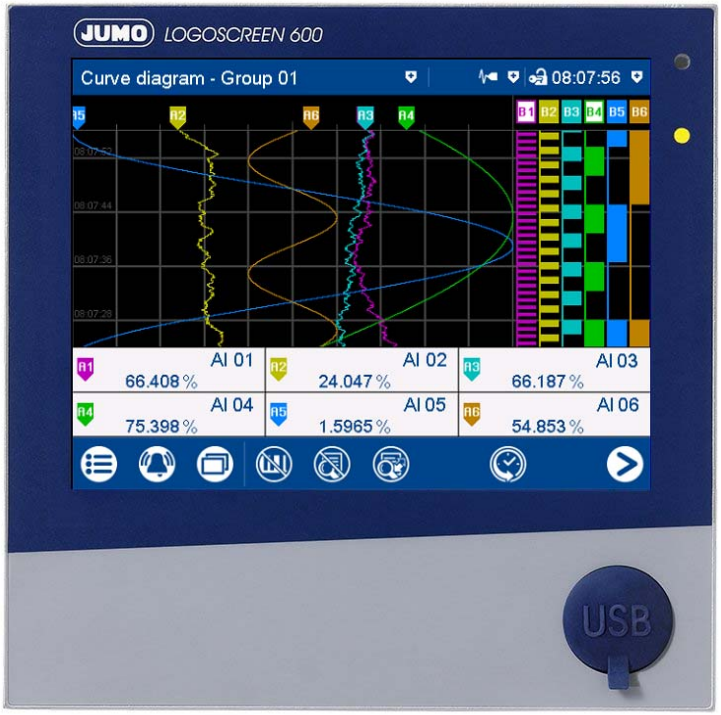
JUMO LOGOSCREEN 600

Paperless Recorder with Touchscreen



Brief Instructions

70652000T97Z001K000

V6.00/EN/00625186

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1.1 Safety information

1.1.1 Warning symbols

DANGER!
This symbol indicates that **personal injury caused by electrical shock** may occur if the respective precautionary measures are not carried out.

WARNING!
This symbol in connection with the signal word indicates that personal injury may occur if the respective precautionary measures are not carried out.

CAUTION!
This symbol in connection with the signal word indicates that **damage to assets or data loss** will occur if the respective precautionary measures are not taken.

CAUTION!
This symbol indicates that **components could be destroyed** by electrostatic discharge (ESD = Electro Static Discharge) if the respective cautionary measures are not taken.
Only use the ESD packages intended for this purpose to return device inserts, assembly groups, or assembly components.

READ DOCUMENTATION!
This symbol – placed on the device – indicates that the associated **device documentation has to be observed**. This is necessary to recognize the kind of the potential hazards as well as the measures to avoid them.

1.1.2 Note symbols

NOTE!
This symbol refers to **important information** about the product, its handling, or additional use.

REFERENCE!
This symbol refers to **further information** in other sections, chapters, or manuals.

FURTHER INFORMATION!
This symbol is used in the tables and refers to **further information** in connection with the table.

DISPOSAL!
This device and the batteries (if installed) must not be disposed in the garbage can after use! Please ensure that they are disposed properly and in an **environmentally friendly manner**.

1.1.3 Intended use

The device is designed for use as a paperless recorder in an industrial environment as specified in the technical data. Other uses or uses beyond those defined are not viewed as intended uses.

The device has been manufactured in compliance with applicable standards and directives as well as applicable safety regulations. Nevertheless, personal injury or material damage may occur in the event of improper use.

To avoid danger, the device may only be used:

- For the intended use
- When in good order and condition
- When taking into account the technical documentation provided

Risks resulting from the application may arise, e.g. as the result of missing safety provisions or wrong settings, even when the device is used properly and as intended.

1.1.4 Qualification of personnel

This document contains the necessary information for the intended use of the device to which it relates.

It is intended for staff with technical qualifications who have been specially trained and have the appropriate knowledge in the field of automation technology.

The appropriate level of knowledge and the technically fault-free implementation of the safety information and warnings contained in the technical documentation provided are prerequisites for risk-free mounting, installation, and startup as well as for ensuring safety when operating the described modules. Only qualified personnel have the required specialist knowledge to correctly interpret and implement the safety information and warnings contained in this document in specific situations.

1.2 Acceptance of goods, storage, and transport

1.2.1 Checking the delivery

- Ensure that the packaging and contents are not damaged
- Check that the delivery is complete using the delivery papers and the order details
- Inform the supplier immediately if there is any damage
- Store damaged parts until clarification is received from the supplier

1.2.2 Notes on storage and transport

- Store the device in a dry, clean environment. Observe the admissible environmental conditions (see "Technical data")
- Protect the device from shock during transport
- The original packaging provides optimum protection for storage and transport

1.2.3 Returning goods

In the event of repair, return the complete device in clean condition.
Use the original packaging to return goods.

Accompanying letter for repair

Please include the completed accompanying letter for repair when returning goods.
Do not forget to state the following:

- Description of the application and
- Description of the error that has occurred

The accompanying letter for repair can be downloaded online from the manufacturer's homepage (use the search function if necessary).

Protection against electrostatic discharge (ESD)

(ESD = electrostatic discharge)
To prevent damage due to ESD, electronic modules or components must be handled, packaged, and stored in an ESD-protected environment. Measures against electrostatic discharge and electrical fields are described in DIN EN 61340-5-1 and DIN EN 61340-5-2 "Protection of electronic devices from electrostatic phenomena".

When returning electronic modules or components, please note the following:

- Pack sensitive components only in an environment providing protection against ESD. Workspaces such as this divert electrostatic charges to ground in a controlled manner and prevent static charges due to friction.
- Use only packaging intended specifically for ESD-sensitive modules/components. These must consist of conductive plastics.

No liability can be assumed for damage caused by ESD.

1 Introduction

CAUTION!
Electrostatic charges occur in non-ESD-protected environments.
Electrostatic discharges can damage modules or components.
For transport purposes, use only the ESD packaging provided.

1.2.4 Disposal

Disposing of the device

DISPOSAL!

Devices and/or replaced parts should not be placed in the refuse bin at the end of their useful life as they consist of materials that can be recycled by specialist recycling plants.

Dispose of the device and the packaging material in a proper and environmentally friendly manner.

For this purpose, observe the country-specific laws and regulations for waste treatment and disposal.

Disposing of the packaging material

The entire packaging material (cardboard packaging, inserts, plastic film, and plastic bags) is fully recyclable.

1.3 Identifying the device version

1.3.1 Nameplate

The nameplate is affixed to the case.

Contents

The nameplate contains important information. This includes:

Description	Description on the nameplate	Example
Device type	Type	706520/18-100-25/260
Part no.	PN	00XXXXXX
Serial number	F-no.	0070033801215510006
Voltage supply	-	DC 24 V +25/-20 %

Device type (type)

Compare the specifications on the nameplate with the order.

Identify the supplied device version using the order details (order code).

Part no. (PN)

The part no. clearly identifies an article in the catalog. It is important for communication between the customer and the sales department.

Fabrication no. (F-no.)

Among other things, the fabrication number contains the date of production (year/week).

Example: F-no. = 007003380121551**0006**

The characters in question are in positions 12, 13, 14, and 15 (from the left).

The device was therefore produced in the 51st calendar week of 2015.

1.3.2 Order details

	(1)	**Basic type**
706520		Paperless recorder with 1x Ethernet, 2x USB (1x host, 1x device), and 1x RS232/485 interface and one relay
	(2)	**Basic type extension**
0		Without software package
1		With software package (setup program incl. USB cable, PC Evaluation Software PCA3000, PCA Communication Software PCC; in conjunction with extra code „888“: additionally with software PC Security Manager PCS and PC Audit-Trail Manager PCAT)
	(3)	**Language**
8		Set per default (German/English)
9		Set according to customer specifications
	(4)	**Option 1 (expansion slot 1)**[1]
0		Not used
1		3 analog and 6 digital inputs, 1 analog output
	(5)	**Option 2 (expansion slot 2)**[a]
0		Not used
1		3 analog and 6 digital inputs, 1 analog output
	(6)	**Option 3 (expansion slot 3)**[a]
0		Not used
1		12 digital inputs/outputs (independently configurable as input or output)
	(7)	**Voltage supply**
23		AC 110 to 240 V +10/-15 %, 48 to 63 Hz
25		AC/DC 20 to 30 V, 48 to 63 Hz
	(8)	**Extra code**
.		Not used
260		Math and logic module (6 channels each)
	(9)	**Extra code**
.		Not used
887		Manipulation detection with digital certificate
888		FDA 21 CFR Part 11 with digital certificate
	(10)	**Extra code case**
.		Not used
970		Universal carrying case Compact[2]

[1] Subsequent expansion is only possible in JUMO Central Services.

[2] This extra code is only available in combination with voltage supply AC 110 to 240 V. The UL approval is not applicable. Use only by technically qualified personnel who are specially trained and have the relevant knowledge in the field of automation technology! Observe the ambient temperature and the protection type (see technical data)!

	(1)		(2)	(3)		(4)	(5)	(6)		(7)		(8)		(9)		(10)
Order code		/			-				-		/		,		,	
Order example	706520	/	1	8	-	1	0	0	-	23	/	260	,	887	,	970

1.3.3 Scope of delivery

1 paperless recorder in the ordered version
1 brief instructions
4 mounting elements
1 CD with detailed operating manual and supplementary documentation

1.3.4 Accessories

Description	**Part no.**
Setup program	00645110
USB cable, A-plug to micro-B-plug, 3 m	00616250
PC Evaluation Software PCA3000	00431882
PCA Communication Software PCC	00431879
PC software package consisting of: Setup program, PC Evaluation Software PCA3000, PCA Communication Software PCC, PC Security Manager PCS and PC Audit-Trail Manager PCAT. Please specify all version numbers when placing repeat orders.	00666817
USB memory stick, 2 GB[1]	00505592
Activation for math and logic module (setup program required)	00393217
TP-LINK TL-WR710N (Wi-Fi router)	00658592

[1] The USB memory stick indicated has been tested and is designed for industrial applications. No liability is assumed for other brands.

1 Introduction

1.4 Content of the technical documentation

The documentation for this device is addressed to equipment manufacturers (OEMs) and users with appropriate technical expertise; it consists of the following documents.

1.4.1 Device documentation in printed form

70652000T97...

Brief instructions

A hard copy of the brief instructions is part of the scope of delivery of the device.

The brief instructions describe the installation, the electrical connection and the operation of the device. They also contain the order details and a list of technical data.

The brief instructions are an excerpt from the operating manual.

1.4.2 Device documentation in the form of PDF files

The documents specified below are stored as PDF files on the CD contained in the scope of delivery of the device. They can also be downloaded from the manufacturer's website.

70652000T10...

Data sheet

The data sheet contains general information about the device, the order details, and the technical data. It forms the basis for selecting the device and making a purchasing decision.

70652000T90...

Operating manual

The operating manual contains full details on installation, the electrical connection, operation, parameterization and configuration of the device. In addition, it contains the order details and a list of technical data.

In the case of the present device, the operating manual also describes the use of the setup program (PC program) with which the device can also be configured.

70652000T92...

Interface description (Modbus)

The interface description provides information on communication with other devices or superordinate systems using the Modbus protocol (Modbus RTU, Modbus/TCP).

In the case of the present device, the interface description contains specifications on communication via Ethernet.

70652000T97...

Brief instructions

The brief instructions are also available as a PDF file and have the same scope as the printed document.

1.4.3 Documentation for optional software

The following manuals in the form of PDF files are available for download from the manufacturer's website. They also form part of the scope of delivery of the respective software.

B 709701.0

PC Evaluation Software PCA3000

The operating manual describes the operation and the features of the PC Evaluation Software. The PC Evaluation Software helps to visualize and evaluate the recorded registration data (measurement data, batch data, messages, etc.).

B 709702.0

PCA Communications Software PCC

The operating manual describes the operation and the features of the PCA Communication Software. The PCA Communication Software is responsible for the data transfer from a device or system to a PC or to a network.

B 709703.0

PC Security Manager software PCS

The operating manual describes the operation and the features of the PC Security Manager software. PCS ensures that only authorized persons can gain access to the system components (device, PC software) and sign electronic signatures in electronic documents. The configuration of the Security Manager can only be performed by the system administrator.

PCS is only available for devices with extra code 888.

B 709704.0

PC Audit Trail Manager software PCAT

The operating manual describes the operation and the features of the PC Audit Trail Manager software. PCAT documents actions performed in the PC software components which lead to modifications of files, user lists (rights files), device lists, etc. The different message types are: “Information”, “Warnings”, and “Errors”. Audit trail recordings cannot be modified.

Device audit trail data is not shown in PCAT, only in PCA3000.

PCAT is only available for devices with extra code 888.

1.5 Device version

The device version of the paperless recorder can be determined through the software version (SW version) of the device. The software version is displayed in the "Device info" menu (Main menu > Device info > Versions > Basic device: SW version).

Structure of the software version number (SW version): 323.xx.yy
323 = basic version, xx = device version, yy = current version

In this document, functions which depend on the device version are marked accordingly (e.g. "as of device version 02").

1.6 Functions of the device version 02

New functions

The following new functions were implemented in device version 02.

- Extra code 887 "Manipulation detection with digital certificate": manipulation detection for the recording data by using a certificate (during saving and transfer)
- Extra code 888 "FDA 21 CFR Part 11 with digital certificate": FDA compliant data recording with special input masks and functions; manipulation detection with digital certificate
- Additional user rights
- User management with PC Security Manager software (PCS) for up to 50 users (only with extra code 888)
- Separate transfer of user table and user groups even for a device without extra code 888
- Electronic signature of the batch report (only with extra code 888)
- Electronic signature for a certain time period (only with extra code 888)
- Electronic signature for user logoff (only with extra code 888)
- Authentication prior to entering the comment text
- Additional objects in process image editor: entering values and text
- Additional barcode functions: control characters for reading event text and process values
- General limit value monitoring functions: limit value and switching differential adjustable in the parameterization as well as through Modbus
- Online visualization configurable as standard version or user version

With extra code 888 the device fully supports the requirements for data recording according to the rules 21 CFR Part 11 of the United States Food and Drug Administration.

The extra code 887 or 888 give the device a TÜV certified function for ensuring data security. A digital device certificate provides proof that the recording data has not been manipulated in the device or during transfer.

Changed functions

The following functions were changed from device version 01:

- Flash manager function "Saving all recording data on USB flash drive (backup)": the user can select a time period from which the recording data is saved. In addition, the current readings of the counters and integrators as well as the statistic (report) – even if they have not yet been completed – can be saved along with the recording data.
- General limit value monitoring functions: increased amount to 24
- Batch texts, comment text: maximum number of characters increased to 160

2.1 Brief description

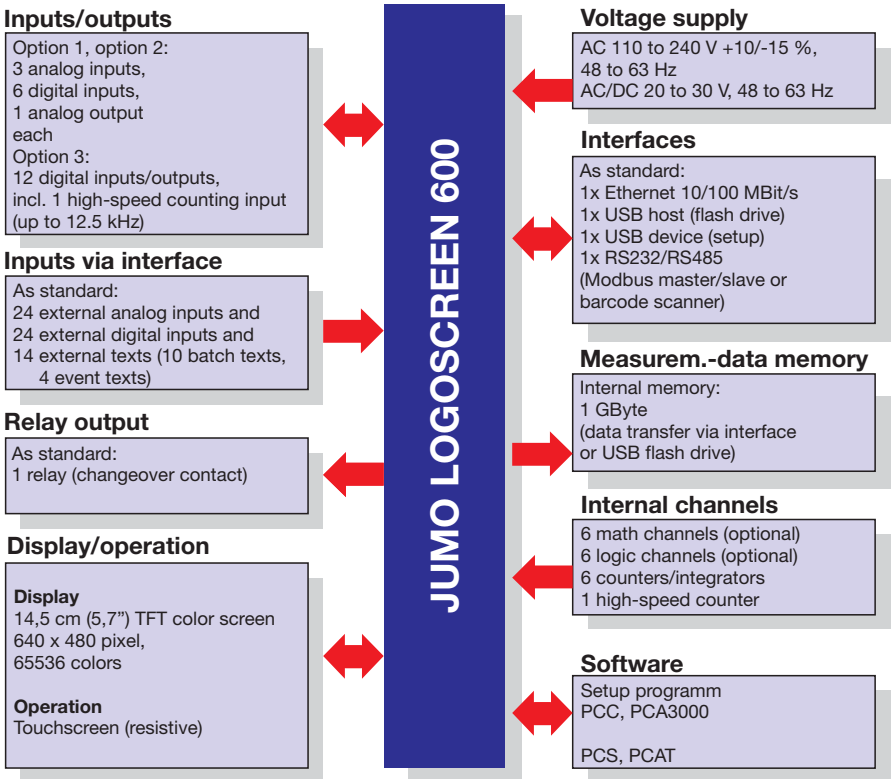
The JUMO LOGOSCREEN 600 paperless recorder features a resistive touchscreen and an intuitive, icon-based operation and visualization concept that makes it very easy to use.

There are different versions of the JUMO LOGOSCREEN 600 available for process data recording. These range from the device version without measuring input in which up to 24 process values are read (master) or received (slave) from external systems via Modbus, through to a device version with six measuring inputs (universal analog inputs), two analog outputs, 12 digital inputs, and 12 individually switchable digital inputs/outputs. In the version with FDA-compliant data recording all the requirements are met in accordance with 21 CFR Part 11.

The JUMO LOGOSCREEN 600 can display data using the default visualizations, such as curve diagram (vertical or horizontal), bar graph, text image (numerical), or digital diagram. For batch-related processes a special batch recording is available which allows the storage of additional information. In addition, users can create up to six individual process screens with up to 100 objects per process screen to fit their requirements using the setup program.

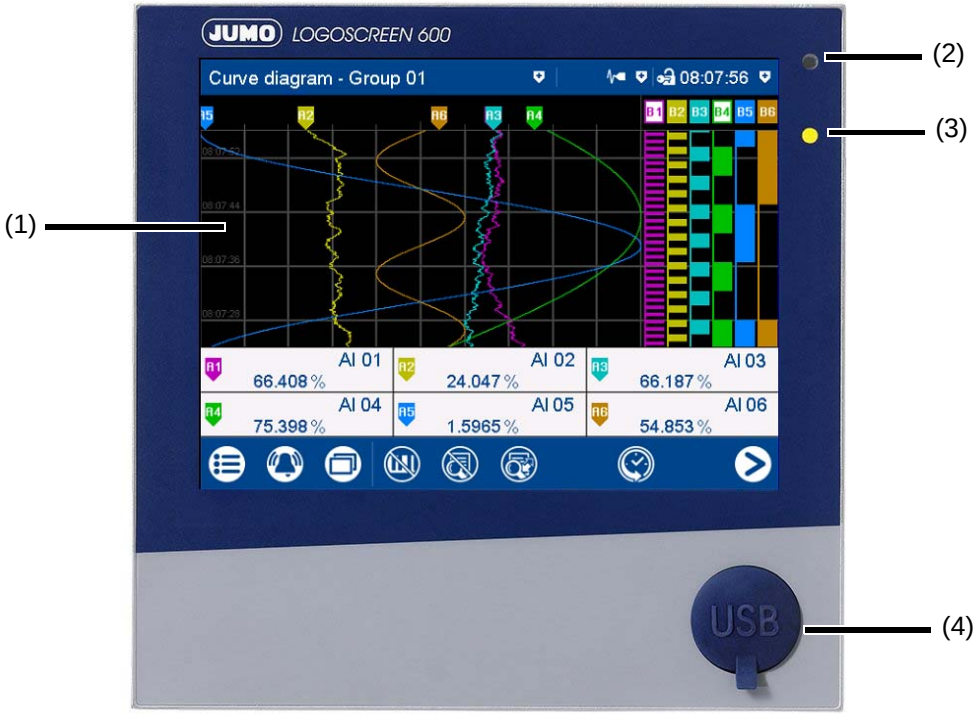
In addition to the setup program further powerful PC programs are available, e.g. for the evaluation of archived data and for the administration of access control.

2.2 Block diagram



2 Description

2.3 Display and control elements



(1) Touchscreen (TFT color screen)

Technical data:

⇨ Chapter 6.1.7 "Screen", page 74

The screen appearance is described in the "Operation" chapter.

⇨ Chapter 5.1.1 "Touchscreen", page 31

(2) Alarm LED

The LED is lit while an alarm is pending.

(3) Power LED

The LED flashes after switching on the device until the startup process is completed. It is then permanently lit.

(4) USB host interface with cover

To remove the cover, take hold of the lug and pull it out.

CAUTION!
Protection type IP65 (front-side) only with closed USB host interface.
Protection type IP65 is only guaranteed with the available default cover of the USB host interface.
Only remove the cover to use the interface; then remount the cover immediately (the cover must be flush with the front of the device).

2.4 Connection elements

The connecting elements on the rear of the device and the front-side USB host interface are described in the "Electrical connection" chapter.

⇨ Chapter 4.3 "Connection elements", page 25

3.1 General information on installation

WARNING!
The device is not designed for use in potentially explosive areas.
There is the risk of an explosion.
Only deploy the device outside of potentially explosive areas.

Mounting site

The device is designed for installation in a panel cut-out. The front of the device and housing have different protection types (see technical data).

Climatic conditions

The ambient temperature and the relative humidity at the mounting site must correspond to the technical data. Aggressive gases and vapors have a negative effect on the operating life of the device. The mounting site must be free from dust, powder, and other suspended matter.

Installation position

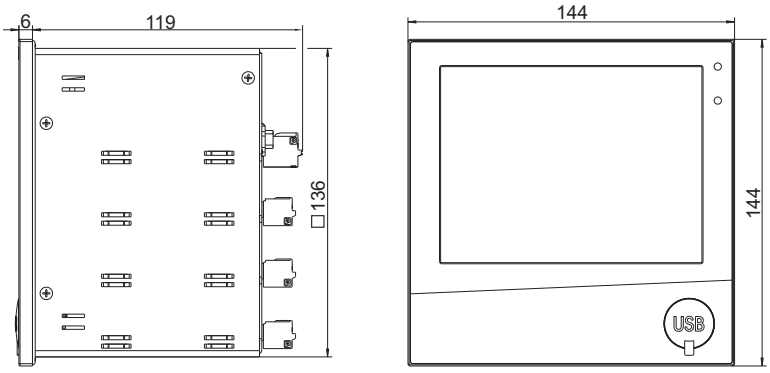
The installation position is not specified, however the screen view angle must be taken into consideration (see technical data).

Technical data

⇨ Chapter 6.1 "Technical data", page 69

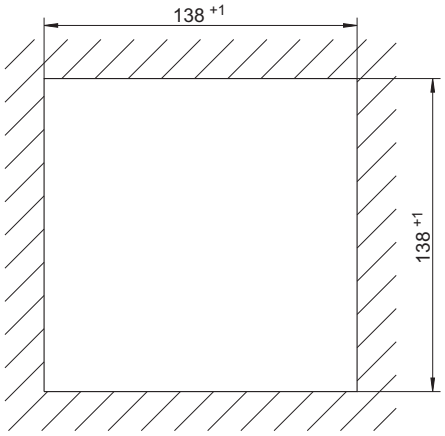
3.2 Dimensions

Device



3 Installation

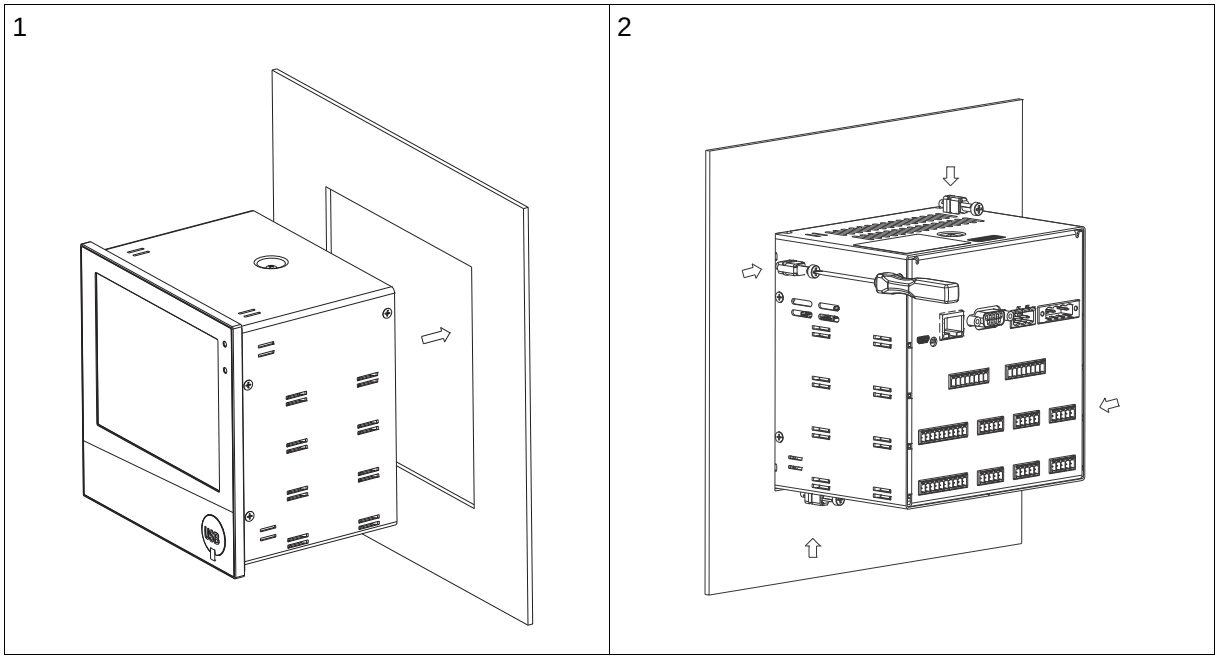
Panel cut-out



Close mounting

Distance between panel cut-outs	Horizontal	Vertical
Minimum clearance	20 mm	20 mm
Recommended distance (easier installation of fastening elements)	50 mm	50 mm

3.3 Panel mounting



Step	Activity
1	Insert the device into the panel cut-out from the front until the seal is flush with the panel.
2	Insert the fastening elements into the recesses of the housing (one element on each corner, see figure) and use a screwdriver to evenly clamp them against the rear side of the panel with a torque of 1.0 Nm.

CAUTION!
The front of the device and case have different protection types.
The protection type IP65 (front-side) is only guaranteed if the seal is flush and even.
The four supplied fastening elements must all be used and distributed evenly as shown in the figure.

3.4 Handling the front of the device

Cleaning

The front of the device (front foil) can be cleaned with standard detergents, rinsing and cleaning agents.

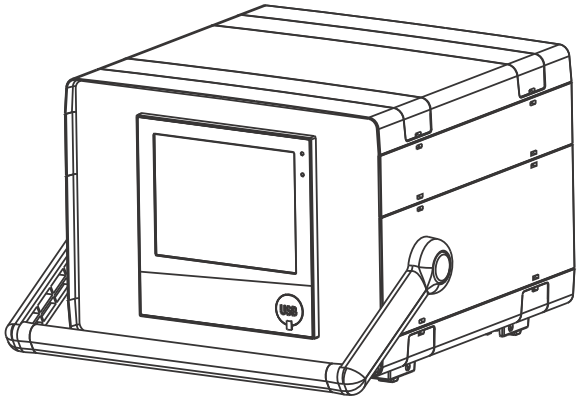
CAUTION!
The front of the device is not resistant to aggressive acids and lyes, scouring agents, and cleaning with a pressure cleaner.
Use of these media can cause damage.
Only clean the front of the device with suitable agents.

Operation

The screen (resistive touchscreen) can be operated by finger pressure or with a commercially available touchscreen stylus.

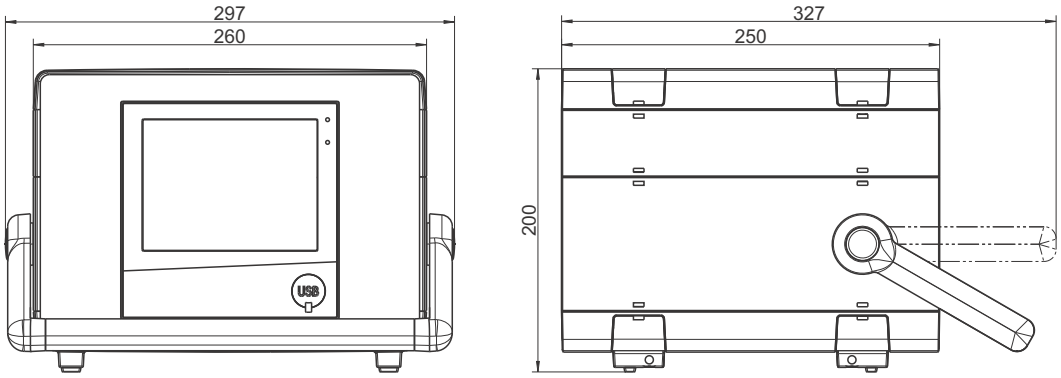
CAUTION!
Sharp or hard objects are not suitable for operating the screen.
They can cause scratches and damage the front foil.
Only operate the screen with your finger or with a suitable stylus.

3.5 Universal carrying case Compact (extra code 970)



3 Installation

Dimensions



Intended use

The paperless recorder within the carrying case is exclusively intended for use by technically qualified personnel who are specially trained and have the relevant knowledge in the field of automation technology.

Cleaning

For the cleaning of the carrying case, the same instructions apply as for cleaning the front of the device.

⇨ Chapter 3.4 "Handling the front of the device", page 21

Miniature fuse

The carrying case is equipped with a replaceable miniature fuse for device protection (5.0 A / 250 V delayed, acc. to EN 60127-2; part no. 65018001). A defective fuse must be replaced with a fuse of the same type. Beforehand, the carrying case must be disconnected from the mains voltage on all poles (pull the mains plug)!

Power cable

The removeable power cable (H05VV-F 3G1; length 2.5 m; part no. 00052953) must not be replaced with an insufficiently dimensioned cable.

Differing technical data

Observe the information on ambient temperature and protection type of the case!

⇨ Chapter 6.1.9 "Environmental influences", page 76
⇨ Chapter 6.1.10 "Case", page 76

4.1 Installation notes

Requirements for personnel

- Work on the device must only be carried out to the extent described and, like the electrical connection, only by qualified personnel.
- Before plugging and unplugging connecting cables, it must be ensured that the acting person is electrostatically discharged (by touching grounded metallic parts, for example).

Cables, shielding, and grounding

- When selecting the electrical wiring material as well as when installing and connecting the device electrically, comply with the requirements of DIN VDE 0100 "Low-voltage electrical installations" and the applicable country-specific regulations (for example, based on IEC 60364).
- Route input, output, and supply cables separately and not parallel to one another.
- Only use shielded and twisted probe and interface cables. Do not route the lines close to current-carrying components or cables.
- For temperature probes, ground the shielding on one side in the control cabinet.
- Do not perform loopthroughs on the grounding cables, but route the cables individually to a shared grounding point in the control cabinet; in doing so, ensure that the cables are as short as possible.
  Ensure that the potential equalization is correct.

Electrical safety

- The device is intended to be installed in control cabinets or plants. Ensure that the customer's fuse protection does not exceed 20 A. Disconnect the device from the mains voltage on all poles prior to starting service or repair work.
- The relay's load circuit can be operated with a hazardous electrical voltage (e.g., 230 V). De-energize the load circuit during mounting/dismounting and electrical connection.
- To prevent the relay contacts being destroyed in the case of an external short-circuit in the load circuit, the latter must be fuse-protected as per the maximum admissible relay current (see technical data).
- The device is not suitable for installation in potentially explosive areas.
- In addition to a faulty installation, incorrectly set values on the device can also impair the correct function of the downstream process. Therefore, ensure that safety devices independent of the device, e.g., overpressure valves or temperature limiters/monitors, are available and that it is only possible for qualified personnel to define settings. Please observe the corresponding safety regulations in this context.

References to other information

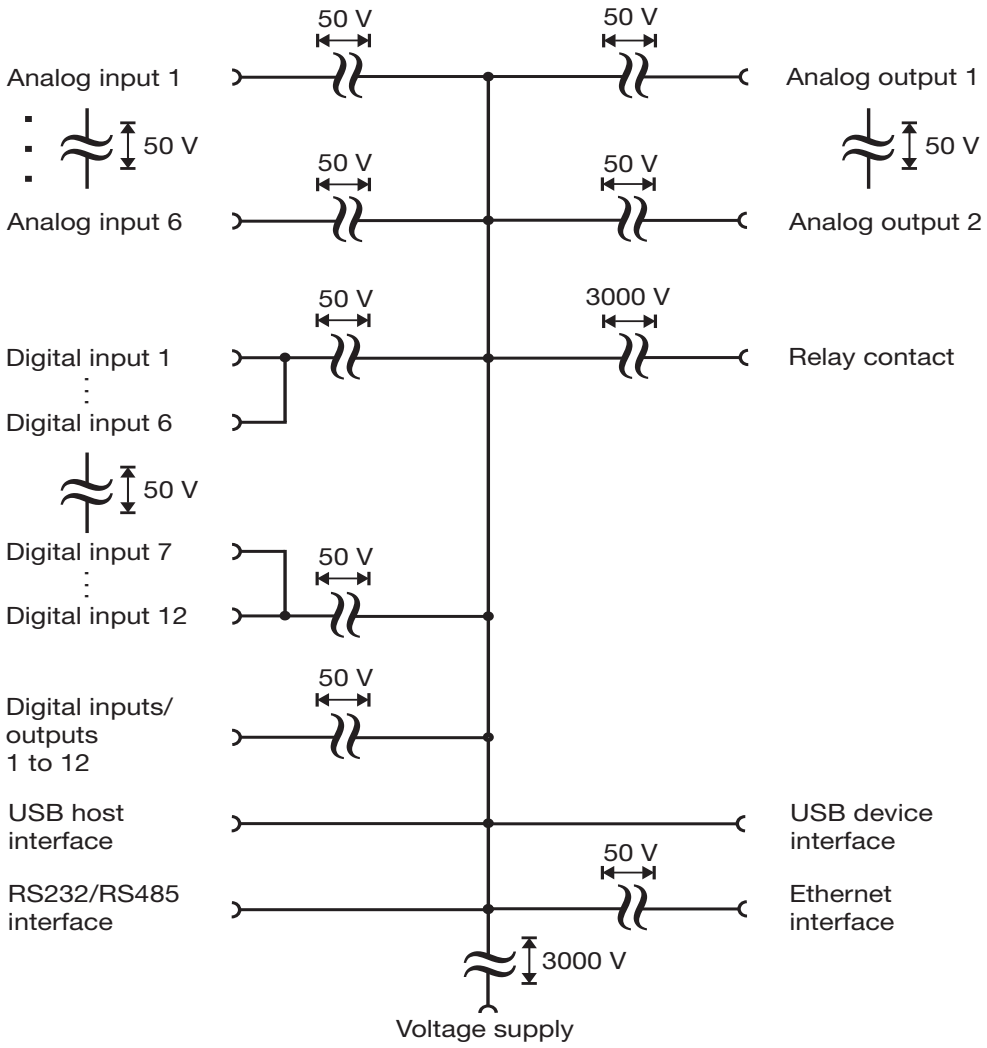
- Electromagnetic compatibility meets the standards and regulations cited in the technical data (see technical data).
- In general, please observe the specifications regarding galvanic isolation.

Technical data

⇨ Chapter 6.1 "Technical data", page 69

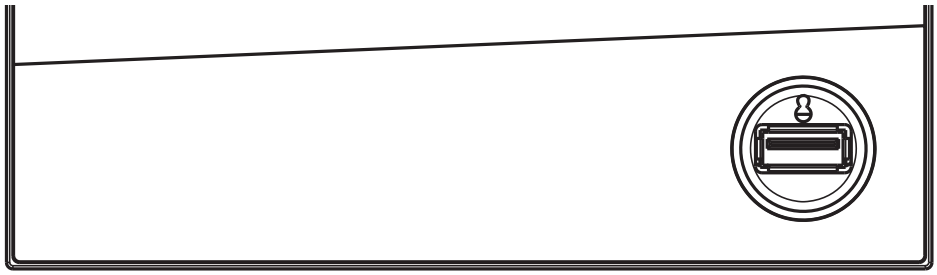
4 Electrical connection

4.2 Galvanic isolation

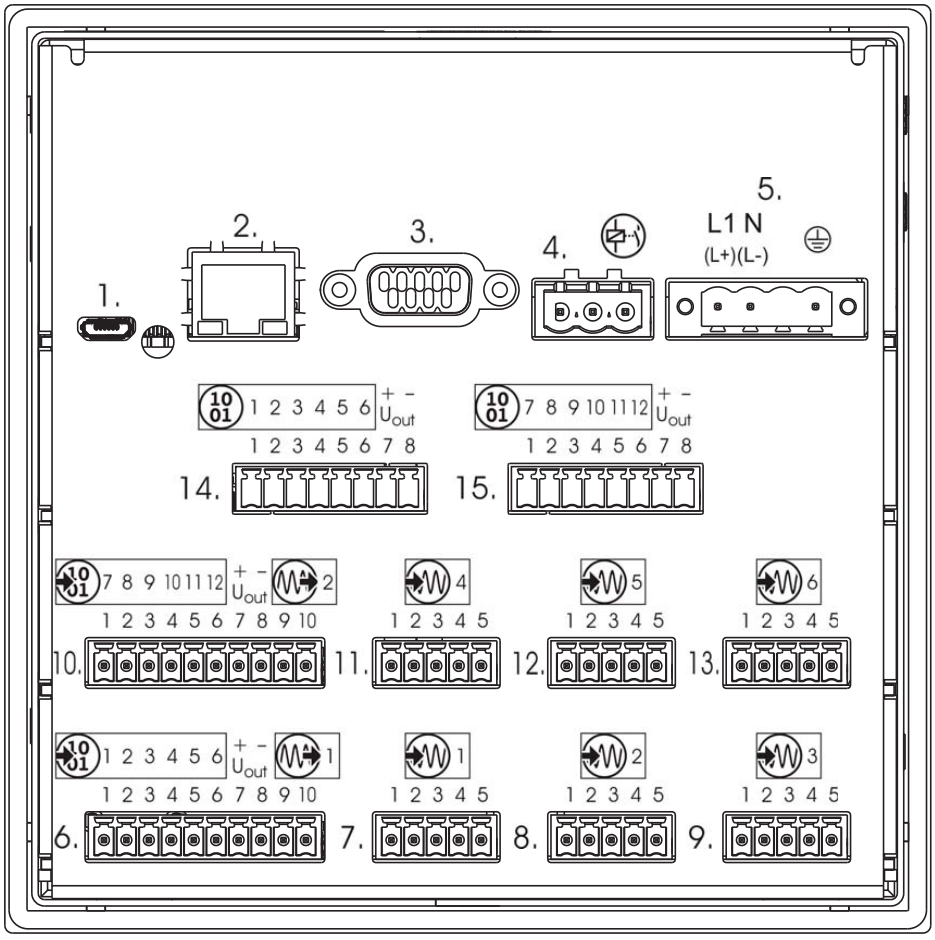


4.3 Connection elements

Front USB host interface (without cover)



Back connection elements



Connection element and assignment

1. USB device interface
3. RS232/RS485 interface
5. Voltage supply
7. Analog input 1
9. Analog input 3
11. Analog input 4
13. Analog input 6
15. Digital inputs/outputs 7 to 12

Connection element and assignment

2. Ethernet interface
4. Relay
6. Digital inputs 1 to 6, analog output 1
8. Analog input 2
10. Digital inputs 7 to 12, analog output 2
12. Analog input 5
14. Digital inputs/outputs 1 to 6

4 Electrical connection

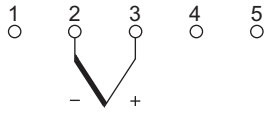
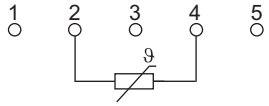
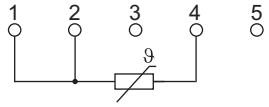
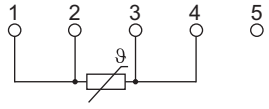
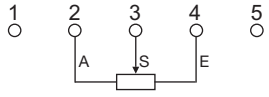
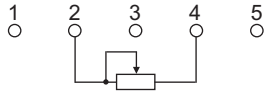
NOTE!
The front-side USB host interface is intended exclusively for connecting a USB flash drive. Any other use is not admissable.

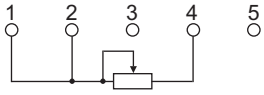
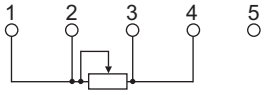
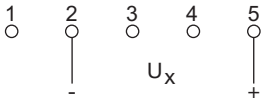
NOTE!
The quality of the USB cable and the USB flash drive has an influence on the correct function of the device. It is recommended to use the components provided by the manufacturer (accessories).

CAUTION!
The device is not suitable for connecting to a PoE (Power over Ethernet) port.
There is a risk of damage to the device.
Connect the device to an Ethernet port without PoE.

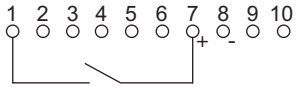
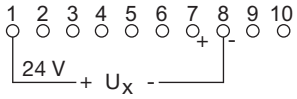
4.4 Connection diagram

4.4.1 Analog inputs 1 to 6 (options 1 and 2)

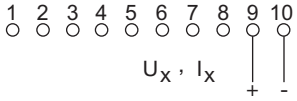
Measuring probe	Connection element / Assignment	Terminals and connection symbol
Thermocouple	7. / Analog input 1 8. / Analog input 2 9. / Analog input 3	
RTD temperature probe two-wire circuit	11. / Analog input 4 12. / Analog input 5 13. / Analog input 6	
RTD temperature probe three-wire circuit		
RTD temperature probe four-wire circuit		
Resistance transmitter		
Resistance/potentiometer two-wire circuit		

Measuring probe	Connection element / Assignment	Terminals and connection symbol
Resistance/potentiometer three-wire circuit	7. / Analog input 1 8. / Analog input 2 9. / Analog input 3	
Resistance/potentiometer four-wire circuit	11. / Analog input 4 12. / Analog input 5 13. / Analog input 6	
Voltage DC -10(0) to +10 V		
Voltage DC -1(0) to +1 V		
Voltage DC 0 to 70 mV		
Current DC 0(4) to 20 mA		

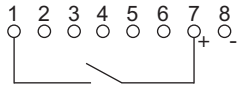
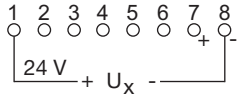
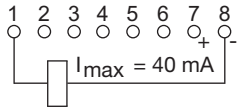
4.4.2 Digital inputs 1 to 12 (options 1 and 2)

Version	Connection element.Terminal / Assignment	Terminals and connection symbol
Digital input DC 0/24 V, auxiliary voltage (output) DC 24 V (50 mA, per option)	6.1 / Digital input 1 6.2 / Digital input 2 6.3 / Digital input 3 6.4 / Digital input 4 6.5 / Digital input 5 6.6 / Digital input 6 6.7 / +24 V 6.8 / GND 10.1 / Digital input 7 10.2 / Digital input 8 10.3 / Digital input 9 10.4 / Digital input 10 10.5 / Digital input 11 10.6 / Digital input 12 10.7 / +24 V 10.8 / GND	 Example: potential-free contact at input 1 and +24 V (auxiliary voltage)  Example: external voltage at input 1 and GND

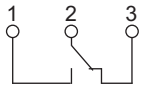
4.4.3 Analog outputs 1 and 2 (options 1 and 2)

Version	Connection element.Terminal / Assignment	Terminals and connection symbol
Analog output DC 0 to 10 V or DC 0(4) to 20 mA (configurable)	6.9 / Analog output 1 + 6.10 / Analog output 1 - 10.9 / Analog output 2 + 10.10 / Analog output 2 -	

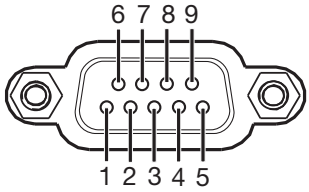
4.4.4 Digital inputs/outputs 1 to 12 (option 3)

Version	Connection element.Terminal / Assignment	Terminals and connection symbol
Digital input DC 0/24 V or digital output DC 0/24 V (individually switchable), auxiliary voltage (output) DC 24 V (100 mA, sum of the currents at the terminals 14.7 and 15.7)	14.1 / Digital input/output 1 14.2 / Digital input/output 2 14.3 / Digital input/output 3 14.4 / Digital input/output 4 14.5 / Digital input/output 5 14.6 / Digital input/output 6 14.7 / +24 V 14.8 / GND 15.1 / Digital input/output 7 15.2 / Digital input/output 8 15.3 / Digital input/output 9 15.4 / Digital input/output 10 15.5 / Digital input/output 11 15.6 / Digital input/output 12 15.7 / +24 V 15.8 / GND	 Example: potential-free contact at input 1 and +24 V (auxiliary voltage)  Example: external voltage at input 1 and GND  Example: external relay at output 1 and GND (max. 40 mA per output, max. 100 mA on the whole)
Note: Auxiliary voltage supply and digital outputs deliver together max. 100 mA at 24 V.		

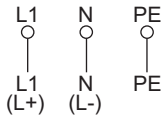
4.4.5 Relay

Version	Connection element.Terminal / Assignment	Terminals and connection symbol
Relay (changeover contact) (max. 3 A at AC 230 V, resistive load)	4.1 / Normally open contact (NO) 4.2 / Joint contact (C) 4.3 / Normally closed contact (NC)	

4.4.6 RS232/RS485 interface

Version	Connection element.Pin / Assignment	Connection element
RS232 9-pin SUB-D socket (switchable to RS485)	3.2 / RxD (received data) 3.3 / TxD (transmission data) 3.5 / GND (ground)	
RS485 9-pin SUB-D-socket (switchable to RS232)	3.3 / TxD+/RxD+ (transmission/ received data +) 3.5 / GND (ground) 3.8 / TxD-/RxD- (transmission/ received data -)	

4.4.7 Voltage supply

Version	Connection element.Terminal / Assignment	Terminals and connection symbol
AC 110 to 240 V +10/-15 %, 48 to 63 Hz **or** AC/DC 20 to 30 V, 48 to 63 Hz **Observe order details!**	5.L1 / Line conductor (for DC: positive terminal L+) 5.N / Neutral conductor (for DC: negative terminal L-) 5.PE / Protection conductor	

5.1 Operating concept

The device is equipped with a resistive touchscreen; the operation is menu-driven. User management protects the device against unauthorized access. The different users can be assigned different privileges so that they can only access specific functions.

In addition to the visualizations available per default, the setup program can be used to create individual process screens for presenting process data.

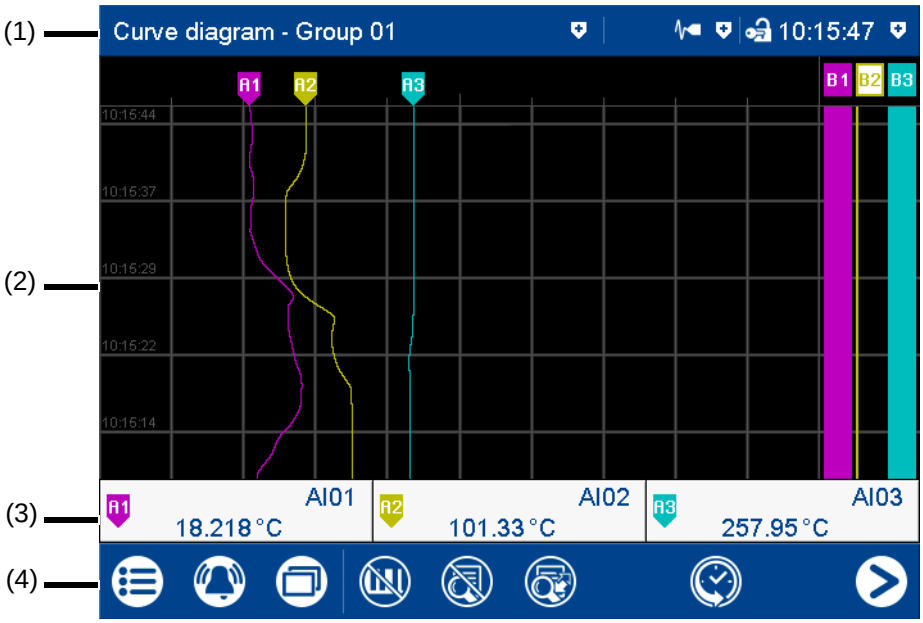
Thanks to the integrated web server, certain visualizations can also be rendered in a web browser.

5.1.1 Touchscreen

The visualization screen shown after switching on the device depends on the configuration (Device: Main menu > Configuration > Display > Generally > Image after reset; see also operating manual, "Configuration" chapter).

The example shown here is the curve diagram (vertical, with digital traces).

View



(1) Status bar

(2) Screen (here: curve diagram with digital traces)

(3) Channel information (display depends on the configuration)

(4) Navigation bar

Status bar

The status bar consists of three areas which are delimited by vertical lines. Each area is an active button which can be used to display ( ) and hide additional information again ( ).

The **area on the left** shows you the diagram type and group number. Tapping the button displays the alarm list.

The **area in the center** is used to display the status, logging operation, and communication types based on icons. The button displays details of the group operating mode (depending on

the screen), the batch logging status, and the status of data transmission via the PCC software as a text display.

Icons used:

Position	Meaning	Icon
Left	Data transmission via PCC software	
	- Transmission active	
	- Transmission not active	No icon
Center	Batch recording	
	- Recording active	
	- Recording not active (or batch not configured)	No icon
Right	Operating mode	
	- Standard operation	
	- Event operation	
	- Time operation	

The **area on the right** shows the logon status as an icon and the time. The button additionally shows the weekday, date, user name, and memory usage.

Icons used:

Position	Meaning	Symbol
Left	Logon status	
	- User not logged in	
	- User logged in	

The status bar is also used as an **alarm display**. In the event of an alarm, the alarm text (red background) and the normal text (blue background) are alternately displayed.

Image

The image area displays the current visualization, menu (e.g., Main menu) with its menu items, or a list (e.g., event list).

Channel information

The channel information display in the curve diagram can be switched on and off (configuration). The description (pointer) of the analog signal (e.g., A1) is displayed along with the abbreviation of the analog or digital signal (e.g., AI01 for analog input 1) and the analog value.

Navigation bar

The navigation bar consists of three areas which are delimited by vertical lines.

The **area on the left** contains the buttons (icons) for calling up
- the main menu (left),
- the alarm and event menu (center), and
- the visualization menu (right).

The **area in the center** contains buttons (icons) whose function depends on the screen currently being displayed.

The **area on the right** contains buttons (icons) for screen navigation:
The "Home" button takes the user directly to a specific screen (configurable).
Pressing the "Next" button (right arrow) selects the next screen on a specific level (e.g., toggle to the next active group).

5.1.2 LED displays

The device is equipped with two LEDs on its front side that display the device status.

Green LED

The green LED (power LED) flashes after switching on the device until the startup process is completed. It is then permanently lit.

Red LED

The red LED (alarm LED) is permanently lit while an alarm is pending.

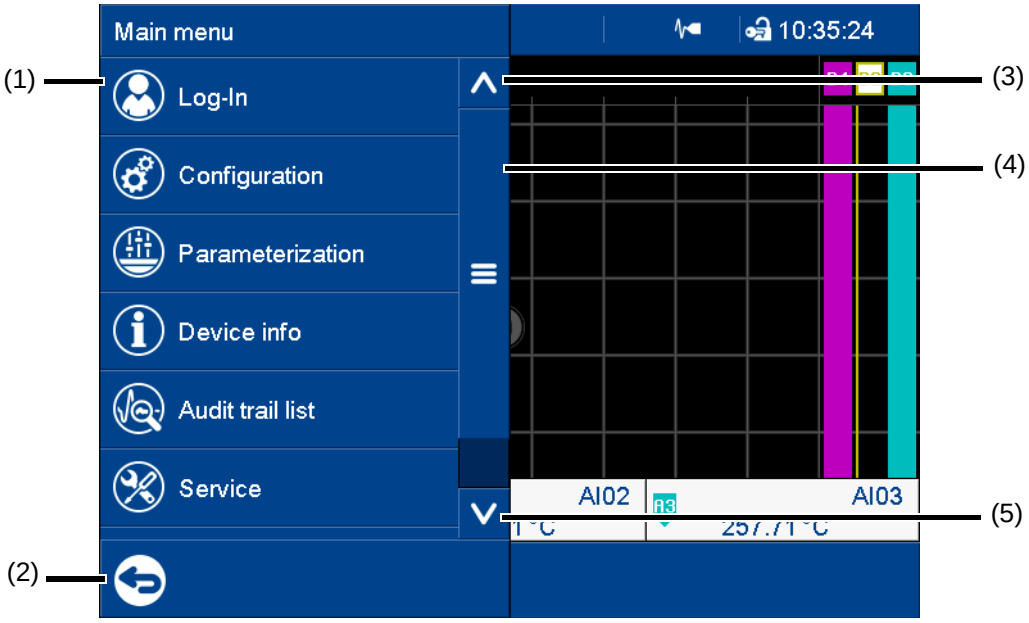
Acknowledging the collective alarm in the alarm list does not reset the alarm display.

5 Operation

5.2 Main menu

The main menu contains functions for configuring, parameterizing, and operating the device.

View



(1) Menu items

(2) Quit main menu

(3) Scroll up

(4) Scroll box (current position within the menu); movable

(5) Scroll down

5.2.1 Log-In

This is the menu in which users log on and off, and change their passwords.
The following IDs, names, and passwords are set by default:

Users	ID	Name	Password
User 1	Master	System Master	9200
User 2	User 1	Data Management	1
User 3	User 2	Data Management	2
User 4	User 3	Data Management	3
User 5	Service	Service	9200

For further information: see operating manual, chapter "Configuration - only in setup program" > "User list" > "Default user settings").

Logoff with signature

With extra code 888 (FDA, as of device version 02) and with the corresponding configuration in the PCS software, an electronic signature is required when logging off. The signature applies to the entire time period for which the user is logged on.

Configuration of the electronic signature: see operating manual, "Configuration – in setup program only" chapter > "Electronic signature".

Example of an electronic signature:

⇨ Chapter 5.8 "Electronic signature", page 63

5.2.2 Configuration

This menu contains functions for configuring the device. The functions are available both on the device and in the setup program (see the "Configuration" chapter in the operating manual).

In addition to this, there are functions that can only be configured with the setup program (see the operating manual, chapter "Configuration - in setup program only" and "Online parameters").

5.2.3 Parameterization

This menu contains the functions for parameterizing the device (see the "Parameterization" chapter in the operating manual).

5.2.4 Device info

This menu contains information about the device (name, versions), the current process values (inputs, outputs, internal functions), and Ethernet interface.

The device version is indicated through the "Version" parameter in the submenu "Versions" > "Basic device":
Standard = device in standard version
21 CFR Part 11 = device in FDA compliant version (as of device version 02)

With extra code 887 (digital certificate) or 888 (FDA) information about the digital certificate is also displayed in this menu.

5.2.5 Audit trail list

This menu lists the audit trail messages generated by the device.

All user intervention with the device is automatically recorded and stored in the audit trail list of the device. The audit trail list is managed independently of the event list.

The audit trail list is designed as a ring buffer which can contain a maximum of 150 entries. When the list is full, each new entry causes the oldest entry to be deleted from the list.

5.2.6 Service

This menu contains various service functions.

Default configuration

You can store the current device configuration with this function.

Similarly, a previously stored configuration can be loaded as the current configuration.

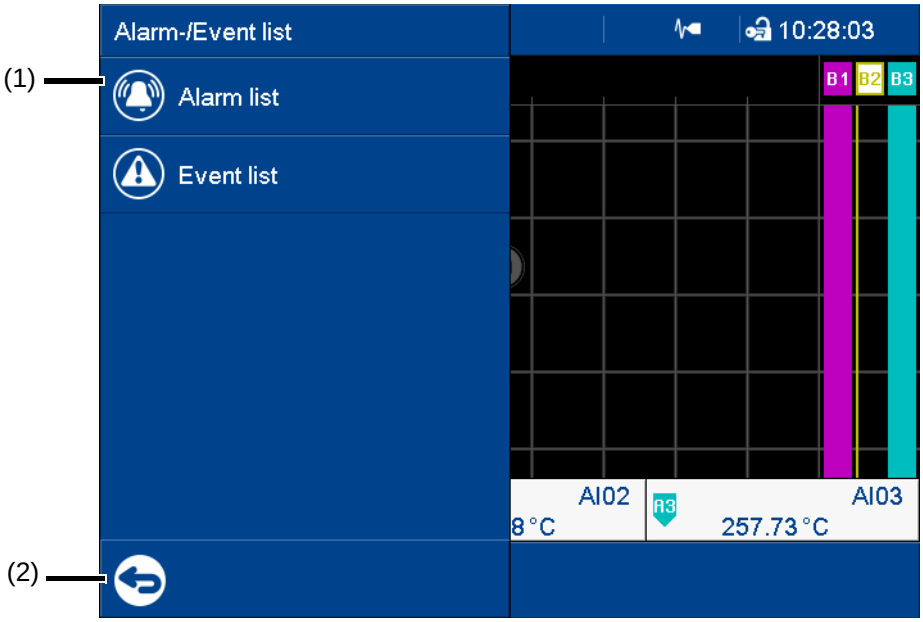
5.2.7 Calibrating the touchscreen

This menu enables you to calibrate the touchscreen (position calibration). To do so, you need to tap the center of the crosshairs shown in the corners of the screen one after another.

5.3 Alarm and event menu

The alarm and event menu enables you to call up the alarm list and event list.

View



(1) Menu items

(2) Quit the alarm and event menu

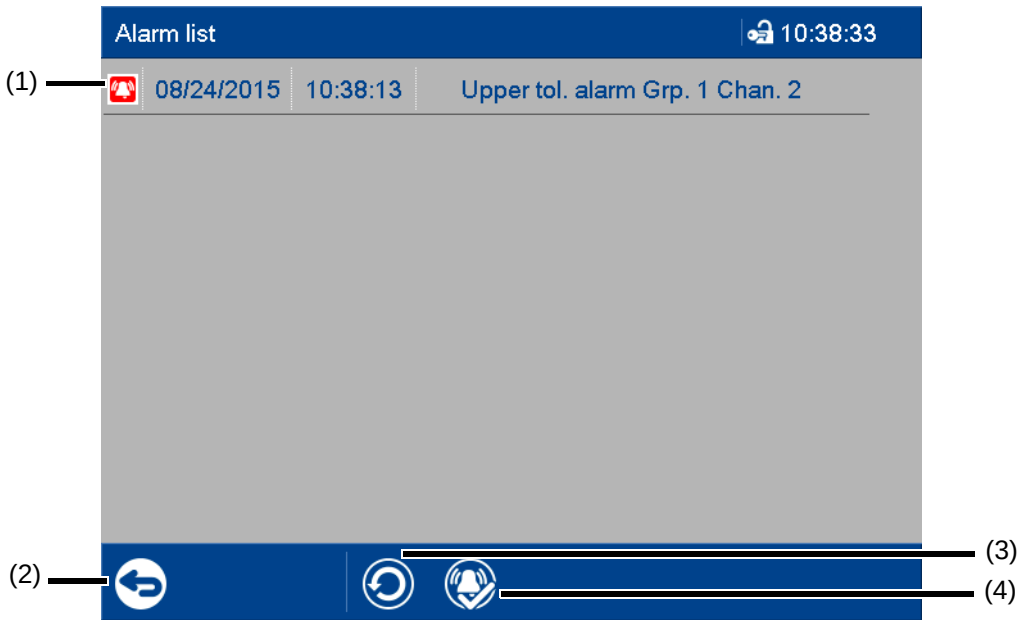
5.3.1 Alarm list

The alarm list shows all pending alarms in their order of occurrence. If an alarm is no longer pending, its entry is automatically removed from the alarm list. The alarm list is rebuilt after power on.

Each alarm represents an event. For this reason, the time at which an alarm occurs and disappears again is recorded in the event list.

A pending alarm is additionally shown by the red LED in the status bar.

View



(1) Alarm (time and alarm text)
(2) Quit alarm list
(3) Update alarm list
(4) Acknowledge collective alarm

Collective alarm

The following collective signals are created and are available in the digital selector:

- Collective alarm
  This signal is active while an alarm is pending (the alarm list is not empty).
- Collective alarm acknowledged
  This signal is activated when an alarm occurs; it remains active until acknowledged even if the alarm disappears in the meantime.

5.3.2 Event list

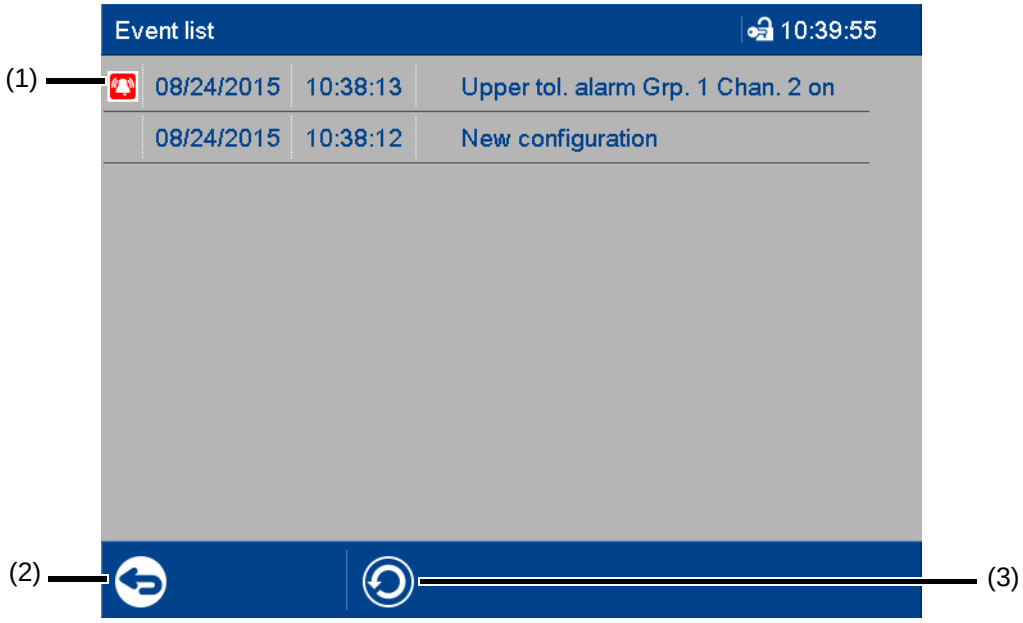
The event list contains event entries in chronological order. A maximum of 150 entries are stored and displayed. When new entries are added, the oldest entries are deleted. The event list is kept after power off.

As with process data, events are transferred to the PC Evaluation Software PCA3000 for evaluation.

Events include:

- System messages (e.g., power on, configuration change, time sync)
- Device alarms (malfunctions; e.g., battery discharged, data loss, input not calibrated)
- Configured alarms
- Configured events
- Counter messages (counter status and counter reset)
- Batch messages (start and end of batch recording)
- General messages (e.g., comments, error messages from the interfaces, USB flash drive plugged in/removed, collective alarm acknowledged)

View



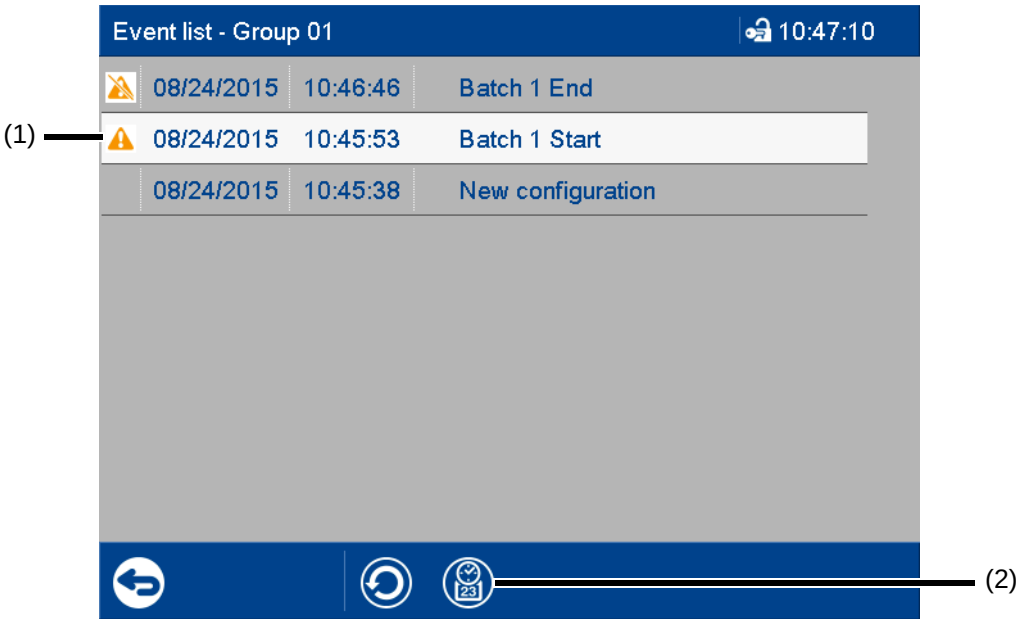
(1) Event (here: alarm) with time and event text (configurable)

(2) Quit event list

(3) Update event list

Event list in memory display

If the alarm and event menu is called up from the memory display (history) (or from the curve presentation of a completed batch), the event list is opened directly. An additional button is available here which lets you mark the time of a specific event in the memory display with the cursor position.



(1) Selected event

The event is selected by tapping.

(2) Show memory display

In the memory display, the cursor is moved to the position (time) at which the event occurred.

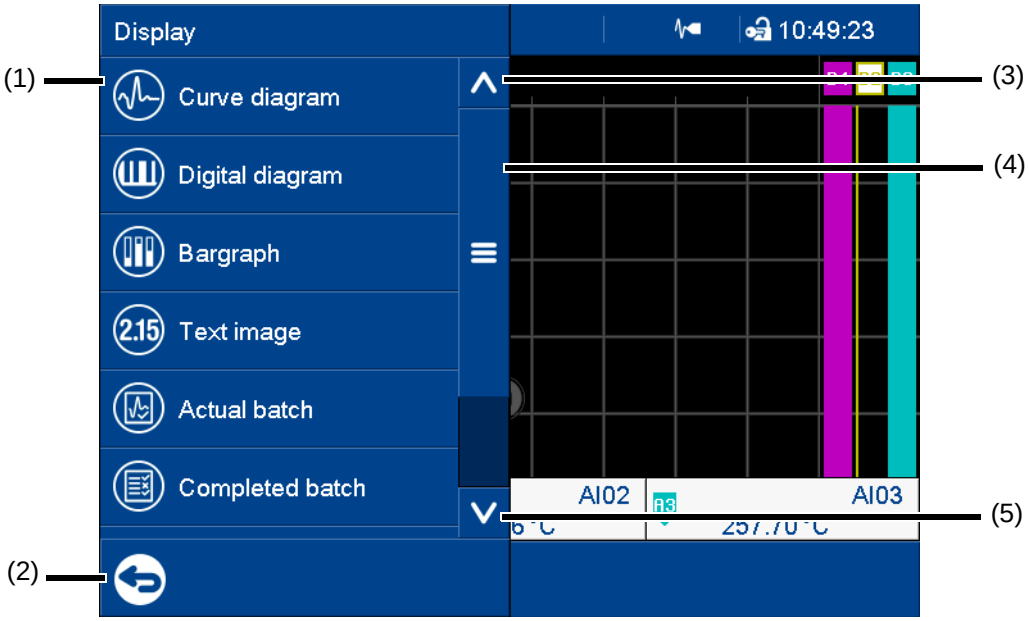
If the respective point in time is no longer in the memory display, the cursor is moved to the start of the memory display (oldest point in time).

5 Operation

5.4 Visualization menu (display)

In the visualization menu, the view type and group that should be currently displayed on the device are selected. Up to 6 analog channels and 6 digital channels of a group can be shown on one screen.

View



(1) Menu items

(2) Quit visualization menu

(3) Scroll up

(4) Scroll box (current position within the menu); movable

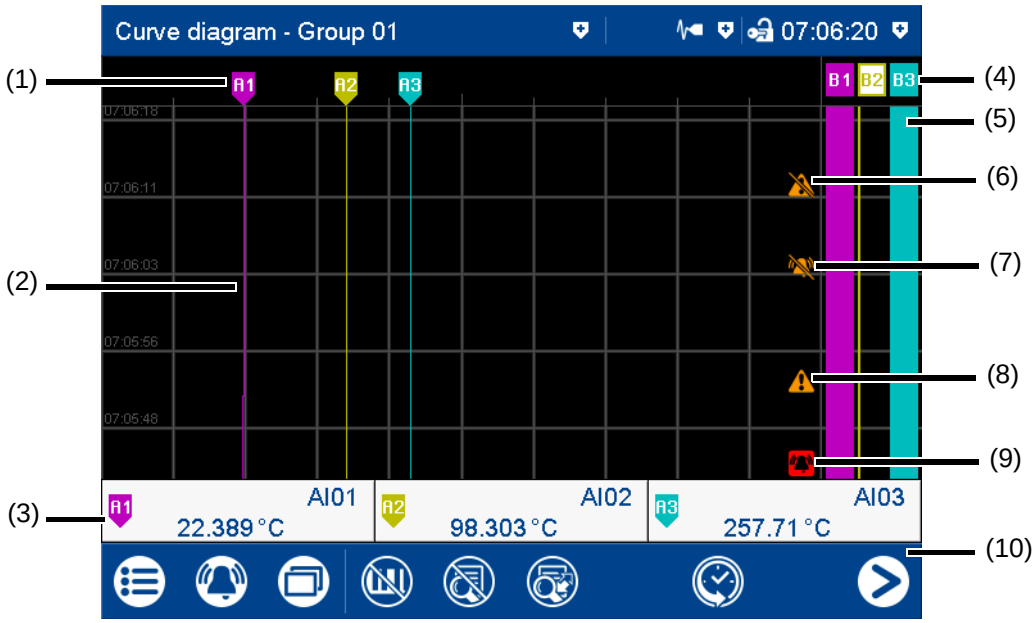
(5) Scroll down

5.4.1 Curve diagram

In the curve diagram, the analog and digital signals configured for the relevant group are displayed as analog curves or digital traces. Digital traces and channel information can be hidden in the group configuration.

The diagram type (horizontal, vertical) is selected individually for each group in the configuration. The following view shows the vertical diagram. Accordingly, the description also applies to the horizontal diagram (see the example later on).

Group view



(1) Description (point) of the analog curve

(2) Analog curve (color change with alarm)

(3) Channel information: description (pointer), short signal description (configurable), and current value of analog signal (color change with alarm)

(4) Description (point) of the digital trace

(5) Digital trace

(6) Event off

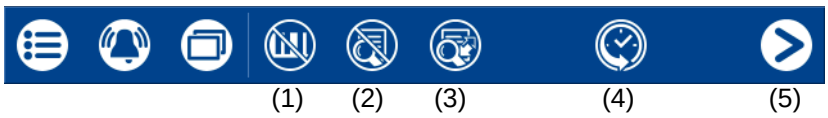
(7) Alarm off

(8) Event on

(9) Alarm on

(10) Navigation bar

Navigation bar



(1) Hide/show digital traces

(2) Hide/show channel information

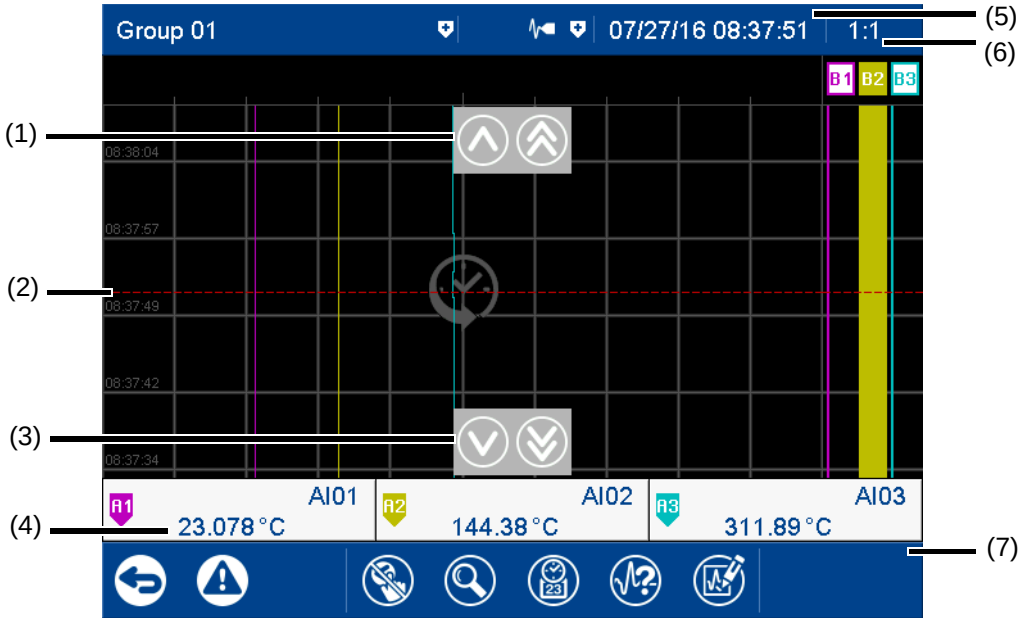
(3) Hide/show analog values

(4) Call up memory display (history)

(5) Go to next active group

5 Operation

Memory display (history)



(1) Move time for memory values forward (later memory values)

(2) Cursor (time of numeric memory values)

(3) Move time for memory values back (earlier memory values)

(4) Analog value at selected time

(5) Time of memory values (cursor position)

(6) Zoom factor

(7) Navigation bar

Navigation bar

(1) Quit history

(2) Access event list

(3) Hide/show cursor keys

(4) Change zoom factor

(5) Find memory values (enter time)

(6) Curve selection (activate/deactivate view)

(7) Rendering electronic signature or display information about rendered signature

Electronic signature

With extra code 888 (FDA) and with the corresponding configuration in the PCS software a certain time period can be provided with an electronic signature. The signature applies to the time period that is displayed in the diagram at the time of the signature. The displayed area may have to be expanded prior to signing. During signing, the time period can only be reduced; an increase is then no longer possible.

Any user who has the respective authorization can sign this signature ("Confirm batches, electronic signature" right). This can be another user than the one who is currently signed in.

Configuration of the electronic signature: see operating manual, "Configuration – in the setup program only" chapter > "Electronic signature".

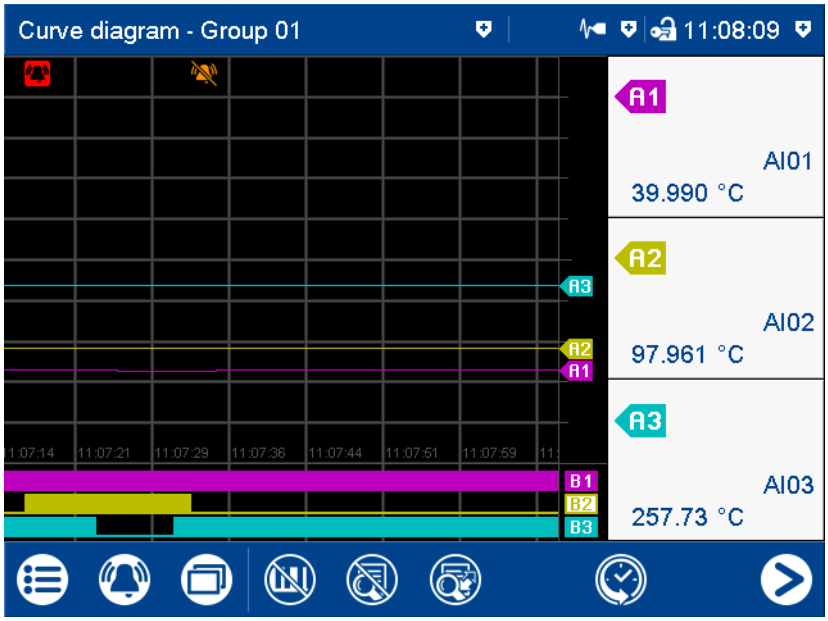
Example of an electronic signature:

⇨ Chapter 5.8 "Electronic signature", page 63

Horizontal diagram

In the horizontal diagram, the analog curves and digital traces run from right to left. The channel information is shown on the right edge of the screen; the icons for event and alarm at the top edge of the screen.

Digital traces and channel information can be hidden in the group configuration, as in the vertical view.

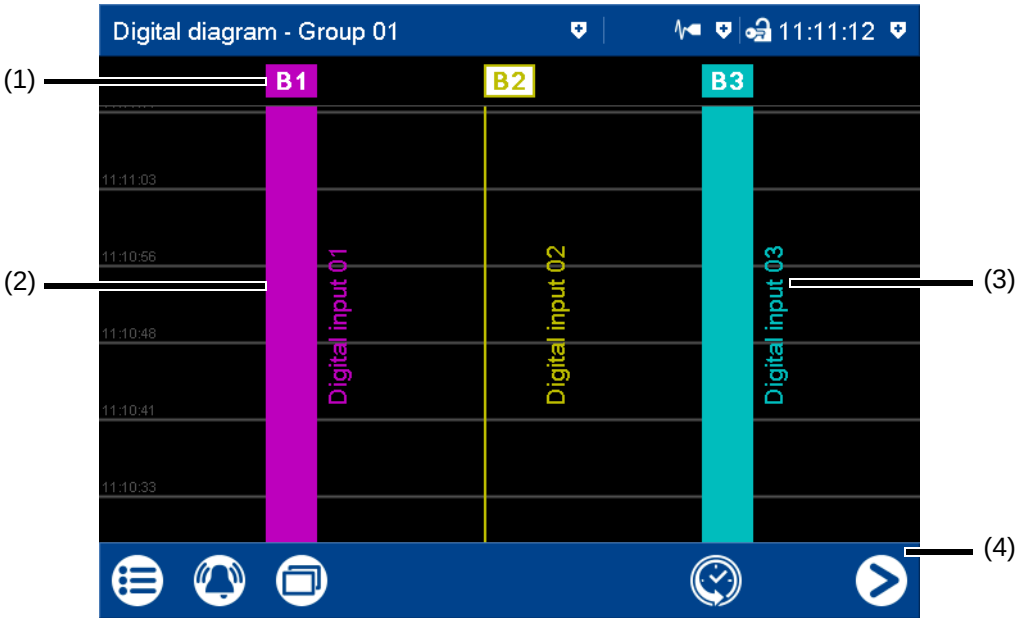


5.4.2 Digital diagram

In the digital diagram, the digital signals configured for the relevant group are displayed as digital traces.

The diagram type (horizontal, vertical) is selected individually for each group in the configuration. The following view shows the vertical diagram. Accordingly, the description also applies to the horizontal diagram.

Group view



(1) Description (point) of the digital trace
Displays the logical state:
Colored button = HIGH (B1, B3)
Colored frame = LOW (B2)

(2) Digital trace

(3) Digital signal description (configurable)

(4) Navigation bar

Navigation bar

(1) Call up memory display (history)

(2) Go to next active group

Memory display

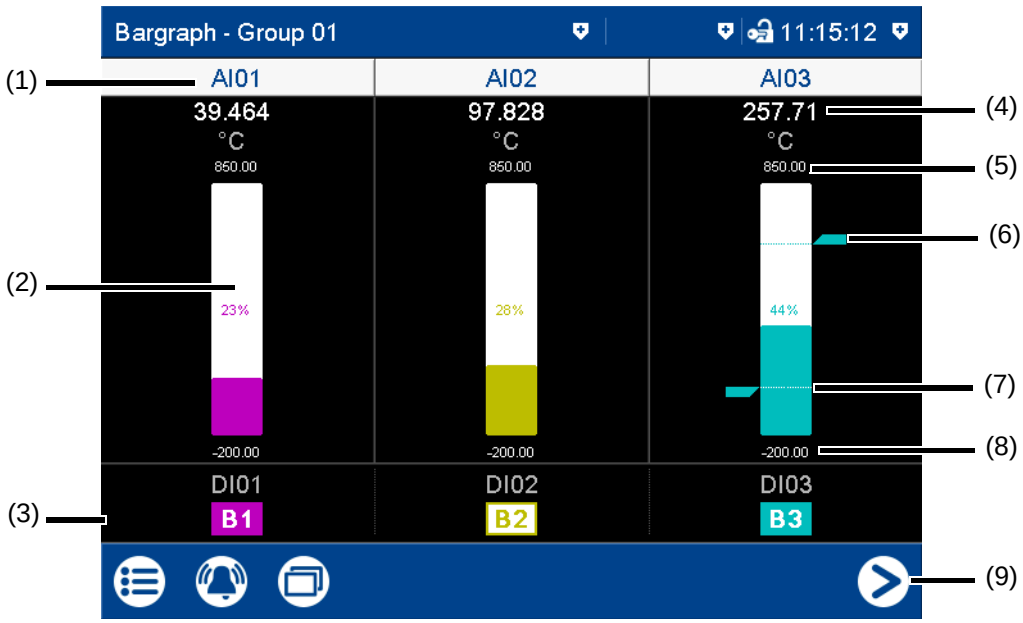
See memory display in the curve diagram.

⇨ Chapter 5.4.1 "Curve diagram", page 41

5.4.3 Bar graph

In the bar graph view, the analog signals configured for the relevant group are shown as bar graphs, and the digital signals – depending on their logical state – as colored areas or frames. The diagram type selected for the group (horizontal, vertical) is irrelevant for the bar graph view. The view is always as a column diagram (vertical) and not as a bar diagram (horizontal).

Group view



(1) Short analog signal description (configurable)

Call up individual view of analog signal (numerical view and bar graph); see text image - individual view.

(2) Bar diagram of the analog signal (color change with alarm)

(3) Digital signal with short signal description (configurable) and designation (pointer)

Displays the logical state:
Colored button = HIGH (B1, B3)
Colored frame = LOW (B2)

(4) Current analog value (color change with alarm)

(5) End value of scaling (display range, configurable)

(6) Limit value for max. alarm (configurable)

(7) Limit value for min. alarm (configurable)

(8) Start value of scaling (display range, configurable)

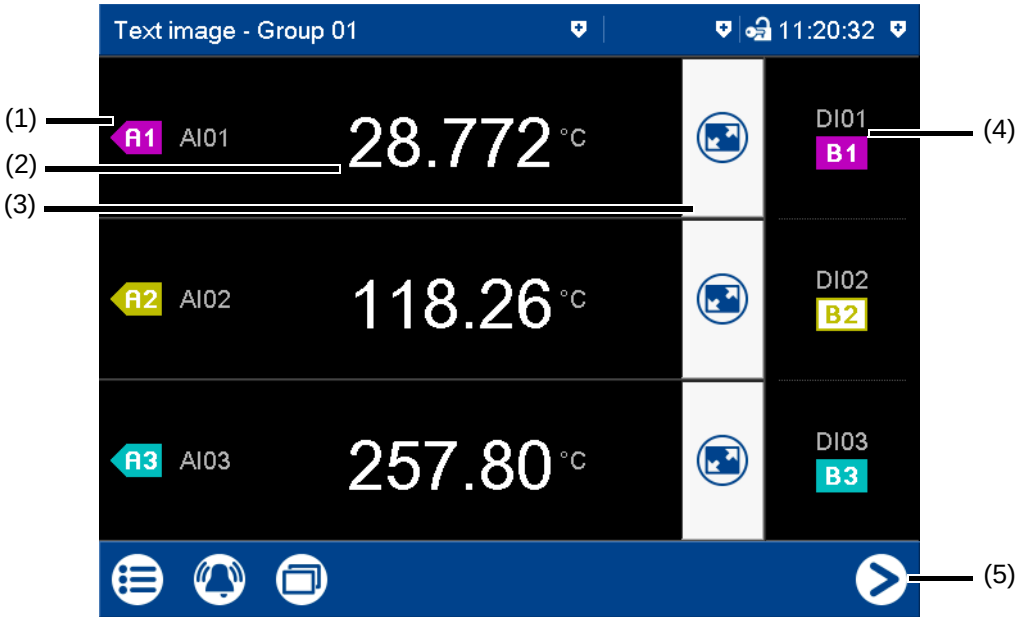
(9) Go to next active group

5 Operation

5.4.4 Text image

The text image shows the current values for the analog signals configured for the relevant group as numbers. The digital signals – depending on their logical state – are shown as colored areas or frames.

Group view



(1) Description (pointer) and short analog signal description (configurable)

(2) Current value of analog signal

(3) Call up individual view of analog signal (numerical view and bar graph)

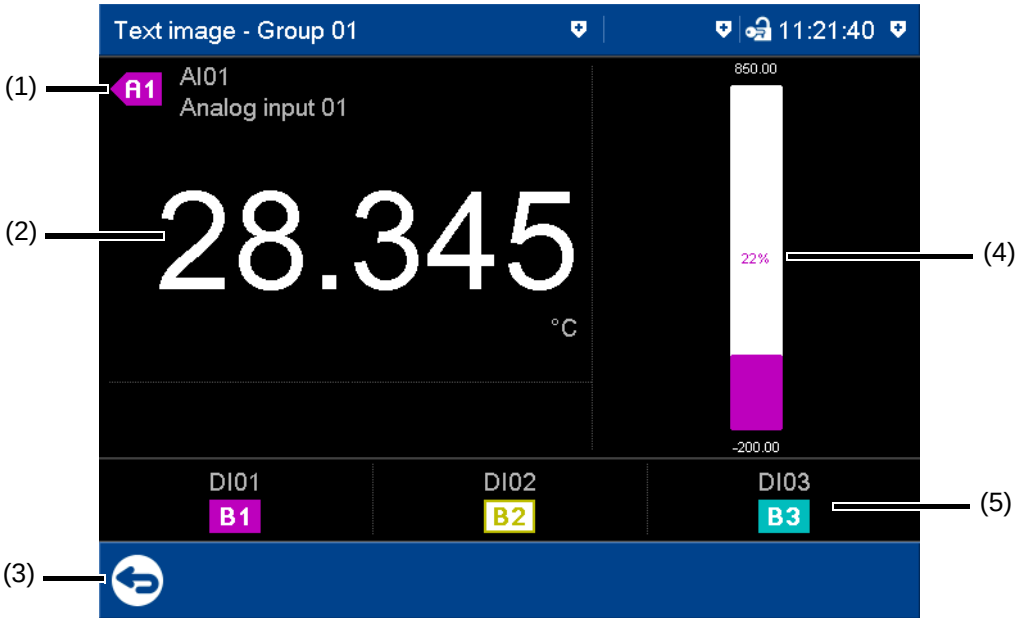
In the individual view, all digital signals of the group are also displayed.

(4) Digital signal with short signal description (configurable) and designation (pointer)

Displays the logical state:
Colored button = HIGH (B1, B3)
Colored frame = LOW (B2)

(5) Go to next active group

Individual view



(1) Designation (pointer), short signal description (configurable), and signal description (configurable) of the analog signal

(2) Current value of the analog signal

(3) Back to group view

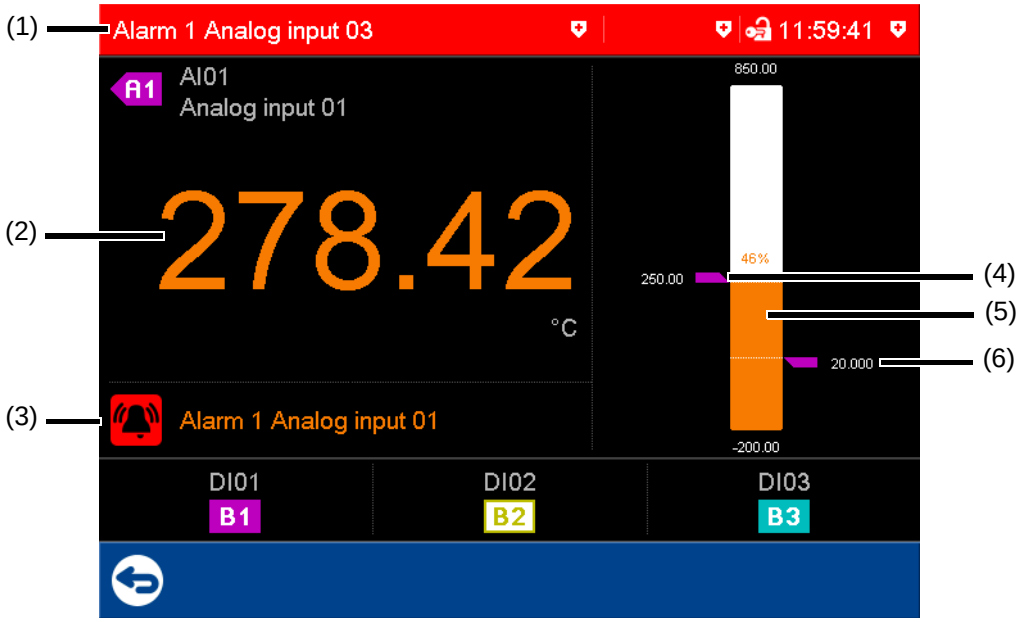
(4) Bar graph of the analog signal

(5) Digital signal with short signal description (configurable) and designation (pointer)

Displays the logical state:
Colored button = HIGH (B1, B3)
Colored frame = LOW (B2)

5 Operation

Individual view with alarms



(1) Last alarm to have occurred (here: from analog input 03)

(2) Current value of analog signal with color change (alarm)

(3) Alarm text of analog input

(4) Limit value for max. alarm (configurable)

(5) Bar graph of analog signal with color change (alarm)

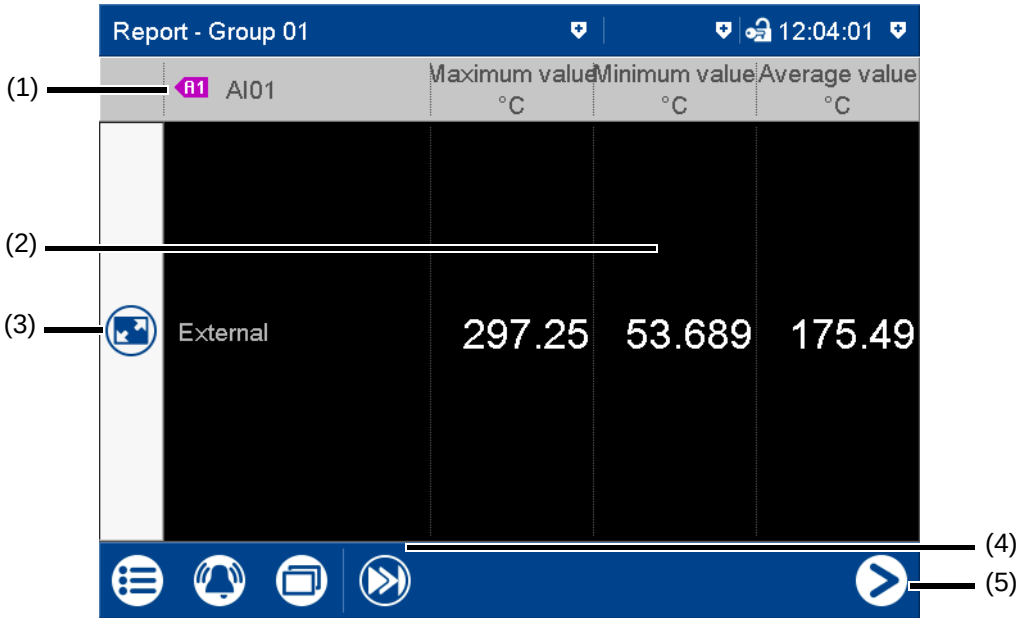
(6) Limit value for min. alarm (configurable)

5.4.5 Report

A report shows the statistical information for the relevant group. A report contains the maximum, minimum, and mean values of the analog signals during the recording time (the recording period is configurable). A distinction is made between the current (on-going) report and the completed report.

To create a report, it must be activated in the configuration for the relevant group.

View



(1) Description (pointer) and short analog signal description (configurable)

(2) Values of analog signal in the current (not completed) report

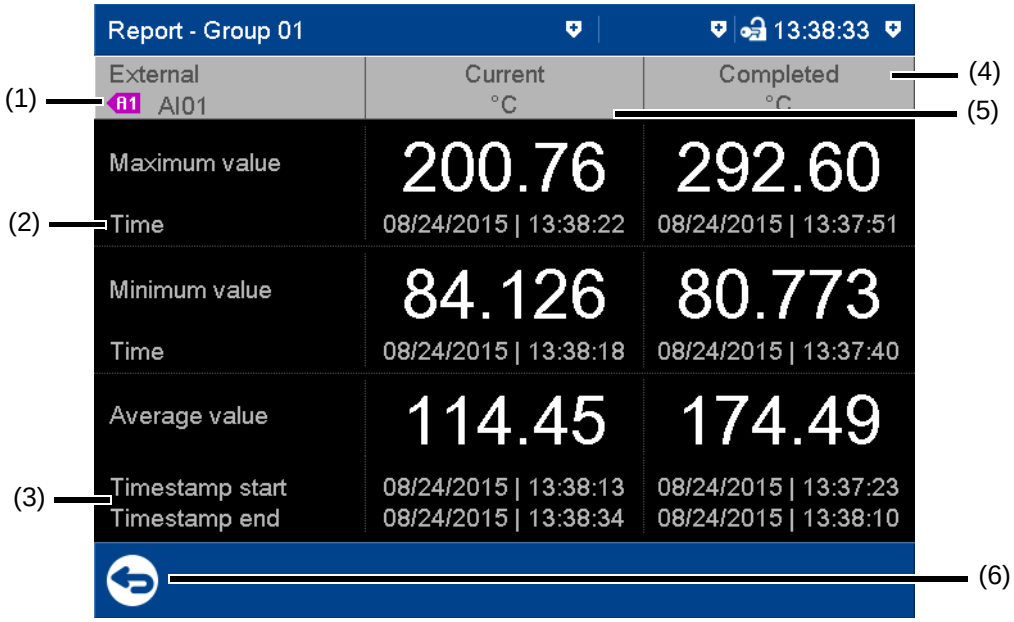
The type (configurable; here: external) decides when the report is stored and thus completed.

(3) Call up detailed view of analog signal

(4) Go to the next analog signal within the group

(5) Go to the report for the next group

Detailed view



(1) Description (pointer) and short analog signal description (configurable); report type (configurable; here: external)

(2) Time at which the max. value (or min. value) occurred

(3) Time stamp for current report: beginning of recording and current time

Time stamp for completed report: beginning and end of reporting period

(4) Completed report

(5) Current (on-going) report

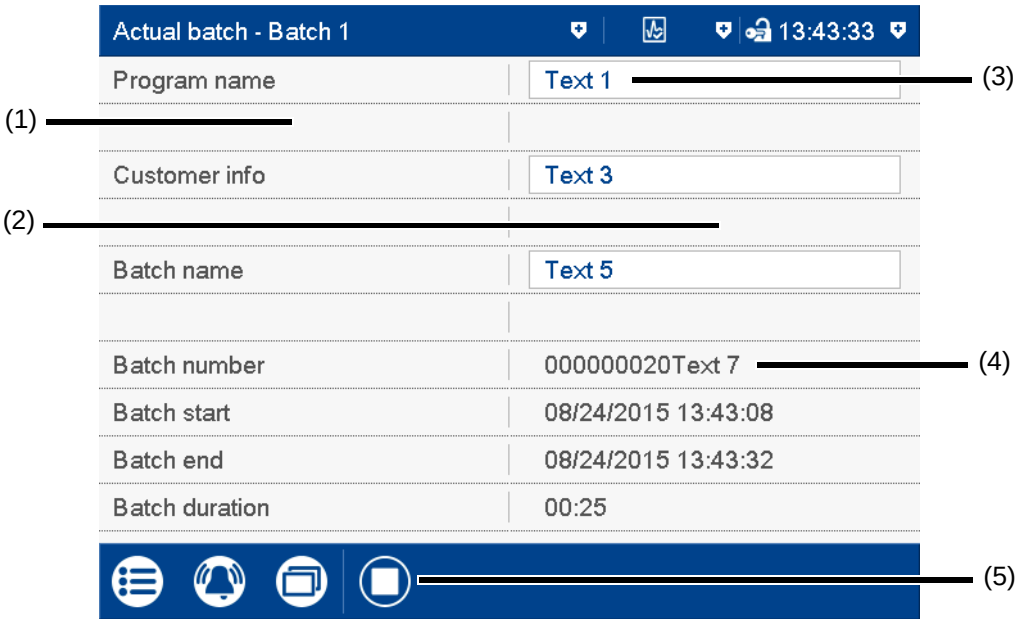
(6) Back to previous view

5.4.6 Current batch

This function opens the protocol for the current batch recording. Batch recording can be started and stopped (depending on the configuration).

The protocol layout is defined in the batch configuration. This is where the individual lines of the protocol are defined, and the text for the left column, and content of the right column, are specified (Device: Main menu > Configuration > Batch > Batch line x; see also the "Configuration" chapter in the operating manual).

View



(1) Left column

(2) Right column

(3) Editable text (depending on the configuration)

(4) Batch number and non-editable text (depending on the configuration)

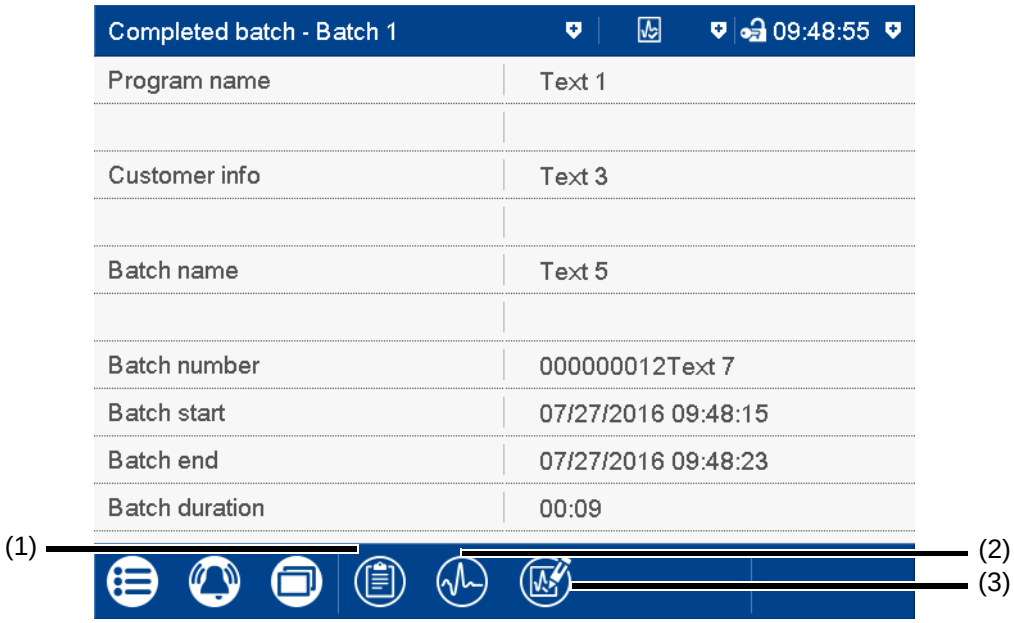
(5) Stop/start batch recording (only for configured "Batch start via touchscreen")

5.4.7 Completed batch

This function displays the report for the completed batch recording. Recorded data can be shown as a report and as a curve diagram.

If necessary, the report can also display the data from current batch recording.

View



(1) Open report (statistical information for the completed batch recording, and, if necessary, the current batch recording)

(2) Open curve presentation (analog curves and digital traces of the completed batch recording)

(3) Rendering electronic signature or display information about rendered signature

Electronic signature

With extra code 888 (FDA) and with the corresponding configuration in the PCS software the completed batch can be provided with an electronic signature. The signature can only be provided once per completed batch; it cannot be revoked. If a signature was provided already then this state is displayed through the following symbol (3): 

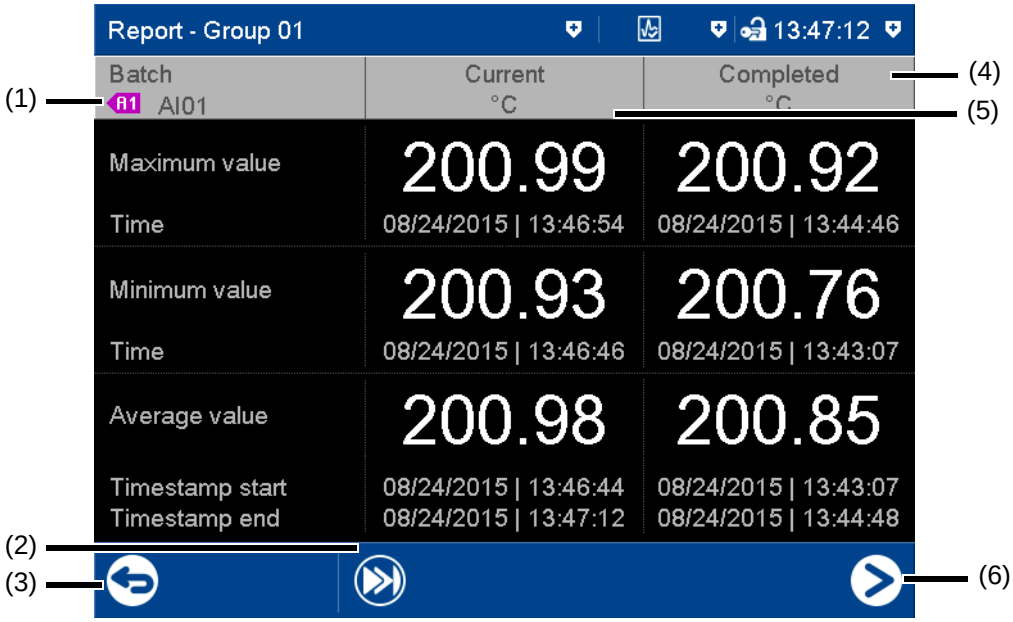
Any user who has the corresponding authorization can sign the signature ("Confirm batches, electronic signature" right). This can be another user than the one who is currently logged on.

Configuration of the electronic signature: see operating manual, "Configuration – in the setup program only" chapter > "Electronic signature".

Example of an electronic signature:

⇨ Chapter 5.8 "Electronic signature", page 63

Report for batch



(1) Description (pointer) and short analog signal description (configurable)

(2) Go to the next analog signal within the group

(3) Back to the batch report view

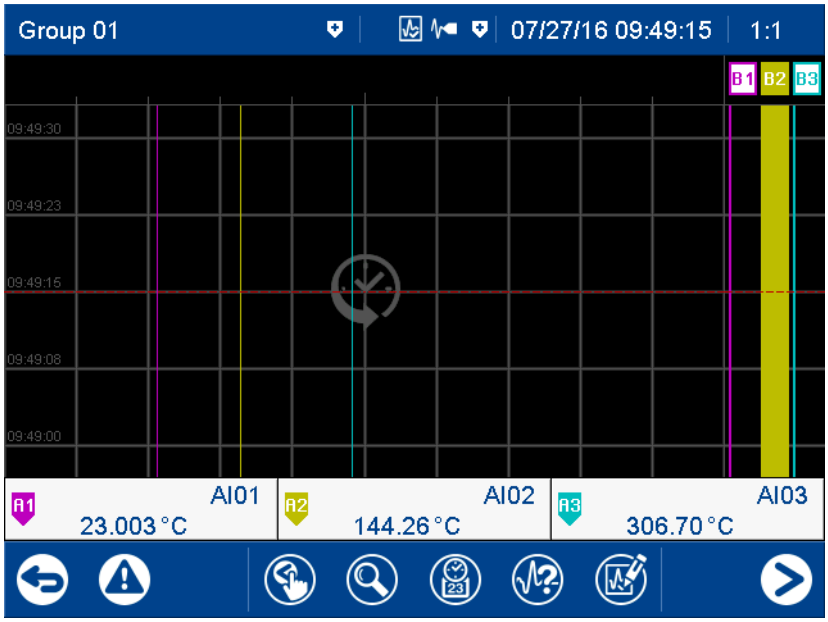
(4) Data (statistical information) for the completed batch recording

(5) Data (statistical information) for the current (on-going) batch recording

(6) Go to next group

⇨ Chapter 5.4.5 "Report", page 49

Curve presentation for the batch



The functions are identical with those of the memory display in the "Curve diagram" visualization.

⇨ Chapter 5.4.1 "Curve diagram", page 41

When opening the curve presentation, the zoom factor is computed so as to display the data of the entire batch recording on the screen.

5.4.8 Process screen

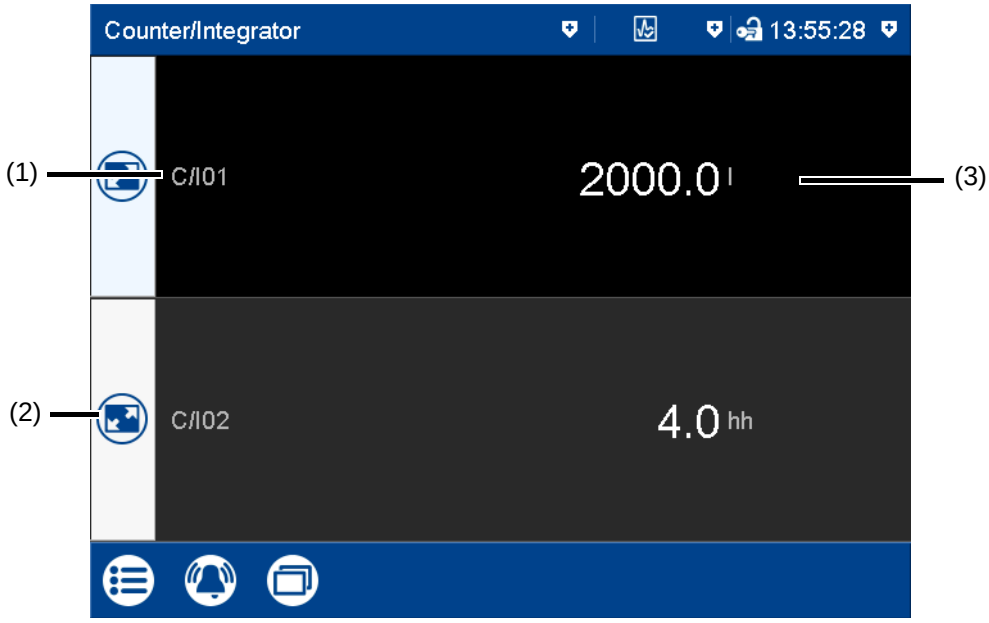
This visualization shows the individual process screens. You can use the arrow keys in the navigation bar to change to the next process screen.

Up to 6 process screens can be created with the setup program and uploaded to the device. For a process screen to be displayed, it must be activated (configuration parameters in the setup program; see operating manual, chapter "Configuration - in setup program only" > "Process screens").

5.4.9 Counter/Integrator

This visualization shows all activated counters/integrators. Up to 6 counters/integrators can be configured on the device.

View

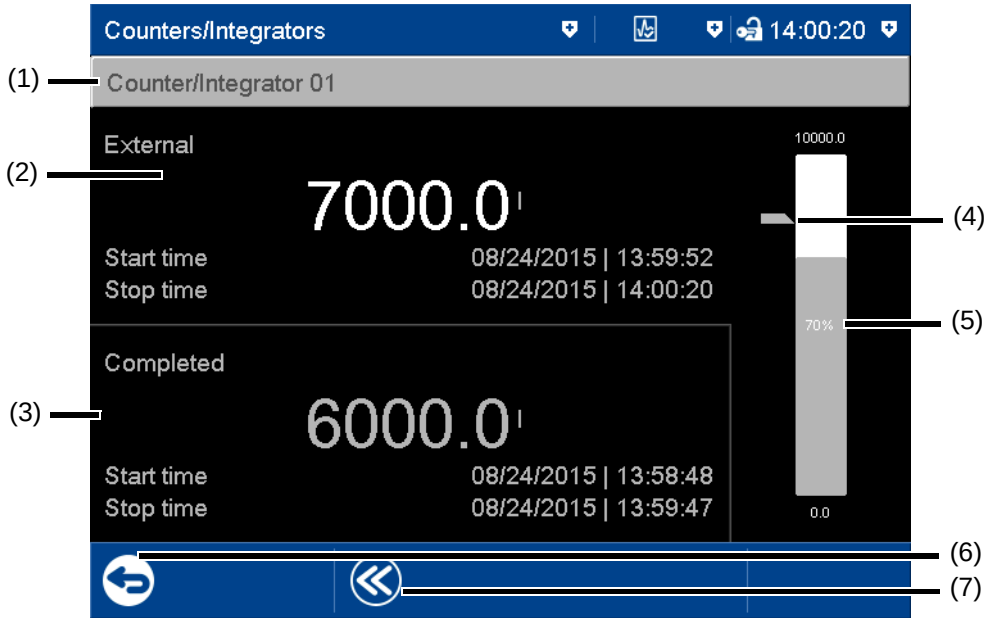


(1) Short description (configurable) of the counter/integrator

(2) Open detailed view of the counter/integrator

(3) Current status of the counter/integrator (unit configurable)

Detailed view



(1) Description (configurable) of the counter/integrator

(2) Details of current counter/integrator

The type (configurable; here: external) decides when the status of the counter/integrator is stored and thus completed.

(3) Details of the completed counter/integrator

(4) Limit value for max. alarm (configurable)

(5) Bar graph view of the current counter/integrator

Start and end of the display range are configurable.

(6) Back to view of all activated counters/integrators

(7) Display of the last 7 completed batch/counter readings

5.4.10 Comment text

This function can be used to enter a text (max. 160 characters) that is entered after completing the entry in the event list.

⇨ Chapter 5.5 "Text input dialog", page 56

The comment text is either assigned to the concerned group or all groups. The assignment depends on the current visualization in which the device is in when the function is invoked.

With the following visualizations the comment text is assigned to all groups: current batch, completed batch, process screen, counter/integrator

With the following visualizations the comment text is only assigned to the concerned group: curve diagram, digital diagram, bar graph, text image, report

The assignment to a certain group applies when only the event list of a certain group is displayed (memory presentation, curve presentation of the completed batch). In addition, the PCA3000 PC evaluation software can filter the events according to groups.

Comment with authentication

Depending on the "Comment with authentication" parameter (as of device version 02), user ID and password are required to enter a comment text (see operating manual, chapter "Configuration - in the setup program only" > "User list" > "Password rules").

With a device that has extra code 888 (FDA) the concerned setting is performed with the PCS software.

The approach when entering a comment with authentication basically corresponds to the one when rendering an electronic signature for a completed batch (only steps 2 to 4).

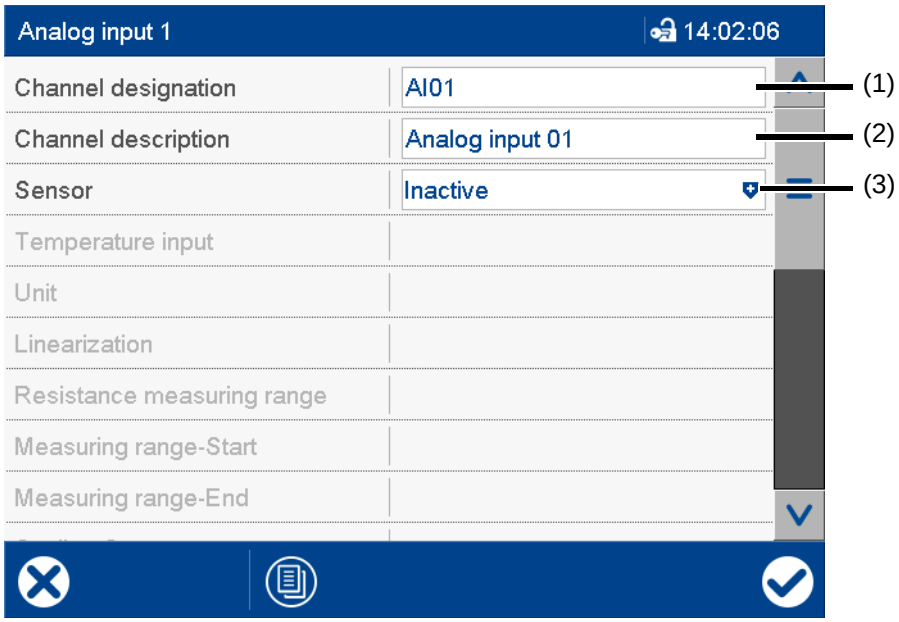
Example of an electronic signature:

⇨ Chapter 5.8 "Electronic signature", page 63

5.5 Text input dialog

The text input dialog is used for all functions in which the user can enter or edit text.

Example: Configuration of an analog input

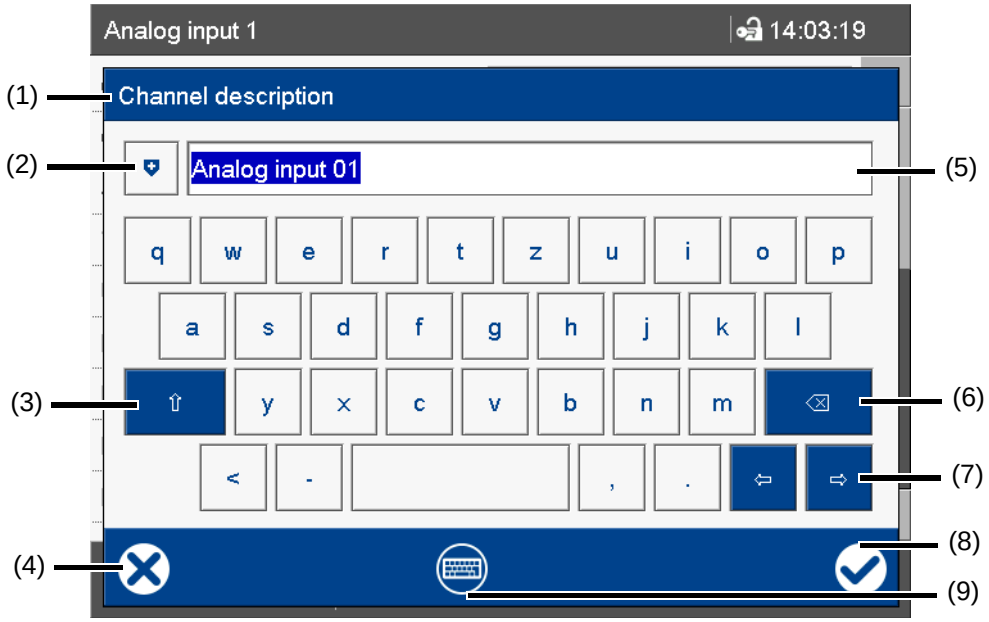


(1) Text editable (max. 5 characters)

(2) Text editable (max. 21 characters)
Tap the text box to edit the text.

(3) Drop-down menu (text not editable)

Text input dialog



(1) Parameters (description of the configuration parameter from the previous dialog)

(2) Open text list (history of last 20 text entries)

The text from the list replaces the text in the input box.

(3) Shift key (toggle to the second level of the current keyboard layout, e.g., uppercase)

To hold, you need to press the key for longer. To reset, (briefly) press the key again.

(4) Cancel text entry (input is not applied)

(5) Input box with current text

After changing to the text input dialog, the current text is fully selected. Tapping on the input box displays a cursor. Tapping and dragging the cursor lets you select multiple characters.

(6) Backspace key

The character to the left of the cursor is deleted. If multiple characters are selected, they are deleted.

(7) Cursor keys (move cursor left or right)

(8) Complete text entry (input is applied)

(9) Toggle keyboard layout (letters, digits, non-standard characters, for example)

Keyboard mappings

Each of the 30 keys in the default keyboard layout can be mapped with up to 10 characters. The Shift key toggles between the first two characters. To select more characters, you need to hold down the relevant key for longer. This displays a selection window in which you can select the desired character by tapping.

(1) Multiple assignment of the "a" key

To leave the selection window without selecting a character, tap on the screen outside of the selection window.

More examples of multiple assignments of individual keys:

q Q @

s S ß

< > | ’

Keyboard layout

The "Keyboard layout" key enables you to switch between the various keyboard layouts (keyboard assignments) (e.g., letters, digits, non-standard characters).

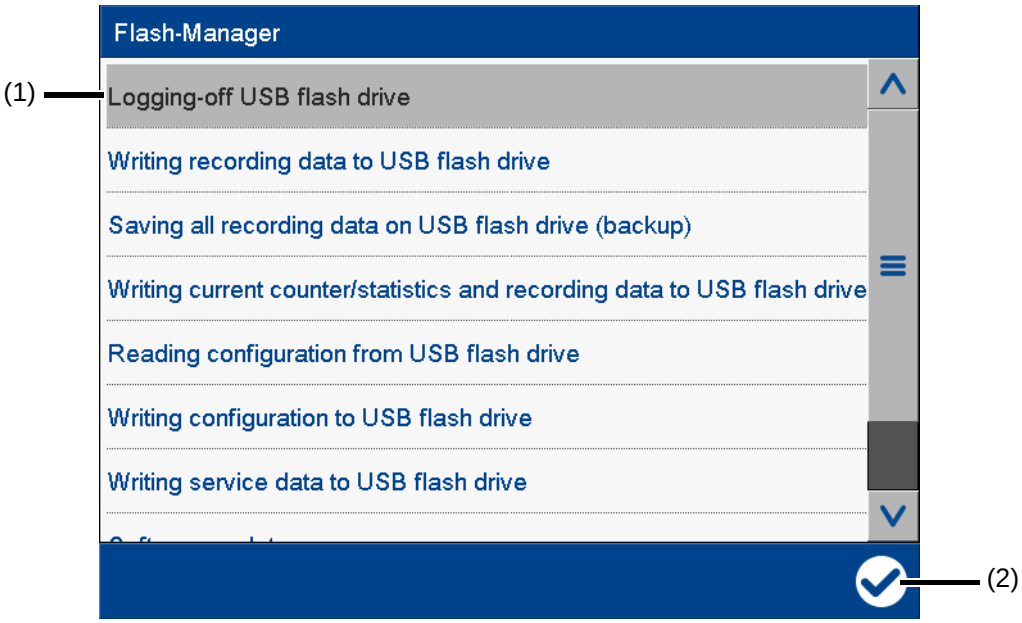
In the default keyboard layout (e.g., letters), each key can be assigned up to 10 characters. In the other keyboard layouts, only one character per key is possible.

The keyboard can be assigned individually for each language with the setup program (max. 6 layouts).

5.6 Flash manager

The Flash manager menu automatically opens when the device is in basic status and a USB flash drive (FAT16/FAT32 file system) is plugged into the front USB port. If the device is in a menu (main menu, alarm-/event list, display), the Flash manager is opened only after leaving the menu.

Device dialog



(1) Flash manager functions
The selected function is grayed out.

(2) "Apply" button

The Flash manager provides functions for transferring specific data between the device and a USB flash drive. The available functions depend on the logged in user's rights, or on the public rights. The selected function is performed by pressing the "Apply" button (check mark).

CAUTION!
Do not remove the USB flash drive without ejecting it.
There is a risk of losing data.
Before removing the USB flash drive, make sure to run the "Logging-off USB flash drive" function. Do not remove the USB flash drive until you see the "Hardware can now be removed!" message.

Flash manager functions

- ***Logging-off USB flash drive***:
  Function for safely removing the USB flash drive to avoid data loss
- ***Writing recording data to USB flash drive***:
  Any recorded data not yet backed up is written to the USB flash drive (retrieving the data). When this function is called up again, only the newly-added recorded data since the last run is transferred to the USB flash drive.
- ***Saving all recording data on USB flash drive (Backup)***:
  All recorded data available on the device (including previously backed up data) is transferred to the USB flash drive (data backup). This function can take up to 30 minutes to com-

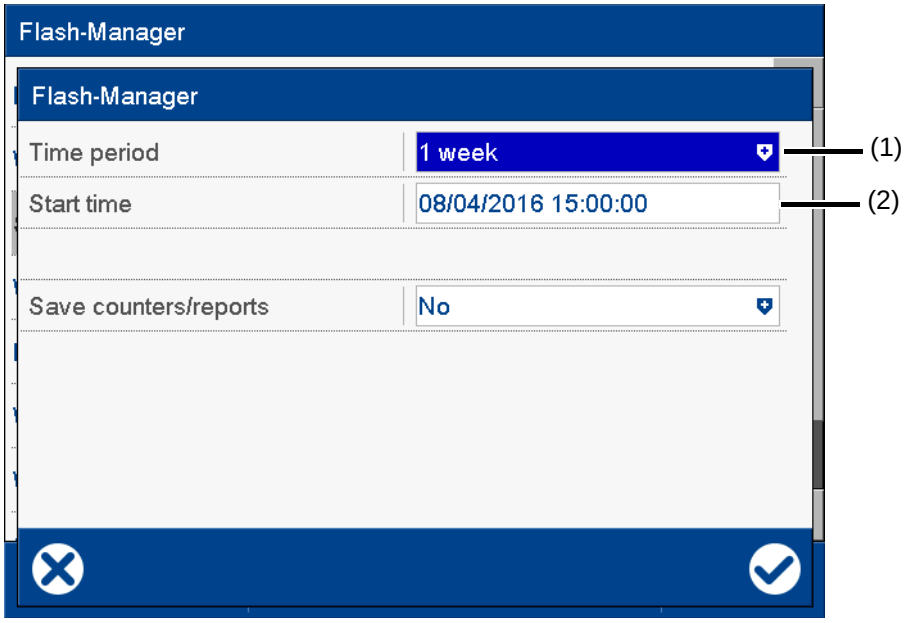
plete.
Device version 01: When you run the "Writing recording data to USB flash drive" function after this, only the newly-added recorded data is transferred to the USB flash drive.
As of device version 02, the user can choose a time period from which the recording data is saved. The "Total" time period corresponds to the previous function. For the other time periods (1 day, 1 week, 4 weeks) the determined starting time is displayed and updated (see example further down). Here, the user can also choose any starting time in the past. Using parameter "Save counters/reports" it is possible to save the current readings of the counters and integrators as well as the statistic (report) – even when they have not yet been completed – along with the recording data.

- ***Writing current counter/statistics and recording data to USB flash drive***:
  The current counter and integrator statuses, as well as the statistics (report) are read out, and written to the USB flash drive along with the newly recorded data.
- ***Reading configuration from USB flash drive***:
  The configuration data (except the user list) is transferred from the USB flash drive to the device. This reconfigures the device and data recording is restarted.
- ***Writing configuration to USB flash drive***:
  The configuration data (incl. the user list) is transferred from the device to the USB flash drive.
- ***Writing service data to USB flash drive***:
  Internal service data is transferred to the USB flash drive and can be sent to the device manufacturer for diagnosis.
- ***Software update***:
  Function for updating the device software; the USB flash drive must contain specific data provided by the device manufacturer.
- ***Reading user list from USB fash drive***:
  The user list is transferred from the USB flash drive to the device and activated.

CAUTION!
Data loss due to software update.
A software update deletes all recorded data stored on the device (incl. counters/integrators and statistics).
Before updating the software, back up the recorded data on a USB flash drive.

Save recording data of a certain time period

In the following example the recording data of a week should be saved.



(1) Select time period

(2) Determined starting time (editable)

The starting time of the device is automatically determined depending on the current date (here it is: August 11, 2016), the current time (here it is 15:00:00), and the selected time period. This time can be changed by the user.

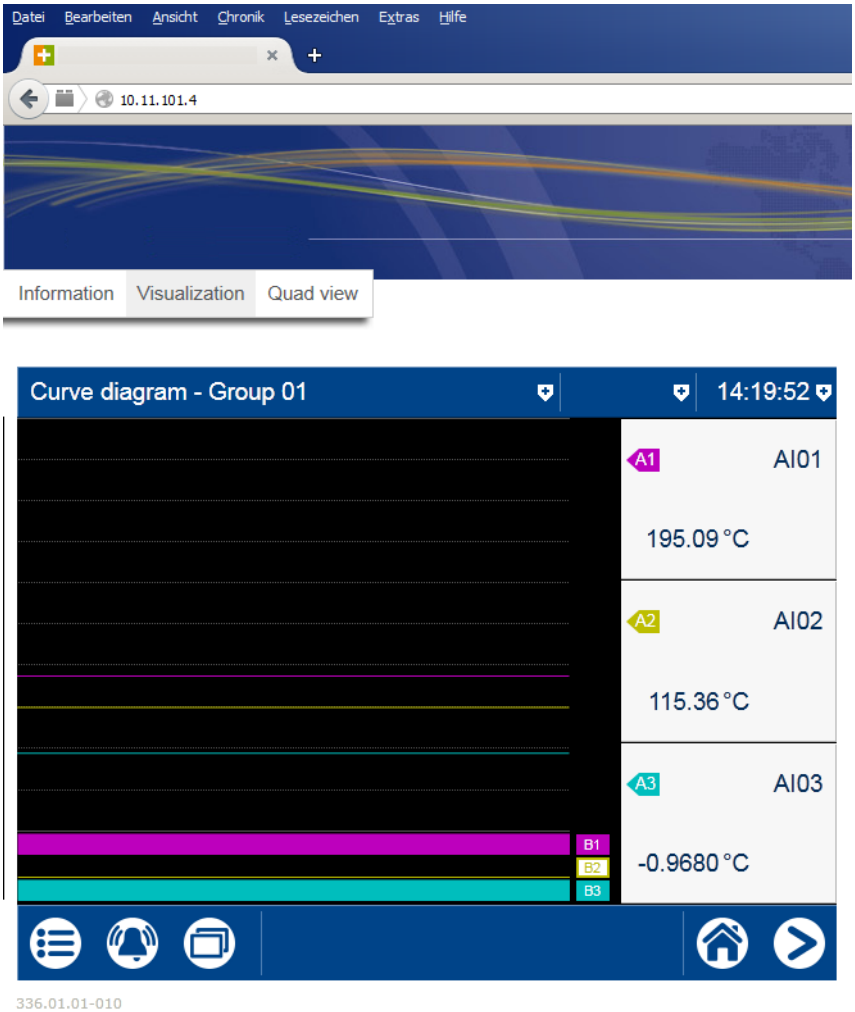
NOTE!
The recording data that is saved in the device is organized into data blocks of 20 kB each. The result can be that even data that was recorded prior to the started time is saved.

5 Operation

5.7 Web server

The device includes a built-in web server which supports online visualization with the help of a web browser. The user can access the process values, various visualizations, and the device's alarm and event list.

For access, you need to enter the device's IP address in the address line of the web browser. If needed, you can also use the DNS device name.



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The start page, index.htm, exists by default; more HTML pages can be transferred to the device using the setup program. To prevent unauthorized access, you can enable a logon procedure with user name and password.

The web server is configured with the setup program (see the operating manual chapter "Configuration - in setup program only" > "Web server").

The web server is also enabled with the setup program (see the operating manual chapter "Configuration" > "Device": Version of online visualization):

NOTE!
The view depends on the web browser you use.
Supported web browsers: Microsoft® Internet Explorer[1], Mozilla Firefox[2]

[1] Microsoft® and Internet Explorer are registered trademarks of Microsoft® Corporation.

[2] Mozilla and Firefox are registered trademarks of the Mozilla Foundation.

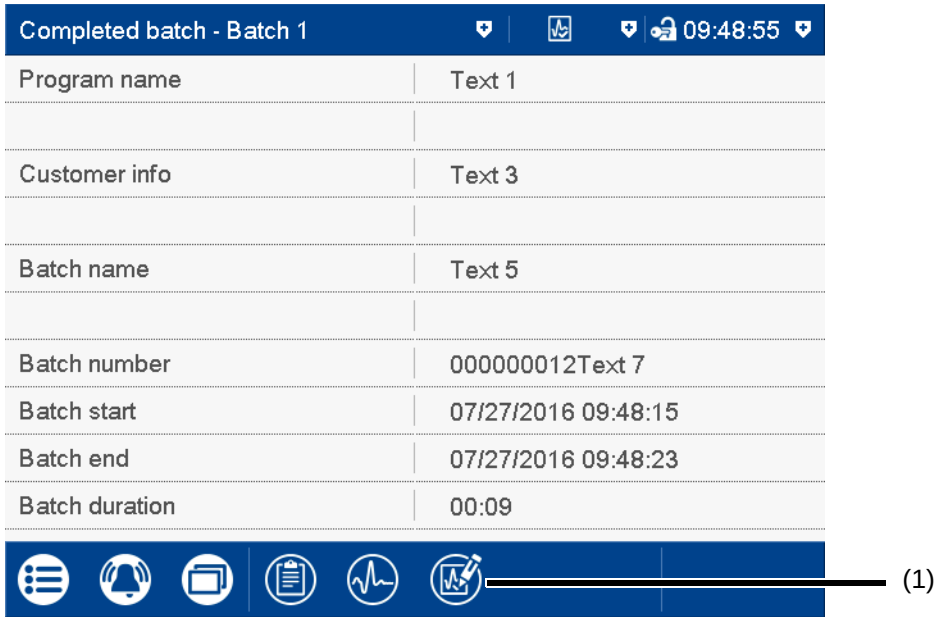
5.8 Electronic signature

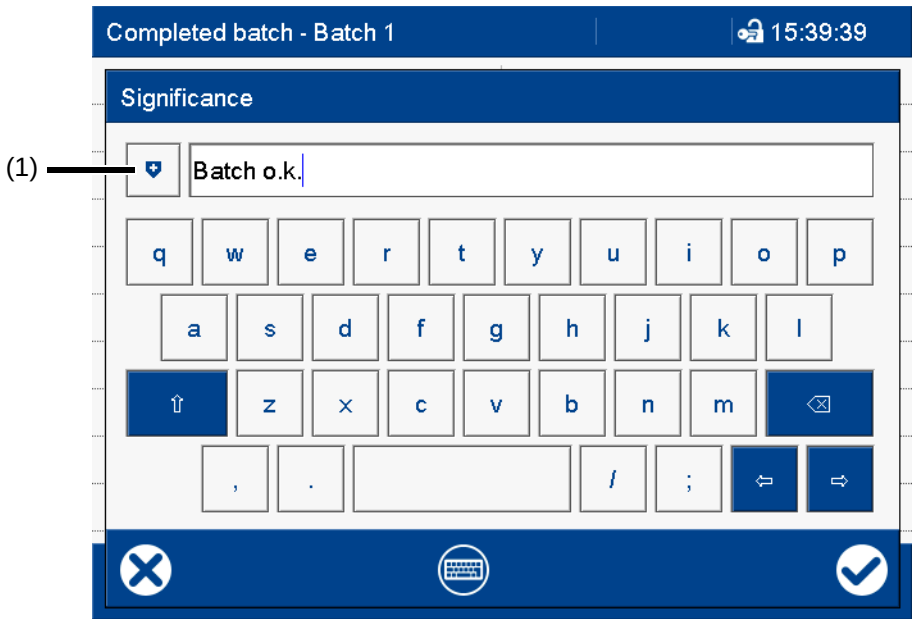
As of device version 02 and with extra code 888 (FDA), the user has the option to provide a completed batch or the recording data of a certain time period with his/her electronic signature. A logged-on user can provide his/her signature during logoff – it applies to the entire time period for which the user was signed in.

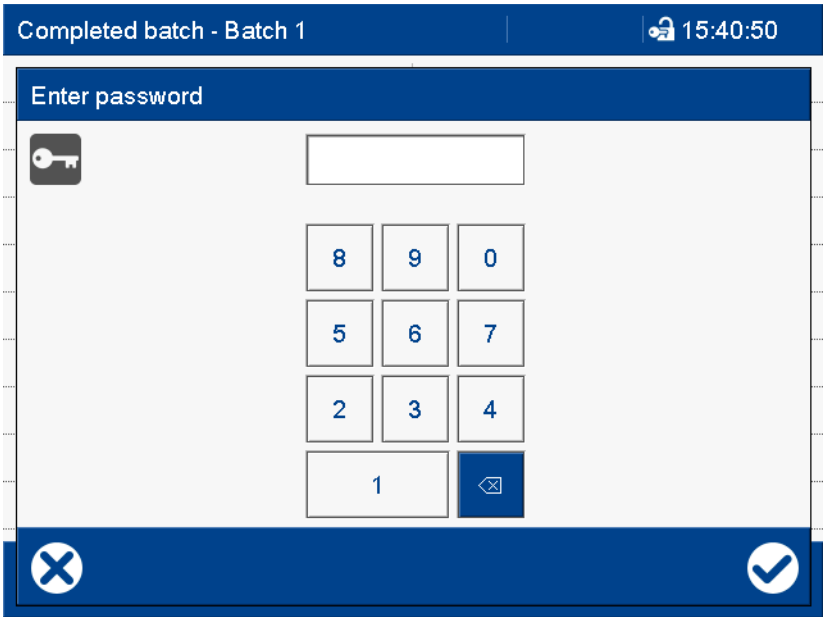
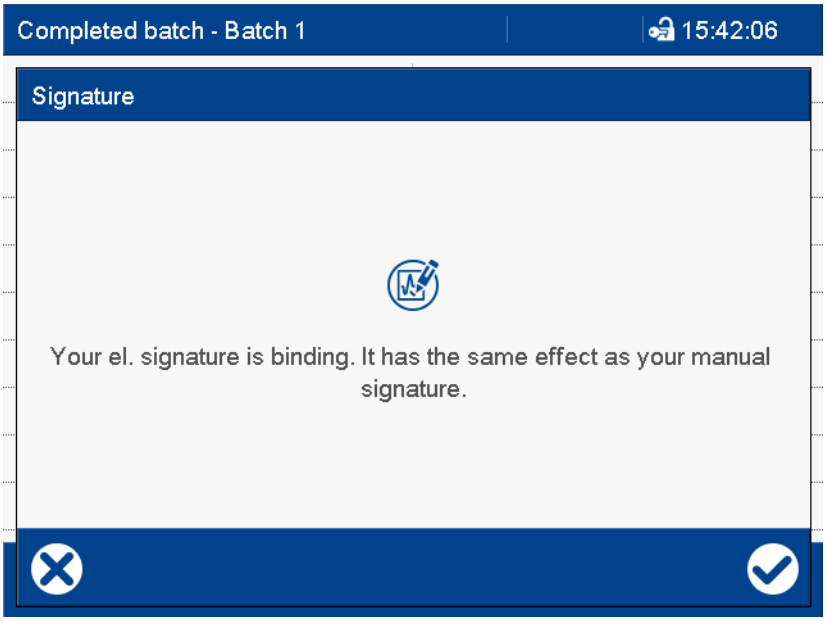
The prerequisites for the electronic signature are the device-dependent settings in the PCS software as well as the related user right.

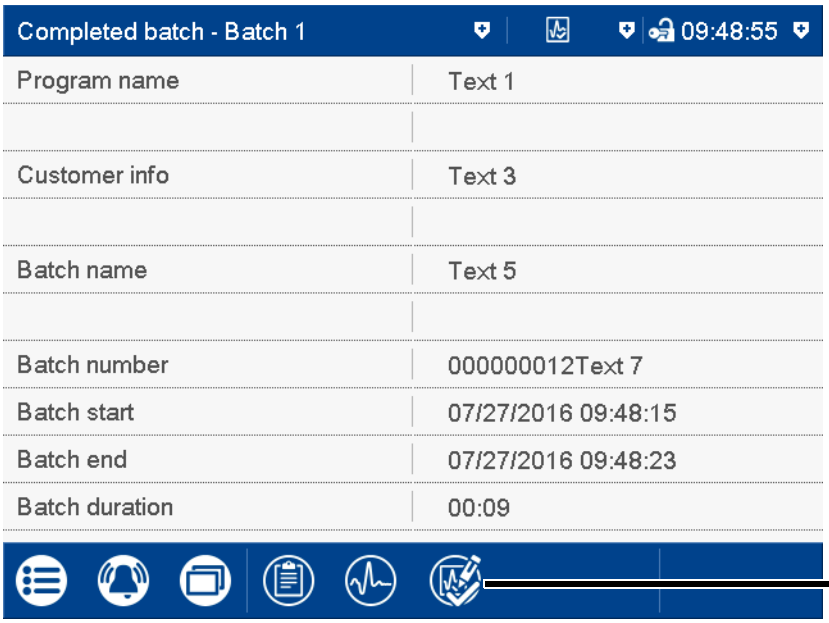
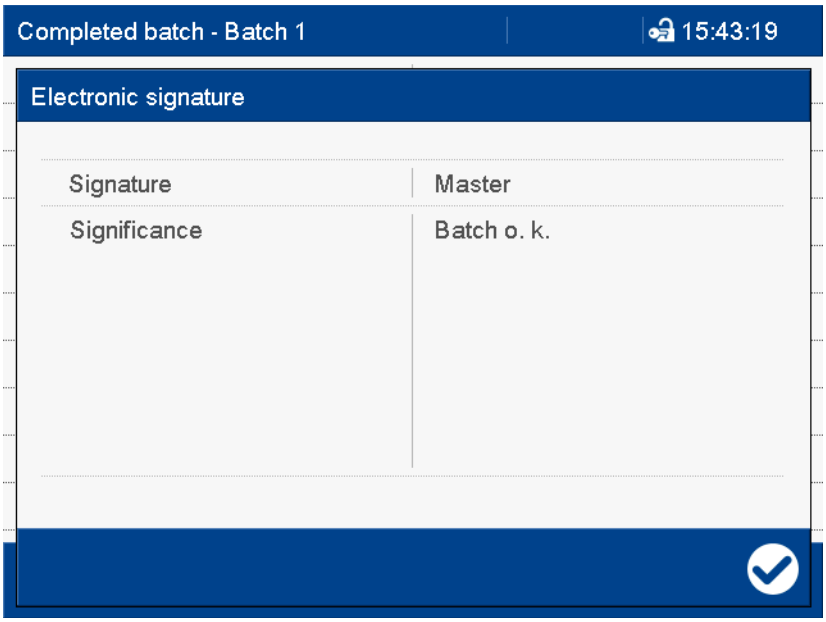
Completed batch

The following example shows the electronic signature of a completed batch.

Step	Activity
1	In the protocol of a completed batch recording press the button (1) for the electronic signature: 

Step	Activity
2	Select your user ID (in this case: Master)  The user has to select his/her ID. This step is required because someone other than the currently logged-on user can provide this signature.
3	Enter text that describes the meaning of the signature (evaluation text) using the keyboard. Alternatively, select text from the text list (1) and, if required, edit it:  The possibilities of entering a text depend on the configuration (no text available, enter text via keyboard, select text from text list, select text from text list and edit).

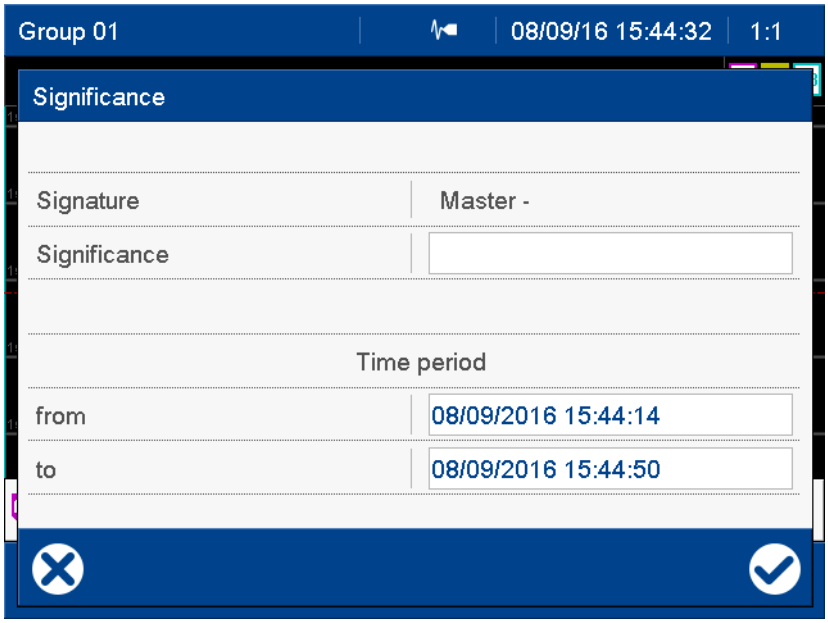
Step	Activity
4	Enter password: 
5	Confirm process:  The process can be still be aborted here.

Step	Activity
6	In the protocol of a completed batch recording press the button (1) to display the provided signature:  ➥ The signature (here: Master) and the meaning of the signature (here: Batch o.k.) are displayed. 

Time period

The electronic signature for a time period essentially differs from the signature for the completed batch by requiring the time period in question to be selected.

The signature applies to the time period that is displayed in the diagram at the time of the signature. The displayed area may have to be expanded prior to signing. During signing the time period can only be reduced; an increase is then no longer possible.



Logoff

The electronic signature during logoff requires no entry of the user ID as this function is only available for the user who is currently logged-on. The further steps, including entry of the password, correspond to those of the signature for the completed batches from step 3 (Enter text for meaning) to step 5 (Confirm process). The signature can only be evaluated with the PCA3000 software.

The signature applies to the entire time period for which the user was logged on.

5 Operation

6.1 Technical data

6.1.1 Analog inputs (options 1 and 2)

General information

Quantity	0, 3, or 6
Connector number (back of device)	7 to 9, 11 to 13

Thermocouples

Description	Type	Standard	ITS	Measuring range	Accuracy[1]
Fe-CuNi	"L"	DIN 43710	ITPS-68	-200 to +900 °C	≤ 0.25 %
Fe-CuNi	"J"	IEC 60584-1	ITS-90	-210 to +1200 °C	≤ 0.25 % from -100 °C
Cu-CuNi	"U"	DIN 43710	ITPS-68	-200 to +600 °C	≤ 0.25 % from -100 °C
Cu-CuNi DIN	"T"	IEC 60584-1	ITS-90	-270 to +400 °C	≤ 0.25 % from -150 °C
NiCr-Ni DIN	"K"	IEC 60584-1	ITS-90	-270 to +1372 °C	≤ 0.25 % from -80 °C
NiCr-CuNi	"E"	IEC 60584-1	ITS-90	-270 to +1000 °C	≤ 0.25 % from -80 °C
NiCrSi-NiSi	"N"	IEC 60584-1	ITS-90	-270 to +1300 °C	≤ 0.25 % from -80 °C
Pt10Rh-Pt	"S"	IEC 60584-1	ITS-90	-50 to 1768 °C	≤ 0.25 % from 20 °C
Pt13Rh-Pt	"R"	IEC 60584-1	ITS-90	-50 to 1768 °C	≤ 0.25 % from 50 °C
Pt30Rh-Pt6Rh	"B"	IEC 60584-1	ITS-90	0 to 1820 °C	≤ 0.25 % from 400 °C
W5Re/W26Re	"C"	ASTM E230M-11	ITS-90	0 to 2315 °C	≤ 0.25 % from 500 °C
W3Re/W25Re	"D"	ASTM E1751M-09	ITS-90	0 to 2315 °C	≤ 0.25 % from 500 °C
W5Re/W20Re	"A1"	GOST R 8.585-2001	ITS-90	0 to 2500 °C	≤ 0.25 % from 500 °C
Chromel-Copel	"L"	GOST R 8.585-2001	ITS-90	-200 to +800 °C	≤ 0.25 % from -80 °C
Chromel-Alumel		GOST R 8.585-2001	ITS-90	-270 to1372 °C	≤ 0.25 % from -80 °C

Ambient temperature influence	≤ 100 ppm/K
Smallest measuring span	Type L (Fe-CuNi), J, U, T, K, E, N, Chromel-Alumel: 100 K Type S, R, B, C, D, A1, Chromel-Copel: 500 K
Measuring range start/end	Freely programmable within the limits in steps of 0.1 K
Cold junction	Internal (Pt100) or external (constant)
Reference point accuracy (internal)	± 1 K
Reference point temperature (external)	-30 to +85 °C (adjustable)
Sampling rate	3 or 6 channels: 125 ms
Input filter	Digital filter, 2nd order; filter constant can be set from 0 to 100.0 s
Galvanic isolation	See "Galvanic isolation"
Base measuring range	20 to 70 mV

[1] The accuracy value refers to the maximum measuring range. Small measuring ranges lead to reduced linearization accuracy.

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RTD temperature probe

Description	Standard	ITS	Connection type	Measuring range	Accuracy[1]	Measuring current
Pt50	IEC 751: 2008	ITS-90	2-/3-/4-wire	-200 to +850 °C	≤ 0.1 %	500 µA
Pt100	IEC 751: 2008	ITS-90	2-/3-/4-wire	-200 to +850 °C	≤ 0.1 %	500 µA
Pt500	IEC 751: 2008	ITS-90	2-/3-/4-wire	-200 to +850 °C	≤ 0.1 %	100 µA
Pt1000	IEC 751: 2008	ITS-90	2-/3-/4-wire	-200 to +850 °C	≤ 0.1 %	100 µA
Pt100	JIS 1604		2-/3-/4-wire	-200 to +650 °C	≤ 0.1 %	500 µA
Pt50	GOST 6651-2009 A.2	ITS-90	2-/3-/4-wire	-200 to +850 °C	≤ 0.1 %	500 µA
Pt100	GOST 6651-2009 A.2	ITS-90	2-/3-/4-wire	-200 to +850 °C	≤ 0.1 %	500 µA
Cu50	GOST 6651-2009 A.3	ITS-90	2-/3-/4-wire	-180 to +200 °C	≤ 0.4 %	500 µA
Cu100	GOST 6651-2009 A.3	ITS-90	2-/3-/4-wire	-180 to +200 °C	≤ 0.4 %	500 µA
Ni100	DIN 43760	ITPS-68	2-/3-/4-wire	-60 to +250 °C	≤ 0.2 %	500 µA
Ni100	GOST 6651-2009 A.5	ITPS-68	2-/3-/4-wire	-60 to +180 °C	≤ 0.2 %	500 µA

Ambient temperature influence	≤ 50 ppm/K
Smallest measuring span	15 K
Sensor lead wire resistance	Max. 10 Ω per lead for two-wire circuit Max. 30 Ω per lead for three/four-wire circuit
Measuring range start/end	Freely programmable within the limits in steps of 0.1 K
Sampling rate	3 or 6 channels: 125 ms
Input filter	Digital filter, 2nd order; filter constant can be set from 0 to 100.0 s
Galvanic isolation	See "Galvanic isolation"

[1] The accuracy value refers to the maximum measuring range. Small measuring ranges lead to reduced linearization accuracy.

Resistance transmitter and resistor/potentiometer

Description	Measuring range	Accuracy[1]	Measuring current
Resistance transmitter	0 to 4000 Ω	≤ 0.1 %	100 µA
Resistance/potentiometer	0 to 400 Ω	≤ 0.1 %	500 µA
	0 to 4000 Ω	≤ 0.1 %	100 µA
Ambient temperature influence	≤ 100 ppm/K		
Connection type			
Resistance transmitter	Three-wire circuit		
Resistance/potentiometer	Two/three/four-wire circuit		
Smallest measuring span	60 Ω		
Sensor lead wire resistance	Max. 10 Ω per cable for two-wire and three-wire circuits		
Resistance values	Freely programmable within the limits in steps of 0.1 Ω		
Sampling rate	3 or 6 channels: 125 ms		
Input filter	Digital filter, 2nd order; filter constant can be set from 0 to 100.0 s		
Galvanic isolation	See "Galvanic isolation"		

[1] The linearization accuracy value refers to the maximum measuring range. Small measuring ranges lead to reduced linearization accuracy.

Voltage, current (standard signals)

Description	Measuring range	Accuracy[1]	Input resistance or burden voltage
Voltage	0 to 70 mV	≤ 0.1 %	> 500 kΩ
	0 to 10 V	≤ 0.05 %	> 500 kΩ
	-10 to +10 V	≤ 0.05 %	> 500 kΩ
	-1 to +1 V	≤ 0.08 %	> 500 kΩ
	0 to 1 V	≤ 0.08 %	> 500 kΩ
Current	4 to 20 mA	≤ 0.1 %	< 2 V
	0 to 20 mA	≤ 0.1 %	< 2 V
Ambient temperature influence	≤ 100 ppm/K		
Smallest measuring span			
Voltage	5 mV		
Current	0.5 mA		
Measuring range start/end			
Voltage	Freely programmable within the limits in steps of 0.01 mV		
Current	Freely programmable within the limits in steps of 0.01 mA		
Deviation below/above the measuring range	According to NAMUR recommendation NE 43 (only current input 4 to 20 mA)		
Sampling rate	3 or 6 channels: 125 ms		
Input filter	Digital filter, 2nd order; filter constant can be set from 0 to 100.0 s		
Galvanic isolation	See "Galvanic isolation"		

[1] The accuracy value refers to the maximum measuring range. Small measuring ranges lead to reduced linearization accuracy.

Measuring circuit monitoring

The device response in the event of a fault is configurable.

Measuring probe	Probe break	Short-circuit	Polarity
Thermocouple	is detected	is not detected	is detected in certain conditions[1]
RTD temperature probe	is detected	is detected	is not detected
Resistance transmitter	is detected	is not detected	is not detected
Resistance/potentiometer	is detected	is not detected	is not detected
Voltage 0 to 70 mV	is detected	is not detected	is detected
Voltage 0 to 10 V	is not detected	is not detected	is detected
Voltage -10 to +10 V	is not detected	is not detected	is not detected
Voltage 0 to 1 V	is detected	is not detected	is detected
Voltage -1 to +1 V	is detected	is not detected	is not detected
Current 0 to 20 mA	is not detected	is not detected	is not detected
Current 4 to 20 mA	is detected	is detected	is detected

[1] dependent on the set characteristic line

6.1.2 Digital inputs (options 1 and 2)

Quantity	0, 6, or 12
Connector number (back of device)	6 and 10
Input	
Level	Logic level "0": < 3.5 V; logic level "1": > 10 V
Sampling rate	125 ms (max. counting frequency: 8 Hz)
Potential-free contact	R_{ON}: < 1 kΩ; R_{OFF}: > 50 kΩ (use of the auxiliary voltage 24 V)
Auxiliary voltage	DC 24 V +10/-15 %, max. 50 mA per option

6.1.3 Digital inputs/outputs (option 3)

Quantity	0 or 12
Connector number (back of device)	14 and 15
Input or output	Individually configurable as input or output
Input	
Level	Logic level "0": < 3.5 V; logic level "1": > 10 V
Sampling rate	125 ms (max. counting frequency: 8 Hz)
Potential-free contact	R_{ON}: < 1 kΩ; R_{OFF}: > 50 kΩ (use of the auxiliary voltage 24 V)
High-speed input	Input 1
Function	Counts each positive edge of the input signal
Max. counting frequency	12.5 kHz
Mark-to-space ratio	30 to 70 % (high-pulse ≥ 30 µs, low-pulse ≥ 30 µs)
Accuracy in flow measurement	0.5 % of measured value; ambient temperature influence: 50 ppm/K
Output	
Output signal	DC 0/24 V +10/-15 %; galvanically isolated
Current	Max. 40 mA per output, max. 100 mA on the whole
Auxiliary voltage	DC 24 V +10/-15 %, max. 100 mA (incl. current of digital outputs)

6.1.4 Analog outputs (options 1 and 2)

Quantity	0, 1, or 2
Connector number (back of device)	6 and 10
Voltage	
Output signal	DC 0 to 10 V
Load resistance	> 500 Ω
Current	
Output signal	DC 0(4) to 20 mA
Load resistance	< 450 Ω
Accuracy	0.5 %
Ambient temperature influence	150 ppm/K

6.1.5 Relay

Quantity	1
Connector number (back of device)	4
Relay (changeover contact)	
Switching capacity	3 A at AC 230 V, resistive load
Contact life	30,000 switching operations at rated load

6.1.6 Interfaces

RS232/RS485	
Quantity	1 (can be switched between RS232 and RS485)
Connector type	SUB-D 9-pin (socket)
Baud rate	9600, 19200, 38400, 115200
Data format	8/1n, 8/1e, 8/1o
Protocol	Modbus RTU as master or slave; barcode scanner
Application	Communication with Modbus master/slave, connection of a barcode scanner
External inputs	Via Modbus master/slave functionality: 24 analog and 24 digital inputs, 10 batch texts, 4 event texts
Ethernet	
Quantity	1
Connector type	RJ45 (socket)
Transfer rate	10 Mbit/s, 100 Mbit/s
Protocol	IPv4; TCP, UDP; DHCP, DNS, HTTP, SMTP, SNTP, Modbus/TCP
Application	Communication with PC (setup program, data archiving, web server), email server, SNTP server, and Modbus master/slave
External inputs	Via Modbus master/slave functionality: 24 analog and 24 digital inputs, 10 batch texts, 4 event texts
Max. cable length	100 m
USB host	
Quantity	1 (on front with cover)
Connector type	A (socket)
Standard	USB 2.0 (high speed)
Application	Exclusively for connecting a USB flash drive (FAT16/FAT32; see accessories)
Max. load current	100 mA
USB device	
Quantity	1 (on the back)
Connector type	Micro-B (socket)
Standard	USB 2.0 (high speed)
Application	To connect to a PC (setup program, PCC/PCA3000)
Max. cable length	5 m

6.1.7 Screen

Type	TFT color screen/touchscreen (resistive)[1]
Size	14.5 cm (5.7")
Resolution	640 × 480 pixels (VGA)
Number of colors	65536
Frame rate	60 Hz (type)
Brightness setting	Adjustable on the device
Screen saver (switch-off)	After waiting period or control signal

[1] TFT color screens can have pixel errors due to technological and/or production-related reasons. Four pixel errors are deemed acceptable for this paperless recorder. They do not constitute an assertion for warranty claims.

6.1.8 Electrical data

Voltage supply	AC 110 to 240 V +10/-15 %, 48 to 63 Hz or AC/DC 20 to 30 V, 48 to 63 Hz (not in conjunction with extra code 970)
Electrical safety	According to DIN EN 61010-1 Overvoltage category II up to 300 V mains voltage, pollution degree 2
Protection rating	I with internal isolation from SELV
Power consumption	
AC 110 to 240 V	< 45 VA
AC/DC 20 to 30 V	< 30 VA
Data backup	Internal flash memory
Data buffering	Battery (operating life > 7 years); additionally, storage capacitor for buffering during battery change (buffer time approx. 6 minutes)
Clock	Battery-buffered real-time clock
Electrical connection	On the back via push-in spring-cage terminals
Conductor cross section	At plug connector 4 and 5 (voltage supply and relay)
Wire or strand without ferrule	Min. 0.2 mm^2, max. 2.5 mm^2
Strand with ferrule	Min. 0.25 mm^2, max. 2.5 mm^2
2 × strand with twin ferrule with plastic collar	Min. 0.5 mm^2, max. 1.5 mm^2 (both strands with identical cross section)
Stripping length	10 mm
Conductor cross section	At plug connector 6 to 15 (inputs and outputs)
Wire or strand without ferrule	Min. 0.14 mm^2, max. 1.5 mm^2
Strand with ferrule	Without plastic collar: min. 0.25 mm^2, max. 1.5 mm^2 With plastic collar: min. 0.25 mm^2, max. 0.5 mm^2
Stripping length	9 mm
Voltage supply influence	< 0.1 % of the measuring range

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6.1.9 Environmental influences

Ambient temperature range	
Storage	-20 to +60 °C
Operation	0 to +50 °C; in conjunction with extra code 970: 0 to +40 °C
Site altitude	Up to 2000 m above sea level
Climatic environmental conditions	According to DIN EN 60721-3 with extended temperature range
Resistance to climatic conditions	≤ 85 % rel. humidity without condensation
Storage	According to class 1K2
Operation	According to class 3K3
Mechanical environmental conditions	According to DIN EN 60721-3
Storage	According to class 1M2
Transport	According to class 2M2
Operation	According to class 3M3
Electromagnetic compatibility (EMC)	According to DIN EN 61326-1
Interference emission	Class A – only for industrial use –
Interference immunity	Industrial requirements

6.1.10 Case

Case type	Flush-mounted case according to DIN IEC 61554 made of zinc-plated steel sheet (indoor use)
Case front	Made of diecast zinc with decor foil
Front frame dimensions	144 mm x 144 mm (front frame depth approx. 8 mm incl. seal)
Mounting depth	119 mm (incl. spring-cage terminals)
Panel cut-out	$138^{+1.0}$ mm × $138^{+1.0}$ mm
Panel thickness	2 to 8 mm
Case fastening	In panel, using the four supplied mounting elements
Operating position	Any, with due consideration for the viewing angle of the screen, horizontal ±50°, vertical ±30°
Protection type	According to DIN EN 60529, IP65 on the front, IP20 on the back; in conjunction with extra code 970: IP20 with the carrying case open, IP20D with the carrying case closed
Weight	Max. 1.6 kg

6.1.11 Approvals / approval marks

Approval mark	**Testing agency**	**Certificates/certification numbers**	**Inspection basis**	**Valid for**
c UL us	Underwriters Laboratories	E201387	UL 61010-1 (3rd Ed.), CAN/CSA-22.2 No. 61010-1 (3rd Ed.)	All types of the flush-mounted device; not in conjunction with extra code 970

6.2 Change of the buffer battery

CAUTION!
The device contains a buffer battery that is used for data buffering when the device is in switched off mode or if the power fails. The life of the battery is at least 7 years. A low battery is indicated by the battery pre-alarm ("Battery low"). An empty battery is indicated by the battery alarm ("Battery empty").
If the battery is not changed in time, data may be lost!
The battery must be replaced within 4 weeks after the battery pre-alarm has been triggered. The battery change must be carried out exclusively by the manufacturer‘s service department. For this purpose the device must be sent to the manufacturer.

6.3 China RoHS

部件名称 Product group: 706520	有毒有害物质或元素 Hazardous substances					
	铅（Pb）	汞（Hg）	镉（Cd）	六价铬（Cr(VI)）	多溴联苯（PBB）	多溴二苯醚（PBDE）
外壳 Housing (Gehäuse)	X	○	○	○	○	○
过程连接 Process connection (Prozessanschluss)	○	○	○	○	○	○
螺母 Nut (Mutter)	○	○	○	○	○	○
螺钉 Screw (Schraube)	○	○	○	○	○	○

本表格依据 SJ/T 11364-2014的规定编制。

(This table is prepared in accordance with the provisions of SJ/T 11364-2014.)

O：表示该有害物质在该部件所有均质材料中的含量均在 GB/T 26572 规定的限量要求以下。

(O: Indicates that said hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement of GB/T 26572.)

X：表示该有害物质至少在该部件的某一均质材料中的含量超出 GB/T 26572 规定的限量要求。

(X: Indicates that said hazardous substance contained in one of the homogeneous materials used for this part is above the limit requirement of GB/T 26572.)

6.4 Barcode

Initialize the barcode scanner

The barcode scanner must be initialized once before use. Example:

Step	Activity
1	Scan the „Factory Default Settings“ barcode.
2	Scan the „RS-232 Standard“ barcode („Select RS-232 Standard“).

Information and bar codes can be found in the manual of the barcode scanner used.

6.4.1 Batch control

NOTE!
The batch control via barcode scanner requires the appropriate configuration of the paperless recorder. The right „Enter batch texts“ is required.

Display the batch report

This function requires the appropriate display configuration (Configuration > Display > Generally: Barcode -> Batch image = Yes).

Step	Activity
1	Scan the BATCH1 barcode.

The batch report is displayed.

Enter the batch texts

Step	Activity
1	Scan the barcodes for the batch text of each line one after the other (starting from the first line).

All batch lines which were configured for barcode input are successively filled with the scanned text (max. 160 characters). The last line will be overwritten at the next entry.

A dollar sign within a scanned text causes the text following the dollar sign to be entered into the next line. In this way, several lines can be filled with one scan.

NOTE!
The codes for batch control (BATCH1, START, STOP, RESET) can not be read as a batch text.

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Reset the texts

Step	Activity
1	Scan the RESET barcode.


RESET

The entered batch texts are reset. The default texts are shown and the first line is prepared again for the text input.

The default text is defined in the configuration of the batch line (Configuration > Batch > Batch line: Default text).

Start the batch reporting

Step	Activity
1	Scan the START barcode.


START

The batch reporting is started.

Stop the batch reporting

Step	Activity
1	Scan the STOP barcode.


STOP

The batch reporting is stopped.

In the current batch report, depending on the configuration of the batch line, texts that have been read via barcode are either reset to the default text (Configuration > Batch > Batch line: Delete line = Yes) or maintained.

In the completed batch report, the texts are saved.

6.4.2 Enter event texts and process values

As of device version 02 an event text or process value (external text/analog/digital variables) can be entered by means of specific control characters.

The text or value, which is scanned using a control character, is exclusively used as event text or process value. Afterwards, the system automatically switches back to barcode input for batch control.

Enter text into event list

%En% = entry in the event list of group n (n = 1 to 4 for group 1 to 4; n = 0 for all groups)

Example: %E1%ABC

The text "ABC" is entered into the event list of group 1.

Example: %E0%DEF

The text "DEF" is entered into the event lists of all groups.

Enter text into external text variable

%Tn% = enter as text into the external text variable n (n = 1 to 10)

Example: %T1%ABC

The text "ABC" is entered into external text variable 1.

The entered text is available in the text selector.

The control character and the following text can also be scanned one after another. To do so, for the first scan process only the control character must be used.

Example for the first scan process: %T1%

The next scanned text is interpreted as text for the external text variable 1.

Example for the second scan process: ABC

The text "ABC" is entered into external text variable 1.

Enter float value in external analog variable

%Fn% = enter as float value into the external analog variable n (n = 1 to 24)

Example: %F1%447.6

The float value 447.6 is entered into external analog variable 1.

The entered value is available in the analog selector.

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Enter Boolean value in external digital variable:

%Bn% = enter as Boolean value into the external digital variable n (n = 1 to 24)

Example: %B1%1

The Boolean value 1 (TRUE) is entered into the external digital variable 1.

The entered value is available in the digital selector.

A scan process allows several values to be entered into consecutive variables.

Example: %B2%101

The Boolean values 1, 0, 1 are entered as of variable 2 (variable 2 = 1, variable 3 = 0, variable 4 = 1).

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