	6AV6646-1BC18-0NA0
ITC1900 V3 PRO	PRO device for support arm (extendable, round tube)	6AV6646-1BD18-0AA0	6AV6646-1BD18-0NA0

ITC V3 devices 22"

Designation	Type	Article number, device with Siemens logo	Article number, device without Siemens logo
ITC2200 V3	Built-in unit	6AV6646-1BA22-1AA0	6AV6646-1BA22-1NA0
ITC2200 V3 PRO	PRO device for pedestal (extendable, flange bottom)	6AV6646-1BB22-1AA0	6AV6646-1BB22-1NA0
ITC2200 V3 PRO	PRO device for support arm (not extendable, flange top)	6AV6646-1BC22-1AA0	6AV6646-1BC22-1NA0
ITC2200 V3 PRO	PRO device for support arm (extendable, round tube)	6AV6646-1BD22-1AA0	6AV6646-1BD22-1NA0

Brands

The following designations marked with the symbol ® are registered trademarks of Siemens AG:

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

Style conventions

The following text notation will facilitate reading this manual:

Style Convention	Scope
"Add screen"	• Terminology that appears in the user interface, for example dialog names, tabs, buttons, menu commands • Required input, for example, limits, tag values. • Path information
"File > Edit"	Operating sequences, for example, menu commands, shortcut menu commands
<F1>, <Alt+P>	Keyboard operation

Please observe notes labeled as follows:

Note

Notes contain important information concerning the product, its use or a specific section of the documentation to which you should pay particular attention.

Naming conventions

Term	Applies to
Device, HMI device, Industrial Thin Client	All ITC V3 devices and ITC V3 PRO devices
Built-in unit	All ITC V3 built-in units
PRO device	All ITC PRO devices

Figures

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

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

Work steps within the figures are marked with white process numbers on a black background according to the sequence to be followed: ❶, ❷, ❸, ...

Table of contents

Overview 1

1.1 Product description

SIMATIC ITC - the high-performance local thin client solution

Industrial Thin Clients are low-cost HMI terminals that provide local HMI functionality in plants spread over large areas. In this way, Industrial Thin Clients contribute to an improved overview, operability, and productivity of plants. In addition, the Industrial Thin Clients also reduce the total cost of ownership (TCO) by virtue of their extremely easy commissioning, efficient Ethernet networking, reduced software costs, and minimal service costs.

The Industrial Thin Client itself requires no installation and no licenses to operate. You can also bridge greater distances via Ethernet.

The Industrial Thin Client offers the following operating modes. The operating mode is defined as part of first commissioning.

- ITC Operating mode
- SINUMERIK operating mode

ITC Operating mode

In the ITC operating mode, the Industrial Thin Client always communicates with a host, such as an HMI device, industrial PC, or server, via the following connection types:

- Web browser functionality
- SIMATIC WinCC Sm@rtServer
- Standard RDP (Remote Desktop Protocol) from Microsoft
- VNC (Virtual Network Computing)
- On-demand application service from Citrix
- WinCC OA

You can do the following from the Industrial Thin Client:

- Display and run web-based content from a web server available on the network (e.g., S7 controller, Intranet/Internet) via the integrated web browser.
- Run WinCC projects on other HMI devices or industrial PCs via Sm@rtServer.
- Run HMI applications (e.g., WinCC), Office applications (e.g., Excel), or SAP directly at the machine via RDP.
- Operate a PC remotely with VNC (similar to RDP).
- Access a Citrix server as Citrix client.
- Access a WinCC OA server as client.

You will find the description of the ITC operating mode in Section "ITC Operating mode (Page 65)".

SINUMERIK operating mode

In SINUMERIK operating mode, the Industrial Thin Client behaves like a SINUMERIK operator panel face with built in Thin Client Unit TCU.

You will find the description of the SINUMERIK operating mode in Section "SINUMERIK operating mode (Page 119)".

Features

Installation compatibility

The Industrial Thin Client built-in units are compatible with SIMATIC Industrial PCs, Industrial Flat Panels, HMI devices and SINUMERIK TOP Panels of the same series.

Front

- Integrated glass front, anti-reflective coating, resistant to scratches and chemicals
- Brilliant 15", 19" or 22" TFT display with 16 million colors

Touch screen

- Capacitive touch screen
- Suitable for operation with glove, pen and finger
- Detection of accidental contact

IP65 fully-enclosed

The Thin Client PRO with an IP65 protection class housing features all-round dust- and hose water protection. The ready-to-use HMI device can be mounted either from the top or the bottom to a support arm system or to a pedestal.

A basic adapter and adapter sets that can be ordered separately support mounting systems from various manufacturers (including VESA standard for flat screens). The rear panel can be easily opened. The interfaces of the HMI device can therefore be reached without problem. Special cables or plugs are not required.

The Thin Client PRO is impressive not only on account of its ease of servicing but also due to its sophisticated design and slimline device depth.

Easy commissioning

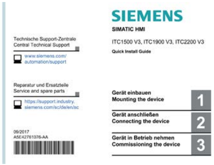
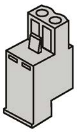
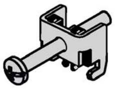
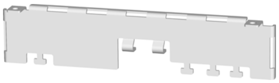
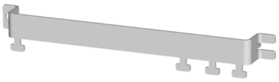
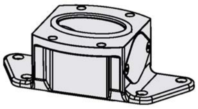
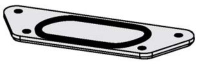
The Industrial Thin Client merely requires an IP address. For fast on-site commissioning and diagnostics, the SIMATIC ITC is equipped with a Setup Wizard optimized for touch operation. Local software installation on the device is not necessary. The display and user interface of the application are provided by the host.

High robustness

As a remote operator terminal without any rotating media (hard drive or fan), you can operate the Industrial Thin Client on machines having stringent requirements for mechanical robustness.

1.2 Product package

The following components are included in the scope of delivery of the device:

Designation	Figure		Quantity
HMI device			1
Installation instructions (Quick Installation Guide)	SIEMENS SIMATIC HMI ITC1500 V3, ITC1900 V3, ITC2200 V3 Quick Install Guide Technische Support-Zentrale Central Technical Support www.siemens.com/automation/support Reparatur und Ersatzteile Service and spare parts https://support.industry.siemens.com/sc/de/en/sc Gerät einbauen Mounting the device 1 Gerät anschließen Connecting the device 2 Gerät in Betrieb nehmen Commissioning the device 3 09/2017 A5E42761076-AA		1
Power supply connector			1
Mounting clips with screw		Steel mounting clip, captive For built-in units	12
Strain relief bracket		For built-in units	1
		For PRO devices	1
Basic adapter		Only for PRO devices for support arm (not extendable, flange top) and for pedestal (extendable, flange bottom)	1
Cover for mechanical interface:		Only for PRO devices for support arm (extendable, round tube)	1

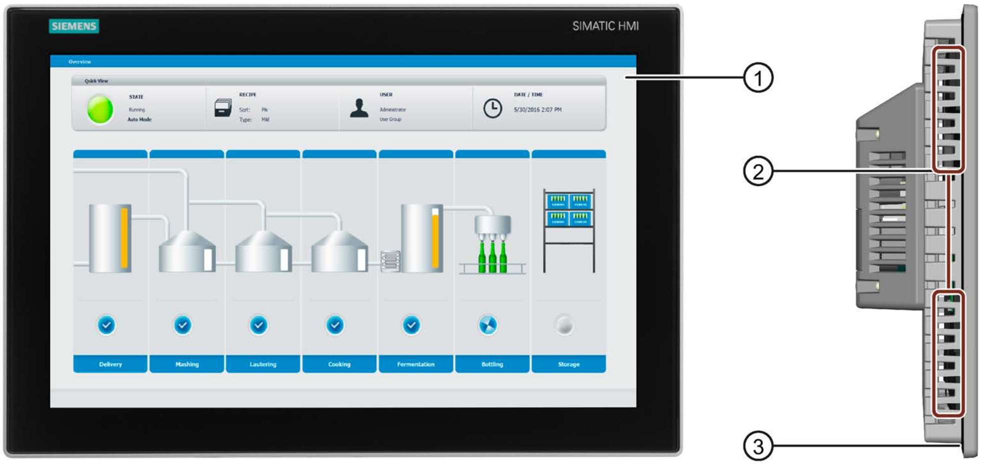
Some components of the product package are also available separately, see section "System components and accessories (Page 21)".

1.3 Layout of the devices

1.3.1 ITC V3 built-in units

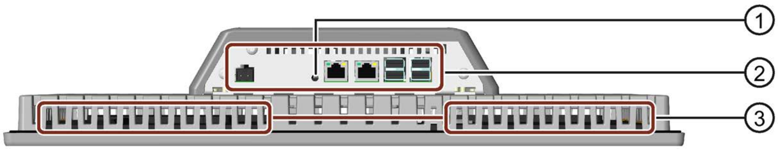
The following figures show the structure of the Industrial Thin Clients using an example of the SIMATIC ITC1900 V3 built-in units with Siemens logo.

Front view and side view



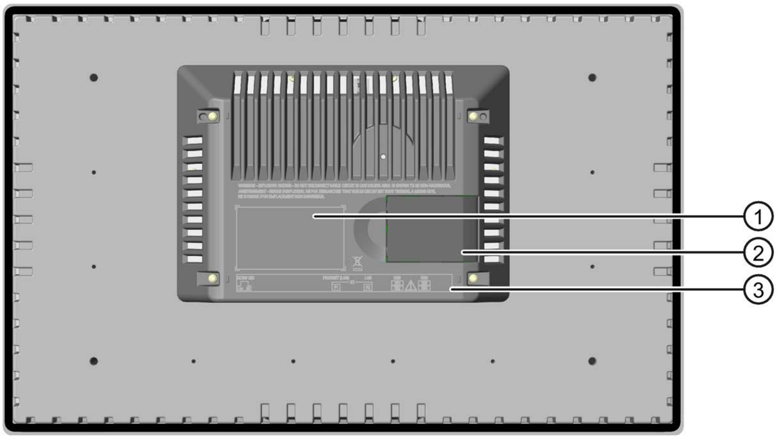
① Capacitive touch screen
② Recesses for mounting clips
③ Mounting seal

Bottom view



① "Factory settings" button
② Interfaces
③ Recesses for mounting clips

Rear view

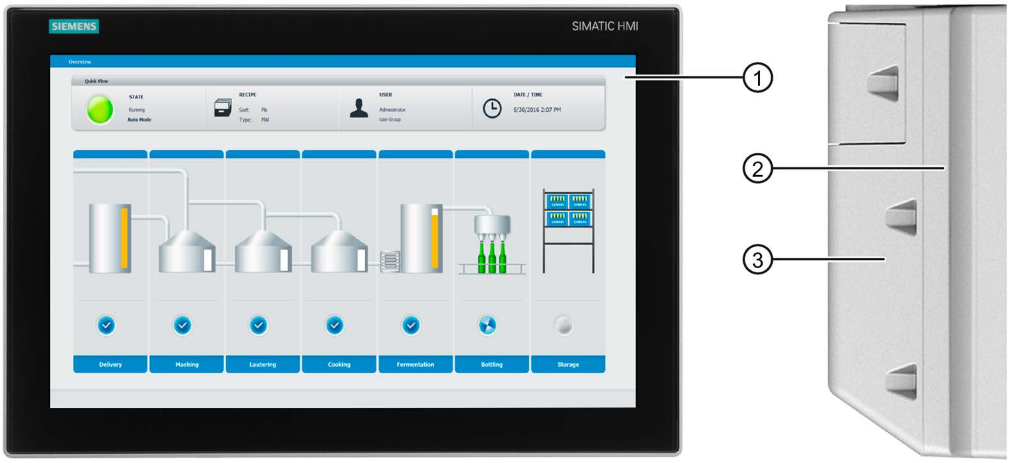


① Rating plate
② Cover
③ Interface designation

1.3.2 PRO devices for support arm (not extendable, flange top)

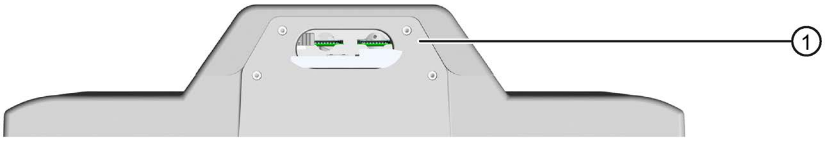
The following figures show the structure of the devices using the example of the ITC1900 V3 PRO for support arm (not extendable, flange top) with Siemens logo.

Front view and side view



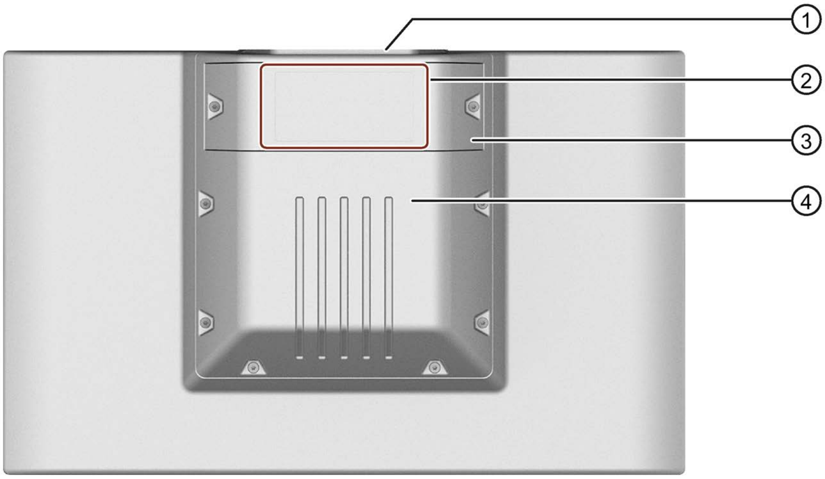
① Display with touch screen
② Enclosure
③ Backplane cover

Top view



① Mechanical interface for fastening

Rear view

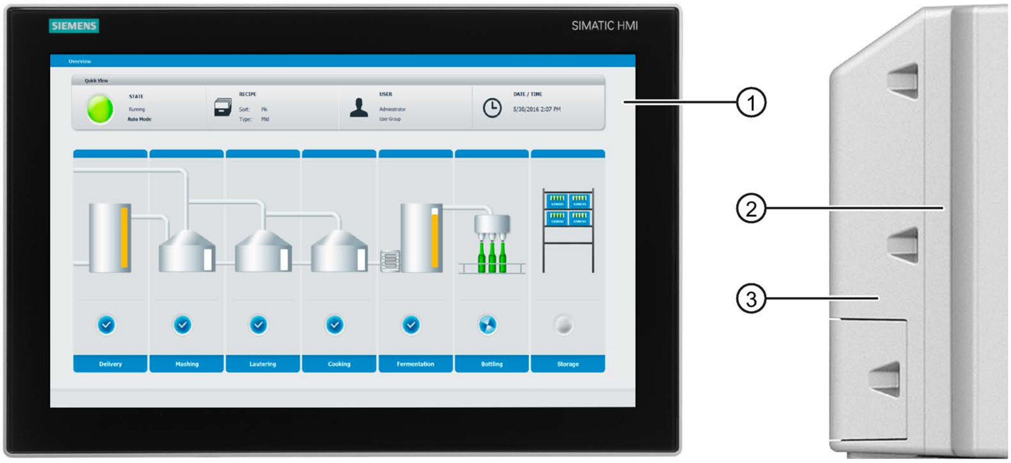


① Mechanical interface for fastening
② Rating plate
③ Terminal compartment cover
④ Backplane cover

1.3.3 PRO devices for pedestal (extendable, flange bottom)

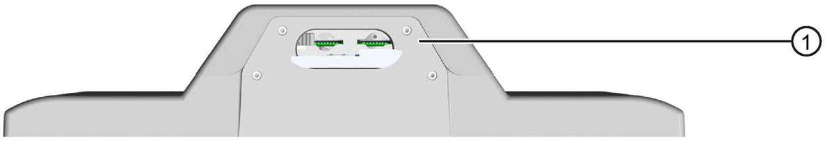
The following figures show the structure of the devices using the example of the ITC1900 V3 PRO for pedestal (extendable, flange bottom) with Siemens logo.

Front view and side view



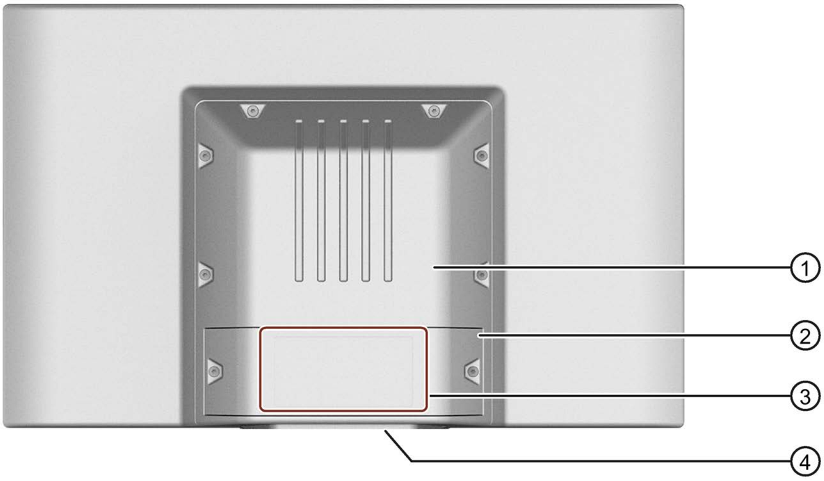
① Display with touch screen
② Enclosure
③ Backplane cover

Bottom view



① Mechanical interface for fastening

Rear view

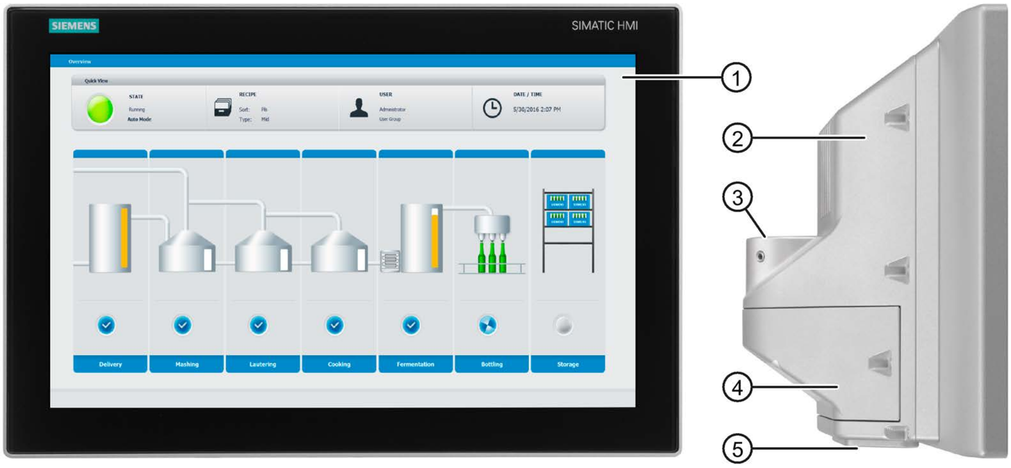


① Backplane cover
② Terminal compartment cover
③ Rating plate
④ Mechanical interface for fastening

1.3.4 PRO devices for support arm (extendable, round tube)

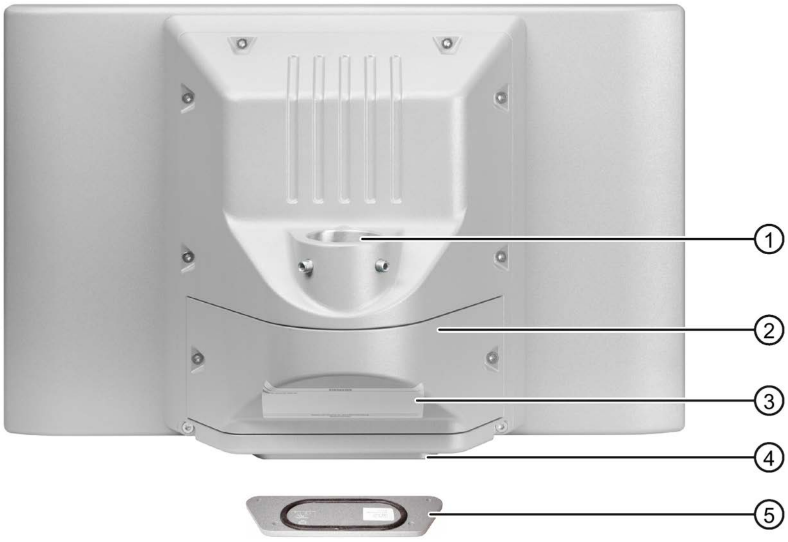
The following figures show the structure of the devices using the example of the ITC1900 V3 PRO for support arm (extendable, round tube) with Siemens logo.

Front view and side view



① Display with touch screen
② Enclosure
③ Mechanical interface for fastening (round tube)
④ Terminal compartment cover
⑤ Mechanical interface below

Rear view

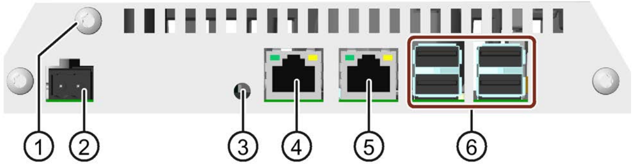


① Mechanical interface for fastening (round tube)
② Terminal compartment cover
③ Nameplate
④ Mechanical interface below
⑤ Lower cover, included in the product package

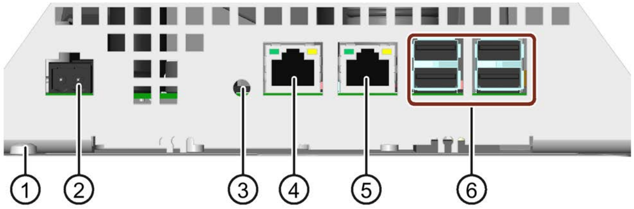
1.3.5 Interfaces

The following figures show the interfaces of the ITC V3 devices.

Built-in units



PRO devices



① Functional grounding connection
② X80 power supply connector
③ "Factory settings" button
④ X1 P1 PROFINET (LAN), 10/100/1000 MBit
⑤ X1 P2 LAN, 10/100/1000 MBit
⑥ X61 ... X64 USB Type A

1.4 System components and accessories

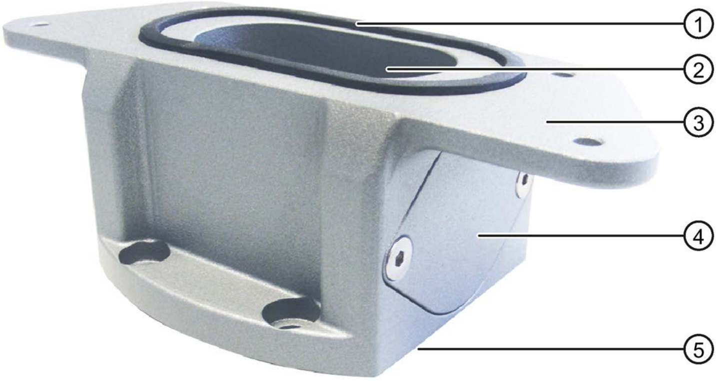
System components are products that have been developed for a specific system and can not be used in general, for example, like the base adapter. System components are always directly related to a core product.

Accessories can typically be used for multiple devices from the same or different device families, for example, batteries, touch pens or protective membranes.

1.4.1 System components for PRO devices

Base adapter

You use the base adapter to mount PRO devices for support arm (not extendable, flange top) or for pedestal (extendable, flange bottom) on the support arm or on the pedestal. A base adapter is included with the product package of the corresponding PRO device. The base adapter can also be ordered separately.



① Seal
② Channel cable
③ Mechanical interface to the PRO device
④ Cover
⑤ Mechanical interface to the support arm or pedestal including seal

Article number: 6AV7674-1KA00-0AA0

Adapter sets and couplings

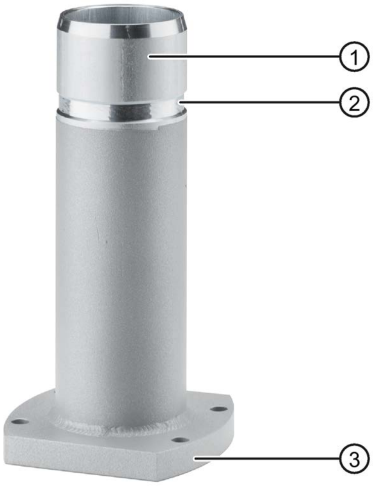
The following mechanical adapter versions are also available for mounting a PRO device for support arm (not extendable, flange top) or for pedestal (extendable, flange bottom) via the base adapter:

- Adapter set VESA75 for VESA75-compatible systems, Article number 6AV7674-0KE00-0AA0
- Adapter set VESA100 for VESA100-compatible systems, Article number 6AV7674-0KD00-0AA0

In addition, other manufacturers offer support arm or pedestal systems with mechanical interfaces or adapters for Siemens PRO devices, e.g. RITTAL, ROLEC, BERNSTEIN, HASEKE, ROSE. Observe the specifications provided by the respective manufacturer.

Flange mount adapter

A flange mount adapter is available for mounting a PRO device for support arm (extendable, round tube).

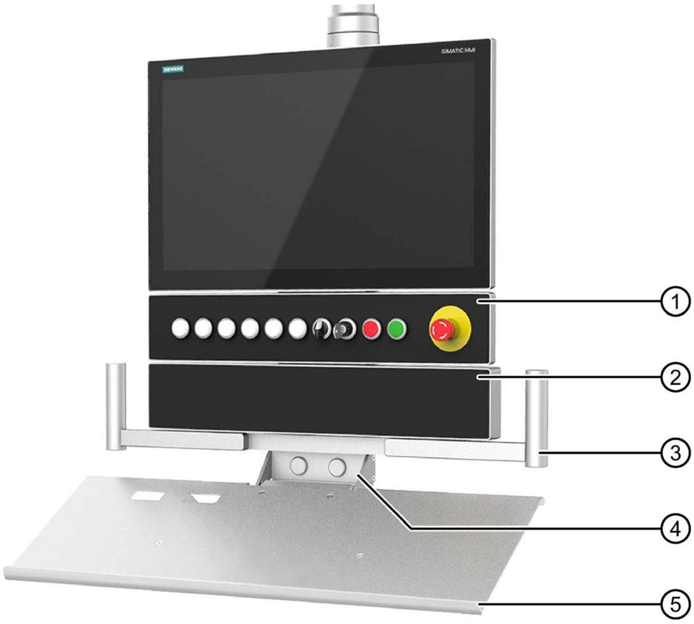


① Flange mount adapter
② Ring groove for fastening on PRO device with setscrews
③ Mechanical interface to support arm

Article number: 6AV7674-1KF00-0AA0

Extensions for PRO devices

The following example shows a PRO device for a support arm (extendable, round tube) with Extension Unit, Extension Unit box sowie en PRO Options handles and keyboard shelf with keyboard tray.



① **Extension Unit**, Example: Extension Unit 22" with eight operator controls including emergency stop button.

② **Extension Unit box**, deep empty enclosure, example: Extension unit box 22" without operator controls.

③ **Handles**, configured to fit 22” device

④ **Keyboard shelf** for mounting the keyboard tray or installaing a suitable keyboard

⑤ **Keyboard tray**

Note

Maximum two Extension Units permissible

A maximum of two Extension Units are permitted under a PRO device for pedestal (extendable, flange bottom) or for support arm (extendable, round tube).

Extension Unit

The Extension Unit is used to install additional operator controls below a SIMATIC PRO device for pedestal (extendable, flange bottom) or for support arm (extendable, round tube).

The Extension Unit can be custom-equipped and is supplied without operator controls. The front of the Extension Unit is fitted with pre-perforated installation points for operator controls. The Extension Unit are available in four different sizes:

- Extension Unit 12", article number 6AV7674-1LA3x-0AA0
- Extension Unit 15", Article number 6AV7674-1LA4x-0AA0
- Extension Unit 19", Article number 6AV7674-1LA5x-0AA0
- Extension Unit 22", Article number 6AV7674-1LA6x-0AA0

In each Extension Unit size, you have the flexibility to choose between the following interface variants (x) for connection to the system:

- Hardwired (x=1)
- PROFINET (x=2)
- PROFIsafe (x=3)

In addition, different operator controls, such as emergency stop button, selector switch, illuminated button, keyswitch and indicator light are available.

Note

Only operator controls with Siemens approval may be installed in the Extension Unit.

Extension Unit box

The Extension Unit box offers a deep empty housing to install larger customer-specific components underneat a 16:9 SIMATIC PRO device for pedestal (extendable, flange bottom) or for support arm (extendable, round tube).

The extension unit is supplied without operator controls; the front is not prepared for installation of operator controls. The Extension Unit box are available in four different sizes:

- Extension Unit box 12", Article number 6AV7674-1LA30-0AA0
- Extension Unit box 15", Article number 6AV7674-1LA40-0AA0
- Extension Unit box 19", Article number 6AV7674-1LA50-0AA0
- Extension Unit box 22", Article number 6AV7674-1LA60-0AA0

Handles

The adjustable width handles make it easier to align or position the device as a whole without touch the display of the PRO device.

Article number: 6AV7674-1LB10-0AA0

Keyboard shelf

On the keyboard shelf, you can install the keyboard tray or a suitable keyboard. In addition, the keyboard shelf has two face-side openings for USB interfaces and two rear-side openings for cable glands.

Article number: 6AV7674-1NF01-0AA0

Keyboard tray

The keyboard tray offers enough space for keyboard and mouse.

Article number: 6AV7674-1NG00-0AA0

Additional information

You can find additional extension units and information on system components for fully-enclosed IP65 and type 4X/12-protected devices on the Internet (https://mall.industry.siemens.com/mall/en/WW/Catalog/Products/10268745).

1.4.2 Accessories

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

Note

This section includes a selection of accessories suited to your operator control. You can find additional versions of this selection and the full range of accessories for HMI devices in the Industry Mall on the Internet (https://mall.industry.siemens.com/mall/en/WW/Catalog/Products/10144445). Details such as the delivery quantity and technical specifications of accessories can be found in the Industry Mall under the respective article numbers.

HMI I/O components

Name	Article number
Plug for the power supply of the HMI device, 2-pole, screw terminals	6AV6671-8XA00-....
Plug for the power supply of the HMI device, 2x2-pole, spring-type terminals	6ES7193-4JB00-....

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

Storage media

Use only the following storage media for the HMI device.

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

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

Fasteners

Name	Article number
Set with steel mounting clips	6AV6671-8XK00-....

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

Input help

Name	Article number
Touch pen system for resistive and capacitive touch systems	6AV2181-8AV20-...

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

Other accessories

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

Safety instructions 2

2.1 General safety instructions

The device is designed for use in the industrial sector for operating and monitoring plant processes.

Machinery Directive

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

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

Strong high-frequency radiation

NOTICE
Observe immunity to high-frequency radiation
The device has an increased immunity to high frequency radiation according to the specifications on electromagnetic compatibility in the technical specifications. Radiation exposure in excess of the specified immunity limits can impair device functions and result in malfunctions and therefore injuries or damage. Read the information on immunity to high frequency radiation in the technical specifications.

Additional notes for built-in units

> **WARNING**
>
> **The rear of the device constitutes open equipment.**
>
> The rear of the device constitutes open equipment. This means that the device may only be installed in an enclosure or cabinet which provides front access for operating the device. The enclosure, the cabinet or the electrical operating rooms must provide protection against electric shock and the spread of fire. The requirements regarding the mechanical strength must also be taken into account.
>
> Access to the enclosure or cabinet in which the device is installed should only be possible by means of a key or tool and for trained and authorized personnel.
>
> **Electrocution risk when control cabinet is open**
>
> When you open the control cabinet, there may be a dangerous voltage at certain areas or components.
>
> If you touch these areas or components, you may be killed by electric shock.
>
> Disconnect the cabinet from the mains before opening it. Do **not** plug in or pull out the system component during operation.

ESD

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

Industrial Security

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

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

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

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

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

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

Disclaimer for third-party software updates

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

Notes on protecting administrator accounts

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

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

2.2 Security management for HMI devices

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

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

Remote maintenance is not recommended for production and should be disabled before production is started.

The remote maintenance settings are disabled by default. If you enable them for maintenance purposes, disable the remote maintenance settings once again for production in the start menu "Configuration > System", "Remote maintenance" (see configuration settings, section "System settings (Page 78)").

2.3 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 only indoors ("Indoor use only").

Note

Operate the device only in a normal atmospheric environment

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

Note

The device is intended for operation on a SELV/PELV circuit according to IEC/EN 61010-2-201 in a dry environment, which means for the different types of devices:

- Built-in units: A dry environment at the rear of the device
- PRO devices: A dry environment inside the enclosure

You can find additional information in the section "Operating Conditions (Page 167)".

Industrial applications

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

- Requirements for emissions EN 61000-6-4: 2007
- Requirements for interference immunity EN 61000-6-2: 2005

Use in mixed-use zone

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

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

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

Individual acceptance is required.

Use in residential areas

Note

HMI device not intended for use in residential area

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

Use with additional measures

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

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

TFT displays

NOTICE

Burn-in effect

A permanently displayed picture of two or more colors can result in a burn-in effect, i.e. the image remains slightly visible for a certain time even on a blank screen. The longer the image has been burned in, the longer the image remains. In an extreme case, the image is displayed permanently.

The ghost image usually disappears by itself if the screen remains off for a long period or the screen content changes, for example, when the screen saver is activated. Screen savers for the backlit active black mode reduce the burn-in effect.

- Activate a screen saver on the server.

Backlighting

The brightness of the backlighting decreases incrementally during its operating period. You can extend the life of the display and backlight by taking the following measures:

- Reduce the backlighting, see section "System settings (Page 78)".
- Observe the operating period of the backlighting, see section "Specifications (Page 181)".

2.4 Use in hazardous areas

The following warnings apply to operating a device with Ex approval in hazardous areas.

⚠ WARNING

Explosion Hazard

Do not disconnect while circuit is live unless area is known to be non-hazardous. Substitution of components may impair suitability for Class I, Division 2 or Zone 2.

Risque d'Explosion

Ne pas déconnecter pendant que le circuit est sous tension, sauf si la zone est non-dangereuse. Le remplacement de composants peut compromettre leur capacité à satisfaire à la Classe I, Division 2 ou Zone 2.

⚠ WARNING

Do not plug or pull connectors in potentially explosive atmospheres

If you plug in or pull out the connector during operation, there is a risk of sparkover. An explosion can be triggered in the hazardous area due to sparkover, and death or serious bodily injury can occur.

Plugging or pulling connectors, such as a 24 V DC power supply plug, is **prohibited** in the potentially explosive atmosphere.

Only plug or pull a connector when one of the following two conditions is met: The area is no longer hazardous or the device and its plug-in connections are de-energized.

To switch off the device, close all open programs or the current project, and switch off the power to the device.

Also read the enclosed documentation for use in potentially explosive atmospheres and the information in the section "Certificates and approvals (Page 161)".

Installing and connecting the device 3

3.1 Preparing for installation

Select the mounting location of the HMI device

Points to observe when selecting the mounting location:

- Position the HMI device so that it is not subjected to direct sunlight.
- Position the HMI device such that it is ergonomically accessible for the operator.

  Choose a suitable mounting height.
- Note the permissible mounting positions.

3.1.1 Checking delivery

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

Note

Damaged parts

A damaged part will cause the HMI device to malfunction.

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

Check the scope of supply of the HMI device (see Product package (Page 14)).

Additional documents may be included in the delivery.

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

3.1.2 Checking the operating conditions

Note the following aspects before installing the HMI device:

1. Familiarize yourself with the standards, approvals, EMC parameters and technical specifications for operation of the HMI device. This information is available in the following sections:
   - Certificates and approvals (Page 161)
   - Electromagnetic compatibility (Page 163)
2. Check the mechanical and climatic ambient conditions for operation of the HMI device:
   - Mechanical environmental conditions (Page 165)
   - Climatic ambient conditions (Page 166)

3.1.3 Built-in units

3.1.3.1 Permitted mounting positions

Mounting position

The device is suitable for installation in:

- Mounting cabinets
- Control cabinets
- Switchboards
- Consoles

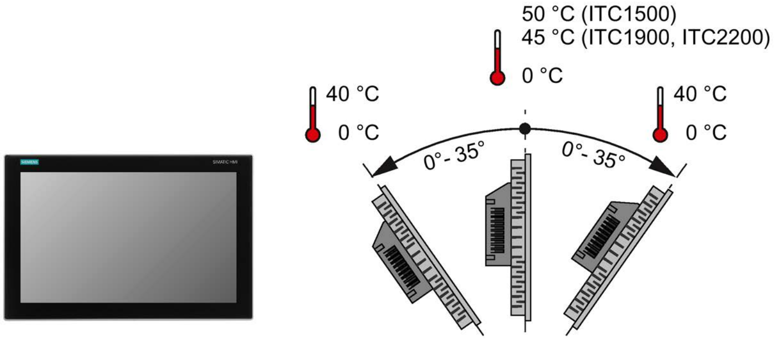
In the following, all of these mounting options are referred to by the general term "control cabinet".

The device is self-ventilated and may be installed up to an angle of +/-35° to the vertical.

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

For detailed information regarding the permitted ambient temperatures, refer to section "Climatic ambient conditions (Page 166)".

Mounting in landscape format

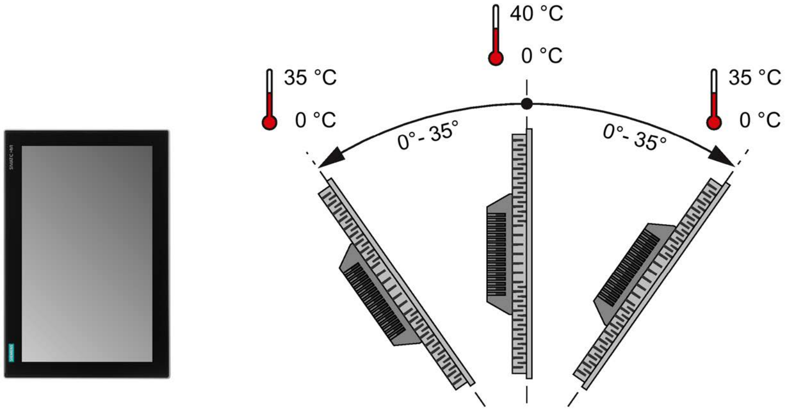


Mounting in portrait format

Note

Portrait format must also be supported by the software

Only install the HMI device in portrait format when the software used supports portrait format.



3.1.3.2 Checking clearances

The following clearances around the device are required:

- Above and below the mounting cutout for ventilation purposes: 50 mm each
- Keep 15 mm free to the right and left of the mounting cutout for inserting the mounting clips.
- At least 10 mm behind the rear panel of the device. The device depth in the control cabinet is 73.1 mm.

Note

Ensure compliance with the permissible ambient temperature when the device is installed in a cabinet and especially in a closed enclosure.

3.1.3.3 Preparing 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 enduring 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 IP65 degree of protection 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

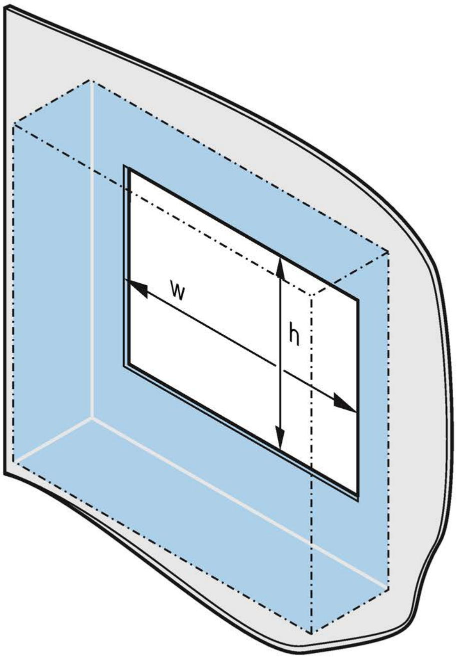
  This condition must be fulfilled for the mounted HMI device.
- Permitted surface roughness in the area of the mounting gasket: ≤ 120 µm (R_z 120)

Compatibility of the mounting cutout to other HMI devices

The Industrial Thin Client built-in units are compatible with SIMATIC Industrial PCs, Industrial Flat Panels, HMI devices and SINUMERIK TOP Panels of the same series with corresponding display size.

Note that despite the same dimensions for the mounting cut-out, the device depth of ITC V3 devices can differ from the device depth of the compatible devices.

Dimensions of the mounting cutout



	w^{+1}_{0}	h^{+1}_{0}
ITC1500	382	241
ITC1900	448	278
ITC2200	513	315

The width and height values must be reversed accordingly for mounting in portrait format.

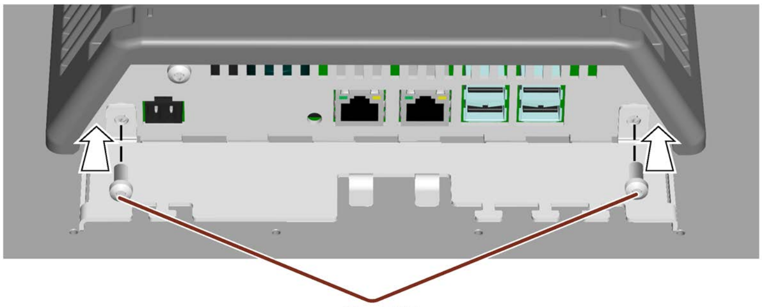
3.1.3.4 Installing a strain relief

A strain relief plate is included with the product package.

Fasten the strain-relief with the screws intended for this purpose, torque 0.8 Nm.

The screws are already inserted in the device in the delivery state.

The figure below shows an example.



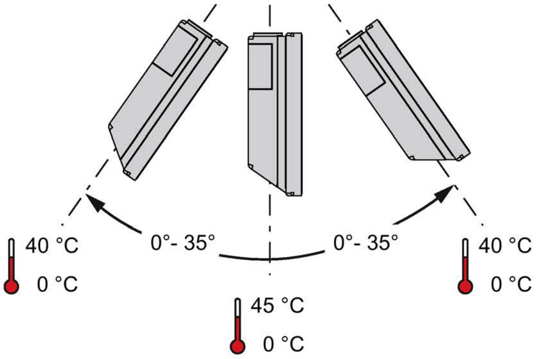
3.1.4 PRO devices

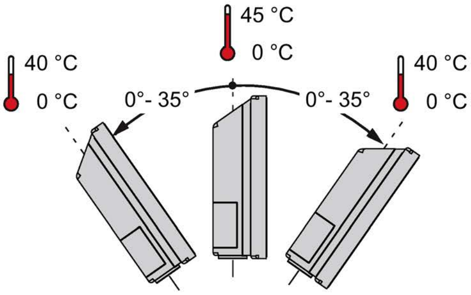
3.1.4.1 Permitted mounting positions

The device is intended for mounting on a support arm or stand.

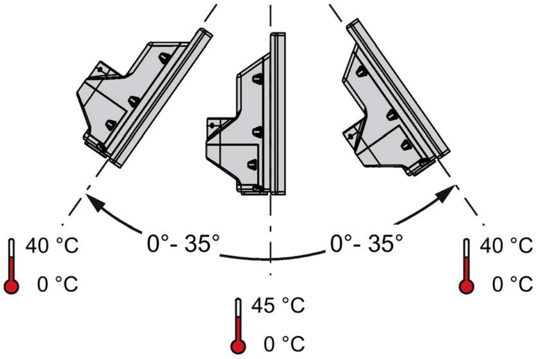
The following figures show the permissible mounting positions of the different PRO devices.

PRO devices for support arm (not extendable, flange top) and for pedestal (extendable, flange bottom)





PRO devices for support arm (extendable, round tube)



Note

Mounting a PRO device in portrait format is **not** permitted.

3.1.4.2 Installing a strain relief

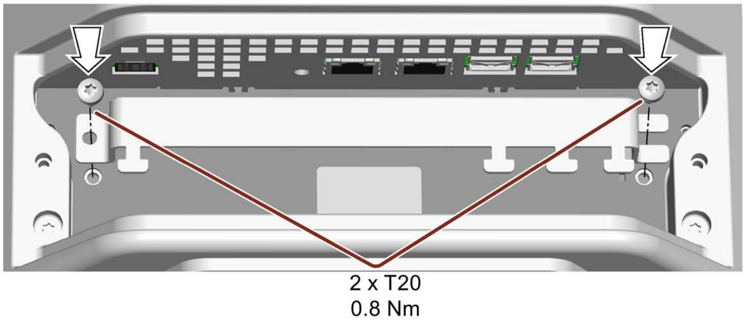
A strain relief plate is included with the product package.

Mount the strain relief plate as follows:

1. Loosen the two screws of the terminal compartment cover and remove the terminal compartment cover.
2. Fasten the strain-relief with the screws intended for this purpose, torque 0.8 Nm.

   The screws are already inserted in the device in the delivery state.

   The figure below shows an example.

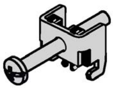
   

   For PRO devices for support arm (not extendable, flange top), the strain relief plate must be installed rotated by 180°.
3. If you do not install the device to a support arm or a pedestal immediately afterwards, close the terminal compartment. Fasten the terminal compartment cover with the two associated screws, torque 1.5 Nm. Check that the seal is sitting correctly.

3.2 Installing the built-in unit

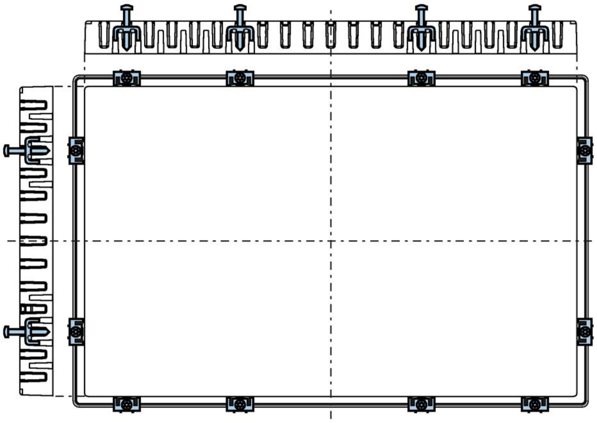
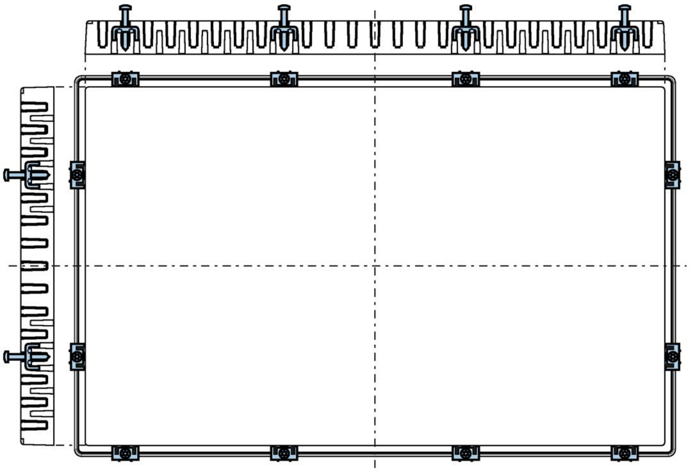
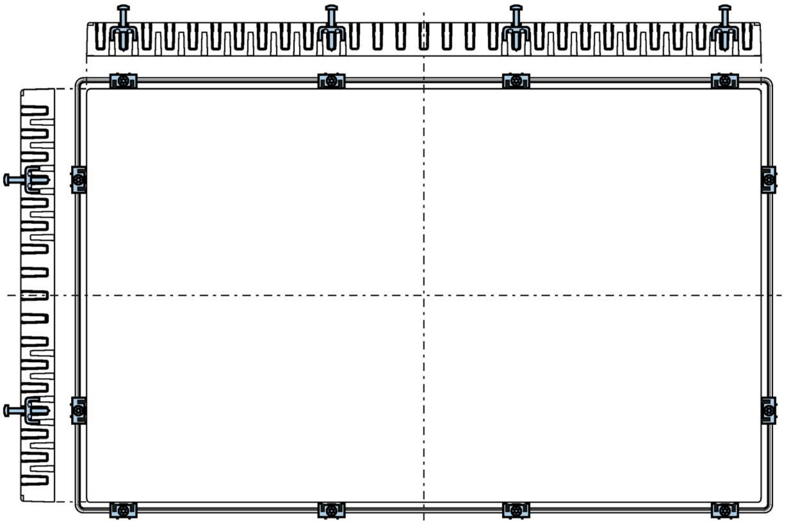
3.2.1 Positions of the mounting clips

You attach the device with 12 mounting clips from the accessory kit, which are also available as an accessory.



See also section "Accessories (Page 25)".

In order to achieve an IP65 degree of protection for the device, mounting clips must be installed in the following positions.

Device	Positions of the mounting clips
ITC1500 V3	
ITC1900 V3	
ITC2200 V3	

3.2.2 Fastening the device with mounting clips

Requirement

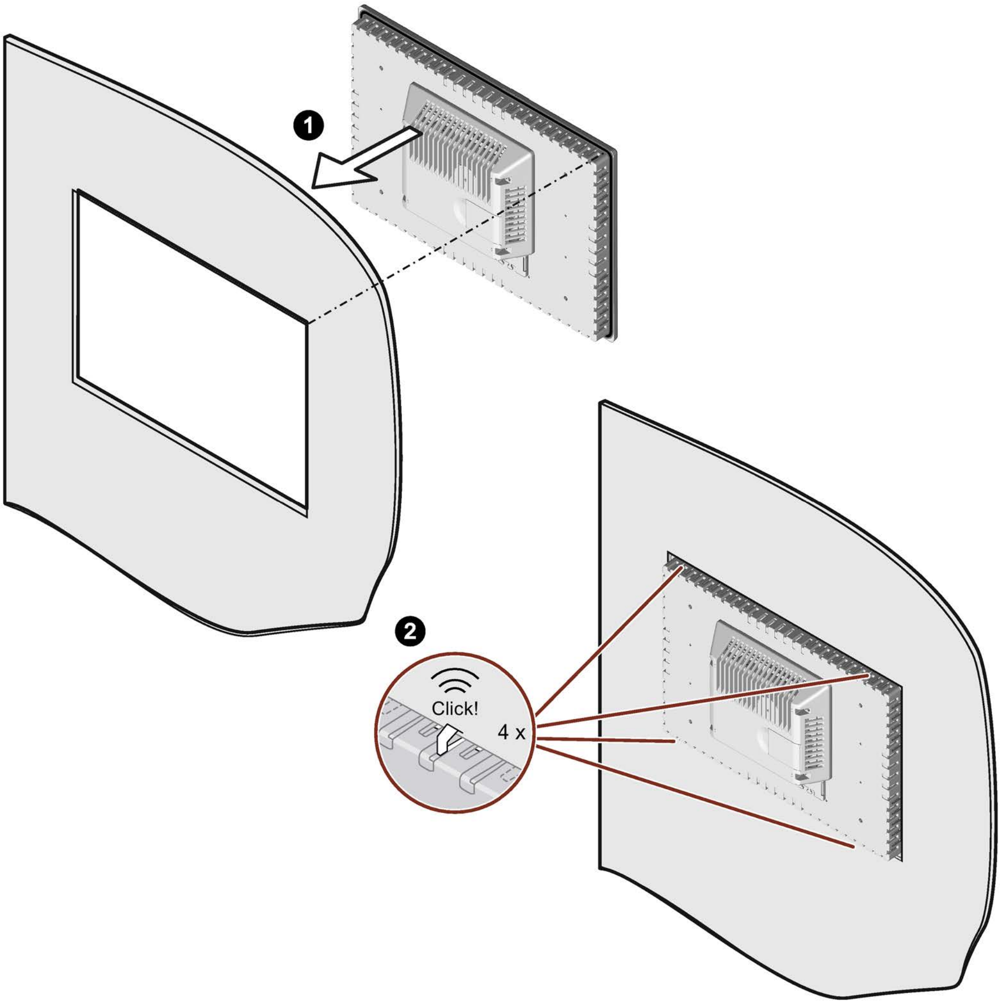
- All packaging components and protective films have been removed from the device.
- The mounting clips included in the accessory kit are to hand.
- Slotted screwdriver, blade 0.5 x 3 mm

Procedure

Note

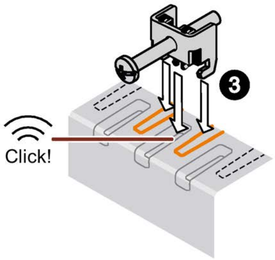
If the mounting seal is damaged, the degree of protection is not guaranteed.

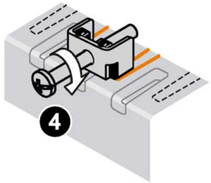
1. Insert the device into the mounting cutout from the front.



2. Make sure that all four spring locks on the top and bottom of the device fully engage. If necessary, gently press the device into the recess if it is not fully engaged.

3. Insert a mounting clip into the cutout provided on the device. Make sure it is in the correct position; see the section "Positions of the mounting clips (Page 39)".





4. Fasten the mounting clip by tightening the screw with the slotted screwdriver, torque 0.5 Nm.
5. Repeat step 3 and 4 for all mounting clamps until all clamps are fastened.
6. Check the fit of the mounting seal.

3.3 Installing a PRO device

3.3.1 Notes on mounting

> ⚠ WARNING
>
> **The device must be mounted securely.**
>
> Inadequately dimensioned fasteners may cause the device to fall down. Serious physical injury may result.
>
> Make sure that fasteners are adequately dimensioned during installation. Make sure to consider the weight of the device and the forces acting on the device when dimensioning. This applies in particular to dynamic load of the device. All fasteners including mounting surfaces, support arm systems, and fastening elements such as screws must be able to carry at least four times the weight of the device.
>
> Observe any further statutory specifications applying at the location of use of the device and further applicable regulations with regard to fastening the device.
>
> Pay attention to the torque specifications in the following sections.

NOTICE

Degree of protection for overall device

If you are using a support arm system or a pedestal system that does not have IP65 degree of protection or Enclosure Type 4X/12 (indoor use only), IP65 degree of protection or Enclosure Type 4X/12 (indoor use only) are lost for the entire device. Spray and water jets as well as penetrating substances can then damage the device.

Use a suitable support arm system or pedestal system with IP65 degree of protection or Enclosure Type 4X/12 (indoor use only) for your application.

Note

Liability disclaimer

The device is mounted to a pedestal or a support arm via the mechanical interface with screws. Siemens AG assumes no liability for the consequences of incorrect installation.

Warranty at risk

If you do not install the HMI device in accordance with the specifications in these operating instructions, the warranty for the device is voided.

- Always install the device according to these operating instructions.
- If the seal on the backplane cover is damaged, it can be repaired. For a repair scenario, following the instructions in the section "Spare parts and repairs (Page 160)".

IP65 degree of protection and Enclosure Type 4X/12 (indoor use only) at risk

If there are no seals on the mechanical interfaces or if they are damaged, IP65 degree of protection and Enclosure Type 4X/12 (indoor use only) is at risk. Check the condition and proper seating of the seals.

NOTICE

Damaging the seal when opening

If the device has not been opened for a long time, the backplane cover or terminal compartment cover may stick to the seal of the enclosure. Opening the device with excessive force or with tools will destroy the seal. Spray and water jets as well as penetrating substances can then damage the device.

Open the terminal compartment cover gently, without too much pressure.

3.3.2 PRO devices for support arm (not extendable, flange top) and for pedestal (extendable, flange bottom)

Note

Mounting with and without a base adapter

The SIMATIC PRO devices are designed for mounting with the base adapter. If you install the device without a base adapter, you must adjust the mechanical interface between the support arm or pedestal and the unit accordingly, including placement of an appropriate seal on the mechanical interface.

Requirement

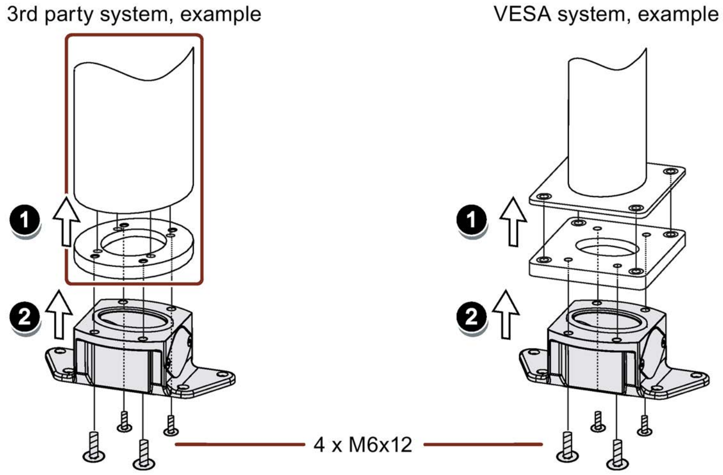
- All packaging components and protective films have been removed.
- Siemens base adapter with screws, included in the product package of a PRO device for support arm (not extendable, flange top) or for pedestal (extendable, flange bottom).
- One of the following support arms or pedestal systems:
  - Support arm or pedestal with mechanical VESA interface and the corresponding Siemens adapter set
  - Support arm or pedestal with mechanical interface for the Siemens base adapter
    The type of mechanical interface differs depending on the type of support arm or pedestal.

  See also section "System components for PRO devices (Page 21)".
- The following cables are fed through the pedestal or the support arm to which the device is mounted:
  - Cables for the power supply
  - Equipotential bonding cable
  - Data cables, e.g. PROFINET/Ethernet or USB cable

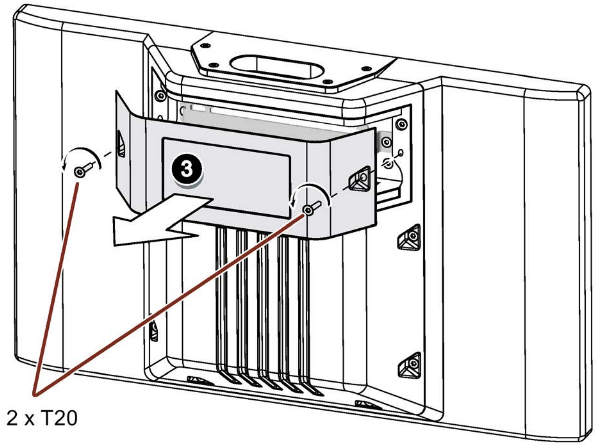
Procedure

This section describes the mounting of the device to a support arm system using example figures. Installation on a pedestal is carried out in the same way. For PRO devices for support arm (not extendable, flange top), the base adapter is screwed on from the top of the device. For PRO devices for pedestal (extendable, flange bottom) the base adapter is screwed on from the bottom of the device. A PRO device for support arm system cannot be used on a pedestal and vice versa.

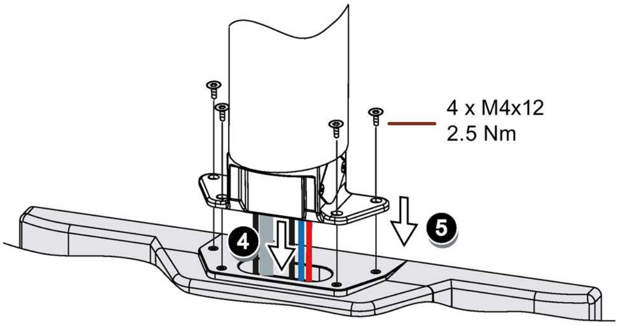
1. If an adapter plate for the Siemens base adapter is included in your support arm system, attach the adapter plate to the support arm with 4 M6x12 screws. Pay attention to the torque that is specified for the support arm.



2. Attach the base adapter with 4 M6x12 screws to the mechanical interface of the support arm from below. Pay attention to the torque that is specified for the support arm.
3. Loosen the 2 screws of the terminal compartment cover and remove the terminal compartment cover.



4. Insert all connection cables through the opening of the PRO device. Make sure that the connection cables are not damaged.



5. Attach the device with 4 M4x12 screws to the base adapter from the top, torque 2.5 Nm. Make sure that the connection cables are not crushed.
6. Connect all cables according to the description in the section below.
7. Fasten the terminal compartment cover to the device with the 2 screws, torque 1.5 Nm. Check that the seal is sitting correctly.

3.3.3 PRO devices for support arm (extendable, round tube)

Requirement

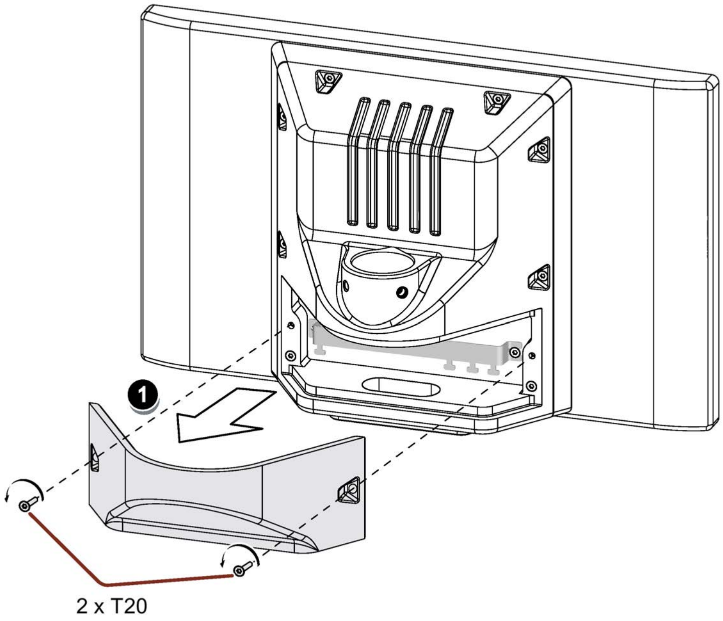
- One of the following support arm systems:
  - Support arm with round tube end with outside diameter 48.3 mm, appropriate for the opening of the PRO device
    When selecting the round tube, ensure that its inside diameter is large enough so that all needed cables and their connectors can fit through.
  - Support arm with mechanical interface, suitable for the flange of the flange mount adapter, and Siemens flange mount adapter (not included in product package)
  - Support arm with mechanical VESA interface, the corresponding Siemens adapter set and the Siemens flange mount adapter (not included in product package)

  See also section "System components for PRO devices (Page 21)".
- The PRO device, all packaging components and protective films have been removed
- The lower cover of the PRO device from the accessory kit
- The following cables are fed through the support arm to which the device is mounted:
  - Cables for the power supply
  - Equipotential bonding cable
  - Data cables, e.g. PROFINET/Ethernet or USB cable

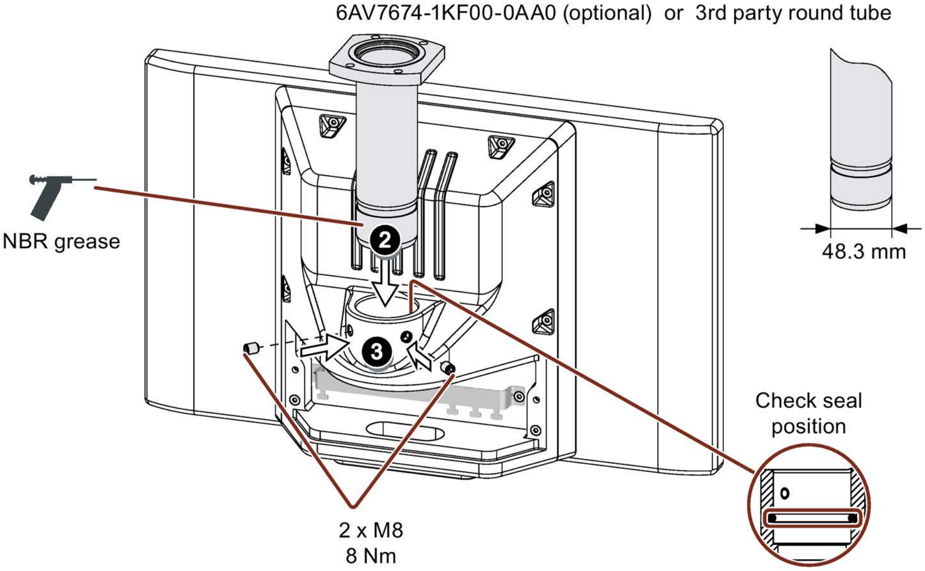
Procedure

The following figures show an example of how to attach the PRO device to a support arm system using the optionally available Siemens flange mount adapter. The same approach is used to mount the PRO device to a 48.3 mm round tube.

1. Loosen the 2 screws of the terminal compartment cover and remove the terminal compartment cover.



2. Ensure that the NBR seal is correctly seated on the inside of the mechanical interface to the flange mount adapter, see figure below. Grease the flange mount adapter or 48.3 mm round tube with grease suitable for NBR seals, and insert the flange mount adapter or 48.3 mm round tube into the corresponding opening of the PRO device.

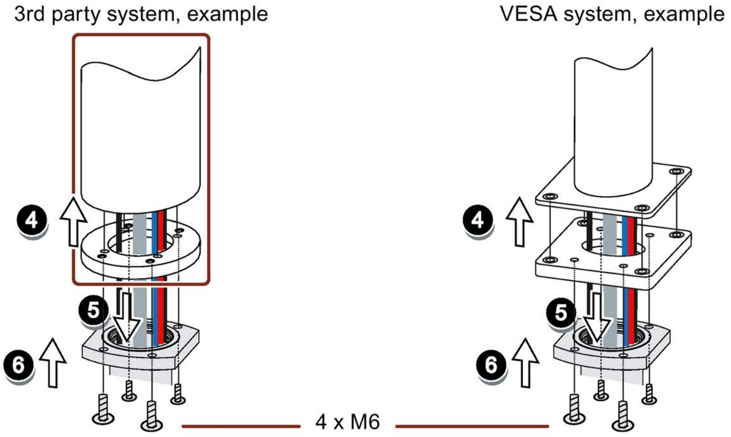


3. Attach the flange mount adapter or the 48.3 mm round tube with the two M8 threaded pins. Observe the appropriate torque:
   - Siemens flange mount adapter: 8 Nm
   - 48.3 mm steel round tube 8 Nm
   - 48.3 mm aluminum round tube: 5 Nm

4. If you use an adapter plate from a Siemens VESA adapter set, attach the adapter plate to the support arm with four M6x12 screws.

   If you use an adapter plate suitable for the Siemens flange mount adapter, attach the adapter plate to the support arm using the appropriate mounting hardware.

   When tightening the screws, adhere to the torque that is specified for the support arm.



5. Insert all connection cables through the opening of the flange mount adapter or 48.3 mm round tube into the connection compartment of the PRO device. Make sure that the connection cables are not damaged.
6. If you use an adapter plate from a Siemens VESA adapter set, attach the flange mount adapter to the support arm from the bottom with four M6 screws, 16 mm to 20 mm in length.

   If you do not use an adapter plate or use a differnt one, attach the flange mount adapter to the support arm from the bottom with four M6 screws. The length of the screws depends on the specifications for the support arm and must be at least 16 mm to ensure secure fastening of the flange mount adapter.

   The screws are not included in the product package of the PRO device. Pay attention to the torque that is specified for the support arm. Make sure that the connection cables are not crushed.
7. Connect all cables according to the description in the section below.
8. Fasten the terminal compartment cover to the device with the 2 associated screws, torque 1.5 Nm. Check that the seal is sitting correctly.
9. Attach the lower cover from the product package to the PRO device with 4 M4x12 screws, torque 1.5 Nm. Alternatively, you can extend the PRO device by adding an Extension Unit at the bottom. Observe the associated documentation.

See also

System components for PRO devices (Page 21)

3.4 Connecting the device

3.4.1 Notes on connection

Connecting cables

Note

Use copper cables on plugs with clamping connections

Use copper (Cu) cables for all leads that are connected to the device via terminals, for example, on the 24 V DC power plug of 24 V DC power cables.

Use only shielded standard cables as data connection cables. You can find order information in the Industry Mall (https://mall.industry.siemens.com).

Connection sequence

NOTICE

Damage to the HMI device

If you do not keep to the connection sequence you could damage the HMI device.

Be sure to connect the HMI device in the following sequence:

1. Equipotential bonding
2. Power supply
3. PROFINET/Ethernet
4. USB devices

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

Connecting the cables

NOTICE

Adhere to the local installation regulations

When connecting the cables, observe the local regulations and the local installation conditions, such as protective circuits for power supply lines.

Short-circuit and overload protection

Various measures as protection against short-circuits and overloads are required for setting up a full installation. The types of components and the degree to which the protective measures are mandatory depend on the regulation that applies to your system setup.

- When connecting the cables, make sure that you do not bend the contact pins.
- Secure the cable connectors by fastening the connector to the socket with screws.

- Provide adequate strain relief for all cables.
- The pin assignment of the interfaces is described in the technical specifications.

3.4.2 Connecting the equipotential bonding circuit

Differences in electrical potential

Differences in electrical potential can develop between spatially separate system components. Such electrical potential differences can lead to high equalizing currents across 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 in order 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 cable must not exceed 10% of the shielding impedance.
- The cross-section of an equipotential bonding conductor must be capable of handling the maximum equalizing current. Equipotential bonding cables with a minimum conductor cross-section of 16 mm² are required between switching cabinets.
- 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 shield of the data cable from the HMI device flush at the equipotential bonding rail using suitable cable clamps. The equipotential bonding rail should be as close to the HMI device as possible.
- Route the equipotential bonding conductor and data cables in parallel and with minimum clearance in between.

Note

Equipotential bonding cable

Cable shields are not suitable for equipotential bonding. Always use the prescribed equipotential bonding conductors for this. An equipotential bonding conductor between control cabinets must have a minimum cross-section of 16 mm². The cable between the ground bar and HMI device must have a minimum cross-section of 4 mm².

Connection diagram

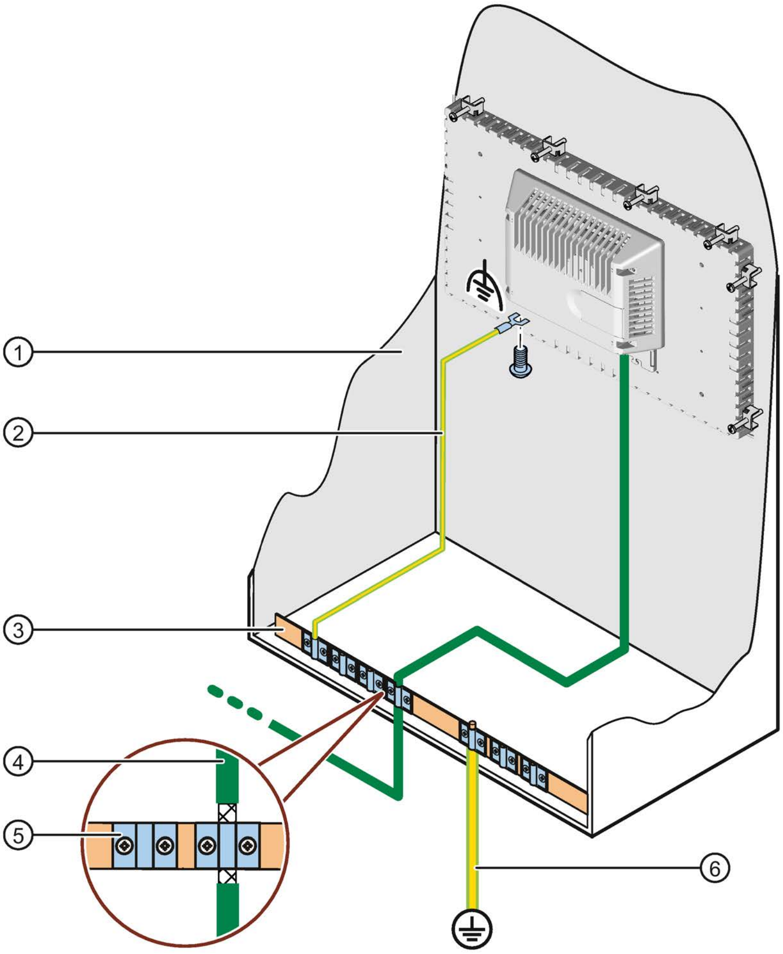
The following figure shows the connection of the equipotential bonding using the example of the ITC1900 V3 and applies analogously to the other ITC V3 devices.

Note

Cable routing for the PRO devices

Since the PRO device is mounted on a pedestal or a support arm instead of in a control cabinet, the connecting cables must be routed through the support arm or pedestal. The cross-sections specified for the built-in units are also valid for the PRO devices.

Follow the corresponding connection diagrams in the Quick Install Guide, which is enclosed with your PRO device.



① Control cabinet

② Equipotential bonding cable, 4 mm ^{2}

③ Equipotential busbar for equipotential bonding cables, ground connection and shield support of data cables

④ PROFINET data cable

⑤ Cable clamp

⑥ Ground bar, 16 mm ^{2}

3.4.3 Connecting the power supply

NOTICE

Safe electrical isolation

Use only power supply units with safety isolation complying with IEC 60364-4-41 or HD 384.04.41 (VDE 0100, Part 410), for example according to the SELV/PELV standard, for the 24 V DC supply.

The supply voltage must be within the specified voltage range. Malfunctions in the HMI device may otherwise result.

Applies to non-isolated system configuration

Connect the connection for GND 24 V from the 24 V power supply output to the equipotential bonding for a uniform reference potential. Select a central termination point as far as possible.

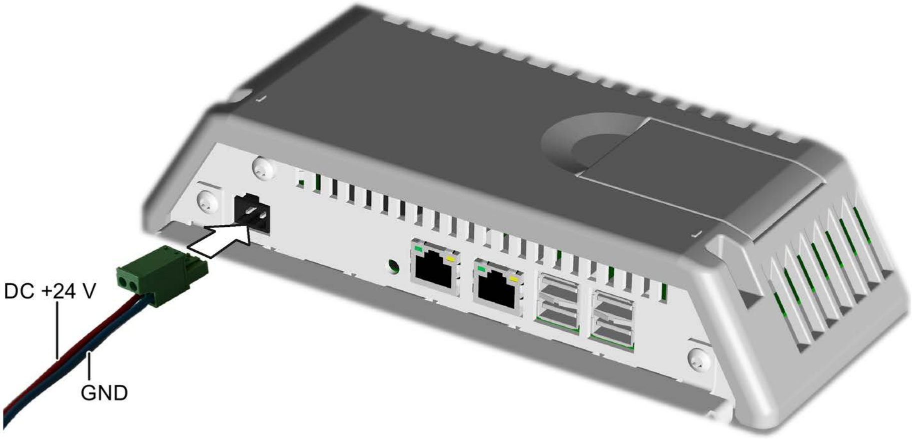
NOTICE

External protective circuit

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

Connection diagram

The figure below shows an example of a connection between the device and the power supply.



Note when connecting

The power supply plug is included in the accessory kit. The power supply plug is designed for cables with a maximum cross-section of 1.5 mm².

Additional information on the power supply connector supplied and other permissible power supply connectors can be found in the section "Accessories (Page 25)."

Connecting the power supply

NOTICE
Do not damage the socket
Do not tighten the screws of the power supply connector if it is plugged into the HMI device. The pressure from the screwdriver may otherwise damage the HMI device socket. Connect the power cables when the power supply is disconnected from the HMI device.

1. Switch off the power supply.
2. Connect the power cables to the power plug as shown in the figure above.
3. Connect the power plug to the corresponding socket on the HMI device as shown in the figure. Check for correct polarity of the cables by referring to the interface labeling on the back of the HMI device.

Reverse polarity protection

The device is equipped with reverse polarity protection.

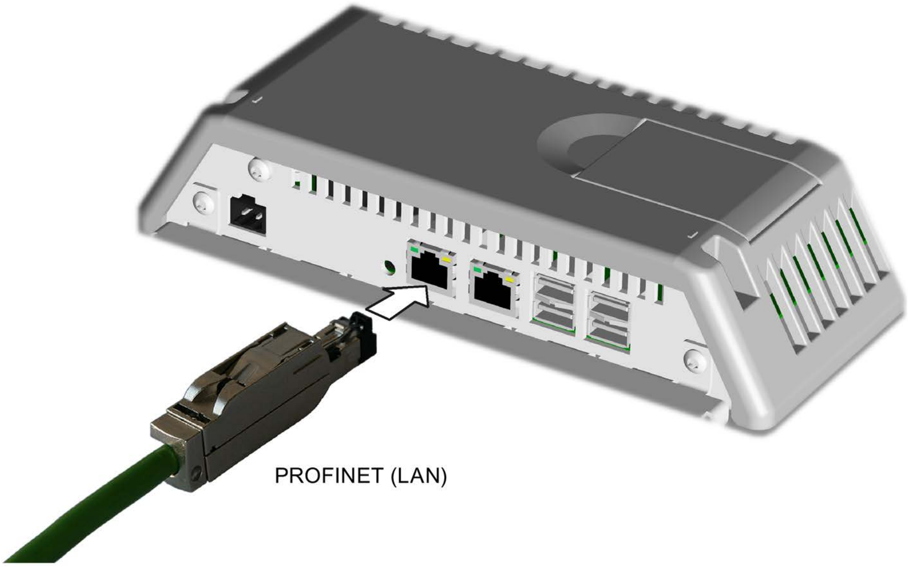
See also

Interfaces (Page 20)

3.4.4 Connecting device to the server

Connection diagram

The following figure shows the connection between the device and the server via PROFINET/Ethernet.



For PROFINET communication, use interface X1 P1 "PROFINET (LAN)", e.g. to use topology detection.

Procedure

1. Connect the PROFINET/Ethernet cable to the interface PROFINET (LAN) on the device
2. Connect the PROFINET/Ethernet cable to the network or server.

See also

Interfaces (Page 20)

3.4.5 Connecting a USB device

You can connect the following industrial grade devices to the USB port:

- Mouse
- Keyboard
- Industrial USB Hub 4
- USB memory devices

  The device only supports USB storage devices that have been formatted with the FAT16/32 or NTFS file system.

Note

Malfunction caused by external device

A malfunction may occur if you connect an external device with its own power supply and without equipotential bonding or excessive current load to the USB port.

Ensure a non-insulated installation. Observe the values for maximum load of the USB port (see section "Specifications (Page 181)").

You can find additional information in section "Accessories (Page 25)".

See also

Interfaces (Page 20)

USB (Page 183)

Use USB memory devices (Page 118)

3.4.6 Switching on and testing the device

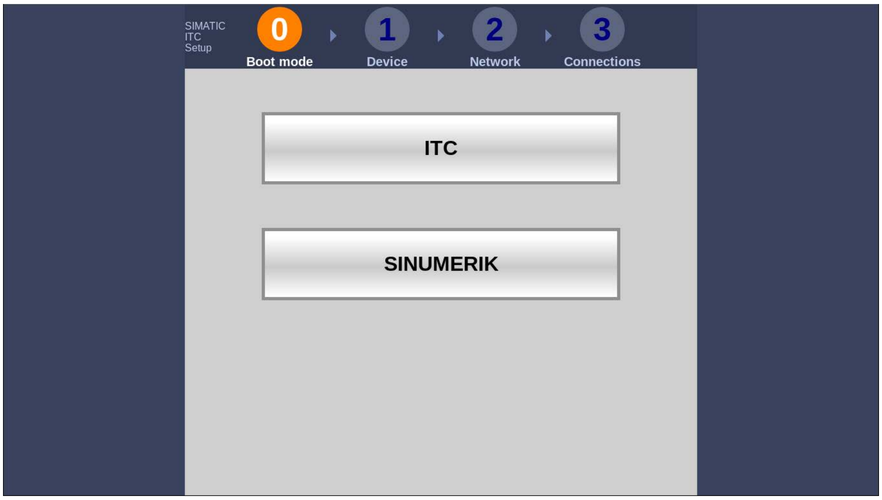
Execute a function test after connecting.

Function test

1. Switch on the power supply of the HMI device.

   If the device fails to start, you might have crossed the wires on the power plug. Check the connected cables and change their polarity.

If the HMI device is properly connected, then you will see in the first commissioning dialog:



2. Switch the operator control off or perform the commissioning depending on the desired operating mode according to the following sections:
   - ITC commissioning (Page 69)
   - SINUMERIK commissioning (Page 119)

Shutdown the device

Proceed as follows:

1. Exit all open programs and ITC or SINUMERIK connections with the HMI device.
2. Turn off the power supply to the HMI device.

See also

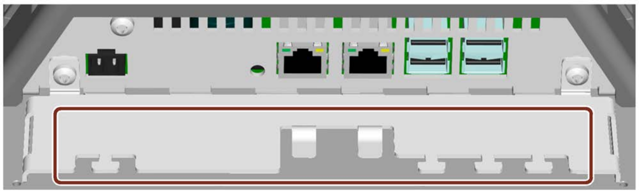
Basics (Page 86)

Password settings (Page 94)

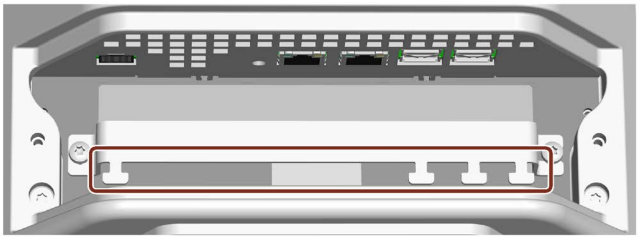
3.5 Securing cables

After connecting the cables, secure the cables with cable ties on the marked fastening elements.

Built-in units



PRO devices



See also

Installing a strain relief (Page 37)

3.6 Removing the device

3.6.1 Removing the built-in unit

The HMI deices is generally removed by following the steps taken to install in it but in the reverse order.

Procedure

Proceed as follows:

1. Exit all open programs and ITC or SINUMERIK connections with the HMI device.
2. Switch off power to the HMI device.
3. If you use the HMI device in a hazardous area, ensure that both of the following conditions are met: The area is no longer hazardous or the operator control and its plug-in connections are de-energized.

4. Remove all cable ties which are located on the operator control to relieve strain from the connection cables.
5. Remove all connector plugs and the equipotential bonding from the operator control.
6. Secure the operator control so that it cannot fall out of the installation slot.
7. Remove the screws from the cover of the mounting clip and remove all mounting clips.
8. Replace the operator control from the installation slot.

See also

Installing the built-in unit (Page 39)

Connecting the device (Page 49)

3.6.2 Removing a PRO device

The HMI deices is generally removed by following the steps taken to install in it but in the reverse order.

Procedure

Proceed as follows:

1. Exit all open programs and ITC or SINUMERIK connections with the HMI device.
2. Switch off power to the HMI device.
3. If you use the HMI device in a hazardous area, ensure that both of the following conditions are met: The area is no longer hazardous or the device and its plug-in connections are de-energized.
4. Open the connection bay by removing the connection bay cover.
5. Remove all cable ties which are located in the connector compartment on the operator control to relieve strain from the connection cables.
6. Remove all connector plugs and the equipotential bonding from the operator control.
7. Replace the operator control from the support arm or pedestal. Make sure that the connection cables are not damaged.
8. Fasten the terminal compartment cover to the device with the 2 screws, torque 1.5 Nm.

See also

Installing a PRO device (Page 42)

Connecting the device (Page 49)

Operating the device 4

4.1 Overview

Introduction

If you are using the device to access a server, the screen display of the server is shown on the device. You operate the server screen from the device.

Operator input options

The following operator input options are available, depending on the peripherals that are connected to your device:

- External keyboard, connected via USB
- External mouse, connected via USB
- Touch screen
  You can control operating objects by touching with your finger.
  To double-click, touch an operating object twice in rapid succession. The server can be configured for opening folders and files with a single click.

  Depending on the server to which the Industrial Thin Client is connected, the following applies:

  – HMI device as server: The capacitive touch screen offers single-touch functionality

  – Industry PC as server: The capacitive touch screen offers multitouch functionality in cases where multitouch is supported by the server.

Unintentional actions

⚠WARNING

Unintentional actions

Always touch only one operating element on the screen Otherwise, you may trigger unintentional actions.

On-screen display for remote access to a server

The server screen is displayed as a full screen.

4.2 Notes on the capacitive touch screen

4.2.1 General information

The following information applies to all devices with a capacitive touch screen, regardless of whether the touch screen is operated in single-touch or multitouch mode.

⚠WARNING

Personal injury or property damage due to no earth connection

An inadequate earth connection or the lack of one may cause malfunction of the capacitive touch screen. Functions may not work properly. This can result in personal injury or property damage.

- Always connect the device to an earth conductor.
- The earth conductor from the device must be connected directly to earth with low impedance (short connection, minimum cross-section 4 mm^2).

You can find additional information on connecting the ground conductor in the section "Connecting the equipotential bonding circuit (Page 50)".

⚠WARNING

Personal injury or property damage due to maloperation

Incorrect operation of devices with a touch screen can occur. This can result in personal injury or property damage.

Take the following precautions:

- Configure the plant so that safety-related functions are not operated with the touch screen.
- Switch off the device for cleaning and maintenance.

NOTICE

Damage to the touch screen

Operation of the touch screen in the following ways will reduce its service life up to and including total failure:

- Touching it with a pointed or sharp object
- Abrupt impact with solid objects

Use only your finger or a touch pen to touch the touch screen

Note

Do not touch the touch screen during startup

During the startup process, the device automatically calibrates the capacitive multitouch screen. The touch screen is locked during calibration.

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

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

Security functions in an industrial environment

The touch screen is locked for security reasons when following happens:

- There is a conductive liquid on the touch screen with ground contact via the enclosure or the operator, for example.
- Electromagnetic interference is present that exceeds the specification according to EN 61000-4-2.

Once the interference is over, the touch screen is no longer locked.

4.2.2 Devices with capacitive single-touch screen

⚠ WARNING

Danger of malfunction due to improper execution of gestures on the touch screen

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

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

Note when operating the capacitive single-touch screen:

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

Notes on operation

Note when operating the capacitive single-touch screen:

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

Functions of the capacitive single-touch screen

- Automatic calibration of the touch screen during startup; manual calibration is not necessary.
- Touch and gesture control according to the operation capabilities of the device to which your ITC V3 device is connected.

4.2.3 Operating a device with capacitive multi-touch screen

You operate the multi-touch screen with one or multiple fingers. You can also operate it using gestures with up to five fingers at a time.

⚠ WARNING

Danger of malfunction due to improper execution of gestures on the touch screen

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

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

Note the following when operating the touch screen with multi-touch function:

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

Before you start to operate the device, make sure you are familiar with the multi-touch functions of the Windows operating system, as well as with the application to be used and its functions. Ensure that the gestures which the user executes on the multi-touch display are recognized by the application. It is possible that certain gestures need to be trained beforehand.

Notes on operation

Note when operating the multi-touch screen:

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

Functions of the multi-touch screen

- Detection of up to 5 finger touches at a time.
- Detection of gestures that are supported by the operating system or the software installed on the device.

Note

Multi-touch operation can provide advanced features or pose limitations depending on the operating system and the software installed on the device. Read the corresponding documentation.

- You do not need to calibrate the touch screen. Some operating systems do offer touch calibration. However, this calibration does not lead to any improvement in accuracy.

ITC Operating mode 5

5.1 System requirements

The following list shows the operating system and software requirements depending on the specific type of connection.

- RDPm, Sm@rtServer

RDP	Sm@rtServer	
X		Windows Server 2008 R2 (64-bit)
X		Windows Server 2012 R2 (64-bit)
X		Windows Server 2016 (64-bit)
X		Microsoft Windows 7 SP1 (32-bit and 64-bit)
X		Microsoft Windows 10 (32-bit and 64-bit)
	X	As of SIMATIC WinCC V14 (TIA Portal) with the options: • SIMATIC WinCC Sm@rtServer for SIMATIC Panels • SIMATIC WinCC Sm@rtServer for Runtime Advanced

- VNC: The following protocols are supported for the following versions:
  RealVNC 6.0.1, TightVNC 2.8.5 and UltraVNC 1.2.1.0
- WinCC OA: The connection to WinCC OA is supported as of version WinCC OA 3.16. Support with an earlier version can be requested from the WinCC OA team. Additional information can be found on the Internet at the following address:
  SIMATIC WinCC Open Architecture (http://w3.siemens.com/mcms/human-machine-interface/en/visualization-software/simatic-wincc-open-architecture/wincc-oa-basic-sw/Pages/default.aspx).
- Citrix: The current Citrix version is supported. The corresponding system requirements apply. You can find additional information on the Internet at the following address:
  Citrix product page (https://www.citrix.com/products.html)
- Web access via HTML5

See also

Technical Support (https://support.industry.siemens.com)

5.2 Typical applications

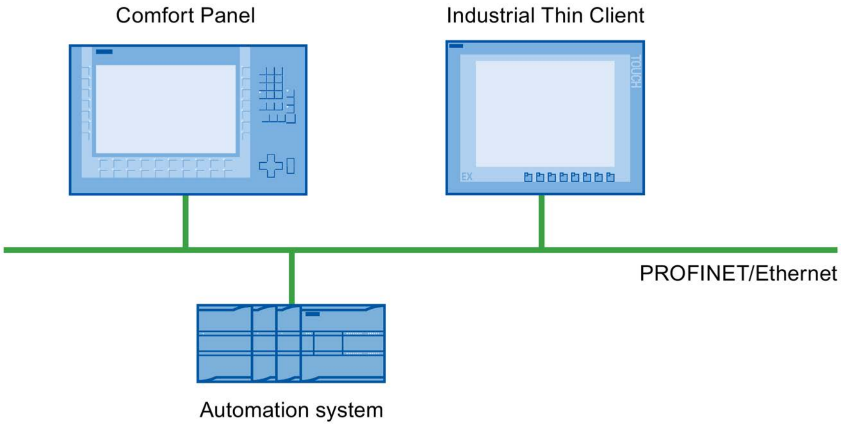
Industrial Thin Clients can be used as operator terminals in different scenarios. With the Industrial Thin Client, for example, you can access an HMI device and hence control a work process. You can also use the Industrial Thin Client to run Office applications on a server, for example, on a PC and modern web applications.

Typical applications are presented in the following.

Access to a Sm@rtServer

The Industrial Thin Client accesses an HMI device or industrial PC as a Sm@rtServer client using the SIMATIC WinCC Sm@rtServer option. You operate and monitor the WinCC project (TIA Portal) of the device on which the Sm@rtServer is activated.

The following figure shows one possible configuration.



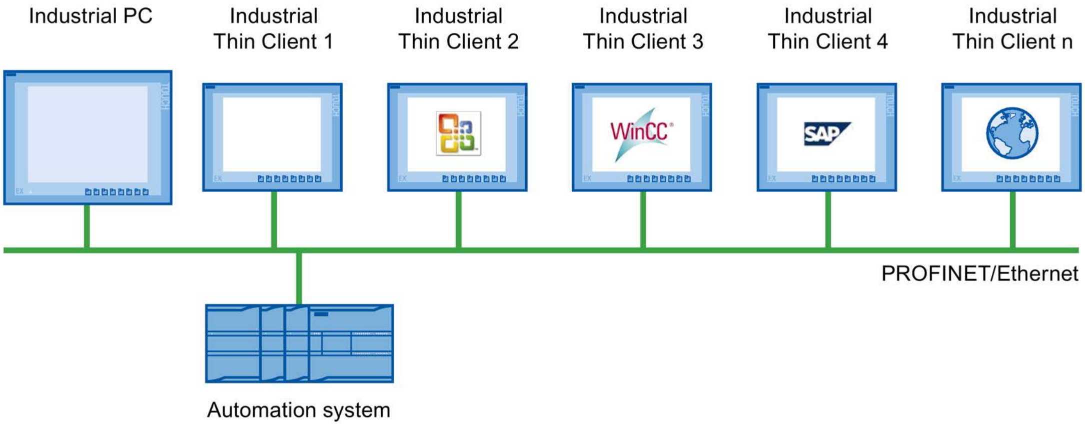
Access to a server via "RDP".

The Industrial Thin Client uses RDP (Remote Desktop Protocol) to access a server, such as an industrial PC or a PC. The following applications are also possible.

- WinCC/Web Navigator

  The Industrial Thin Client uses an Internet browser on the server to access the WinCC Web Navigator as a Web Navigator client. In this case, the Windows Server operating system must be installed on the server. For more information, refer to the documentation for the WinCC/Web Navigator option.
- The Industrial Thin Client accesses an Office application (e.g., MS Excel) or SAP application on the server. In contrast to the Windows Server operating systems, you can only operate one screen with Windows 7. The other monitor is always blocked.
- The Industrial Thin Client accesses an Office application, such as MS Excel, running with the Windows Server operating system or a SAP application on the server.

The following figure shows one possible configuration with the Windows Server operating system on an Industrial PC or a PC.

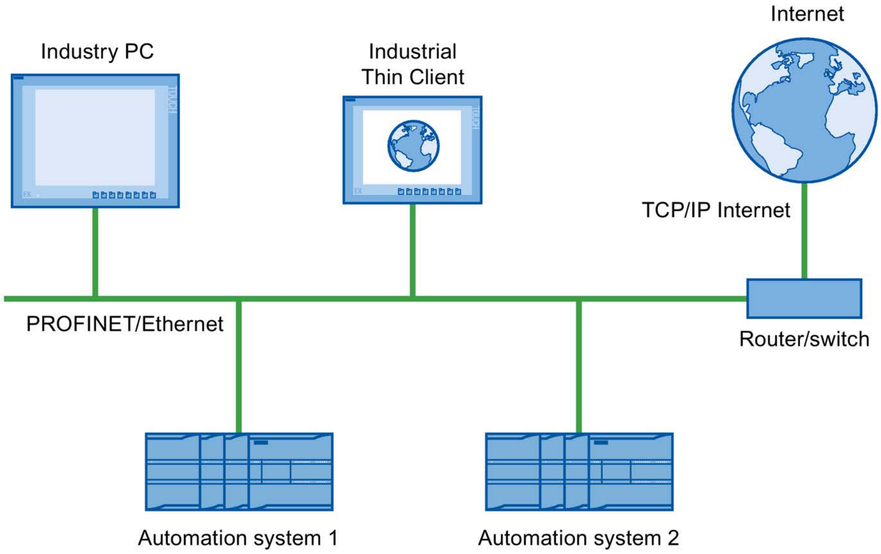


Access to a server via "VNC"

You use VNC in a similar way as RDP to remotely monitor and run a PC and to monitor its screen outputs. In contrast to RDP, all clients display the same server screen.

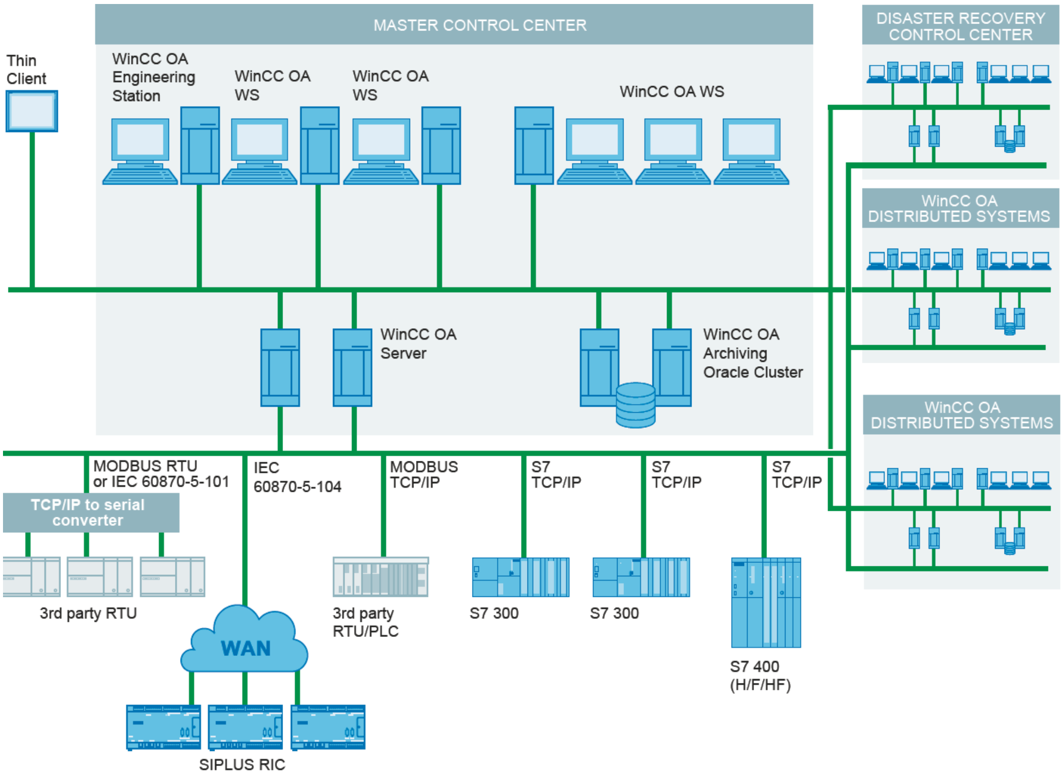
Access to a web server via "Web"

The Industrial Thin Client displays applications and the content of a web server using the integrated web browser functionality . Web-based content may be diagnostic or user-specific web pages of an S7 controller (PROFINET), for example, or content from the Intranet/Internet.



Access to a web server via the "WinCC OA"

The Industrial Thin Client operates similarly to a SIMATIC WinCC OA WebClient. The WinCC OA server makes the client component available to the Industrial Thin Client.



5.3 ITC commissioning

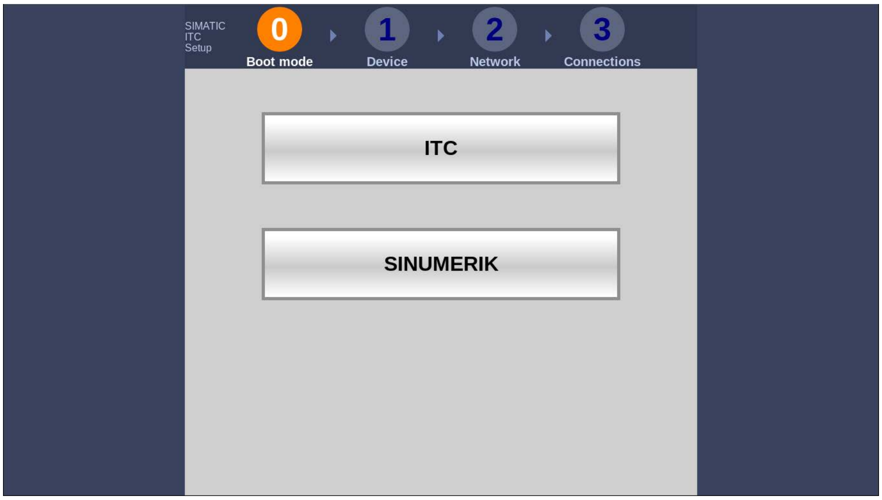
Requirement

The devices is connected according to the description in these operating instructions to the 24V DC power supply and equipotential bonding is connected.

Procedure

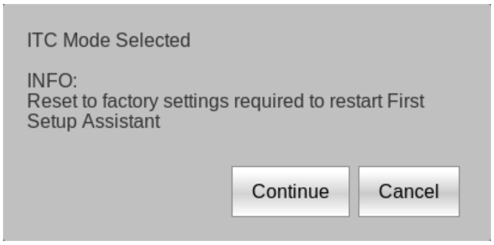
1. Switch on power to the Industrial Thin Client.

   The first commissioning dialog to select the operating mode is displayed.

2. Select the operating mode "ITC".

   The following dialog appears:

   ITC Mode Selected

   INFO:
   Reset to factory settings required to restart First Setup Assistant

3. Confirm the dialog with the "Continue“ button.

   The device starts in ITC operating mode. Information regarding the included free software is displayed during startup.

   The Setup Wizard guides you in setup steps 2 through 4 through the configuration of selected device and network data as well as passwords and connection settings.

4. Follow the instructions of the Setup wizard.

   The Setup Wizard remains open until the configuration settings are validated.

The first commissioning was successful if one of the following conditions applies:

- The taskbar is displayed.
- The configured startup connections are established.

Result

The first commissioning has been completed and the operating mode has been defined. In the future, the device starts in ITC operating mode and the first commissioning dialogs are no longer displayed.

To re-commission, you must reset the device to factory settings or update the firmware, see section "System settings (Page 78)".

5.4 Interrupting and restoring a connection

Introduction

The connection to the server can be interrupted in several ways:

- The server is offline or has has not completed its startup sequence.
- The password is incorrect.
- A firewall is blocking server access.
- The server has been shut down, for example, for maintenance purposes.
- The PROFINET/Ethernet network cable has been disconnected.
- A connection problem occurred in the network.
- A client-server connection was started on another device which logs onto the server with the same data. The client-server connection running on your device is then terminated.

Note that there can be multiple client-server connections at one time.

Automatic connection establishment

The device offers the possibility to re-establish an interrupted connection automatically. There are two basic standard cases for this:

- Initial start of a connection
  The connection cannot be established because the server is not ready, for example. The device makes continuous attempts to establish the connection to the server.
- Existing connection
  An existing connection to the server is interrupted because the network cable has been removed or the network is faulty, for example. The permanently device attempts to re-establish the connection to the server.

To reconnect automatically, activate the "Reconnect automatically" option in the connection settings. When "Reconnect automatically" is selected, the device continually attempts to reconnect to the server. This procedure can be aborted by closing the connection via the taskbar.

5.5 Assigning device parameters

5.5.1 Possible applications

The Industrial Thin Client can fulfill the following functions as an operator terminal:

- Access to an HMI device as a Sm@rtServer client via the WinCC Sm@rtServer option.
- Access as a client via the "RDP" protocol.
- Access as a client via the "VNC" protocol.
- Access a Citrix server as Citrix client.
- Access as a client on a WinCC OA server.
- Access as a web client to a web server, e.g. of an S7 controller or the Intranet.

When the device accesses a server, for example, an HMI device or a PC, as a client, the screen display of the server is shown on the screen of the Industrial Thin Client. The user uses the Industrial Thin Client to access programs or projects on the server.

Note

"Sm@rtServer", "RDP", "VNC", and "Web" are referred to as connection types in this document.

Note

The browser of the Industrial Thin Client is based on Firefox version ESR 52.

5.5.2 Opening the configuration

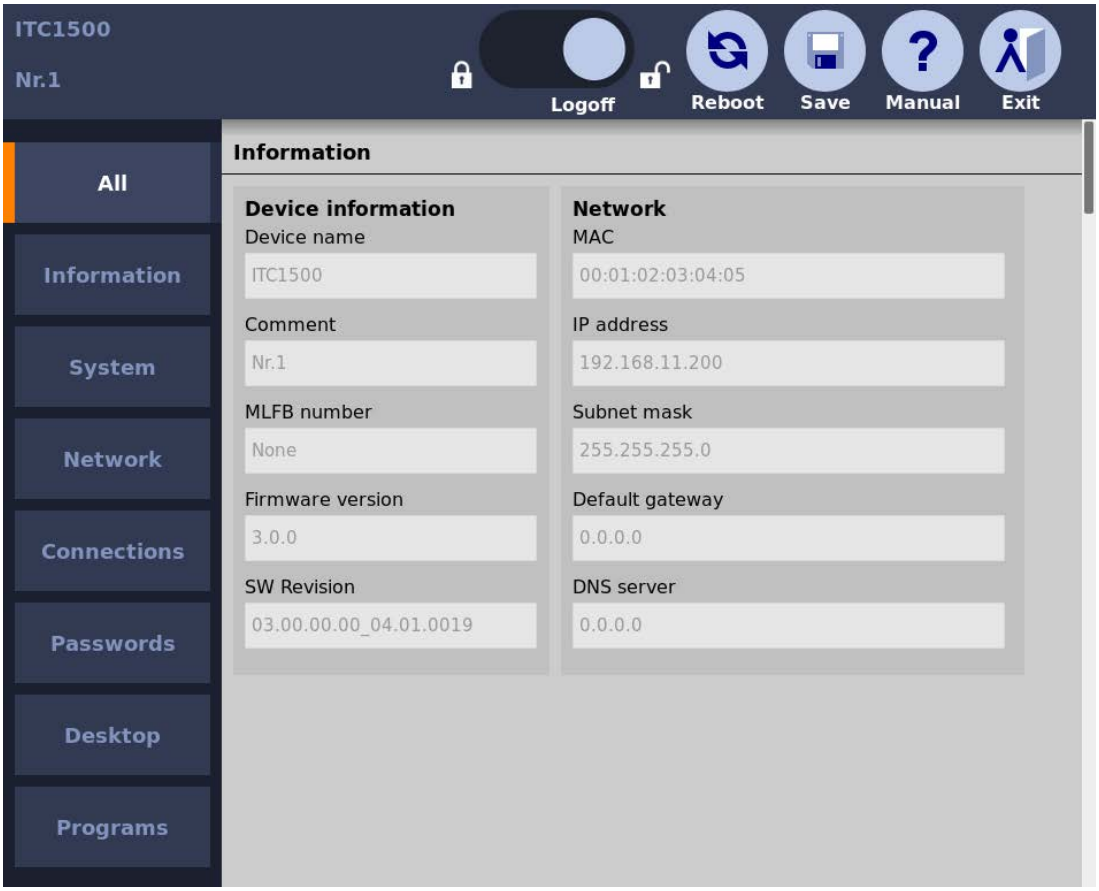
Introduction

You set the device parameters in the device configuration settings.

Note

Alternatively, you can edit the configuration settings of the device via remote access from a PC, see section "Remote configuration (Page 102)".

Procedure on the device



Information

Device information

Device name: ITC1500

Comment: Nr.1

MLFB number: None

Firmware version: 3.0.0

SW Revision: 03.00.00.00_04.01.0019

Network

MAC: 00:01:02:03:04:05

IP address: 192.168.11.200

Subnet mask: 255.255.255.0

Default gateway: 0.0.0.0

DNS server: 0.0.0.0

1. Press the ⚙ "Start menu" symbol in the task bar.
2. Select the menu entry "Configuration". First, the "All" submenu is displayed. It contains all configuration settings. You can find more detailed information in the section "Access and structure (Page 74)".
3. Go left to another submenu, for example "Information". The device information is displayed, see section "Device data (Page 77)").
4. Close the configuration settings with the "Exit" symbol.

You can find additional menu entries in the Start menu and the description of the taskbar in the section "Structure and functions of the taskbar (Page 112)".

NOTICE

Unintended reactions of the device

Two people can edit the configuration settings simultaneously: locally on the device and via remote configuration. The most recently saved settings are the valid settings at any given time (blue "Save" symbol).

Organize access to the configuration settings in such a way that only one person can edit the configuration settings at one time.

Note

Unauthorized access

To prevent unauthorized persons from logging on and gaining free access to the configuration settings and client-server connections, you should immediately assign a new administrator password after first commissioning or restoring of factory settings.

Access without logon

If you are not logged in, you only have read access to the currently valid network settings and the device data such as the IP address and the MLFB of the device. See also section "Device data (Page 77)".

See also

Starting a connection (Page 113)

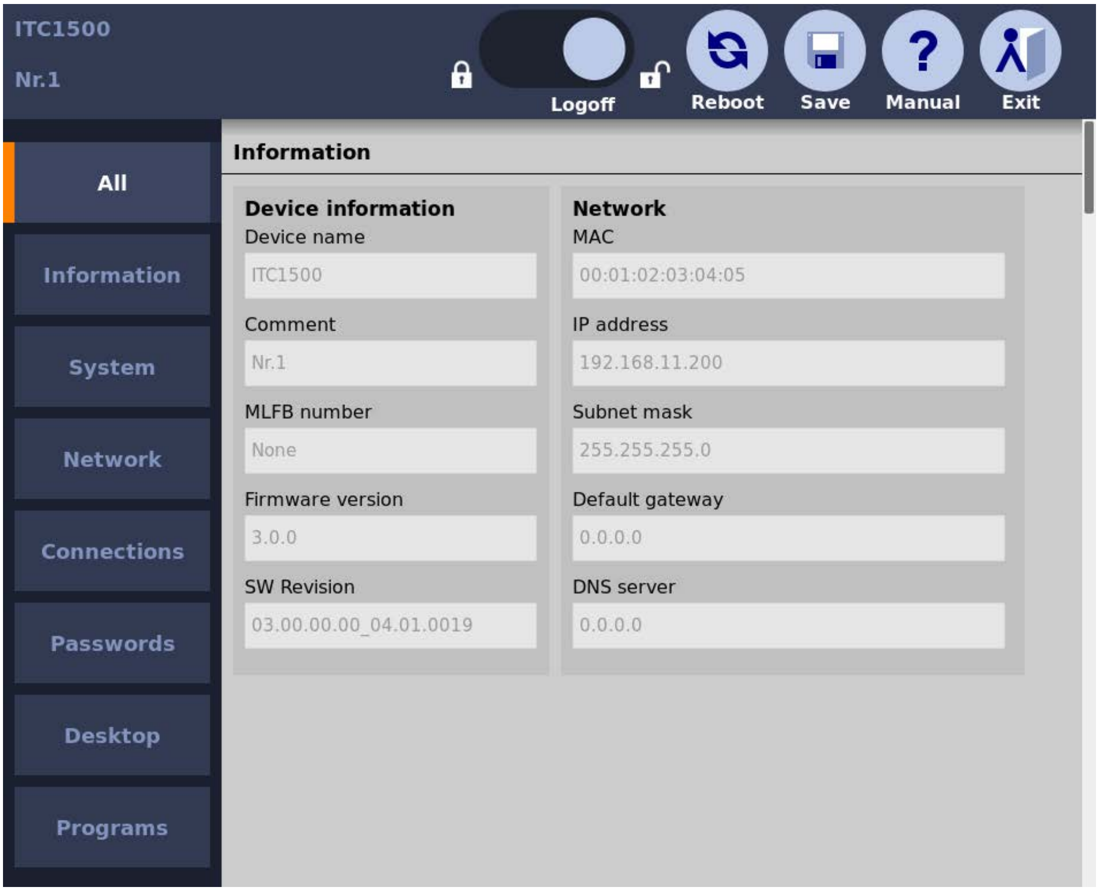
Password settings (Page 94)

5.5.3 Configuration settings of the device

5.5.3.1 Access and structure

Structure

The following figure shows the configuration settings in the "Configuration" Start menu.



Information

Device information

Device name: ITC1500

Comment: Nr.1

MLFB number: None

Firmware version: 3.0.0

SW Revision: 03.00.00.00_04.01.0019

Network

MAC: 00:01:02:03:04:05

IP address: 192.168.11.200

Subnet mask: 255.255.255.0

Default gateway: 0.0.0.0

DNS server: 0.0.0.0

This configuration settings have the following submenus:

- "All": displays all configuration settings in a single window
- "Information" shows devices and network parameters.
- System settings under "System":
  - Update firmware
  - Back up and reload the configuration file
  - Restore to factory settings
- Network settings under "Network"
- Connection settings under "Connections":

  configures client-server connections for remote access
- Administrator password and connection password under "Passwords"

- Desktop settings under "Desktop":
  - Taskbar
  - On-screen keyboard
  - Background image
- Application settings under "Applications": Web browser settings

Note

Forced termination of connection

When you change and save the configuration settings, all open client-server connections are terminated and all open programs are closed without a confirmation prompt. The autostart connections are re-established afterwards and the new configuration settings are put into effect.

Access without logon

If you open the configuration settings and do not log on as administrator, only "Configuration > Information" is shown in the Start menu with the current network settings and device information.

You have read-only access to the device and network data and cannot make any changes.

Access with logon

In order to view and edit the configuration settings (read and write access), you must log on with a valid administrator password.

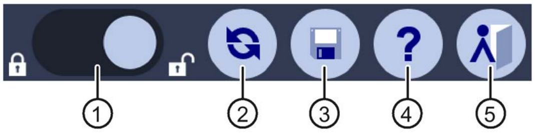
Note

Permanent data

Some data cannot be configured, for example, "MLFB number", "Firmware version", "MAC address", etc.

Symbols

Use the following icons above the submenus to access the configuration settings.



① "Log on" as an administrator and then "log off"
② "Restart" device
③ "Save" configuration settings
④ Call "Help"
⑤ "Exit" configuration

See also

Network settings (Page 83)

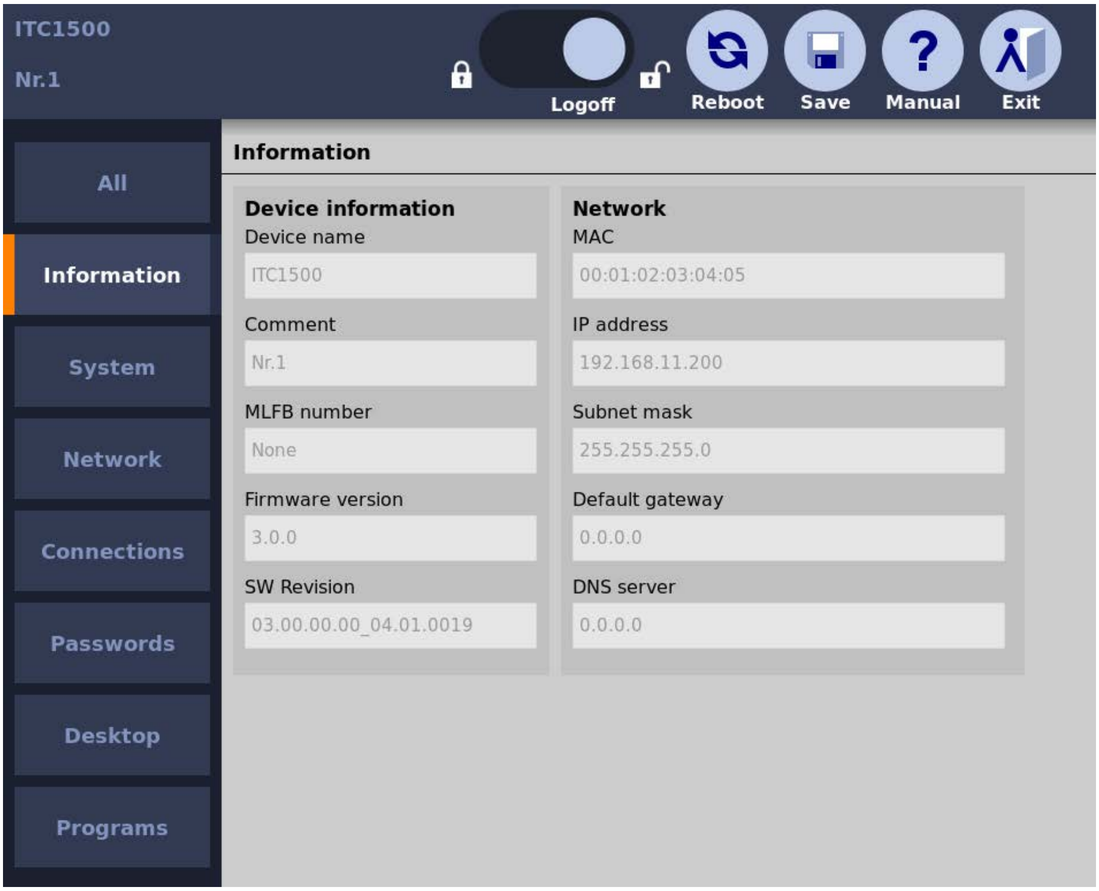
System settings (Page 78)

Password settings (Page 94)

Setting up startup connection (Page 92)

5.5.3.2 Device data

The following figure shows the device data in the Start menu "Configuration > Information".



Information

Device information

Device name
ITC1500

Comment
Nr.1

MLFB number
None

Firmware version
3.0.0

SW Revision
03.00.00.00_04.01.0019

Network

MAC
00:01:02:03:04:05

IP address
192.168.11.200

Subnet mask
255.255.255.0

Default gateway
0.0.0.0

DNS server
0.0.0.0

The device data identify the device uniquely and are shown here for informational purposes only. You can change the device data via the system settings and the network settings, see sections "System settings (Page 78)" and "Network settings (Page 83)". The home page of the web browser also displays device data and network settings.

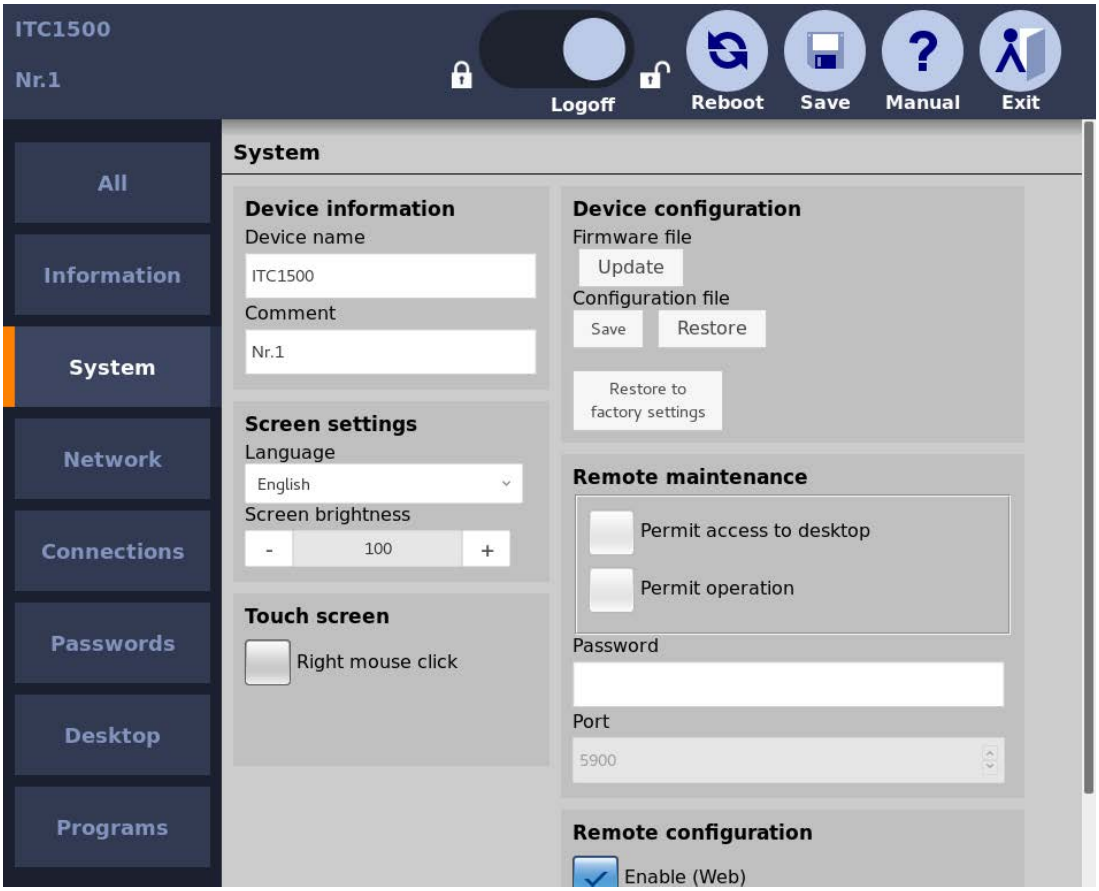
Note

If no administrator is logged on, the configuration settings only show the "Information" submenu.

5.5.3.3 System settings

Introduction

The following figure shows the system settings in the Start menu "Configuration > System".



Device name: ITC1500

Comment: Nr.1

Language: English

Screen brightness: - 100 +

☐ Right mouse click

☐ Permit access to desktop

☐ Permit operation

Password:

Port: 5900

☑ Enable (Web)

You can perform the following actions:

- Specify device name
- Setting up screen: Language, brightness, right mouse click
- Update firmware
- Save and retrieve the configuration file
- Restore to factory settings
- Setting for remote maintenance via VNC
  Remote maintenance is performed via an encrypted connection. Remote maintenance requires a VNC client that supports the corresponding encryption, for example Tiger VNC.

Specifying device name

In the "Device information" area, specify a name for the Industrial Thin Client in "Device name". This name will allow the administrator to identify the device. The device name will be displayed at the following places:

- In the title bar of the configuration settings
- As the PROFINET station name in SIMATIC Manager

The device name is also the PROFINET station name and must meet the following conditions:

- One or more identifiers separated by a dot.
- Length of identifier: 1-25 characters
- Length of the device name: 1-255 characters, but only up to 26 characters are displayed on the device
- The identifiers contain lower case letters a-z and numbers 0-9.
- The identifiers cannot start or not end with "-".
- The first identifier does not have the form "port-xyz" or "port-xyz-abcde" where a, b, c, d, e, x, y, z = numbers 0 to 9.
- Identifiers do not start with "xn--" if RFC 3490 is applied.
- The device name may not end with "0".
- The device name does not have the n.n.n.n format, where n = 0 to 999.

Devices with more than one Ethernet interface do not need more than one device name.

Only up to 23 characters of the **comment** are displayed on the device (see above).

Setting up screen

Set the system language that includes the following texts under "Language":

- Start menu and settings
- On-screen keyboard and externally attached USB keyboard
- Messages

⚠**CAUTION**

Damage to the machine or plant through operating error

The configured system language, English for example, also determines the keyboard language of the externally connected USB keyboard. If you then connect an English keyboard, the keys do not have the same meaning as what is printed on them.

This may result in operating errors at the machine and personal injury or damage to the machine or plant. To connect an English keyboard, set the system language to English under "Language" in the Start menu "Configuration > System".

Under "Screen brightness", adjust the intensity of the backlighting.

If you select the "Right mouse click" option, each contact on the touch screen lasting more than 2 seconds will be interpreted as a right-click.

Example: If you touch the "Workstation" icon in Windows for more than 2 seconds, the operating system or application will respond as though you had right-clicked the icon: the context menu is displayed where you can select the "Properties" item, for example.

Update firmware

You update the device firmware either directly on the device via USB or with remote access from a PC, see section "Remote configuration (Page 102)".

NOTICE

Data loss during firmware update

All configuration settings are lost during a firmware update. The factory settings are restored after the update, which also resets passwords.

Save the configuration file before you update the firmware and reload it after the update (see below).

NOTICE

Damage to the device

If the power supply or the connection to the device containing the firmware is interrupted during the update process, the device may no longer be functional.

- Ensure that the power supply and the connection to the device are maintained during the entire updating process.
- Make sure that all applications running on the device are closed.
- Before updating the firmware, restart the device to prevent memory problems.

In the "Device configuration" area, use the "Update" button to select an update file "*.upd". The selected file will be transferred to the device. To determine whether the selected file is suitable for the device, the system checks it against the following criteria, for example:

- The selected file is an update file.
- The selected update file is more current than the version installed on the device.
- The selected update file is suitable for this device.

If all the criteria are met, the selected update file will be run on the device. The device and the Setup Wizard restart automatically.

Note

The progress of the update is displayed on the screen.

Saving and retrieving the configuration file

You back up the configuration file of the device either directly on the device via USB or with remote access from a PC, see section "Remote configuration (Page 102)".

The configuration file contains all device-specific configuration settings with the exception of the background image. You can back up the configuration file of a device and reload it to several devices, for example:

- Use the "Save" button to back up the configuration file for the device to the connected USB drive. To do this, you select a folder in the file system and close the dialog with "OK". The configuration file is saved to the folder.
- Use the "Load" button to import the backed up configuration file from the connected USB drive again, for example if the current configuration file has been inadvertently overwritten. To do this, you select a configuration file from a file dialog and close the dialog with "OK".

  The syntax within the configuration file is checked. If the syntax is free of errors, the configuration file will be transferred to the device and the old configuration file will be overwritten; otherwise a message will be output.

Note

Saving the configuration file

Configuration files of the older version V2.x are no longer supported. Back up the current configuration file before and after each firmware update.

You are prompted to enter a password between 8 and 32 characters in length when saving.

Loading the configuration file

Only load configuration files that were created on the device or with Remote configuration. A configuration file may not be altered after backup, for example, by means of an editor.

You are prompted during loading to again enter the password you assigned when you performed the save.

IP address conflicts

Do not load configuration files with the same IP addresses on different devices. Reassign the IP addresses.

Restore to factory settings

Restoring factory settings has the following effects:

- The default configuration file overwrites the configuration file. All connection data for the network, remote access and web browser is reset. The language and screen brightness, the settings and position of the taskbar and on-screen keyboard, and the background image are reset.

NOTICE
Data loss restoring the factory settings
Back up the configuration file and then reload it (see above).

- The administrator password is deleted and must be reassigned at next restart.

Procedure

- Touch the "Restore to factory settings" button. The "Resetting to factory defaults" message is shown on the touch screen. The device reboots automatically if you confirm this message.

Alternative procedure

1. Switch off power to the device.
2. Press and hold the button "Factory settings" on the device with a sharp object and turn the device power back on. The "Default settings" button is next to the interface X1 P1 PROFINET (LAN).

   The device restarts.

   Press and hold the "Factory settings" button on the device with a pointed object during a reboot until first commissioning is completed and a message is briefly displayed.

Service device remotely via VNC

Allows remote access to the device. The device has a VNC server for this purpose. With VNC remote access, you can "Permit access to Desktop" or "Permit operation", in other works, enable operation of the plant or machine from the device. You also set the "port" and the "password" for remote access. Remote access must always be protected by a password, i.e. an entry in the "Password" field is required.

Activating remote configuration

You can use the "Remote configuration" option, "Activate (Web)" to specify whether or not it is allowed to configure the Industrial Thin Client via the Web browser of another device. The configuration settings of the Industrial Thin Client are accessed via an encrypted connection in HTML5 format, which means access must be made with a Web browser that supports HTML5 and encrypted connections (https).

See also

Opening the configuration (Page 71)

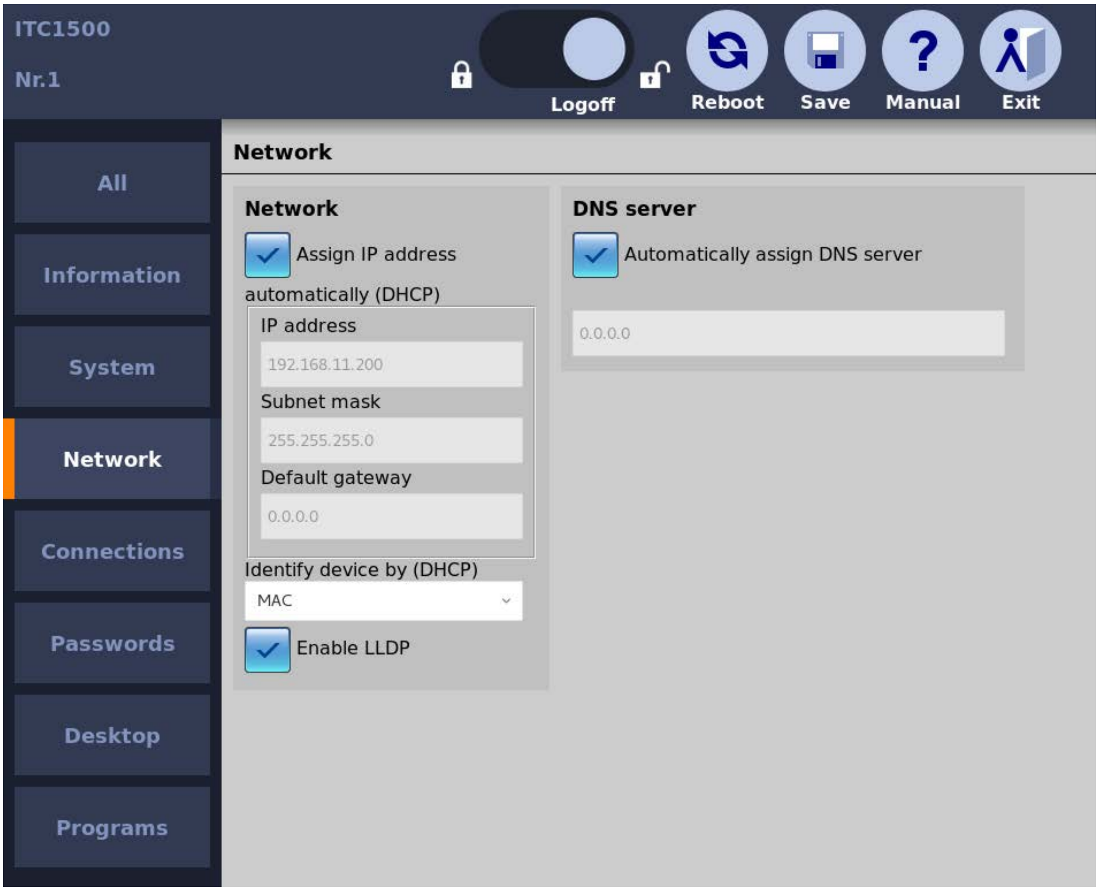
Network settings (Page 83)

Switching on and testing the device (Page 55)

5.5.3.4 Network settings

Introduction

The following figure shows the network settings in the Start menu "Configuration > Network".



Network

Network

☑ Assign IP address automatically (DHCP)

IP address: 192.168.11.200

Subnet mask: 255.255.255.0

Default gateway: 0.0.0.0

Identify device by (DHCP): MAC

☑ Enable LLDP

DNS server

☑ Automatically assign DNS server

0.0.0.0

You can perform the following actions:

- Specify network parameters
- Assign network parameters dynamically
- Use DNS server
- Check valid settings

Specify network parameters

You assign the network parameters either statically or dynamically:

- If "Assign IP address automatically (DHCP)" is not selected, assign a valid static IP address, subnet mask, and default gateway.
- You can also use the "Assign IP address automatically (DHCP)" option to specify that the network parameters will be assigned dynamically by the DHCP server and are therefore not available for assignment (grayed out).

Note

IP address conflicts

Before an IP address is assigned, a check is made to determine whether a device with this IP address already exists in the network. If so, an error message is appears and the address is not assigned. Assign an individual IP address to each device.

The subnet mask specifies the maximum number of nodes, e.g., "255.255.255.0".

Note

Invalid subnet mask

If a subnet mask is invalid, an error message appears and the subnet mask is not assigned. Assign a valid subnet mask.

Activate a PROFINET service under "Enable LLDP" (Link Layer Discovery Protocol) that identifies the Industrial Thin Client in the network as such. If other network components also make their identity known, the management station, such as STEP7, can then detect the network topology automatically.

Assign network parameters dynamically

The following applies only if the "Assign IP address automatically (DHCP)" option is selected.

The device has two features that identify it uniquely. Under "Device identification (DHCP)", you specify the identification feature that the DHCP server uses to identify the device:

- If you select "Device name", the DHCP server identifies the device based on the name stored in the "Device name" field of the system settings, see section "System settings (Page 78)". If configured correspondingly, the DHCP server searches for the device name in its configuration file and transfers the network settings stored there to the Industrial Thin Client.
- If you select the most common identification parameter "MAC address", the DHCP server identifies the device on the basis of its MAC address.

Use DNS server

You can manually enter the IP address of the DNS server under "DNS server". If you select the "Automatically assign DNS server" option, the manual IP address is overwritten by an IP address assigned by the DHCP server. This requires that the "Assign IP address automatically (DHCP)" option is also selected.

Note

No connection between client and server

If you edit the configuration settings from an external PC, take the following into account: The connection can be interrupted as soon as you enter a different IP address in "IP address" or select the "Assign IP address automatically (DHCP)" option.

If you edit the configuration settings locally on the device, the connection to the configuration settings will be maintained even if you change the IP address in the configuration settings.

If the "Assign IP address automatically (DHCP)" option is selected and no DHCP server is available, no IP address will be assigned to the device. Communication between the server and device is not possible.

- Start the configuration settings locally on the device, and assign an IP address to the device that is not already used in the network.

Alternatively, you can select the "Assign IP address automatically (DHCP)" option with "Device name".

Note

A maximum of 240 characters is permitted. For connections via RDP, the device name will be automatically truncated to the first 15 characters at logon.

Check valid settings

In the Start menu "Configuration> Information", the network settings that are currently valid are always shown, regardless of whether they were assigned statically or dynamically. Use this approach to check whether the change in the network settings was accepted or not.

See also

Opening the configuration (Page 71)

PROFINET basic functions (Page 93)

5.5.3.5 Connections

Basics

Introduction

Users can connect from the Thin Client to different servers. Example:

- RDP Server 1: Access to office planning documents
- VNC Server 2: Access to Office spreadsheets
- Sm@rtServer 3: Access to WinCC messages at the plant
- WinCC OA-Server 4: Access to WinCC OA workstations
- Web-Server 5: Access to web-based content, for example, of an S7 controller (PROFINET) or Intranet/Internet using the integrated web browser.

Note

Web connection and web browser

You can configure a Web connection, for example, the server address, via the connection settings, see section "Connection settings (Page 89)". You configure the Web browser itself and its proxy settings in the application settings, see section "Application settings (Page 100)".

You can establish up to 5 such client-server connections at the same time. These connections are specified mainly by the following parameters:

- Connection type, e.g., "Sm@rtServer" or "RDP"
- IP address of the server
- Port of the server

The Industrial Thin Client then displays the server screen as a full screen.

This section shows how you configure client-server connections. The connection settings can be found in the configuration settings in the Start menu "Configuration > Connections".

Displaying client-server connections in the taskbar

The "Display connection (favorites)" option is enabled by default so that the client-server connection appears in the start bar (under "Favorites") and can be started from there. The favorites contain a maximum of 10 client-server connections.

It makes sense to disable the "Show connection (Favorites)" option, for example, when the associated server must be serviced at regular intervals.

Factory default settings

- "Obtain IP address automatically (DHCP)"

Note

Unauthorized access

To prevent unauthorized persons from logging on and gaining free access to the configuration settings and client-server connections, you should immediately assign a new administrator password after first commissioning or restoring of factory settings.

Note

Avoiding malfunctions

The factory default is that the IP address is assigned dynamically (DHCP). If you disable the "Obtain IP address automatically (DHCP)" option, there is no static IP address ("0.0.0.0"). Therefore, assign an individual IP address to each device.

Some client-server connections have already been created as examples. Set up client-server connections with valid IP addresses.

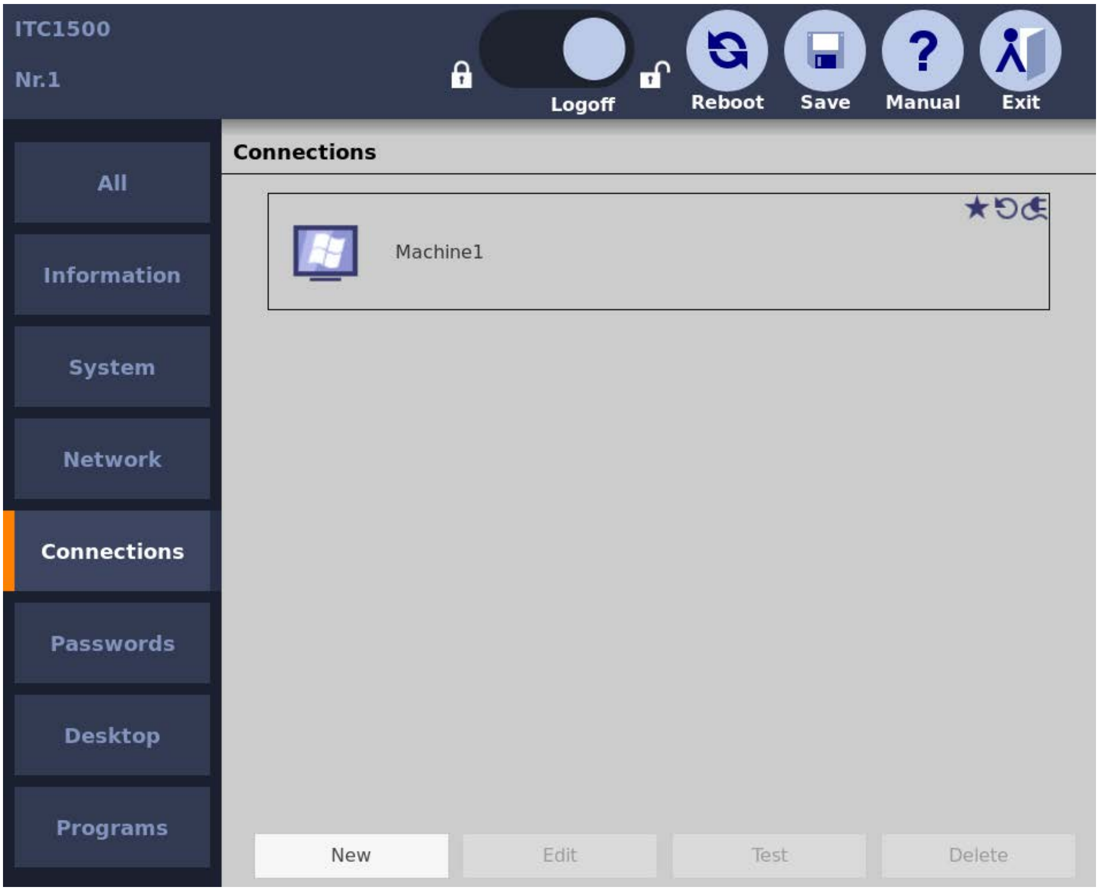
See also

PROFINET basic functions (Page 93)

Setting up client-server connections

Structure of the tab

The following figure shows the list of client-server connections in the Start menu "Configuration > Connections".



Below the list there are buttons for editing a selected client-server connection.

Buttons

The buttons have the following functions:

- "New": creates a new client-server connection.
- "Edit": opens the connection settings of the client-server connection.

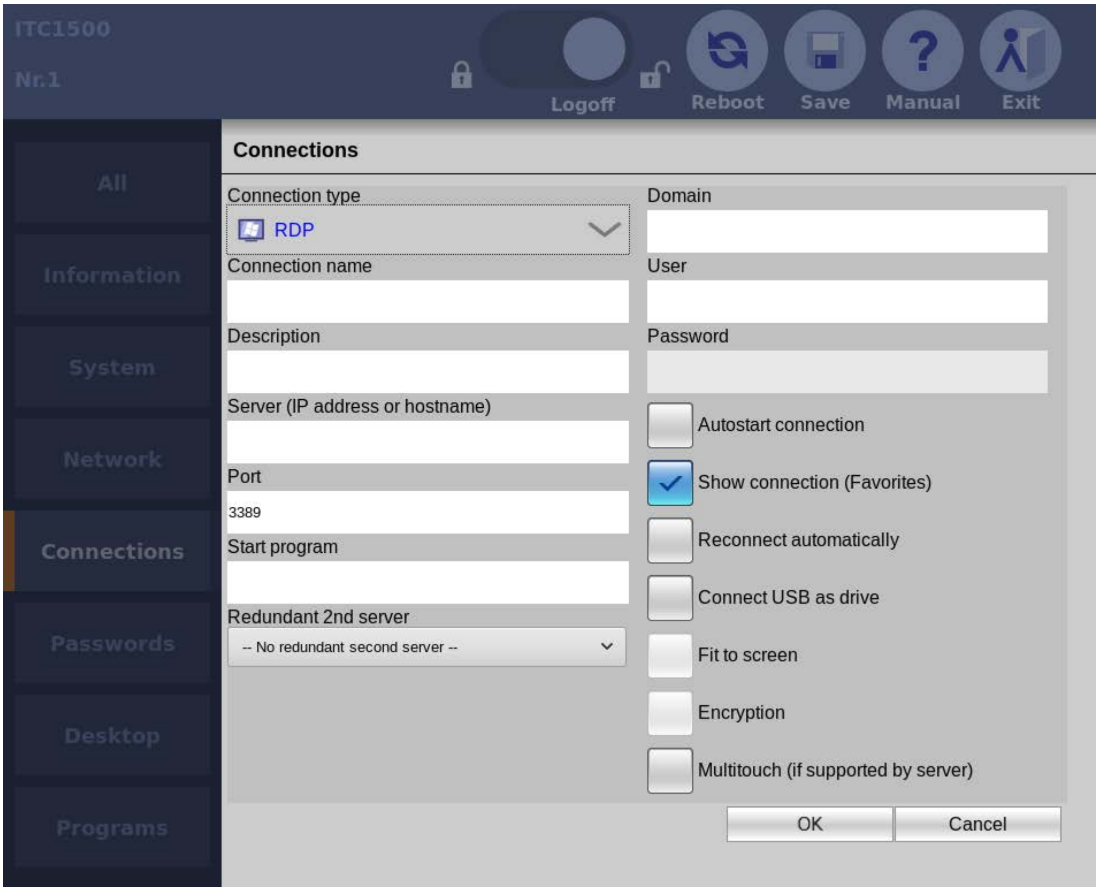
  Same dialog as "New" with the only difference that the "Connection type" can no longer be changed.
- "Testing": Checks if the server and port can be reached (ping).
- "Delete": deletes the client-server connection.

See also

Opening the configuration (Page 71)

Connection settings

By way of example, the following figure shows the connection settings for an RDP connection in the Start menu "Configuration > Connections".



Connections

Connection type: RDP

Connection name

Description

Server (IP address or hostname)

Port: 3389

Start program

Redundant 2nd server: -- No redundant second server --

Domain

User

Password

□ Autostart connection

☑ Show connection (Favorites)

□ Reconnect automatically

□ Connect USB as drive

□ Fit to screen

□ Encryption

□ Multitouch (if supported by server)

You select a client-server connection, or create a new one. The following connection settings can be specified:

Note

Grayed-out fields

Not all connection settings are available for each type of connection (exception: RDP). Connection settings that are not required are grayed out.

- The "Connection type" specifies the type of client-server connection, e.g. RDP connection, VNC connection, etc.
- In "Connection name", you enter a name for the client-server connection, e.g. "Server screen 1". The client-server connection will then appear with this name in selection menus. If the operator selects "Server screen 1" in the taskbar, for example, the client-server connection configured with this name will be started.
- In "Description", you enter a text for the client-server connection. This description then appears in selection menus under "Connection name".

- Under "Server (IP address)", you specify an IP address or host name at which the server can be reached.
- In "URL" ("Web" connection type only), you specify an Internet address at which the web server can be reached.
- The default port is set under "Port". RDP: 3389, Sm@rtServer/VNC: 5900.
- In "Start program" (RDP only), you specify the software program that is automatically started on the server with this RDP connection. For this function, a "Server" type operating system is required on the server PC. The server must be configured accordingly.
- Under "Redundant 2nd server" (RDP only), select a second RDP connection that is already configured. If the first RDP connection configured here fails, the second RDP connection will be started (fallback). And vice versa: If the second RDP connection fails, the first RDP connection will be restarted.

  To use two redundant RDP connections, the following options must be enabled for both connections:

  – "Show connection (Favorites)"

  – "Reconnect automatically"
  If the "Redundant 2nd server" and "Reconnect automatically" options are enabled, before the start of the other connection, an attempt is made three times to restore the currently active connection with a time interval of about 15 seconds.
- You specify the logon information for logging the device onto the server under "Domain" (RDP, Citrix), "User" (RDP, Citrix, WinCC OA), and "Password".

Note

Password length

With the connection to a Sm@rtServer with WinCC Advanced (TIA Portal) V13 or higher, a password length of more than eight characters is supported after the "Encryption" checkbox is selected.

WinCC OA

In WinCC OA, the "User" and "Password" fields are used for HTTP download of Runtime. Logon in the WinCC OA logon screen is therefore not possible. A password is required to assign a user name.

- If you select "Autostart connection", this client-server connection is automatically established when the device is restarted or rebooted and after modified configuration settings are saved. "Automatic start connection" only works when the "Display connection (favorites)" flag is set for the connection.

Note

Limited number of client-server connections

A maximum of 5 client-server connections can be started at the same time. An error message appears when a 6th connection is activated.

- If you select "Show connection (favorites)", this client-server connection will appear in the taskbar under "Favorites". If the favorites contain 10 connections, you cannot add an additional connection, and this option is no longer available.

  If you deselect the option, the client-server connection is not visible to the operator and can only be started by the administrator in the Start menu "Configuration > Connections" via the "Test" button.
- When "Reconnect automatically" is selected, the device continually attempts to reconnect to the server. This procedure can be aborted by closing the connection via the taskbar.

Note

Only one user with RDP on Windows operating system

If a second client has established the same RDP connection to the server with the identical logon information, the client-server connection of the first client is interrupted. Even if "Reconnect automatically" is enabled, the device does not try to re-establish the connection to prevent a ping-pong effect between the clients.

- If you select the "Connect USB as drive" option (RDP only), you can access a USB memory device connected to the Industrial Thin Client on the touch screen. The USB data are transferred to the server and displayed there in Windows Explorer for the devices. For additional information, see section "Use USB memory devices (Page 118)".

Note

Security threat to the system

The USB may infect the server with viruses, Trojans, spam, etc.

Use a suitable virus scanner to check the data on the USB memory device, or deselect the "Connect USB as drive" option.

Non-supported operating systems

The "Connect USB as drive" function is currently not supported for the following operating systems of the connection partner:

- Windows Server 2012, 64-bit

- When "Fit to screen" is enabled (only with Sm@rtServer and VNC), the Industrial Thin Client scales the server screen to its own display size.

- When "Encryption" is enabled (Sm@rt connection only), the data is transferred encrypted between client and server. In this case, activate encryption on the server as well.

  If the server does not support this function, an error message will be displayed. Depending on the height-to-width ratio, the server screen is displayed within a black bar.
- When "Multitouch" is enabled, you can use a server with a multitouch-capable operating system in multitouch mode.

Note

Server operating system with multitouch support required.

When you enable the "Multitouch" setting for the connection to a server with a **non-**multitouch-capable operating system, it is **not** possible to operate the server via the Industrial Thin Client. Only enable the "Multitouch" setting for the connection to a server with a multitouch-capable operating system.

Setting up startup connection

Introduction

You can designate each client-server connection as an autostart connection. This means that this client-server connection will also be started every time the device starts. The autostart connections can be restarted even after the configuration settings have been changed.

Note

Limited number of client-server connections

A maximum of 5 client-server connections can be started at the same time. If a 6th connection is activated, an error message appears

The order cannot be defined for startup. Therefore, which of the autostart connections will ultimately be displayed on the screen is undefined. However, you can generally switch between the client-server connections.

Procedure

Proceed as follows to identify a client-server connection as an autostart connection:

1. Choose "Configuration > Connections" in the Start menu.
2. Select a client-server connection.
3. Touch the "Edit" button to confirm.
4. Select the "Autostart connection" option.

PROFINET basic functions

Introduction

The PROFINET basic functions help to diagnose the device using standard mechanisms. The required diagnostics functions are available, for example, in STEP 7.

Functions

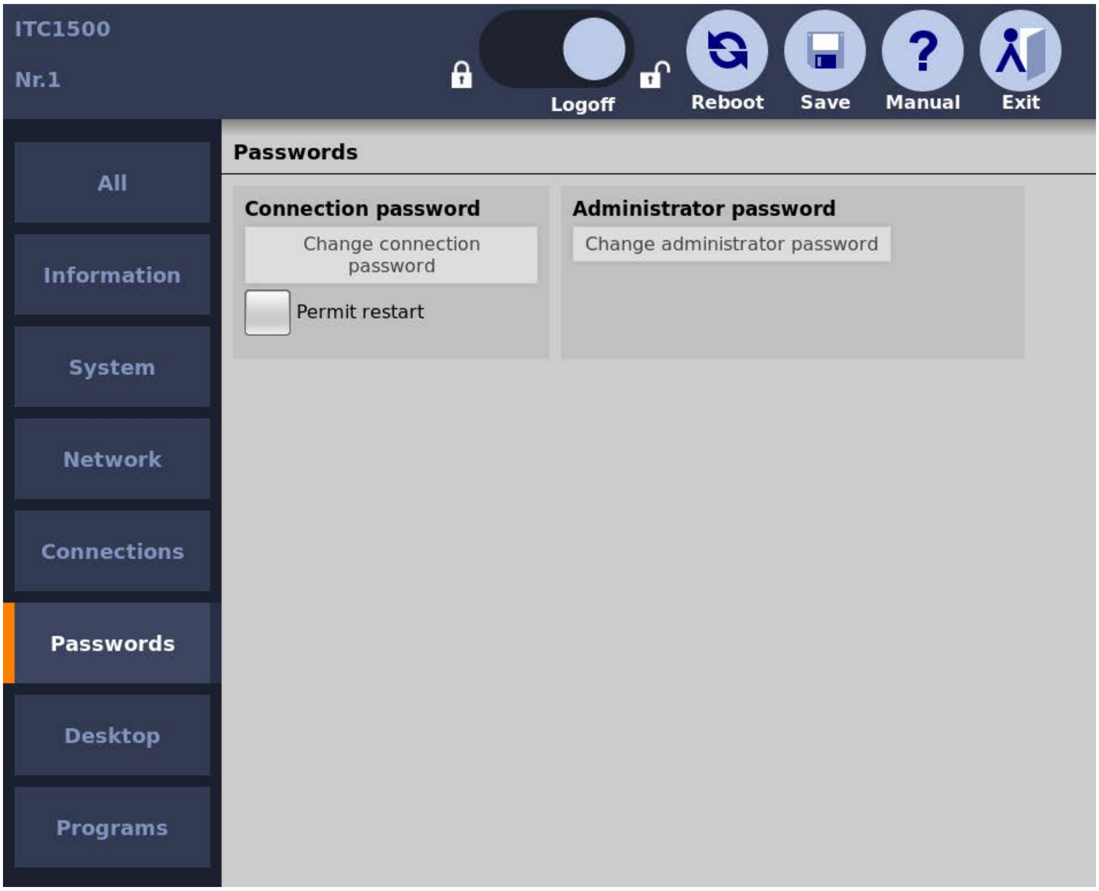
As of SIMATIC Manager V5.4, SP2, the PROFINET basic functions offer the following functions:

- As soon as the device is connected to PROFINET, it is displayed as an available device in the Lifelist in SIMATIC Manager. You can view the properties of the device, e.g., IP address.
  Additional information from the "Target system" context menu is not supported by the device.
- You can assign a name and an IP address to the device in SIMATIC Manager under "Target system > Edit Ethernet device".
- As of TIA Portal V12: The device can be configured in the topology editor.

5.5.3.6 Password settings

Introduction

The following figure shows the password settings in the Start menu "Configuration > Passwords".



Note

Forced termination of connection

When you save the changed configuration settings, all open client-server connections are terminated and all open programs are closed without a confirmation prompt. The configured autostart connections are re-established.

Logging in as an administrator

A user that is not logged on can operate the Start menu, but only the device data from the configuration settings will be visible ("Configuration > Information").

To edit the configuration settings, follow these steps:

1. Move the blue circle (slider) "Logon" in the toolbar to the right.
2. Enter the administrator password.
3. Click the "Logon" button to close the dialog.

You are logged on as administrator.

Logging off as an administrator

To protect the configuration settings from unauthorized access from the outside, follow these steps:

1. Move the blue circle (slider) "Logon" in the toolbar to the left.

You are logged off as administrator.

Changing the administrator password

During first commissioning or restoring of factory settings, you are prompted to assign a new administrator password.

Note

Unauthorized access

To prevent unauthorized persons from logging on and gaining free access to the configuration settings and client-server connections, you should immediately assign a new administrator password after first commissioning or restoring of factory settings.

The administrator password can be changed in the "Configuration > Passwords" Start menu.

1. Touch the "Change administrator password" button. The "Change password" dialog opens.
2. Enter the old password.
3. Assign a new password.

   Note that the number of characters is limited to a minimum of 8 and a maximum of 32. It is possible to enter a blank administrator password, but not a space as the administrator password.
4. Repeat the new password.
5. If you select "Hide passwords", the password is no longer shown when you log on.

Forgetting the administrator password

If you forget your administrator password, you must restore the factory settings.

Note

Losing the current configuration settings

When restoring to factory settings, the current configuration file is overwritten.

After factory settings are restored, a saved configuration file can be transferred back to the device.

Once the configuration file is restored, the password contained therein will be valid after the device is restarted. Change the password if necessary, and make a note of it.

Closing connections with connection password

You can specify a password for terminating a client-server connection in the Start menu "Configuration > Passwords". If the operator wants to terminate a connection, this connection password must be entered. If the operator enters an incorrect password, the connection will not be terminated.

Note

Misuse

No connection password is assigned in the factory state. Without password protection it is possible for unauthorized persons to terminate client-server connections.

Following initial commissioning and after restoring the factory settings, you should immediately assign a connection password.

Closing Citrix and connection password

When an operator closes a Citrix application program via the user menu or closes the Windows window, Citrix is also terminated without entering the connection password.

The length of the connection password is restricted to a maximum of 30 characters.

Note

If a connection password has been specified, you can alternatively terminate a client-server connection by using the administrator password.

If you select "Allow restart", the menu entry "Restart" will be displayed underneath in the Start menu. The operator can use this entry to restart the device.

Changing the connection password during ongoing operation

Changing the connection password works in the same way as "Changing the administrator password" (see above) , for example from an external PC, while the operator is working on the device. The change of the connection password becomes effective immediately. The operator can then only terminate the current client-server connection with the new connection password.

You can also change the connection password by entering the administrator password instead of the old connection password.

See also

Opening the configuration (Page 71)

System settings (Page 78)

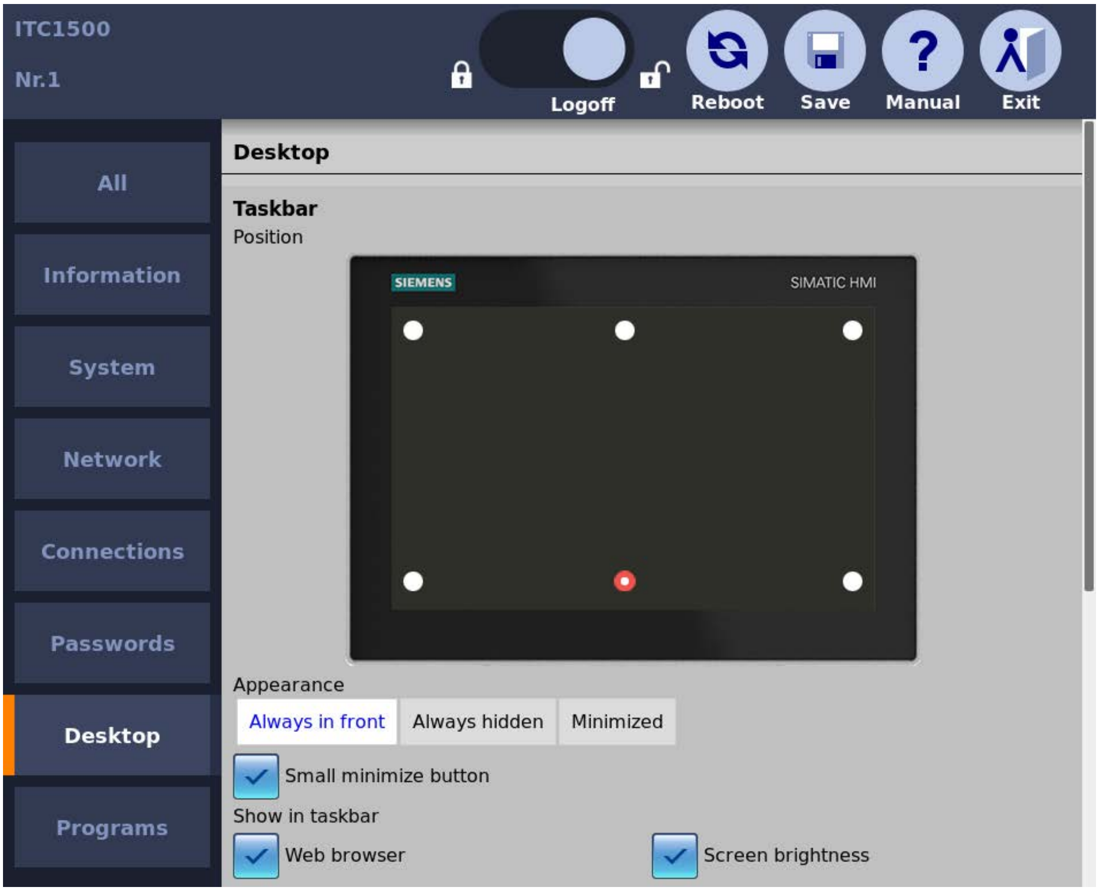
Access and structure (Page 74)

Device data (Page 77)

5.5.3.7 Desktop settings

Introduction

The following figure shows the desktop settings in the Start menu "Configuration > Desktop".



Desktop

Taskbar

Position

Appearance

[✓ Always in front] Always hidden Minimized

☑ Small minimize button

Show in taskbar

☑ Web browser ☑ Screen brightness

You can make the following settings:

- Position of the taskbar
- Display of the taskbar
- Menu entries in the Start menu
- Size and position of the on-screen keyboard
- Background image

Specifying the position of the taskbar

Touch one of the 6 buttons on the displayed touch screen. The configuration settings will be saved and the taskbar will then be moved to the corresponding position. The taskbar cannot be moved with drag&drop. The default position of the taskbar is "Bottom center".

Specifying the display of the taskbar

- "Always in front" (default setting)

  The taskbar is displayed after the device is switched on. The buttons to minimize or maximize the taskbar are not displayed. The operator cannot change the taskbar.
- "Always hidden"

  The taskbar is hidden. The operator cannot display the taskbar and, thus, cannot make any changes to the active client-server connections. Because the configuration settings cannot be opened without the taskbar, this setting can only be disabled again with external access, see section "Remote configuration (Page 102)".
- "Minimized"

  The taskbar is minimized in the display. The operator can maximize or minimize the start bar using the appropriate buttons, which are always shown.

Specify size of "Minimize start bar" button

If the "Minimize small button" option is enabled, the height of the "Minimize" button is reduced by half.

Specifying menu entries in the Start menu

The settings show the menu entries of the Start menu in the taskbar.

- Web browser
- Screen brightness
- Clean screen
- USB devices

If you select a menu entry, it will be displayed. If you deselect a menu entry, it will be hidden and can no longer be called.

Specifying the size and position of the on-screen keyboard

In "Position", you can dock the on-screen keyboard at the top or bottom edge of the screen. In "Size", you select one of 5 predefined keyboard sizes.

Setting up a background image

Under "Background image", specify a graphic file to be displayed as the background image. Use the "Browse" button to select a graphic file on the connected USB drive.

Note

Required properties of background images

- Format: PNG, JPG, JPEG
- File size: max. 5 MB
- Resolution: Maximum 1920 x 1080 for ITC2200
- Colors: Maximum 16777216

Display of the background image

- The background image is always stretched to fit the screen resolution, even when this distorts it and grossly enlarges it.
- Therefore, the background image should have exactly the same width x height as the screen resolution, for example 1280 x 800, or at least the same proportions, for example 640 x 400.

Restoring the factory settings

The background image is restored.

See also

Structure and functions of the taskbar (Page 112)

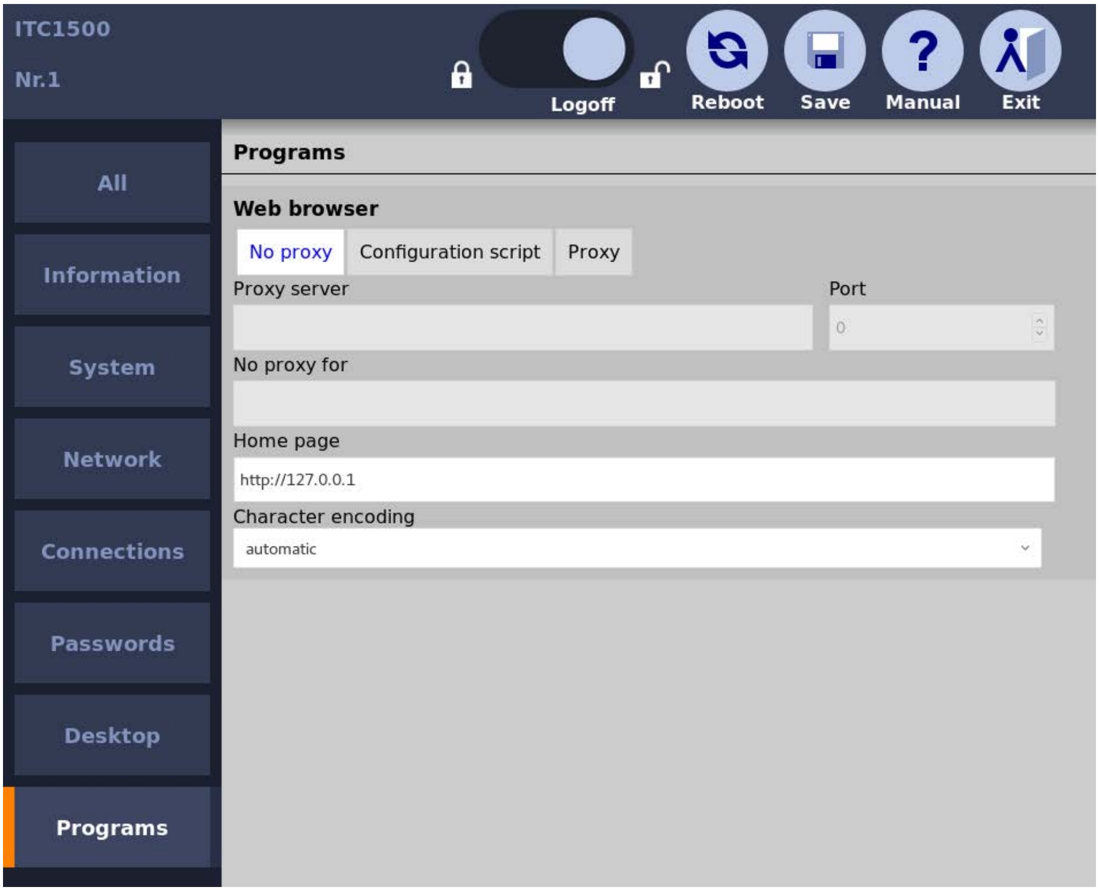
Starting a connection (Page 113)

5.5.3.8 Application settings

Introduction

Additional, configurable application programs (software applications) can run on the Industrial Thin Client. The web browser is currently the only application.

The following figure shows the web browser settings in the Start menu "Configuration > Applications".



Programs

Web browser

Proxy server:

Port: 0

No proxy for:

Home page: http://127.0.0.1

Character encoding: automatic

- If "Proxy" is selected: Enter the address of a central connection node in "Proxy" if your network accesses the Internet from this connection node, e.g., in order to filter web contents or make them available in the cache. In case of doubt contact your system administrator.
- If "Configuration script" is selected: In "Configuration script", specify the address of a script that picks out the appropriate proxy server for each web address. The configuration script contains a JavaScript function with proxy specifications, e.g., for the case that a server does not answer. The configuration script is provided by your network administrator.
- For addresses that you enter in "No proxy for", there is no proxy server request, and a direct connection to the Internet or an intranet will be established instead. Use a comma to separate multiple addresses (see "Proxy bypass").

- If "No proxy" is selected, there is no proxy server request, and a direct connection to the Internet or an intranet will be established instead.
- Under "Port", specify the internal port at which the proxy server can be reached: The default is 8080.
- In "Home page", specify an Internet address that will be called automatically when the web browser starts.
- With "Character encoding", you specify the character set that is used by the web browser if a web page does not provide any information about the character set to be used. The character set "UTF-8" is set by default. You can have the appropriate character set determined "automatically". If characters are represented incorrectly, you can also change to "ISO-8859-1".

Proxy bypass

You can make the following entries in the "No proxy for" field:

Object for which no proxy is to be used	Content of the input field "No proxy for"	Example	Comments
Domain	Suffix of the domain	".siemens.com, siemens.com"	Both suffix variants must be entered in order to exclude an entire domain.
Host name (without domain)	Host name only	"MyWinPC"	Excludes "MyWinPC.
Host name (with domain)	Host name and domain	"MyWinPC.siemens.com"	Excludes "MyWinPC.
IP address	IP address	"192.168.1.0"	Excludes the device with the IP address "192.168.1.0".
Network	IP address range	"192.168.1.0/24"	Closes all devices with an IP address ranging from "192.168.1.0" to "192.168.1.24".

Placeholder characters are not permitted, e.g. "*" or "192.168.*.*".

No entries are set as default.

The "localhost" and "127.0.0.1" objects are always excluded. No proxy is used for these objects.

Adjusting the display in the web browser

You can enlarge or reduce the display in the web browser:

- Use the key combination <CTRL><+> to enlarge the display.
- Use the key combination <CTRL><-> to reduce the display.

Note

Depending on the keyboard you are using, it may be necessary to press the Shift key to access the "+" and "-" keys. In this case, use <Control><Shift><+> to enlarge the display and <Control><Shift><-> to reduce it.

See also

Opening the configuration (Page 71)

5.5.4 Remote configuration

Introduction

Remote configuration enables remote configuration and remote update of a SIMATIC Industrial Thin Client from a PC that is connected to the Industrial Thin Client via a network.

Functions

You can perform the following actions from a central PC for an Industrial Thin Client:

- Edit configuration settings
- Back up and restore the configuration
- Identifying a device
- Change IP addresses
- Update firmware
- Restart devices

Remote access

During remote access, you perform the corresponding configuration functions directly on the Industrial Thin Client, i.e. the user interface corresponds to the user interface on the Industrial Thin Client itself.

The remote access to the Industrial Thin Client is made via an encrypted connection in HTML5 format, which means access must be made with a Web browser that supports HTML5 and encrypted connections (https).

Requirement

- The Industrial Thin Client and the PC for remote access are located in the same subnet.
- The "Remote configuration" option is activated in the system settings of the Industrial Thin Client (Page 78).
- A Web browser that supports HTML5 and encrypted connections is installed on the PC.

Procedure

1. Open the Web browser.
2. Enter the IP address or device name of the Industrial Thin Client that you want to configure in the address line of the Web browser.

If a message appears regarding the certificate for the encrypted connection, confirm the message.

5.6 Configuring the server

5.6.1 RDP

5.6.1.1 RDP overview

Introduction

RDP, "Remote Desktop Protocol", is a protocol that the Industrial Thin Client uses to access a server with a Windows operating system, e.g. Windows Server. The Industrial Thin Client can access all programs running on the server, if the programs have been enabled for remote access. The following statements also apply accordingly to Windows 7.

Licensing the Windows Server

You do not require any licenses on your device to access the server. You require the following server licenses:

- One Windows Server license per server
- One Windows Server Client Access License (CAL) per user
- Additionally, one Terminal Server Client Access License (TS User CAL) per user that can be used independent of the device

Note

TS Device CAL cannot be used

In the case of the "TS Device CAL" license, which can be used on a certain device independently of the user, the device is logged onto the license server using the last four digits of the MAC address. When you replace the device, the license is blocked by the license server and released again after about 3 months.

User CAL and Device CAL licenses are supported for all approved Windows operating systems.

Detailed information on licenses and applicable conditions of use are available on the Internet under "Windows Server 2003 Terminal Server Licensing (http://www.microsoft.com/windowsserver2003/techinfo/overview/termservlic.mspx)".

Licensing Windows 7

You do not require any licenses on your device under Windows 7 to access the server. Only one license on the PC for your operating system, e.g. Windows 7.

You do not require any additional licenses on the server for Remote Desktop.

See also

System requirements (Page 65)

5.6.1.2 Administration on the server

Administration Windows Server

The administration on the server depends on the individual IT infrastructure. Establish the settings for the server configuration under the following menu commands under "Start > Programs > Administrative Tools:"

- Terminal services configuration
- Terminal services administration
- Terminal services licensing

You will find more information on the Internet in the "MSDN Knowledge Base" of the "Microsoft support (http://support.microsoft.com)".

You can specify on the server that certain users of the Industrial Thin Client can only access specified programs on the server.

When the device is configured, you assign a password for the connection to the server. If the device establishes a connection to the server, a password will be requested by default irrespective of this. Under "Start > Programs > Administrative Tools > Terminal Service Configuration" you can specify that the password is not requested again.

Administration Windows 7

In order for the Industrial Thin Client to access the server, you must enable remote access on the server. You can enable remote access under "Start > Settings > Control Panel > System > Remote" with the option "Allow users to establish a remote desktop connection." Use the "Select remote users" button to open a dialog in which you select the users that are authorized to access the server.

In addition, you enable the server ports that have been set for remote access in the firewall.

Keyboard language

An English and German on-screen keyboard is available on the device. Depending on the delivery version of the device, additional languages may be available, for example, Hungarian or Spanish. Set the keyboard language on the device so that it matches the keyboard language on the server. If the keyboard languages on the device and the server are different, the keys pressed on the device keyboard will not be interpreted correctly on the server.

Configuring double-click

If it is too difficult to double-click the touch screen with your finger or the touch stylus, then make the setting in Windows Explorer on the server that files and folders should open with a single click under "Tools > Folder options > General > Click items as follows".

You have the option to establish a greater range in which two clicks can be detected as a double-click under [HKEY_CURRENT_USER\Control Panel\Mouse] in the Windows registry of the server. Under "DoubleClickHeight" and "DoubleClickWidth" enter 10 pixels, for example.

Windows 10

If you connect via RDP to a Windows 10 PC on which another user is already logged on, the user must confirm your access to the PC. Alternatively, you can wait 30 seconds to get access automatically. However, the connection is then often interrupted with the misleading error message "Session was disconnected because of unknown error".

5.6.2 Citrix:

5.6.2.1 Citrix overview

Introduction

The Citrix Receiver software provides business applications centrally for any terminal devices at all business locations as on-demand service. This may take place in form of hosted applications that are executed on a server in the company data processing center. Rollouts of new applications, updates and patches are thus available immediately to all users.

Citrix server licensing

To access the Citrix server, you do not require any licenses on your device. Depending on your specific requirements, you need a Citrix XenApp or XenDesktop server.

See also

System requirements (Page 65)

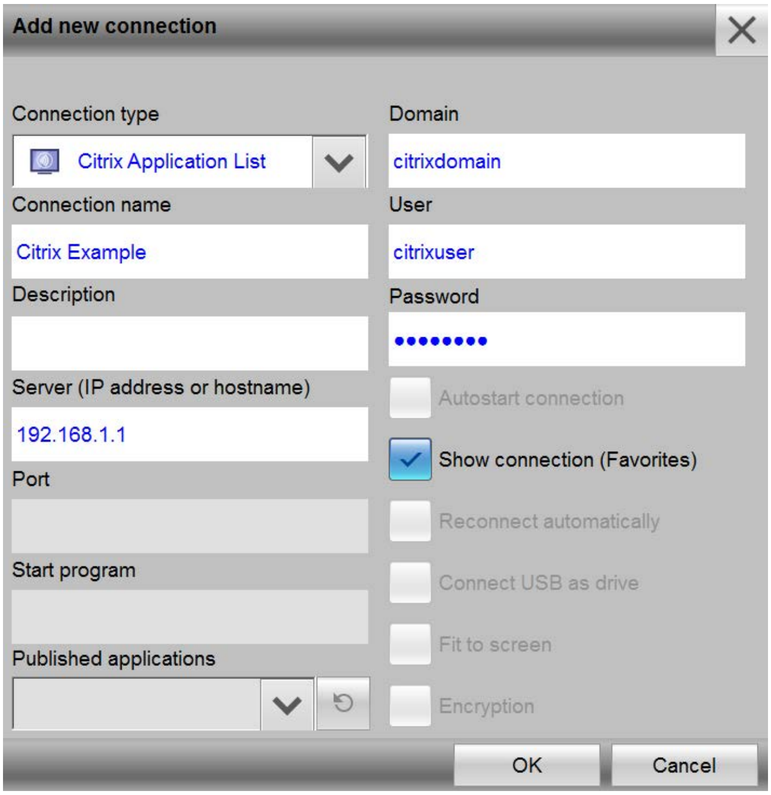
5.6.2.2 Connecting to a Citrix application or a desktop

Connections to a specific application or a desktop can be configured with the help of the Remote Configuration Center on a PC or via the local configuration settings on the Industrial Thin Client.

To access a Citrix application or a desktop, you have the following two options:

- Connection type "Citrix Application List":

  You specify all parameters of the Citrix connection with the exception of the application that is to be opened. When the connection is started, the user can select which application is opened.



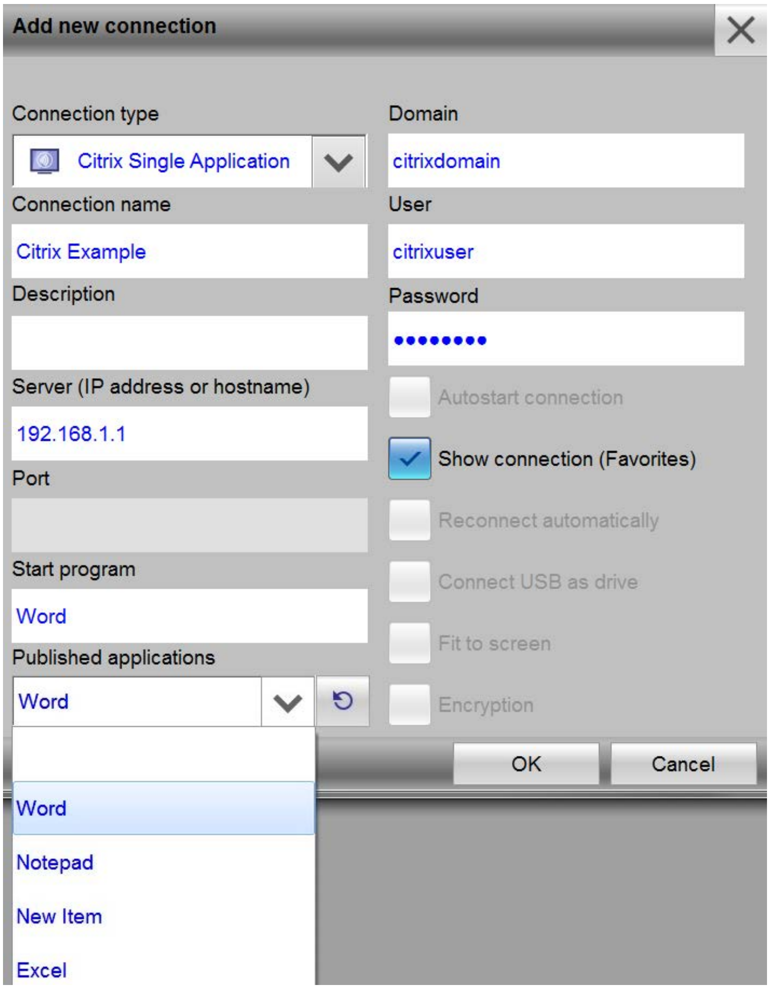
Add new connection

Connection type: Citrix Application List
Connection name: Citrix Example
Description:
Server (IP address or hostname): 192.168.1.1
Port:
Start program:
Published applications:
Domain: citrixdomain
User: citrixuser
Password: ●●●●●●●●

□ Autostart connection
☑ Show connection (Favorites)
□ Reconnect automatically
□ Connect USB as drive
□ Fit to screen
□ Encryption

- Connection type "Citrix Application":

  You specify all parameters of the Citrix connection including the application that is to be opened when the connection is started.



Add new connection

Connection type: Citrix Single Application

Connection name: Citrix Example

Description:

Server (IP address or hostname): 192.168.1.1

Port:

Start program: Word

Published applications: Word

Word
Notepad
New Item
Excel

Domain: citrixdomain

User: citrixuser

Password: ••••••••

□ Autostart connection

☑ Show connection (Favorites)

□ Reconnect automatically

□ Connect USB as drive

□ Fit to screen

□ Encryption

In order for applications to be shown in the start bar, they have to be configured as favorites on the server.

Depending on the server configuration, you can also access these applications or desktops via the Web browser.

5.6.2.3 Restrictions

The following restrictions apply to the Citrix client of the HMI device:

- Automatic scaling is not supported.
- Access to USB storage media is not supported.
- Read/write access to the local file system is not supported.

- Only one connection can be active at any given time. A message is displayed if you try to open a Citrix connection while a Citrix connection is already in place. The user is informed that the existing connection must be closed before the new connection can be established.
- The following functions are not available during the configuration of Citrix connections:
  - "Autostart connection"
  - "Reconnect automatically"
- The Citrix client supports the following certificates:

Certificate	Issuer
Class4PCA_G2_v2.pem	VeriSign Trust Network
Class3PCA_G2_v2.pem	VeriSign Trust Network
BTCTRoot.pem	Baltimore Cyber Trust Root
GTECTGlobalRoot.pem	GTE Cyber Trust Global Root
Pcs3ss_v4.pem	Class 3 Public Primary Certification Authority
GeoTrust_Global_CA.pem	GeoTrust

5.6.3 VNC

Introduction

Use VNC for remote control of another computer via a network. VNC is the abbreviation for "Virtual Network Computing" and shows the desktop of another computer. In contrast to RDP, all clients display the same server screen.

Requirement

The operating system you use does not play a role because the software is available for all current platforms. The connection via the network uses the TCP/IP protocol and should be configured with a password for security reasons.

Layout

VNC works according to the client-server model. The program consists of the server module VNC server and the client component VNC Viewer. The server program runs on the computer whose screen outputs you want to monitor, whereas the clients receive the screen outputs and in turn send keyboard and mouse inputs to the server.

See also

System requirements (Page 65)

5.6.4 Sm@rtServer

Introduction

With the SIMATIC WinCC Sm@rtServer option, HMI devices communicate with each other via PROFINET. Sm@rtServer thus enables client/server configurations for distributed operator stations in a system.

A description of the Sm@rtServer configuration can be found in the online help of WinCC or in the "WinCC Professional Options" manual.

Requirement

A server HMI device on which the Sm@rtServer has been started is required for client/server operation via Sm@rtServer.

Operating principle

If the Sm@rtServer has been started on a server HMI device, the Industrial Thin Client can access the server HMI device via the "Sm@rtServer" connection type. Depending on the configuration of the Sm@rtServer on the server HMI device, the Industrial Thin Client can monitor or operate the project on the server HMI device.

Licensing

You do not require any licenses in order to access an HMI device. The SIMATIC WinCC Sm@rtServer option is license-free as of WinCC V14 (TIA Portal). There can only be a project compiled with the Sm@rtServer option on the server HMI device you are accessing with the Industrial Thin Client.

See also

System requirements (Page 65)

5.6.5 WinCC OA

Introduction

SIMATIC WinCC OA (Open Architecture) is a SCADA system for visualizing and operating processes, production work-flows, machines and plants in all industries. As of WinCC OA V3.16, ITC V3 devices are supported.

You can find the description of WinCC OA configuration in the online help of WinCC OA under "Special Functions > Industrial Thin Client". You can find additional information on the Internet at SIMATIC WinCC Open Architecture (http://w3.siemens.com/mcms/human-machine-interface/en/visualization-software/simatic-wincc-open-architecture/wincc-oa-basic-sw/Pages/default.aspx).

Requirement

A SIMATIC WinCC OA server that supports Industrial Thin Clients is a requirement for operating a SIMATIC WinCC OA connection.

Operating principle

The Industrial Thin Client operates similarly to a SIMATIC WinCC OA WebClient.

The WinCC OA server provides the client components to the Industrial Thin Client.

Licensing

You do not require any licenses on the Industrial Thin Client in order to access WinCC OA. The license is covered by the user interface license on the WinCC OA server. More on this in the online help of WinCC OA.

See also

System requirements (Page 65)

5.7 Operating ITC

5.7.1 Notes on Sm@rtServer access

Monitoring mode

If you access a device on which only monitoring mode has been configured for Sm@rtServer access, you can only monitor the device; you cannot intervene for control purposes.

Operating right for Sm@rtServer

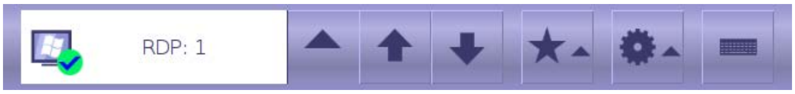
When you access a device, it is possible that this device is being used at the time. In this case, the Industrial Thin Client does not have operating rights.

If you touch the touch screen, a message is displayed stating that no operator input is possible. How you request or force operating rights depends on the configuration on the device you are accessing with the Industrial Thin Client.

5.7.2 Operating the taskbar

5.7.2.1 Structure and functions of the taskbar

If the taskbar is configured accordingly in the desktop settings, the taskbar will be displayed after the device is switched on. See also section "Desktop settings (Page 97)".



The operator cannot change the position of the taskbar on the touch screen, but the administrator can do so in the desktop settings.

Functions

The following functions can be called from the taskbar.

⚙▲ Start menu

- Web browser: opens the integrated Web browser, which displays the device information as the homepage by default, see also section "Device data (Page 77)". The web browser supports HTML, XML, CSS, JavaScript and Java so that you can establish any type of connection to the Intranet/Internet.
- Screen brightness: adjusts the screen brightness of the background lighting. Two buttons "+" and "-" are displayed on the right for this purpose.
- Clean screen: You use this function to disable the touch screen for input for a period of 15 seconds, for example, if the screen is being cleaned, see section "Cleaning the device (Page 159)".
- USB devices: see section "Use USB memory devices (Page 118)".
- Restart: reboots the device.

  When the "Restart" menu command is hidden, select "Permit restart", see section "Password settings (Page 94)".
- Configuration: central configuration settings of the device.

Connection list, shows the client-server connection that is currently displayed

If you touch the ▲ icon, a list of started client-server connections is displayed. Use the "Favorites" icon to start a client-server connection. The icons have the following meaning:

- Green check mark: Client-server connection is running.
- Red X: Client-server is interrupted, see section "Interrupting and restoring a connection (Page 70)".

> **Note**
>
> **Maximum number of connections**
>
> A maximum of 5 client-server connections can be started at the same time.
>
> When an attempt is made to start a sixth connection, an error message appears and a selection of started connections is displayed from which a connection can be closed.

You close a connection using the "X" on the right.

⬇ Go to the preceding started client-server connection

⬆ Go to the next started client-server connection

★ Favorites

List of client-server connections selected for the taskbar. If you select a client-server connection from the list, the corresponding connection will be established.

⌨ On-screen keyboard

Displays the on-screen keyboard. Use the on-screen keyboard to enter alphanumeric values, special characters and function key commands. The on-screen keyboard is automatically displayed if you edit a field. If you touch the icon again, the on-screen keyboard is hidden.

Showing a minimized taskbar

If the "Minimized" option is selected in the "Taskbar" area in desktop settings "Configuration > Desktop", the taskbar is only displayed again when you touch the button with the "Maximize" arrow on the edge of the screen.

Taskbar is hidden

If the "Always hidden" option is selected in the "Taskbar" area in the desktop settings, the taskbar will always be hidden and cannot be displayed.

Note

If the administrator saves changes of configuration settings, the display and position of the taskbar may be changed.

5.7.2.2 Starting a connection

Overview

You can connect to a server From the Industrial Thin Client according to the configured connection settings. The following connection types are supported:

- RDP
- Sm@rtServer/VNC
- WinCC OA
- Web: In addition to the web connection settings, web settings are required for the browser that displays the web connection.

Note

Limited number of browser instances

A maximum of 5 browser instances can be started at the same time. When you open a sixth browser instance, an error message appears.

You can open the Web browser separately to establish a connection of any kind to the Internet regardless of the maximum number of browser instances and client-server connections.

Note

Limited number of client-server connections

A maximum of 5 client-server connections can be started at the same time. If a 6th connection is activated, an error message appears

Procedure for client-server connection

Proceed as follows to establish a client-server connection:

1. Touch the ★ "Favorites" icon in the taskbar.
2. Select a client-server connection.

The configured connection to the server or system network will be started.

Procedure for web browser

Proceed as follows to establish a connection to the Internet or an intranet:

1. Select the "Web browser" menu command in the taskbar of the ⚙ Start menu. The web browser will open.

   The IP address of the device is stored as the home page. The home page displays important device data and network settings.

2. Specify a valid Internet address in the address line of the web browser.

See also

Desktop settings (Page 97)

5.7.2.3 Changing from one connection to another

You can easily change between the started client-server connections.

- RDP: 1 Connection list: Select a different client-server connection using the ▲ icon.
- ⬇ Go to the preceding started client-server connection.
- ⬆ Go to the next started client-server connection.

5.7.2.4 Terminating a connection

Introduction

You can terminate a client-server connection as follows:

- Via the menu command "Close".
- For additional options, refer to the section "Special features".

Procedure

Proceed as follows to terminate an active client-server connection:

1. Touch the "Connection list" icon in the taskbar. A list of all started client-server connections opens.
2. Choose the "Close" menu command next to the connection.
3. If required, enter the connection password, see section "Password settings (Page 94)".

Note

Misuse

RDP can be set on the server so that the user stored in the connection settings remains logged in even after an RDP connection has been terminated.

Make sure that only authorized persons have access to the device or log off (see Special features).

Administrator password

You can also enter the administrator password instead of the connection password.

Special features

RDP

Note

Terminate the RDP connection alternatively by using "Start" > "Disconnect". The "RDP session has been terminated by peer!" dialog box will be displayed on the device; acknowledge it with "OK". The connection password is not requested.

You log off from the RDP server with "Start" > "Logoff".

See also

Starting a connection (Page 113)

5.7.3 Operating the on-screen keyboard

On-screen keyboard

If you have not connected an external keyboard to the device, use the on-screen keyboard for inputs, e.g., in the configuration settings.

The on-screen keyboard is opened automatically provided:

- You activate an entry field in the configuration dialogs of the Thin Client.
- You use the Sm@rtServer connection type and activate an entry field on the server.

Note

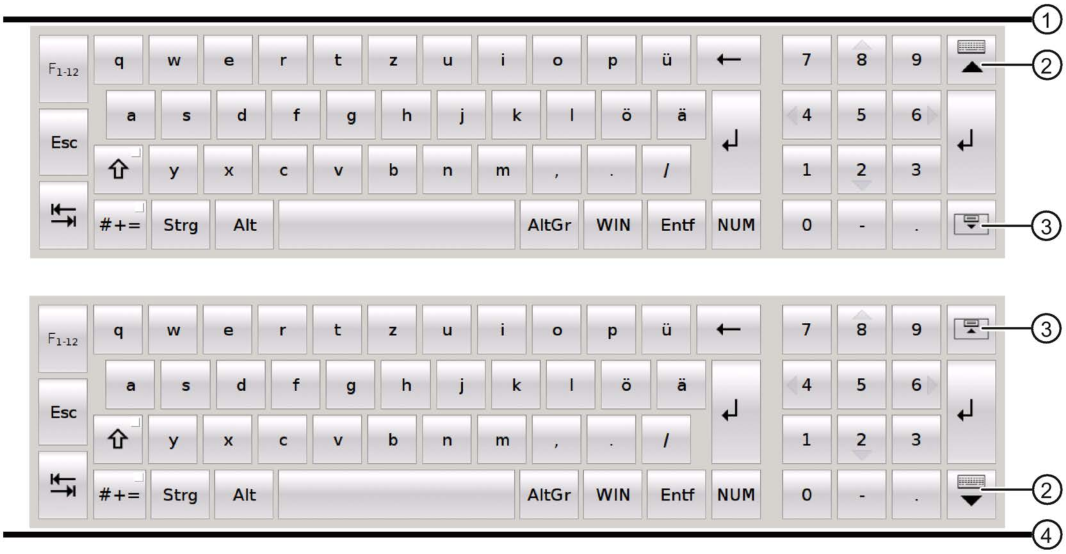
On-screen keyboard

An English and German on-screen keyboard is available on the device. Depending on the delivery version of the device, additional languages may be available, for example, Hungarian or Spanish. The keyboard language can be changed in the menu "Configuration > System". The following applies to the user interface:

- With German keyboard layout: German user interface
- With English keyboard layout: English user interface
- For all other keyboard layouts: English user interface

Operating the on-screen keyboard

You operate the on-screen keyboard by directly touching the keys of the keyboard on the touch screen. The functions of the keys on the on-screen keyboard are basically the same as those on an external keyboard.



You position the screen keyboard as follows:

- In the desktop settings, you can position the on-screen keyboard at the top ① or bottom ④ edge of the screen.
- Depending on the position at the screen edge, the buttons ② and ③ on the right change:
- The button ② closes the on-screen keyboard.
- The button ③ moves the on-screen keyboard to the other edge of the screen (top or bottom).

Windows key

The "Win" key corresponds to the Windows key on a mechanical keyboard. You use this key to open the Windows Start menu.

Number pad

The on-screen keyboard has a separate number pad that you open with the "NUM" key. If you have connected an external keyboard, you cannot make any entries via the number pad of the external keyboard.

Latch function

If you keep the buttons <Ctrl>, <Alt>, <AltGr> and <WIN> pressed for some time, they are permanently enabled as though they are being pressed even after you have released them.

5.7.4 Use USB memory devices

Introduction

Use the USB port on the back of the device to access connected USB storage devices.

RDP

In the case of an RDP connection you have read and write access to one or several USB storage devices.

With active RDP connection the USB storage devices are exported to the RDP server. A folder with the name "media on <Client hostname>" is created in Windows Explorer, in which a separate subfolder is displayed for each USB storage device. If you change the host name in the configuration settings of the device, the name of the folder is adapted automatically on the RDP server.

Requirement

- The "Connect USB device as drive" option is selected in the connection settings in "Settings > Configuration > Connections".

Procedure

1. Insert the USB memory device in the USB port on the device.
2. Choose "Settings > USB devices" in the taskbar. A media explorer opens.
3. Touch the "View details" icon in the menu bar.
4. Open the desired folder in the tree menu on the left. Its content is displayed in the window on the right.
5. You can cut, copy, paste, and delete files via the menu bar.
6. You use the navigation buttons to navigate back, up, and to the root directory of the USB drive.

Removing a USB memory device

To remove the USB memory device, proceed as follows:

1. Make sure the device is no longer being accessed.
2. Close the accessing application.
3. Close the media explorer via the connection list in the taskbar.
4. Wait for 5 to 10 seconds.
5. Remove the USB memory device from the USB port of the device.

See also

Connecting a USB device (Page 55)

SINUMERIK operating mode 6

6.1 SINUMERIK commissioning

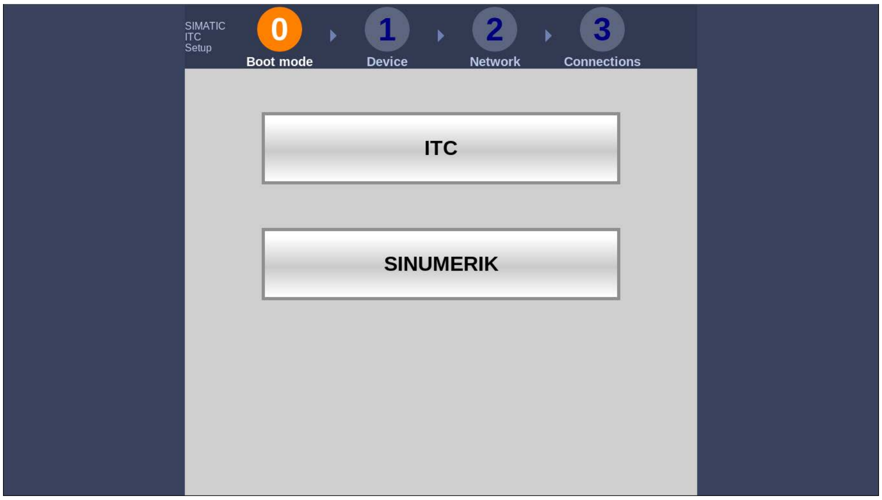
Requirement

The devices is connected according to the description in these operating instructions to the 24V DC power supply and equipotential bonding is connected.

Procedure

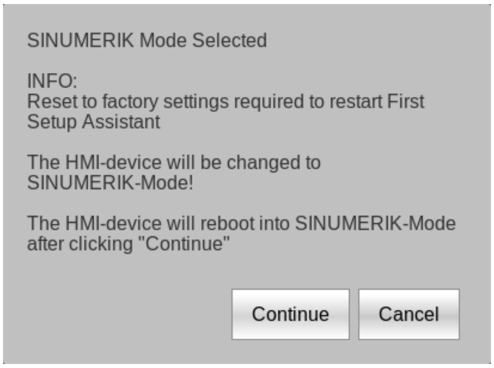
1. Switch on power to the Industrial Thin Client.

   The first commissioning dialog to select the operating mode is displayed.



2. Select the operating mode "SINUMERIK".

   The following dialog appears:



SINUMERIK Mode Selected

INFO:
Reset to factory settings required to restart First Setup Assistant

The HMI-device will be changed to SINUMERIK-Mode!

The HMI-device will reboot into SINUMERIK-Mode after clicking "Continue"

3. Confirm the dialog with the "Continue“ button.

   The device restarts.

After successful first commissioning, the SINUMERIK server screen is displayed.

Result

The first commissioning has been completed and the operating mode SINUMERIK has been defined. In the future, the device starts in SINUMERIK operating mode and the first commissioning dialogs are no longer displayed.

The further description of the SINUMERIK operating mode can be found in the following section.

To re-commission, you must reset the device to factory settings or update the firmware.

Restoring factory settings in SINUMERIK operating mode

1. Switch off power to the device.
2. Press and hold the button "Factory settings" on the device with a sharp object and turn the device power back on. The device restarts.

   The "Default settings" button is next to the interface X1 P1 PROFINET (LAN).
3. Press and hold the "Factory settings" button on the device with a pointed object during a reboot until first commissioning is completed and a message is briefly displayed.

Updating firmware in SINUMERIK operating mode

1. Switch off power to the device.
2. Press and hold the button "Factory settings" on the device with a sharp object and turn the device power back on. The device restarts.

   The "Default settings" button is next to the interface X1 P1 PROFINET (LAN).
3. Press and hold the "Factory settings" button on the device with a pointed object during a reboot until first commissioning is completed and a message is briefly displayed.
4. Select ITC operating mode and follow the instructions of the Setup wizard.
5. Connect a USB drive using an update file ".upd" with the device USB interface. The firmware version of the update file must be more recent than the firmware version on the device.
6. Choose "Settings > System" in the taskbar.
7. In the "Device configuration" area, use the "Update" button to select the update file "*.upd".

   The device restarts and the first commissioning dialog is displayed.
8. Select the operating mode "SINUMERIK“ in the first commissioning dialog.

6.2 Networking

6.2.1 System settings

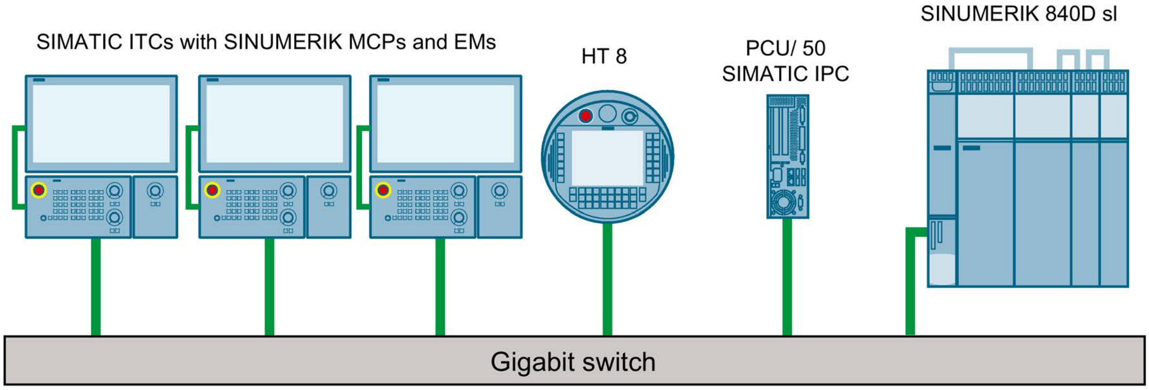
6.2.1.1 Industrial Thin Client (ITC)

ITC overview

The Industrial Thin Client (ITC) for the distributed configurations permits spatial separation of the ITC and SINUMERIK PCU/ IPC or NCU. On the SINUMERIK solution line, the ITC is used to visualize the user interface of the PCU 50, SIMATIC IPC for SINUMERIK, or NCU.

It is possible to connect one ITC to several PCUs/ IPCs/ NCUs. All ITCs and PCUs/IPCs/NCUs that are connected to each other via a Gigabit switch form the "system network". The user interface of a PCU/ IPC/ NCU is copied to several ITCs. This means that all ITCs display the same screen. Operator actions can only be performed on one ITC at a time. This ITC then has user authorization. The PCU/ IPC can also have its own ITC connected directly to it.

The following diagram shows a **configuration example** for a distributed topology:



The mobile SINUMERIK HT 8 handheld terminal works on the thin client principle and combines the functions of an operator panel with a machine control panel.

The configuration and cabling of the whole system based on a permissible configuration is described in Section "Network configurations (Page 133)".

Supplementary conditions

The following supplementary conditions apply for the operation of a ITC:

- In the system network, the number of **active** thin clients is limited:
  - Maximum 2 thin clients: NCU 710.3 PN
  - Maximum 4 thin clients: NCU 720.3 PN or NCU 730.3 PN
  - Maximum 4 thin clients: PCU/ IPC

  Any number of ITCs can be operated in the system network.
- CompactFlash cards cannot be used on the ITC.
- A 16 bit or 32 bit depth of color setting may be selected.
- If a PC keyboard is connected to the ITC, it is not possible to ensure that all special keys, e.g., multi-media keys, will be transferred to the software of the NCU / PCU / IPC.
- Machine control panels connected via a PROFIBUS network are not supported for switchover.
- Distributed memory media can be connected to the ITC via USB.
- The ITCs must be networked on the basis of the Gigabit standard, e.g. Gigabit switch or Ethernet cable according to CAT 6 or higher.

6.2.1.2 Settings for SINUMERIK solution line

Fundamentals

The system network for SINUMERIK solution line is structured as a star topology with a central Ethernet switch, to which all Ethernet-based components of the system are connected.

For an NCU, the connection is via the X120 Ethernet socket, for an IPC/PCU, it is via the "Ethernet 2" or "X2" or "X2 P1" connection. There is no default for all other components with two Ethernet connections. These components have an internal 2-port switch and may be used to connect an additional operator component. Thus, in this case, there can be deviations from the strict star topology.

System network

In the system network, the IP address 192.168.214.xxx with subnet mask 255.255.255.0 is pre-selected. Here there is precisely one DHCP server with DNS that can run on one NCU or one PCU. The server ensures assignment of IP addresses to the Ethernet components in the system network (DHCP clients) from a specified address band.

The following rules apply for assignment of IP addresses in the system network:

- For all NCUs, IPCs, and PCUs, the commissioning engineer assigns static IP addresses in the associated address ranges, as well as meaningful computer names (host names). All other operator components are automatically assigned an IP address by the DHCP server. Its name is generated automatically (for MCP, MPP, HT 8), or is entered during commissioning (ITC).
- If there are multiple NCUs, IPCs and/or PCUs in the system network, depending on the start-up sequence the system automatically specifies the DHCP server and automatically ensures synchronization of all necessary data so that the next time the system boots any other NCU, IPC, or PCU could take on the role of DHCP server. However it is better to specify a DHCP master. This is an NCU, IPC, or PCU in the system network that is available on each system boot and which regularly takes over the task of the DHCP server and DNS server.

  Synchronization of data takes place in any event so that any other NCU, IPC, or PCU can take over this task, unless you deactivate this option in the DHCP configuration. All non-master NCUs/ IPCs/ PCUs wait while the system boots for a preset time for the availability of the master.

  Note

  In a system network or on a boot server, i.e. on the NCU, IPC, or PCU that accommodates the active DHCP server, a maximum of 30 operator panels may be operated simultaneously with the ITC.

  A maximum of 10 operator panels with an ITC may connect up simultaneously with the same HMI application when powering up.

Connection to a company network

Each NCU can be connected via X130, and each PCU/ IPC can be connected via "Ethernet 1" to a company network. The company network is used to exchange operating software with servers or to execute part-programs directly from servers in the company network. Company network and system network should always be logically and also physically separated.

Service interface X127

The service interface X127 of the NCU is used for direct connection of a PG/PC for service purposes. Here, access with STEP 7 to the PLC, and with NCU 7x0.3 PN also to PROFINET is possible.

With direct connection (peer-to-peer) of a PG/PC to X127 it is absolutely necessary that the PG is operated as a DHCP client.

6.2.1.3 System boot with system network

System behavior at boot

The system boot behavior is based on the following principle:

- For configuration of an NCU 7x0 with a PU 50, the default for a network configuration is as follows: The NCU keeps the default IP address 192.168.214.1 on X120, the PCU 50/IPC keeps the default IP address 192.168.214.241 on Eth2.
- For a configuration of more than one NCU 7x0 without PCU/IPC, with one or several PCUs/IPCs, a distinction must be made between two cases:
  - All address conflicts and DHCP conflicts are resolved automatically when booting and the system is ready for operation. In this configuration there is **no** guarantee that all NCUs and PCUs/IPCs will always receive the same IP address at each system boot.
  - If the user requires all NCUs, and possibly also the PCU/IPC, to have a defined constant IP address at each boot, for example, because the IP address is stated explicitly in the PLC program, the user must configure a static IP address in the adapter settings in the Windows Control Panel for each affected NCU 7x0/PCU 50/IPC.
- You can specify a DHCP master in the basesys.ini file.
- Assigning names:
  - Assign meaningful names for all NCUs in the basesys.ini file otherwise the names will be generated automatically.
  - A PCU 50/IPC always has a computer name that you can change when required.
- The IP addresses of the ITC, TCU, MCP/ MPP, EKS, HT2, and HT8 are freely assigned within the specified address range on each boot. MCP/ MPP, HT2, and HT8 are identified in the PLC via their DIP switch setting.

Using DNS name service

Availability of the DNS (Domain Name System) name service offers the following advantages for system network administration:

- The name service enables easier configuration with names instead of IP addresses for management of operating units: All components in the system network can be addressed via a symbolic computer name. This name can to some extent be freely assigned, to some extent it is derived automatically from a DIP switch setting (MCP, MPP, EKS, HT 8, HT 2).
- A computer node in the system network (NCU, PCU/IPC, ITC, MCP, HT 8, etc.) can be addressed solely through assignment of the IP address, either via a freely selectable name or via an internally generated name in the system network, and thus becomes independent from its network address in the system network. Thus a change in the network address does not necessarily necessitate a series of additional setting changes.
- In addition, the name service is used by the system for address resolution for MCP/MPP, direct keys, and EKS when changing the user authorization.

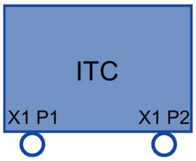
6.2.1.4 Factory default settings

Meaning of the symbols:

○	Eth 1 as a DHCP client
●	Eth 2 as a DHCP server
■	Eth 2 with a fixed IP address

Preconfiguration of the ITC

The ITC is configured as a DHCP client and primarily accepts IP addresses from SINUMERIK components, from the DHCP server of such components that are inherent to SINUMERIK, for example, an NCU at X120 or a PCU/IPC on the system network or from a default DHCP server. The behavior of the ITC cannot be changed here.



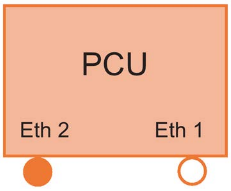
An ITC is a SINUMERIK DHCP client.

The ITC has two network connections.

An ITC executes a boot via the network. The boot server is the computer node from which the ITC also obtains its IP address.

Preconfiguration of the PCU

A PCU has two Ethernet interfaces with default settings for use with SINUMERIK solution line:

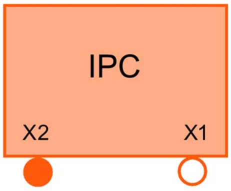


Eth 1 is pre-selected as a default DHCP client for connection to a company network.

Eth 2 is pre-selected as a SINUMERIK DHCP server for connection to a system network. On Eth 2 the fixed IP address 192.168.214.241 is pre-selected.

Preconfiguration of the IPC

An IPC has two Ethernet interfaces with default settings for use with SINUMERIK solution line:



X1 is preset as a default DHCP client for connection to a company network.

X2 is preset as a SINUMERIK DHCP server for connection to a system network. The static IP address 192.168.214.241 is preset on X2.

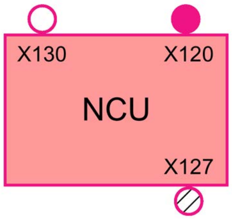
Preconfiguration of the NCU

On the X120, the NCU is preconfigured for the SINUMERIK DHCP protocol. The NCU is preselected here as a SINUMERIK DHCP server. On X120, the NCU occupies the fixed IP address 192.168.214.1 with the subnet mask 255.255.255.0 in its capacity as a DHCP server. The DHCP server of the NCU assigns IP addresses from the range 192.168.214.10 – 192.168.214.239 to the DHCP clients.

It is also possible to make the NCU a DHCP client. The configured IP address in basesys.ini is a "requested" IP address, which is rejected in the case of an address conflict and also denied and replaced by a dynamic IP from the address range.

In large system networks, it makes sense to set an NCU/ PCU/ IPC as the DHCP master. If an additional 2-3 hosts are used (NCU/ PCU/ IPC), the user sets DHCP priority to "ON_HIGH". For the other hosts, the user sets DHCP priority to "ON_CLIENT_SYNC" or "ON_CLIENT_NO_SYNC".

Restricting the available address band that is managed by the DHCP server of the NCU frees up IP addresses 192.168.214.2 to 192.168.214.9 as well as addresses 192.168.214.241 to 192.168.214.254 for network nodes with fixed IP addresses.



The NCU has three Ethernet connections:

- X120 to connect to the system network with an active DHCP server (Eth 0)
- X130 to connect to the company network as a default DHCP client (Eth 1)
- X127 as a service connection with an active DHCP server (Ibn 0)

On X130, the NCU is set as a default DHCP client for the address reference from a company network. The IP address received here is specified by the DHCP server from the company network.

On X127, an NCU is a standard DHCP server in contrast to the SINUMERIK DHCP server. On X127, the NCU has the fixed IP address 192.168.215.1 with the subnet mask 255.255.255.224 as Service input. The IP addresses 192.168.215.2 – 192.168.215.23 are dynamically assigned to the DHCP clients. The range 192.168.215.24 - 192.168.215.30 is reserved, and can be used by stations on the network with a fixed IP address, e.g. by a modem.

Reserved IP addresses for NCU and PCU/IPC

The following defaults apply on delivery:

- Connection to the system network with subnet mask 255.255.255.0:

IP address	Network station	Remark
192.168.214.1	NCU on X120	Default
192.168.214.2 – 9	For additional NCUs with a fixed IP address on the system network	Not assigned
192.168.214.10 – 239	For additional ITCs, later for additional PCUs, IPCs, NCUs, MCPs and MPPs	DHCP clients
192.168.214.240	Reserved for EKS (Electronic Key System)	Default
192.168.214.241	Fixed IP address of PCU/IPC on Eth 2	Default
192.168.214.242 – 249	For additional PCUs/IPCs with a fixed IP address	Not assigned
192.168.214.250 – 254	For PGs with a fixed IP address (Service connection)	Not assigned

- Service connection with subnet mask 255.255.255.224:

IP address	Network station	Remark
192.168.215.1	NCU on X127	Default
192.168.215.2 – 23	For service purposes with PG, PC	DHCP clients
192.168.215.24 – 30	Fixed IP address, e.g. for a modem	Not assigned

6.2.2 ITC commissioning

6.2.2.1 Key assignment

Key assignment

Functions of the keys and softkeys in the "Operator panel service system":

Softkey	Key on OP	External keyboard	Description
↓	HSK1	<F1>	Moves the cursor down a row
↑	HSK2	<F2>	Moves the cursor up a row
Page↓	HSK3	<F3>	Moves the cursor down a page
Page↑	HSK4	<F4>	Moves the cursor up a page
Char↓	HSK5	<F5>	Inserts text or digits
Char↑	HSK6	<F6>	Inserts text or digits
Cancel	VSK7	←	Cancel / Return
Ok	VSK8	→	OK / Confirm
---	NEXT WINDOW	Pos1	Moves the cursor to the top row
---	END	End	Moves the cursor to the bottom row

Exceptions to the above are mainly the result of input fields. Where these are present, the left/right cursor keys move the input cursor rather than performing an OK/cancel function. The Return key takes you to the next field (like the "down" key) rather than closing the entire dialog with OK. There are also Backspace (deletes character to the left) and Delete (deletes character to the right) keys for editing text and numbers. The F5, F6, Backspace, Delete, and Select keys (between the cursor keys) can be used to switch between Yes/No fields.

Note

Special function for Touch Panels without additional keys

Letters and numbers in input fields can be edited with HSK5/HSK6, which switch one character forward or backward. With a touch screen, you can activate all the softkeys and even select rows in a menu simply by touching them.

A virtual keyboard automatically appears for operator panels without keys.

6.2.2.2 Settings in the "TCU.ini" file

Directories

The tcu.ini file is created in the following directories:

NCU:

```
../siemens/system/etc/tcu.ini
```

```
../user/system/etc/tcu.ini
```

```
../oem/system/etc/tcu.ini
```

PCU/IPC (Windows 7 and Windows 10):

```
C:\ProgramData\Siemens\MotionControl\siemens\System\etc\tcu.ini
```

```
C:\ProgramData\Siemens\MotionControl\user\System\etc\tcu.ini
```

```
C:\ProgramData\Siemens\MotionControl\oem\System\etc\tcu.ini
```

Note

The following entries are evaluated by SINUMERIK Operate:

- VNCServer/VetoMode
- VNCServer/AlarmBoxTimeOut
- VNCServer/FocusTimeout
- VNCServer/AdaptResolution
- VNCServer/MaxActiveTCUs
- VNCViewer/ExternalViewerSecurityPolicy

Restrictions

Restrictions for such external operator control units are:

- Neither MCP and direct keys nor an EKS system can be assigned. This also means that these devices cannot be activated to be an operator control unit in the system.
- Direct keys cannot be triggered, i.e. the softkeys to the direct keys can be triggered in the operating software. However, the keys do not appear in the direct key image to the PLC.
- There is no config.ini configuration file, as for a TCU, i.e. a configuration for a TCU is not possible for such an operator control unit (power-up behavior, displacement, t:m:n); however, the displacement mechanism on the external operator control units is effective.
- An external operator control unit is never signaled as active operator station in the PLC.

Configuring the external operator control units in the tcu.ini file in section:

```
[externalTcu]

# EXTERNAL TCU IP-ADDRESSES

# List of accepted TCUs in IP-V4-format (index 1 to maximal 16)

ExternalTcuIP_1=
```

You can also set the desired screen resolution in the tcu.ini file:

```
[VNCServer]

Resolution = ...
```

6.2.2.3 Displacement mechanism for ITCs

In order to be able to operate a machine with more than the maximum number of operator panels, the displacement mechanism ensures that **only the permitted number of ITCs is active** in a shadowing group. The remaining ITCs are switched to passive mode, which means they are no longer a load on resources. As a result, the number of ITCs that can be connected to one HMI application is practically no longer limited. All that is limited is the number of ITCs that can be active at any one time.

Supplementary conditions

The following supplementary conditions apply when operating ITCs:

2 active ITCs in parallel on NCU 710.3 PN

4 active ITCs in parallel on NCU 720.3 PN, NCU 730.3 PN

4 active ITCs in parallel on PCU/ IPC

Displacement rules

You configure the displacement mechanism in SINUMERIK Operate in the "Setup" operating area > menu forward key > "OPs" softkey for the respective operator panel.

An ITC can be in the following states:

- **The ITC is active and has user authorization:** This is recognizable by the fact that the ITC displays the screen of the operating software and the screen is bright.
- **The ITC is active,** is in monitoring mode and has no user authorization: This can be recognized by the fact that the ITC shows the screen of the operating software, however darker than that displayed on the ITC with user authorization.
- **The ITC is passive:** The ITC shows the selection menu of the possible connections instead of a screen of the operating software, and the softkey for selection of the last active connection of the ITC is shown in color.

When powering up, of ITC always attempts to establish the first connection. The ITCs from a shadowing group establish their specified connection one after the other as long as the maximum number of permissible active operator units is not exceeded.

If an ITC encounters the situation that this number is already reached in its power up, it attempts to obtain a connection via the displacement mechanism. If it can displace a formerly active operator unit, it takes on the active status itself; otherwise it transitions to passive status immediately after booting.

6.2.2.4 Disable switchover between ITC via PLC

Overview

The ITC switchover disable offers the option of dynamically disabling switchover from one ITC to the next via the PLC when the system is running. For the duration of the disable, a user authorization request to change user authorization between ITCs will be ignored by the system and rejected.

The rejected user authorization request causes a message to be output in the dialog line of the HMI, in the form of a feedback message for the requester. The message disappears after five seconds.

HMI ↔ PLC data interface

The “switchover disable” function is always active and does not have to be switched on explicitly. The function is controlled by a data bit in the PLC. The HMI transfers the active OP to the PLC, thus forming the basis of the control function in the PLC.

The control bits and control information for this function are stored in the m:n data interface of the PLC. In terms of m:n, this function can be operated separately for the currently overridden HMIs in both m:n online interfaces (DB19.DBW120 ff for HMI1 and DB19.DBW130 ff for HMI2). If a system is not running an m:n, only the first m:n online interface is used for this function.

Switchover disable is controlled by a TCU_SHIFT_LOCK bit, managed by the user, on each HMI in the PLC. The bit address for the first HMI is DB19.DBB126.6 and DB19.DBB136.6 for the second HMI.

The PLC m:n online interface is expanded so that byte DB19.DBB118 is also assigned to the first interface and byte DB19.DBB119 to the second. These bytes acquire the index of the active ITC/OP for the relevant HMI. The byte is called TCU_INDEX. Byte TCU_INDEX is written to by the relevant HMI, with the TCU index configured for the active ITC.

The TCU_SHIFT_LOCK bit is monitored by the appropriate HMI. A value = 1 triggers the switchover disable. Switchover is enabled if the value returns to 0. The TCU_SHIFT_LOCK bit can be set, for example, to the PLC by the user pressing a key or it can be managed by the PLC user program according to its own logic. The TCU_SHIFT_LOCK bit is managed in the PLC exclusively by the user; the HMI only accesses this bit in read-only mode.

The HMI writes the configured index of the ITC or PCU/IPC, whose OP currently has user authorization in the shadow group, to field TCU_INDEX. If no OP is active, a value of 0 is entered in TCU_INDEX.

If no TCU index is configured for the active ITC/OP, then the value 255 = undefined is transferred as the TCU index. This means that the values 0 and 255 may not be configured as the TCU index.

Configuration

The TCU index is configured on the PCU /IPC in the same way as a machine control panel address (MCP address). The TCU index is set in the "OP Properties" dialog of the "System Network Center" program.

Operating principle

If the TCU_SHIFT_LOCK bit is set for switchover disable, a user authorization request is not carried out independently of the mode set on the HMI for allocation of user authorizations (veto mode), i.e., a change of user authorization is rejected.

This message appears on all OPs for approximately 5 seconds:

```
"No switchover: Switchover disable set in current PLC."
```

While this message is displayed, operations on the OP with the user authorization can still be carried out unaffected.

Note

Active switching of an OP to another PCU/IPC is possible

The switchover disable only relates to changing the user authorization on the OPs in a shadowing group on a PCU/IPC.

This means that active switching away from one OP to another PCU/IPC is not prevented.

Special features

The following special cases should be noted:

- Even if switchover disable is set, the TCU_INDEX field value may change in the PLC. This is the case under the following circumstances:
  - If the OP in possession of the user authorization is actively switched to another PCU/IPC. Depending on whether another ITC takes over user authorization or no ITC is currently active, like for user authorization switchover, the index of the ITC or the PCU/IPC itself is entered if its directly connected OP is active.

    This can also be the value 255, if no TCU index is available for the OP. 0 is entered if an OP is no longer available in the shadow group.
  - If an m:n switchover is in progress. The HMI program of the incoming PCU/IPC deactivates the HMI program which is active on it. An OP from the shadow group of the new (incoming) PCU/IPC must receive the user authorization. The TCU index of this OP is entered in the TCU_INDEX field.
  - If a PCU/IPC is disconnected from an NCK/PLC in the context of m:n. No HMI program and, therefore, no OP with user authorization is then available on the exited NCK/PLC. This is signaled independently of a switchover disable by entering the value 0 into the TCU_INDEX field.
- If an ITC is actively switched over to another PCU/IPC it can be deactivated there, i.e. it does not obtain user authorization if a switchover disable is set for the destination PCU/destination IPC.
- With an m:n PCU/IPC switchover – the PCU/IPC is switched to another NCK and, therefore, to another PLC – the PCU/IPC accepts the switchover disable settings of that PLC.

- The m:n interlock options on the PLC side have priority over the ITC switchover disable, so that a set ITC switchover disable cannot prevent an m:n switchover. If necessary, the m:n influencing options should be synchronized here with those for the ITC in the PLC. It may, for example, be practical to set or remove the m:n displacement disable simultaneously with the ITC switchover disable.

Obtaining user authorization

At a TCU, which has no user authorization, press any key. The operating software does not evaluate this key; this only serves to request user authorization.

The settings for the right to veto are stored in file tcu.ini and are only effective if the operating software is installed on the PCU/IPC. At the OP of the TCU, you can use the operating software just the same as for an OP directly connected to the PCU/IPC.

6.2.2.5 Example: This how you select the behavior of the ITCs during run-up.

Example: Distributing boot support across two PCUs/IPCs

Make the following settings to distribute the boot support across two PCUs/IPCs:

- On PCU_1/IPC_1, select "Boot support runtime and configuration only (TFTP/FTP)"
- On PCU_2/IPC_2, select "Boot support IP address only (DHCP)"
- On PCU_3/IPC_3, select configuration "No boot support"

<table>
<tr><td colspan="3"><b>ITC_1</b>
192.168.214.10</td><td colspan="3"><b>ITC_2</b>
192.168.214.11</td><td colspan="3"><b>ITC_3</b>
192.168.214.12</td><td colspan="3"><b>ITC_4</b>
192.168.214.13</td></tr>
<tr><td colspan="3"><b>VNC connections:</b>
192.168.214.241
192.168.214.242
192.168.214.243</td><td colspan="3"><b>VNC connections:</b>
192.168.214.241
192.168.214.243</td><td colspan="3"><b>VNC connections:</b>
192.168.214.241
192.168.214.243</td><td colspan="3"><b>VNC connections:</b>
192.168.214.241
192.168.214.242</td></tr>
<tr><td colspan="12">Switch to system network</td></tr>
<tr><td colspan="4"><b>PCU_1/IPC_1</b>
192.168.214.241</td><td colspan="4"><b>PCU_2/IPC_2</b>
192.168.214.242</td><td colspan="4"><b>PCU_3/IPC_3</b>
192.168.214.243</td></tr>
<tr><td colspan="4">Services:
X DHCP
✓ TFTP
✓ FTP
✓ VNC</td><td colspan="4">Services:
✓ DHCP
X TFTP
X FTP
✓ VNC</td><td colspan="4">Services:
X DHCP
X TFTP
X FTP
✓ VNC</td></tr>
<tr><td colspan="12">Company network</td></tr>
</table>

"ITC support" settings

In this particular case, PCU_2/IPC_2 serves as the DHCP server. This DHCP server makes the IP addresses available to the connected ITCs. PCU_3/IPC_3 is not involved in the run-up of the ITCs, it is however displayed by the ITCs using VNC.

6.2.3 Network configuration

6.2.3.1 Permissible network topologies

Ethernet connection

A SINUMERIK 840 D sl can only be operated as a network within which the individual components communicate with one another via Ethernet connections. This network must be set up.

The individual components are factory-set so that the most frequently occurring standard configurations can be operated without changing the settings related to the network.

Division into system network and company network

On the SINUMERIK solution line, the components are generally split into a company network on the one hand and a system network on the other.

The connection to the company network provides access to the network drives, for example. On the system network, process data communication and image transmission runs from the components with operator software to the display units of the ITC in question.

This separation is performed via the following specified use of the Ethernet interfaces on the components:

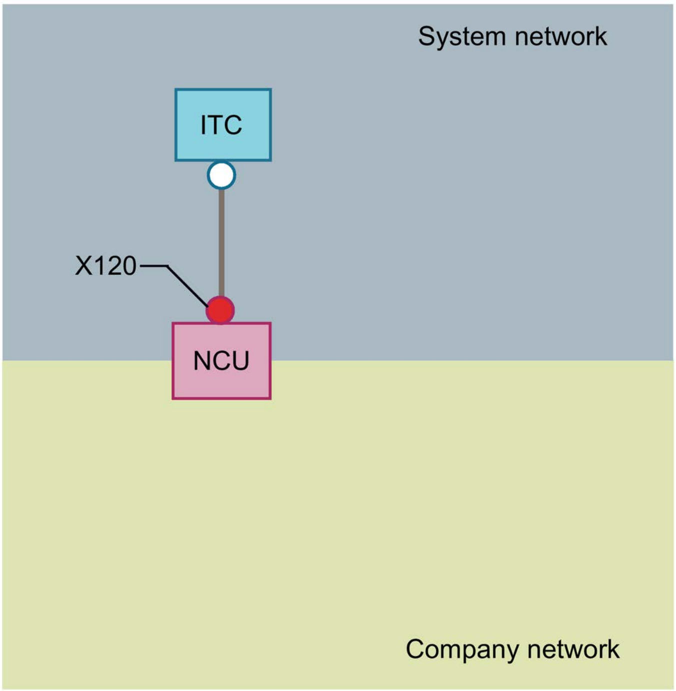
- An ITC is only connected to the system network.
- An NCU is always connected to the system network via X120.
- Ethernet interface Eth 2 of the PCU/IPC is preconfigured for connection to the system network; while Ethernet interface Eth 1 is used for connection to the company network.
- An NCU is connected to the company network via X130.

Meaning of the connections:

○	Eth 1 as a DHCP client
●	Eth 2 as a DHCP server
■	Eth 2 with a fixed IP address
Green connection	Uncrossed Ethernet cable
Gray connection	Crossed Ethernet cable (crossover)

6.2.3.2 Networks without connection to the company network

Configuration 1: NCU and ITC



An ITC is connected directly via Ethernet to X120 on the NCU. NCU and ITC are suitably preconfigured with IP addresses.

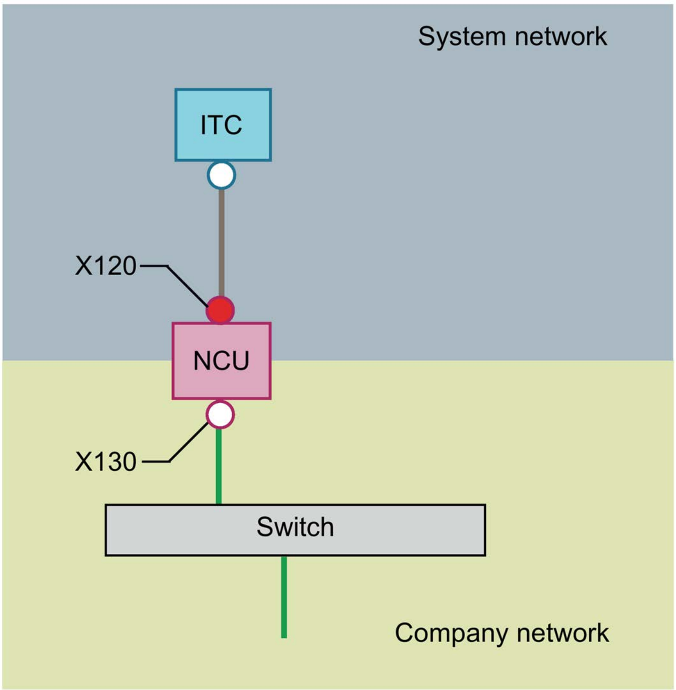
The IP addresses are not significant for further operation.

The ITC is connected to the NCU via a **crossed** Ethernet cable.

The direct connection of the NCU via X120 to the ITC automatically establishes a simple system network consisting of two computer nodes.

6.2.3.3 Networks with NCU connection to the company network

Configuration 2: NCU and ITC



The ITC is connected directly to the NCU via a **crossover** Ethernet cable. On X130, the NCU is connected to a switch to the company network with a straight cable.

As in configuration 1, there is a direct Ethernet connection between an ITC and X120 on the NCU. NCU and ITC are suitably preconfigured with IP addresses. The IP addresses used here are not significant for further operation.

IP configuration: DHCP server on the company network

On the X130, the NCU is set to the address reference via DHCP. If the company network has a DHCP server that provides the NCU with an IP address/configuration, the NCU is integrated in the company network.

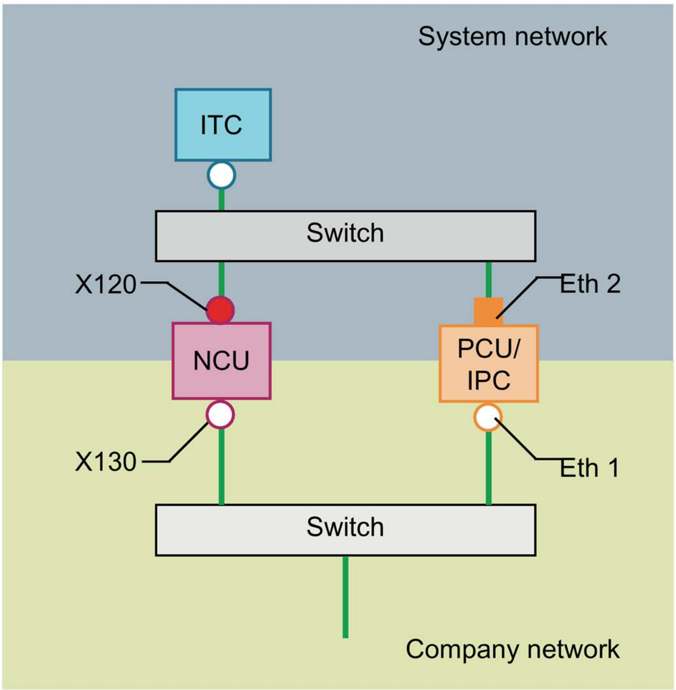
Depending on the infrastructure available or the level of network administration of the company network, the following network parameters must be set for the NCU on X130:

- Computer name on the company network
- The address of a DNS server
- The address of a gateway (default router)

The IP address of the NCU on this connection is also assigned via the network administration.

If the company network offers a low level of administration, in the worst case scenario the network has only one DHCP server that assigns the addresses from a predefined address range, the NCU receives an IP address that is initially unknown.

Configuration 3: PCU/ IPC with ITC to NCU



In this configuration, a switch is also required for the system network. All components are connected using straight Ethernet cables.

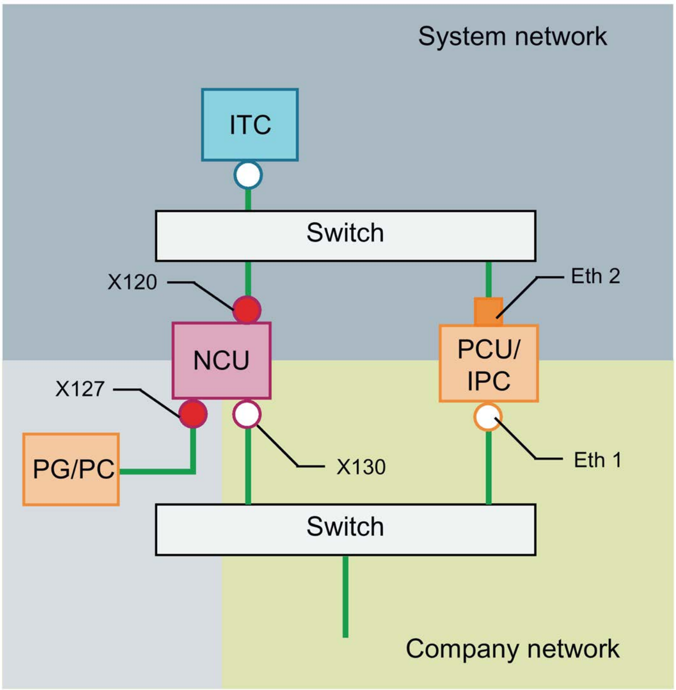
On X120, the NCU occupies the fixed IP address 192.168.214.1 in its capacity as a DHCP server (not used in this configuration). For this configuration on Eth 2, the PCU/IPC is assigned a static IP address in the range 192.168.214.241 – 192.168.214.249 with a subnet mask 255.255.255.0 . The DHCP server of the NCU supplies the ITC with an IP address and is used as a boot server for the ITC.

The observations made for configuration 2 apply here with regard to the connection to the company network. The connection to a switch on the company network is made via a **patch cable** for Ethernet.

To connect one ITC to both HMI systems you must create an additional connection to the NCU for the ITC.

Connecting the programming device (PG) to the NCU

Description



For service purposes a programming device is connected to the NCU at X127 as a standard DHCP client (automatically obtain an IP address). An NCU is a standard DHCP server on X127. On X127, the NCU occupies the fixed IP address 192.168.215.1 with the subnet mask 255.255.255.224.

At X127, IP addresses from 192.168.215.2 onwards are assigned via DHCP; e.g. to connect a programming device. This is the reason that a fixed IP address must not be set at the programming device.

6.2.3.4 Example: Configuring a VNC connection to a PC

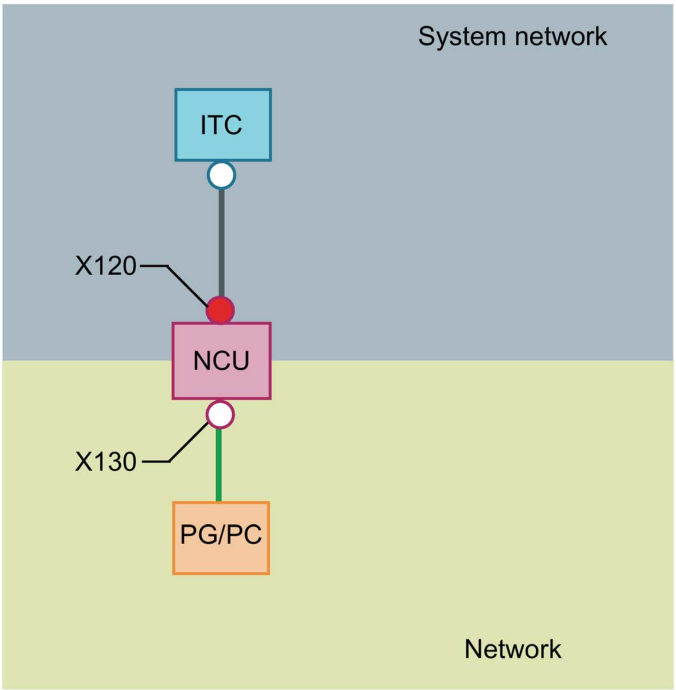
Requirements

In order to use an ITC to get visual access to a computer from a SINUMERIK system via VNC, the following requirements apply:

- The VNC connections should be configured in the HMI.
- The boot server (active DHCP server) in the system network must be an NCU.
- This NCU must be integrated via X130 or X120, i.e. in the network that contains the computer to be monitored.
- The computer to be monitored must be configured in the config.ini configuration file of the ITC according to the general configuration for an ITC in a separate host section as a switchover target for this ITC.

  Where necessary, a password has to be specified in the configuration, if the VNC server requires one on the target system (see below).
- To ensure that the ITC recognizes the new switchover target, the ITC must be restarted and run up.
- The screen resolution of the observed computer must be adjusted to the conditions of the ITC. Otherwise the ITC will scale the image that it receives to the display area that it can manage, resulting in suboptimal display.

Configuration example



Configuration

The config.ini file is located in the following directory:

NCU:

```
/user/common/tcu/<TCU name>/common/tcu
```

PCU/IPC (Windows 7 and Windows 10):

```
C:\ProgramData\Siemens\MotionControl\user\common\tcu\<TCU name>\common\tcu
```

The config.ini file must be stored on the boot server (active DHCP).

Example:

```
[Station]

maxhostindex=2                  /* Number of nodes that are defined under [host_1]
                                and [host_2].
mcpIndex=192

tcuIndex=1

eksIndex=0

[host_1]

Address=192.168.214.1           /* Address of the NCU to which the connection is
                                established during booting.
[host_2]

Address=157.163.230.202         /* Address of the PC
password=123456                 /* Password of the VNC server on the PC
```

Switching over between the nodes

∧ MENU SELECT

With the menu back key + MENU SELECT, the following actions are triggered:

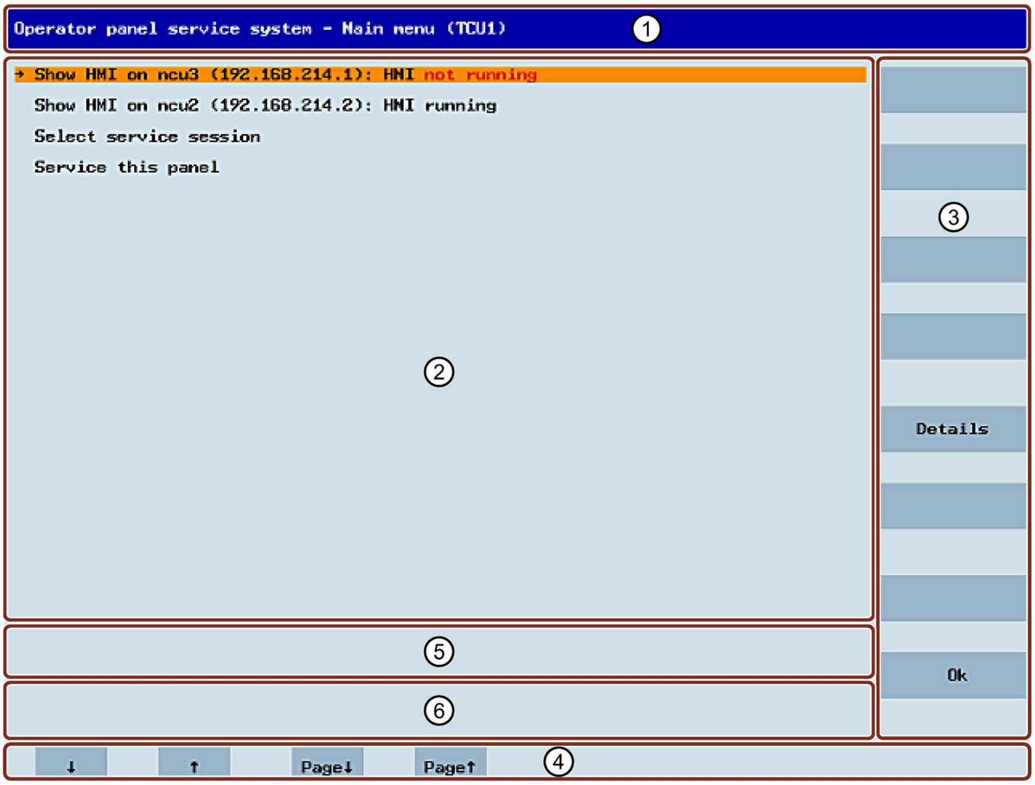
- The ITC name is displayed in the header of the displayed window, e.g. ITC1.
- A selection list for connecting to the other nodes is displayed on the ITC.

6.2.4 Service and diagnostics

6.2.4.1 Operation of the ITC main menu

"Main menu"

The "Main menu (TCU1)" dialog is started with the menu back key and the <MENU SELECT> key:



Operator panel service system - Main menu (TCU1)

→ Show HMI on ncu3 (192.168.214.1): HMI not running
Show HMI on ncu2 (192.168.214.2): HMI running
Select service session
Service this panel

① Title "Main menu" with the selected device name in brackets, in this case "TCU1"

② Central area with the list of servers and two further permanent items, "Select service session" and "Service this panel":

- "Select service session" triggers a server scan which detects all the VNC servers in the local system network. These are then displayed in a session menu which largely reflects the main menu.
- "Service this panel" opens the "Service menu for operator panel" submenu.

③ Eight vertical softkeys for use depending on the context

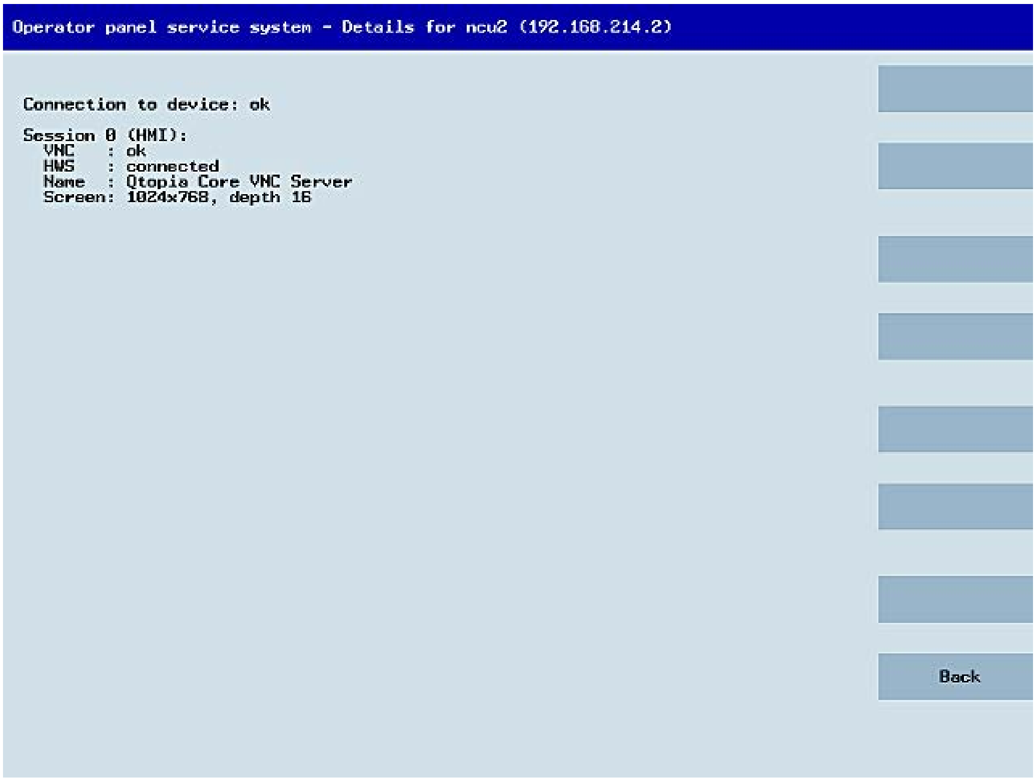
④ Four horizontal softkeys for navigating with the cursor

⑤ Message line whose content can be set via HWS commands from the servers

⑥ Error line in which error messages as well as transient status messages are output

"Details" softkey

The following connection data for the selected device appears when the "Details" softkey is pressed:



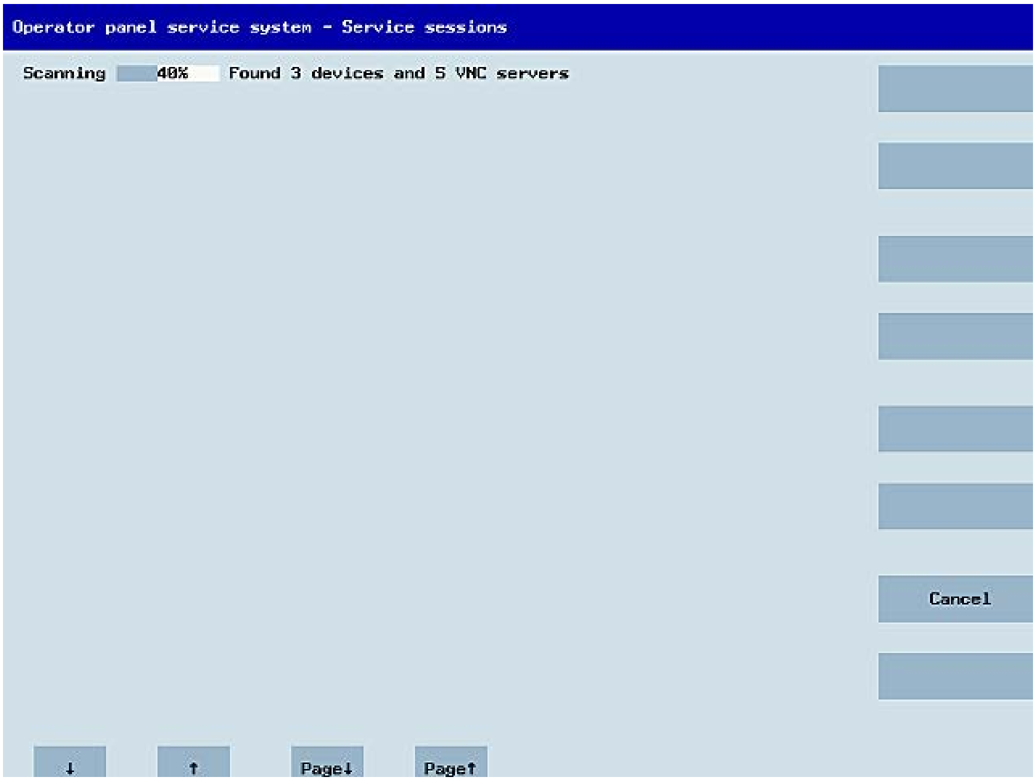
Operator panel service system - Details for ncu2 (192.168.214.2)

```
Connection to device: ok

Session 0 (HMI):
  VNC    : ok
  HWS    : connected
  Name   : Qtopia Core VNC Server
  Screen: 1024x768, depth 16
```

6.2.4.2 Operation of ITC menu "Service sessions"

"Service sessions" dialog

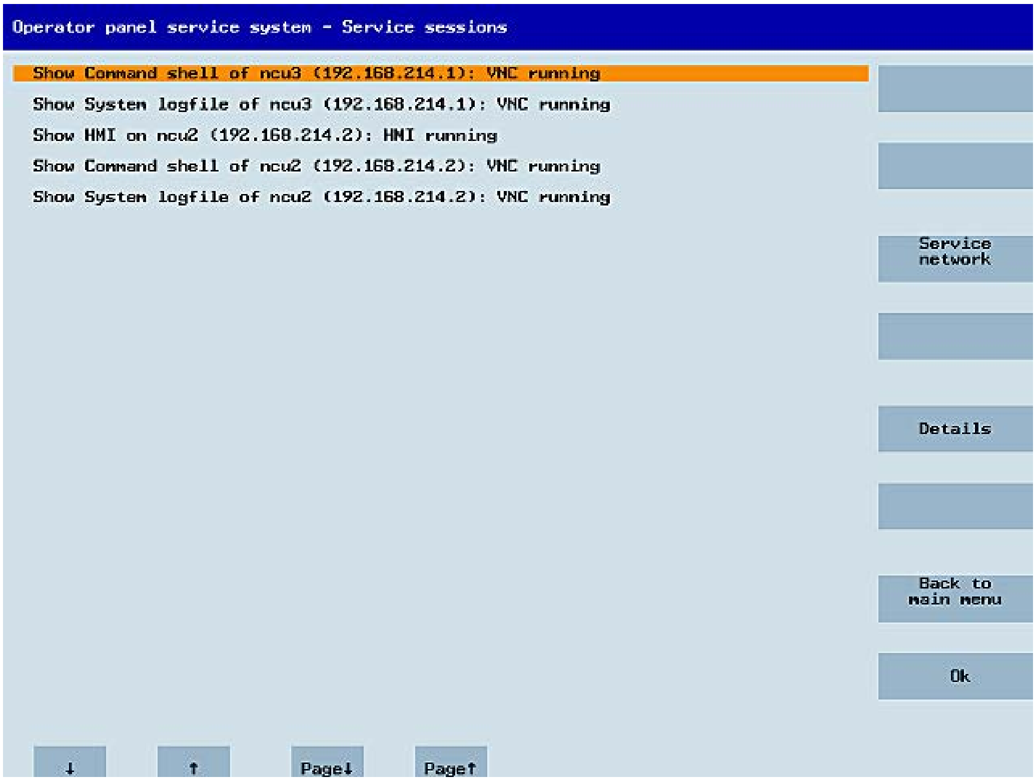
When "Select service session" is selected from the main menu, the resulting process begins by triggering a server scan:



Operator panel service system - Service sessions

Scanning 40% Found 3 devices and 5 VNC servers

After this, the following dialog appears:



Operator panel service system - Service sessions

```
Show Command shell of ncu3 (192.168.214.1): VNC running
Show System logfile of ncu3 (192.168.214.1): VNC running
Show HMI on ncu2 (192.168.214.2): HMI running
Show Command shell of ncu2 (192.168.214.2): VNC running
Show System logfile of ncu2 (192.168.214.2): VNC running
```

Central area with the server list:

The individual server lines contain either "Show WHAT on NAME (IP)" or the IP address only where the name is unknown.

Session number	VNC server
Session 0	HMI
Session 4	Command shell
Session 5	System logfile
Session 6	System Network Center (SNC)
...	
Session <N>	Other servers

These details are followed by a status message regarding the accessibility of the VNC server.

- "Connection not ok" appears if it is already impossible to access the server from the IP side (if switched off, for example).
- "HMI running/ not running", if an HMI VNC server is accessible.

The VSK8, Return or right cursor keys can be used to launch a VNC viewer for the selected server.

Connection status:

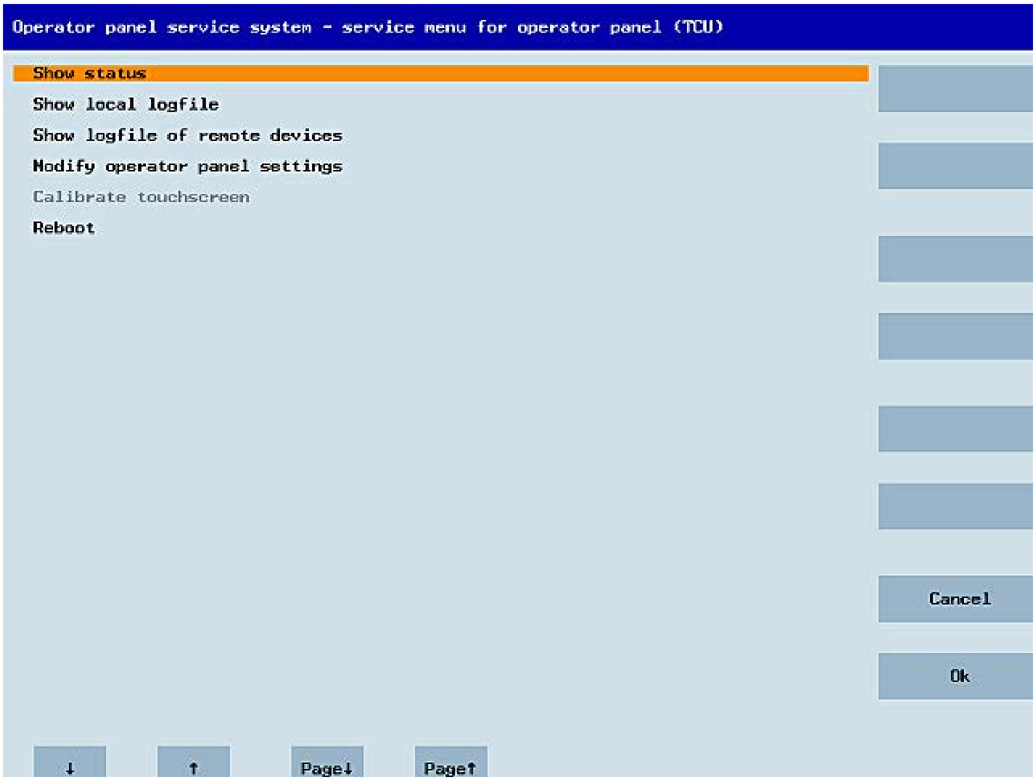
Further details on the connection status can be called with the "Details" softkey. In the next dialog, "not ok" or "not running" are accompanied by an additional error message with more precise details on the reason for the loss of function. With more favorable scenarios, the session name for the VNC server will also be specified along with its resolution.

The connection and HMI status are monitored on a regular basis in the background. This may mean that these specifications change spontaneously if a change is made on the relevant server, e.g. it may be switched off, the HMI may become available, etc.

6.2.4.3 Operation of ITC menu "Service menu"

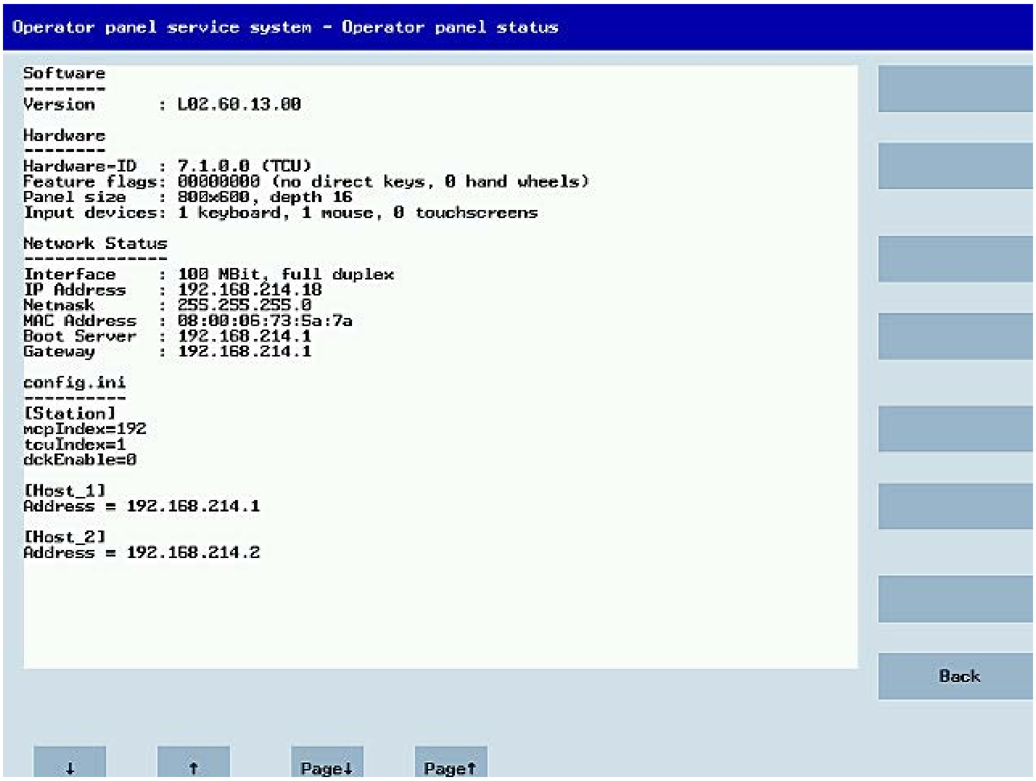
"Service menu for operator panel (TCU)" dialog

The following dialog appears when "Service this panel" is selected from the main menu:


Operator panel service system - service menu for operator panel (TCU)
Show status
Show local logfile
Show logfile of remote devices
Modify operator panel settings
Calibrate touchscreen
Reboot
Cancel
Ok
↓
↑
Page↓
Page↑

The following menu items are available here:

- "Show status" shows status information, for example: Software version, HW infos, network data of the ITC and its configuration:

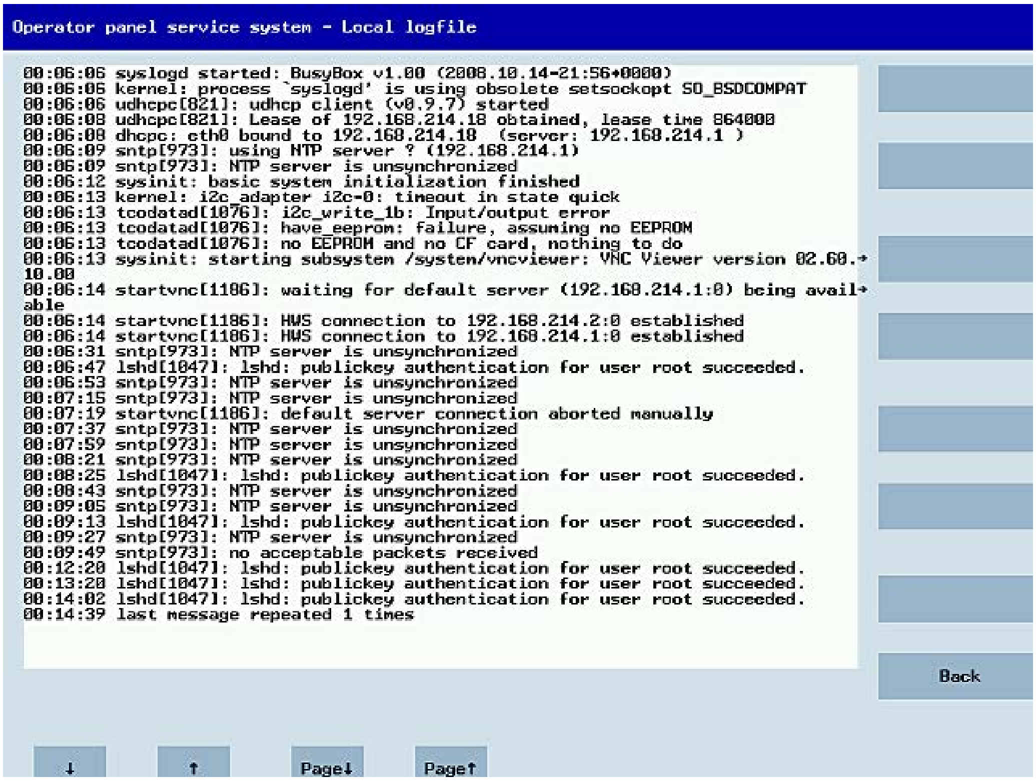


Operator panel service system - Operator panel status

```
Software
---------
Version       : L02.60.13.00

Hardware
---------
Hardware-ID   : 7.1.0.0 (TCU)
Feature flags: 00000000 (no direct keys, 0 hand wheels)
Panel size    : 800x600, depth 16
Input devices: 1 keyboard, 1 mouse, 0 touchscreens

Network Status
--------------
Interface     : 100 MBit, full duplex
IP Address    : 192.168.214.18
Netmask       : 255.255.255.0
MAC Address   : 08:00:06:73:5a:7a
Boot Server   : 192.168.214.1
Gateway       : 192.168.214.1

config.ini
----------
[Station]
mcpIndex=192
tcuIndex=1
dckEnable=0

[Host_1]
Address = 192.168.214.1

[Host_2]
Address = 192.168.214.2
```

- "Show local logfile" shows a filtered version of the system log file in the `/var/log/messages` directory, which contains only the messages of the local ITCs.

  Syslog messages received via the network are not displayed.



Operator panel service system - Local logfile

```
00:06:06 syslogd started: BusyBox v1.00 (2008.10.14-21:56+0000)
00:06:06 kernel: process `syslogd' is using obsolete setsockopt SO_BSDCOMPAT
00:06:06 udhcpc[821]: udhcp client (v0.9.7) started
00:06:08 udhcpc[821]: Lease of 192.168.214.18 obtained, lease time 864000
00:06:08 dhcpc: eth0 bound to 192.168.214.18  (server: 192.168.214.1 )
00:06:09 sntp[973]: using NTP server ? (192.168.214.1)
00:06:09 sntp[973]: NTP server is unsynchronized
00:06:12 sysinit: basic system initialization finished
00:06:13 kernel: i2c_adapter i2c-0: timeout in state quick
00:06:13 tcodatad[1076]: i2c_write_1b: Input/output error
00:06:13 tcodatad[1076]: have_eeprom: failure, assuming no EEPROM
00:06:13 tcodatad[1076]: no EEPROM and no CF card, nothing to do
00:06:13 sysinit: starting subsystem /system/vncviewer: VNC Viewer version 02.60.→
10.00
00:06:14 startvnc[1186]: waiting for default server (192.168.214.1:0) being avail→
able
00:06:14 startvnc[1186]: HWS connection to 192.168.214.2:0 established
00:06:14 startvnc[1186]: HWS connection to 192.168.214.1:0 established
00:06:31 sntp[973]: NTP server is unsynchronized
00:06:47 lshd[1047]: lshd: publickey authentication for user root succeeded.
00:06:53 sntp[973]: NTP server is unsynchronized
00:07:15 sntp[973]: NTP server is unsynchronized
00:07:19 startvnc[1186]: default server connection aborted manually
00:07:37 sntp[973]: NTP server is unsynchronized
00:07:59 sntp[973]: NTP server is unsynchronized
00:08:21 sntp[973]: NTP server is unsynchronized
00:08:25 lshd[1047]: lshd: publickey authentication for user root succeeded.
00:08:43 sntp[973]: NTP server is unsynchronized
00:09:05 sntp[973]: NTP server is unsynchronized
00:09:13 lshd[1047]: lshd: publickey authentication for user root succeeded.
00:09:27 sntp[973]: NTP server is unsynchronized
00:09:49 sntp[973]: no acceptable packets received
00:12:20 lshd[1047]: lshd: publickey authentication for user root succeeded.
00:13:20 lshd[1047]: lshd: publickey authentication for user root succeeded.
00:14:02 lshd[1047]: lshd: publickey authentication for user root succeeded.
00:14:39 last message repeated 1 times
```

- "Show logfile of remote devices" shows the log file of the other devices in the network:

  The syslog messages of devices in the system network which send syslog messages by broadcast, such as NCU 7x0, ...

- "Modify operator panel settings" opens another submenu, see next section.
- Calibrate touch screen" is only active if there is a touch screen. This menu item recalibrates an available touch screen.
- "Reboot" initiates a cold restart of the system (reboot).

Note

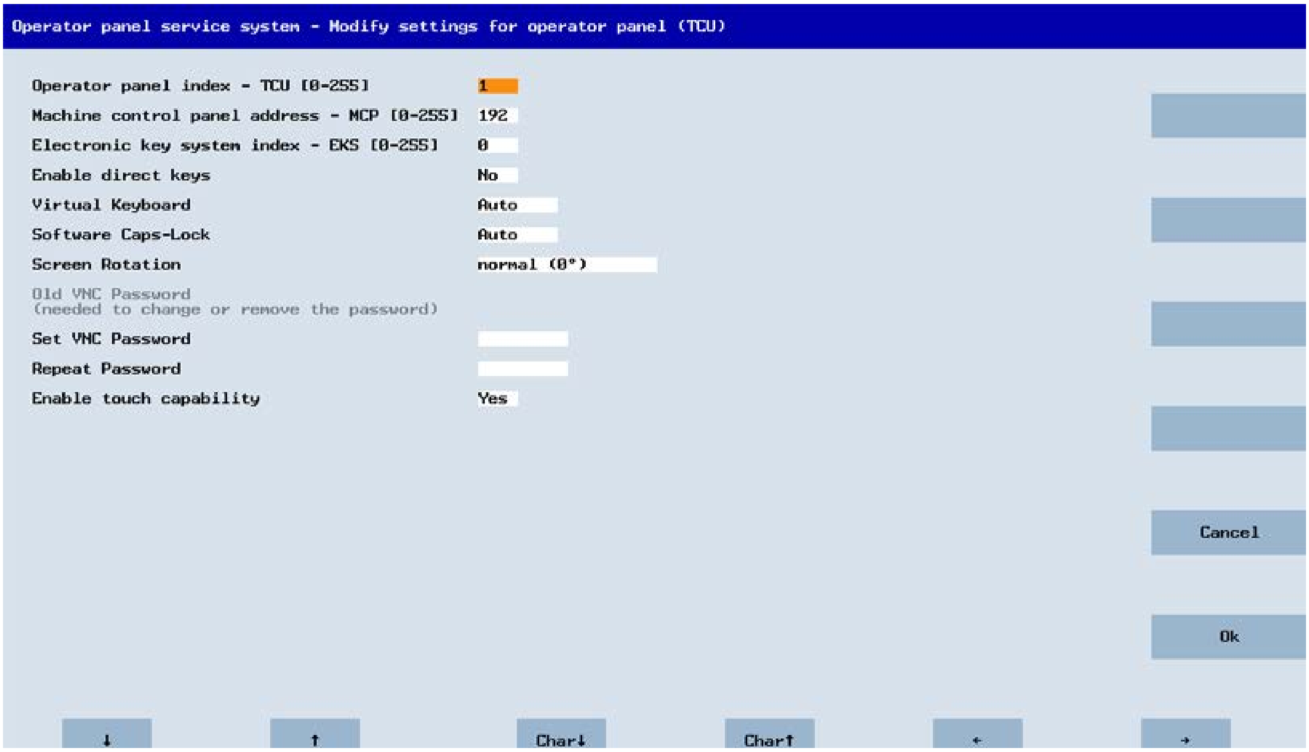
Long lines are broken and wrapped around.

Lines that are longer than the space available wrap round onto the next line so that you do not have to scroll horizontally. When this occurs, the line has a right-facing arrow at its right edge.

6.2.4.4 Operation of ITC menu "Modify settings"

"Modify settings for operator panel (TCU)" dialog

The following dialog appears when "Modify settings" is selected from the main menu:



Operator panel service system - Modify settings for operator panel (TCU)

Operator panel index - TCU [0-255]	1
Machine control panel address - MCP [0-255]	192
Electronic key system index - EKS [0-255]	0
Enable direct keys	No
Virtual Keyboard	Auto
Software Caps-Lock	Auto
Screen Rotation	normal (0°)
Old VNC Password (needed to change or remove the password)	
Set VNC Password	
Repeat Password	
Enable touch capability	Yes

The following parameters are set here during first commissioning:

- "HT 8 individual mode" (yes/no)

  This is only visible with HT 8, and is used to switch between Auto Mode and Individual Mode.

  You do not have to make settings for an HT 8 in Auto Mode because the name is generated automatically: ("DIP<n>") MCP address and TCU index are derived from the DIP setting ("DIP<n>").

- "Operator panel index - TCU" (0-255)

  Defines the TCU index; see column "TCU" on the user interface.

- "Machine control panel address - MCP" (0-255)

  Specifies the address of the associated MCP; see column "MCP" on the user interface.

- "Electronic key system index - EKS" (0-255)

  Specifies the index of the associated EKS; see column "EKS" on the user interface.

- "Enable direct keys" (yes/no)

  Specifies whether direct keys are registered with the PLC (yes) or are treated as ordinary keys (no); see column "DCK" on the user interface.

- "Virtual Keyboard" (Auto/On/Off)
  Specifies whether a virtual keyboard is shown on the screen for touch screens. Depending on the panel features (Auto), the HMI decides whether a touch screen or keyboard is available.
  This parameter can also be set manually (On/Off).
- "Software Caps-Lock" (Auto/On/Off)
  The HMI can manage the Caps-Lock status of a keyboard in the software itself, when, for example, the key is not available. This is normally (Auto) switched on via a display machine data item. This machine data item can be overwritten individually for the ITC with the setting (On/Off).
- "Old VNC Password"
  If a password has already been set, it must be entered here so that it can be changed. If no password has been set, this field is grayed-out. The existing password can also be deleted if, after entering the old password, no new password is to be entered at "Set VNC Password" and "Repeat Password".
- "Set VNC Password"
  Assign a password, which is stored in the ITC and, if required, sent to the server when the VNC connection is established.
- "Repeat Password"
  Repeat the password entered at "Set VNC Password".
- "Enable touch capability" (yes/no)
  Specifies whether the screen can be operated by touch. If you deactivate this option, you will need a keyboard to reactivate it.

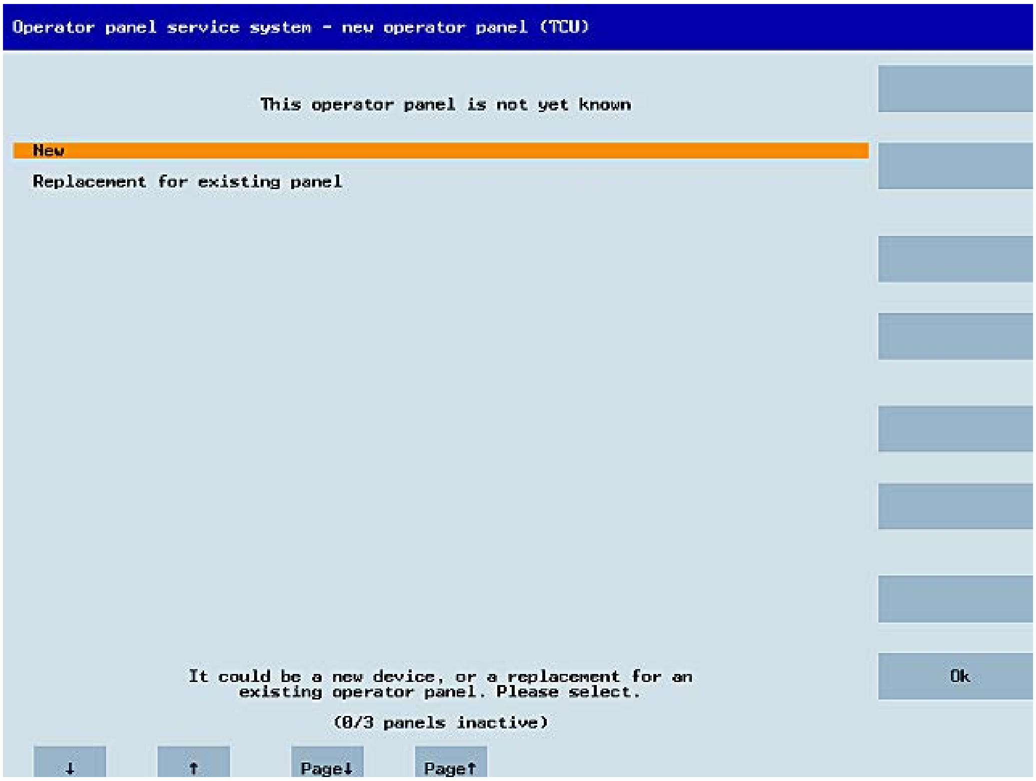
The values are applied and stored with "OK". You can also make any subsequent adaptations or changes via the user interface in the "Setup" operating area > menu forward key > "OPs" softkey.

6.2.4.5 Operation of the menu for a new ITC or replacement ITC

Registering a new ITC

When an unknown ITC not yet registered with the boot server is started, a selection menu containing the "New" and "Replacement for existing panel" items is displayed. The accessibility of all the registered ITCs is tested in the background.

The status of this test is displayed in the message line: "(0/3 panels inactive)".



Operator panel service system - new operator panel (TCU)

This operator panel is not yet known

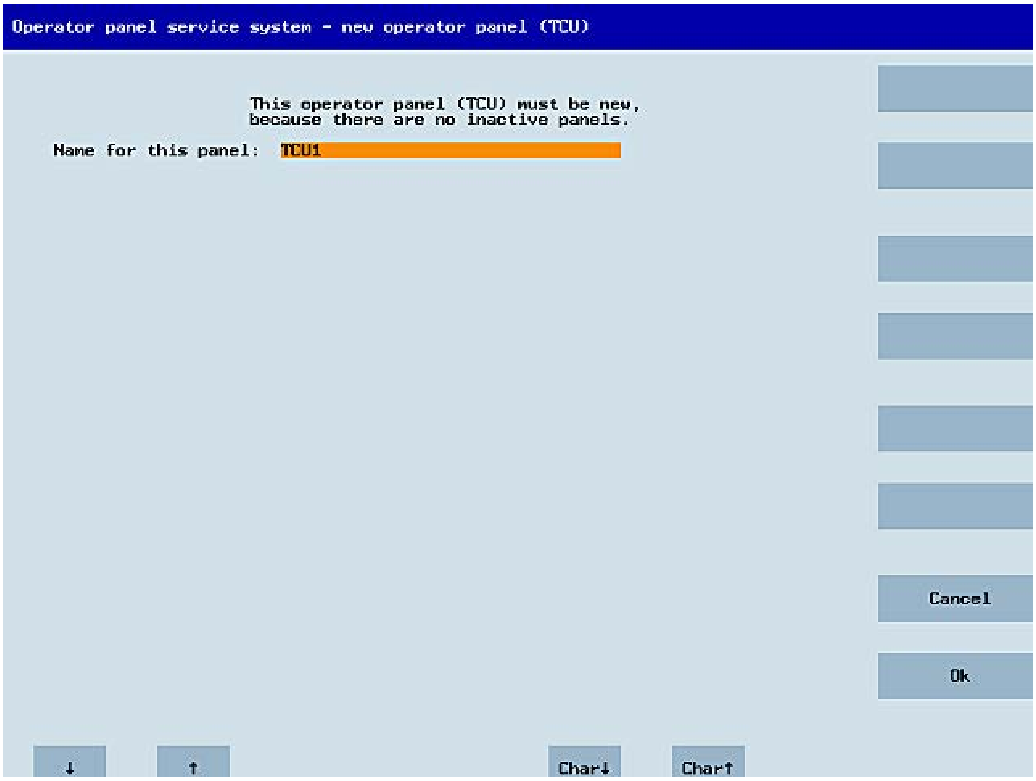
New

Replacement for existing panel

It could be a new device, or a replacement for an existing operator panel. Please select.

(0/3 panels inactive)

If all ITCs are active, the new ITC cannot be a replacement. The system will then automatically switch to the name assignment phase after a set period of time has elapsed.



Operator panel service system - new operator panel (TCU)

This operator panel (TCU) must be new,
because there are no inactive panels.

Name for this panel: TCU1

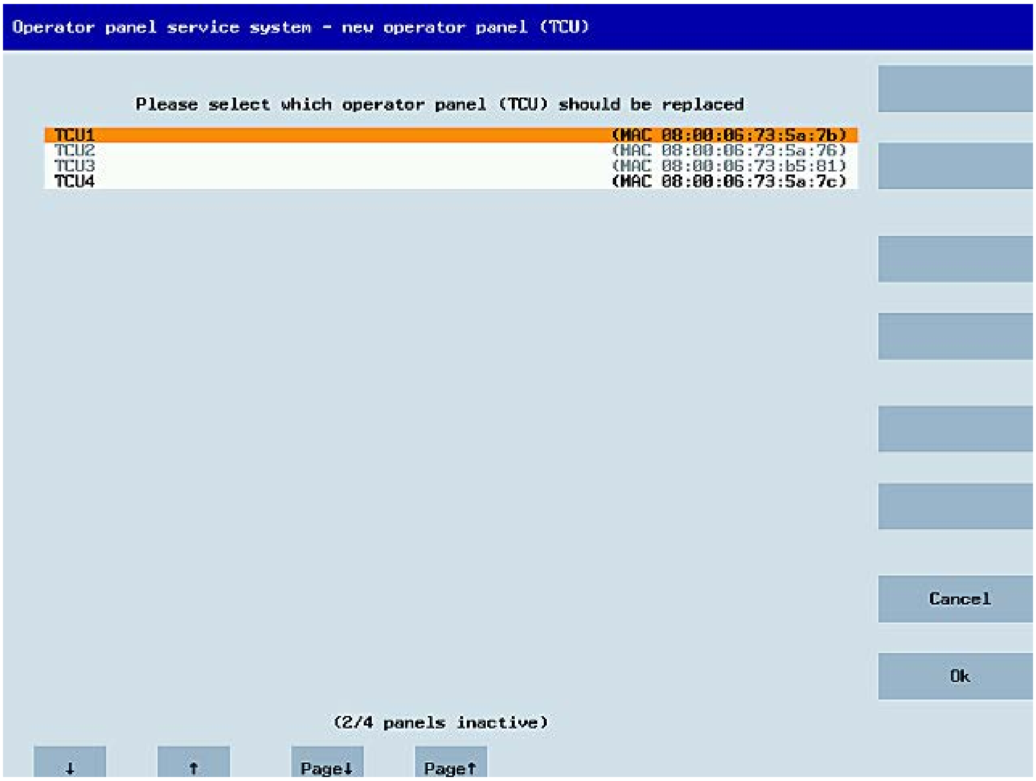
If an ITC is to be operated with software version < 4.7 SP6 HF3, the ITC is operated in the compatibility mode. You can view and change the emulation type in the settings.

Replacing a device

If "Replacement" is selected, all the registered ITCs and TCUs will appear in a selection menu. Those that are active in the network are grayed out. They are functioning and should not be replaced by a spare part. The cursor automatically defaults to the first line for selection.

As the accessibility test is still running in the background, the active status of the lines may change if panels are switched on or off.

If a name is ultimately chosen, it will be applied to the new ITC along with the associated saved settings.



Operator panel service system - new operator panel (TCU)

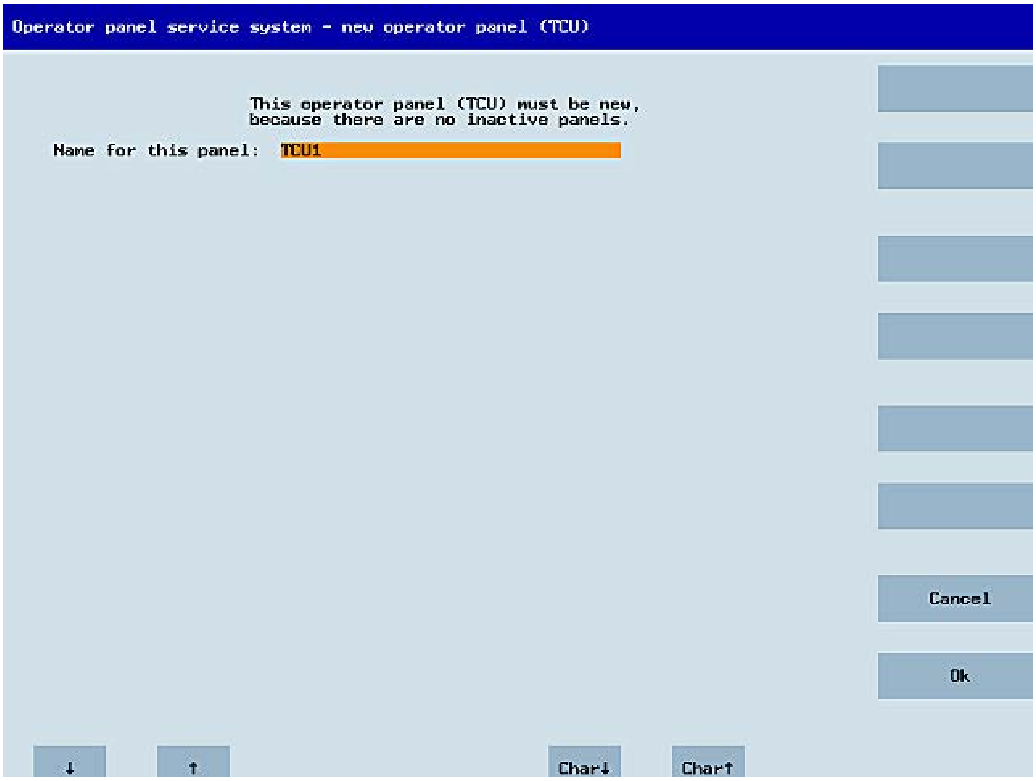
Please select which operator panel (TCU) should be replaced

```
TCU1                                                  (MAC 08:00:06:73:5a:7b)
TCU2                                                  (MAC 08:00:06:73:5a:76)
TCU3                                                  (MAC 08:00:06:73:b5:81)
TCU4                                                  (MAC 08:00:06:73:5a:7c)
```

(2/4 panels inactive)

Assigning a name

If, as described above, the system automatically follows the "New" path, an additional message will appear: "This operator panel (TCU) must be new, because there are no inactive panels." This message will not appear if "New" is selected manually.



Operator panel service system - new operator panel (TCU)

This operator panel (TCU) must be new,
because there are no inactive panels.

Name for this panel: TCU1

Any name is suggested in the input field, although the user can change this. The default name is "TCU<N>", where <N> is the lowest number yet to be used. If, however, the name is already allocated after the OK softkey has been pressed, which may happen if a number of TCUs/ ITCs log on at the same time, and the suggestion has not changed, a new and unused name will be specified.

If the name selected was still available, this will now be allocated. If required, you can adapt the settings. To enable any changes to be made, a new dialog appears in which all the parameters have been pre-assigned their default values. You can make any changes you like or just select "OK" to accept the existing values.

6.2.4.6 How to register an ITC in the system network

Precondition

The boot server (NCU or PCU 50/ IPC) defined in the system network as a DHCP master, must be switched on and available in the network.

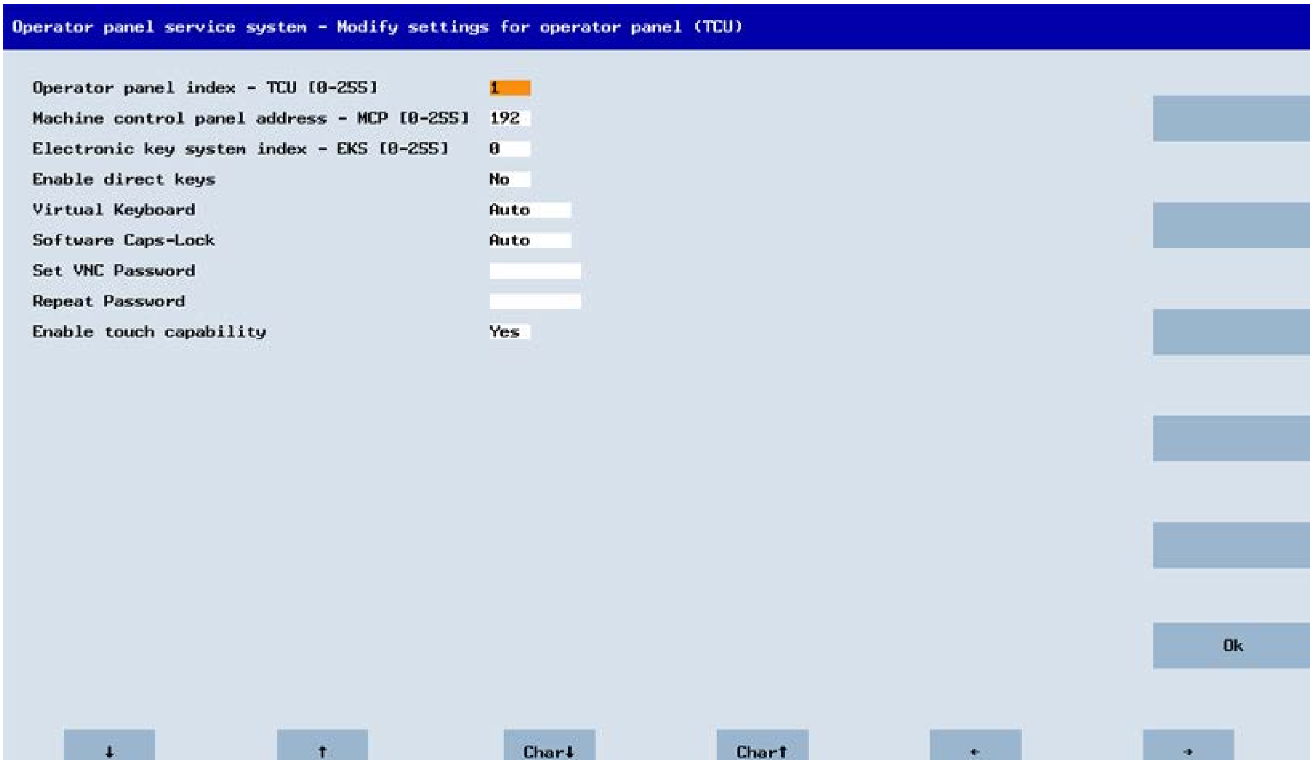
Using ITC

Procedure:

1. Connecting ITC

   This opens the "New operator panel (TCU)" dialog.
2. Select "New" to connect a new ITC and confirm with "OK".
3. In the next dialog, accept the name suggested by the system or enter a name and confirm this with "OK".

   The following parameters are preselected for the ITC:



Operator panel service system - Modify settings for operator panel (TCU)

Operator panel index - TCU [0-255] 1
Machine control panel address - MCP [0-255] 192
Electronic key system index - EKS [0-255] 0
Enable direct keys No
Virtual Keyboard Auto
Software Caps-Lock Auto
Set VNC Password
Repeat Password
Enable touch capability Yes

4. Restart the ITC to apply the new settings.
5. If you want to change the parameters, select "Main menu" > "Service this panel" > "Modify operator panel settings".

Procedure for the HT 8

1. Connect the HT 8 to a connection module and calibrate the touch screen.

   Additional softkeys are available for convenient touch panel operation:

   – "OK" has the same function as the <INPUT> key

   – Select "DEF" to save the "Default" settings.

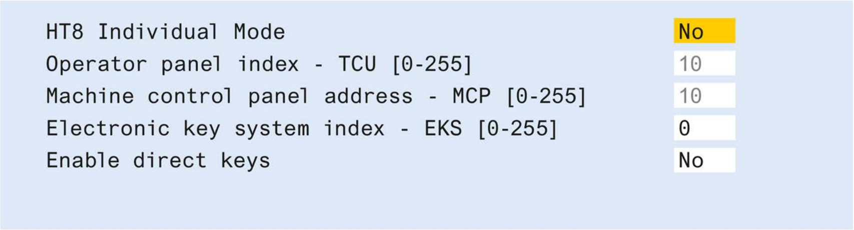
   – "Edit" has the same effect as the <F10> or <MENU SELECT> key.

2. Select HT 8 Individual Mode:

   According to the default setting for an HT 8, "HT 8 Individual Mode" is deselected with "No". This means "Auto" mode is activated for automatic detection in the system network. The HT 8 is automatically detected based on its name "DIP_". If "HT 8 Individual Mode" is activated with "Yes", the HT 8 is identified by its MAC address on the system network.

3. For an HT 8, confirm the "DIP..." name proposed by the system or adapt the name. You can select any other characters.

   Press the <INPUT> key to apply the following values as default settings for the HT 8:



```
HT8 Individual Mode                                No
Operator panel index - TCU [0-255]                 10
Machine control panel address - MCP [0-255]        10
Electronic key system index - EKS [0-255]          0
Enable direct keys                                 No
```

   The following message will then appear: "New TCU 'DIP10' registered."

Note

TCU index for the HT 8

The TCU index is used to evaluate the direct keys. Direct keys can only be activated by appropriate devices. For an HT 8 the TCU index cannot be set, but is assigned by the system.

Activate direct keys

The signals from pressing the direct keys are sent directly to the PLC. In the PLC, the keys appear as 16 digital inputs.

Additional information on programming the PLC is provided in:

SINUMERIK Basic Functions Function Manual, Basic PLC Program (P3)

Definition: Operator panel

The term operator panel designates a unit that consists of an OP/TP, an ITC or PCU/ IPC and a machine control panel (MCP) all of which are connected to each other via Ethernet.

All ITCs, PCU 50s and IPCs can be used along with the OP/TP with "integrated TCU", e.g. OP 08T, OP 015T, TP 015AT.

Specifying settings without machine control panel

If a PCU, IPC or an ITC has no machine control panel (MCP), you must set one of the two following options:

- MCP address = 0 or no entry

  After the change of user authorization, there is no switchover of the machine control panel; the previously active MCP remains active.

- MCP address = 255

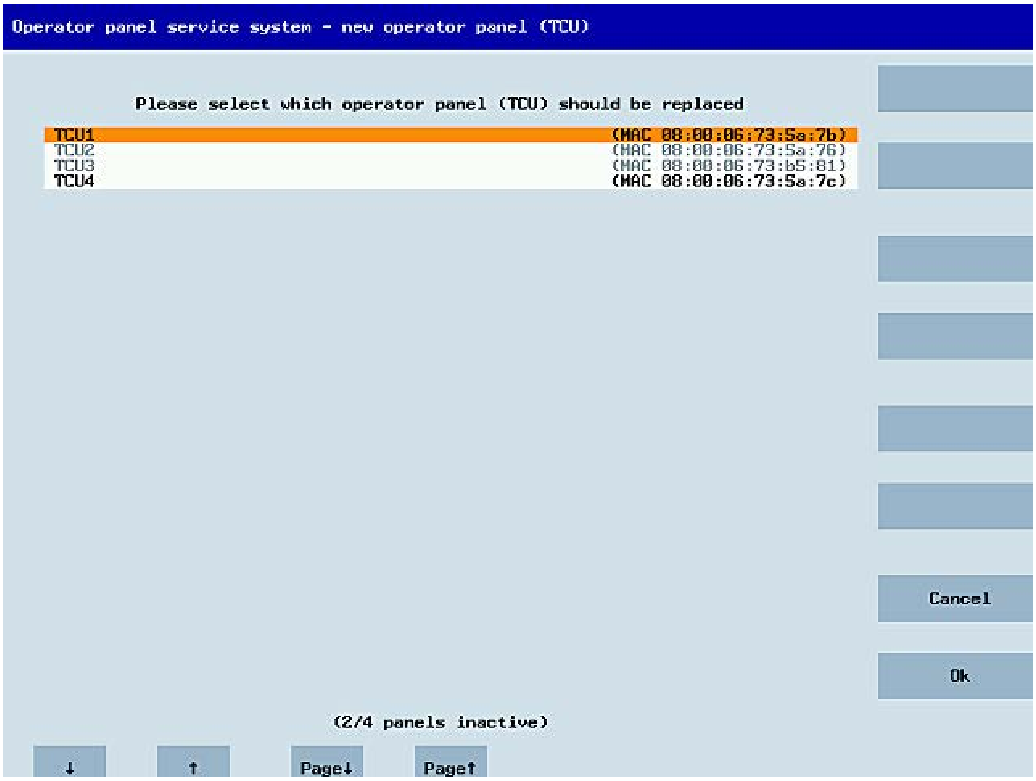
  If the user authorization is transferred to this PCU, IPC or ITC, the previous machine control panel is deactivated and there is no active machine control panel from this point on.

6.2.4.7 How to register a replacement ITC

To connect the replacement ITC, proceed as follows:

1. Connect the new ITC.

   The "New operator panel (TCU)" dialog opens.
   This dialog lists the ITCs on the system network along with their "active" or "inactive" status:



```
Operator panel service system - new operator panel (TCU)

Please select which operator panel (TCU) should be replaced

TCU1                                  (MAC 08:00:06:73:5a:7b)
TCU2                                  (MAC 08:00:06:73:5a:76)
TCU3                                  (MAC 08:00:06:73:b5:81)
TCU4                                  (MAC 08:00:06:73:5a:7c)

(2/4 panels inactive)
```

2. Select the name previously assigned to the defective ITC. Now the new ITC is recognized on the network and acquires all of the configuration settings from the ITC that is to be replaced.

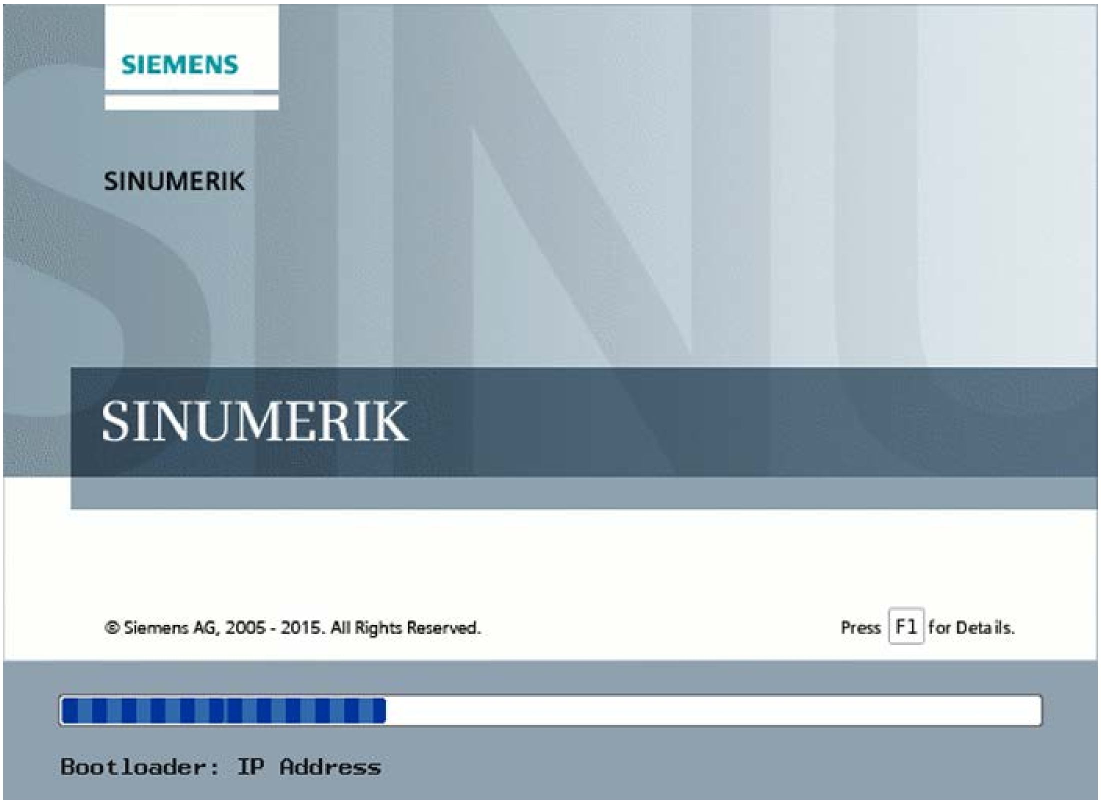
6.2.4.8 Run-up of the panel

Messages during booting

Messages during run-up

While the ITC runs up, a progress indicator is displayed with messages showing the current status after the BIOS has been loaded and before the operating system starts. While the IP address is being determined via DHCP and the TFTP is being downloaded (boot image), a progress bar indicates that run-up of the ITC is not yet complete, or that a fault has occurred.

The figure below shows the structure of these messages:



```
Bootloader: IP Address
```

You can see the current boot phase below the progress bar. If a fault occurs, you can call further information by touching the "F1" field.

Diagnostics options during booting

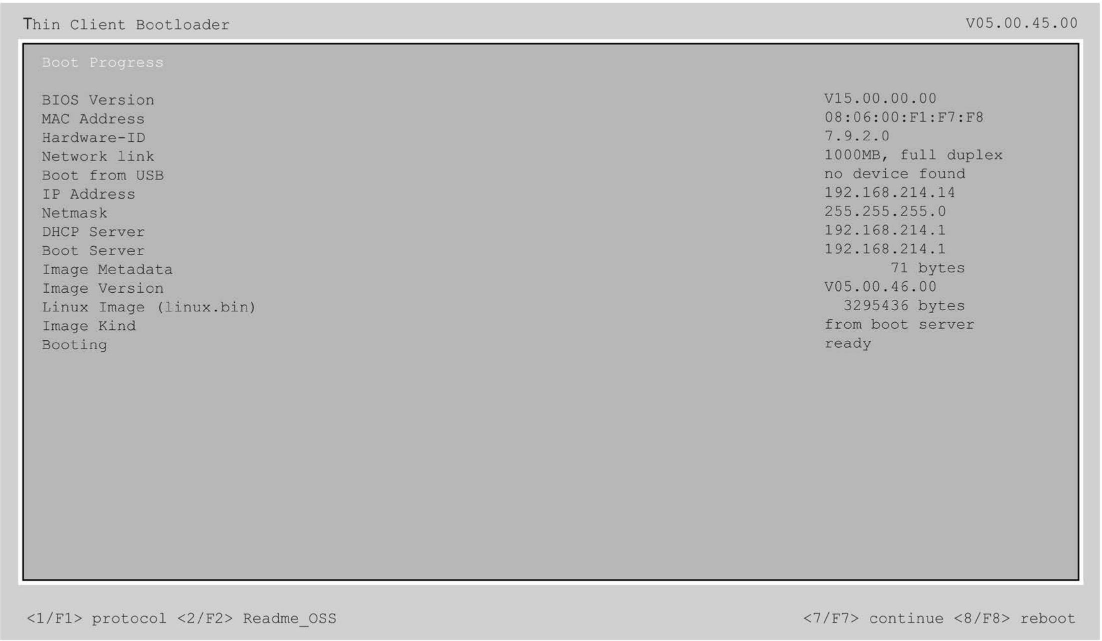
Diagnostics while booting supplementary conditions

In the following supplementary conditions, the diagnostics window is displayed and run-up of the ITC is interrupted:

- When the <1 / F1> function is selected during booting
- When a warning message is displayed
- When a fault occurs

  You can select functions <1 / F1> to <8 / F8> mentioned below by tapping on the Panel. Alternatively, you can do this via the corresponding function keys of a connected USB keyboard.

Using the <1 / F1> function



```
Thin Client Bootloader                                                                      V05.00.45.00

  Boot Progress

  BIOS Version                                                                  V15.00.00.00
  MAC Address                                                                   08:06:00:F1:F7:F8
  Hardware-ID                                                                   7.9.2.0
  Network link                                                                  1000MB, full duplex
  Boot from USB                                                                 no device found
  IP Address                                                                    192.168.214.14
  Netmask                                                                       255.255.255.0
  DHCP Server                                                                   192.168.214.1
  Boot Server                                                                   192.168.214.1
  Image Metadata                                                                       71 bytes
  Image Version                                                                 V05.00.46.00
  Linux Image (linux.bin)                                                         3295436 bytes
  Image Kind                                                                    from boot server
  Booting                                                                       ready

 <1/F1> protocol <2/F2> Readme_OSS                                      <7/F7> continue <8/F8> reboot
```

Key / text	Meaning
F1 protocol	Display detailed information
F2 Readme_OSS	Details of the Open Source licenses
F7 continue	Continue ITC run-up
F8 reboot	Restart ITC

Press <1 / F1> to continue

If you select function <F1> in the diagnostics window, the, detailed diagnostic information is output.

Key / text	Meaning
F1 ... F6	Navigate within the window (alternatively, the relevant keys on the OP can be used).
F7 -detail	Display less information
F8 +detail	Display more information
F9 back	Return to diagnostics window

Device maintenance and repair 7

7.1 General information on maintenance and servicing

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

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

7.2 Cleaning the device

The HMI device is designed for low-maintenance operation. You should still clean the device front regularly, however.

⚠ WARNING

Unintended reaction when cleaning the unit

You risk unintentional actuation of control elements if you clean the device while it is switched on.

You may unintentionally trigger actions of the device or controller. Personal injury or damage to the machinery may result.

Switch off the device before cleaning or, during ongoing operation, clean the touch screen only when it is in a locked state. Note that the touch screen lock automatically ends after 15 seconds.

Detergents

NOTICE

Damage to the HMI device caused by impermissible detergents

Inadmissible and unsuitable detergents can damage the control unit.

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

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

Observe the information on chemical resistance (http://support.automation.siemens.com/WW/view/en/39718396).

Requirement

- Cleaning cloth
- Dishwashing liquid or foaming screen cleaning agent

Procedure

Proceed as follows:

1. Switch off the device or disable the touch screen using the "Clean screen" function in taskbar.

   If you use the "Clean screen" function, the touch screen is disabled for 15 seconds. If the cleaning requires more time, activate the "Clean screen" function several times for the entire cleaning period.
2. Spray detergents on the cleaning cloth and not directly on the device.
3. Clean the device with the cleaning cloth.

7.3 Spare parts and repairs

Repairs

In the event of a repair, you must return the device to the Return Center in Erlangen. Repairs may only be carried out at the Return Center in Erlangen.

The address is:

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

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

Spare parts

You can find spare parts and accessories for the HMI device in section "Accessories (Page 25)".

7.4 Recycling and disposal

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

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

Technical specifications 8

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.

CE approval

The devices meet the general and safety-related requirements of the following EU Directives and conform to the harmonized European standards (EN) published in the official gazettes of the European Union and confirmed in the EU declarations of conformity:

- 2014/30/EU "Electromagnetic Compatibility" (EMC Directive)
- 2014/34/EU "Equipment and protective systems for use in hazardous areas" (Explosion protection directive)
- 2011/65/EU "Directive of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment" (RoHS Directive)

EU Declaration of Conformity

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

Siemens AG
Digital Factory
Factory Automation
DF FA AS SYS
P.O. Box 1963
D-92209 Amberg, Germany

The Declaration of Conformity and other certificates are also available at the following Internet address: Industrial Thin Clients Certificates (https://support.industry.siemens.com/cs/ww/en/ps/16794/cert).

UL approval

Observe the following information:

- The device shall be supplied from an isolating source, rated 24 VDC.
- Only for use in LAN, not for connection to telecommunication circuits.

Underwriters Laboratories Inc., to

- UL 61010-2-201 (E116536)
- CSA C22.2 No. 142 (Process Control Equipment)

or

Underwriters Laboratories Inc., to

- UL 61010-2-201 (E222109)
- CSA C22.2 No. 142 (Process Control Equipment)
- ANSI/ISA 12.12.01
- CSA C22.2 No. 213 (Hazardous Location)

Approved for use in

- Class I, Division 2, Group A, B, C, D T4 or
- Class I, Zone 2, Group IIC T4 or
- non-hazardous locations

FM Approval

Factory Mutual Research (FM) conforming to

- Approval Standard Class Number 3611, 3600, 3810
- CSA C22.2 No. 213
- CSA C22.2 No. 61010.1

Approved for use in

- Class I, Division 2, Group A, B, C, D T4
- Class I, Zone 2, Group IIC T4

Ex approval

The following approvals apply to the HMI device in accordance with

- EN 60079-0:2012 +A11 2013
- EN 60079-15:2010
- EN 60079-31:2014

valid:

Ex	II 3 G	Ex nA IIC Tx Gc
	II 3 D	Ex tc IIIC T 70 °C Dc IP65 x: Temperature values, see EC design examination certificate

You can find additional information on use of the HMI device in hazardous areas under: ATEX-FAQ (https://support.industry.siemens.com/cs/ww/en/view/291285)

The EC type examination certificate is available on the Internet at: Technical Support (https://support.industry.siemens.com)

IEC 61010-2-201

The devices meet selected requirements and criteria of the IEC 61010 standard, Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 2-201: Particular requirements for laboratory equipment for the heating of materials.

RCM AUSTRALIA/NEW ZEALAND

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

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

KOREA

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

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

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

Identification for Eurasion Customs Union

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

WEEE label (European Union)

Disposal instructions, observe the local regulations and the section "Recycling and disposal (Page 160)".

8.2 Electromagnetic compatibility

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

EMC-compatible installation of the HMI device

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

Observed the following manuals in addition to these operating instructions:

- Designing interference-free controllers (https://support.industry.siemens.com/cs/ww/en/view/59193566)
- Industrial Ethernet/PROFINET – Passive network components (https://support.industry.siemens.com/cs/ww/en/view/84922825)

Pulse-shaped disturbance

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

Pulse-shaped interference	Tested with	Degree of severity
Electrostatic discharge in accordance with IEC 61000-4-2	Air discharge: 8 KV Contact discharge: 6 kV	3
Burst pulses (high-speed transient interference) in accordance with IEC 61000-4-4	2 kV signal cable with 24 V DC 2 KV signal/data cable > 30 m 1 KV signal cable < 30 m	3
High-energy single pulse (surge) in accordance with IEC 61000-4-5 [1]	Asymmetrical coupling: • 2 kV power cable DC voltage with protective elements • 2 kV signal cable/data cable > 30 m, with protective elements as required Symmetrical coupling: • 1 kV power cable DC voltage with protective elements • 1 kV signal cable > 30 m, with protective elements as required	3

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

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

Sinusoidal interference

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

Sinusoidal interference	Test values
HF radiation (electromagnetic fields) according to IEC 61000-4-3	80% amplitude modulation at 1 kHz • to 10 V/m from 80 MHz to 1 GHz • to 10 V/m from 1.4 GHz to 2 GHz • to 1 V/m from 2 GHz to 2.7 GHz
HF current feed on cables and cable shields according to IEC 61000-4-6	Test voltage 10 V with 80% amplitude modulation at 1 kHz in the 10 kHz to 80 MHz range
Magnetic field intensity	50/60 Hz; 100 A/m RMS

Emission of radio interference

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

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

See also

EMC information in section "Notes about usage (Page 30)".

8.3 Mechanical environmental conditions

8.3.1 Storage conditions

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

The device was tested according to IEC 60721-3-2 Class 2M4 with the following additions and restrictions:

Type of condition	Permitted range
Free fall	≤ 0.3 m
Vibration according to IEC 60068-2-6	5 .. 8.4 Hz, deflection 3.5 mm 8.4 ... 500 Hz, acceleration 1 g
Shock according to IEC 60068-2-27	250 m/s², 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 devices have been tested according to IEC 60721-3-3 Class 3M3 with the following additions and restrictions:

Built-in units

Type of condition	Permitted range
Vibration according to IEC 60068-2-6	5 ... 8.4 Hz, deflection 3.5 mm 8.4 ... 200 Hz, acceleration 1 g
Shock according to IEC 60068-2-27	150 m/s², 11 ms, 3 shocks

Shock pulses within the specified range can be transferred to the display but do not impact the functionality of the device.

PRO devices

Type of condition	Permitted range
Vibration according to IEC 60068-2-6	10 ... 58 Hz, deflection 0.0375 mm 58 ... 200 Hz, acceleration 0.5 g
Shock according to IEC 60068-2-27	150 m/s^2, 11 ms, 3 impacts

8.4 Climatic ambient conditions

8.4.1 Long-term storage

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

The device meets the requirements according to IEC 60721-3-1 Class 1K21.

8.4.2 Transport and short-term storage

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

The device was tested according to IEC 60721-3-2 Class 2K11 with the following additions and restrictions:

Type of condition	Permitted range
Temperature	–20 ... 60 °C
Atmospheric pressure	1140 ... 660 hPa, corresponds to an elevation of -1000 to 3500 m
Relative humidity	10 ... 90 %
Pollutant concentration	SO_2: < 0.5 ppm; relative humidity < 60% no condensation H_2S: < 0.1 ppm; relative humidity < 60 %, no condensation

Note

If dewing has developed, wait until the HMI device has dried completely before switching it on.

Do not expose the HMI device to direct radiation from a heater.

8.4.3 Operating Conditions

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

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

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

Type of condition	Mounting position	Permitted range
Temperature, Mounting in landscape format	Vertical	0 ... 45 °C [1]
	Inclined, maximum inclination 35°	0 ... 40 °C
Temperature, Mounting in portrait format [2]	Vertical	0 ... 40 °C
	Inclined, maximum inclination 35°	0 ... 35 °C
Air pressure, operating elevation	1140 ... 795 hPa, corresponds to an elevation of -1000 to 2000 m	
Relative humidity	10 ... 90%, no condensation [3]	
Pollutant concentration	SO2: < 0.5 ppm; relative humidity < 60%, no condensation [3] H_2S: < 0.1 ppm; relative humidity < 60%, no condensation [3]	

[1] ITC1500 V3 built-in unit: 0 ... 50 °C

[2] Mounting in portrait format only permitted for built-in units, not for PRO devices

[3] Built-in units: no condensation on the back of the device,
PRO devices: no condensation inside the enclosure

Read the information in the section "Notes on use (Page 30)" and the information about the mounting positions:

- Permitted mounting positions for built-in units (Page 34)
- Permitted mounting positions for PRO devices (Page 38)

Note

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

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

Insulation test

The insulation resistance is verified by type testing with the following test voltages:

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

Degree of pollution and overvoltage category

The device meets the following requirements according to IEC 61010-2-201:

Degree of pollution built-in units	2 (front) 1 (rear)
Degree of pollution PRO devices	2
Overvoltage category	II

Protection class

Protection class III according to IEC 61010-2-201.

Protection from foreign objects and water

The device meets the requirements of IEC 60529 and UL50.

Device side	Degree of protection
Front	When mounted: • IP65 • Type 4X/Type 12 (indoor use only, front face only) according to UL50
Rear panel	IP20 Protection against contact with standard test probes. There is no protection against the ingress of water, dust and noxious gas.

The front protection rating can only be guaranteed if the mounting seal lies flush against the mounting cutout. Read the corresponding information in section "Preparing the mounting cutout (Page 36)".

Protection from foreign objects and water PRO devices

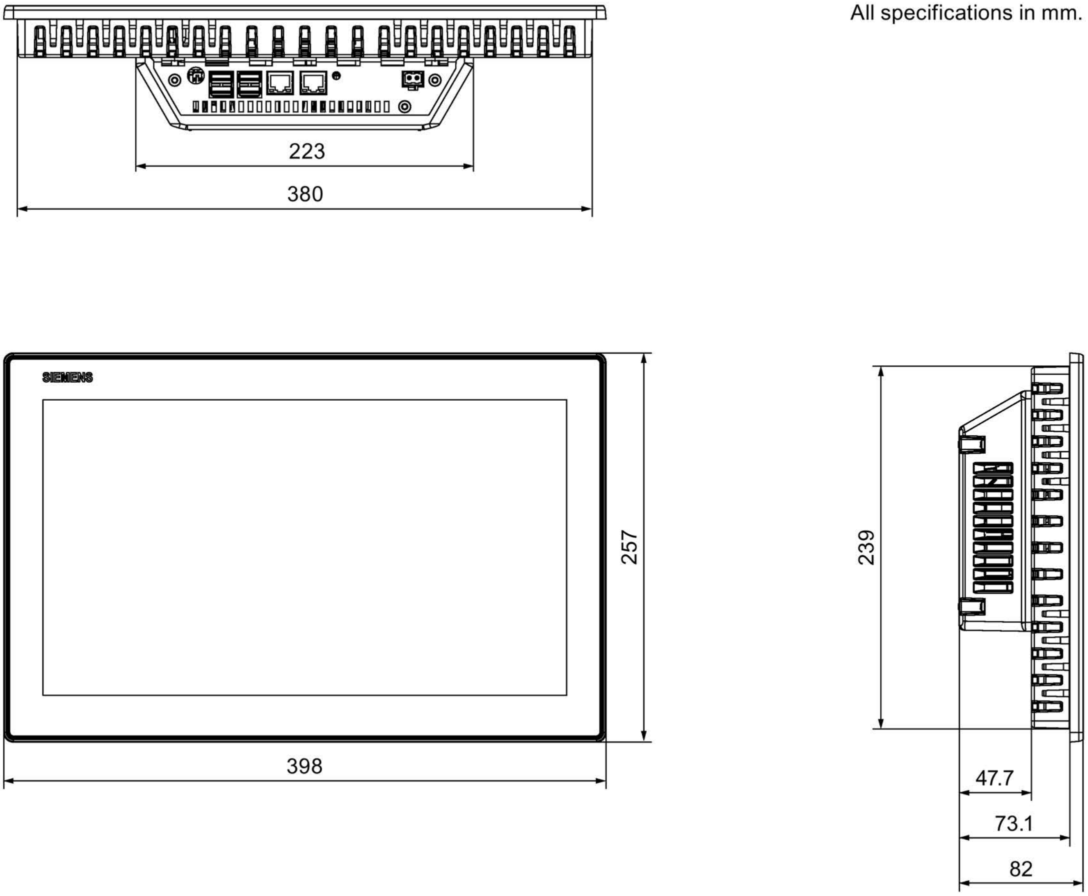
The device meets the requirements of IEC 60529 and UL50.

Device side	Degree of protection
All-round	• IP65 according to IEC 60529 • Enclosure Type 4X/12 (indoor use only) according to UL50

The types of protection can only be ensured if the seals are completely in contact with all mechanical interfaces and the connection compartment and the associated covers are closed.

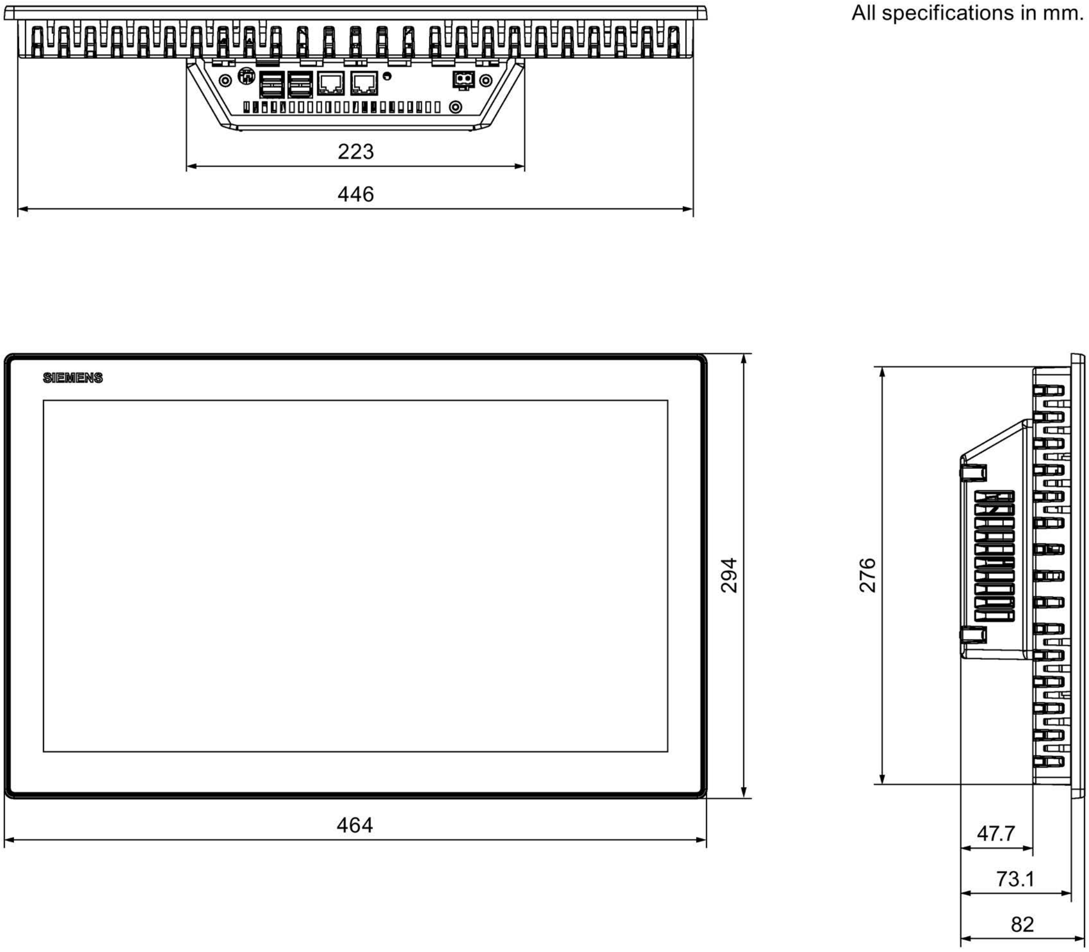
8.6 Dimensional drawings

8.6.1 ITC1500 V3



All specifications in mm.

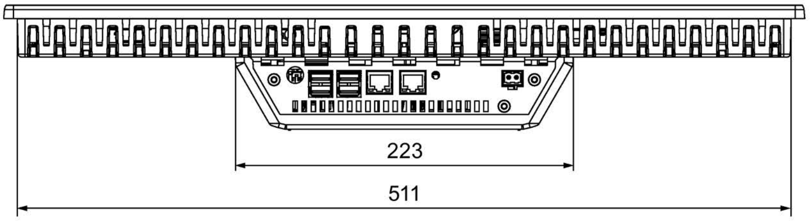
8.6.2 ITC1900 V3

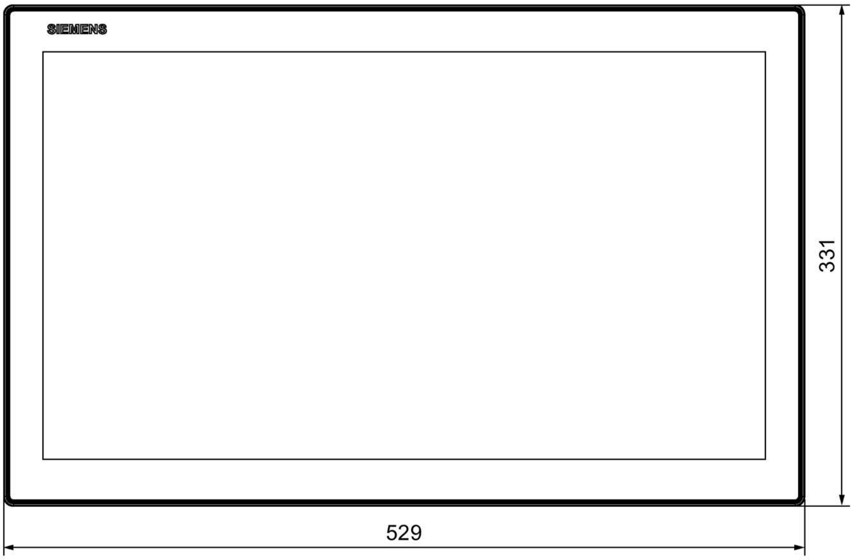


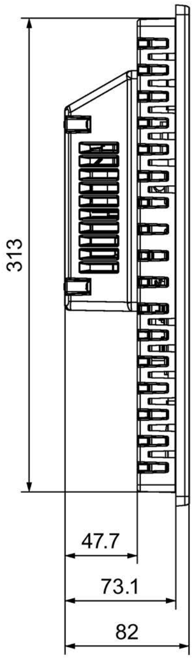
All specifications in mm.

8.6.3 ITC2200 V3

All specifications in mm.

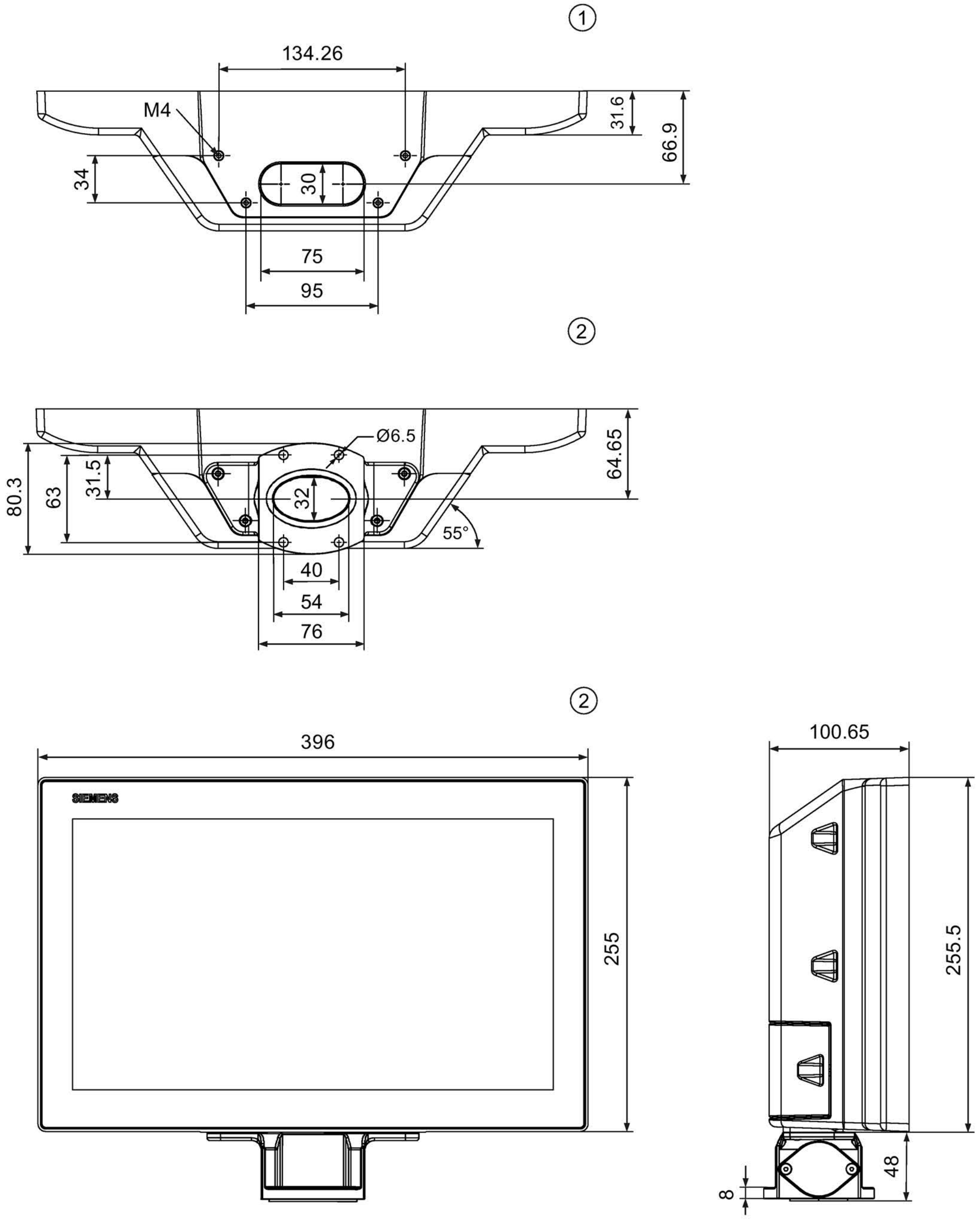






8.6.4 ITC1500 V3 PRO

ITC1500 V3 PRO for pedestal (extendable, flange bottom)

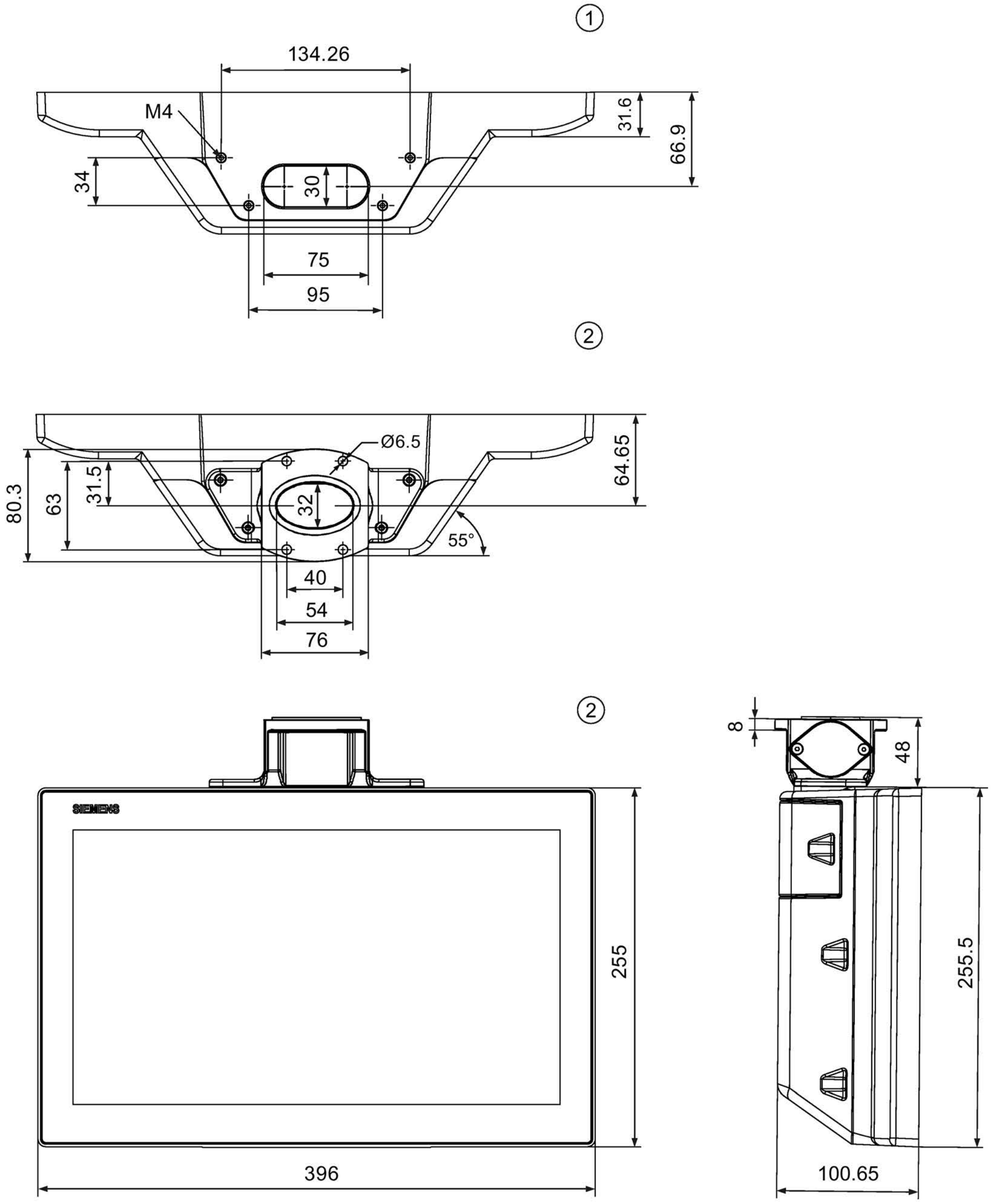


All dimensions in mm.

① Without base adapter

② With base adapter

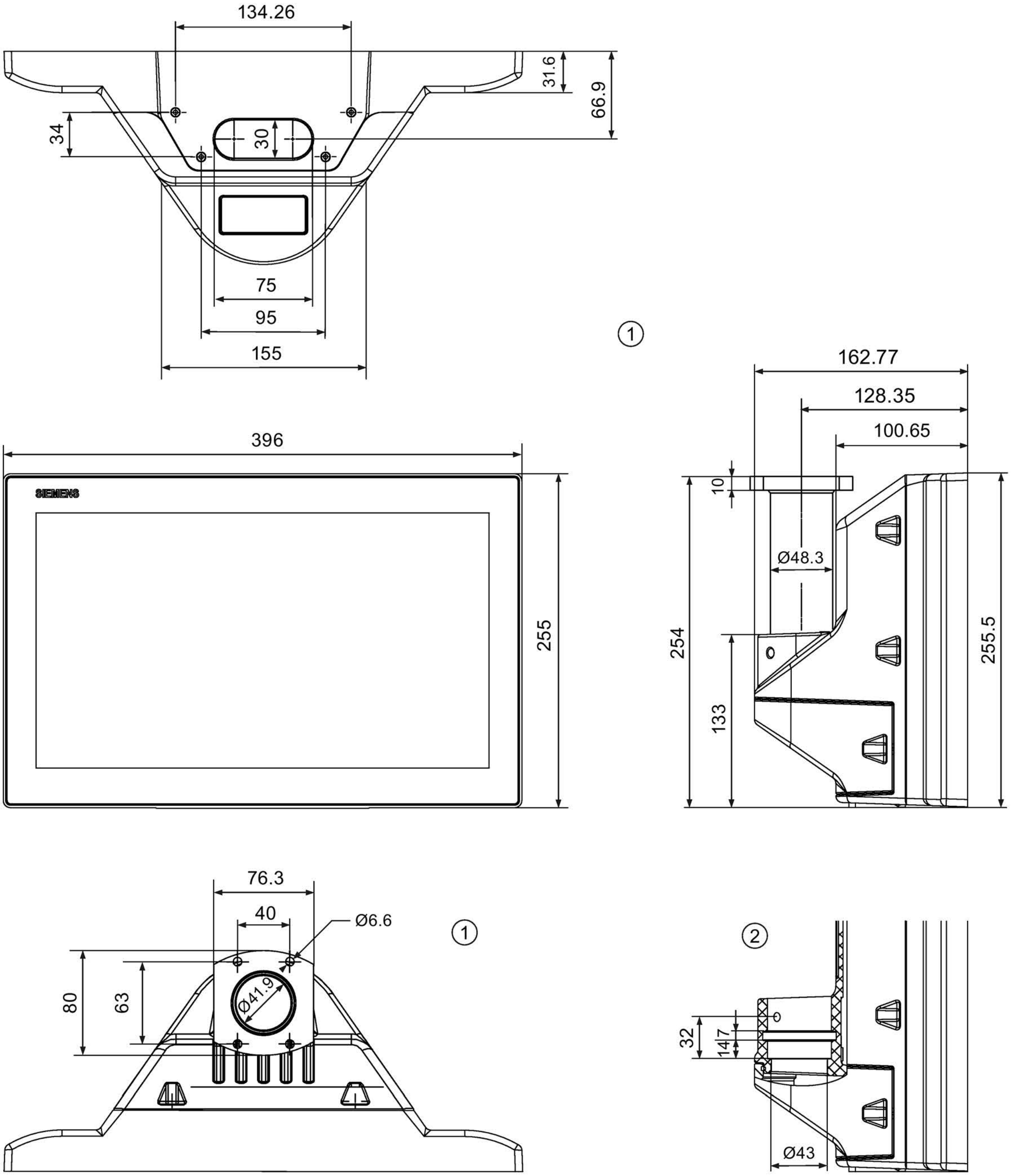
ITC1500 V3 PRO for support arm (not extendable, flange top)



All dimensions in mm.

① Without base adapter
② With base adapter

ITC1500 V3 PRO for support arm (extendable, round tube)



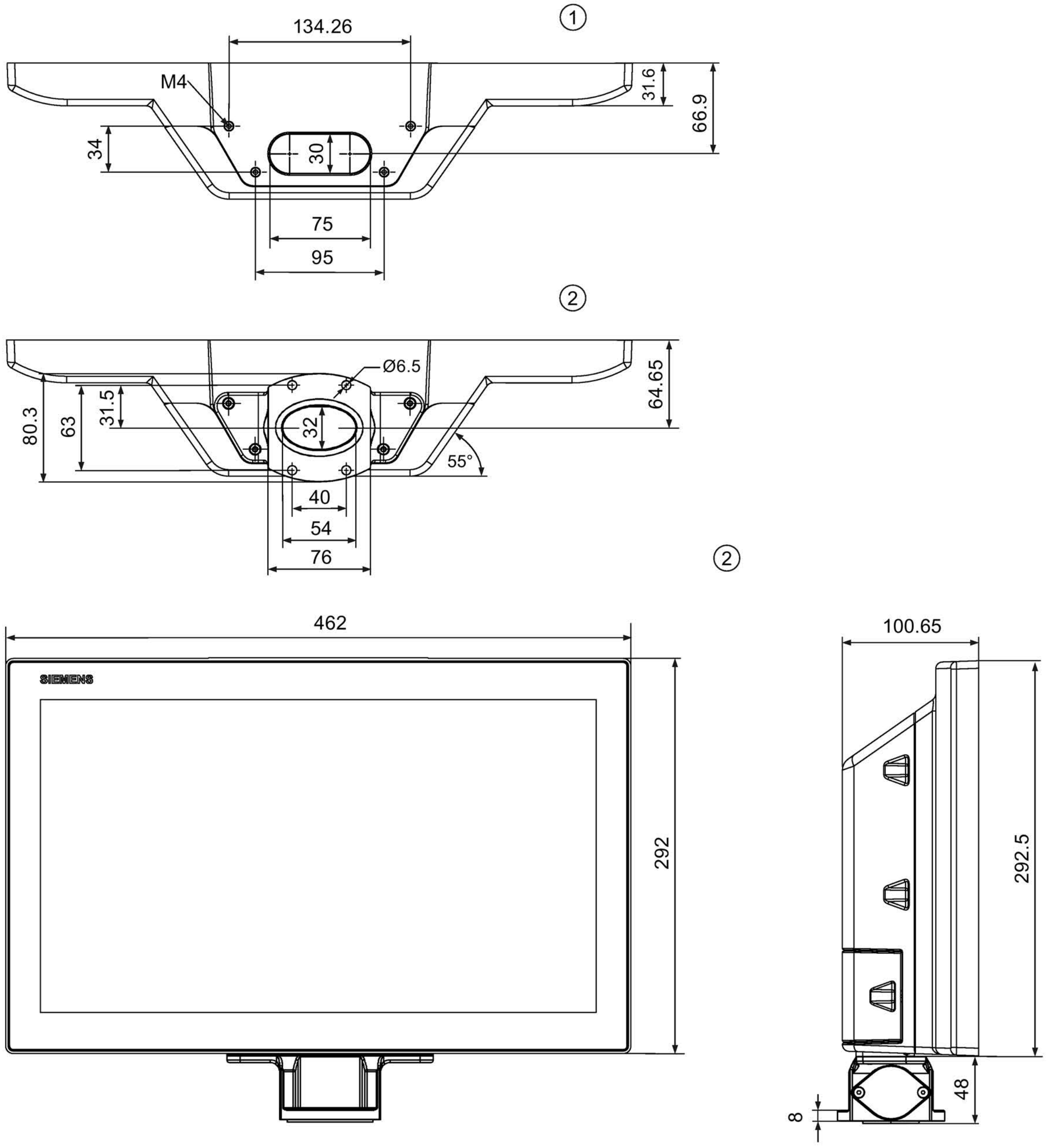
All specifications in mm.

① with flange mount adapter

② without flange mount adapter

8.6.5 ITC1900 V3 PRO

ITC1900 V3 PRO for pedestal (extendable, flange bottom)

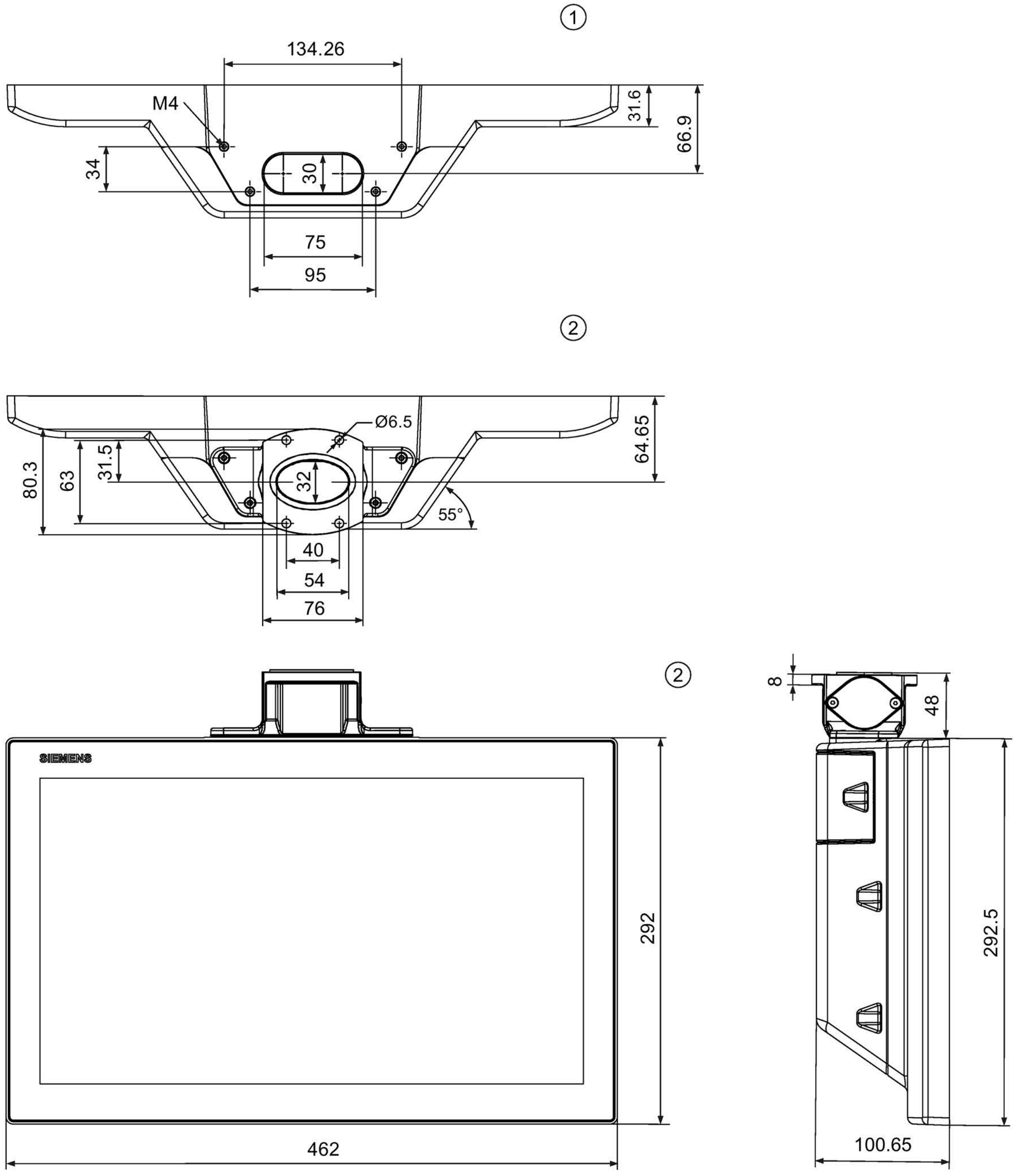


All dimensions in mm.

① Without base adapter

② With base adapter

ITC1900 V3 PRO for support arm (not extendable, flange top)

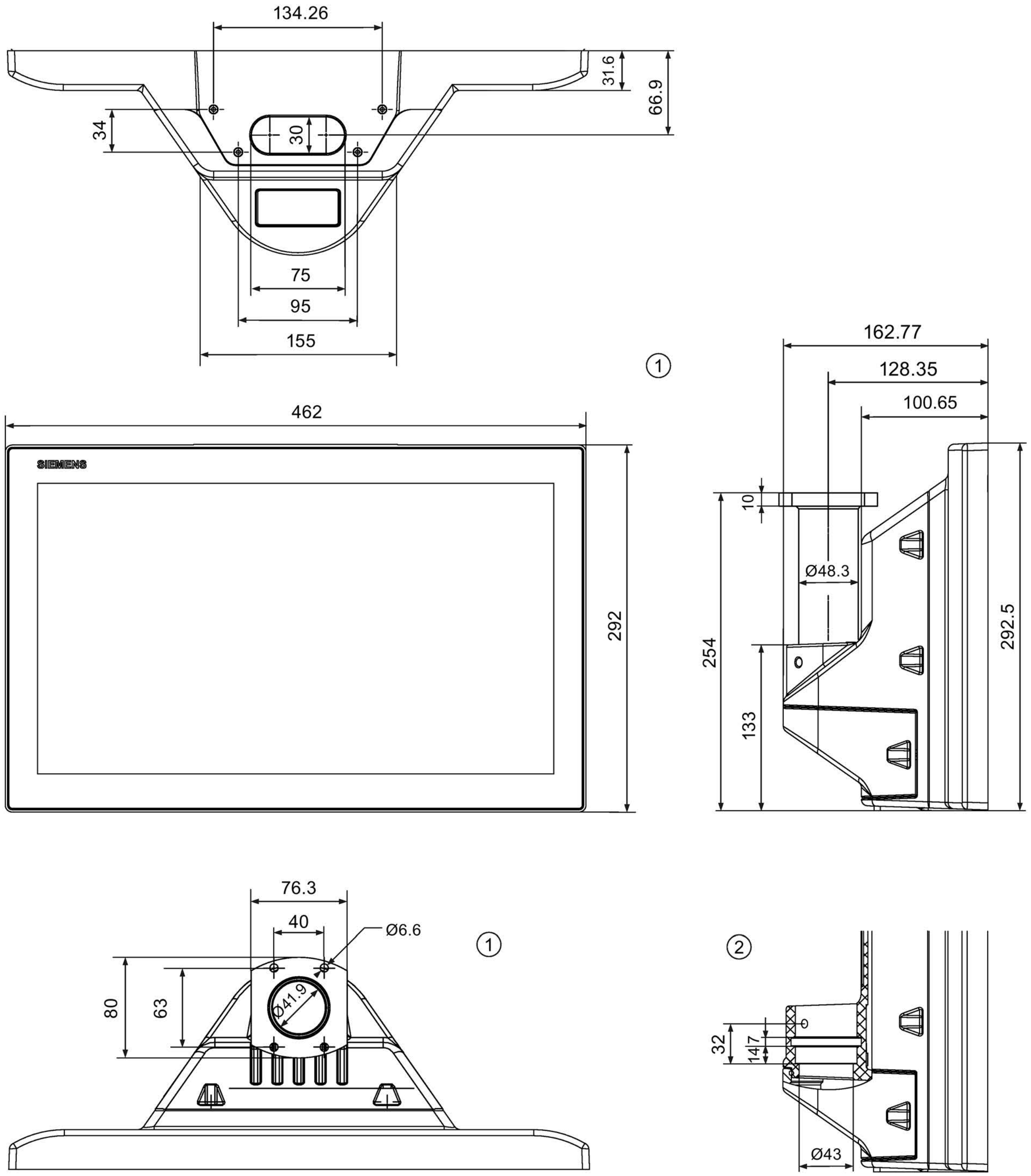


All dimensions in mm.

① Without base adapter

② With base adapter

ITC1900 V3 PRO for support arm (extendable, round tube)



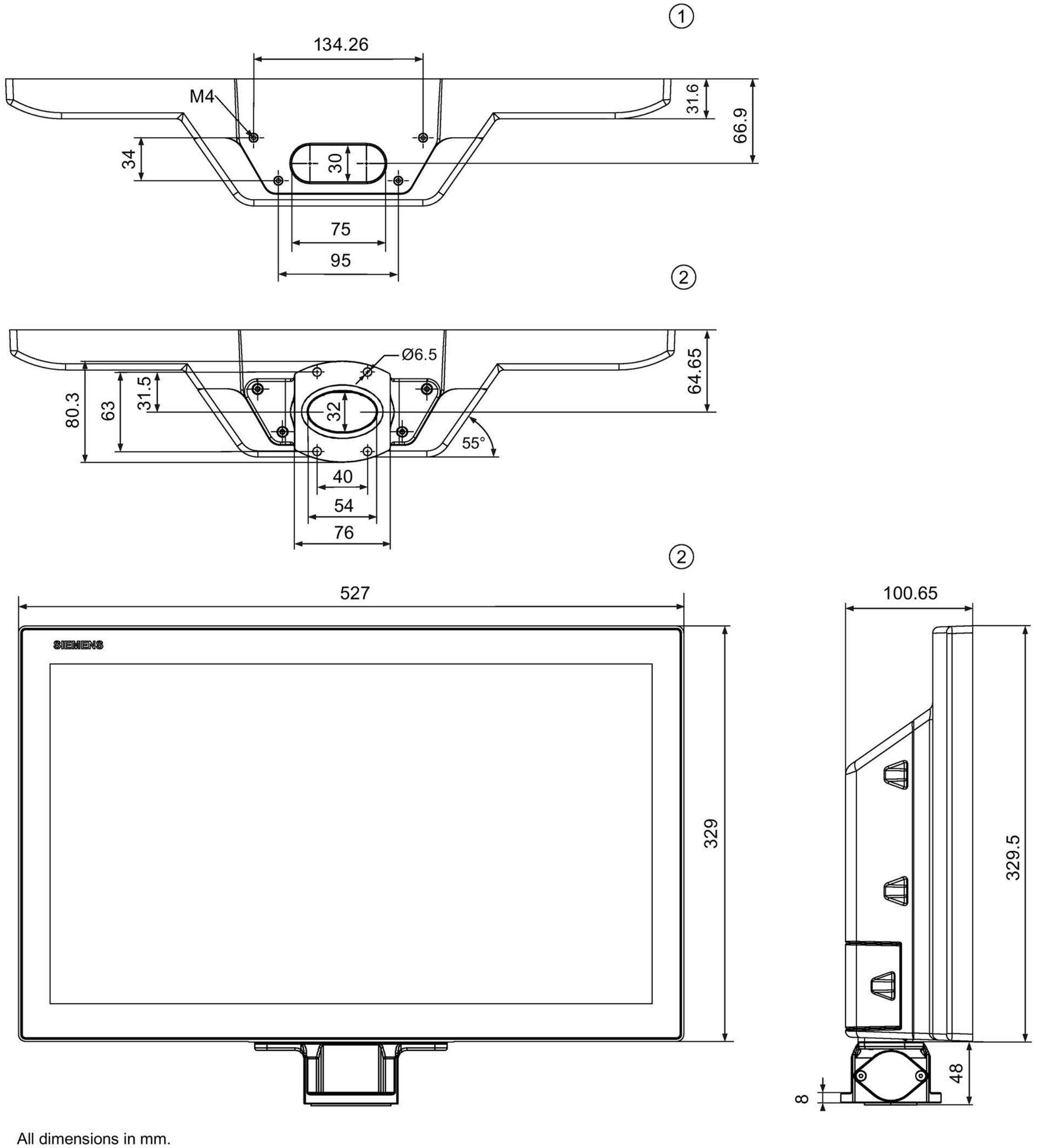
All specifications in mm.

① with flange mount adapter

② without flange mount adapter

8.6.6 ITC2200 V3 PRO

ITC2200 V3 PRO for pedestal (extendable, flange bottom)

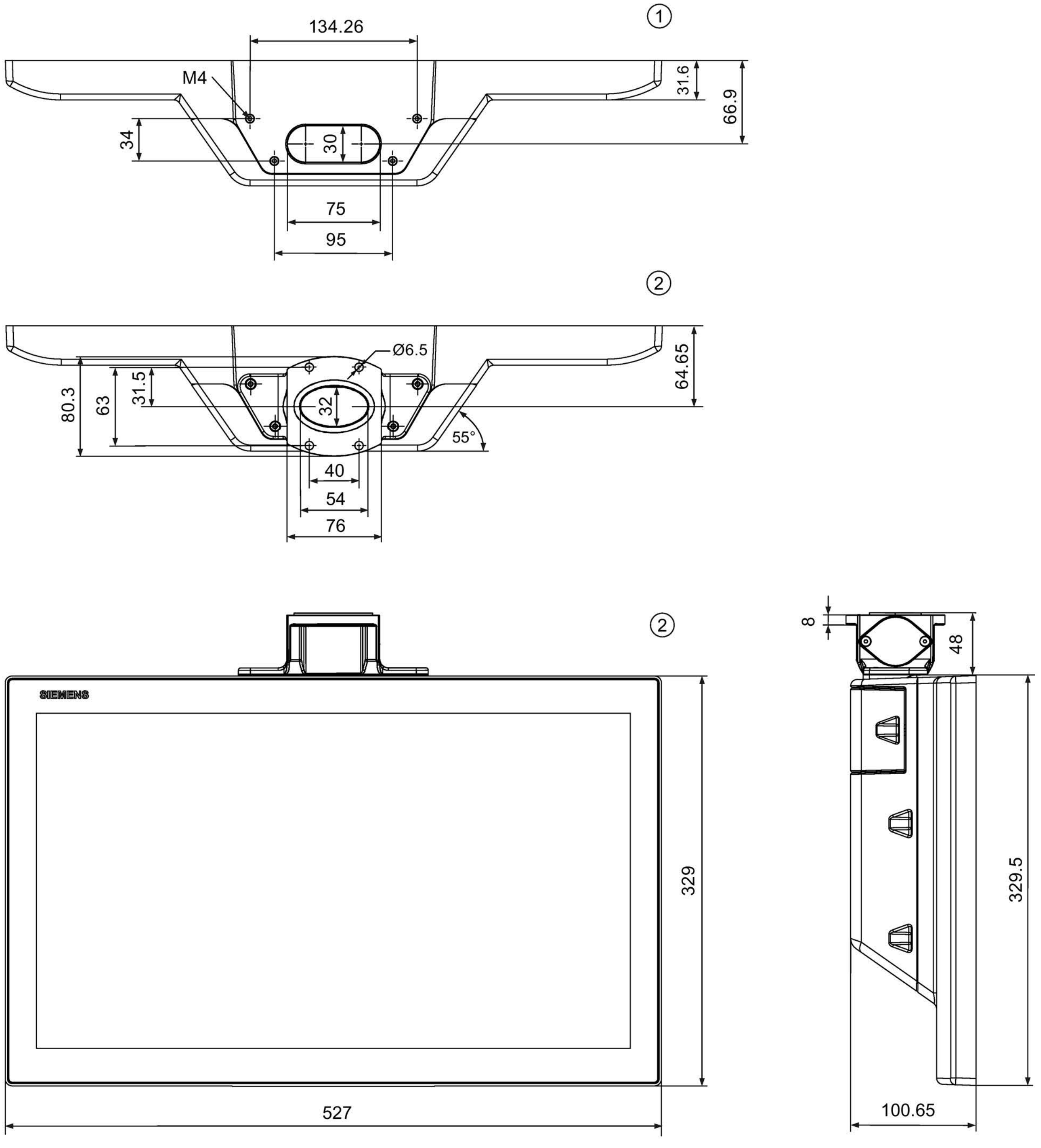


All dimensions in mm.

① Without base adapter

② With base adapter

ITC2200 V3 PRO for support arm (not extendable, flange top)

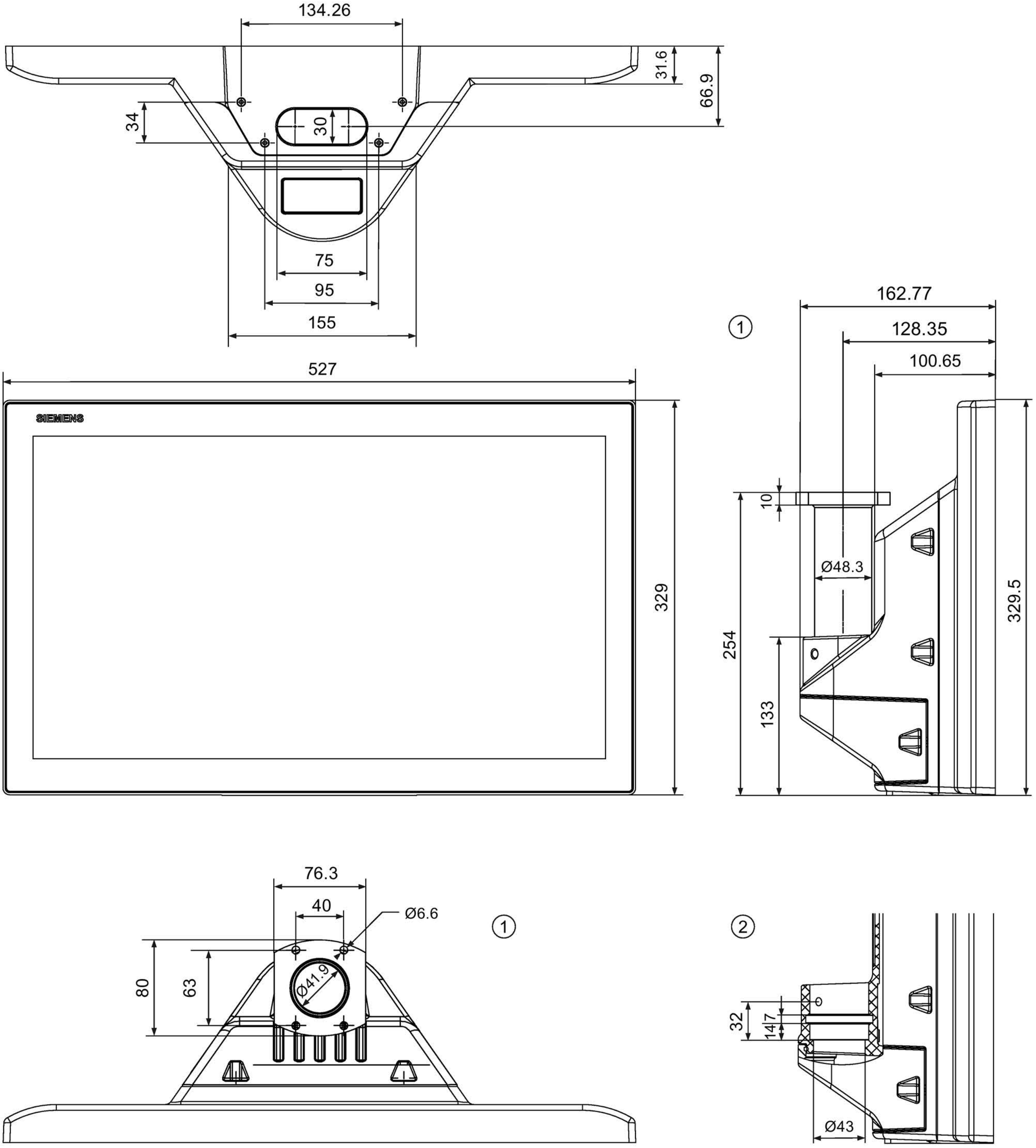


All dimensions in mm.

① Without base adapter

② With base adapter

ITC2200 V3 PRO for support arm (extendable, round tube)



All specifications in mm.

① with flange mount adapter

② without flange mount adapter

8.7 Specifications

Weight

	ITC1500 V3	ITC1900 V3	ITC2200 V3
Weight without packaging, with power supply plug, mounting clips and strain relief plate	5.0 kg	6.1 kg	7.2 kg

Weight of PRO devices for support arm (not extendable, flange top) and for pedestal (extendable, flange bottom)

	ITC1500 V3 PRO	ITC1900 V3 PRO	ITC2200 V3 PRO
Weight without packaging	6.3 kg	7.4 kg	8.5 kg

Weight of PRO devices for support arm (extendable, round tube)

	ITC1500 V3 PRO	ITC1900 V3 PRO	ITC2200 V3 PRO
Weight without packaging	6.2 kg	7.2 kg	8.1 kg

Display

	ITC1500 V3, ITC1500 V3 PRO	ITC1900 V3, ITC1900 V3 PRO	ITC2200 V3, ITC2200 V3 PRO
Type	LCD TFT		
Active display area	15.6" 344.2 x 193.5 mm	18.5" 409.8 x 230.4 mm	21.5" 475.2 x 267.3 mm
Resolution	1366 x 768 pixels		1920 x 1080 pixels
Possible colors	Up to 16 million		
Brightness control	Yes, value range 1 to 100		
Backlighting Half Brightness Life time (MTBF [1])	LED 50000 h		LED 30000 h
Pixel error class in accordance with ISO 9241-307	I		

[1] MTBF: Operating hours after which the maximum brightness is reduced by half compared to the original value. The MTBF increases with reduced brightness or with the use of a screen saver on the server.

Input device

	ITC1500 V3, ITC1500 V3 PRO	ITC1900 V3, ITC1900 V3 PRO	ITC2200 V3, ITC2200 V3 PRO
Touch screen	Yes, projective-capacitive		

Memory

	ITC1500 V3, ITC1500 V3 PRO	ITC1900 V3, ITC1900 V3 PRO	ITC2200 V3, ITC2200 V3 PRO
RAM	2 GB DDR3 SDRAM		
Memory	8 GB SSD		

Interfaces

	ITC1500 V3, ITC1500 V3 PRO	ITC1900 V3, ITC1900 V3 PRO	ITC2200 V3, ITC2200 V3 PRO
X1 P1 PROFINET (LAN)	1 x RJ45 Gigabit Ethernet, 10/100/1000 Mbps [1]		
X1 P2 LAN	1 x RJ45 Gigabit Ethernet, 10/100/1000 Mbps [1]		
X61 ... X64 USB 2.0	4 x Host [2]		

[1] With integrated switch (one IP address only), switch functionality only via LAN

[2] USB type A, maximum load 500 mA, equivalent to USB standard 2.0

Power supply

	ITC1500 V3, ITC1500 V3 PRO	ITC1900 V3, ITC1900 V3 PRO	ITC2200 V3, ITC2200 V3 PRO
Rated voltage Permitted voltage range	24 V DC +19.2 V to +28.8 V		
Rated current	1.4 A	1.4 A	1.7 A
Rated current, load-dependent	1.1 ... 1.7 A	1.1 ... 1.7 A	1.4 ... 2.1 A
Inrush current I^2t	0.5 A^2s		
Power consumption [1]	33.6 W	33.6 W	40.8 W
Maximum permitted transient	35 V (500 ms)		
Minimum time between two transients	50 s		
Internal protection	Yes		

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

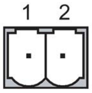
Miscellaneous

	ITC1500 V3, ITC1500 V3 PRO	ITC1900 V3, ITC1900 V3 PRO	ITC2200 V3, ITC2200 V3 PRO
Audio reproduction	Via onboard beeper		

8.8 Description of the ports

8.8.1 Power supply

Plug connector, 2-pin

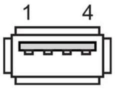


The following table shows the pin assignment of the power supply.

Pin	Assignment
1	+24 VDC
2	GND 24 V

8.8.2 USB

USB socket



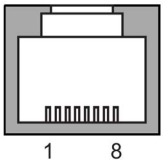
The following table shows the pin assignment of the USB port.

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

8.8.3 PROFINET (LAN), LAN - 10/100/1000 MBit

Names of interfaces on HMI device: X1 P1 and X1 P2

RJ45 plug connector



Pin	Assignment
1	D1+
2	D1–
3	D2+
4	D3+
5	D3-
6	D2-
7	D4+
8	D4-

8.9 Performance data

Performance values

The performance depends on the network capacity in your system. With the SIMATIC WinCC Sm@rtServer option, the performance varies within the values specified in the WinCC documentation.

See also

FAQ 25576569 (http://support.automation.siemens.com/WW/view/en/25576569)

Technical Support

A

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

- Technical support (https://support.industry.siemens.com)
- Support request form (http://www.siemens.com/automation/support-request)
- After Sales Information System SIMATIC IPC/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 (https://mall.industry.siemens.com)

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

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

Current documentation

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

Tools & downloads

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

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

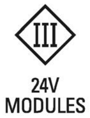
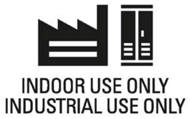
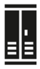
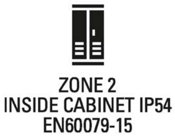
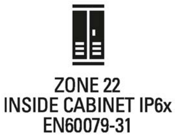
Markings and symbols

B

B.1 Safety-relevant symbols

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

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

Symbol	Meaning	Reference
	Protection class III, supply only with protective low voltage (SELV/PELV)	IEC 60417-1-5180 "Class III equipment"
	Only for industrial applications and indoor areas (control cabinet)	
	Install in control cabinet only	
	Devices approved for Ex Zone 2 in a control cabinet with min. IP54	
	Devices approved for Ex Zone 22 in a control cabinet with min. IP6x	

Abbreviations C

CAL	Client Access License (Windows Server)
DC	Direct Current
DHCP	Dynamic Host Configuration Protocol
DIP	Dual In-Line Package
DNS	Domain Name System
DP	Distributed I/O
ESD	Components and modules endangered by electrostatic discharge
EKS	Electronic Key System
EMC	Electromagnetic Compatibility
EN	European standard
ESD	Components and modules endangered by electrostatic discharge
FAT	File Allocation Table
GND	Ground
HF	High Frequency
HMI	Human Machine Interface
HT	Handheld Terminal
HTML	Hypertext Mark-up Language
HTTP	Hypertext Transfer Protocol
HSK	Horizontal Soft Key
IEC	International Electronic Commission
IP	Internet Protocol
IPC	Industrial Personal Computer
MAC	Media Access Control
MCP	Machine Control Panel
MPI	Multipoint Interface (SIMATIC S7)
MPP	Machine Push Button Panel
MS	Microsoft
MSDN	Microsoft Developer Network
NCK	Numerical Control Kernel
NCU	Numerical Control Unit
NTFS	New Technology File System
OP	Operator Panel
PC	Personal Computer
PCU	Panel Control Unit
PG	Programming device
PLC	Programmable Logic Controller

PPI	Point-to-Point Interface (SIMATIC S7)
PELV	Protective Extra Low Voltage
PN	PROFINET
RDP	Remote Desktop Protocol
RJ45	Registered Jack Type 45
SNC	System Network Center
TCU	Thin Client Unit
TFT	Thin Film Transistor
TFTP	Trivial File Transfer Protocol
TOP	Thin Client Operator Panel
TP	Touch Panel
TS-CAL	Terminal Server Client Access License (Windows Server)
UL	Underwriter’s Laboratory
USB	Universal Serial Bus
VNC	Virtual Network Computing
VSK	Vertical Soft Key

Glossary

Browser

A browser is a computer program that is used to start Web sites in the Internet.

Client-server system

A client/server system is a network structure in which the resources are offered by a central server that the workstations (clients) can access.

Degree of protection

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

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

Domain Name System (DNS)

The DNS is a service in the Internet that converts domain names into IP addresses.

Dynamic Host Configuration Protocol (DHCP)

DHCP enables dynamic assignment of an IP address and additional configuration parameters to computers in a network, via an appropriate server.

Electromagnetic Compatibility (EMC)

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

EMC

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

Ethernet

Ethernet is a fixed-cable data network technology for local area networks (LANs). Ethernet enables data transfer in the form of data frames between all devices that are connected in a local area network, for example, computers, printers.

HMI device

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

Plant

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

PLC

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

Process visualization

Visualization of technical processes by means of text and graphic elements. Configured plant screens allow operator intervention in active plant processes by means of the input and output data.

PROFINET

PROFINET is a standard for an industrial Ethernet in automation systems.

Project

Result of a configuration using a configuration software. The project normally contains several screens with embedded system-specific objects, basic settings and alarms. The project is transferred to an HMI device and monitored and operated with the HMI device.

Protection class

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

Remote Desktop Protocol (RDP)

RDP enables network access to applications that are executed on a Windows Terminal Server. In this process the RDP regulates transmission of screen content and keyboard and mouse inputs over the network.

Screen

Form of the visualization of all logically related process data for a plant. The visualization of the process data can be supported by graphic objects.

Sm@rtServer

The Sm@rtServer option from SIMATIC WinCC (TIA Portal) enables communication between HMI systems based on Ethernet networks or via the Intranet/Internet. This enables an HMI device to be monitored and remotely controlled by another HMI device.

Virtual Network Computing (VNC)

VNC enables network access to applications that are executed on a remote computer regardless of the platform. In this process the VNC controls transmission of screen content and keyboard and mouse inputs over the network.

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