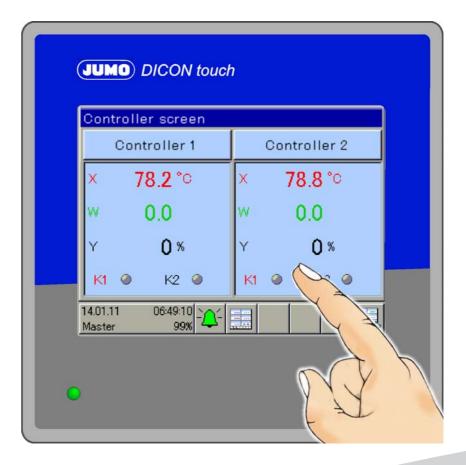
JUMO DICON touch

Two-channel process and program controller with with paperless recorder and touchscreen



B 703571.0 Operating Manual



2015-03-01/00603327

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1.1 Safety information

General information

This manual contains information that must be observed in the interest of your own safety and to avoid damage to assets. This information is supported by symbols which are used in this manual as indicated.

Please read this manual before commissioning the device. Keep the manual in a place accessible to all users at all times.

If difficulties occur during commissioning please refrain from carrying out any manipulations that could jeopardize your warranty rights.

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 signs



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.

V	-	Y
	\mathbf{N}	T
	Ľ	X
/	ب	ð,

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 Representation

Menu structure

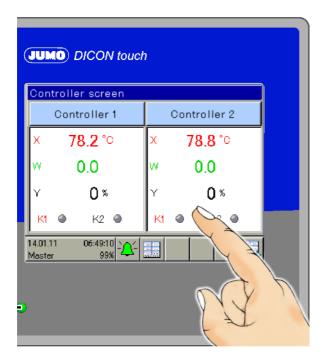
The > symbol between words indicates a menu structure and enables the parameters to be quickly detected in the configuration level or for navigation in the setup program, such as the software version of the devices, for example:

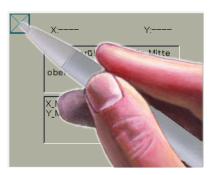
DEVICE MENU > GENERAL > VERSION > SW VERSION

Active input

The device has no buttons and is operated using a finger or a pen.

The following instructions will therefore make references to **"touching"** and the images displayed will show a hand operating the device.





1.2 Description

The DICON touch is a two-channel universal process and program controller that displays information on a vibrant screen. The device is easy to operate via a touchscreen.

Both control channels use the tried-and-tested JUMO control algorithm with two possible optimization options. These enable a simple and highly-accurate startup. It also enables multiple zone control, cascade control, or other complex control tasks.

The block diagram below illustrates the various different hardware options offered by the modular hardware concept. Four analog universal inputs and up to eight external inputs can record a variety of physical measured values with high precision. The actuators can be controlled directly in the device with either an analog or digital setup. These can be expanded further through external digital outputs. Interfaces such as Modbus (master/slave), PROFIBUS, or Ethernet with Web server can be used for the communication with higher-order systems.

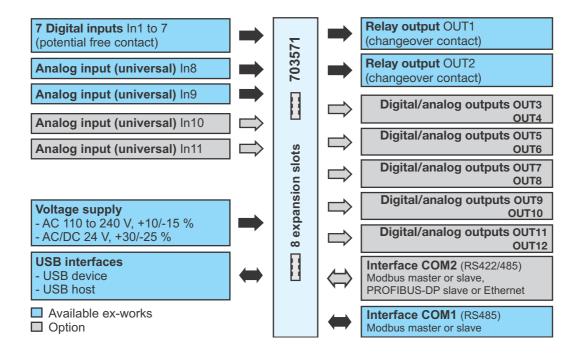
To ensure secure process operation, the device has a password-protected user administration with individual assignment of rights for different levels or control commands. Screen masks for controllers, program generators, recording, and for overview screens are ready-made and available. An individual process screen can be created using the configuration software. Using the extra-code recording function, important analog and digital process values can be saved so that they are tamper-proof, so that they can be graphically visualized, and so that they can be exported via interface or USB stick in a tamper-proof fashion to the PC.

The configuration software ensures that the process controller can be easily programmed, that math or logical coherences can be described, and that customer-specific linearizations can be created. In addition, tools for simulating external signals or control paths are included. These tools can also record for the duration of the startup.

A comprehensive alarm and limit-value concept as well as a flexible digital signal administration complete the "all-in-one" device.

1 Introduction

1.3 Block diagram



2.1 Order details

	(1)	Basic type
703571		JUMO DICON touch - two-channel process and program controller with RS485 interface
	(2)	Version
8		Standard with default settings
9		Customer-specific configuration (specifications in plain text)
	(3)	National language of display texts
01		German
02		English
03		French
	(4)	Input IN10
00		Not used
10		Analog input (universal)
	(5)	Input IN11
00		Not used
10		Analog input (universal)
	(6)	Outputs OUT3/4
00		None
11		One relay (changeover contact)
12		Two relays (N/O contact)
13		One solid-state relay 230 V, 1 A
14		One logic output DC 0/22 V max. 30 mA ¹
15		Two logic outputs 0/12 V, 20 mA
16		One analog output
17		Two PhotoMOS® relays® ²
20		Two solid state relays 230 V, 1 A for motor actuator (double slot: OUT3/4 and OUT7/8) ^a
	(7)	Outputs OUT5/6
00		None
11		One relay (changeover contact)
12		Two relays (N/O contact)
13		One solid-state relay 230 V, 1 A
14		One logic output 0/22 V, max. 30 mA ^a
15		Two logic outputs 0/12 V, 20 mA
16		One analog output
17		Two PhotoMOS® relays
20		Two solid state relays 230 V, 1 A for motor actuator (double slot: OUT5/6 and OUT9/10) ^a
	(8)	Outputs OUT7/8 (only available for assignment with module 20 on OUT3/4)
00		None

-		
11		One relay (changeover contact)
12		Two relays (N/O contact)
13		One solid-state relay 230 V, 1 A
14		One logic output 0/22 V, max. 30 mA ^a
15		Two logic outputs 0/12 V, 20 mA
16		One analog output
17		Two PhotoMOS® relays
	(9)	Outputs OUT9/10 (only available for assignment with module 20 on OUT5/6)
00		None
11		One relay (changeover contact)
12		Two relays (N/O contact)
13		One solid-state relay 230 V, 1 A
14		One logic output 0/22 V, max. 30 mA ^a
15		Two logic outputs 0/12 V, 20 mA
16		One analog output
17		Two PhotoMOS® relays
	(10)	Outputs OUT11/12
00		None
11		One relay (changeover contact)
12		Two relays (N/O contact)
13		One solid-state relay 230 V, 1 A
14		One logic output 0/22 V, max. 30 mA ^a
15		Two logic outputs 0/12 V, 20 mA
16		One analog output
17		Two PhotoMOS® relays
	(11)	Voltage supply
23		AC 110 to 240 V +10/-15 %, 48 to 63 Hz
39		AC/DC 24 V +30/-25 %, 48 to 63 Hz
	(12)	COM2 interface
00		Not used
08		Ethernet
54		RS422/485 Modbus RTU
64		PROFIBUS-DP ^a
	(13)	DIN-tested
000		Without approval
056		With DIN approval
	(14)	GL-tested
000		Without approval
062		With GL approval
	(15)	Extra code
	-	

2 Identifying the device version

000	Without extra code
213	Recording function
214	Math and logic module
223	Program controller
879	AMS2750/CQI-9 ³

- ¹ GL approval still not available
- ² PhotoMOS is a registered trademark of Panasonic Corporation
- ³ For the calibration certificate the channels to be checked are to be defined with the thermocouple type and the desired measuring points.

	(1)								-														
Order code		/]-[-			-						-		-	/],[,	, 1
Order exam- ple	703571	/	Х	-	Х	-	Х	Х	- 3	Х	Х	Х	Х	Х	-	Х	- X	/	Х	,	Х	, Х	

¹ List extra codes in sequence, separated by commas.

2.2 Scope of delivery

- 1 controller in the ordered version
- 1 Operating Manual B 703571.0
- 1 panel seal 4 retaining elements for panel installation

2.3 General accessories

Article	Part no.
Program editor/startup	00607139
Setup/program editor	00606496
PCA3000/PCC JUMO software package 709701/709702	00431884
USB cable A-connector mini B-connector 3 m	00506252

2.4 Accessories

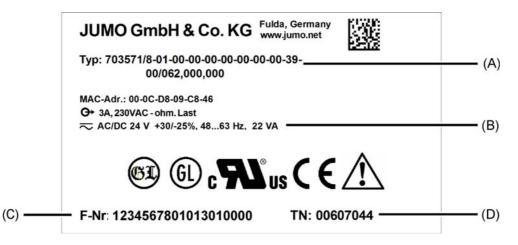
Item	Parts no.
Modules for expansion slots:	
One analog input (universal)	00581159
One relay output (changeover contact)	00581160
Two relay outputs (N/O contact)	00581162
One logic output DC 0/22 V, max. 30 mA	00581165
Two logic outputs DC 0/12 V max. 20 mA	00581168
One solid state relay AC 230 V, 1 A	00581164
Two solid state relays AC 230 V, 1 A for motor actuator	00621574
Two PhotoMOS® relays ¹ DC 50 V, max. 200 mA, AC 35 V, max. 200 mA	00581171
One analog output (universal)	00581169
Ethernet interface	00581174
Serial interface RS422/RS485	00581172
PROFIBUS-DP interface	00581173

¹ PhotoMOS is a registered trademark of Panasonic Corporation

2.5 Nameplate

Position

The nameplate is affixed to the case.



Contents

The nameplates contain important information. This includes:

Description	Designation on the nameplate
Device type (A)	Туре
Voltage supply, power consumption (B)	
Fabrication number (C)	F-No.
Part no. (D)	TN

Device 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 number (F-No.:)

Among other things, the fabrication number contains the date of production (year/week). Example: F-No. = 1234567801013010000

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

The device was therefore produced in the 1st calendar week of 2013.

Identifying the optional modules

The device type also contains information about optional default modules, as in the following example of the Ethernet interface (Figure 08):

703571/8-01-00-00-00-00-00-00-25-08... (see type key)

Further information on identifying optional modules is included in this chapter:

⇒ B 703571.0 - Chapter 9.2 "Slots", page 51

3.1 Mounting site and climatic conditions

The mounting site should be free from vibration, dust and corrosive media. Install controllers as far away as possible from sources of electromagnetic fields, such as those created by frequency converters or high-voltage ignition transformers. Conditions at the mounting site must correspond to the following environmental influences:

3.1.1 Environmental influences

Ambient/storage temperature range	-5 to +55 °C/-30 to +70 °C
Resistance to climatic conditions	Humidity 3K3 (DIN EN 60721-3-3) with extended temperature range, rel. humidity \leq 95 % mid-year without condensation

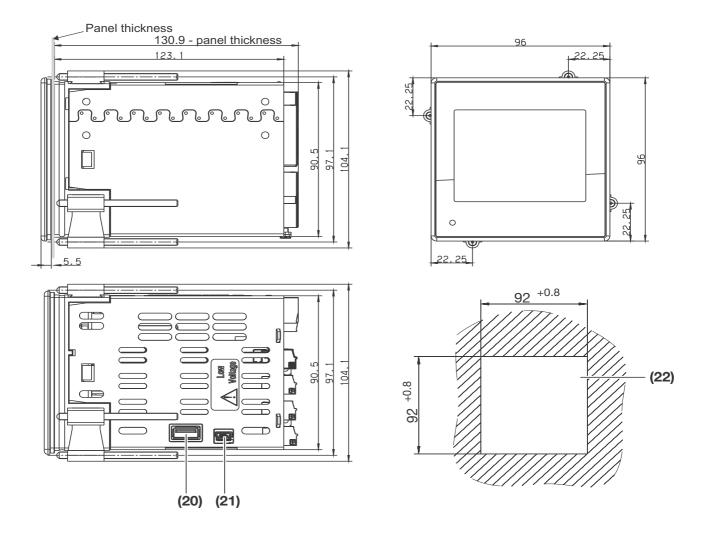
3.1.2 Case

Case type	Plastic front frame with metal case barrel
Front frame dimensions	96 mm × 96 mm
Panel cut-out	$92^{+0.8}$ mm × $92^{+0.8}$ mm according to DIN IEC 61554
Close mounting	Spacing between the panel cut-outs, min. 35 mm horizontally and min. 80 mm vertically
Panel thickness	Max. 5 mm
Depth behind panel	Max. 130 mm
Mounting	Four mounting brackets
Operating position	Any
(including the viewing angle of the TFT color screen)	Horizontal ±65°, vertical +40 to -65°
Protection type	Front IP66, rear IP20, according to DIN EN 60529
Weight (fully fitted)	approx. 1000 g

3.1.3 Electrical data

Voltage supply Connection Voltage		At the back via screw terminals AC/DC 24 V +30/-25%, 48 to 63 Hz or AC 110 to 240 V +10/-15 %, 48 to 63 Hz	
Power consumption		230 V: max. 38.1 VA/11.5 W 24 V: max. 21.9 VA/11.5 W	
Inputs and outputs Connection Conductor cross section	At the back via scr Max. 2.5 mm ² , wi	rew terminals re or strand with end sleeve	
Electrical safety	J. J	According to DIN EN 61010-1 Overvoltage category III, pollution degree 2	
Electromagnetic compatibility Interference emission Interference immunity	Class A - For indu	According to DIN EN 61326-1 Class A - For industrial applications only Industrial requirements	
Memory data recorder	Memory cycle	Recording interval	
When recording:	1 s	approx. 44 days	
4 analog signals	5 s	approx. 220 days	
3 digital signals	10 s	approx. 441 days	
	60 s	approx. 2646 days (7 years, 91 days)	

3.2 Dimensions



(20) USB host interface

(21) USB device interface for setup

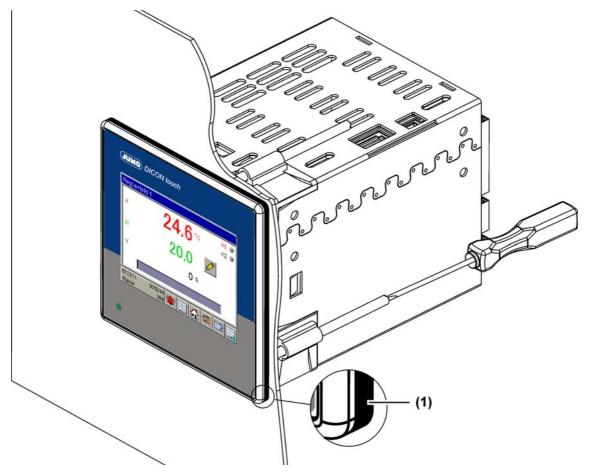
(22) Panel cut-out

3.3 Close mounting

If several devices are mounted on a switch board above or next to each other, the panel cutouts must be positioned 35 mm horizontally and at least 80 mm vertically away from each other.

3 Mounting

3.4 Insertion in panel cut-out



Step	Activity
1	Affix delivered panel seal (1) on the device from the rear
2	Insert the device into the panel cut-out from the front and ensure the panel seal is correctly positioned so that no water or dirt can penetrate the case.
3	From the panel rear, slide the mounting brackets into the guides on the sides of the case. In doing so, the flat faces of the mounting brackets must make contact with the case.
4	Place the mounting brackets against the panel rear and tighten evenly with a screwdriver until the controller housing is firmly positioned in the panel cut-out.

3.5 Care and treatment of the front cover

The front plate can be cleaned with commercial detergents and cleaning agents.



NOTE!

The resistive touchscreen cover reacts to finger pressure or can be operated using commercially available pens with a rounded plastic tip.





CAUTION!

Sharp tools can scratch and damage the cover.

The front plate is not resistant to corrosive acids or lyes, abrasives, or cleaning with highpressure cleaners.

Do not use sharp objects near the device.

3 Mounting

4.1 Installation notes



CAUTION!

The delivery status of the device at the first startup does not necessarily correspond to the intended application (for example, Controller 2 inactive).

This may result in undefined plant behavior.

Therefore, where possible during startup, no actuators should be connected and load current circuits should be isolated. The plant installer is essentially responsible for the startup process.

4.1.1 Cables, shielding, and grounding

When selecting the electrical wiring material as well as when installing and connecting the controller 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).

- Where possible, route input, output, and supply cables separately and not parallel to one another.
- Only use shielded and twisted probe and interface cables and where possible, route them at a distance from components or lines that are live.
- 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 potential equalizer is correctly routed.

4.1.2 Electrical safety

- The primary fuse protection for the voltage supply should not exceed a value of 20 A (passive) and should not be less than 2 A.
- In order to prevent the destruction of the relay or solid state relay outputs in the event of an external short circuit in the load circuit, the load circuit should be fused to the maximum admissible output current.
- In addition to a faulty installation, incorrectly set values on the controller could also impair the correct function of the following process. Therefore, ensure that safety devices independent of the controller (for example, 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.
- Since not all existing control paths can be controlled with the setting function, the stability of the actual value reached should be monitored.

4.1.3 Intended use, misuse

• The controller is intended for use in the industrial sector.

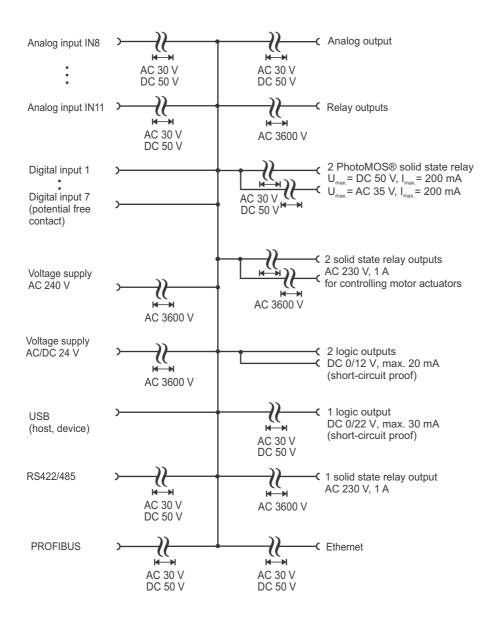


WARNING!

The controller is not suitable for installation in areas with an explosion hazard There is the risk of an explosion. The device must only be used outside of areas with an explosion bazard

The device must only be used outside of areas with an explosion hazard.

4.2 Galvanic isolation



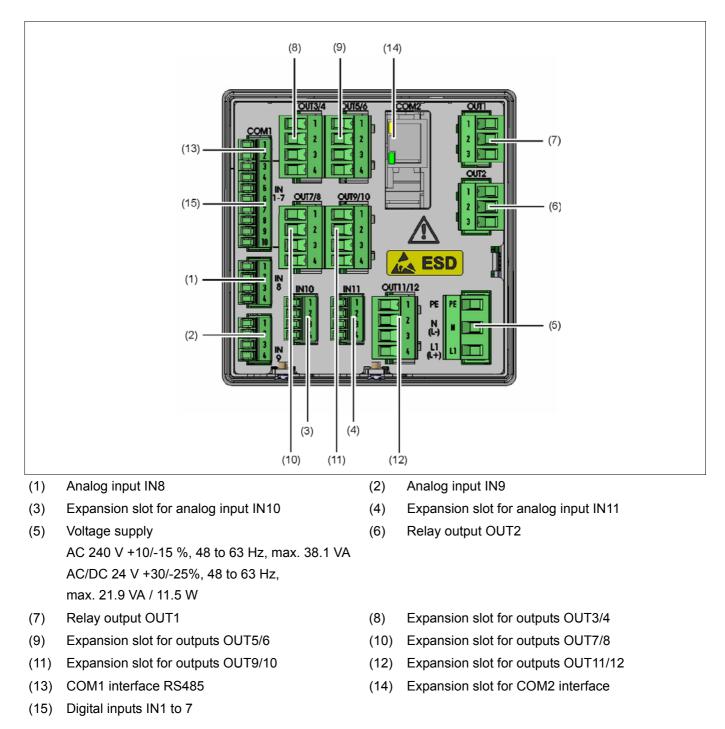
4.3 Connection diagram



DANGER!

Works involving dangerous electrical voltage (230 V) are performed here. There is a risk of electric shock. Switch off all voltage circuits before routing. The electrical connection must only be carried out by gualified personnel.

4.3.1 Connection elements



4 Electrical connection

4.3.2 Analog inputs

Input IN8, IN9 as standard

Two analog inputs can be added to input (IN10), (IN11) optional boards

Connection	(Connection ele- ment) Input	Symbol and terminal designation
Thermocouple	(1) IN8 (2) IN9 (3) IN10 (4) IN11	
RTD temperature probe Two-wire circuit	— (4) IN II	
RTD temperature probe Three-wire circuit		
Voltage DC 0(2) to 10 V		+
Voltage DC 0 to 1 V		+O 2 O 4
Voltage DC 0 to 100 mV		+O 3 O 4
Current DC 0(4) to 20 mA		+
Resistance transmitter		2
A = Start E = End		↓ s 3
S = Slider		<u> </u>

4.3.3 Analog outputs

One analog output can be added to output OUT 3/4 to 11/12 using optional boards

Connection	(Connection ele- ment) Input	Symbol and terminal designation
One analog output DC 0/2 to 10 V or DC 0/ 4 to 20 mA (configurable)	 (8) OUT3/4 (9) OUT5/6 (10) OUT7/8 (11) OUT9/10 (12) OUT11/12 	$\begin{array}{c} + \circ 1 \\ \circ 2 \end{array}$

4.3.4 Digital inputs

Input IN1 to 7 as standard (cannot be extended)

Connection	(Connection ele- ment) Input	Symbol and terminal designation
Digital input, potential-free contact as standard	(15) IN1 to 7	0 3, 4, 5, 6, 7, 8, 9 0 10

4.3.5 Digital outputs

OUT1 and OUT2 as standard

The controller is fitted with two relay outputs (changeover contacts) as standard.

Connection	(Connection element) Output	Symbol and terminal designation
Relay output (changeover contact)	(6) OUT2 (7) OUT1	
		3

4 Electrical connection

Connection	(Connection element) Output	Symbol and terminal designation	
One relay output (changeover contact)	(8) OUT3/4 (9) OUT5/6	O	1
	(10) OUT7/8 (11) OUT9/10		2
	(12) OUT11/12		3
Two relay outputs (N/O con- tact) ¹	-	0-0P_0	1
		ρ- <u></u> ρ- <u>ρ</u>	2
			3
			4
One solid state relay AC 230 V, 1 A		⇒ √∕	1
One logic output	-		2
DC 0/22 V, max. 30 mA (short-circuit proof)		$- \frac{U_X, I_X}{-} $	2
Two logic outputs DC 0/12 V max. 20 mA	-	+	1
(short-circuit proof, not galvanically isolated from each other)			2
			3
			4
Two PhotoMOS® relays ² max. DC 50 V, 200 mA max. AC 35 V, 200 mA		⋬⋺	1
(galvanically isolated)			2
		¥≠L	3
			4

Outputs OUT 3/4 to 11/12 are expandable using the following optional boards

Connection	(Connection element) Output	Symbol and terminal designation
Two solid state relays AC 230 V, 1 A (for controlling the left and right-hand motor actuators, galvanically isolated)		$\Rightarrow \checkmark \bigcirc 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0$

¹ Combining a mains voltage circuit with a protective low-voltage circuit on the "dual normally open contact" option is not admissible.

² PhotoMOS is a registered trademark of Panasonic Corporation.

4.3.6 Digital outputs

Standard

Two relay outputs (changeover contact)	
Switching capacity	Max. 3 A at AC 250 V, resistive load 150,000 operations at nominal load
Contact life	150,000 operations at nominal load

Per optional board

One relay output (changeover contact)			
Switching capacity	Max. 3 A at AC 250 V, resistive load		
Contact life	150,000 operations at nominal load		
Two relay outputs (N/O contact) ¹			
Switching capacity	Max. 3 A at AC 250 V, resistive load		
Contact life	150,000 operations at nominal load		
One solid state relay			
Switching capacity	1 A at AC 230 V, resistive load		
Protection circuitry	Varistor		
Two solid state relay for motor actuators			
Switching capacity	1 A at AC 230 V, resistive load		
Protection circuitry	RC combination		
One logic output (voltage supply for transmitter)	DC 0/22 V, max. 30 mA (short-circuit proof)		
Two logic outputs	DC 0/12 V max. 20 mA (short-circuit proof, not galvanically isolated)		
Two PhotoMOS® relays ²	DC 50 V, max. 200 mA, (galvanically isolated from each other, not short-circuit proof)		
	AC 35 V, max. 200 mA, (galvanically isolated from each other, not short-circuit proof)		

¹ Combining a mains voltage circuit with a protective low-voltage circuit on the "dual normally open contact" option is not admissible.

² PhotoMOS is a registered trademark of Panasonic Corporation.

4 Electrical connection

4.3.7 Voltage supply (according to nameplate)

AC 230V (DC 24V)

Connection	(Connection ele- ment)	Symbol and terminal designation		
Protection conductor	PE			
Neutral conductor	N (L-)	N N		
Line conductor	L1(L+)	L1 (L+)		

4.3.8 Interfaces

USB device, USB host and COM1 interfaces as standard

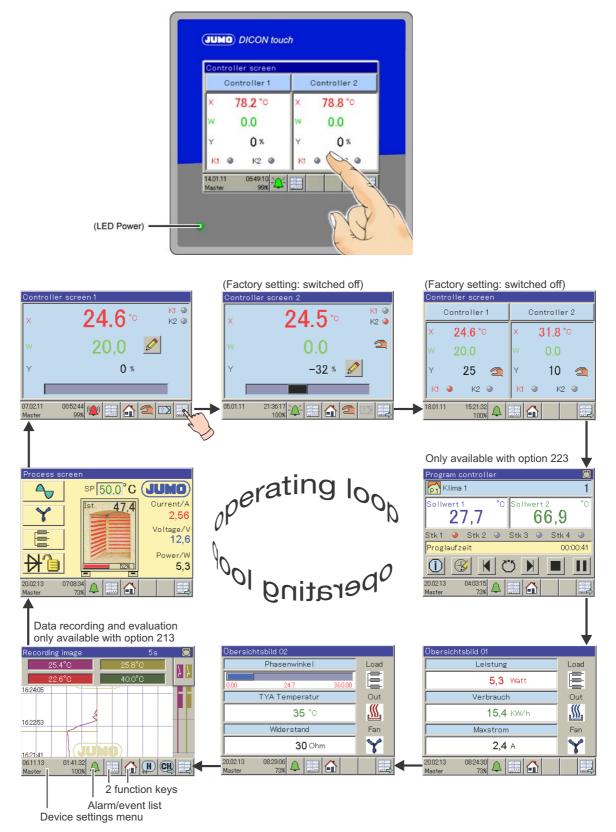
Connection	(Connection element)	Symbol and terminal designation		
USB device interface	(21)			
USB host	(20)			
COM1 serial interface RS485 (galvanically isolated)	(13)	1 TxD+/RxD+ Transmission/ 2 TxD-/RxD- 1 TxD+/RxD+ Transmission/ received data + Transmission/ received data -		

Connection	(Connection element)	Symbol and terminal designation		
Ethernet	(14)		1 TX+	Transmission data +
			2 TX-	Transmission data -
			3 RX+	Received data +
			6 RX-	Received data -
Serial interface RS422			1 RxD+	Received data +
(galvanically isolated)			2 RxD-	Received data -
			3 TxD+	Transmission data +
			4 TxD-	Transmission data -
Serial interface RS485 (galvanically isolated)			3 TxD+/RxD+	Transmission/
			4 TxD-/RxD-	received data +
				Transmission/ received data -
PROFIBUS-DP			3 RxD/TxD-P (B)	Transmission/ received data +
			5 DGND	Ground
			6 VP (+5 V)	Voltage supply
			8 RxD/TxD-N (A)	Transmission/ received data -

COM2 interface can be expanded using optional boards

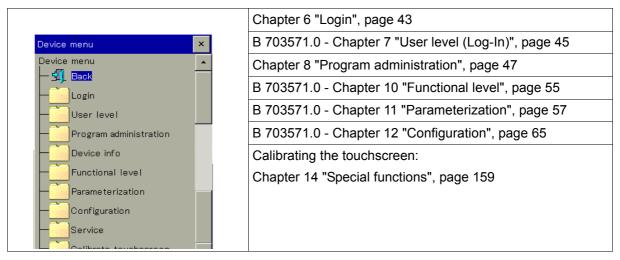
5.1 Display and operating concept

The DICON touch is operated via a resistive touchscreen and also reacts to finger pressure. Commercially available pens with plastic tips can also be used.



5.2 Device menu

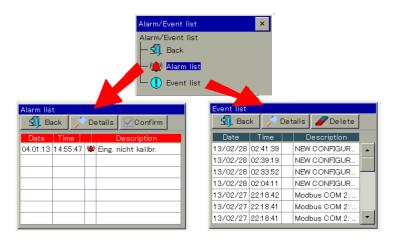
All the functions in the device menu are described in the following sections of the B703571.0de operating manual.



5.3 Alarm and event list

In these lists, alarms and events appear that are partly confirmed. Additional entries can be configured to appear in the lists.

- ⇒ B 703571.0 Chapter 12.9.5 "Alarm", page 105
- ⇒ B 703571.0 Chapter 12.5.1 "Alarms", page 76



5.4 Function buttons, history and channel changeover

Both these function buttons are set and configurable by default at "Operating level" and "Home" (back to Main view).

⇒ B 703571.0 - Chapter 12.10.1 "General configuration", page 106

The "History"(H) and "Channel changeover"(Ch) buttons enable navigation in the recorder image and change their meaning according to the dialog.

⇒ Chapter 5.5.4 "Recording image", page 40

5.5 Images in the operating loop

Start screen

After switch-on, the globe appears until the device software is started up.



Then Controller screen 1 appears (default setting).

Using the icon in the bottom right-hand corner, all the images defined in the operating loop can be called up one after another.

⇒ For the screen settings see B 703571.0 - Chapter 12.10 "Screen", page 106

⇒ To view the images displayed see B 703571.0 - Chapter 12.10.4 "Operating loop", page 108

5.5.1 Controller screen 1, Controller screen 2 and Controller overview

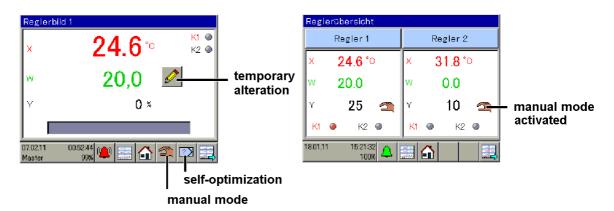
You can change the color of these screens in the setup program. The basic structure cannot be changed however.

default

Fixed-setpoint controller and Controller 1 are set up.

In order to function properly, the controller requires an actual value, a setpoint value, and an output to influence the actual value (for example, a heat source via a relay as a two-state controller). Self-optimization can only detect new parameters using a closed control loop.

⇒ Chapter 12.6.3 "Self-optimization controller", page 82



If lines or arrows appear, check the configuration or the connection.

⇒ Chapter 16 "Error and alarm messages", page 167

Enter setpoint values on the device for the fixed-setpoint controller

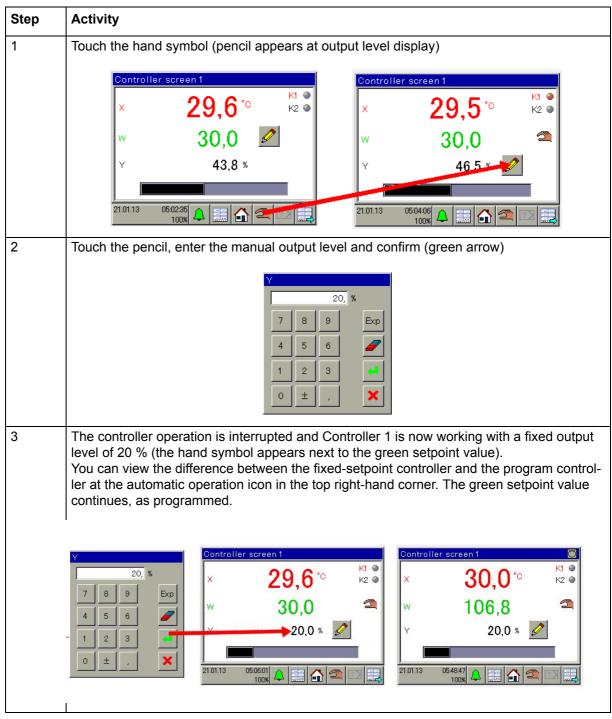
⇒ Chapter 11.4 "Setpoint values", page 62

Enter setpoint values for the fixed-setpoint controller with the setup program

⇒ Chapter 11.4 "Setpoint values", page 62

Start manual mode

In manual mode, the controller is fixed at a particular output level. First of all, the screens show the active controller, where the output is at approx. 40 %.



➡ You can now manually influence the output level (by hand)

Exit manual mode

By touching the screen below the hand, you can exit manual mode and return to normal controller operation.

Self-optimization

⇒ B 703571.0- Chapter 12.6.3 "Self-optimization controller", page 82

5.5.2 Program controller

TIP!

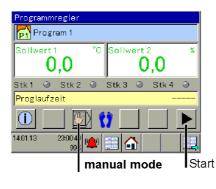


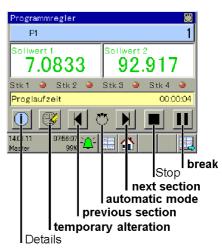
This screenshot is not available by default and only appears if the extra code for the program controller is enabled and configured.

⇒ Chapter 2.1 "Order details", page 14

default

There are no programs available. The following options are available for ordering a program:





Enter setpoint curves on the device

⇒ Chapter 8.1.1 "On the device", page 47

Enter setpoint curves using the setup program

⇒ Chapter 8.1.2 "About the setup program", page 48

Start, Stop

The black arrow starts an available program. A request appears asking which program should be started and the programmed setpoint curves are then synchronized for both controller channels. The symbol for automatic operation appears in the center. Touching the black rectangle stops the program, adopting the conditions prior to the program starting.

Pause

Pauses the time base of a program in operation, whereby the current setpoint values and the conditions of the control contacts are maintained. Touching the pause button again resumes program operation.

Next section, previous section

The program in operation jumps to the next or previous section.

Temporary alteration

Allow one-time changes to the setpoint values for a program without storing it permanently in the program table. When you next run the program, the original setpoint values will be reactivated.

Start/stop manual mode (for program controller)

Manual mode is performed exactly as for a fixed-setpoint controller.

⇒ Chapter 5.5.1 "Controller screen 1, Controller screen 2 and Controller overview", page 37

Self-optimization

⇒ B 703571.0- Chapter 12.6.3 "Self-optimization controller", page 82

5 Operation

5.5.3 General screen 1.2

default

Two general screens are available that do not contain any variables.

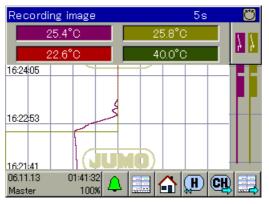
General screen 01		General screen 02				
Leistung	Load	Phasenwinkel	Load			
5,3 Watt		0.00 24.7 360.00				
Verbrauch	Out	TYA Temperatur	Out			
15,4 KW/h	<u></u>	35 °≎	<u>.</u>			
Maxstrom	Fan	Widerstand	Fan			
2,4 A	Y	30 Ohm	Y			
20.02.13 08:24:30 🕰 🧮 🚮		20.02.13 08:29:06 Master 73%				

The variables displayed can be configured. ⇒ B 703571.0- Chapter 12.10.8 "General screens 1, 2", page 112

5.5.4 Recording image

default

Here the device is displaying up to four analog and three digital channels, like a line recorder. Extra code 213 is required for data to be recorded and evaluated.



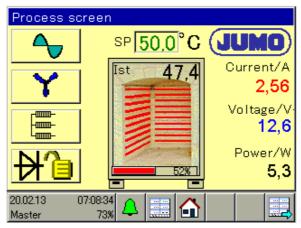
You can view historical data (from previous recordings) with the H button and switch channels with the CH button. If the channels displayed are configured, the screen must still be active for the operating loop display.

⇒ B 703571.0 - Chapter 12.11 "Recording", page 113

5.5.5 Process screen

default

This screen can be freely configured and is empty by default. A background image of your plant can be stored and animated with all the process values for the device.



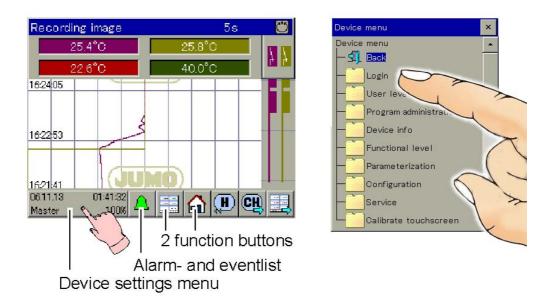
The setup program is required to design the graphics.

⇒ B 703571.0 - Chapter 13.11 "Process screen", page 151

Some of the levels in the device menu are username- and password-protected. The level protection is defined in the user list by the setup program, using five different users. On entering the password, each user is entitled to use the "rights" available.

User list	User 2: Rights
Character table: Public rights: User 1 User 1 User 3 User 3 User 4 Password: •••••••• Rights: OK Cancel	Configuration (Device, Interface) S Configuration (Device, Interface) S Time setting (device, interface) S Time setting (device, interface) S Read configuration (Device) S Read configuration (Device, Interface) S Read configuration (Device, Interface) S Read configuration (Device) S Read configuration
	Symbol for one group of rights Symbol for individual rights §§ At least one right

If permitted, the rights and passwords can also be changed on the device.



Touching the screen in the bottom left-hand corner opens the device menu window. Touching the 'Login' function opens the Login window.

6.1 Logging on

This sequence shows the logon process as the master user (with the default password 9200):

Login		ID	input			Process Password input
	Log-In		ID input	Master		
0	Log-Out					7 8 9
1 E	Change password		🖌 ОК	Cancel		4 5 6 🖉 Itage/V
ß	Change password					1 2 3 🕌 ower/W
	Back				_	

User 1 is now logged on and is permitted to access all functions listed under "Rights".

6.2 Logging out

As soon as you are logged on, the Log-Out button is no longer grayed out and touching it will enable you to log out. Consequently, your user rights will be limited.

Login	
	Log-In
() True	Log-Out
	Change password
	Back

6.3 Changing the password

You can change the user password that you are currently logged in with here.

To do this, you must first enter the old password (for the master user) and then the new one. If the password is incorrect, the change will not be accepted.





NOTE!

This level is empty by default and parameters can only be defined using the setup program to appear in the device.

Up to 25 parameters of any type from the configuration or parameter level can be included in this level. These parameters, for example, often need to be changed or made available to operating personnel.

ONLY SETUP > USER LEVEL

Setup dialog

Parameter	Description	Limit value mi	Limit value m
Configuration selector \Setpoint values \Controlle	Setpoint value 1	-99999.0	85.0
Configuration selector Wo selection		0	100
Configuration selector Wo selection		0	100
Configuration selector Wo selection		0	100
Configuration selector Wo selection		0	100
Configuration selector Wo selection		0	100
Configuration selector Wo selection		0	100
Configuration selector Wo selection		0	100
Configuration selector Wo selection		0	100
Configuration selector Wo selection		0	100
Configuration selector Wo selection		0	100
Configuration selector Wo selection		0	100
Configuration selector Wo selection		0	100
Configuration selector Wo selection		0	100
Configuration selector Wo selection		0	100

7.1 Example 4 Transferring controller setpoint values to the user level

The four reversible controller setpoint values should be transferred to the user level. Doubleclicking on the empty entry opens the selector window.

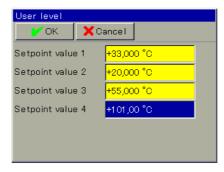
Setup dialog

		Conferenciation and a star 10 star interaction of Constanting	Coloristus lus D	00000 0	Parameter:
1	2	Configuration selector \Setpoint values \Controlle	Setpoint value 2	-99999.0	
	3	Configuration selector \Setpoint values \Controlle	Setpoint value 3	-99999.0	Configuration selector \Setpoint values \Controller 1 Setpoint value 4
	4	Configuration selector \Setpoint values \Controlle	Setpoint value 4	-99999.0	
	5	Configuration selector Wo selection		0	Undocumented parameters
- 11	6	Configuration selector Wo selection		0	
- 11	7	Configuration selector Wo selection		0	Modbus TCP Serial interfaces
- 11	8	Configuration selector Wo selection		0	Modbus-Frames for reading
- 11	9	Configuration selector Wo selection		0	Modbus-Frames for writing
- 11	10			0	
- 11	11			0	Analog inputs
dat	12			0	🗄 ·· Fine adjustment
- 11	13			0	
	14			o I	
- 11	15			o I	
- 11	15	Configuration selector vio selection			Controller setpoint values
- 11	_				Setpoint values
- 11		Edit			- Controller 1
ĮL					
-		Des services a destining the set			Setpoint value 2
	1	Program administration:			···· Setpoint value 3
		Program cimulation:			Setpoint value 4
		Dragram cimulation:			

7 User level (Log-In)

Device display

Once the setup data has been transferred to the device, the setpoint values can be entered on the device.



8.1 Enter program curves

Ten programs can be entered on the device or in the setup program.

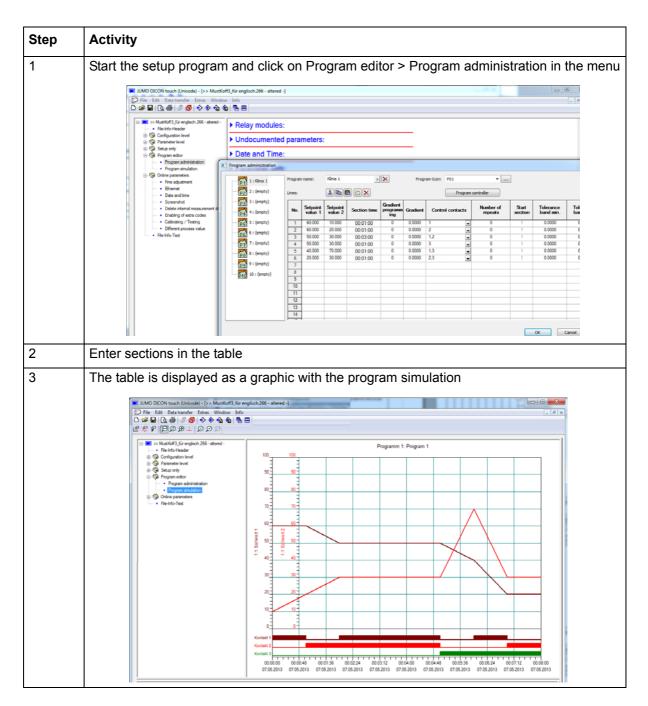
8.1.1 On the device

Step	Activity
1	Enter program names and icons
2	Enter first section: If the program memory is empty, the section will be highlighted in red.
	Each section consists of: target values 1 and 2, section time, control contacts, tolerance band, number of repetitions from start section, and parameter block.
3	Repeat section entries until the table is complete Image: Concel representation of table is complete
4	 Touching the pencil symbol enables additional editing functions. Editing the program header Copying and deleting the program Creating a new section

Two program curves have now been programmed.
 They can be started at any section at an adjustable time and run in parallel.

8 Program administration

8.1.2 About the setup program



Step	Activity
4	Save the setup file and transfer the setup data to the device
	Reading out data from the system!
	Progress, connection 1:
	Progress, connection 2:
	Progress of the complete project:
	Actions performed and current actions: (1) Start reading out module configuration
	Cancel
5	If a green icon (smiley) appears, then the programs have been successfully transferred.
	Datenübertragung
	The Data transfer has been sucessfully completed
	Schleßen Detals

Two program curves are now saved in the device and can be started at any section at an adjustable time and run in parallel.

8.1.3 Section run time

The period of time between sections.

Setpoint values varying from section to section create a ramp-like setpoint curve (with a negative or positive slope).

8.1.4 Setpoint values 1 and 2

Each program contains 2 setpoint value profiles which can be used to create 2 program controllers.

8.1.5 Control contacts

Eight control contacts can be set at any one time. They are available in the digital selector and can switch on relays, for instance.

⇒ Setup program:

CONFIGURATION LEVEL > DIGITAL OUTPUTS

			Digital outputs			
adient	Control contacts	Nu	Digital output 1 [OUT 1]	Digital output 1 [OUT 1]		
0000	1 💌		Digital output 2 [OUT 2]	Description:	Relay [OUT 1]	>
0000	Contact 1 Contact 2 Contact 3		Digital output 9 [OUT 9/10]	Signal source:	Digital selector\Logic output Logic output 1	•
0000	Contact 4 Contact 5 Contact 6		Digital output 10 [OUT 9/10]	Polarity inversion:	No	•
0000	Contact 7			Manual mode:	allowed	-
	Contact 8					

They can also be logically linked or can initiate internal device functions.

8 Program administration

8.1.6 Tolerance band

⇒ B 703571.0 - Chapter 12.6.7 "Ramp function", page 95

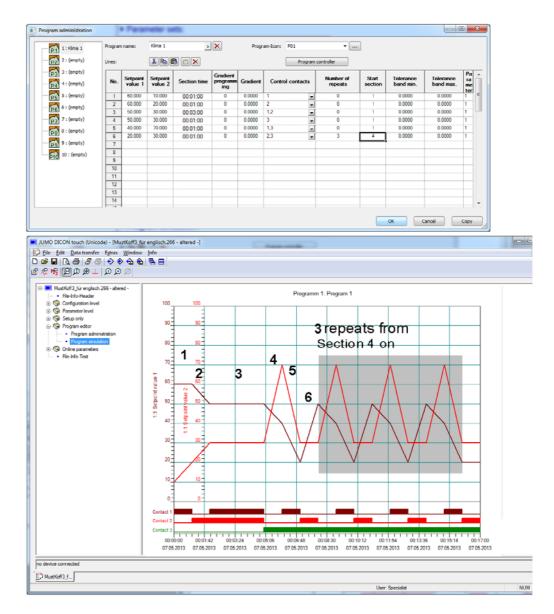
8.1.7 Number of repetitions

The number of repetitions is entered for a specific start section.

8.1.8 Start section

Repetition begins from this section.

Example



8.1.9 Parameter block

For each controller channel, parameter blocks 1 to 4 are available and can be switched in any combination

The device information function enables hardware and software modules to be displayed.

9.1 General information

The type extra codes enabled in the device are displayed next to the device names.

General					
General	Versio	in N	lotherb	•	•
Device name	Na	me			•
Ethernet	Ye	s			
Recording		s			
Mathematics/Logic		s			
Program controller		s			
Setup quick info					
					•
13/03/04 00:26 6	:46)7% - Â-				3]

9.1.1 Version, motherboard, Ethernet information

Software version, fabrication number, and testing ID are displayed. Displays the hardware on the motherboard.

MAC address, IP address, gate address, DNS address, and transfer rate.

General		General			General		
General Ve	rsion Motherb 🔸		Version Moth	erboard Ethern 🔸	•	Motherboard Ether	net 💽
Software version	266.01.02		Board type IN 8	Universal input		MAC address	00-0C-D8-09-7E-2
VDN version	E00.000.000		Software version	233.01.03		IP address	10.11.101.3
SW vers. 1. boot I	302.01.01		VDN version IN 8	E00.000.000		IP mask	255.255.0.0
SW vers. 2. boot I	303.01.01		Test ID IN 8	PRUEF-ID		Gate address	10.11.0.175
Hardware version	326.00.01					DNS address	10.10.0.11
Hardw. VDN version	<mark>жжж,жж,</mark> жж					DNS device name	
	000000000000000000000000000000000000000	•	Board type IN 9	Universal input	•	Transfer rate	00 MBit/s full duple
13/03/04 00:30:54 67%	<u>F</u>	5]	13/03/04 00:31:15 67%	Σ-	<u>5</u>	13/03/04 00:31:31 67% -	

9.2 Slots

Assignment of expansion slots is displayed in the device.

Slots						
IN 10	OUT 3	OUT 9/10				
Board type		Universal input				
Software ve	ersion	233.01.03				
VDN versio	n	E00.000.000				
Test ID						
13/03/04 0	10:38:06 67% - 🏹 -	1				
	0170					

9.3 Inputs/outputs

The switching statuses and measurement values are displayed here.

9 Device information

9.3.1 Digital and analog inputs, digital and analog outputs, external digital, and external analog inputs

Inputs/Outputs		Inputs/Outputs	
Digital inputs	Analog ir 🔸 🕨	Analog inputs	Digital ou 🔸 🕨
IN 1: 1		IN 8: 21.686 °C	
IN 2: 1		IN 9: 20.945 °C	
IN 3: <mark>0</mark>		IN 10: % IN 11: %	_
IN 4: <mark>0</mark> IN 5: <mark>0</mark>		IN 11: %	
IN 6: 0			
IN 7: 0			
13/03/04 00:46:36 67%	<u> 1</u>	13/03/04 00:47:18 67%	<u> </u>
Inputs/Outputs		Inputs/Outputs	
Digital outputs	Analog ol 🔸 🕨	Analog outputs	External digit 🔸 🕨
OUT 1: 0 OUT 1	7: 0	OUT 3: <mark>8,1201 mA</mark>	40,601 %
OUT 2: <mark>0 OUT 8</mark>	в: О	OUT 5: 0.0000 V	0.0000 %
OUT 3: 0 OUT 9	9: <mark>0</mark>	OUT 7: 0.0000 V	0.0000 %
OUT 4: 0 OUT 1	10: <mark>0</mark>	OUT 9: 0.0000 V	0.0000 %
	11:0	OUT 11:0.0000 V	0.0000 %
13/03/04 00:47:59 67%	<u>3</u>	13/03/04 00:49:13 67%	<u>3</u>
Inputs/Outputs		Inputs/Outputs	
External digital inputs Ext	ernalanal 🔸 🕨	External analog inputs	I ↓ ↓
	0	1:%	5: %
	0	2: %	6: °C
	0 0	3: <mark> %</mark> 4: %	7: % 8: %
	×	·· · · · · · · · · · · · · · · · · · ·	0.
13/03/04 00:50:35 67%	<u>3</u>	13/03/04 00:51:22 67%	<u>5</u>

9.4 Functions

9.4.1 Mathematics, logic signal, limit value outputs

Functio	ons			1	Functio	ns			1	Functio	ins		
N	lathematics		Logic sig 🔹 🕨		Ŀ	ogic signal	Lim	it value c 🔺 🕨		Limit	value output:	3	Timer sig 🖪
No	Mathematics	No	Mathematics		No	Logic signal	No	Logic signal		No.	Output	No	Output
1	<<<<<	5	<<<<<		1	0	5	0	Ш	1	0	9	0
2	<<<<<	6	<<<<<	Ш	2	0	6	0		2	0	10	0
3	<<<<<	7	<<<<<	Ш	3	0	7	0		3	0	11	0
4	<<<<<	8	<<<<<	Ш	4	0	8	0		4	0	12	0
									Ш	5	0	13	0
				ļ					ļ				
13/03/04	01:37:05 67%		<u>5</u>		13/03/04	01:37:50 67%		द्य		13/03/04	01:39:12 67%	É	

9.4.2 Timer signal, digital controller signals, control contacts, controller, analog flag, digital flag

Functio	ons				Functio	ins		
Ti	mer signals	Digit	tal contro 🖪		Digital	control signals	C	ontrol cc 🔺 🕨
No	Timer run time	3	Timer outpu	ıt	No	Output	No	Output
1	00:00:00		0		1	0	5	0
2	00:00:00		0		2	0	6	0
					3	0	7	0
					4	0	8	0
10 (00 (04	00.00.05				10/00/01			
13/03/04	02:02:25 67%			5]	13/03/04	02:03:25 67%		<u>5</u>
Functio	ons				Functio	ins		
Cor	ntrol contact		Control 🖪	•	C	ontroller		Analog f 🔸 🕨
No	Control contact	No	Control cor	ntact	Contro	oller Paramete	r set	etpoint value:
1	0	5	0		1	1		1
2	0	6	0		2	1		1
3	0	7	0					
4	0	8	0					
13/03/04	02:04:13				13/03/04	02:05:23		
	67% -4-			5]		67% -4-		<u> 1</u>
Functio	ons				Functio	ons		
A	nalog flag		Digital f 🖪	+	[Digital flag		 ▲ ▶
No	Analog flag	No.	Analog fla	ag	No.	Digital flag	No	Digital flag
1	0.0000	5	0.0000		1	0	5	0
2	0.0000	6	0.0000		2	0	6	0
3	0.0000	7	0.0000		3	0	7	0
4	0.0000	8	0.0000		4	0	8	0
13/03/04	02:05:59 67%			<u>5</u>	13/03/04	02:06:36 67%		

9.5 Status

9.5.1 Ethernet status 1 to 9

Status	
Ethernet	
Ethernet status 1	342162
Ethernet status 2	49362
Ethernet status 3	15396
Ethernet status 4	0
Ethernet status 5	14649
Ethernet status 6	0
Ethernet status 7	16001
Ethernet status 8	0
Ethernet status 9	<u> </u>
13/03/04 02:14:12 67%	<u>ś</u>

10.1 General information



NOTE!

The functional level is faded out by default and must be activated using the setup program.

10.1.1 Activate functional level

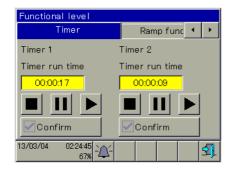
The functional level is activated in the screen menu and subsequently appears in the device menu.

⇒ Chapter 12.10 "Screen", page 106

Screen		×
Screen	Screen \ General configuration	
General configuration	Display after program resart:	Process screen
Configuration screen	Simulating inputs:	No
Start screen and waterm	Alarm text header:	Yes 🔻
Operation loop	Lock touchscreen:	
Colours recording		No selection
Colours controller screen	Functional level:	display 🔽
Colours controller screen	Function key 1:	display
Device menu	× Function key 2:	Home button 🔻
	Home button:	Process screen 🔻
Program administrat	ion	
Device info		
Functional level		
Parameterization		
Configuration		
Calibrate touchscre	en 🔽	
Сору		OK Cancel

The functional level is used primarily for testing and diagnostic purposes. Analog and binary values of the outputs can be controlled manually here. This may be useful, for instance, for checking an individual piece of equipment in a plant. For maintenance and repair works, for example, the timer, ramp function, and limit value monitoring can be operated and switching operation can be acknowledged.

Example for the timer





NOTE!

The parameters described in this section can be entered either in the setup program or in DI-CON touch. This is where the parameters that are directly linked to the alignment of the controller with the control path are set, after the system has been commissioned.

You must be logged in to change the parameters.

- ⇒ Device menu section > Login
- ⇒ Chapter 7 "User level (Log-In)", page 45

Setup dialog

JUMO DICON touch (Unicode) - [>> MustKot	i3_für englisch.266 - altered -]	
😰 File Edit Data transfer Extras Window	Info	
🗅 🖆 🔚 🖪 🚭 🍃 💋 🔶 🔶 🎕		
Must Koff 3_für englisch.266 - altered -	 Relay modules: Undoc Date and Time Date a Time synchronizat.: No selection Param Time zone GMT: 60 min Setpor Count Start DST: User II User II End DST: Cotober Last Sunday 03:00:00 	
File-Info-Text	Websi OK Cancel	

11.1 Date and time

The following table shows the time settings for the device.

Parameter	Setting	Description
Current date	2011/01/01 2083/12/31	Enter the date here.
Current time	00:00:00 23:59:59	Enter the time here.

11.2 Daylight saving time

The following table shows the settings for daylight saving time.

Parameter	Setting	Description
Synchronization	No function Digital selector	A digital signal can be selected here to syn- chronize the time.
Switch daylight saving time	Automatic Inactive	Enables you to set the time to change auto- matically.

11 Parameterization

Parameter	Setting	Description	
Start DST	Month: March		
	Week: last week		
	Day: Sunday		
	Time: 02:00:00		
End DST	Month: October		
	Week: last week		
	Day: Sunday		
	Time: 03:00:00		

11.3 Controller/parameter blocks

Setup dialog

P	arameter sets	vented parameters:					×
	Controller 1	Controller 1 \Parameter set 1					
	Parameter set 1	Controller structure 1:	PID	•	Controller structure 2:		-
	Parameter set 2	Proportional band 1:	14.901	°C	Proportional band 2;	0.0000	•⊂
		Derivation time 1:	30.709	s	Derivation time 2;	80.000	s
	Parameter set 4	Reset time 1:	123.94	s	Reset time 2;	350.00	s
	Controller 2	Switching period 1:	20.0	s	Switching period 2:	20.0	s
	Parameter set 1	Contact distance:	0.0	°⊂			
	······································	Switch hyst. 1:	1.0	°C	Switch hyst, 2;	1.0	°⊂
	Parameter set 4	Actuator time:	60	s			
	111	Working point:	0	%			
1		max. output level limit:	100	%			
		Min. output level limiting:	-100	%			
		Min. relay switch-on time 1:	0	5	Min, relay switch-on time 2;	0	5
				J			
	Сору					ОК	Cancel

The following table shows the parameters in a parameter block. These parameters are also available for the other three parameter blocks. Two parameter blocks can be defined for each of the two controller channels. Switching the parameter blocks is performed separately for each controller channel via a digital signal.

Depending on the controller type configured, certain parameters may be omitted or ineffective. Parameters that appear in pairs such as Proportional band 1 and 2 refer to the first and second controller outputs (for instance, with three-state controllers).

The parameter blocks are assigned to both controllers in the configuration level.

⇒ B 703571.0 - Chapter 12.6.2 "Controller inputs", page 80

Parameter	Setting	Description
Proportional band	0 9999	Value for the proportional band
1 (Xp1)		The controller structure has no effect if $Xp = 0$ (behavior identical to limit value
Proportional band 2	0 9999	monitoring)! For a continuous controller, Xp must be
(Xp2)		> 0.
Derivative time 1 (Tv1)	0 80 9999 s	The derivative time influences the differ- ential component (D component) of the controller output signal.
Derivative time 2 (Tv2)	0 80 9999 s	The greater the derivative time, the more effect the D component has.
Reset time 1 (Tn1)	0 350 9999 s	The reset time influences the integral component (I component) of the control- ler output signal.
Reset time 2 (Tn2)	0 350 9999 s	The greater the reset time, the less effect the I component has.
Cycle time 1 (Cy1)	0 20 999.9 s	When using a switched output, the cycle time should be chosen so that the energy supply to the process is as con-
Cycle time 2 (Cy2)	0 20 999.9 s	tinuous as possible without overloading the switching elements.
Contact spacing (Xsh)	0 999.9	Spacing between the two control con- tacts for a three-state controller, modu- lating controller, and continuous controller with integrated position con- troller
Switching differ- ential 1	0 1 999.9	Hysteresis for a switching controller with proportional band $Xp = 0$
(Xd1)		
Switching differ- ential 2	0 1 999.9	
(Xd2)	5 60 3000 s	
Actuator time (TT)	5 60 3000 S	Control valve running time range used for a modulating controller and continu- ous controller with integrated position controller
Working point (Y0)	-100 to 0 to +100 %	Working point correction for a P or PD controller (correction value for the output level)
		If the actual value (x) has reached the setpoint value (w), the output level (y) corresponds to the working point (Y0).
Max. output level limit	0 to 100 %	Admissible maximum output level (only effective if $Xp > 0$)
(Y1)		

11 Parameterization

Parameter	Setting	Description
Min. output level limit (Y2)	-100 to +100 %	Admissible minimum output level (only effective if Xp > 0)
Minimum relay ON period 1	0 to 60 s	Limits the frequency of switching for switched outputs
(Tk1)		
Minimum relay ON period 2	0 to 60 s	
(Tk2)		

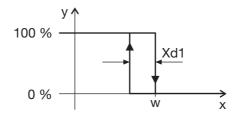
Transmission behavior

The transmission behavior (controller structure) is determined by the configuration of the parameters for the proportion band (P component), derivative time (D component), and reset time (I component).

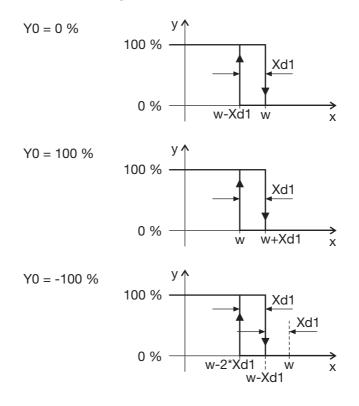
Two-state controller

This controller has a switched output and can be parameterized with P, PI, PD, or PID transmission behavior. The proportional band Xp must be greater than 0 for the controller structure to take effect.

If Xp = 0, the behavior corresponds to the function of limit value monitoring with switching differential Xd1 (working point Y0 = 0 %):



Influence of working point Y0 on the switching behavior

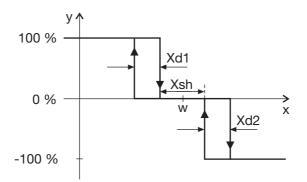


11 Parameterization

Three-state controller

This controller has two outputs, which can be configured as continuous (analog output) or switched (digital output). In both cases, the controller can be parameterized with P, PI, PD, or PID transmission behavior. The proportional bands Xp1 and Xp2 must be greater than 0 for the controller structure to take effect.

If Xp1 = 0 and Xp2 = 0, the behavior corresponds to the function of limit value monitoring with switching differential Xd1 and Xd2, and contact spacing Xsh (working point Y0 = 0 %):



Modulating controller

This controller has two switched outputs and can be parameterized with PI or PID transmission behavior. The proportional band Xp must be greater than 0 for the controller structure to take effect.

The modulating controller is used for actuator drives with three switching statuses (actuator open, closed, hold). If output level feedback is available, the active output is deactivated when the output level limits are reached.

Continuous controller

This controller has a continuous output (analog output) and can be parameterized with P, PI, PD, or PID transmission behavior. The proportional band Xp must be greater than 0 for the controller structure to take effect (the setting Xp = 0 is normally used in practice).

Position controller

This controller is a continuous controller with integrated position controller and two switched outputs (digital outputs) with PI or PID transmission behavior.

The position controller is used for actuator drives with three switching statuses (actuator open, closed, hold). An output level feedback is required.

11.4 Setpoint values

Four switchable setpoint values are assigned to a fixed-setpoint controller and can be entered on the device or in the setup program.

The following table shows the setpoint changeover for fixed-setpoint controllers using two digital signals that can be Chapter 12.6.6 "Controller setpoint values", page 93 set.

For program controllers

⇒ Chapter 8.1 "Enter program curves", page 47

Туре	Signal 2 (Bit 1) setpoint changeover	Signal 1 (Bit 0) setpoint changeover	Setpoint value, Controller 1	Setpoint value, Controller 2	
Fixed-setpoint	0	0	Setpoint value 1	Setpoint 1	
controller	0	1	Setpoint value 2	Setpoint value 2	
	1	0	Setpoint value 3	Setpoint value 3	
	1	1	Setpoint value 4	Setpoint value 4	
Program control- ler			W1 and W2 are predefined by the program generator		
			🔰 🖌 OK 🛛 🗶 Can	cel 🖉	
			No W1 W2 I	Runtime SK	
			1 20,000 100,00 (00:20:00 00000001	
			2 60,000 160,00 (00:40:00 00000000	
			3 60,000 160,00 (00:15:00 00000001	
			4 90,000 220,00 0	00:30:00 00000001	
				00:55:00 00000000	

11.4.1 Entered on the device

The setpoint values in the parameter level are entered on the device.

Parameterization ×	Controller 1
Parameterization	V Cancel
- 🗐 Back	Setpoint value 1 +40.000 °C
Clock	Setpoint value 2 +0.0000 °C
ե 🔁 Setpoint values	Setpoint value 3 <mark>+0.0000 °C</mark>
	Setpoint value 4 +0.0000 °C
Controller 2	

11.4.2 Entered using the setup program

The setpoint values are entered in the setup dialog parameter level.

Set	tpoint values		×
	- Controller 1	Controller 1	
	- Controller 2	Setpoint value 1: 40.000	
		Setpoint value 2: 0.0000	
		Setpoint value 3: 0.0000	
		Setpoint value 4: 0.0000	
	Сору	ОК	Cancel

11 Parameterization



NOTE!

The parameters described in this section can be edited using either the setup program or DI-CON touch. The settings (for example, measured value recording, outputs, Ethernet, and controller type) that are required immediately for commissioning in a specific plant and therefore that seldom need to be changed, are set here.

Depending on the configuration, signals which are not in use are grayed out. Functions available in both selectors are highlighted in a specific color.

12.1 Analog selector

Analog selection - Nalog inputs - Analog inputs - Analog inputs - Catholie - Controller - Controller - Controller - Program setpoint values - Section en values - Section en values - Sampling periode

The analog selector contains all analog signals available in the configuration dialogs of a tree structure in the DICON touch.

 Settorin values Program setpont values Program setpont values Section end valu

Internal: Internal signal for the DICON touch (including signals from the analog inputs)

• External: External input, for example, one that can be transmitted via an interface

Category	Signal	Туре	Description
No function			No signal selected
Analog inputs	Analog input (IN8) Analog input (IN9)	Internal	Measured values for analog inputs 1 to 4
	Analog input (IN10) Analog input (IN11)		➡ Chapter 12.5 "Analog inputs IN8, IN9, IN10, IN11", page 73
External analog inputs	External analog inputs 1 to 8	Exter- nal	Analog value for the external analog input 1 to 8
			➡ Chapter 12.18 "External ana- log inputs", page 135
Mathematics	Mathematics 1 to 8	Internal	Result of mathematical function 1 to 8
			➡ Chapter 12.15 "Mathematics/ logic", page 130
Controller 1	Actual value for Controller 1	Internal	
	Setpoint value, Controller 1		➡ Chapter 12.6.1 "Controller
	Controller differential, Controller 1		configuration", page 77
	Output level display, Controller 1		
	Output 1, Controller 1		
	Output 2, Controller 1		
-	Cascade output level, Controller 1		
Controller 2	Actual value, Controller 2		
	Setpoint value, Controller 2		
	Controller differential, Controller 2		
	Output level display, Controller 2		
	Output 1, Controller 2		
	Output 2, Controller 2		
	Cascade output level, Controller 2		

12 Configuration

Category	Signal	Туре	Description
Setpoint values	Ramp end value, Controller 1 Setpoint specification, Controller 1 Setpoint value 1 to 4, Controller 1 Ramp end value, Controller 2 Setpoint specification, Controller 2 Setpoint value 1 to 4, Controller 2	Internal	Setpoint value for controller channel 1 to 2 as fixed setpoint controller ⇒ Chapter 12.6.6 "Controller setpoint values", page 93
Program setpoint	Program setpoint 1, 2	Internal	Setpoint value for controller channel 1 to 2 as program controller ⇒ Chapter 12.12 "Program con- troller", page 116
Section end val- ues	Section end value 1 to 2	Internal	
Flags	Flags 1 to 8	Internal	Analog value of the analog flag ⇒ Chapter 12.16 "Flags/ser- vice", page 132
Service	Terminal temperature	Internal	Measured value (internal Pt100)
Sampling rate	Sampling rate	Internal	Measured value, sampling rate

12.2 **Digital selector**

· Digital selector - Controller

- Digital inputs

The digital selector contains all digital signals that are available in the configuration dialogs of Digital inputs External digital inputs a tree structure in the DICON touch.

¹ Digital control signals ¹ Digital control signals ¹ Limit value control signals ¹ Limit value controls ¹ Timer ¹ Timer ¹ the controls of the signal: the source of the signal: -- Logic output
 -- Ramp signals
 -- Program controller
 -- Control contacts

Internal: Internal signal for the DICON touch (including digital input signals) •

External: External value is transferred via the interface, for example •

Category	Signal	Туре	Description
No function			No signal selected
Controller 1	1st output, Controller 1	Internal	Switching outputs, Controller 1
	2nd output, Controller 1		
	Self-optimization, Controller 1		Logic level "0", function inactive
	Manual mode, Controller 1		Logic level "1", function inactive
	Controller 1, off		➡ Chapter 12.6.1 "Controller
	Controller cycle alarm 1		configuration", page 77
	Output level alarm 1		
Controller 2	1st output, Controller 2	Internal	Switching outputs, Controller 2
	2nd output, Controller 2		
	Self-optimization, Controller 2		Logic level "0", function inactive
	Manual mode, Controller 2		Logic level "1", function inactive
	Controller 2, off		➡ Chapter 12.6.1 "Controller
	Controller cycle alarm 2		configuration", page 77
	Output level alarm 2		

Category	Signal	Туре	Description
Digital inputs	Digital input 1 to 7	Internal	Logic level for connected floating contacts 1 to 7
			➡ Chapter 12.4 "Digital inputs IN1 to 7", page 72
External digital inputs	External digital input 1 to 8	External	Logic level for the external digital inputs 1 to 8
			➡ Chapter 12.17 "External digital inputs", page 134
Digital controller signals	Digital controller signals 1 to 8	Internal	Logic level for the defined digital controller signals 1 to 8
			➡ Chapter 12.14 "Digital con- troller signals", page 126
Limit value out- puts	Limit value output 1 to 16	Internal	Logic level of the limit value mon- itoring 1 to 16
			➡ Chapter 12.9 "Limit value monitoring", page 100
Timer	Timer output 1 Timerendsignal 1	Internal	Logic level of the output signals for Timer 1, 2
	Timertoleranceband 1		Logic level "0", function inactive
	Timerstopsignal 1		Logic level "1", function inactive
	Timeroutput 2		⇔ Chapter 12.13 "Timer or time
	Timerendsignal 2		switch", page 124
	Timertoleranceband 2		
	Timerstopsignal 2		
Logic output	Logic output 1 to 8	Internal	Result of logic function 1 to 8
			➡ Chapter 12.15 "Mathematics/ logic", page 130
Ramp signals	Rampendsignal 1	Internal	Logic level "0", function inactive
	Tolerancebandsignal 1		Logic level "1", function inactive
	Rampendsignal 2 Tolerancebandsignal 2		➡ Chapter 12.6.7 "Ramp func- tion", page 95
Program control-	Program end signal	Internal	Logic level "0", function inactive
ler			Logic level "1", function inactive
	Programautosignal		➡ Chapter 12.12 "Program con-
	Tolerancebandsignal		troller", page 116
Control contacts	Programstopsignal Control contacts 1 to 8	Internal	Logic level of the control con-
Control contacts		Interna	tacts, for example in automatic mode.
			➡ Chapter 8.1.5 "Control con- tacts", page 49
Flags	Digital flags 1 to 8	Internal	Logic level of the digital flag
			➡ Chapter 12.16 "Flags/ser- vice", page 132
Service	Service signal	Internal	Logic level of the service signal
			➡ Chapter 12.16 "Flags/ser- vice", page 132

Configuration

Category	Signal	Туре	Description
Function buttons	Function button 1 to 2	Internal	Logic level of the two function buttons
			➡ Chapter 5.1 "Display and operating concept", page 35
Analog input alarm	MinAlarm IN8	Internal	Min and max alarm signals of the analog inputs 1 to 4
	MaxAlarm IN8		➡ Chapter 12.5 "Analog inputs
	MinAlarm IN9		IN8, IN9, IN10, IN11", page
	MaxAlarm IN9		73
	MinAlarm IN10		
	MaxAlarm IN10		
	MinAlarm IN11		
	MaxAlarm IN11		
Ext. analog entry alarm	MinAlarm Ext. AE 1	Internal	Min and max alarm signals for the
	MaxAlarm Ext. AE 1		ext. analog inputs 1 to 8
	MinAlarm Ext. AE 2		➡ Chapter 12.18 "External ana-
	MaxAlarm Ext. AE 2		log inputs", page 135
	MinAlarm Ext. AE 3		
	MaxAlarm Ext. AE 3		
	MinAlarm Ext. AE 4		
	MaxAlarm Ext. AE 4		
	MinAlarm Ext. AE 5		
	MaxAlarm Ext. AE 5		
	MinAlarm Ext. AE 6		
	MaxAlarm Ext. AE 6		
	MinAlarm Ext. AE 7		
	MaxAlarm Ext. AE 7		
	MinAlarm Ext. AE 8		
	MaxAlarm Ext. AE 8		
Math alarm	MinAlarm Math 1	Internal	
	MaxAlarm Math 1		⇔ Chapter 12.15 "Mathematics/
	MinAlarm Math 2		logic", page 130
	MaxAlarm Math 2		
	MinAlarm Math 3		
	MaxAlarm Math 3		
	MinAlarm Math 4		
	MaxAlarm Math 4		
	MinAlarm Math 5		
	MaxAlarm Math 5		
	MinAlarm Math 6		
	MaxAlarm Math 6		
	MinAlarm Math 7		
	MaxAlarm Math 7		
	MinAlarm Math 8		
	MaxAlarm Math 8		

Category	Signal	Туре	Description
Digital alarms	Digital alarm 1 to 7	Internal	Alarms for connected floating contacts 1 to 7
			➡ Chapter 12.4 "Digital inputs IN1 to 7", page 72
Ext. digital	Ext. digital alarm 1 to 8	External	Alarms for ext. digital inputs
alarms			➡ Chapter 12.17 "External digital inputs", page 134
Digital control alarms	Digital control alarm 1 to 8	Internal	Alarms for the defined digital con- troller signals 1 to 8
			➡ Chapter 12.14 "Digital con- troller signals", page 126
Limit value alarms	Limit value alarm 1 to 16	Internal	Alarms for the limit value monitor- ing 1 to 16
			➡ Chapter 12.9 "Limit value monitoring", page 100
Logic alarms	Logic alarms 1 to 8	Internal	Alarms for logic function 1 to 8
			➡ Chapter 12.15 "Mathematics/ logic", page 130
Alarms and	Collective alarm	Internal	Collective alarm for the controller
internal signals	Collective alarm acknowledged		
	Memory alarm		Memory alarm limit exceeded
			➡ Chapter 12.3 "Basic set- tings", page 70
	Fault		
	Field bus error		
	Battery empty		Back-up battery must be replaced
	Pre-alarm battery		Back-up battery voltage under 2.6 V
	Login		Logic level "0", user not logged on
			Logic level "1", user logged on
	USB inserted		Logic level "0" USB not inserted
			Logic level "1", USB inserted
	Temp. in Fahrenheit		Logic level "0", temp. not °F
			Logic level "1", temp. in °F
	Inside temperature too high		Logic level "0", inside tempera- ture not too high
			Logic level "1", inside tempera- ture too high

12 Configuration

12.3 Basic settings

The settings are applicable for the entire device.

Setup dialog

asic settings Setup info	
Device name:	Name
Language:	1: English 👻
Language select. aft. Power-On :	
Supply frequency:	50 Hz 👻
Temp. device:	°C 🗸
Interface temp.:	°C 🗸
Reading out data via:	Interface 🔹
Memory alarm limit:	20 %
Setup quick info:	>
Version onlinevis.:	333.01.01
Device software Comparison criteria:	Equal or greater
Software-Version:	Standard Software

Basic settings			
VOK XCancel			
Name			
English			
Yes			
50 Hz			
°C			
°C	•		
	Name English Yes 50 Hz °C		

Parameter

Parameter	Selection/settings	Description
Device name	Name	20 characters of editable text
Language	1.German 2.English	The device can save up to two languages. Additional languages can only be added using the setup program: EDIT > SETUP ONLY > COUNTRY SETTINGS .
		➡ Chapter 13.3 "Country settings", page 144
Language selection afte	r "power on"	
&	Not selected (empty); no	The device starts without language selec- tion
	Selected (,); yes	The language selection appears
Supply frequency	50 Hz	
	60 Hz	
Temp. of device	Deg. Celsius	Temperature unit for displaying the tem-
	Deg. Fahrenheit	perature in the device
Temp. of interface	Deg. Celsius	Temperature unit for displaying the tem-
	Deg. Fahrenheit	perature values using the interface
Read out data using:	Interface	Secure recording data using the interface
(only setup)	USB	Secure recording data on the stick
		➡ Chapter 12.11 "Recording", page 113
Memory alarm limit (in the device)	0 to 20 % to 100 %	If the enabled memory data recorder does not reach this limit in the device, an alarm will be issued.
Setup quick info	-	Any text may be transferred to the device during the data transfer.

Parameter	Selection/settings	Description				
Online version vis. (only setup)	Standard online visualization	Software version of the webserver soft- ware				
	No online visualization					
	Example 333.01.01-13	If relevant, additional versions are listed that can be selected in the version library and can be specifically selected for the software update.				
Comparison criteria	Compatible	Setup software<->device software				
(only setup)	Equal to or greater than					
Software version (only setup)	Standard software	The device software version is available here				

Language selection after power ON

This setting means that language selection appears following "power on", which gives the user the opportunity to select their preferred language.

Language selection scree				
🖌 ОК	X Cancel			
Language	English			
_				
Fenster	nicht mehr anzeigen			

Memory alarm limit

If 20 % of the enabled memory is not used during recording, for example, an entry will be made in the alarm list. This enables the user to recover the recording data using the USB stick or the interface (as indicated).

The value of the free memory only returns to 100 % when the data has been recovered. If the remaining 20 % is used up, the oldest recorded data is overwritten and replaced with the new data. In this case, there will be a recording gap.

12.4 Digital inputs IN1 to 7

A maximum of seven digital inputs (IN 1 to 7) are available for connecting to floating contacts with a common ground.

Setup dialog

C	Digital inputs							
	IN1 Digital input 1	IN1 Digital input 1						
	Alarm	Description: Digital	inp. 01	>				
	IN2 Digital input 2							
	IN3 Digital input 3							
	IN4 Digital input 4							
	IN6 Digital input 6							
				A	larm lis	t		
	IN1 Digital input 1	IN1 Digital input 1 \ Alarm			🛐 Ba		Details 🔽 Confirm	n
	Alarm	Alarm type	Event		Date	Time	Description	
	IN2 Digital input 2	Polarity for alarm		0	4.01.13	14:55:47	📽 Eing. nicht kalibr.	
	IN3 Digital input 3		Alarm Digital inp. 01					
	IN4 Digital input 4			-				
	IN5 Digital input 5							
	Сору		ОК	Cancel				

Parameter

Parameter	Selection/settings	Description		
Channel description	Digital input 01	(15 characters) of editable text that indicates, for example, what the signal will be used for.		
Alarm type				
	Off	Alert switched off.		
	Alarm	A message will be entered in the alarm list depending on the signal level that has been set.		
	Event	A message will be entered in the events list depending on the signal level that has been set.		
Polarity for alarm	Signal level that triggers an alarm or an event.			
	High	Contact closed: high (logic "1")		
(only setup)	Low	Contact open: low (logic "0")		
Alarm text (only setup)	Digital input alarm 01	20 characters of editable text which is entered into the alarm or event list.		

Polarity for alarm

An alarm is only displayed for as long as the signal level (closed contact) is also selected. If the contact is opened, the alarm entry disappears automatically.

Alarm text

The setup program is required to view and edit the texts.

12.5 Analog inputs IN8, IN9, IN10, IN11

Analog inputs IN8 and IN9 are installed by default as universal measuring inputs for RTD temperature probes, thermocouples, resistance transmitters/resistance potentiometers, and standard signals. Two additional analog inputs, IN10 and IN11, can be retrofitted.

Setup dialog

Analog inputs	-		×
IN 8 Analog input 1	IN 8 Analog input 1		
	Description:	Analog input 1	
IN 9 Analog input 2	Probe:	Resistance 3-wire	
🖭 — 📀 IN 10 Analog input 3	Linearization:	Pt100 -	¢.
here are	Unit:	%	Τ
more Analog inputs	Comma format:	XXXX.X 💌	
	Measuring value offset:	0.0000	°C
	Measuring value factor:	1.0000	
	Filter time const.:	2.95	S
	Scaling start:	-200.00	°C
	Scaling end:		°C
	Lead wire resistance:	0.0	Ω
	ext. compensation temp.:		
	fixed compensation temp.:	50.0	°C
	KTY at 25 ℃ / 77 °F;	2000	Ω
	Resistance measuring range:		
Сору			OK Cancel

Parameter	Selection/settings	Description
Channel description	Analog input IN8, IN9, IN10, IN11	(15 characters) of editable text
Probes	Selection of measuring probe for the relevant analog input	
	No function	No sensor selected
	Res.three-wire	RTD temperature probe in three-wire circuit
	Res.two-wire	RTD temperature probe in two-wire circuit
	Int. thermocouple	Internal thermocouple Cold-junction temperature
	Ext. thermocouple	External thermocouple Cold-junction temperature
	Constant thermocouple	Constant thermocouple Cold-junction temperature
	Resistance transmitter	Resistance transmitter
	0 to 20 mA	Standard signal
	0 to 10 V	Standard signal
	0 to 1 V	Standard signal
	0to 100 mV	Standard signal
	4 to 20 mA	Standard signal
	2 to 10 V	Standard signal

Parameter	Selection/settings	Description
Linearization	Available options and default se selected.	ettings depend on the measuring probe
RTD probe	Linear	
	Pt100	DIN EN 60751
	Ni100	DIN EN 60751
	Pt500	DIN EN 60751
	Pt1000	DIN EN 60751
	Ni1000	
	Pt100J	JIS 1604
	Pt50	GOST 6651-94
	Cu50	GOST 6651-94
	KTY11-6	Туре КТҮ11-6
	Pt100 Gost	
	Pt50 Gost	
	Cu100 Gost	
	Cu50 Gost	
Thermocouples	CRCopel	
	Fe-CuNi L Gost	
	Cu-CuNi T	
	Fe-CUNi J	
	Cu-CuNi U	
	Fe-CuNi L	
	NICr-Ni K	
	Pt10Rh-Pt S	
	Pt13Rh-Pt R	
	Pt30Rh-Pt6Rh B	
	NiCrSi-NiSi N	
	NiCr-CuNi E	
	W5Re-W26Re C	
	W3Re-W25Re D	
	In40-Rh	
	Pt10Rh-Pt	
	Customer-spec. 1	
	Customer-spec. 2	
	Customer-spec. 2	
	Customer-spec. 4	Customer-specific linearization with 4th
	Cusiomer-spec. 4	order polynomial
Unit	5 characters (%)	Unit for numerical representation of measured value
Decimal place	XXXXX.	No decimal place
	XXXX.X	1 decimal place
	XXX.XX	2 decimal places
	XX.XXX	3 decimal places
	X.XXXX	4 decimal places

Parameter	Selection/settings	Description	
Measured value off- set	-100 to 0 to +100	Parallel translation of all measured values	
Measured value fac- tor	1,000	Slope	
Filter time constant	0 to 0.6 to 100	Time constant for adjusting the digital input filter (0 s = filter off)	
Start of scaling	Default setting depends on sensor ar	nd linearization.	
	-99999 to +99999	Start value of display range for standard signals	
Scaling end	Default setting depends on sensor and linearization.		
	-99999 to +99999	End value of display range for standard signals	
Lead wire resistance	0 Ω	The lead wire resistance is entered here with a two-wire circuit.	
Ext. compensation	No selection	-	
temperature	Analog selector	The measurand used to record the cold- junction temperature is set here.	
Fixed compensation temperature	0 to 50 to 100 °C	If the cold junction has a fixed tempera- ture, this is entered here.	
KTY at 25 °C/77 °F	0 to 2000 to 10000 Ω	Basic resistance of a KTY probe at 20 °C	
Resistance measur- ing range	0 to 400 Ω	The following measuring ranges are available for a customer-specific linear-	
	0 to 4000 Ω	ized resistance measurement	

Linearization

Linearization is dependent upon the probe that is connected (measuring probe).

The predefined linearizations can be supplemented with **customer-specific linearization**. ⇒ Setup program:

SETUP ONLY > CUSTOMER-SPECIFIC LINEARIZATION

Measuring value offset, measuring value factor

The value for the measuring value offset provides parallel translation of all measured values and the value for the measuring value factor influences the increase in the values displayed.

Filter time constant

The filter time constant adjusts the digital input filter (2nd order filter). If the input signal changes suddenly, approx. 26 % of the change is recorded following a period that corresponds to the filter time constant (2× filter time constant: approx. 59 %; 5× filter time constant: approx. 96 %). A large filter time constant means: high attenuation of interference signals, slow reaction to the actual value display, low limit frequency (low-pass filter).

Scaling start, end

The maximum measuring range limits are displayed here, depending on the probe selected and the linearization. These limits only affect the recording. If, for example, the scaling end for a Pt100 is reduced from 850 °C to 400 °C, the recording only displays values up to 400 °C.

Lead wire resistance

On connecting a RTD temperature probe in a two-wire circuit, longer lines may lead to measuring errors. This value is used to compensate the resistance of the probe line and depends on the line length. Enter the ohmic resistance of the probe line here to achieve the best possible temperature measurement.

12.5.1 Alarms

Limit value monitoring with one or two alarms and various alarm types can be activated for each analog input. In addition, this function is required in order to trigger the collective alarm of the controller module if the event of deviation above or below the measuring range (out of range). This limit value monitoring is available in addition to the functions described in Chapter 12.9 "Limit value monitoring", page 100 and is independent of these.

Setup dialog

	Analog inputs			
	IN 8 Analog input 1	IN 8 Analog input 1 \ Alarm		
	Alarm	Minimum alarm:	Event 🔹	
	🗄 🗝 🕞 IN 9 Analog input 2	Minimum value:	-99999	°C
	🗄 📀 IN 10 Analog input 3	Minimum alarm text:	Underrange Input 8 >	
	here are			
8	more Analog inputs	Maximum alarm:	Event 🗸	
		Maximum value:	99999	°C
i		Maximum alarm text:	Overrange Input 8 >	
i				

Parameter	Selection/settings	Description
IN 8 Analog input	1, IN9 Analog input 2	I
Minimum alarm	Off	Monitoring is not active.
	Alarm	Alarm results in an entry in the alarm list.
	Event	Alarm results in an entry in the event list.
Minimum value	-99999 to 0 to +99999	Limit value at which an alarm is issued.
Minimum alarm text	Underrange AE1	Text which is entered into the alarm or event list in the event of deviation.
Maximum alarm	Off	Monitoring is not active.
	Alarm	Alarm results in an entry in the alarm list.
	Event	Alarm results in an entry in the event list.
Maximum value	-99999 to 0 to +99999	Limit value at which an alarm is issued.
Maximum alarm text	Overrange AE1	Text which is entered into the alarm or event list in the event of deviation.

12.6 Controller1, 2

Two controllers (controller channels) are available. The parameters listed here can be configured independently of each other for controller 1 to controller 2.

12.6.1 Controller configuration

The controller type, the control direction, the output level for changeover to manual mode and for deviation above or below the measuring range, as well as the output level standardization and the deadband width are specified here.

Setup dialog

Controller			×
Controller 1 Controller inputs Controller self-optimization Controller circuit monitoring Output level monitoring Controller setpoint values Ramp function Controller 2	Controller type: Control direction: Manual mode: Accept manual output level: Accept range output level: Manual output level: Range output level:	Free Actual value Range output level	% %
	Time for manual output level: Time for range output level:		min
	Start cascades standardisation: End cascades standardisation:	0.0000	
	Deadband: additional functions:	0.0000	%
		Extention 2 Extention 3 Extention 4	

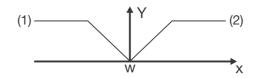
Parameter	Selection/settings ¹	Description
Controller 1, Co	ntroller 2	
Controller type Off		Controller channel is switched off
		(default setting for Controller 2)
	Two-state controller	Controller with a switched output
		(default setting for controller 1)
	Three-state controller	Controller with two continuous or switched outputs (for example, for heating/cooling)
Modulating controller Controlle		Controller with two switched outputs (for motor actuator)
	Continuous controller	Controller with a continuous output (analog signal)
	Position controller	Continuous controller with integrated position controller (for motor actuator)
Control direc- tion	Direct (2)	The controller output level is positive if the actual value is greater than the setpoint value (cooling).
	Inverse (1)	The controller output level is positive if the actual value is smaller than the setpoint value (heating).

Parameter	Selection/settings ¹	Description		
Manual mode				
Enabled		Manual mode possible on the device		
	Disabled	Manual mode disabled		
Y in manual mod	le	Defines the output level (%) that the controller should adopt after switching to manual mode.		
	Y manual mode	The value set below for Y manual mode is adopted.		
	Current value	The current controller output level before switching to manual mode is adopted.		
	Average value	The average value calculated using the set time below is adopted.		
Y with error		Defines the output level (in %) that the controller should display, if one of the analog values relevant for the con- troller is invalid (incorrect actual value, setpoint value, output level feedback, etc).		
	Y substitute value	The Y substitute value set below is adopted.		
	Current value	The current output level before deviation above or below the measuring range is adopted.		
	Average value	The average value calculated using the set time below is adopted.		
Y manual mode	0 to 100 %			
Y substitute value	0 to 100 %			
Time for manual aver- age value	1 to 3600 min	Time for the average value when "Y in manual mode" average value is set		
Time for substi- tute average value	1 to 3600 min	Time for averaging of values if the "Y with error" average value is is set		
Start of cascade standardization	0 to 100 %	The output level can be standardized here (only for cas- cade controllers).		
End of cascade standardization	0 to 100 %			
Deadband (neutral zone)	0.00 to 100 %	Output level movements within the deadband are sup- pressed, for example by noisy signals. The deadband is only effective for controller structures with I-component.		
Additional functions not selected (empty)		· · · · · · · · · · · · · · · · · · ·		
(only setup)	() Expansion 1	Reserved functions for service		
	() Expansion 2			
	() Expansion 3			
	() Expansion 4			

¹ Bold: default setting

Control direction

Is set inversely by default (1) for heating mode.



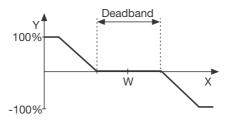
Manual mode

If the setting is disabled, manual mode is not possible on the device and the button for manual mode will be grayed out.



Deadband

Default is 0, i.e. no distance between heating and cooling contact.



12.6.2 Controller inputs

The analog inputs for the controller are configured in this menu – including the signals for switching off the controller and switching on the parameter block – as well as the parameters for manual mode.

Setup dialog

Controller			x
Controller 1	Controller actual value:	Analog selection\Analog inputs IN8 Analog input 1	•
Controller self-optimization	Controller setpoint value:	Analog selection\Program setpoint values Program setpoint value 1	•
Controller circuit monitoring	Output level feedback:	No selection	-
- Controller setpoint values	Manual output level:	No selection	•
Ramp function	additive variable disturbance:	No selection	•
	multiplicative variable disturb:	No selection	•
	Signal Manual/Auto changeover:	No selection	•
	Signal locked manual mode:	No selection	•
	Signal 1 Parameter Set Switch: Signal 2 Parameter Set Switch:	No selection	-
	Signal 2 Parameter Set Switch:	No selection	-
	Signal Actual Value Switch: Signal controller Off:	No selection	-
	Signal controller On:	No selection	-
		No selection	•

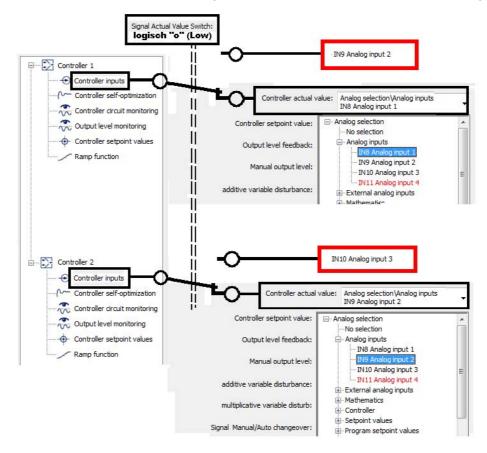
Parameter	Selection/settings	Description
Controller 1, Controller 2		
Controller actual value	IN8 analog input 1	Analog signal for actual value
	Analog selector	
Controller setpoint value	Setpoint specifica- tion for Controller 1	Analog signal for setpoint value
	Analog selector	
Output level feedback	No selection	Analog signal for output level feedback
Manual output level	Analog selector	Analog signal for manual output level
Additive variable disturbance		Analog signal for additive variable distur- bance
Multiplicative variable distur- bance		Analog signal for multiplicative variable disturbance

Parameter	Selection/settings	Description
Manual signal/auto-switching	No selection	This signal switches between manual
	Digital selector	mode and automatic mode.
Locking signal for manual mode		This signal locks manual mode
Signal 1	-	The parameter blocks entered in the
Parameter block switching		Chapter 11.3 "Controller/parameter
Signal 2	-	blocks", page 58 are switched using both
Parameter block switching		these signals.
Signal for actual value switching	-	The analog inputs (actual value inputs)
		are switched using this digital signal.
Controller signal off	1	The controller can be switched to On or
Controller signal on	1	Off using this signal.

Actual value switching

Provided that no signal is selected for switching the actual value, the actual values set from the analog selector for the controller configuration are active. If, however, a signal is set for switching the actual value, then the High signal level (logic "1"), is switched to the actual value outlined in red.

Controller 1 is then linked to IN9 (analog input 2) and Controller 2 to IN10 (analog input 3).



12.6.3 Self-optimization controller

Self-optimization determines the optimum controller parameters for a PI or PID controller.

Setup dialog

Iler 1 Method: Oscillation Scontroller inputs Controller self-optimization Controller circuit monitoring Output level monitoring Output level monitoring Output type 1: Automatic Automatic Automatic Standby output: O Output level step method: 30 Takeover switching period: Signal Start/Stop: No selection No selection	• • • • • %

Parameter

Parameter	Selection/settings ¹	Description
Method	Oscillation	Oscillation method
	Step response	Step response method
Lock	Enabled	Self-optimization can be started on the device
	Disabled	Self-optimization is disabled
Exit type 1, 2	Automatic	Output level is recognized automatically.
	Relay	Output level is displayed using the relay
	Solid state, logic	using the solid state relay or digital signal
	analog	using the analog output.
Standby output	0 to 100 %	
Output level for step method	0 to 30 to 100 %	Output level for step response level
Acquisition of switch-	Yes	Cy is detected during self-optimization
ing period (Cy)	No	Cy is not detected
Signal start/stop	No selection	Start/stop signal for self-optimization
	Digital selector	
Locking signal	No selection	Signal for locking self-optimization
	Digital selector	

¹ Bold: default setting

Method

The standard method is the oscillation method, whereas the step response method is used specifically in the plastics industry.

With the oscillation method, the output level is set alternately to 100 % and 0 %, which produces oscillation of the control variable. With the step response method, a step of a specified size is made from the standby output. In both cases, the controller determines the optimum controller parameters from the response of the actual value.

⇒ Chapter 12.6.3 "Self-optimization controller", page 82 and following pages

Optimization according to the oscillation method or Optimization according to the step response method

Exit type 1, 2

The cycle time is calculated on the basis of the type of controller output.

Optimized controller parameters

With both self-optimization methods, certain parameters are optimized according to the configured controller type and configured parameters. The controller structure is derived from the type of the optimized parameters: Proportional band Xp (P component), derivative time Tv (D component), and reset time Tn (I component).

Configured con- troller type	Configured parameter	Optimized parameter	Optimized controller structure
Two-state control- ler	Xp1 = any; Tv1 = 0; Tn1 > 0	Xp1, Tn1, Cy1, dF	PI
	All other settings	Xp1, Tv1, Tn1 Cy1, dF	PID
Three-state con- troller	Xp1 = Xp2 = any; Tv1 = 0; Tn1 > 0	Xp1, Xp2, Tn1, Cy1, Cy2, dF	PI
	All other settings	Xp1, Xp2, Tv1, Tn1, Cy1, Cy2, dF	PID
Modulating con- troller	Xp1 = any; Tv1 = 0; Tn1 > 0	Xp1, Tn1, dF	PI
	All other settings	Xp1, Tv1, Tn1, dF	PID
Continuous con- troller	Xp1 = any; Tv1 = 0; Tn1 > 0	Xp1, Tn1, dF	PI
	All other settings	Xp1, Tv1, Tn1, dF	PID
Position control- ler	Xp1 = any; Tv1 = 0; Tn1 > 0	Xp1, Tn1, dF	PI
	All other settings	Xp1, Tv1, Tn1, dF	PID

The cycle time Cy and the filter time constant dF are also optimized.

For first-order control paths, the parameters required for the PI controller structure are optimized, independently of the configured parameters.

Error handling

If the actual value deviates above or below the measuring range during self-optimization, self-optimization is aborted. In this case, the configured parameters are not changed.



WARNING!

During self-optimization according to the oscillation method, output level limits Y1 and Y2 are not active for switched outputs or solid state outputs.

The output level may exceed or fall below the set limits.

It must be ensured that this does not result in damage to the plant.



NOTE!

Optimization must be performed under genuine operating conditions and requires a closed control loop, whose actuator influences the actual value(heating controlled by relay output). It can be performed as many times as required.

Start of self-optimization

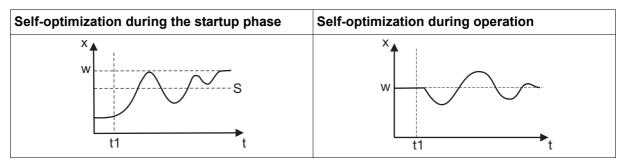
Self-optimization can be started using any signal from the digital selector. Any other signal from the digital selector can be used to abort (stop) autotuning.

Optimization according to the oscillation method

In the case of a large control deviation between the setpoint value and actual value (for example, in the startup phase), the controller determines a switching line around which the control variable performs a forced oscillation during self-optimization. The switching line is determined so that the actual value does not exceed the setpoint value if possible.

In the case of minor control deviation (for example, if the control loop is in a steady state during operation), oscillation is forced around the setpoint value. Here, the setpoint value is exceeded in any case.

The controller automatically chooses between two procedures depending on the extent of the control deviation:



- x Actual value
- S Switching line

- w Setpoint value
- t1 Start of self-optimization

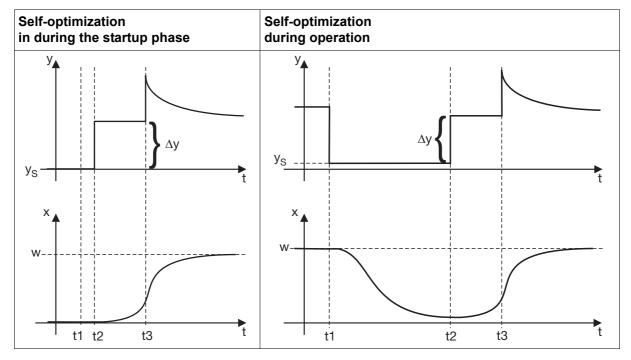
Optimization according to the step response method

Initially, a configurable standby output is produced until the actual value "settles" to a constant. This is automatically followed by a configurable output level step (step size) to the control path. Main applications of the step response method:

- Optimization immediately after "power on" during startup (considerable time saving, standby output setting = 0 %)
- Control path does not oscillate easily (for example, extremely well insulated furnace with low losses, long oscillation period)
- Actual value must not exceed setpoint value If the output level is known for the corrected setpoint value, overshooting is prevented with the following setting:

Standby output + step size \leq output level in corrected state

The progression of the output level and actual value depends on the status of the process at the point when self-optimization starts:



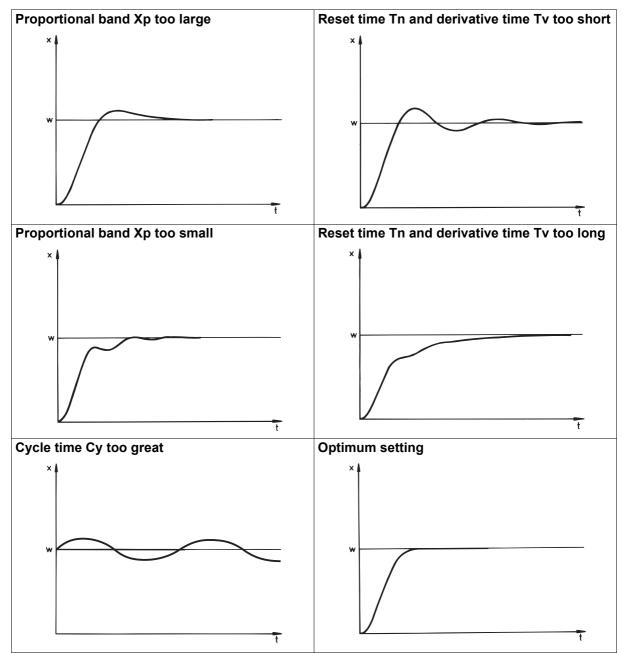
- y Output level
- ${\rm y}_{\rm S}~$ Standby output
- x Actual value
- w Setpoint value

- Δy Step size
- t1 Start of self-optimization
- t2 Point of output level step
- t3 End of self-optimization

Checking the optimization

You can check for optimum adjustment of the controller to the control path by recording the startup process (with "Startup", for example) with a closed control loop. The diagrams below indicate possible incorrect adjustments and correction of these.

Here, the guiding behavior of a third-order control path for a PID controller is recorded as an example. The procedure for setting the controller parameters can also be applied to other control paths.



12.6.4 Control loop monitoring

Control loop monitoring monitors the control behavior during startup of a plant and in the event of a setpoint value step by analyzing the change of the actual value during an output level change. An alarm is issued if the actual value does not respond according to the specifications. The alarm signal is available from the digital selector and can be processed further at any time.

Setup dialog

Controller		×
Controller 1		
Controller inputs	Function: Inactive	
Controller self-optimization	Response time: 0 s	
Controller circuit monitoring	Monitoring band: 0.0000	
Output level monitoring		
Controller setpoint values		
Ramp function		
Controller 2		

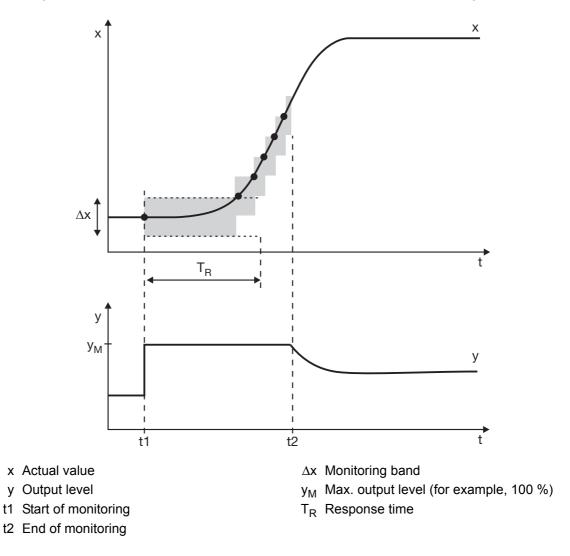
Parameter	Selection/settings	Description
Function	Inactive	Control loop monitoring is generally not permitted
&	Active	Control loop monitoring is generally permitted
Response time	0 to 1999	Time period in which the actual value must leave the monitoring band.
		"0 s" setting means: Response time = reset time Tn
Monitoring band	0.0000 to 1999	Monitoring band width that must leave the actual value within the response time
		"0" setting means: Monitoring band = 0.5 × proportional band (Xp)

Description of the function

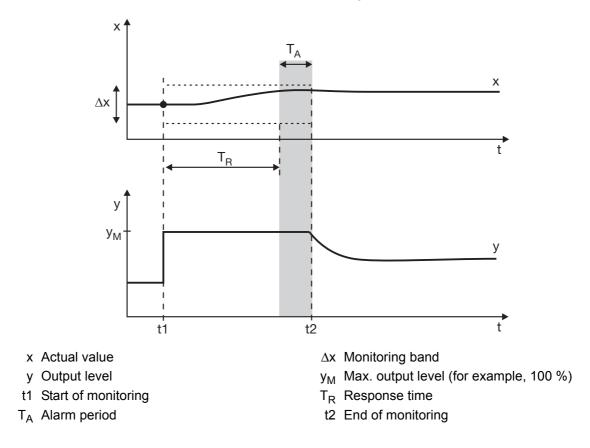
Monitoring starts as soon as the maximum output level is produced in heating mode (see example) or as soon as the minimum output level is produced in cooling mode. Starting from this point, the actual value must leave the monitoring band – the range around the current value at the start of monitoring – within the response time. If it is not, an alarm is triggered.

On leaving the monitoring band, the actual value at the time is used as a reference value for a new monitoring band. The response time starts over.

Monitoring ends as soon as the maximum or minimum output level is no longer produced.



If the actual value does not leave the monitoring band within this timeframe, an alarm signal is generated. The alarm signal is maintained for as long as the maximum or minimum output level is produced and the actual value is within the monitoring band.



An alarm may be caused by:

- Partial or total failure of heating elements or other parts in the control loop
- Reversal of the control direction (for example, "cooling" instead of "heating")

12.6.5 Output level monitoring

Output level monitoring monitors the output level in the corrected state. The output level must be within a definable range around a mean output level. If it is not, an alarm is issued. The alarm signal is available from the digital selector and can be processed further at any time.

Setup dialog

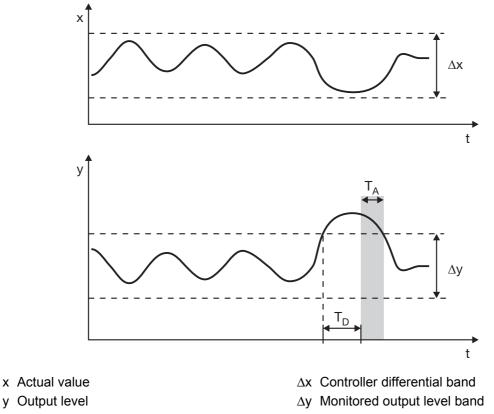
Controller			×
E Controller 1			
Controller inputs	Function:	Inactive -]
Controller self-optimization	Determination time:	350	s
Controller circuit monitoring	Output level band:	10	-] %
Output level monitoring	Alarm delay:	[] s
Controller setpoint values] 2
Ramp function	Controller differential band;	1]
Em Controller 2			

Parameter	Selection/settings	Description
Lock	Inactive	Output level monitoring generally not permitted
	Active	Output level monitoring generally not permitted
Determination time	0 s to 350 s to 9999 s	Calculation time for the mean output level
Output level band	0 % to 10 % to 100 %	Monitored output level band (admissible range around the mean output level)
Alarm delay	0 s to 9999 s	Delay time for alarm triggering
Controller differential band	0 to 1 to 1999	Controller differential band (admissible range around the actual value in corrected state)

Description of the function

Once the output level monitoring has been activated, determination of the mean output level starts as soon as the actual value is within the controller differential band. When the mean output level has been determined, the current output level must be within the monitored output level band. If it is not, an alarm is triggered.

In the event of a setpoint value change, the output level monitoring is temporarily deactivated until the actual value returns to the controller differential band. The mean output level is then determined again.



T_D Alarm delay

 T_A Alarm period

Application examples:

- Monitoring of signs of aging and faults on heating elements
- Reporting of faults during operation

Functional limitations

Output level monitoring is not active in the following cases:

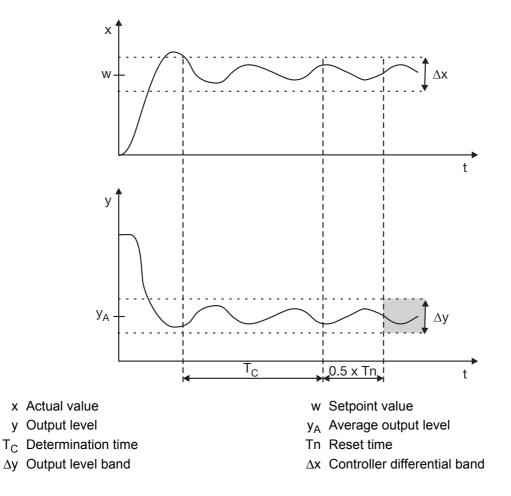
- Proportional band Xp = 0
- · Self-optimization active
- Manual mode
- Ramp function active
- Controller operating as program controller
- Modulating controller without output level feedback (or output level feedback in "out of range" state)
- Position controller with output level feedback in "out of range" status

Parameter dimensioning

Appropriate dimensioning of parameters used for determining the mean output level is required for the output level monitoring to function correctly.

The **controller differential band** around the actual value defines the corrected state. It should be dimensioned so that it is adhered to during normal operation. The progression of the actual value can, for example, be recorded with the recording function on the device or with the startup function of the setup program. Determination of the mean output level starts when the actual value enters the control differential band. Calculation of the mean output level starts over if there is temporary deviation from the control differential band during output level determination or if the setpoint value is changed by more than $0.5 \times \text{control differential band} \Delta x$.

An average output level is calculated over the **determination time** by a sliding average. The time selected should be sufficiently long to ensure as accurate a calculation as possible. A waiting time of 0.5 × reset time Tn is connected to the determination time, during which time the actual value and output level are checked to see if they are within in the specified limits. If the limits are exceeded, the calculation will restart. Once the calculation is successful, the output level monitoring will be activated.



12.6.6 Controller setpoint values

With this separate setpoint value function, the setpoint values and the ramp function can be configured flexibly for both controller channels (Controller 1 to 2).

Up to four setpoint values are available for each controller channel and can be switched using two digital signals.

The analog signal for the setpoint value (external setpoint value 1 to 2) is selected from the analog selector. This signal can be charged with a correction value (setpoint value 1 to 4). If no analog signal is selected (inactive), the correction value acts as a stable setpoint value.



NOTE!

The active setpoint value is not automatically used as a setpoint value for the controller channel; it must first be assigned in the controller configuration (see Chapter 12.6.2 "Controller inputs", page 80).



NOTE!

If an analog signal is used as a setpoint value without a correction value, it can also be directly assigned in the controller configuration. In this case, setpoint value limitation, setpoint changeover, and the ramp function are not available.

Equally, a fixed setpoint value can be assigned directly in the controller configuration (see Chapter 12.6.2 "Controller inputs", page 80).

Setup dialog

Controller					×
Controller 1					
Controller inputs	Signal exter	rnal setpoint value:	No selection	-	
Controller self-optimization	exte	rnal setpoint value:	without correction	•	
Controller circuit monitoring	Prog	ram setpoint value:	Analog selection\Setpoint value Setp. value 1 Control. 1	es ▼	
Controller setpoint values	Setpoint value 1 Start:	-99999	Setpoint value 1 End:	85.000	
Ramp function	Setpoint value 2 Start:	-99999	Setpoint value 2 End:	85.000	
🗄 💽 Controller 2	Setpoint value 3 Start:	-99999	Setpoint value 3 End:	85.000	
	Setpoint value 4 Start:	-99999	Setpoint value 4 End:	85.000	
		Boost function:	no function	•	
		Boost value;	0.0000		
		Boost signal:		-	
		Boost period:	0		s
	Signal 1 Set	point value switch:	No selection	-	
	Signal 2 Set	point value switch:	Na selection	•	

Parameter	Selection/settings	Description
Signal for ext. setpoint value	No function	Signal source for ext. setpoint value.
	Analog selector	
External setpoint value	No offset	There is no ext. setpoint offset
	Offset	The external setpoint value is added to the internal setpoint value of the fixed setpoint controller or program controller.

Parameter	Selection/settings	Description
Program setpoint value	Program setpoint value 1	The source for the program setpoint value is
Ω	Program setpoint value 2	selected here for the active program control- ler.
Setpoint value 1 to 4 start	-99999 to +99999	Setpoint limit start
Setpoint value 1 to 4 end	-99999 to +99999	Setpoint limit end
Boost function	No function	Boost function switched off
&	Delta value	Setpoint value is increased by a Delta value.
	Percentage value	Setpoint value is increased by a percentage value.
Boost value	0.00 to 99999	Amount by which the setpoint value is increased (in K or % by the setpoint value)
Boost signal	No selection	-
	Digital selector	The boost function is switched on using this signal.
Boost duration	0 to 999	Duration of boost period (in s)
Signal 1 setpoint change-	No selection	Signal 1 is selected here for the setpoint
over	Digital selector	changeover for the fixed-setpoint controller.
Signal 2 setpoint change- over		Signal 2 is selected here for the fixed-setpoint changeover
Ŷ		

Program setpoint value

This setting is only available if the program controller is configured. The setpoint values can then be read off the program curves that are entered.

Boost function

The boost function is used to release tools in the plastics industry during the production process. The setpoint values for all heating zones are thereby increased by a specific Delta or percentage value for a specific time period.

Setpoint changeover

The setpoint values 1 to 4 for both fixed-setpoint controllers are located in the parameter level and can be entered as follows:

➡ Chapter 11.4 "Setpoint values", page 62

Switching can be performed using digital signals from the digital selector.

Signal 2 (Bit 1) setpoint changeover	Signal 1 (Bit 0) setpoint changeover	Active setpoint value, Con- troller 1	Active setpoint value, Con- troller 2
0	0	Setpoint value 1	Setpoint value 1
0	1	Setpoint value 2	Setpoint value 2
1	0	Setpoint value 3	Setpoint value 3
1	1	Setpoint value 4	Setpoint value 4

12.6.7 Ramp function

The ramp function enables the setpoint value to be continually changed up to the ramp end value (active setpoint value).

A tolerance band can be set around the setpoint value curve to monitor the actual value. If the actual value deviates from the tolerance band, a digital signal (tolerance band signal) is activated.

Setup dialog

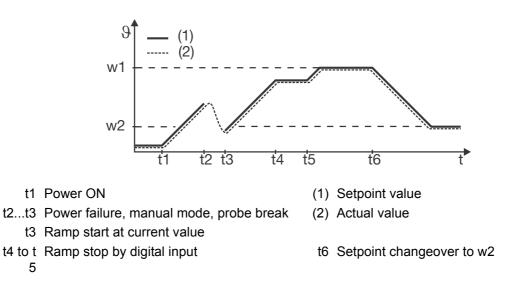
Controller			
Controller Controller 1 Controller inputs Controller self-optimization Controller circuit monitoring Controller setpoint values Ramp function Controller 2	Positive gradient: negative gradient: Tolerance band: Signal ramp stop: Signal ramp off:	0.0000	K/Min K/Min
	Signal restart:	No selection	
	Signal actual value input:	Analog selection\Controller Setpoint value Control. 1	
	additional functions:	0	

Parameter	Selection/settings	Description
Ramp function	Ramp off	Ramp function switched off
	Ramp in minutes	Ramp function switched on
	Ramp in hours	
	Ramp in days	
Positive gradient	0.00 to 999.00	In the event of a setpoint value step, the ramp rises depending on the time unit that has been set.
Negative gradient	0.00 to 999.00	In the event of a setpoint value step, the ramp declines depending on the time unit that has been set.
Tolerance band	0.00 to 999.00	The tolerance band monitors deviation of the actual value from the current setpoint value (tolerance band = admissible devi- ation)
Signal for ramp stop	No selection	The ramp can be stopped with this signal (see t4 in image)
	Digital selector	
Signal for ramp off	No selection	The ramp can be switched off with this signal
	Digital selector	

Parameter	Selection/settings	Description
Restart signal	No selection Digital selector	The ramp can be restarted with this sig- nal
Signal actual value input	Analog selector/Controller 1	This actual value is monitored by the tol- erance band
	Actual value for Controller 1	
Additional func- tions (only setup)	0.00 to 999.00	Reserved functions for service

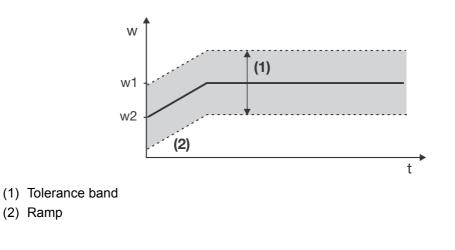
Ramp function

This function creates a ramp-like setpoint curve out of a step-like setpoint curve, where the rising and declining slopes can have different gradients.



Tolerance band function

For a program controller/generator and ramp function, a tolerance band can be laid to monitor the actual value of the setpoint value curve. If the upper and lower limits are exceeded, a tolerance band signal is triggered, which can be processed further internally or issued via an output.



12.7 Digital outputs

Depending on how the expansion slots have been mounted, two fixed digital outputs called OUT1 and OUT2 and ten additional digital outputs (OUT3/4 to OUT11/12) are available.

Setup dialog

Digital outputs		×
Digital output 1 [OUT 1] Digital output 2 [OUT 2] Digital output 9 [OUT 9/10] Digital output 10 [OUT 9/10] more digital outputs possible		

Parameter	Selection/settings	Description
Designation	Relay [OUT 1]	(15 characters) of editable text For example, for the signal that is issued via the digital output.
Signal source	Digital selector/controller 1st output, Controller 1	This signal is issued at the digital output.
Inversion	No	Switching behavior remains unchanged
	Yes	Inverts the switching behavior
Manual mode	Not permitted	
	Permitted	Digital output can be edited in manual mode.
Designation	Relay [OUT 2]	Signal designation issued via the digital output.
		Inactive = output inactive
Signal source	Digital selector/controller	This signal is issued at the digital output.
	2nd output, Controller 1	
Inversion	No	Switching behavior remains unchanged
	Yes	Inverts the switching behavior
Manual mode	Not permitted	
	Permitted	Digital output can be edited in manual mode.

12.8 Analog outputs

A maximum of three analog outputs can be configured as current or voltage outputs (standard signal) and are freely scalable.

Setup dialog

Analog outputs			×
	OUT3/4 Analog output 1		
	Description:	Analog Output 1	
	Signal source:	Analog selection\Controller Output 1 Controller 1	
	Output signal:	4-20mA 🔻	
	Response at error:	Low	
	Safety value;	0.0000	mA
	Scaling start:	0.0000	
	Scaling end:	100.00	
	Manual mode:	not allowed 🔻	

Parameter	Selection/settings	Description
Designation	Analog output 1	(15 characters) of editable text for the signal issued via the analog output (for example, a math function event).
Signal source	No selection	-
	Analog selector	This signal is issued via the analog output.
Output signal	0-10 V	
	0-20 mA	
	4-20 mA	
	2-10 V	
Signal in the event of an error	Low	Lower unit signal limit is issued
	High	Upper unit signal limit is issued
	Namur Low	See table (limits according to Namur)
	Namur High	See table (limits according to Namur)
	Frozen	Retains the last valid values
	Substitute value	Issues the set substitute value
Substitute value	For example, 0 to 10 V	Substitute value which can be set within the output signal limits (for example, 0 to 10 V).
Scaling start	0.00 to 100.00	
Scaling end	100.00 to. 0.00	
Manual mode	Not permitted	Analog output not editable in manual mode
	Permitted	Analog output editable in manual mode.

Behavior on error

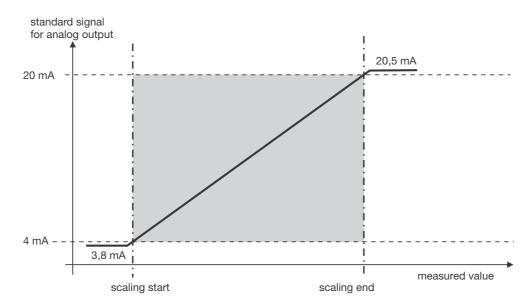
Limits according to NAMUR recommendation NE 43:

	Signal type 2 to 10 V	Signal type 4 to 20 mA
Measurement information M	1.9 to 10.25 V	3.8 to 20.5 mA
Failure information A for deviation below measured value/short-circuit ("NAMUR Low")	≤ 1.8 V	≤ 3.6 mA
Failure information A for deviation above measured value/probe break ("NAMUR High")	≥ 10.5 V	≥ 21 mA

Zero point and end value

A value range is assigned to the physical output signal by specifying the zero point and end value (scaling). The default setting corresponds to a value range of 0 to 100 (for example, an output level of 0 % to 100 % for a controller output).

If, for example, a temperature with a value range from 150 °C to 500 °C is issued via an analog output with signal type 0 to 20 mA, the zero point must be set to 150 (corresponds to 0 mA) and the end value must be set to 500 (corresponds to 20 mA).



Status after change of configuration

Modified parameters are incorporated immediately.

Behavior after power on

During the initialization phase of the controller module, the output signal adopts a value of 0 % (in relation to the value range of the signal type).

Error handling

The behavior in the event of deviation above or below the measuring range (out of range) can be configured. The settings made there also apply for probe/conductor breaks or probe/conductor short-circuits. This results in a safe state for operation in the event of an error. Error detection depends on the type of measuring probe (see technical data, measuring circuit monitoring).

12.9 Limit value monitoring

One of eight alarm functions can be selected for all 12 limit value monitorings, to monitor a freely selectable input value (actual value) against a fixed limit values AF7 and AF8 or a limit value related to the setpoint value (setpoint value \pm limit value) (AF1 to AF6). Each limit value monitoring delivers an output signal that can be linked to or issued to a digital output.

Setup dialog

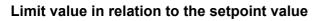
Limit value monitoring			X
	Limit value monitoring 1		
□····· Cimit value monitoring 1	Function:	AF1 -	
Limit value monitoring 3 Limit value monitoring 4	Actual value:	Analog selection\Analog inputs	
Limit value monitoring 5	Setpoint value:	_	
		No selection	
Elimit value monitoring 7	Limit value AL:	100.00	
Elimit value monitoring 8	Hysteresis:	1.0000	
Limit value monitoring 9	Position of hysteresis:	symmetrically 💌	
Limit value monitoring 10	Start-up alarm suppression:	Inactive 🗸	
Limit value monitoring 11	Switch-On delay:	0	s
Limit value monitoring 12	Switch-off delay:	0	s
Eimit value monitoring 13	Pulse time:	0	s
	Response at error:	Off 🔹	
⊡	Confirm:	Off 🔹	
ighter the second secon	Signal acknowledgement:	No selection	
	Signal Locked:	No selection	
	additional functions:	Extention 1 Extention 4 Extention 2 Extention 3	
Сору		ОК	ancel

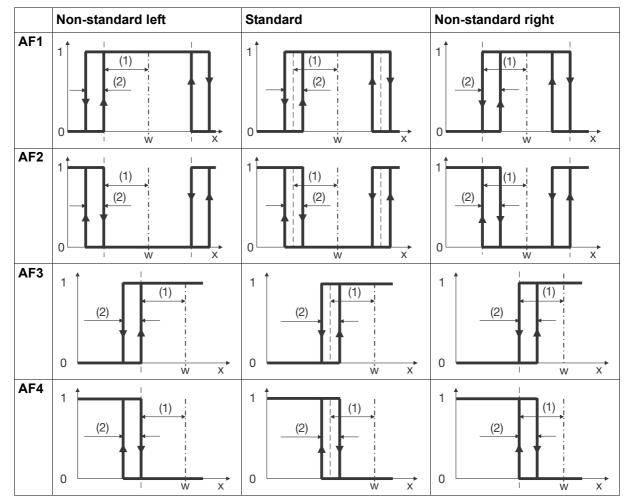
Parameter	Selection/settings	Description
Function	No function	
	AF1 to AF8	Alarm function (AF 1 to 8) selectable
Actual value	No selection	Analog signal to be monitored
	Analog selector	
Setpoint value	No selection	Setpoint value w (reference signal for AF1 to AF6)
	Analog selector	
Limit value AL	0.0000 to 99999	- For AF1 to 6, in relation to a changing setpoint
		value w
		- For AF7 and AF8, in relation to a fixed limit value
Hysteresis	0.0000 to 1 to 9999.9	Switching distance between switch-on and switch-off

Parameter	Selection/settings	Description
Position of hysteresis	Standard Non-standard left Non-standard right	Here you can adjust the setting for which side the hysteresis should be on.
Start-up alarm sup- pression	Inactive	AF switching behavior is not suppressed
	Active	AF switching behavior is suppressed, provided that value has is not within the valid range.
Switch-on delay	0.0000 to 99999	After entering the AF event, the time for the switch-on delay begins to elapse. The AF output remains unchanged at first until the set time has completely elapsed and the AF event is relayed to the AF output. If the AF actual value leaves the "bad area" for the switch-on delay during this time, the count- down begins again for each new limit value viola- tion.
Switch-off delay	0.0000 to 99999	Identical behavior as with switch-on delay, except that the AF switch-off process is delayed. Self- locking takes priority over the switch-off delay.
Pulse time	0.0000 to 99999	AF output is automatically deactivated after the pulse time. The output is only re-activated to the maximum level via the set pulse time after repeated deviation above or below the alarm values.
		Self-locking takes priority over the switch-off delay.
Signal in the event of a	an error	
	Off	AF output is switched off in the event of an error
	On	AF output is switched on in the event of an error
Self-locking	Off	The alarm function is automatically reset following a limit value violation.
	"Inactive" status	Self-locking can only be acknowledged if the AF actual value is re-located in the valid range.
	"Active" status	Self-locking can always be acknowledged if it has been activated
Acknowledging self- locking	No selection	No acknowledgement possible
	Digital selector	This signal acknowledges self-locking.
Locking signal	No selection	This signal locks the alarm function.
	Digital selector	
Additional functions no	ot selected (empty)	
(only setup)	(V) Expansion 1	Reserved functions for service
	(V) Expansion 2	
	(V) Expansion 3	
	(🔽) Expansion 4	

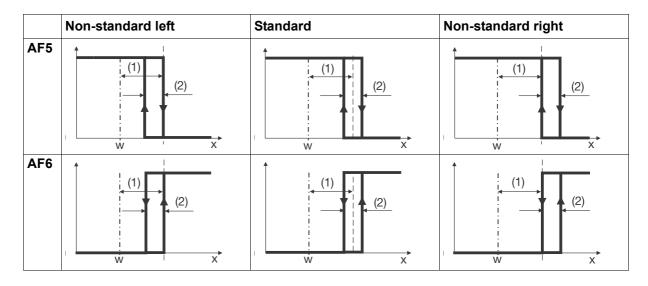
12.9.1 Function and hysteresis

For the AF1 to AF6 alarm functions, the final limit value depends on the setpoint value – the entered limit value is added to or subtracted from the setpoint value. The AF7 and AF8 alarm functions work with a fixed limit value which corresponds to the limit value entered. Shown with the associated hysteresis functions (non-standard left, standard, non-standard right)



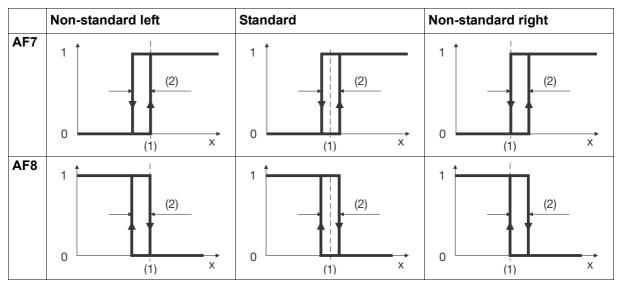


- 1 Output signal active
- x Actual value
- (1) Limit value (setpoint value distance)
- 0 Output signal not active
- w Setpoint value
- (2) Hysteresis



- 1 Output signal active
- x Actual value
- (1) Limit value (setpoint value distance)
- 0 Output signal not active
- w Setpoint value
- (2) Hysteresis

Fixed limit value



- 1 Output signal active
- x Actual value
- (1) Limit value

- 0 Output signal not active
- (2) Hysteresis

12.9.2 Hysteresis

The designations "Non-standard left" and "Non-standard right" typically relate to alarm functions AF3/AF4 and AF7/AF8. The designation is not conclusive for alarm functions AF1/AF2 and AF5/AF6.

⇒ Chapter 12.9.1 "Function and hysteresis", page 102

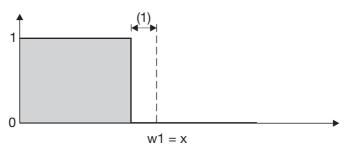
12.9.3 Start-up alarm suppression

Active start-up alarm suppression means:

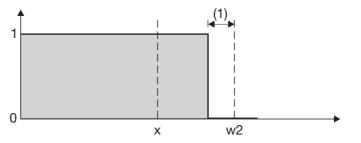
- After power on, the output signal remains inactive, even if the actual value is in the alarm range.
- If the limit value or setpoint value is changed so that the actual value moves from outside of the alarm range to within the alarm range, the output signal remains inactive
- The limit value monitoring only starts to operate according to its alarm function again once the actual value has left the alarm range. This means that the output signal remains inactive until the actual value returns to the alarm range.

Example of active start-up alarm suppression

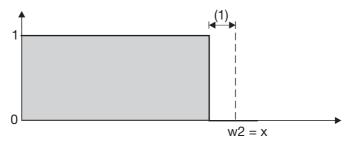
The following example shows monitoring of the actual value "x" with the alarm function AF4 (without hysteresis) for a specified limit value (1). The setpoint value is changed from w1 to w2. **Output state**: The output signal is not active as the actual value is outside of the alarm range (gray area).



Change of setpoint value: The output signal remains inactive, although the actual value is now within the alarm range.



Set state: The actual value has left the alarm range and reached the new setpoint value. The output signal remains inactive until the actual value returns to the alarm range.



12.9.4 Acknowledging self-locking

For an alarm function, for example, one that is set to monitor an important process temperature, it may be necessary leave it permanently in this state rather than automatically resetting it.

If **INACTIVE STATUS** is set, this self-locking is only acknowledged if the actual value returns to the permitted area.

If **ACTIVE STATUS** is set, this self-locking can always be acknowledged. Self-locking takes priority over the switch-off delay.

12.9.5 Alarm

In addition to evaluation of the limit value monitoring output signal, there is also the option to make an entry in the event list in the case of an alarm.

Setup dialog

L	imit value monitoring			×
	Eimit value monitoring 1	Limit value monitoring 1 \ Alarm		
	Alarm	Alarm type:	Alarm -]
	Limit value monitoring 2	Polarity for alarm:	High 🔻	
	Limit value monitoring 3	Alarm text:	Alarm Limit value 01 >	Ī
	Limit value monitoring 4			
	Limit value monitoring 5			
	Limit value monitoring 6			
	Limit value monitoring 7			

Parameter

Parameter	Selection/settings	Description
Alarm type		
	Off	Alert switched off.
	Alarm	A message will be entered in the alarm list depending on the signal level that has been set.
	Event	A message will be entered in the events list depending on the signal level that has been set.
Polarity for alarm	High	Limit value monitoring: High (logic "1")
	Low	Limit value monitoring: Low (logic "0")
Alarm text	Alarm limit value 01	20 characters of editable text which is entered into the alarm or event list.

Alarm text

Setup program: Selection of text from a list

Clicking on the ">" button opens a list with text numbers and the associated texts. The texts are editable.

12.10 Screen

The screen selection and the appearance of those screens in the operating loop is set using this function.

12.10.1 General configuration

Setup dialog

Sc	reen				x
	Screen	creen \General configuration			
	General configuration	Display after program resart:	Process screen	•	
	Configuration screen	Simulating inputs:	No	▼	
	Start screen and watermi	Alarm text header:	Yes	•	
	Operation loop	Lock touchscreen:			
	Colours recording		No selection	•	
	Colours controller screen	Functional level:	display	-	
	Colours controller screen	Function key 1:	Select operator level	-	
	+ Progr. controller screen	Function key 2:	Home button	•	
	• General screen 1	Hore but on:	Process screen		
	General screen 2	Controller scrien 1			
	4 <u> </u>	x 24 w 20 v	.6° k² ● 0		
	Сору	07.02.11 00:52:44 Master 99%		OK Cano	:el

Parameter	Selection/settings	Description
Display after restart	Controller screen 1	Any of the screens in the operating loop can be selected as the start screen.
Simulate inputs	No	Genuine recorded data is shown.
	Yes	Simulated data is displayed within the mea- suring range.
Alarm text for header	Yes	Alarms are inserted cyclically in the header.
	No	Alarms are not inserted.
Lock touchscreen	No selection	
	Digital selector	The screen can be locked to prevent unau- thorized operation.
Functional level	Display	➡ Chapter 10.1 "General information", page
	Fade out	55
Function button 1	Selecting user level	A selection of functions appears here that
Function button 2	Home button	can be started using the function buttons.
Home button	Controller screen 1	Any of the screens in the operating loop can be selected.

12.10.2 Configurating the screen

The screen brightness and the screensaver can be set using this function.

Setup dialog

S	reen			×
	E Screen	Screen \ Configuration screen		
	General configuration	Brightness:	8	
	Configuration screen	Screen switch-off:	Inactive 👻	
	Start screen and waterm;	Waiting period:	300	5
	Operation loop	Control signal:		
	Colours recording			

Parameter

Parameter	Selection/settings	Description
Brightness	0 to 8 to 10	Screen brightness
Screen switch-off	Switched off	Screen is always on
	Waiting period	Screen is switched off following a waiting period.
	Controller signal	Screen is switched off with a signal.
Waiting period	10 to 300 to 32767 s	If the screen is not touched, it will turn off after this period.
Controller signal	No selection	No switch-off
	Digital selector	This signal switches the screen off.

12.10.3 Start screen and watermark

Background screens and watermarks are set using this function.

Setup dialog

Screen	X
Screen	Screen \Start screen and watermark
General configuration	V Start screen active
Configuration screen	Startbild
Start screen and waterm	✓ Diagram watermark
Operation loop	Wasserzeichen Diagramm
Colours recording	
Colours controller screen	Istory watermark
Colours controller screen	Wasserzeichen Historie

Parameter	Selection/settings	Description
Start screen active	Default JUMO Sensors+Automation	Any screen shown with power ON (for example, your company logo).
Watermark in dia- gram	Default JUMO	Any screen shown as a watermark in the recorder image.
Watermark his- tory		

12.10.4 Operating loop

Screens are set to appear in the operating loop using this function.

Setup dialog

x				creen	S
			Screen \Operation loop		Γ
	•	display	Controller screen:	General configuration	
	-	display	Controller screen 1:	Configuration screen	
	-	display	Controller screen 2:	Start screen and waterm	
	-	display	Program controller:	Operation loop	
	-	display	General screen 1:		
	-	display	General screen 2:		
		display	Recording screen:	<u> </u>	
	_		-		
	• • • • •	display display display display display	Controller screen 2: Program controller: General screen 1:	Start screen and waterm;	

Parameter (only setup)

Parameter	Selection/settings	Description
Controller screen	Display/do not display	
Controller image 2	Display/do not display	
Controller over- view	Display/do not display	
Program control- ler	Display/do not display	
General screen 1	Display/do not display	
General screen 2	Display/do not display	
Process screen	Display/do not display	

12.10.5 Recording colors

The colors for the channels and alarms displayed can be set using this function.

Setup dialog

Screen			×
Screen	Screen \ Colours recording		
General configuration	Analog channel 1:	161: R175 G0 B0 🔹	
Configuration screen	Analog channel 2:	41: R47 G80 B0 🔹	
Start screen and waterm	Analog channel 3:	1: R0 G0 B0 🔹	
Operation loop	Analog channel 4:	228: R255 G0 B255 🔹	
Colours recording	Digital channel 1:	35: R47 G0 B160 🔹	
Colours controller screen	Digital channel 2:	45: R47 G127 B0 🔹	
Progr. controller screen	Digital channel 3:	1: R0 G0 B0 🔹	
General screen 1	Background colour analog chann.:	256: R255 G255 B255 🔹	
General screen 2	Background colour Digit. curves:	183: R175 G175 B160 🔹	
	Alarm reference curve:	217: R208 G208 B0 🔹	
	Alarm 1:	237: R255 G127 B0 🔹	
	Alarm 2:	225: R255 G0 B0 🔹	
	Time stamp in diagram:	1: R0 G0 B0 🔹	
۰ III ۲	Gridlines in diagram:	147: R128 G128 B160 🗸	
Сору		ОК	Cancel

Parameter	Selection/settings	Description
Analog channel 1 to 4		The color for the recording data
Digital channel 1 to 3	R47 G47 B255	can be selected in the RGB color
Background color for analog channels	R0 G0 B0 A G0 B95 R0 G0 B160 E	selector.
Background color for digital channels	R0 60 8255 R0 647 80 R0 647 895 R0 647 8160	
Alarm for reference channel	R0 G47 B255 R0 G80 B0	
Alarm 1	R0 G80 B95 R0 G80 B160	
Alarm 2	R0 G80 B255 R0 G127 B0	
Time stamp in diagram	R0 G127 B95 R0 G127 B160	
Grid lines in diagram	R0 G127 B255 R0 G128 B0	

12.10.6 Color for controller screens 1, 2

The colors for controller image 1 and 2 can be set using this function.

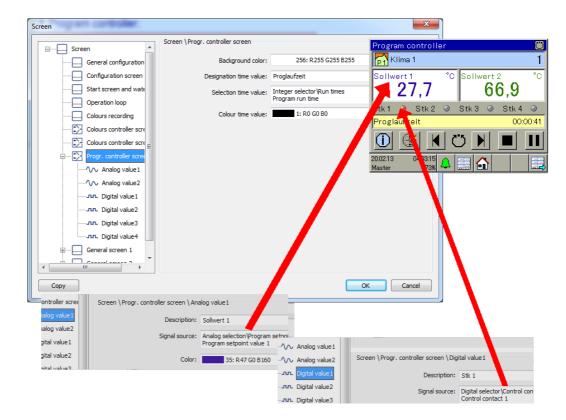
Setup dialog

So	reen			×
Γ	□ Screen	Screen \ Colours controller screen 1		Controller screen 1
	General configuration	Background color:	188: R 175 G208 B25	0.4
	Configuration screen	Color actual value:	161: R175 G	× 24.
	Start screen and waterm	Color setpoint:	45: R47 G12	
	Operation loop	Color output level:	1: R0 G0 B0	[™] 20
	Colours recording	Color heater cont.:	161: R 175 G0 B0	Y
	Colours controller screen	Color cooler cont.:	1: R0 G0 B0	
	Colours controller screen			
	Progr. controller screen General screen 1			07.02.11 00:52:44 Master 99%
	۰ III ا			
	Сору		(OK Cancel

Parameter	Selection/settings	Description
Background color		RGB color selector
Color for actual value		
Color for setpoint value		
Color for output level		
Color for heating contact		
Color for cooling contact		

12.10.7 Program controller screen

Setup dialog



Parameter

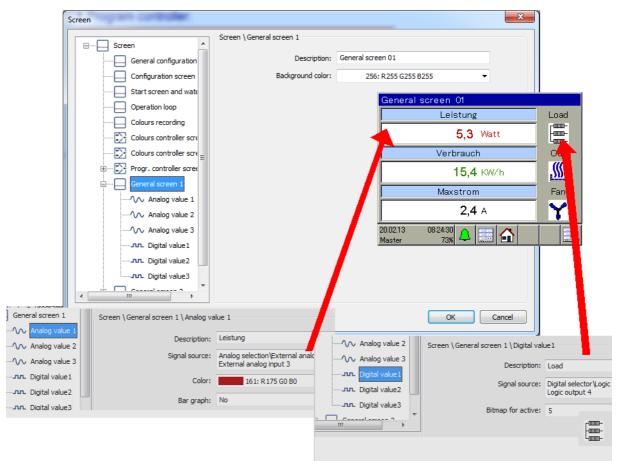
Parameter	Selection/settings	Description
Background color		RGB color selector
Designation of time value		Program runtime
Signal source	No selection	
	Analog selector (integer)	
Color for time value	R0 G0 B0	RGB color selector

Parameter for analog value 1 to 4, digital value 1 to 4

Parameter	Selection/settings	Description
Designation	Setpoint 1	Text for analog value 1 to 3
Signal source	No selection	
	Analog selector	
Color	RGB color selector	Color for analog values and text
Designation	Stk 1	Text for digital values 1 to 4
Signal source	No selection	
	Digital selector	

12.10.8 General screens 1, 2

Setup dialog



Parameter	Selection/settings	Description
General screen	General screen 01	Text for general screen 1
Background color	(white)	RGB color selector
Designation	Analog value 1 to 3	Text for analog value 1 to 3 (in light-blue box)
Signal source	No selection	Any analog value can be displayed here
	Analog selector	
Color	RGB color selector	Color for analog values and text
Bar graph	Yes	Bar graph
	No	No bar graph
Color for bar graph	RGB color selector	Color for analog values and text
Designation	Digital value 1 to 3	Text for digital value 1 to 3 (in gray area)
Signal source	No selection	Any digital value can be displayed here
	Digital selector	

12.11 Recording



NOTE!

The recording is switched off by default and a maximum of four analog signals and a maximum of three digital signals are displayed in the form of a recording screen. Release is required for the recorded data to be saved or read out and processed. ⇒ Chapter 15.6 "Enabling of extra codes", page 165

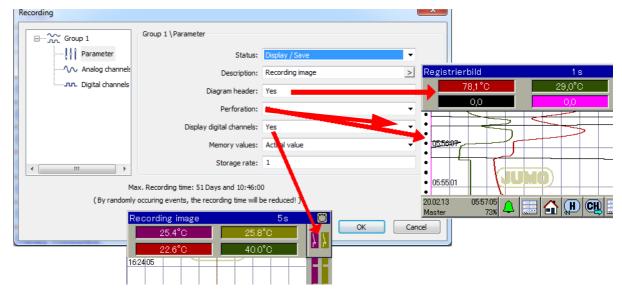
The appearance of the recording image can be set here. The watermark can be adjusted here

⇒ Chapter 12.10.3 "Start screen and watermark", page 107

12.11.1 Parameter

Setup dialog

In this example, four analog signals and three digital signals are recorded per second.



Parameter	Selection/settings	Description
Status	Switched off	
	Display and save	The temporal variation of the analog and digital signals is first displayed on the screen and then saved.
Designation	Recording image	Text for recording image
Diagram header	Yes	Numeric representations of the analog signals
		➡ Chapter 12.10.5 "Recording colors", page 109
	No	No diagram header visible
Perforation	Yes	Only visible if digital channels are switched off.
	No	No perforation visible
Display digital channels	Yes	Digital signal levels are highlighted in color.
	No	
Memory values	Mean value	The mean value is calculated using the set mem- ory cycle and saved.

Parameter	Selection/settings	Description
	Current value	The value is saved at the scanning instance.
	Minimum value	The minimum is determined and saved using the set memory cycle.
	Maximum value	The maximum is determined and saved using the set memory cycle.
Memory cycle	1 to 5 to 3600 s	A value is recorded every 5 seconds.

Updating/backing up recording data

When the memory data recorder is full, the recorded data can be saved on the PC using data archiving software or exported onto a mass storage device. The USB host socket is used for this purpose.



Function	Meaning	
Safely remove hardware	To prevent hardware damage or loss of data, it is necessary to select this menu item before removing an inserted USB stick. Please follow the instructions on the device's display.	
Recorded data update	Measurement data that have not yet been retrieved are stored on the stick together with their configuration data. The measurement data are stored in DAT files and the configuration data in SET files. This data can be opened and evaluated with the aid of the JUMO PCA3000 evaluation software. Data that has been read out is marked internally as retrieved and the available memory display is reset to 100 %.	
Recorded data backup	All measurement data in the ring buffer (including data already retrieved) are transmitted to the memory stick together with their con figuration data. The measurement data are stored in DAT files and the configuration data in SET files. These files can be opened and evaluated with the aid of the JUMO PCA3000 evaluation software. I contrast to the recorder update, there is no internal marking of the recorder data and no reset of the available memory display.	

Table 1:

12.11.2 Analog channels

Setup dialog

Recording		×
Group 1	Group 1 \ Analog channels Analog channel 1 Analog channel 2 Analog channel 3 Analog channel 4 Description: Channel 1 > Signal source:	
	Analog selection\Controller Setpoint value Control. 1	
	Line width: Bold 👻	
۰ III +		
	ax. Recording time: 51 Days and 10:46:00 occuring events, the recording time will be reduced!)	

Parameter

Parameter	Selection/settings	Description
Analog signal 1 to 4		I
Designation	Channel 1	
Signal source	No selection	Any analog value can be recorded here
	Analog selector	
Line width	Fine	
	Bold	

12.11.3 Digital channels

Setup dialog

Recording		×
Group 1	iroup 1 \Digital channels Digital channel 1 Digital channel 2 Digital channel 3 Description: Channel 1 > Signal source: Digital selector\Limit value outputs Limit value output 1	
	Recording time: 51 Days and 10:46:00 .uring events, the recording time will be reduced!)	

Parameter	Selection/settings	Description
Digital signal 1 to 3		
Designation	Channel 1	
Signal source	No selection	Any digital value can be displayed here
	Digital selector	

12.12 Program controller

You can choose here between the program controller and the fixed-setpoint controller. With the fixed-setpoint controller, all program functions are deactivated and the setpoint values are switched, as described in Chapter 11.4 "Setpoint values", page 62.

Setup dialog for fixed-setpoint controller

With the fixed-setpoint controller, all additional program functions are grayed out and therefore inactive.

I	Program controller					x
	Program controller	Program controller				
	Control signals		Function:	Fixed-setpoint controller	•	
			Program start:		*	

Setup dialog for program controller

Programmregler			×
	Programmregler		
Programmregler			
Steuersignale		Programmregler 🗸	
Erweiterte Funktion		Programmanfang 🔻	
	Bei Netzausfall:	Programm abbrechen 👻	
Betriebsart Hand		Weiterlauf	
Bei Fehler	Wiederholung:		
Woolienprogramm			
	Letzten Sollwert ausregeln:		
	Start bei Netz-Ein:	Nein 👻	
	Temp. Änderungen übernehmen:	Nein	
	Sollwertsprung:	Nein 👻	
	Gradienteneinheit:	Kelvin/Minute 👻	
	Istwerteing, für Tol.bandüberw.:	Analogselektor\Analogeingänge IN8 Analogeingang 1	·
	Signal Istwert 2:	Keine Auswahl	·
	Programmtoleranzband:	0.0000	
	Programmendezeit:	0 s	

Parameter	Selection/settings	Description
Function	Fixed-setpoint controller	All additional parameters are grayed out for this setting.
	Program controller	
Program start	From program start	Program is at start
	Actual value	at current actual value
	Time	started at this time.
In the event of power failure	Abort	The program is aborted following a power failure.
	Continuous operation	The program continues to run from the point of disruption after the power fail- ure.

Parameter	Selection/settings	Description
	Start at actual value	The program continues to run from the point of disruption after power failure.
In the event of an error	Continuous operation	Program continues to run.
	Program stop	The time base for the program genera- tor is halted.
Repeat	No	No program repeat
	Yes	-
Regulate last setpoint value	No	-
	Yes	Regulates the power return on the last setpoint value.
Start with power on	No	No automatic program start after power on.
	Yes	Automatic program start after power on.
Adopt temp. changes	No	Temporary changes not adopted.
	Yes	Adopt temporary changes
Setpoint step	No	
	Yes	
Gradient unit	Kelvin/minute	
	Kelvin/hour	
	Kelvin/day	
Actual value input for tolerance band monitoring	IN8 analog input 1	This value is monitored by the toler- ance band.
	Analog selector	➡ Chapter 12.6.7 "Ramp function", page 95
Signal for actual value 2	IN8 analog input 1	
	Analog selector	
Program tolerance band	0.0000 to 1.0000 to 9999. 0	Value of the tolerance band
Program end time	0.0000 to 9999.0	

12.12.1 Controller signals

Setup dialog

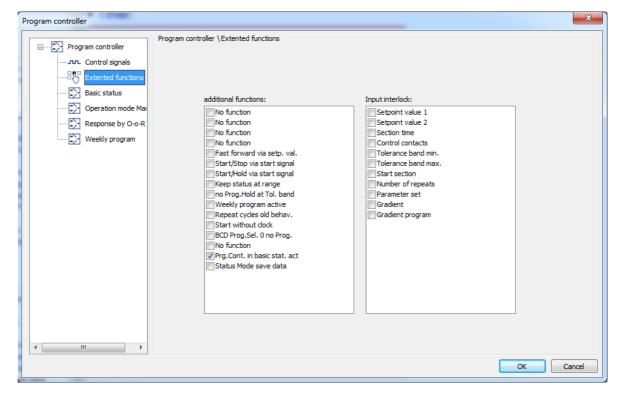
Program controller			23
Program controller	Program controller \Control signals		
Control signals	Signal Program Start:	No selection	
Basic status	Signal Program Abort:	- Digital selector No selection	
Coperation mode Mai	Signal Program Pause:	 Controller Digital inputs External digital inputs 	
Weekly program	Signal Next Section:	Billing and a second signals Billing and a second signals	
	Signal Fast Forward:	Chint Valie Outputs Construction Cogic output Cogic output Cogic output	
	Signal Section Start:	Program controller Control contacts	
	Signal Next Program:	The Selection Th	
	Signal Last Program:	No selection	
	Signal operation mode Manual:	No selection	
	Signal BCD Program selection:	Inactive 💌	
۰ III >			

Parameter	Selection/settings	Description
Signal Program Start	Digital selector	This signal starts a program.
	No selection	
Signal Program Abort	Digital selector	This signal aborts a program.
	No selection	
Signal Program Stop	Digital selector	This signal stops a program.
	No selection	
Signal Next Section	Digital selector	This signal switches to the next pro- gram section.
	No selection	
Signal Fast Forward	Digital selector	This signal fast forwards through the programs. The longer the signal appears for, the faster the process.
	No selection	
Signal Section Start	Digital selector	Switches back to section start.
	No selection	
Signal Next Program	Digital selector	Start next program
	No selection	
Signal Last Program	Digital selector	Start last program
	No selection	
Signal Manual Operation Mode	Digital selector	Start manual mode
	No selection	
Signal BCD Program Selection	Switched off	Program selection using digital con- troller signals

Parameter	Selection/settings	Description	
	Digital controller signal 1 to 8		

12.12.2 Extended functions

Setup dialog



Parameter	Selection/settings	Description
Add. prog. functions	Not selected (empty)	-
	(No function	Reserved functions for service
	(🔽) Fast forward	
	etc.	
Input lock	Not selected (empty)	-
	() Setpoint value 1	The checked program controller func-
	() Setpoint value 2	tions are locked.
	(🔽) Section time	
	(Control contacts	
	() Tolerance band min.	
	() Tolerance band max.	
	() Start section	
	() Number of repetitions	
	() Parameter block	

12.12.3 Basic status

This is where settings are adjusted for what should be active in the basic status of the program controller, that is, if no program is active in automatic mode.

Setup dialog

Program controller	x
Program controller \Basic status	
Program controller	
Control signals Program setpoint value 1: 0.0000	
Basic status Program setpoint value 2: 0.0000	
Operation mode Mar Control contacts: Control Contact 1	
Contact 2 Contact 3	
Weekly program	
Contact 5 Contact 6	
Contact 7	
Contact 8	
Parameter set R1, R2: Parameter set 1	
Active functions:	
Limit value monitoring 2	
Limit value monitoring 4	
Limit value monitoring 5	
Limit value monitoring 7	
Limit value monitoring 8	
Limit value monitoring 9	
Limit value monitoring 11	
Limit value monitoring 12	
OK	cel

Parameter	Selection/settings	Description
Program setpoint value 1	0.00 to 99999	The value entered here is the active
Program setpoint value 2	0.00 to 99999	basic status.
Control contacts	Not selected (empty)	
	(♥) Contact 1 to 8	Checked control contacts are active in the basic status.
Parameter block R1/R2	Parameter block 1 to 4	The parameter block set here is active for both controllers in the basic status
Active functions	Not selected (empty)	
	(🔽) Limit value monitoring 1 to 12	The checked limit value monitoring is active in the basic status.
	(🔽) Controller 1, 2	The checked controller is active in the basic status

12.12.4 Manual operation mode

You can set what is active in manual operation mode here.

Setup dialog

F	rogram controller			x
	Program controller	Program controller \Operation mode Manual		
		Program setpoint value 1:	0.0000	
	Basic status	Program setpoint value 2:	0.0000	
	Operation mode Ma	Control contacts:	Contact 1 Contact 2 Contact 3 Contact 4 Contact 5 Contact 6 Contact 7 Contact 7	
		Parameter set R1, R2:	Parameter set 1 🔹	

Parameter	Selection/settings	Description
Program setpoint value 1	0.00 to 99999	The value entered here is active in
Program setpoint value 2	0.00 to 99999	manual operation mode.
Control contacts	Not selected (empty)	
	(🔽) Contact 1 to 8	Checked control contacts are active in manual operation mode.
Parameter block R1/R2	Parameter block 1 to 4	The parameter block set here is active for both controllers in manual operation mode

12.12.5 Behavior for out of range parameters

Here you can set which parameters should be active in the program controller in the event of a deviation above or below the measuring range.

Setup dialog

Pr	ogram controller			×
		Program controller \Response by O-o-R		
	Program controller			
	Control signals	Program setpoint value 1:	0.0000	
	Extented functions			
	Basic status	Program setpoint value 2:	0.0000	
	Operation mode Mai	Control contacts:	Contact 1	
	Response by O-o-R	control contacts.	Contact 2	
	Weekly program		Contact 3 Contact 4	
			Contact 4	
			Contact 6	
			Contact 7 Contact 8	
		Parameter set R1, R2:	Parameter set 1	
	∢ ▶			

Parameter	Selection/settings	Description
Program setpoint value 1	0.00 to 99999	The value entered here is active for out
Program setpoint value 2	0.00 to 99999	of range parameters.
Control contacts	Not selected (empty)	
	(Contact 1 to 8	Checked control contacts are active when out of range.
Parameter block R1/R2	Parameter block 1 to 4	The parameter block set here is active for both controllers when out of range

12.12.6 Weekly program

Ten different weekly programs can be defined here.

Setup dialog

P	rogram controller		x
Γ	Program controller	ogram controller \Weekly program	
	Control signals	Weekly program: Inactive	
	Extented functions		
	Basic status	Weekly program 1 Weekly program 2 Weekly program 3 Weekly program 4 Weekly program 5 Weekly proc	
	Operation mode Mar	Program number: 0	
-	Response by O-o-R	Start day:	
	Weekly program		
		Start time: 00:00:00	
		automatic start:	
		Weekly program 1 Weekly program 2	
		Weekly program 3	
		Weekly program 4	
		Weekly program 6	
		Weekly program 7	
		Weekly program 9	
		Weekly program 10	
	<		
		OK Can	cei

Parameter	Selection/settings	Description
Automatic start	Not selected (empty)	
	(♥) Weekly program 1 to 10	Checked weekly programs start automatically
Weekly program 1	Program number: 0	Inactive
	Program number: 1	Number of program to be started
	Start day: Sunday	Program starts on this day
	Start time: 1	Program starts at this time
Weekly program 2 to 10	Program number	Number of program to be started
	Start day	Program starts on this day
	Start time	Program starts at this time

12.13 Timer or time switch

Two functions are available that can be used as a timer or time switch. The settings can be copied to another timer using the **COPY** button.

Setup dialog timer

Т	mer					X
F		Timer 1				
	Sunday	Function:	Timer	•	Signal acknowledgement;	•
	Monday	Description:	Timer01	>	Signal Start:	
	Tuesday	Status after Power-On:	Stop	•	-	No selection
	🛛 Wednesday 🕅 Thursday	Time:	00:45:00	hh:mm:ss	Signal Stop:	No selection
	Friday	Lead time:	0	s	Signal Hold:	No selection
	Saturday	Timer end time:		s	Signal restart:	
	🗄 ····· 🛣 Timer 2	Tolerance band:	0.0000			No selection
		Tolerance band-Actual	No selection	•	Output signal:	High 🔻
		Tolerance band-Setpoint	No selection	•	additional functions:	Extention 1
	Сору					OK Cancel

Parameter	Selection/settings	Description
Function	Inactive	-
	Timer	Timer function active, time switch grayed out
Designation	Timer 01	(15 characters) of editable text
Behavior after power on	Stop	The timer is stopped after power failure.
Lead time	0 to 9999	Lead time, until the timer is started
Timer time	00:00:00 to 99:59:59	The timer works for this time period
Timer end time	0 to 9999	Time until the timer is stopped
Tolerance band	0.0000 to 99999	If the distance between the tolerance band set- point and actual values still lies within the toler- ance band, the timer output signal is low (logic "0").
Tolerance band actual	Analog selector	These values are compared with one another:
value	No function	If setpoint and actual values lie far apart from one another and exceed the tolerance band, the
Tolerance band setpoint value	Analog selector	timer stops and the timer output signal changes to high (logic "1").
	No function	
Acknowledgement sig- nal		A timer alarm is acknowledged with this signal.

Parameter	Selection/settings	Description
Start signal	Digital selector	The timer is started with this signal
	No function	
Stop signal	Digital selector	The timer is stopped with this signal
	No function	
Signal hold	Digital selector	The timer is halted with this signal.
	No function	
Restart signal	Digital selector	
	No function	
Output signal	High	The signal level is set here for the active timer.
	Low	This signal is available in the digital selector for further use.
Additional timer function	Not selected (empty)	
	(🔽) Extension 1	Reserved functions for service

Setup dialog for time switch

Timer			×
	Timer 1 \Sunday 24 Hours timer:		
Sunday Monday Wednesday	V Hour 0 V Hour 1 Hour 2 Hour 3 Hour 4	Switch-on time 1: 04:15:00	Switch-off time 1: 04:45:00
Thursday Triday X Saturday Saturday	Hour 5 V Hour 6 V Hour 7 V Hour 8 Hour 9	Switch-on time 2: 10:30:00	Switch-off time 2: 11:00:00
Tine 2	Hour 10 Hour 11 Hour 12 Hour 13 Hour 14 Hour 15	Switch-on time 3: 15:00:00	Switch-off time 3: 15:30:00
	Hour 16 Hour 17 Hour 18 Hour 19 Hour 20 Hour 21 Hour 22 Hour 22	Switch-on time 4: 23:00:00	Switch-off time 4: 23:45:00
Сору			OK Cancel

Parameter	Selection/settings	Description
Function	Inactive	-
	Control timer	Timer function active, timer function grayed out
Sunday	Hours 0 to 24 (🔽)	The period of time for which the time switch should be active on this day can be selected in hour units here by checking the relevant box ("High": logic 1).
	Switch-on time 1 to 4	Four additional switch times can be set here, for
	Break time 1 to 4	example if the switch-on time period is less than a full hour.

Parameter	Selection/settings	Description
Monday to Saturday	Hours 0 to 24 (🔽)	Same settings possible as for Sunday
	Switch-on time 1 to 4	
	Break time 1 to 4	

12.14 Digital controller signals

A maximum of eight unrelated links with up to four signals each (digital selector) can be configured.

Use the **Copy** button to transfer the selected link to another link and to then make changes there as desired.

The result of a link is available in the digital selector.

Setup dialog

Digital control signal			 X
	Digital controller signal 1		
Digital controller signal 1			
Alarm	Description:	Digit. contr.01	>
Digital controller signal 2	Signal source:	Digital selector \Digital inputs	•
Digital controller signal 3		IN1 Digital input1	
	Function:	no function	-
	OR-Signal:	no function Pulses	
Digital controller signal 6		Delay	
	BCD-Signal 1;	Pulse function positive edge	
	BCD-Signal 2:	negative edge	
	DCD-Digital 2;	BCD-Function	
	BCD-Signal 3;		
	BCD-Signal 4;		-
	Polarity inversion:	No	•
	Switch-On time:	0	5
	Switch-Off time:	0	5
	Pulse time:	0	s
Сору		C	K <u>C</u> ancel

Parameter	Selection/settings	Description
Designation	Digital controller 01	(15 characters) of editable text
	No selection	Any digital value that should be linked
	Digital selector	with a function
Function	No function	-
	Impulse	
	Delay	
	Pulse function	
	Positive slope	
	Negative slope	

Parameter	Selection/settings	Description
	"Or" function	
	BCD function	
"OR" signal	No selection	Any digital value that should be linked
	Digital selector	with an OR signal source at top
BCD signal 1	No selection	1st BCD digital value
	Digital selector	
BCD signal 2	No selection	2nd BCD digital value
	Digital selector	
BCD signal 3	No selection	3 BCD digital value
	Digital selector	
BCD signal 4	No selection	4th BCD digital value
	Digital selector	
Inversion	No	-
	Yes	
Switch-on time	0	For example, if the signal set under the
Break time	0	signal source is delayed
Pulse time	0	For example, if the signal set under the signal source has a pulse function

Function

The following screen shows an OR function for digital inputs 1 and 2, which is issued from digital output OUT2

-JUL Digital controller signal 1	Digital controller signal 1			E Digital output 1 (OUT 1)	tal output 2 (OUT 2)		
Alarm	Description:	Digit. contr.01	2	E Deital output 2 (OUT 2)	Gestrictions	Relay (OUT2)	>
-JUL Digital controller signal 2	Signal source:	Digital selector Digital inputs IN1 Digital input1		Digital output 9 (OUT 9/10)	Signal source:	Digital selector (Digital control signals Digital control signal 1	-
-Jun. Digital controller signal 3 -Jun. Digital controller signal 4	Punction:	GR-Function			Polarity inversion:	No	•
	OR-Signal:	Digital selector/Digital inputs IN2 Digital input2	÷		Manual mode:	allowed	•
	BCD-Signal 1:	No selection	-				
	BCD-Signal 2:	No selection	•				
	BCD-Signal 3:	No selection					
	BCD-Signal 4:	No selection		Copy		OK	

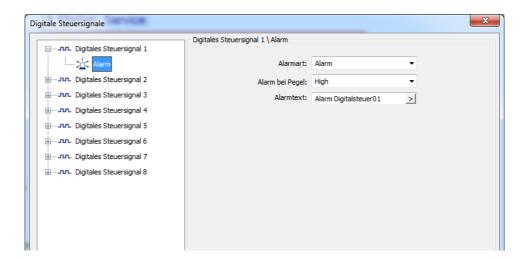
BCD signal

With the BCD function (Binary Coded Decimal), four digital signals (four-bit) are processed for one digital controller signal, for example, one that can switch between 16 different programs.

Digital control signal			X	Program	n control	ller			— X
Controller signal 1	Digital controller signal 1	Digit. contr./01		-		igram controller	Program controller \ Control signals		
B-JNL Digital controller signal 2	Signal source:	No selection				Control signals	Signal Program Start:	No selection	
	Function:	BCD-Function *				Basic status Operation mode Ma	Signal Program Abort:	No selection	
	OR-Signal:				-02	Response by O-o-R		No selection	
Bn. Digital controller signal 6 Bn. Digital controller signal 7	BCD-Signal 1:	Digital selector Digital inputs IN1 Digital input1			ΞD	Weekly program	Signal Next Section:	No selection	
	BCD-Signal 2:	Digital selector Digital inputs IN2 Digital input2					Signal Fast Forward:	No selection	
	BCD-Signal 3:	Digital selector Digital inputs IN3 Digital input3					Signal Section Start:	No selection	
	BCD-Signal 4:	Digital selector (Digital inputs DH4 Digital input4					Signal Next Program:	No selection	
	Polarity inversion:			1			Signal Last Program:	No selection	
	Switch-On time: Switch-Off time:						Signal operation mode Manual:	No selection	
	Pulse time:						Signal BCD Program selection:	Inactive	
Сару			Gancel					Digital control signal 2 Orgital control signal 3 Digital control signal 3 Digital control signal 4 Orgital control signal 5 Digital control signal 6 Digital control signal 7	OK Cancel

12.14.1 Alarms

Setup dialog



Parameter	Selection/settings	Description
Alarm type		
	Off	Alert switched off.
	Alarm	A message will be entered in the alarm list depending on the signal level that has been set.
	Event	A message will be entered in the events list depending on the signal level that has been set.
Polarity for alarm	Signal level that triggers a a	n alarm or event
	High	Digital controller signal: High (logic "1")
(only setup)	Low	Digital controller signal: Low (logic "0")
Alarm text (only setup)	Alarm digital controller 01	20 characters of editable text which is entered into the alarm or event list.

Polarity for alarm

An alarm is only displayed for as long as the digital controller signal High (logic "1") is shown. If the signal level Low (logic "0"), the alarm entry disappears automatically.

Alarm text

The setup program is required to view and edit the texts.

12.15 Mathematics/logic

Limited functionality only is possible on the device.

Programming, for example, of formulas, can be done using the setup program:

Eight functions are available. The optional mathematics/logic function supports four formulae, which can be used freely either for mathematical calculations (analog values) or for logical links (binary values). Fixed formulae for calculating the differential, ratio, and relative humidity are also provided. In this case, two analog values (variable A and B), for example, the measured values of analog input 1 and 2 are linked to each other. The dry-bulb temperature and the wet-bulb temperature are required for calculating the relative humidity and should be determined with a psychrometric humidity sensor.

The results are available in the analog selector or digital selector. If the function is not active, the mathematical value = 3.0E+37 and the logic value = 0 (FALSE). The settings can be copied to another math/logic function using the **Copy** button.

Setup dialog

Mat	thematics/Logic	vice.			×
	= - f(x) Mathematics/Logic 1	Mathematics/Logic 1			
	Alarm	Description:	Mathematics 01 >		
	Logic-Alarm		Math formula		
		Linearization:			
	f(x) Mathematics/Logic 3	Temperature:			
			%		
		Comma format:			
	$\underbrace{\bigoplus}_{f(x)} f(x) \text{Mathematics/Logic 6}$	Meas. range start:		%	
		Meas. range end:		%	
		Variable a:	100.00		additional functions:
		Variable a,			Extention 2
		Variable b;	-		Extention 3 Extention 4
		save via Power-Off:	No		
		Formula (Text):			
					*
					Ψ.
			Code-V	/iew (Inte	rnal function) Formula Editor
	Сору				OK Cancel

Parameter	Selection/settings	Description
Designation	Math configuration 1 to 8 (inactive)	Name of the mathematical function available as a variable in the analog selector for further processing.
Function	Inactive	
	Differential	Differential controller (a-b)
	Ratio	Ratio controller (a/b)

Parameter	Selection/settings	Description
	Humidity	Humidity controller (a;b)
	Math formula	Mathematical linking (a+b) x 2
	Logic formula	Logic linking (a AND b)
Linearization		The mathematical calculation can be linked with a (customer-specific) linear-ization table.
Secure using power off		
Measuring range start	0	
Measuring range end	100.00	
Variable a		
Variable b		
Unit	%	
Decimal place		
Temperature		
Additional math functions		Reserved functions for service
Formula (text)		

Function

The math and logic functions are available if the "Math/logic" option in the setup program has been activated.

Math formula, logic formula

Use the "Formula Editor" button to open an editor that can be used to create formulae by selecting variables and operators. Formulae can be entered freely according to standard mathematical rules. Any number of spaces may be used within the formula symbol string. Spaces are not admissible in function designations, names of variables, or constants.

Available variables:	Available operators:
 Analog selection ⊕ Digital selector 	+ Addition - Subtraction * Multiplication / Division (Opening damp) Closing damp SQRT() Root MIN() Minimum value MAX() Maximum value SIN() Sinus COS() Cosinus TAN() Tangent ** x squared y EXP() Exponential function ABS() Absolute value INT() Integer part
Add	Add
Formula (Text):	
	*
	Ŧ
	OK Cancel

12.16 Flags/service

12.16.1 Flags

Eight analog flags and 8 digital flags are available. The settings can be copied to another flag using the **Copy** button.

Setup dialog

Available variables:	Available o	perators:	
 ← Analog selection ← Digital selector 	+ - * / () SQRT() MIN() MAX() SIN() COS() TAN() ** EXP() ABS() INT()	Addition Subtraction Multiplication Division Opening damp Closing damp Root Minimum value Maximum value Maximum value Sinus Cosinus Tangent x squared y Exponential function Absolute value Integer part	E
Add Formula (Text):		Add	A 7

Analog flag parameters

Parameter	Selection/settings	Description
Analog flag	0.0000 to 100	Can be set within the limits of any value with four deci- mal places.
Temperature	None	
	Relative	
	Absolute	
Unit	%	Entry of a unit with up to five characters possible
Decimal place	Auto	Automatic switching
	XXXXX.	No decimal place
	XXXX.X	1 decimal place
	XXX.XX	2 decimal places
	XX.XXX	3 decimal places
	X.XXXX	4 decimal places
Measuring range start	0.0000 to 100	
Measuring range end	0.0000 to 100	

Digital flag parameters

Parameter	Selection/settings	Description
Digital flags 1 to 8	Off	Low (logic "0")
	On	High (logic "1")

12.16.2 Service

Here you can set which signal should be monitored, for example with a service counter. This can trigger an alarm if exceeded and can be acknowledged with the set signal.

Setup dialog

Flag, Service			×
	Service		
⊡ ∕v Analog flag	Service interval:	0	
	Function:	Counter switch. operation	•
	Monitoring signal:		
Analog flag 3	Horitoring signat	No selection	-
	Signal acknowledgement:	No selection	-
Analog flag 5	Operation hours counter:		-
Analog flag 6	operation nours counter.		
Analog flag 7			
Analog flag 8			
Digital flag			
Service			
Сору		OK	Cancel

Parameter	Selection/settings	Description
Service interval	0 to 99999	The number of switching operations for the set digital signal are counted.
Function	Switch operation counter	Switch operations are counted
	Time in hours	The hours in which the High signal (logic "1") appeared are counted.
	Time in days	The days in which the the High signal (logic "1") appear are counted.
Monitoring signal	No selection	This signal is monitored using the service and if
	Digital selector	the alarm condition is exceeded (for example, the number of switch operations), the logic level switches from "0" to "1".
		The signal can be processed further in the digi- tal selector.
Acknowledgement sig- nal	No selection	The elapsed service interval is acknowledged with this signal.
	Digital selector	
Operation hours coun- ter	Off	
	Display in hours	
	Display in days	

12.17 External digital inputs

Eight external digital inputs are available. The settings can be copied to another input using the **COPY** button. The settings can be copied to another external input using the **COPY** button.

Setup dialog

Flag, Service			×	
	Flag \ Analog flag \ Analog flag 1			
Analog flag	Analog flag:	0.0000	%	
Analog flag 1	Temperature:	None	-	
Analog flag 2	Unit:	%	>	
	Comma format:	XXXX.X	•	
	Meas. range start:	0.0000	%	
······ Analog flag 6	Meas. range end:	100.00	%	
Analog flag 7	Flag, Service			X
Digital flag	EBBB Flag	Flag \Digital flag		
Service	Analog flag	Digital flag 1:	Off	•
		Digital flag 2:	Off	•
	Analog flag 2	Digital hag 5:	Off	▼
	Analog flag 3	Digital flag 4:	Off	▼
Сору	Analog flag 5	Digital flag 5:		•
				▼
				
	Analog flag 8	Digital flag 8:	UTT	•
	Digital flag			
	Service			

Parameter	Selection/settings	Description
Channel descrip- tion	ext. DE 01	
Secure power off	No	-
	Yes	Status is secured beyond power failure.
Alarm type	Off	
Polarity for alarm		
Alarm text	Ext. digital alarm 01	

12.18 External analog inputs

Eight external analog inputs are available. The settings can be copied to another input using the **Copy** button.

Setup dialog

External analog inputs			×
External analog input 1 Alarm External analog input 2 External analog input 3	External analog input 1 Description: Temperature: Unit:	Ext. AI 01 > None % >	
External analog input 4 External analog input 5 External analog input 6 External analog input 7 External analog input 8	Comma format: Meas. range start: Meas. range end: Save Power-OFF:	XX.XXX O.0000 10.000 No	%
Сору		O	Cancel

Parameter	Selection/settings	Description
Designation	Ext. AE 01	
Temperature	None	
	Relative	
	Absolute	
Decimal place	Auto	Automatic switching
	XXXXX.	No decimal place
	XXXX.X	1 decimal place
	XXX.XX	2 decimal places
	XX.XXX	3 decimal places
	X.XXXX	4 decimal places
Measuring range start	0.0000	
Measuring range end	100.00	
Secure power off	No	
	Yes	Status is secured beyond power failure.

12.18.1 Alarms

Setup dialog

External analog input 1	ternal analog input 1 \ Alarm		
	Minimum alarm:	Off	•
€ External analog input 2	Minimum value:	-99999	%
	Minimum alarm text:	Underrange Ext. AI 01	>
	1.11.11.11.11.11.1.1.1.1.1.1.1.1.1.1.1		
External analog input 5	Maximum alarm:	Off	*
External analog input 6	Maximum value:	99999	
External analog input 7			
i∃ ∕∕ External analog input 8	Maximum alarm text:	Overrange Ext. AI 01	>

Parameter	Selection/settings	Description
Minimum alarm		
	Off	Alert switched off.
	Alarm	A message will be entered in the alarm list depending on the minimum value that has been set.
	Event	A message will be entered in the events list depending on the minimum value that has been set.
Minimum value	-99999 to 99999	In the event of deviation below the limit values, an alarm/event will be entered.
Minimum alarm text	Underrange ext. AE 01	20 characters of editable text
Maximum alarm		
	Off	Alert switched off.
	Alarm	A message will be entered in the alarm list depending on the maximum value that has been set.
	Event	A message will be entered in the events list depending on the maximum value that has been set.
Maximum value	-99999 to 99999	In the event of deviation above the limit values, an alarm/event will be entered.
Maximum alarm text	Overrange ext. AE 01	20 characters of editable text

12.19 Serial interfaces

One serial interface is available by default. If additional serial interfaces should be added in the form of optional boards, they will appear here.

Setup dialog

Se	rial interfaces	×
	Serial Interface 1	
	Protocol:	Modbus master 🔹
	Baud rate:	19200 👻
	Data format:	8 - 1 - no parity 💌
	Min. response time:	40 ms
	Modbus-Slave:	
	Timeout master;	10000 ms
	Device address;	1
	Modbus master:	
	Timeout:	700 ms
	Scan cycle:	500 ms
		OK <u>C</u> ancel
		OK <u>C</u> ancel

Parameter	Selection/settings	Description
Protocol	Modbus slave	
	ER8	
	Modbus master	
Baud rate	9600, 19200, 38400	
Data format	8 - 1- no parity	
Minimum response time	0 to 40 to 500 ms	Minimum response time required.
Master timeout	60 to 10000 to 60000	
Device address	1 to 254	
Timeout	60 to 700 to 10000	
Scan cycle	60 to 500 to 99999	

12.20 Modbus TCP

There is no Modbus TCP interface available by default. If it is integrated into the device using optional boards, the following values should be set for Modbus communication:

Setup dialog

Modbus TCP	×
Modbus-Slave:	502
Modbus master:	
Timeout:	5000 ms
Scan cycle:	500 ms
Device 1 Device 2 Device	e 3 Device 4
Manual IP-Address:	0.0.0.0
Port:	502
	OK Cancel

Parameters for Modbus slave

Parameter	Selection/settings	Description
Port	0 to 502 to 1024	

Parameters for Modbus master

Parameter	Selection/settings	Description
Timeout	4000 to 5000 to 10000	
Scan cycle	0 to 500 to 1024	
Device 1	0.0.0.0	
	255.255.255.255	
Device 2	0.0.0.0	
	255.255.255.255	
Device 3	0.0.0.0	
	255.255.255.255	
Device 4	0.0.0.0	
	255.255.255.255	
Manual IP address	0.0.0.0	
	255.255.255.255	
Port	0 to 502 to 1024	

12.21 Relay module (accessories)

An ER8 external relay or logic module can be connected at the serial interface COM1. Relays 1 to 8 can be controlled using the digital selector. The relay module is switched to inactive by default:

Setup dialog

Relay modules		×
Relay modules	Activation: active COM1	T
Relay modules		
Relay modules	Device address:	0
Relay modules 2	Relay 1:	No selection 🔻
	Relay 2:	Digital selector No selection Controller
	Relay 3:	 Digital inputs External digital inputs External digital inputs Digital control signals
	Relay 4:	. Limit value outputs
	Relay 5:	ter Logic output
	Relay 6:	Control contacts Flag
Сору	Relay 7:	No selection 🗸

Parameter	Selection/settings	Description
Activation	Inactive	Not activated
	COM1 active	The external relay module is connected and activated at this interface.
	COM2 active	(only if the interface is integrated as an option)
Device address	0 to 255	
	No selection	-
Relay 1	Digital selector	This signal is issued on the ER8 relay
Relay 2		
Relay 3		
Relay 4		
Relay 5		
Relay 6		
Relay 7		
Relay 8		

12.22 PROFIBUS DP (option)

For a device with integrated PROFIBUS DP, optional boards can adopt the following settings:

Setup dialog

PROFIBUS-DP	×		ROFIBUS-DP	
Function: Device address:		Fu		ancel Aktive
Device address: Data format:		D	evice address	5
	OK Cancel	Di	ata format	<mark>Big Endian</mark>

Parameter	Selection/settings	Description
Function	Inactive	PROFIBUS inactive (bus error message suppressed)
	Active	PROFIBUS active
Device address	0 to 127	-
Device address	1 to 125	May be used for the connected devices
Data format	Big Endian	Also known as "Motorola format"
	Little Endian	Also known as "Intel format"

13.1 Installing the setup program

Insert the CD and the setup program will start automatically. Follow the instructions on the screen.

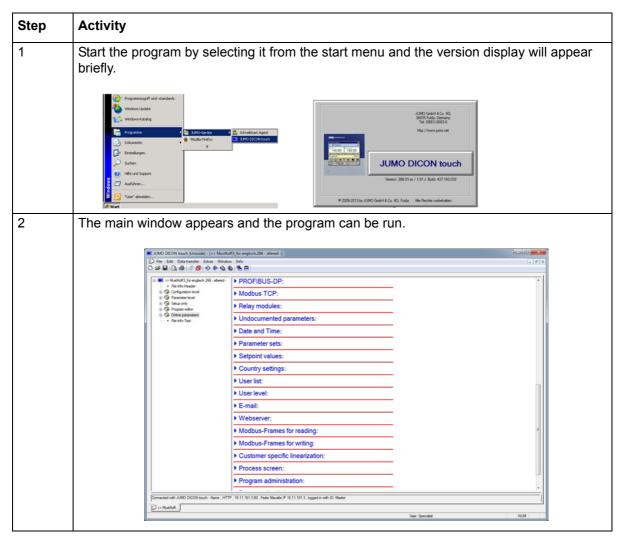
13.1.1 Hardware

- 500 MB hard disk space
- 512 MB RAM

13.1.2 Software requirements

- Microsoft Windows XP
- Microsoft Windows7 32 or 64-bit

13.2 Starting the setup program



➡ Setup program started

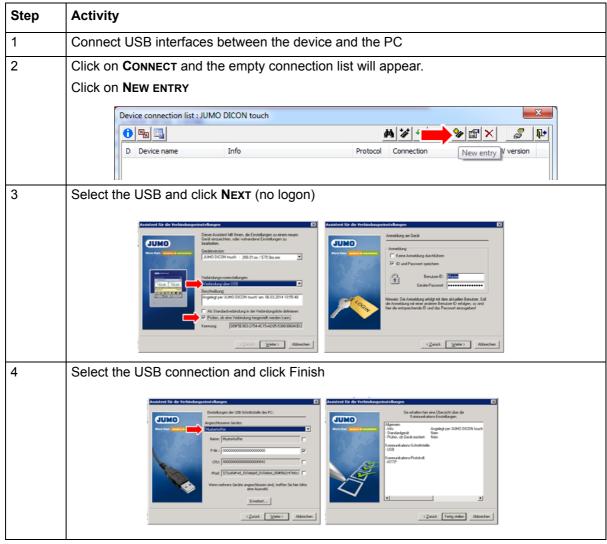
13.2.1 Establish the connection to the device

First of all, you will see from the connection symbol on the menu panel that a device has not yet been connected.



The following possibilities are available for connecting the device:

Via USB device interface



➡ USB connection established

Via Ethernet interface

Step	Activity						
1	Connect Ethernet socket on the device with LAN socket on the router or company network and perform step 2 as with the USB interface						
2	<complex-block></complex-block>						
3	Enter IP address and click Finish						

➡ LAN connection established

13.2.2 Setup data transfer on or from the external mass storage device

The setup program first saves the setup data on the internal hard disk drive, from which the setup program also runs.

However, setup data can also be exported/imported from the device or with the setup program using a mass storage device. The USB host socket is used for this purpose.

The devices can therefore be easily duplicated with identical firmware versions.

Memory manager		CDIR> 19.03.; JUMO DICON touch (Unicode) - [>> MustKoff3 für englisch.266 - altered -]
Memory manager	-	UMMO DICON touch (Unicode) - I>> MustKolf3_für englisch.266 - altered -] File Edit Data transfer Extras Window Info Establish connection File Edit Data transfer to the device File B >> Must File Edit Data transfer from the device File Co Data transfer from the device File So Co Data transfer from the device Alt-F5 Diate transfer from the device File So Co Data transfer from the device Alt-F5 Diate transfer from the device Diate transfer from the device Alt-F5 Diate transfer from the device Dia

From the device	With the setup program				
Write config. to USB stick	Setup data transfer from the device to an external mass storage device				
Reading USB stick config.	Setup data transfer from the external mass storage device to the device				

13.3 Country settings

Additional device languages can be generated or edited here. For example, French can be selected as a second language from the current library and transferred to the device.

□ 🔁 >> MustKoff3_für englisch.266 - altered -													
File-Info-Header													
🖶 🧐 Configuration level													
😥 🧐 Parameter level													
😑 🧐 Setup only													
Country settings													
Country settings											×		
1: English 0.4%													
2: German 0.4%													
		ID: C3	AC 1071	-ED0C-4	HC7-86	01-5C3B	9F7C7E	C7					
	Langu	age: En	alish		_	(Standar	d langu						
	Caligue	age, en				Cotanuan	u langu	age)					
	Date for	mat: JJ	TTMMCC		-		Separ	ating po	oint (dat	te): /			
		Separatir	ng point	(time):	:			Dec	cimal poi	int: .			
	diamate and												
	Character entry	1:											
	1 2	3	4	5	6	7	8	9	0				
	a w	e	r	t	z	u	i	0	p	1			
	a s	d	f	g	h	i	k	1	+	1			
	V X	c	v	b	n	m		<u> </u>	-	1			
	<u> </u>		V				,	•		1			
	, 	haracter	1: 1!										
Sort language:					Lang	uage		New	langua	ge			
						-		Edit		-			
								Delet	e				
								Сору					
										nal functio			
										1.6	• •		

13.4 User list

The user currently logged on is displayed.

User list		×
	Character table:	
	Public rights:	
User 1	•	
	ID:	Master
	Description:	System-Master
	Password:	•••••
	Rights:	
		OK Cancel

13.5 User level

The user levels can only be edited using the setup program.

An example of this can be seen in Chapter 7.1 "Example 4 Transferring controller setpoint values to the user level", page 45.

13.6 E-mail

Five different e-mail texts are entered here and sent to the plant, for instance, in the event of an alarm.

E-	nail	
	E-mail server: Can only be altered by trained personnel !	
	E-mail 1 E-mail 2 E-mail 3 E-mail 4 E-mail 5	
	E-mail addresses:	
	1:	
	2:	
	3:	
	Caution: Characters other than AZ, az, 09, - , _ , @, . , may cause problems!	
	Alarm signal:	
	E-mail subject: Mail Betreff 01	
	Mail betreff 01	
	E-mail text:	
	Mail Text 01	
	~	
	OK <u>C</u> ancel	

13.7 Web server

HTML documents, which can be created using a conventional HTML editor, can be stored in the JUMO DICON touch using the PC setup program. These documents can contain texts, graphics, and JavaScript code. Analog and digital values for the device can be displayed with JavaScript. The result is a website which can be retrieved over the Internet or LAN and displayed via a PC using a conventional web browser. On this website, the user can now see a clear display of the plant or the process, including measured values and operating states. A "standard online visualization" function is stored as default. A PC with Microsoft® Windows® operating system and Silverlight® installed is required to use this function. An HTML document can be created here which visualizes the DICON touch using a web application.



13.8 Modbus frames for reading

This function is used to compile up to eight Modbus frames for reading process values of external devices (via interface) individually for each opposite side. The process values (analog, integer, and digital values, and text) are written to the selected variables from the received Modbus telegram and are available for use in the system. Each frame can be used to configure up to 64 entries (variables); the process values are then grouped and transferred in a Modbus telegram.

Setup dialog

Frame 1 Fran	e 2 Frame 3 Frame 4 Frame 5 Frame 6 Frame Comment: Frame 01	me 7 Frame 8		Modbus-Start a	ldress:	
	Interface: Modbus Master Ser. 1	-		0x003A	(Master)	
	Modbus Master Ser. 1	•		UXUUJA	(Master)	
D	evice address: 10			0x8000	(Slave)	
Entries	External inputs	Modb.add	Modb.add	Data type	Bitposit	Facto
Entry 1	Selector Modbus Read-Frames\Ext	0x003A	0x8000	Float (MSB)		1
Entry 2	Selector Modbus Read-Frames\Ext	0x003C	0x8002	Float (MSB)	-	1
Entry 3	Selector Modbus Read-Frames\Ext	0x003E	0x8004	Float (MSB)	-	1
Entry 4	Selector Modbus Read-Frames\Ext	0x0040	0x8006	Float (MSB)	-	1
Entry 5	Selector Modbus Read-Frames No selection	0x0042	0x8008	none	-	-
Entry 6	Selector Modbus Read-Frames No selection	0x0042	0x8008	none	-	-
Entry 7	Selector Modbus Read-Frames No selection	0x0042	0x8008	none	-	-
Entry 8	Selector Modbus Read-Frames No selection	0x0042	0x8008	none	-	-
Entry 9	Selector Modbus Read-Frames No selection	0x0042	0x8008	none	-	-
Entry 10	Selector Modbus Read-Frames∖No selection	0x0042	0x8008	none	-	-
Entry 11	Selector Modbus Read-Frames No selection	0x0042	0x8008	none	-	-
Entry 12	Selector Modbus Read-Frames No selection	0x0042	0x8008	none	-	-
Entry 13	Selector Modbus Read-Frames∖No selection	0x0042	0x8008	none	-	-
Entry 14	Selector Modbus Read-Frames Wo selection	0x0042	0x8008	none	-	
•		III				۱.
	Frame-Length: 16					Edit



NOTE!

Configuration and use of the Modbus frames for writing is described in the Modbus interface description B 703571.2.0.

13.9 Modbus frames for writing

This function is used to compile up to eight Modbus frames for writing process values to external devices (via interface) individually for each opposite side. The process values (analog, integer, and digital signals, and text) are written to the frames by the system and are available to external devices. Each frame can be used to configure up to 64 entries (process values), which are then grouped and transferred in a Modbus telegram.

Setup dialog

Frame 1 Fran	ne 2 Frame 3 Frame 4 Frame 5 Frame 6	Frame 7 Frame 8				
	Comment: Frame 01	>	1	Modbus-Start ad	dress:	
	Interface: Modbus Master Ser. 1	-		0x0074	(Master)	
D	evice address: 10			0x8800	(Slave)	
Entries	Process values	Modb.add	Modb.add	Data type	Bitposit	Facto
Entry 1	Process value selector \Digital select	0x0074	0x8800	Integer (2 By	rte) 0	-
Entry 2	Process value selector Digital select	0x0075	0x8801	Integer (2 By	/te) 0	-
Entry 3	Process value selector No selection	0x0076	0x8802	none	-	-
Entry 4	Process value selector No selection	0x0076	0x8802	none	-	-
Entry 5	Process value selector No selection	0x0076	0x8802	none	-	-
Entry 6	Process value selector No selection	0x0076	0x8802	none	-	-
Entry 7	Process value selector No selection	0x0076	0x8802	none	-	-
Entry 8	Process value selector No selection	0x0076	0x8802	none	-	-
Entry 9	Process value selector No selection	0x0076	0x8802	none	-	-
Entry 10	Process value selector No selection	0x0076	0x8802	none	-	-
Entry 11	Process value selector No selection	0x0076	0x8802	none	-	-
Entry 12	Process value selector No selection	0x0076	0x8802	none	-	-
Entry 13	Process value selector No selection	0x0076	0x8802	none	-	-
Entry 14	Process value selector No selection	0x0076	0x8802	none	-	
•		III				•
	Frame-Length: 4	Replace erro	or code: 📃	3e+037		Edit



NOTE!

Configuration and use of the Modbus frames for writing is described in the Modbus interface description B 703571.2.0.

13.10 Customer-specific linearization

No linearization tables are stored by default. A maximum of four linearizations can be created with the setup program.

13.10.1 Grid points

Customer-specific linearization is specified by entering up to 40 grid points (pairs of values X/ Y). Here, value X indicates the physical measured value (in mV, mA, or Ohm for example; depending on the sensor type) and value Y indicates the linearized value (temperature in °C, for example).

Setup dialog

ustom. spec. lin.	
	Measuring range start: 0
Kind of linearization: Pairs of values	Measuring range end: 100
Basic values Basic values	For customer-specif linearization, the module only uses the configured formula. The sampling points specified in the table will be compared with the formula when exiting the dialog box and deleted (if necessary)
Formula $y = \begin{bmatrix} 0 \\ +x^4 + \end{bmatrix} \begin{bmatrix} x^3 + \end{bmatrix} \begin{bmatrix} 0 \\ +x^2 + \end{bmatrix}$	- 1 ·× + 0
Display graphic Update graphic	OK Cancel

Parameter

Parameter	Selection/settings	Description
Measured value (X)	-99999 to 0 to +99999	Value of the relevant grid point on the x axis
Linearized value (Y)	-99999 to 0 to +99999	Value of the relevant grid point on the y axis

The definition range of linearization (measuring values, x axis) is monitored in the module and limited as follows:

Lower limit of the definition range = Xmin - 0.0125 × (Xmax - Xmin) Upper limit of the definition range = Xmax + 0.03125 × (Xmax - Xmin)



NOTE!

A measured value that lies outside of the definition range results in a deviation above or below the measuring range (out of range).

Displaying linearization on a graphic ("Display graphic" button)

Use this button to create a graphic of the linearization.

The graphic includes the characteristic lines for both types of linearization where applicable, namely the grid points (table) and the formula.

The display range for the graphic is first of all determined by the smallest and largest grid points; it can be temporarily changed in the display by entering different x values.

Calculating the polynomial using the grid points ("fx" button)

After entering the pair of values, use this button to calculate a polynomial that describes the progression of the linearization characteristic line.

The calculated coefficients are incorporated into the formula. The characteristic lines for both types of linearization then correspond to each other.

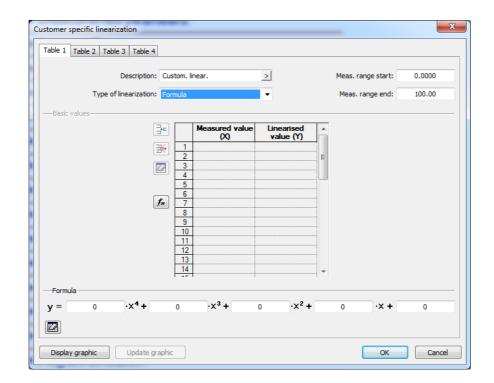
If the x values do not increase in a straight line, the linearization will not be adopted. In this case, it will not be possible to display the graphic or calculate the polynomial.

13.10.2 Formula

Customer-specific linearization is specified using a 4th order polynomial. The polynomial is calculated for the entire linearization range.

Polynomial formula: $y = X4^{*}x^{4} + X3^{*}x^{3} + X2^{*}x^{2} + X1^{*}x + X0$

Setup dialog



Parameter

Parameter	Selection/settings	Description
Measuring range start (Ymin)	-99999 to 0 to +99999	Start value of the y axis

Parameter	Selection/settings	Description
Measuring range end (Ymax)	-99999 to 100 to +99999	End value of the y axis
X0	-99999 to 0 to +99999	Absolute component of the polynomial (point of intersection with the y axis)
X1	-99999 to 1 to +99999	Coefficient of the linear component (x)
X2	-99999 to 0 to +99999	Coefficient of the quadratic component (x ²)
X3	-99999 to 0 to +99999	Coefficient of the cubic component (x^3)
X4	-99999 to 0 to +99999	Coefficient of the quartic component (x ⁴)

The value range for the linearization (linearized values, y axis) is monitored in the module and limited as follows:

Lower limit of the value range = Ymin - 0.0125 × (Ymax - Ymin) Upper limit of the value range = Ymax + 0.03125 × (Ymax - Ymin)



NOTE!

A linearized value that lies outside of the value range results in a deviation above or below the measuring range (out of range).

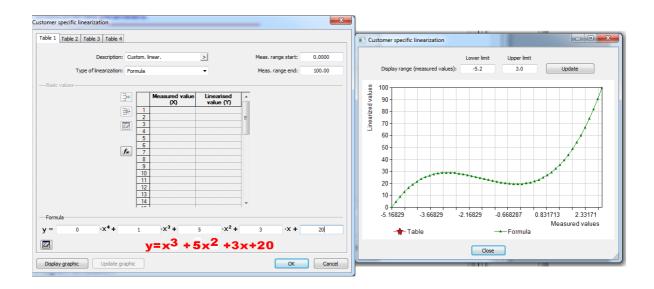
Displaying linearization on a graphic ("Display graphic" button)

Use this button to create a graphic of the linearization.

The graphic includes the characteristic lines for both types of linearization where applicable, namely the formula and the grid points (table).

The display range for the graphic is first of all determined by the "measuring range start" and "measuring range end" values (y values); it can be temporarily changed in the display by entering different x values

Example of third-order polynomial



13.11 Process screen

The process screen is empty by default and can only be created using the setup program.

Process s	creen						23
Process	screen 1						
		Active: 🔽		Nan	ne: Process	screen	>
	Bad	ground:		Background col	or: 25	55: R255 G255 B160	•
Signals	:			¥ 🖻 🛍		★	>
No.	X position	Y position	Width	Height	Туре	Visible	^
1	27	6	50	20	Icon	Yes	
2	3	4	77	38	Button	Yes	E
3	6	139	50	20	Icon	Yes	
4	-						
5	22	94	50	20	Icon	Yes	
6	3	93	77	38	Button	Yes	
7	232	37	82	20	Text	Yes	
8	223	83	92	20	Text	Yes	
9	233	131	81	20	Text	Yes	
10	222	145	94	20	Off	Yes	
11	90	8	50	20	Text	Yes	
12	222	3	50	20	Icon	Yes	
13	116	39	50	20	Text	Yes	-
•	010	00	•	' m	n	W	+
Pre	view					ОК	Cancel
	Process Signals No. 1 2 3 4 5 6 6 7 8 9 10 11 12 13 2 2	Signals: No. X position 1 27 2 3 4 3 5 22 6 3 7 232 8 223 10 222 11 90 12 222 13 116	Process screen 1 Active: I Background: ∞ Signals: ∞ No. X position Y position 1 22 6 2 3 4 3 6 139 4 3 137 5 22 94 6 3 93 7 232 37 8 223 83 9 233 131 10 222 145 11 90 8 12 222 3 13 116 39 4 ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~	Process screen 1 Active: ♥ Badoground: ms Signals: No. X position 1 27 6 2 3 4 7 6 199 4 3 137 5 22 34 7 2 3 6 139 50 6 3 93 7 232 37 82 8 223 83 92 9 233 131 81 10 222 145 94 11 90 8 50 12 222 3 50 13 116 39 50 14 - - -	No. X position Y position Width Height 1 2.2 6 50 20 2 3 4 77 38 3 6 139 50 20 4 3 137 77 38 5 22 94 50 20 6 3 93 77 38 5 222 94 50 20 6 3 92 20 8 22 8 223 83 92 20 11 20 10 222 145 94 20 11 90 8 50 20 11 90 8 50 20 20 13 116 39 50 20 12 222 3 50 20 20 13 116 39 50 20 14	Process soreen 1 Active: ♥ Name: Process Background: Background color: 25 Signals: Image:	Process screen 1 Active: V Name: Process screen Badground: ss: Badground color: 255: R255 G255 B160 Signals: Image: Badground color: 255: R255 G255 B160 No. X position Y position Width Bing: Image: Imag

A process screen can consist of a maximum of 50 objects. These could be icons in bitmap format, frames, surfaces, texts, and analog and digital values of various colors and sizes. The object background is always located right at the bottom. All other objects at the bottom of the list are covered by those at the top.

If a particular object is problematic, it can first be set to VISIBLE>NO.

Preview

In the list on the right-hand side, the position for screen elements is set and displayed on the left in the preview. Clicking on an object (highlighted in blue) causes it to appear in a frame on the left side of the preview window. You can also click in the preview window.



NOTE!

Before beginning the screen layout, icons and background screens must be contained in the library and in the "list of screens" (bitmap max. 320 x 182 pixel). C:\Users\yourname\Documents\Set266u...

13.11.1 Process screen editor

Setup dialog

(1)	(2) (3)	(4) (5)	(6)	(7)	(8)
rocess	creer						×
Proces	screen	1					
		Active:	V	N	ame: Process so	reen	>
		Background:		Background o	olor: 255	: R255 G255 B16	
		background.		background c	200	. K233 6233 010	· ·
Signal	:		(X 🖻 🛱		→ ←	
No.	X p sit	ion Y positi	on Width	Height	Туре	Visible	^
1	27	6	50	20	Icon	Yes	
2	3	4	77	38	Button	Yes	=
3	6	139	50	20	Icon	Yes	
4	3	137	77	38	Button	Yes	
5	22	94	50	20	Icon	Yes	
6	3	93	77	38	Button	Yes	
7	232	37	82	20	Text	Yes	
8	223	83	92	20	Text	Yes	
9	233	131	81	20	Text	Yes	
10	222	145	94	20	Off	Yes	
11	90	8	50	20	Text	Yes	
12	222	3	50	20	Icon	Yes	
13	116	39	50	20	Text	Yes	-
*	045	02		1	D	M	•
		_					
Pre	eview					ок] [Cancel
	(12)					(11)	(10)
					(2)Object		

- (1)Object list
- (3)Selected process screen
- (5)Select background image
- (7)Select background color
- (9)-
- (11)Exit process screen editor; settings are adopted

- (2)Object used
- (4)Activate process screen
- (6)Name of the process screen
- (8)Navigation and processing functions
- (10)Exit process screen editor; settings are not adopted
- (12)Preview of the process screen (preview window is opened in the setup program)

Navigation and processing functions

Button	Function
ж	Cut object from the object list
B	Copy object to another object (only within the same process screen)
Ca	Paste cut object into the object list
**)	Add new object to the object list

Button	Function
×	Remove object from the object list
†	Move object up in object list
÷	Move object down in object list
₽	Edit object

13.11.2 Background

In addition to the background color, a background image can also be used for the background of the process screen. The background image is selected from the list of available screens in the setup program. If the background color is to be visible, the background image must not cover the entire area of the process screen or it must be transparent (option when replacing a screen).

Example

A furnace whose temperature is regulated via an SCR power controller should be displayed here. For this purpose we need a screen of the plant with the most important parameters.

Backgro	ound		-	1.00	<u> </u>	Figure	e list			
		Bitmap name:	Brennofe	nMitte2		No	D	Name	*	
		X position:	0	Visible		1		AlarmGelb AlarmGruen	E	
		Y position:	0	Centered		3		AlarmRot		
				ОК	Cancel	4		Bleistift HandGross		`\}`
						6		HandKlein		
2 33 222	131	81 94	20	Off	Yes	8		Information JumoBackground		
90	8	50	20	Text	Yes	9		JUMOBLD		
222 116	3 39	50 50	20 20	Icon Text	Yes Yes	10	_	LedGrau	Ŧ	Size: 32 x 28 Pixel (1019 Byte)
210	- 02			D. 44-2		•		►		
iew					ок		Replac	Export		OK Cancel

Assign screen name, click on "Visible", click ... , click "Replace"

■ Öffnen	II	1000		10	×
Computer + System (C:) + Benutzer + n	nackj 🕨 Eigene Dokumente	▶ Set266u ▶	• 4 ₇	Set266u durchsuchen	م
Organisieren 🔻 Neuer Ordner				-	
	ProgramW14.d3	BrennofenMitte2. bmp	ofen3.bmp	ofen4.bmp	
Somputer So	Graphic title Title: BrennofenMitte2		ncel	1 Bit (, bmp) Offnen ▼ Abb	▼ brechen

Select the new furnace screen, click "Transparent" and it will appear in the list of screens.

3 AlarmRot 4 Bleistift 5 HandGross 6 HandKlein	
3 AlarmRot 4 Bleistift 5 HandGross 6 HandKlein	
4 Bleistift 5 HandGross 6 HandKlein	
5 HandGross 6 HandKlein	
6 Handklein	
7 Information	
8 JumoBackground	
9 JUMOBLD	
10 LedGrau	
Size: 320 x 182 Pixel (12 kByte)	

Once "Active" is ticked, the background screen will appear in the preview.

Process image	P	rocess s	creen						×
		Process	screen 1						
	1			Active: 📝	-		ne: Process screen		>
			Back	ground:		ackground co	or: 183: R1/	75 G175 B160	_
		Signals	:		X	- E		÷	D
		No.	X position	Y position	Width	Height	Туре	Visible	-
		1	0	0	50	20	Off	Yes	
		2	0	0	50	20	Off	Yes	E
		3	0	0	50	20	Off	Yes	
└───┴崎崎♠		4	0	0	50	20	Off	Yes	
		5	0	0	50	20	Off	Yes	
Language English 🔻 📮 🗐 🕕		6	0	0	50	20	Off	Yes	
		7	0	0	50	20	Off	Yes	
Simulation Close		8	0	0	50	20	Off	Yes	
	411	9	0	0	50	20	Off	Yes	
		10	0	0	50	20	Off	Yes	
		11	0	0	50	20	Off	Yes	
		12	0	0	50	20	Off	Yes	
	1	13	0	0	50	20	Off	Yes	
		•	•	^	50		~#	W	•
		Pre	view				0	<	Cancel

13.11.3 Signal types for process screens (overview)

The variables and icons are now entered in the list until the process screen is complete. The first blue highlighted entry is highlighted in a blue frame in the preview.

Setup dialog

Inals	-						— ×
Type:	Text		-	X position:	10	Width:	50
	Off		-				
Visible	Icon			Y position:	20	Height:	20
✓ Editable	Analog sigr		lge				
	Integer sig	nal	-				
Те	Digital sign	al					-
	Text						
	Frame Rectangle						
	Timo						
Backgro	Bar graph		55 B25! 🔻				
-	Analog valu	ue-Addition					
1	Enter Float	-Value					
F	Enter Text				Те	ext:	>
_	Enter Time						
Foregro	Input digita	al value	-				
	Button		_	1			
	Font size:	15 Pixel	-				
	Alignment:	Left align	-]			
0	bject type:	Horizontal	•	1			
						ОК	Cancel

Signal types

Parameter	Description
Pictogram	Screwdriver, alarm bell
Analog signal	from the analog selector
Integer signal	from the integer selector
Digital signal	from the digital selector
Text	Text from the process or configuration selector
Frame	Transparent border
Rectangle	Rectangle with color fill and border
Time	Run times, timer times, service times
Bar graph	from the analog selector
Extra analog value	Unit, channel description, min or max limit value
Float value input	Field for entering a floating point value
Text input	Field for entering a text
Time input	Field for date and time input
Digital value input	Field for binary value output
Button	Button with touch function

13.11.4 General object features

The description of the general object features applies for all object types for which the parameters in question are available.

The specific object features are described in the following chapters under the corresponding object type.

Setup dialog

ects							
Type:			X position:	10		Width: 50	
Visible			Y position:	20		Size: 20	
🗹 Editable	I	Send acknowledge		Layer:	Layer 1		•
	Source:	Inactive	•				7
			•				
			_		Γ		
							-
					1		_
					, 		_
Color of bac	:kground:	256: R255 G255 B25	5 💌				
	kground: nsparent:		5 v				
Tra	,		₹ ▼				
Trai Fra	nsparent: [me form: [•				
Trai Fra	nsparent: [me form: [Fine					
Tra Fra Color of for	nsparent: [me form: [Fine 1: R0 G0 B0					
Trai Fra Color of for F	nsparent: 「 ame form: 「 eground: 「	Fine 1: R0 G0 B0 16 Pixel					

Parameter

Parameter	Selection/settings	Description
Туре	Selection from list of object types	Object type for the process screen
X position	0 to 10 to 634	X coordinate of the upper left corner of the object in the process screen
Y position	0 to 20 to 402	Y coordinate of the upper left corner of the object in the process screen
Width	1 to 50 to 635	Width of the object
Height	1 to 20 to 403	Size of the object
Visible	Yes (), No ()	"Yes" releases the display of the object in the process screen.
Editable	Yes (), No ()	"Yes" releases the option for entry in the process screen (only for input objects).
Send acknowl- edgement	Yes (), No ()	"Yes" means that an acknowledgement is sent to the internal PLC following an entry in the process screen (only for input objects with a destination vari- able).
Background color	Select color (drop-down menu).	Background color of the object

Parameter	Selection/settings	Description
Transparent	Yes (), No ()	If "Yes", the background color of the object is not active. Instead, the font will be displayed in front of the background color of the process screen.
Frame type	Select form (drop-down menu).	The object can be provided with a frame.
Foreground color	Select color (drop-down menu).	Font color within the object
Font size	Select font size (drop-down menu).	Font size within the object
Alignment	Select alignment (drop-down menu).	Alignment of the font within the object (left-aligned, right-aligned, centered)
Orientation (object type)	Select orientation (drop-down menu).	Orientation of the object in the process screen (horizontal, vertical; not for input objects).

Foreground color

In order for the font to be visible, the foreground and background color must be different from each another. If the "Transparent" setting is selected (), this applies with regard to the background color of the process screen.

13.11.5 Preview screen

A process screen that has been created can be inspected and changed in the preview screen using the setup program prior to being transferred to the device.

The preview screen is opened by touching the "Preview" button:

Preview screen

Process image 0.1234		×
	「 「Without Toolbar	All Languag English Simulation Close

Processing functions

Button	Function
1	Select background color (for example, font color) within the object (drop-down menu).
256 💌	Select background color of the object (drop-down menu).
	Changing the frame form of the object (none, thin, thick, raised, sunken).
AA	Change font size (12, 16, 24, 31, 48, 64 pixels).
=	Change alignment of the font within the object (left-aligned, centered, right-aligned).
وم	Change orientation of the object in the process screen (horizontal, vertical).
Ъ	Move object in process screen forward one level with each click.
	The object is simultaneously moved down in the object list (larger number).
ГГ Г	Move object in process screen back one level with each click.
	The object is simultaneously moved up in the object list (smaller number).
+	Move object in process screen horizontally or vertically.
	Clicking on this button opens an additional window. This contains different arrows (buttons) for moving the object in preset steps.

Processing object features

Changes can be made directly to the object features in question using the processing functions described above. It is also possible to open the object by double-clicking (in the preview screen or in the object list) in order to process the object features.

Moving objects

The user has the following options for moving an object in the preview screen:

- Double-clicking the object to open it and changing the X/Y position.
- Left-clicking and holding the object and moving it directly into the preview screen.
- Moving the object using the arrows.

Foreground color

In order for the font to be visible, the foreground and background color must be different from each another. If the "Transparent" setting is selected (), this applies with regard to the background color of the process screen.

13.11.6 Transfer process screen to device

As soon as the setup data is transferred to the device, it can be retrieved from the operating loop.

14.1 Calibrating the touchscreen

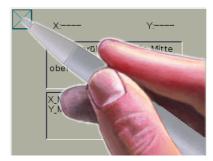
The display on the TFT screen may no longer correspond to the points of contact on the adhesive touchscreen cover.

In this case, the touchscreen must be calibrated.

DEVICE MENU>CALIBRATE TOUCHSCREEN

To do this, four interchangeable screen points must be treated as accurately as possible with a pen wherever an 'x' appears.

The device saves these coordinates and this enables the assignment of the TFT screen and the touchscreen to correspond again.



15.1 Fine adjustment

You can use customer-specific fine adjustment to correct the measured values of the analog input. In contrast to offsetting, which is used to specify a constant correction value for the entire characteristic line, fine adjustment can also be used to change the gradient of the characteristic line.

Setup dialog

Fine adjustment			×
IN 8 Analog input 1	IN 8 Analog input 1		
	Actual-Zero-point:	0.0000	°C
	Actual-End value:	0.0000	°C
	Set-Zero-point:	0.0000	°C
	Set-End value:	0.0000	°C
			OK Cancel

Parameter

Parameter	Selection/settings	Description
Actual zero point	-99999 to 0 to +99999	Lower displayed value
Actual end value	-99999 to 0 to +99999	Upper displayed value
Set zero point	-99999 to 0 to +99999	Lower reference value
Set end value	-99999 to 0 to +99999	Upper reference value

Example

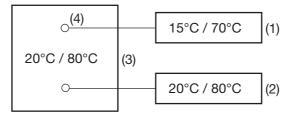
The temperature inside a furnace is measured with an RTD temperature probe and displayed. Due to the temperature drift of the probe, the true temperature (reference measurement) deviates from the displayed value. The amount of deviation is different at the upper and lower measuring points, meaning that measured value offset is not suitable.

Actual zero point: 15 °C (lower displayed value)

Set zero point: 20 °C (lower reference value)

Actual end value: 70 °C (upper displayed value)

Set end value: 80 °C (upper reference value)



- (1) Display values
- (3) Furnace

- (2) Reference values
- (4) Sensor in RTD temperature probe

15 Online parameter

Performing fine adjustment

1) Determine the lower value (as low and constant as possible) with the reference measuring device.

Example: Set furnace temperature to 20 °C.

2) Enter the display value as the actual zero point and the reference value as the set zero point.

Example: Enter 15 and 20.

3) Determine the upper value (as high and constant as possible) with the reference measuring device.

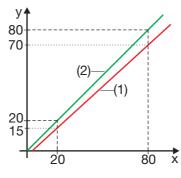
Example: Increase furnace temperature to 80 °C.

4) Enter the display value as the actual end value and the reference value as the target end value.

Example: Enter 70 and 80.

Characteristic line

The following diagram shows the changes in the characteristic line caused by the fine adjustment (point of intersection with the x axis as well as the gradient).



(1)

y Display value

x Reference value

Characteristic line before fine adjustment

(2) Characteristic line after fine adjustment

Resetting the fine adjustment

The following settings must be made to reverse the fine adjustment: Actual zero point = set zero point Actual end value = set end value

15.2 Ethernet (option)

There is no Ethernet interface available by default. If it is integrated into the device using optional boards, the following values should be set:

Setup dialog

hernet				Ethernet	
Config	. IP address:	Manual	•	🖌 ОК	🗙 Cance I
-				Config. IP addre	ss Manual
Manua	l IP address:	10 . 11 . 101 .		Manual IP addre	ss <mark>10.11.101.3</mark>
S	Subnet mask:	255 . 255 . 0 .	0	Subnet mask	255.255.0.0
Standa	ard gateway:	10 . 11 . 0 .	175	Standard gatewa	av 10.11.0.175
DNS o	device name:	MAC000cd8097e25-TY	P7035:	DNS device nam	
	DNS server:	10 . 10 . 0 .	11	DNS server	10.10.0.11
т	ransfer rate:	Automatic	-		

Parameter

Parameter	Selection/settings	Description
IP address assign- ment	Automatic	The DICON touch automatically obtains its IP address from the DHCP server.
	Manual	The IP address for the DICON touch must be assigned manually.
Manual IP address	0.0.0.0	The IP address is entered manually here
	233.233.233.1	(if necessary, it should be requested from
	255.255.255.255	the administrator responsible).
Subnet mask	0.0.0.0	Manual setting of the subnet mask
	255.255.255.0	
	255.255.255.255	
Standardgateway	0.0.0.0	Manual setting of the IP address of the
	255.255.255.255	standard gateway (router)
DNS device name	097e25-TYP703571	Example of unique DNS device name for
	Admissible characters: a to z, A to z, -, 0 to 9 (max. 63 charac- ters); name must begin with a let- ter and may not end with a "-" (hyphen)	multifunction panel (assigned by default)
DNS server	0.0.0.0	IP address of DNS server
	255.255.255.255	
Transfer rate	Automatic	Data transfer rate of Ethernet connection
	10 MBit/s half duplex 10 MBit/s full duplex 100 MBit/s half duplex 100 MBit/s full duplex	

15.3 Date and time

The date and time for the device can be adopted from the connected PC or even entered manually.

Setup dialog

Date and time	×
Date / time ir	
New setting Use date Enter dat	
C Enter dat	06.03.2013
	Set Synchronize Close

15.4 Screenshot

A screenshot can be created here from the current device and saved as a bitmap.

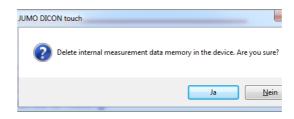
Setup dialog

Screenshot
Create Save Print Close
Unknown
Controller screen 1
× 25.5°°
w 30.0 🖉
Y 30.4 %

15.5 Deleting measurement data memory

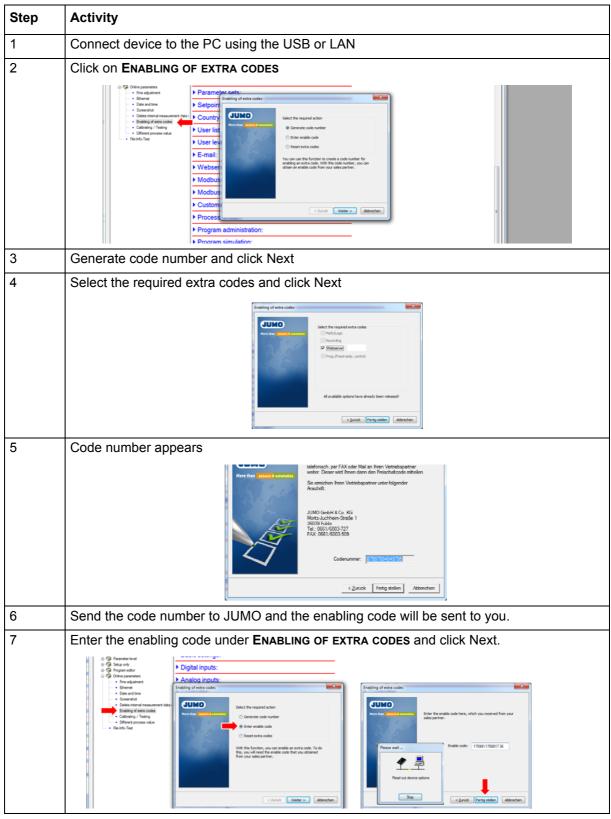
A screenshot can be created here from the current device and saved as a bitmap.

Setup dialog



15.6 Enabling of extra codes

To do this, you need a device that is connected to the setup program.



➡ Extra code enabled

15.7 Testing calibration

This is where the dialogs for calibration and testing of analog and digital outputs appear, along with other device functions.

Setup dialog

Hard / Software Hardware Dicon Touch Software version device: 266.01.02 Software version number CPU: 000000000000000000000000000000000000	brating / Testin	g				_			×
Software version device: 266.01.02 Software version VDN: Fabrication number: CPU: 000000000000000000000 Hardware options Motherboard analog input 1: (IN 8): Calibration status: calibrated CheckID: PRUEF-ID Software version: 233.01.03 Motherboard analog input 2: (IN 9): Calibration status: calibrated CheckID: PRUEF-ID	Hard / Software	Calibration constants	Analog inputs	Analog outputs	Binary outputs	Binary inputs	Battery	Touch	Display 4
	Software versic Software versic Fabrication rur 2. Fabrication r Hardware optic Motherboard a Calibration sta Check(D): PRI Software versi Motherboard a Calibration sta Check(D): PRI	on device: 266.01.02 on VDN: ober CPU: 0000000000 umber: 0000000000000 ms nalog input 1: (IN 8): tus: calibrated JEF-ID ion: 233.01.03 nalog input 2: (IN 9): tus: calibrated JEF-ID tus: calibrated			E				

15.8 Various process values

Values can be read and saved here.

Setup dialog

alu	es to be read Values to be re-written	
	Process value	Additional identifier
1	Process value selector Wo selection	
2	Process value selector Wo selection	
3	Process value selector Wo selection	
4	Process value selector Wo selection	
5	Process value selector Wo selection	
6	Process value selector Wo selection	
7	Process value selector Wo selection	
8	Process value selector Wo selection	
9	Process value selector Wo selection	
10	Process value selector Wo selection	
11	Process value selector Wo selection	
12	Process value selector Wo selection	
13	Process value selector Wo selection	
14	Process value selector No selection	
•		•

16.1 Error messages in float values and on the display

The display is shown as a float value itself. The following statuses are defined.

Error	Float value display	Display
First error value	1.0E+37	
Software – underrange	1.0E+37	<<<<<
Software – overrange	2.0E+37	>>>>>
No valid input value	3.0E+37	
Division by zero	4.0E+37	
Incorrect mathematical value	5.0E+37	
Display capacity exceeded		*****
Invalid value		

In the event of an error, the device function reports this error itself in its output value. All device functions monitor an input value for these error values. In the event of an error, the output value is applied in turn to one of these error values, or another value is specified in the configuration (error value/substitute value).

16.2 Display of error messages for binary values

Binary input values are only displayed with 0 and 1. If no valid input value is available, or the device function cannot deliver a valid output value, the value is set to 0.

Exception

In the configuration level you can set which value the output should accept in the event of an error (error value/substitute value) and this value is then faded in.

Start/end display:

The graphic display elements of the display range are established for this (lower and upper limit in a bar graph display). The numeric representation is dependent on the display start/end and is produced from the entire measuring range. In the recording, measured values smaller than the display start are saved as UNDERRANGE and measured values larger than the display end are saved as OVERRANGE.

Bar graph display:

The numeric representation is dependent on the display start/end and is produced from the entire measuring range. In the recording, measured values smaller than the display start are saved as UNDERRANGE and measured values larger than the display end are saved as OVERRANGE.

Over- and underrange:

Detection is performed at hardware limits and on the scaling in mV. The maximum number of display ranges are therefore always available. For all the values calculated in the device such as mathematics output, flow rate, and external inputs, the following applies: The display range has the same significance here as for hardware inputs.

17.1 Safety information

You can upgrade or retrofit the device flexibly using the following description. All the necessary settings are described in the operating manual. Manipulations not described in the manual or expressly forbidden will jeopardize your warranty rights.



CAUTION!

Risk of damage to the modules by electrostatic discharge can occur. For this reason, avoid electrostatic charge during fitting and removal. Work in an "earthed" working area with the corresponding upgrade!



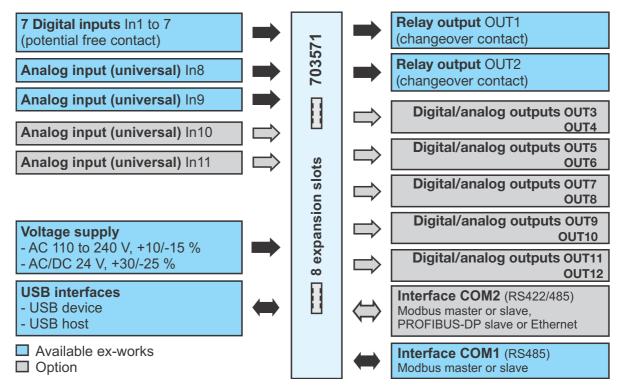
DANGER!

Do not touch live parts inside the device as they are highly charged. Disconnect (all poles) the device from the voltage supply before retrofitting. Only qualified personnel are permitted to carry out module retrofits. The country-specific requirements available regarding changes to an electrical device must be observed.

17.2 Identifying the modules

1	Identify the module from the part number on the sticker attached to the packaging
2	Check which slot the optional board may be inserted into.
	➡ Chapter 4.3 "Connection diagram", page 27
3	Only install modules in the device that are permitted for this optional slot.

Block diagram



17 Retrofitting optional boards

17.3 Installing modules

In this example, a universal analog input is inserted in slot In10.

Step	Activity
1	Disconnect screw terminals and interface cables connected at the rear
2	Loosen two screws at bottom (do not remove), remove side screw completely
3	Lift up back panel and pull out

Step	Activity
4	Slide optional board into the slot provided. The parts no. is located on the screw terminal.
5	Re-tighten the two screws with the associated toothed lock washers and screw in the side
	screw again, to ensure a guiding connection between the back panel and the side panel (secure grounding).
6	Switch on the device again and check whether the new hardware is recognized The new slot should appear in the device as follows: DEVICE INFO -> SLOTS
	Steckplätze IN 10 OUT 3 OUT 9/10 Platinentyp Universaleingang SW-Version 233.01.03-032
	VDN-Version E00.000.000 Prüf-ID
	Prüf-ID
	Prüf-ID 19.01.13 03:12:37 99%
	Prüf-ID 19.01.13 03:12:37 99% Image: Comparison of the setup program by the Hardware Assistant: Current hardware -> Hardware Assistant Image: Comparison of the setup program by the function of the setup program by the setup program by the function of the setup program by the setup progr
	Prüf-ID 1901.13 0312:37 99% Image: Comparison of the setup program by the Hardware Assistant: Current hardware -> Hardware Assistant Image: Comparison of the setup program by the function of the setup program by the setup program by the function of the setup program by the setup pro

Result: The correctly recognized slot can now be configured and connected.

17.3.1 Accessories

Item	Parts no.
Modules for expansion slots:	
One analog input (universal)	00581159
One relay output (changeover contact)	00581160
Two relay outputs (N/O contact)	00581162
One logic output DC 0/22 V, max. 30 mA	00581165
Two logic outputs DC 0/12 V max. 20 mA	00581168
One solid state relay AC 230 V, 1 A	00581164
Two solid state relays AC 230 V, 1 A for motor actuator	00621574
Two PhotoMOS® relays ¹ DC 50 V, max. 200 mA, AC 35 V, max. 200 mA	00581171
One analog output (universal)	00581169
Ethernet interface	00581174
Serial interface RS422/RS485	00581172
PROFIBUS-DP interface	00581173

¹ PhotoMOS is a registered trademark of Panasonic Corporation



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