Preface

Purpose of the operating instructions

These operating instructions provide information based on the requirements defined by IEC 62079 for documentation. This information relates to the HMI device, its storage, transportation, place of use, installation, use and maintenance.

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

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

The WinCC flexible Smart online help contains additional information. The online help contains instructions, examples and reference information in electronic form.

Scope

These operating instructions apply to the following Smart HMI devices:

Product name	MLFB number
SIMATIC HMI Smart 700 IE V4	6AV6648-0DC11-3AX0
SIMATIC HMI Smart 1000 IE V4	6AV6648-0DE11-3AX0

Note

The firmware version must be V4.0.2.0 and later versions.

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

The device is self-ventilated and approved for inclined mounting at angles up to +/-35° from the vertical in stationary cabinets.

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

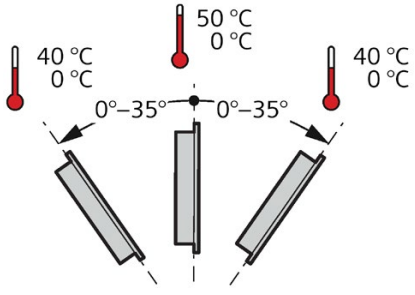
Mounting position

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

Mounting in horizontal format

Ambient temperature in the cabinet with horizontal mounting:

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



Mounting in vertical format

Ambient temperature in the cabinet with vertical mounting:

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

3.1.5 Making the mounting cutout

Note

Stability of the mounting cutout

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

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

Degrees of protection

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

- In order to achieve IP65 protection degree, the material thickness for the mounting cutout should be: 2 mm to 6 mm
- Permitted deviation from plane at the mounting cutout: ≤ 0.5 mm

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

Mounting compatibility

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

Mounting cutout Smart panel	Compatible with the mounting cutouts of the HMI device
Smart 700 IE V4	Smart 700, Smart 700 IE V2, Smart 700 IE V3
Smart 1000 IE V4	Smart 1000, Smart 1000 IE V2, Smart 1000 IE V3

Dimensions of the mounting cutout

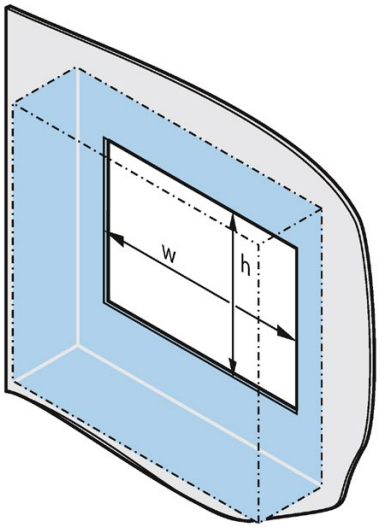
Dimensions of the mounting cutout for the Smart panel in horizontal mounting position:

	w^{+1}_{0}	h^{+1}_{0}
Smart 700 IE	192	138
Smart 1000 IE	259	201

Dimensions of the mounting cutout for the Smart panel in vertical mounting position:

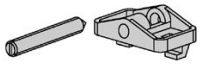
	w^{+1}_{0}	h^{+1}_{0}
Smart 700 IE	138	192
Smart 1000 IE	201	259

All dimensions in mm



3.2 Mounting the HMI device

Required tools and accessories

	Slotted screwdriver, size 2		
	Mounting clips	Smart 700 IE V4	7
		Smart 1000 IE V4	7

Technical specifications

8

8.1 Certificates and approvals

Note

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

CE approval

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

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

RoHS directive

This product meets the requirements stated in the RoHS directive (Restriction of Hazardous Materials): 2011/65/EU

Compliance with the directive has been reviewed according to the following standard: EN IEC 63000

UKCA

The HMI device complies with the designated British standards (BS) published in the official consolidated list of the British Government. The HMI device meets the requirements and protection targets of the following regulations and related amendments:

- Electromagnetic Compatibility Regulations 2016 (EMC)
- Regulations on the restriction of the use of certain hazardous substances in electrical and electronic equipment 2012 (RoHS).

UK Declarations of Conformity for the respective authorities are available from:

Siemens AG
Digital Industries
Factory Automation
DI FA TI COS TT
P.O. Box 1963
D-92209 Amberg

The UK Declaration of Conformity is also available for download from the Siemens Industry Online Support website under the keyword "Declaration of Conformity".

WEEE label (European Union)



Disposal instructions, observe the local regulations and the section "Recycling" (Page 67).

8.2 Electromagnetic compatibility

The device is designed for industrial use.

8.2.1 Emitted interference

The device meets the requirements according to EN/IEC 61000-6-4. The device corresponds to limit class A defined in CISPR 11 or EN 55011.

Note

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

8.2.2 Immunity to interferences

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

8.3 Mechanical ambient conditions

8.3.1 Transport and storage conditions

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

The device meets the requirements according to EN/IEC 61131-2 with the following amendments and limitations:

Type of condition	Permitted range
Free fall	≤ 0,3 m
Vibration to IEC 60068-2-6	5 to 8.4 Hz, deflection 3.5 mm 8.4 to 500 Hz, acceleration 1 g
Shock to IEC 60068-2-27	250 m/s^2, 6 ms, 1000 shocks per axis

8.3.2 Operating Conditions

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

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

The device meets the requirements according to EN/IEC 61131-2 with the following amendments and limitations:

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

8.4 Climatic ambient conditions

8.4.1 Transport and storage conditions

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

The device meets the requirements according to EN/IEC 61131-2 with the following amendments and limitations:

Type of condition	Permitted range
Temperature	–20 °C to +60 °C
Atmospheric pressure	1140 to 660 hPa, corresponds to an elevation of -1000 m to 3500 m
Relative humidity	10% to 90%, without condensation
Pollutant concentration	SO_2: < 0.5 ppm; Relative humidity < 60%, no condensation H_2S: < 0.1 ppm; Relative humidity < 60%, no condensation

Note

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

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

8.4.2 Operating Conditions

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

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

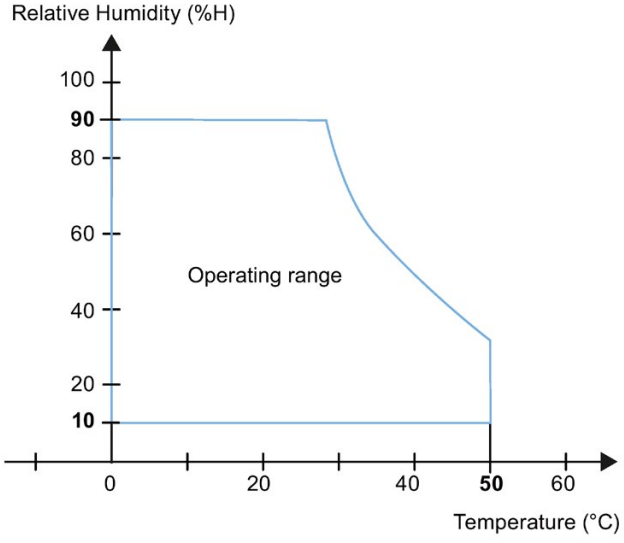
The device meets the requirements according to EN/IEC 61131-2 with the following amendments and limitations:

Type of condition		**Permitted range**
Temperature, device in landscape format	Vertical installation	0 °C to 50 °C
	Inclined installation up to 35°	0 °C to 40 °C
Temperature, device in portrait format	Vertical installation	0 °C to 40 °C
	Inclined installation up to 35°	0 °C to 35 °C
Atmospheric pressure	1140 to 795 hPa, corresponds to an elevation of -1000 m to 2000 m	
Relative humidity	10% to 90%, without condensation	
Pollutant concentration	SO_2: < 0.5 ppm; Relative humidity < 60%, no condensation H_2S: < 0.1 ppm; Relative humidity < 60%, no condensation	

8.4.3 Climate diagram

The diagram below shows the extended range for temperature and humidity during operation based on EN/IEC 61131-2.

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



8.5 Protection classes

8.5.1 Insulation test

The device meets the requirements according to EN/IEC 61010-2-201.

Circuits with a nominal voltage of U_e to other circuits or ground	Test voltage
< 50 V	707V DC

8.5.2 Protection against foreign objects and water

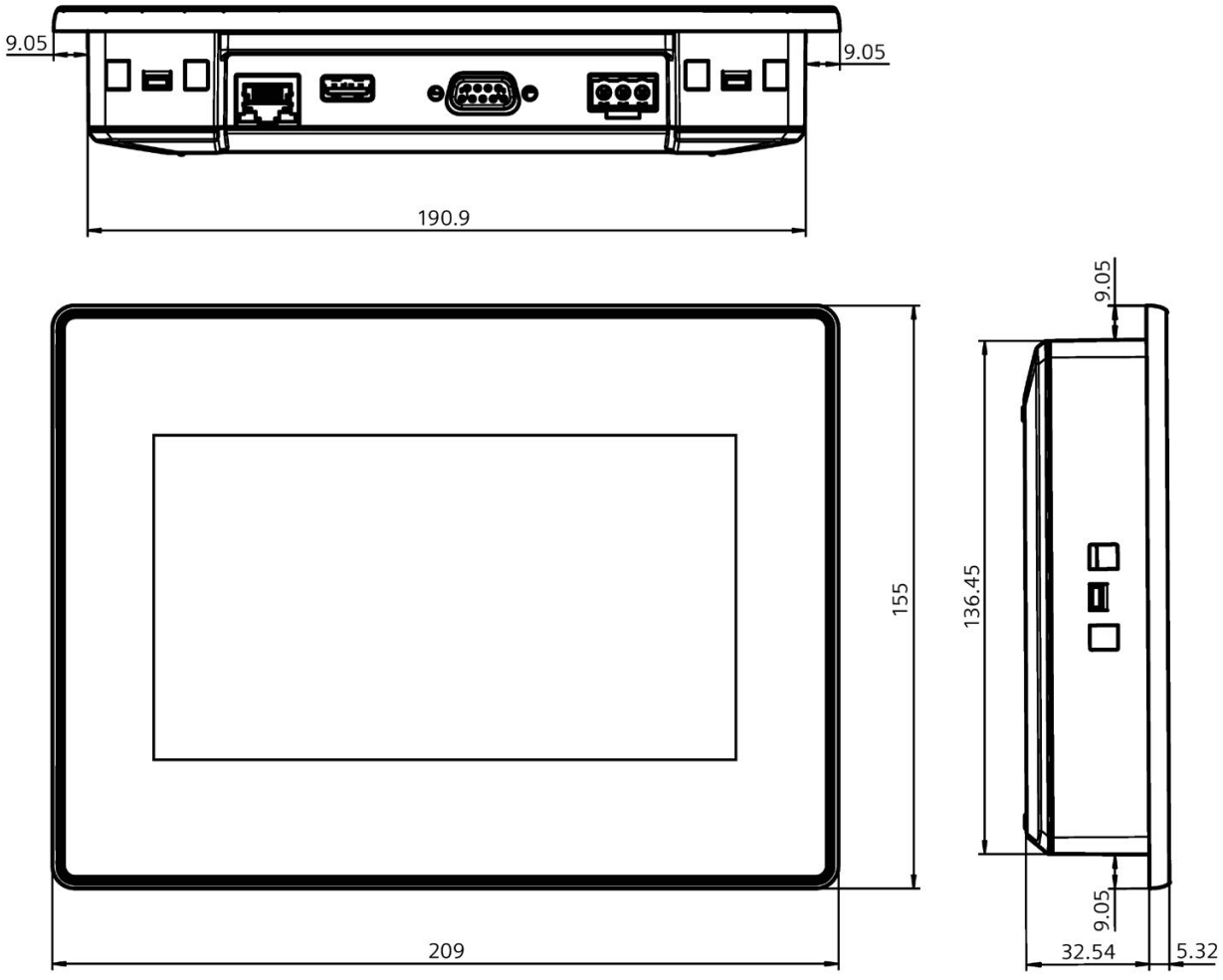
The device meets the requirements according to EN 60529.

Device side	Degree of protection
Front	IP65, when mounted
Rear	IP20, Touch protection test with standard test probes. There is no protection against ingress by water.

The degree of protection of the device front can only be guaranteed if the mounting seal lies flush against the mounting cutout. Read the corresponding information in chapter "Making the mounting cutout (Page 21)".

8.6 Dimension drawings

8.6.1 Dimension drawing of Smart 700 IE V4



All dimensions in millimeters

8.8 Technical data

Weight

	Smart 700 IE V4	Smart 1000 IE V4
Weight without packaging	Approx. 770 g	Approx. 1200 g

Display

	Smart 700 IE V4	Smart 1000 IE V4
Type	LCD TFT	
Active display area	154.1 x 85.9 mm (7")	222.7 x 125.3 mm (10.1")
Resolution	800 x 480 pixels	1024 x 600 pixels
Possible colors	24-bit (16M colors)	
Brightness control	-	
Backlighting Half Brightness Life Time (MTBF [1])	LED 20,000 h	LED 15,000 h
Pixel error class in accordance with EN ISO 9241-307	II	

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

Input device

	Smart 700 IE V4	Smart 1000 IE V4
Type	Touch screen, analog resistive	

Memory

	Smart 700 IE V4	Smart 1000 IE V4
Data memory	256 MBytes	
Program memory	256 MBytes	

Interfaces

	Smart 700 IE V4	Smart 1000 IE V4
1 x RS 422/485	max. 187.5 Kbits/s	
1 x Industrial Ethernet RJ45	10/100 Mbits/s, with auto-crossover	
1 x USB 2.0	max. 500 mA	

Supply voltage

		Smart 700 IE V4	Smart 1000 IE V4
Rated voltage Permitted voltage range		+24 V DC 19.2 to 28.8 V (–20%, +20%)	
Maximum permitted transients		35 V (500 ms)	
Minimum time between two transients		50 s	
Power consumption [1]		4.8 W	5.3 W
Current consumption	typical	Approx. 200 mA	Approx. 230 mA
	Maximum constant current	Approx. 380 mA	Approx. 400 mA
	Inrush current I^2t	Approx. 0.1 A^2s	
Fuse, internal		Electronic	

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

Miscellaneous

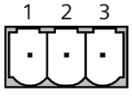
	Smart 700 IE V4	Smart 1000 IE V4
Buffered real-time clock [1], can be synchronized	Yes	
Acoustic feedback	Yes	

[1] Typical buffer time: 6 weeks

8.9 Ports description

8.9.1 DC24V - X80

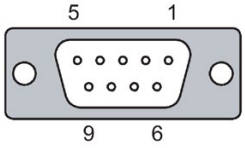
2-pin socket



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

8.9.2 PPI / RS422 / RS485 - X2

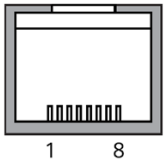
Sub-D socket, 9-pin, with screw lock



Pin	Assignment for the RS 422	Assignment for the RS 485
1	not connected	not connected
2	not connected	not connected
3	TxD+	Data channel B (+)
4	RxD+	RTS
5	GND 5 V, floating	GND 5 V, floating
6	+5 V DC, floating	+5 V DC, floating
7	not connected	not connected
8	TxD–	Data channel A (–)
9	RxD–	NC

8.9.3 Ethernet (LAN) - X1

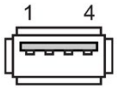
RJ45 socket



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

8.9.4 USB - X60

USB socket



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

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

8.10 Communication with PLCs

Compatible PLCs

The following PLC types can be used with the Smart V4 panels.

PLC type	Supported protocols
SIEMENS S7-200	Ethernet, PPI, MPI
SIEMENS S7-200 CN	Ethernet, PPI, MPI
SIEMENS S7-200 Smart	Ethernet, PPI, MPI
SIEMENS LOGO!	Ethernet
Mitsubishi FX *	Serial point-to-point
Mitsubishi Protocol 4 *	Serial Multi Point
Modicon Modbus PLCs *	Serial point-to-point
Omron CP, CJ *	Serial Multi Point

* Typical PLCs of this PLC type have been successfully tested and approved.