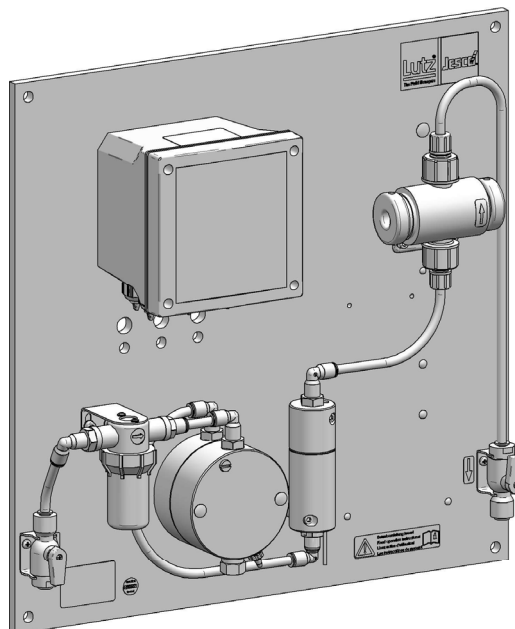


Water sampling station **EASYPRO 1** Operating instructions



Read the operating instructions!
The user is liable for improper installation and operation.

Table of Contents

1 Notes for the reader	4	10 Setup	32
1.1 General non-discrimination.....	4	10.1 General settings (2A)	32
1.2 Explanation of signal words.....	4	10.2 Setting the measured value (2B).....	34
1.3 Explanation of warning signs.....	4	10.3 Temperature measurement (2C).....	36
1.4 Identification of warnings	4	11 Output	37
1.5 Identification of action instructions.....	4	11.1 Relay output (3A)	37
2 Safety	5	11.2 Current output (3B).....	38
2.1 General warnings	5	11.3 Alarm settings (3C)	39
2.2 Hazards due to non-compliance with the safety instructions..	5	12 Archive	40
2.3 Working in a safety-conscious manner	5	12.1 Data logger (4A).....	40
2.4 Personnel qualification.....	5	12.2 Alarm (4B).....	40
3 Intended use	7	13 Manual control	41
3.1 Notes on product warranty	7	14 WiFi	42
3.2 Intended purpose.....	7	15 Using the web application	43
3.3 Foreseeable misuse	7	15.1 Connecting to the web application	43
4 Product description	8	15.2 Dashboard	44
4.1 Scope of delivery.....	8	15.3 Statistics	45
4.2 Design of the water sampling station	8	15.4 Actions	46
4.3 Structure of the flow controller	8	15.5 Settings.....	47
4.4 Control panel	9	15.6 Network.....	47
4.5 Standard view	9	15.7 Software update	47
4.6 Rating plate of the EASYPRO 1 water sampling station	9	16 Shut-down	48
4.7 Rating plate of the TOPAX® L single-channel controller	10	16.1 Short-term shut-down	48
5 Technical data	11	16.2 Long-term shut-down.....	48
5.1 Environmental conditions.....	11	16.3 Storage	48
5.2 Hydraulic specifications	11	16.4 Transportation	48
5.3 Electrical specifications.....	11	16.5 Disposal	48
5.4 Measurement specifications.....	12	17 Maintenance	49
5.5 Mechanical specifications TOPAX L	12	17.1 Maintenance intervals	49
5.6 Measuring cells.....	13	17.2 Setting a service alarm.....	49
6 Dimensions	16	17.3 Measuring cell	49
7 Installation	17	17.4 Flow controller.....	50
7.1 Installation location of EASYPRO 1 water sampling station...	17	17.5 Cleaning the sample water filter	50
7.2 Wall mounting	17	17.6 Resetting to factory settings	50
7.3 Hydraulic installation.....	17	17.7 Finishing maintenance	51
7.4 Installation of TOPAX®L single-channel controller	17	18 Fault resolution	52
7.5 Connecting the power supply	18	18.1 General faults	52
7.6 Installation recommendations	18	18.2 Alarms and messages	54
7.7 Terminal block	18	19 Modbus profile	56
8 Start-up	26	20 Glossary	81
8.1 Displaying measured values and outputs	26	21 Note on EU conformity EASYPRO 1	82
8.2 Displaying the menu	26	22 EU declaration of conformity TOPAX®L	83
8.3 Setting the flow controller	26	23 Decontamination declaration	84
9 Calibration	27	24 Warranty claim	85
9.1 Calibrating a pH and Redox measurement (1A)	27		
9.2 Calibrating a conductivity measurement (1A).....	28		
9.3 Calibrating an mA input (1A).....	29		
9.4 Calibrating an amperometric measuring cell (1A)	30		
9.5 Calibrating the temperature (1B).....	31		

1 Notes for the reader

These operating instructions contain information and instructions for the safe and designated operation of the **EASYPRO 1** water sampling station.

Observe the following principles:

- Read the entire operating instructions prior to starting-up the device.
- Ensure that everyone who works with or on the device has read the operating instructions and follows them.
- Maintain the operating instructions throughout the service life of the device.
- Pass the operating instructions on to any subsequent owner of the device.

1.1 General non-discrimination

These operating instructions use only the masculine gender in cases in which the rules of grammar would allow for gender allocation. This approach serves the purpose of legibility. Readers of all genders are always addressed equally.

1.2 Explanation of signal words

Different signal words in combination with warning signs are used in these operating instructions. Signal words illustrate the gravity of possible injuries if the risk is ignored:

Signal word	Meaning
DANGER	Refers to imminent danger. Ignoring this sign may lead to death or the most serious injuries.
WARNING	Refers to a potentially hazardous situation. Failure to follow this instruction may lead to death or severe injuries.
CAUTION	Refers to a potentially hazardous situation. Failure to follow this instruction may lead to minor injury or damage to property.
PLEASE NOTE	Refers to a danger which, if ignored, may lead to risk to the machine and its function.

Tab. 1: Explanation of signal words

1.3 Explanation of warning signs

Warning signs represent the type and source of a danger:

Warning sign	Type of danger
	General danger
	Danger from electrical voltage
	Danger from poisonous substances
	Danger of damage to machine or functional influences

Tab. 2: Explanation of Warning Signs

1.4 Identification of warnings

Warnings are intended to help you recognise risks and avoid negative consequences.

This is how warnings are identified:

Warning sign	SIGNAL WORD
Description of danger. Consequences if ignored. ⇒ The arrow signals a safety precaution to be taken to eliminate the danger.	

1.5 Identification of action instructions

This is how pre-conditions for action are identified:

- ✓ Pre-condition for action which must be met before taking action.
- ✗ A resource such as a tool or auxiliary materials required to perform the operating instructions.

This is how instructions for action are identified:

- ➔ Separate step with no follow-up action.
- 1. First step in a series of steps.
- 2. Second step in a series of steps.
 - ▶ Result of the above action.
- ✓ **Action completed, aim achieved.**

2 Safety

2.1 General warnings

The following warnings are intended to help you eliminate the dangers that can arise while handling the device. Risk prevention measures always apply regardless of any specific action.

Safety instructions warning against risks arising from specific activities or situations can be found in the respective sub-sections.

	DANGER
Mortal danger from electric shock! Wrongly connected or located cables or damaged ones can cause injuries. ⇒ Replace damaged cables without delay. ⇒ Do not use extension cables. ⇒ Do not bury cables. ⇒ Secure cables to avoid being damaged by other equipment.	

	WARNING
Increased risk of accidents due to insufficient qualification of personnel! The device may only be installed, operated and maintained by personnel with sufficient qualifications. Insufficient qualification will increase the risk of accidents. ⇒ Ensure that all action is taken only by personnel with sufficient and corresponding qualifications. ⇒ Prevent access to the system for unauthorised persons.	

	PLEASE NOTE
Do not dispose of the device in the domestic waste! Do not dispose of electric devices via the domestic waste. ⇒ The device and its packaging must be disposed of in accordance with locally-valid laws and regulations. ⇒ Dispose of different materials separately and ensure that they are recycled.	

2.2 Hazards due to non-compliance with the safety instructions

Failure to follow the safety instructions may endanger not only persons, but also the environment and the device.

The specific consequences can be:

- Failure of major unit and system functions.
- Failure of required maintenance and repair methods
- Risk to persons when working on the device
- Danger to the environment from overdosing

2.3 Working in a safety-conscious manner

Besides the safety instructions specified in these operating instructions, further safety rules may apply. Always comply with all safety-relevant regulations and guidelines which apply at the usage location of the product. Note in particular the following items:

- Safety regulations on handling electricity and live components
- Safety regulations on handling hazardous substances
- Accident prevention regulations
- Safety and operating provisions
- Environmental protection provisions
- Other applicable directives and laws

2.4 Personnel qualification

Any personnel who work on the device must have appropriate special knowledge and skills.

Anybody who works on the device should meet the conditions below:

- Attendance at all the training courses offered by the owner
- Personal suitability for the respective activity
- Sufficient qualification for the respective activity
- Training in how to handle the device
- Knowledge of safety equipment and the way this equipment functions.
- Knowledge of these operating instructions, particularly of safety instructions and sections relevant for the activity
- Knowledge of fundamental regulations regarding health and safety and accident prevention

All persons must have one of the following minimum qualifications:

- Training as specialists to carry out work on the device unsupervised
- Sufficient training that they can work on the device under the supervision and guidance of a trained specialist

2.4.1 Specialist staff

Thanks to their professional training, knowledge, experience and knowledge of the relevant specifications, specialist staff are able to perform the job allocated to them and recognise and/or eliminate any possible dangers by themselves.

2.4.2 Trained electricians

Due to their professional training, knowledge and experience as well as knowledge of specific standards and provisions, trained electricians are able to do the electrical work assigned to them and to recognise and avoid any potential dangers by themselves.

They are specially trained for their specific working environment and are familiar with relevant standards and provisions.

They must comply with the legally binding regulations on accident prevention.

2.4.3 Trained persons

Trained persons have received training from the operator about the tasks they are to perform and about the dangers stemming from improper behaviour.

Trained persons have attended all trainings offered by the operator.

2.4.4 Personnel tasks

In the table below you can check what qualifications are the pre-condition for the respective tasks. Only people with appropriate qualifications are allowed to perform these tasks!

Qualification	Activities
Specialist Staff	■ Installing the hydraulics ■ Operation ■ Shut-down ■ Fault resolution ■ Maintenance ■ Disposal
Trained Electricians	■ Installing the electrics ■ Rectifying electrical faults
Trained Persons	■ Operation ■ Storage ■ Transportation

Tab. 3: Personnel qualification

3 Intended use

3.1 Notes on product warranty

Any non-designated use of the device can impair its function and the protection provided. This leads to invalidation of any warranty claims!

Please note that liability is on the side of the user in the following cases:

- The water sampling station is operated in a manner which is not consistent with these operating instructions, particularly safety instructions, handling instructions and the section "Intended Use".
- Information on usage and environment (see section 5 „Technical data“ on page 11) is not adhered to.
- If people operate the device who are not adequately qualified to carry out their respective activities.
- Unauthorised changes are made to the device.

3.2 Intended purpose

The water sampling station **EASYPRO 1** is used for the treatment of process water.

The operational safety of the product supplied can only be ensured if it is used for its intended purpose. All other types of use are prohibited and will invalidate the warranty.

The controller on the water sampling station monitors the current measured values during water treatment and controls the dosing systems connected for water treatment. In this way, the controller ensures constant water values in various applications. Its main application is to ensure water quality by evaluating the measurement.

3.3 Foreseeable misuse

The following section provides information regarding the device applications which are classified as non-intended use. This section is intended to allow you to detect possible misuse in advance and to avoid it.

Foreseeable misuse is assigned to the individual stages of the product lifetime:

3.3.1 Incorrect assembly

- Connecting the mains voltage without a protective earth
- Non-fused or non-standard mains voltage
- Not possible to immediately or easily disconnect the power supply
- Wrong connecting cables for mains voltage
- Sensors and actors connected to the incorrect terminals or incorrectly configured
- Protective earth removed

3.3.2 Incorrect commissioning

- Commissioning with damaged or outdated sensors
- Commissioning without the establishment of all protective measures, fastenings etc.

3.3.3 Incorrect operation

- Protective equipment not functioning correctly or dismantled
- Unauthorised modification of the controller
- Ignoring of alarm or error messages
- Elimination of alarm or error messages by insufficiently-qualified personnel
- Bridging the external fuse
- Difficult operation due to insufficient lighting or poor access to the device
- Operation not possible due to dirty or illegible display

3.3.4 Incorrect maintenance

- Carrying out maintenance during ongoing operation
- No adequate or regular inspection of correct functioning
- No replacement of damaged parts or cables
- No securing against reactivation during maintenance work
- Using the wrong spare parts

4 Product description

4.1 Scope of delivery

Please compare the delivery note with the scope of delivery. The following components are available for the product. The scope may be less for this version.

- Baseplate with fitting
- **TOPAX® L** single-channel controller
- Sample water filter
- Flow controller with integrated temperature sensor
- Flow control
- Measuring cell fitting
- Buffer solutions for calibrating the measuring cell (depending on the version)

Depending on the model, the measuring cell can be packed separately and not pre-fitted.

4.2 Design of the water sampling station

The water sampling station is fitted with the corresponding measuring technology and a **TOPAX® L**-controller. Depending on the model, it continuously measures not only the sample water temperature but also, for example, the effective chlorine content, the pH value, the Redox value, turbidity, the amount of dissolved oxygen, the total chlorine content or the conductivity, with the help of a sensor.

The water sampling station can therefore be used for the treatment of process water.

The following figure shows a **EASYPRO 1** water sampling station with a **TOPAX® L CH/CD**. Your water sampling station may differ in terms of scope and fittings.

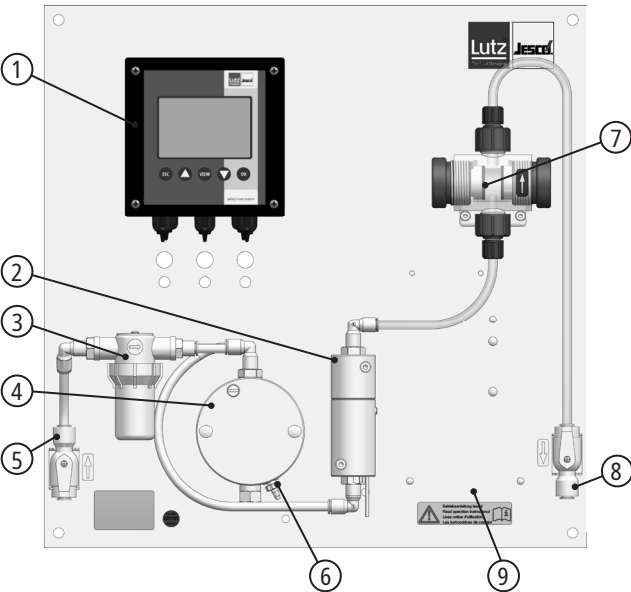


Fig. 1: Water sampling station **EASYPRO 1** (with **TOPAX L® CH/CD**)

Item	Description
1	TOPAX® L Single-channel controller
2	Flow control
3	Sample water filter
4	Flow controller
5	Inflow tap
6	Extraction point
7	Measuring point
8	Outflow tap
9	Space for the buffer solution bracket (depending on the model)

Tab. 4: Legend for the water sampling station

4.3 Structure of the flow controller

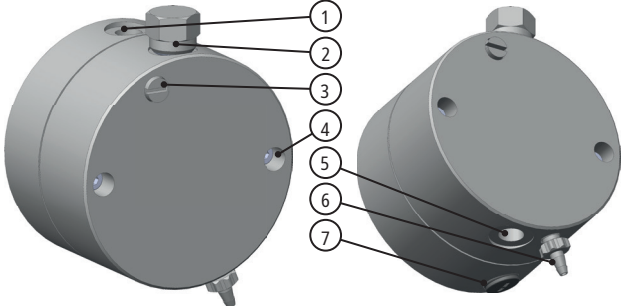


Fig. 2: Structure of the flow controller

Item	Description
1	Outlet connection
2	Inlet connection above (with sealing plugs)
3	Setting screw
4	Fixing screws
5	Inlet connection below
6	Extraction point
7	Temperature measurement point (with sealing plugs)

Tab. 5: Legend for the flow controller

4.4 Control panel

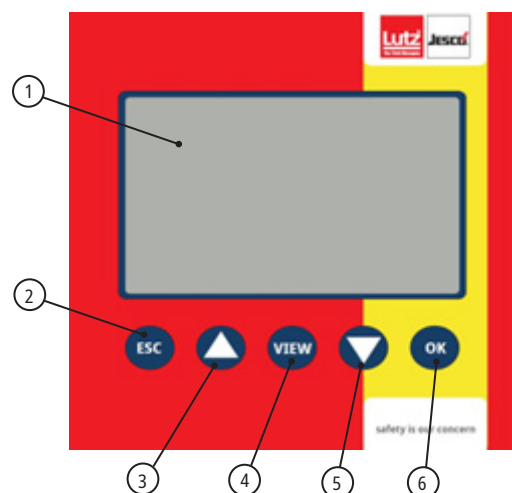


Fig. 3: Control panel

Item	Description
1	LCD display
2	Cancel action or exit menu
3	Move up or increase the value (▲)
4	Select view
5	Move down or decrease the value (▼)
6	Confirm action or open the menu

Fig. 4: Legend for the control panel

4.5 Standard view

The standard view of the device is split into two sections:

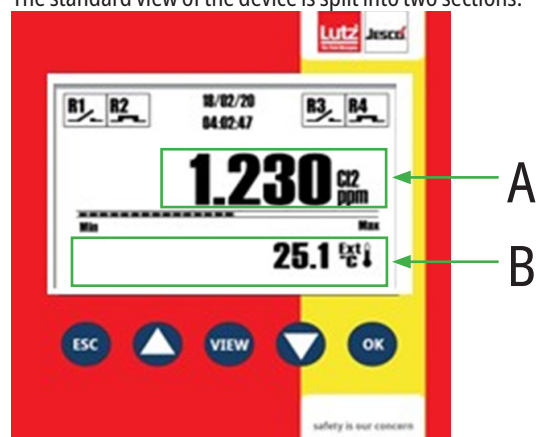


Fig. 5: Standard view

- A: The measured value along with the configured parameters such as the measurement type, unit, etc.
- B: Temperature value from an external sensor (ext) or a manually set value (man), as well as alarms and operational information (such as a service notification).

4.6 Rating plate of the EASYPRO 1 water sampling station

The product is labelled with information regarding its safety and operation. The information must stay legible for the duration of the service life of the product.

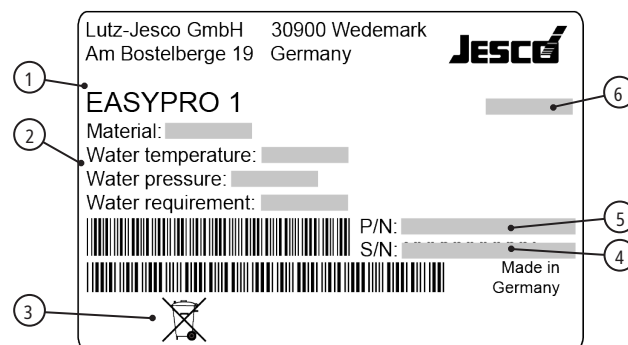


Fig. 6: Rating plate of the EASYPRO 1 water sampling station

Item	Description
1	Product name
2	Technical specification
3	WEEE label
4	Serial number
5	Part number
6	Month/year of manufacture

Fig. 7: Legend for the rating plate of the EASYPRO 1 water sampling station

4.7 Rating plate of the TOPAX® L single-channel controller

The **TOPAX® L** single-channel controller is also labelled with information regarding its safety and operation. The information must stay legible for the duration of the service life of the product.

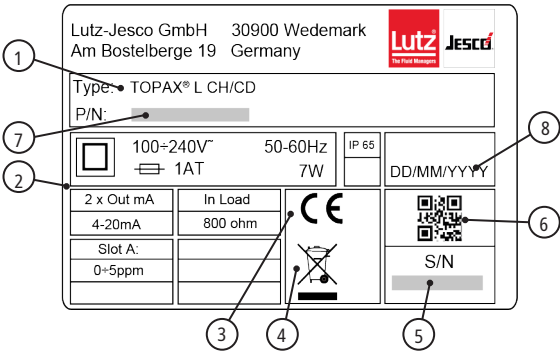


Fig. 8: Rating plate of the TOPAX® L single-channel controller

Item	Description
1	Product name
2	Technical specifications
3	Label showing conformity with applicable European directives
4	WEEE label
5	Serial number
6	QR code for the serial number
7	Part number
8	Production date

Tab. 6: Legend for the rating plate

5 Technical data

5.1 Environmental conditions

Storage temperature	-25 to 65 °C
Ambient temperature	-10 to 50 °C (no direct sunlight)
Emissions	Specifications in accordance with EN 55011 Class A
Relative humidity	0 – 100 % condensing
Protection	IP65

Tab. 7: Environmental Conditions

5.2 Hydraulic specifications

Sample water requirement	CS120 measuring cell	approx. 45 l/h
	Other measuring cells	approx. 30 l/h
Sample water inflow and discharge	PE hose 6/8 mm + stop valve with G 1/4" (M) connection	
Pressure resistance	■ Water inflow max. 6 bar ■ Back pressure (see 5.6) ■ An air gap may be required	
Pressure loss in the water sampling station	ca. 0.3 bar	
Mesh size sample water filter	300 µm	
Sample water temperature (depending on the version)	Min. 5 °C	
	Max. 45 °C or 65 °C	

Tab. 8: Hydraulic Specifications

5.3 Electrical specifications

Power supply (100 – 240 V AC version)	
Electrical requirements	100 to 240 V AC ± 10 %, 8 W)
Frequency	50 to 60 Hz
Power supply fuse	Fuse glass body 5 x 20 mm, T1.25AL250V
Short-circuit protection	Active
Power supply (24 – 48 V DC version)	
Electrical requirements	24 to 48 V DC, or 24 V AC ± 20 %, 8 W
Power supply fuse	Fuse glass body 5 x 20 mm, T1.25AL250V
Short-circuit protection	Active
Reverse polarity protection	Active

Relay outputs	
RL1, RL2, RL3 and RL4	2-SPST mechanical 250 V AC/ 5 A, 30 V DC/3 A
Relay RL1, RL2 configuration	Load activation
Relay RL3, RL4 configuration	Load activation, probe cleaning (RL3 only), alarm repetition
Cycle time	1 – 3600 s
Delay time	1 – 3600 s
Test mode	ON, OFF

SSR outputs (solid state relay)	
SSR1 and SSR2	2-SPST 60 V, max 100 mA, bidirectional, NPN, PNP
Resistance when switched ON	max. 5 Ω
Leakage current when switched OFF	max. 1 µA
Configuration SSR1 and SSR2	Pulse output
Frequency range	0 to 400 imp/min.
Pulse duration	100 ms
Test mode	0 to 400 imp/min.

Outputs 4 – 20 mA	
Analogue output signals	2 outputs 4 – 20 mA, galvanically isolated from each other and from the power supply.
Measurement error	± 0.01 mA
Load	max. 800°Ω
Fault state	NAMUR: OFF, 3.6 mA, 22 mA
Test mode	3 to 23 mA

Digital inputs	
REED digital input	Input for potential-free contact, 5 V DC, max. 6 mA

Communication ports	
Digital communication port RS485	Modbus Server ASCII/RTU standard protocol

Output 24 V DC	
Volt	24 V DC ± 5 %, max. 250 mA ¹
Short-circuit protection	Self-resettable fuse

Tab. 9: Electrical specifications

¹ To prevent damage to the device, DO NOT exceed the maximum permissible current.

User interface	
Connection terminals	Removable screw terminals AWG 14 < 2.5 mm ²
Machine cycle time	approx. 1 s
Control panel	5 tactile feedback keys
Display	Graphic LCD with 128x128 pixels, FSTN, transreflective
Refresh display	500 ms
Backlight	White, green and red with energy-saving function

Tab. 10: User interface

5.4 Measurement specifications

pH/Redox specifications	
pH range	0.00 to 14.00 pH
mV range	-2,000 to 2,000 mV
pH resolution	0.01 pH
pH accuracy	± 0.01 pH
mV resolution	1 mV
mV accuracy	± 1 mV
Input impedance	> 1012

Tab. 11: pH/Redox specifications

Conductivity/resistance specifications	
Range with C 0.01 cm-1 / K 100 sensor	0.005 µS/cm to 200 µS/cm (5 KΩ x cm to 200 MΩ x cm)
Range with C 0.10 cm-1 / K 10 sensor	0.05 µS/cm to 2 mS/cm (500 Ω x cm to 20 MΩ x cm)
Range with C 0.20 cm-1 / K 5 sensor	0.1 µS/cm to 4 mS/cm (250 Ω x cm to 10 MΩ x cm)
Range with C 1.00 cm-1 / K 1 sensor	0.5 µS/cm to 20 mS/cm (50 Ω x cm to 2 MΩ x cm)
Range with C 10.0 cm-1 / K 0.1 sensor	5 µS/cm to 200 mS/cm (5 Ω x cm to 200 KΩ x cm)
Range with C 20.0 cm-1 / K 0.5 sensor	10 µS/cm to 400 mS/cm (2.5 Ω x cm to 100 KΩ x cm)
Cond./resist. resolution	0.0001 / 0.001 / 0.01 / 0.1 / 1 (adjustable in the menu)
Cond./resist. accuracy	± 2 % on the measuring point
Maximal length of the sensor cable	Up to 50 m
TDS range	0.3 to 2.0 ppm/µS

Tab. 12: Conductivity/resistance specifications

mA input specifications	
Sensor type	Sensor with two or three wires
Sensor power supply 4/20 mA 2 wires	(*) 18 V DC ± 5 %, max 30 mA
Short-circuit protection	Active
Measuring range	0 to 20 mA or 4 to 20 mA
Fault state	OFF, 3.6 mA, 22 mA
Resolution	1 µA
Accuracy	± 0.2 %

Tab. 13: mA input specifications

* To prevent damage to the device, DO NOT exceed the maximum permissible current.

Pt100/Pt1000 specifications	
Temperature input	Pt100/Pt1000
Pt100/Pt1000 detection	Automatic
Fault state	Automatic detection of disconnected/damaged probe
Supply current	1 mA
Range for temperature measurement	-50.0 to 150.0 °C
Maximum length of the sensor cable	10 to 20 m depending on sensor
Temperature resolution	0.1 °C (°F)
Temperature accuracy	Pt100: ± 0.5 °C Pt1000: ± 0.2 °C

Tab. 14: Pt100/Pt1000 specifications

5.5 Mechanical specifications TOPAX L

Housing dimensions (W x H x D)	144 x 144 x 122.5 mm
Front frame (W x H)	144 x 144 mm
Weight	1.05 kg
Material	ABS/polycarbonate
Protection	IP65
Relative humidity	0 – 100 % condensing

Tab. 15: Mechanical specifications

5.6 Measuring cells

Technical data for connecting a **TOPAX® L** controller.

5.6.1 Amperometric 3- and open 2-electrode measuring cell

Description	CS120	
Measuring input	all oxidizing ions	
Measuring electrode	Platinum	
Reference electrode	-	
Counter electrode	Copper	Silver
Measuring range	0 – 20 mg/l Cl ₂	
Transfer/slope	20 – 30 µA / mg/l	
Electrolyte	Sample water	
Electrical connection	Free wire end	
Hydraulic connection	G5/8"	
Pressure range	0 – 6 bar	
Flow rate	40 – 50 l/h	
Measuring principle	Amperometric open 2-electrode measuring cell	

Tab. 16: Amperometric 3- and open 2-electrode measuring cell

5.6.2 Membrane-covered measuring cell for measuring free chlorine

Description	CI 4.2			
Measuring input	free chlorine			
Measuring range	0.00 – 0.50 mg/l	0.01 – 2.00 mg/l	0.05 – 5.00 mg/l	0.05 – 10.00 mg/l
Transfer/slope	4 – 20 mA			
Electrolyte filling	Yes, in the diaphragm cap			
Connection	Free wire end			
Pressure range	0 – 0.5 bar			
Flow rate	30 l/h			
Measuring principle	Amperometric membrane-covered cell measuring cell			

Tab. 17: Membrane-covered measuring cell for measuring free chlorine

5.6.3 Membrane-covered measuring cell for measuring chlorine dioxide

Description	CD 4.2	
Measuring input	Chlorine dioxide	
Measuring range	0.00 – 0.5 mg/l	0.01 – 2.00 mg/l
Transfer/slope	4 – 20 mA	
Electrolyte filling	Yes, in the diaphragm cap	
Connection	Free wire end	
Pressure range	0 – 0.5 bar	
Flow rate	30 l/h	
Measuring principle	Amperometric membrane-covered measuring cell	

Tab. 18: Membrane-covered measuring cell for measuring chlorine dioxide

5.6.4 Membrane-covered measuring cell for measuring total chlorine

Description	GCM		
Measuring input	Total chlorine		
Measuring range	0 – 2 mg/l	0 – 5 mg/l	0 – 10 mg/l
Transfer/slope	4 – 20 mA		
Electrolyte filling	Yes, in the diaphragm cap		
Connection	Free wire end		
Pressure range	0 – 1 bar		
Flow rate	30 l/h		
Measuring principle	Amperometric membrane-covered measuring cell		

Tab. 19: Membrane-covered measuring cell for measuring total chlorine

5.6.5 Measuring cell for conductivity measurement (conductive)

Description	Value
Measuring range	max. 100 mS/cm (5 % salt content), depending on input module
C factor	1
Electrical connection	M12x1 plug (A-coded)
Pressure range	0 – 6 bar
Measuring principle	Conductivity measurement (conductive)
Temperature measurement	Integrated Pt100

Description	Value
Hydraulic connection	PG 13.5
Installation dimension	120 x 12 mm

Tab. 20: Measuring cells for conductivity measurement

5.6.6 Measuring cell for measuring the pH value

Description	PE110			
Measuring input	pH value			
Measuring range	0 – 14 pH		2 – 12 pH	
Connection	N attachment head with screw-in thread PG 13.5			
Max. pressure	6 bar		6 bar with pressure cap	6 bar
Temperature range	0 – 80 °C	0 – 130 °C	0 – 60 °C	0 – 50 °C
Installation dimension	120 x 12 mm		180 x 12 mm	120 x 12 mm

Tab. 21: Measuring cells for measuring the pH value

5.6.7 Measuring cell for measuring the Redox value

Description	ME110	
Measuring input	Redox value	
Measuring range	0 – 1000 mV	
Connection	N attachment head with screw-in thread PG 13.5	
Max. pressure	6 bar	0.6 bar
Temperature range	0 – 80 °C	0 – 50 °C
Installation dimension	120 x 12 mm	

Tab. 22: Measuring cell for measuring the Redox value

5.6.8 Measuring cell for measuring turbidity

Description	TR 100
Materials	Black PVC housing with special optics made of oleophobic glass, FPM and silicone seals
Measuring range	0,00 – 10,00 NTU or 0,0 – 100,0 NTU
Accuracy	± 1 % f.s. @ 10.00 NTU / ± 5 % f. s. @ 100.0 NTU
Response time	t ₉₀ < 60 s
Temperature range	0 – 50 °C
Pressure range	0 – 4 bar
Update interval	< 1 s
Measuring method	90° scattered light / EN 27027
Protection class	IP68

Tab. 23: Measuring cell for measuring turbidity

5.6.9 Measuring cell for measuring dissolved oxygen

Description	DO20
Measuring range	0.00 – 20.00 mg/l (ppm)
Accuracy	< 3 % of the measured value at 100 % saturation (25 °C / 1013 hPa)
Reaction time	t ₉₀ < 60 s
Ambient conditions	0 – 50 °C
Pressure range	0 – 5 bar
Temperature	0 – 50 °C
Sampling interval	3 s
Storage temperature	-10 to + 60 °C
Protection class	IP68
Compensation air pressure	10 – 2000 hPa
Compensation temperature	-10 to + 60 °C

Tab. 24: Measuring cell for measuring dissolved oxygen

5.6.10 Other measuring cells

Description	Free bromine		Hydrogen peroxide	Chlorite
	BR 1	BR 1	WP7	MST 1
Measuring range	0.01 – 2.00 mg/l	0.05 – 5.00 mg/l	0.5 – 200.00 mg/l	0.01 – 2.00 mg/l
Transfer/slope	4 – 20 mA			
Electrolyte filling	Yes, in the diaphragm cap			
Connection	Free wire end			
Pressure range	0 – 0.5 bar			
Flow rate	30 l/h			
Measuring principle	Membrane-covered measuring cell			

Tab. 25: Other measuring cells

6 Dimensions

All dimensions in mm

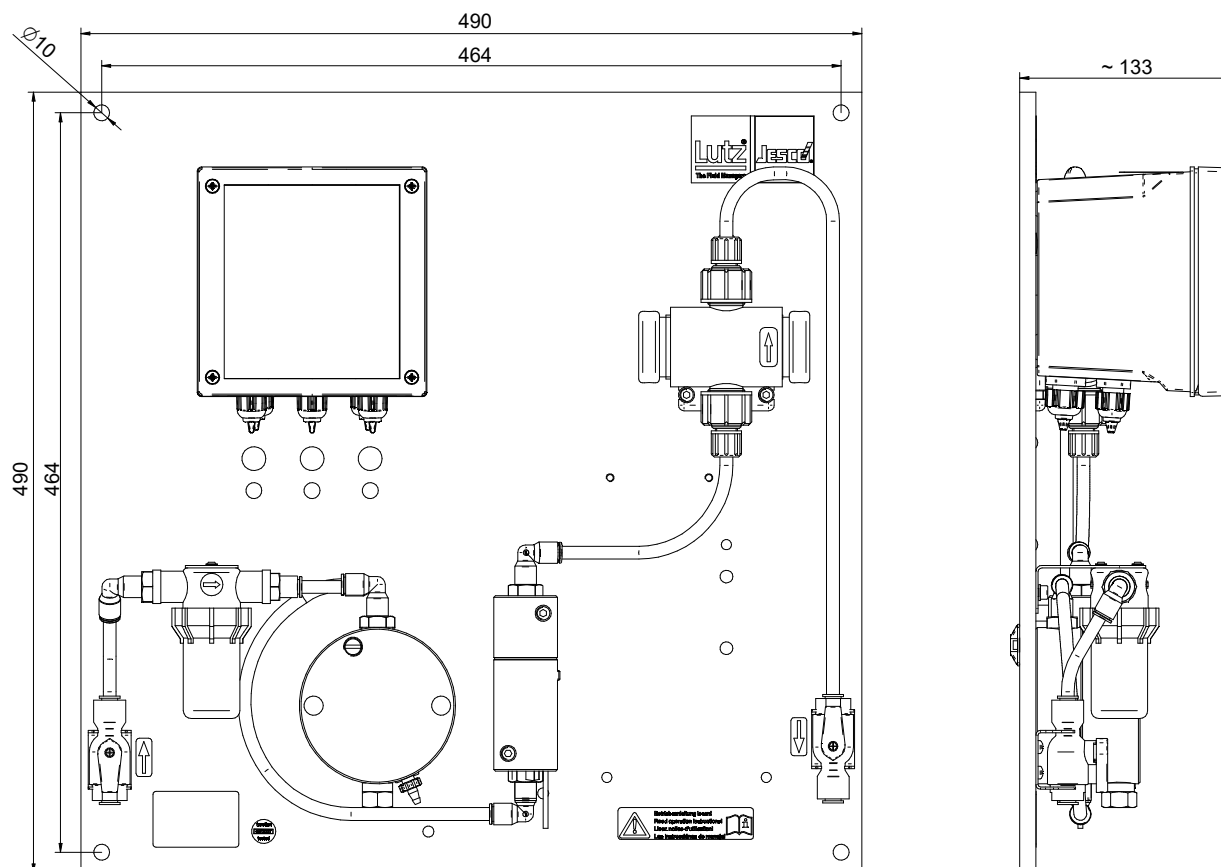


Fig. 9: Dimensions

7 Installation

7.1 Installation location of EASYPRO 1 water sampling station

This section takes you through the installation step by step. The following criteria must be taken into account when selecting the assembly location:

- The installation surface is even.
- The installation height is chosen so that the display of the controller is at eye level for the user.
- Plan to leave free space for installation of the cable next to / over the device. You must be able to install the cables without kinking or damaging them.
- The sample water must reach the water sampling station from the extraction point in as short a distance as possible in order to avoid measured value deviations.
- Various lines (e.g. voltage supply, data cable and sensitive lines for measuring purposes) must be installed separately. The different lines should only cross at 90° so as to prevent falsifications.
- Avoid direct sunlight or heat radiation.

7.2 Wall mounting

Resources required:

- ✂ Mounting set
- ✂ Masonry drill 10 mm
- ✂ (2x) Open-end spanner AF 13

The position of the fastening point is to be inferred from the dimensioned drawing in section 6 „Dimensions“ on page 16. All 6 drill-holes have to be used. The wall panel is clamped on the mounting bolts between two nuts with washers. The unevenness of the wall can be levelled out by adjusting the nuts until the wall panel is kept level and free from tension.

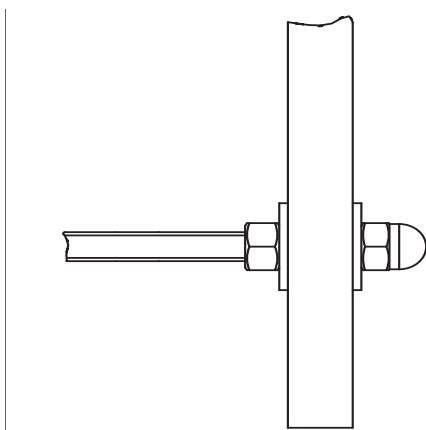


Fig. 10: Wall mounting

7.3 Hydraulic installation

This section takes you step by step through the installation of the hose connections to the water sampling station.



PLEASE NOTE

Hydraulic distortion of the measurement results

Incorrect installation of the hydraulic lines can distort the measurement results. As a result, the controlling of connected systems and control points may be faulty.

- ⇒ Comply with all the guideline instructions for installing the water sampling station and connected products.
- ⇒ Only use hose connections made from polyethylene (PE) with a diameter of 6/8 mm.
- ⇒ Prevent misrepresentations of the sample water en route to the water sampling station by taking the sample water 30 cm above the bottom of the tank or in the centre of the water pipe. The extracted sample water must reach the water sampling station within a short space of time, thereby arriving with a pressure of 0.2 bar.
- ⇒ If the extraction or supply of the sample water does not satisfy these requirements, an external sample water pump must be installed before the water sampling station.
- ⇒ If you expect heavy soiling (e.g. leaves, coarse, small floating materials, etc.) in the sample water, use an external pre-filter. It helps you prevent blockages in the water sampling station.

Pre-conditions for actions:

- ✓ The wall mounting and electrical installation have been successfully completed.

Perform the following work steps:

1. Connect the extraction point of the sample water to the inflow tap (item 5 in Fig. 1 on page 8) by plugging the hose into the inflow tap.
2. Connect the return-flow hose of the sample water to the outflow tap (item 8 in Fig. 1) by plugging the hose into the outflow tap.

- ✓ **Hydraulic of the water sampling station successfully installed.**

7.4 Installation of TOPAX® L single-channel controller

Make sure that the installation location complies with the following requirements:

- The display is easily accessible and is visible.
- Leave space for installing cables underneath the device. You must be able to install the cables without kinking or damaging them.
- Various lines (e.g. voltage supply, data cable and sensitive lines for measuring purposes) must be installed separately. The different lines should only cross at an angle of 90° to prevent interference.
- Electrical, magnetic and electromagnetic fields affect signal transmission and can destroy electronic components.
- Compliance with the permissible ambient temperatures (see section 5 „Technical data“ on page 11).

7.5 Connecting the power supply

If possible, keep any live signal and control cables at a distance and lay them separately (these could cause inductive disturbances, especially for the analogical part of the system).

Absolutely avoid connecting the device to a power supply that has been modified (for example, using transformers) and where the same power supply is also used to power other systems (e.g. of inductive type). This could lead to high voltage spikes, which are difficult to block and/or eliminate once emitted.

DANGER

Mortal danger from electric shock!

Improperly installed or damaged components in the electronics installation can cause injury.

- ⇒ The electrical line must be equipped with an appropriate circuit breaker, in compliance with the proper installation standards.
- ⇒ The power supply and the quality of the grounding connector must be checked to avoid electrical interference.

7.6 Installation recommendations

7.6.1 RC protection for relays

When connecting to the relays, note that inductive loads must be suppressed. If this is not possible, the relay contact on the device terminal must be protected by an RC protective circuit / interference suppression element.

If devices with inductive loads from a nominal current of 1 A are connected to a relay, the contacts in the relay may become bonded. Thus, the device will operate in an uncontrolled manner. To prevent bonding if the load circuit suffers a short-circuit, the relays must be protected separately on the maximum relay switching current.

Pre-conditions for actions:

- ✓ You want to connect an inductive load to the relay.

Perform the following work steps:

1. Switch off the device.
2. Clamp the interference suppression element parallel to the inductive load.
3. If you cannot perform step 2, clamp the interference suppression element parallel to the relay output.

- ✓ **RC protection for relay connected.**



PLEASE NOTE

Danger

Failure to observe this note may lead to risk to the device and its function.

- ⇒ When a relay output is used to operate a third-party device with an inductive/capacitive load input (such as contactors, motors, etc.), overvoltage protection is highly recommended. Check the options of the third-party devices (see Fig. 12 „Relay cable segregation“ on page 18).

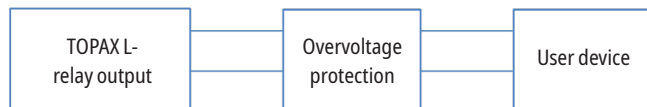


Fig. 11: Overvoltage protection

Keep the relay output cable separate from any other cable connected to the device (see **a** in Fig. 12). A 90° crossing between the cables is allowed (see **b** in Fig. 12).

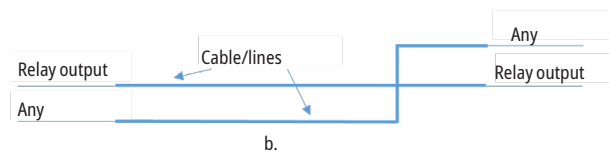
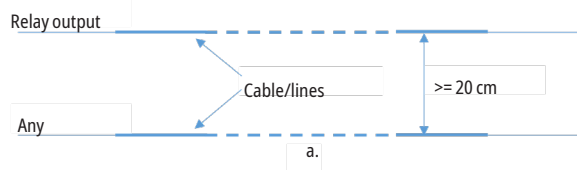


Fig. 12: Relay cable segregation

7.7 Terminal block

L / + N / -		RL 1 COM		RL 1 NO	RL 2 COM	RL 2 NO	RL 3 COM	RL 3 NO	RL 4 COM	RL 4 NO
1	2	3	4	5	6	7	8	9	10	

11	12	13	14	15	16	17	18
NC	NC	RS485 B+	RS485 A-	RS485 GND	NC	NC	NC

19	20	21	22	23	24	25	26
OUT 24VDC	GND	RTD OUT+	RTD IN+	RTD IN-	RTD OUT-	REED	REED

27	28	29	30	31	32	33	34
SSR1+	SSR1**	SSR2+	SSR2**	OUT mA1+	OUT mA1-	OUT mA2+	OUT mA2-

SLOT A	A	B	C	D	E	F
--------	---	---	---	---	---	---

Fig. 13: Terminal block

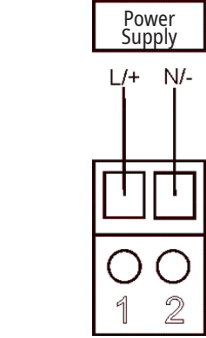
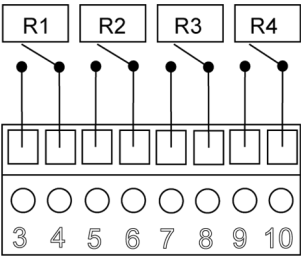
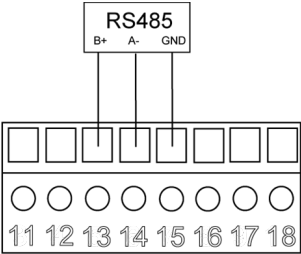
Terminal	Terminal designation		Description
1	L / +		Power supply
2	N / -		
3	RL1	COM	Relay 1 contact
4		NO	
5	RL2	COM	Relay 2 contact
6		NO	
7	RL3	COM	Relay 3 contact
8		NO	
9	RL4	COM	Relay 4 contact
10		NO	
11 – 12	Not used		Not used
13	RS485	B+	Communication port RS485 MODBUS RTU/ASCII
14		A-	
15		RS485 GND ¹	
16 – 18	Not used		
19	OUT 24 V DC	+	
20		GND	
21	RTD	OUT +	
22		IN +	
23		IN -	
24		OUT -	
25	REED	+	
26		-	
27	SSR1	+	
28		-	
29	SSR 2	+	
30		-	
31	OUT mA1	+	
32		-	
33	OUT mA2	+	
34		-	

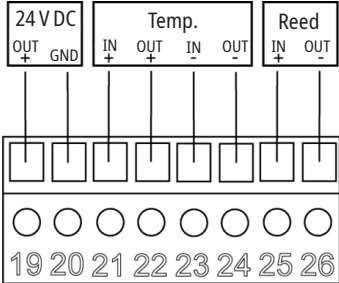
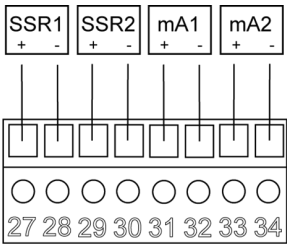
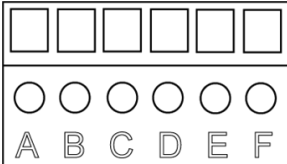
¹RS485 GND terminal is isolated from GND (terminal 20)

Terminal	Terminal designation	Description
A	The connections depend on the existing modules. For specific connections, see the section for the corresponding measurements.	
B		
C		
D		
E		
F		

Tab. 26: Terminal assignment

7.7.1 Terminal connections

Description	Graphic
Power supply of the device: 100 – 240 V AC or 24 – 48 V DC (24 V AC) Note: Check the product label.	
Outputs: R1, R2, R3 and R4: Electromechanical relays (250 V AC or 30 V DC, 5 A resistive)	
Communication ports: RS485: Serial port for data transmission	

Description	Graphic
Inputs and outputs: 24 V OUT: Voltage supply Temperature: Pt100/Pt1000 sensor input Reed: Dry contact signal input	
Outputs: SSR1 and SSR2: Frequency outputs mA1 and mA2: 4 – 20 mA current sensors	
Slot A: The connections depend on the existing modules. For specific connections, see the section for the corresponding measurements.	

Tab. 27: Terminal connections

7.7.2 Connecting the sensors

- ✓ Switch off the device.
 - ✓ Do not lay the cable near high-power or inverter cables to avoid interference with the measurement.
- ➔ Connect the cable of the sensor to the terminal strip of the device.

7.7.2.1 Connecting a pH/Redox sensor (TOPAX L PH/RD)

- ✓ Observe the polarity.
 - ✓ Observe the maximum cable length (10 m) for the pH/Redox sensor.
- ➔ Connect the sensor to the connecting terminals.

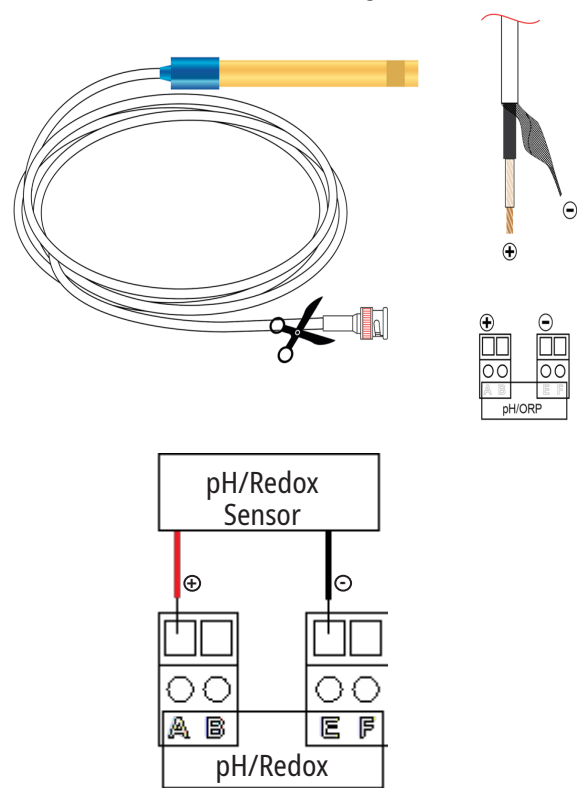


Fig. 14: Connecting a pH/Redox sensor

Terminal	Description
A	Input of the pH/Redox sensor (+)
B	Not used
C	None
D	None
E	Input of the pH/Redox sensor (-)
F	Not used

Tab. 28: Connecting a pH/Redox sensor

7.7.2.2 Connecting a conductivity sensor (TOPAX L LF)

- ✓ Observe the polarity.
 - ✓ Observe the maximum cable length (50 m) for the conductivity sensor.
- ➔ Connect the sensor to the connecting terminals.

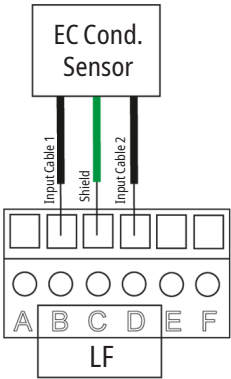


Fig. 15: Connecting a conductivity sensor

Terminal	Description
A	Not used
B	Input of the conductivity sensor
C	Conductivity cable shield
D	Input of the conductivity sensor
E	Not used
F	Not used

Tab. 29: Connecting a conductivity sensor

7.7.2.3 Connecting a 0/4 – 20 mA sensor (TOPAX L MA)

- ✓ Observe the polarity.
- ➔ Connect the sensor to the connecting terminals.

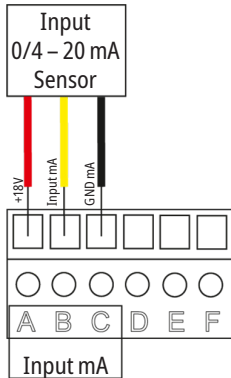


Fig. 16: Connecting a 0/4 – 20 mA sensor

Terminal	Description
A	+18 V power supply output for the sensor
B	Current input from sensor (0/20 mA or 4/20 mA)
C	GND mA used to connect the three-wire sensors
D	Not used
E	Not used
F	Not used

Tab. 30: Connecting a 0/4 – 20 mA sensor

7.7.2.4 Connecting an amperometric copper-platinum chlorine sensor (TOPAX L CH/CD)

- ✓ Observe the polarity.

➔ Connect the sensor to the connecting terminals.

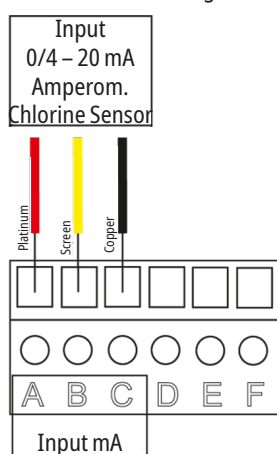


Fig. 17: Connecting an amperometric copper-platinum chlorine sensor

Terminal	Description
A	Working electrode or measuring electrode (platinum)
B	Conductivity cable shield
C	Reference electrode (copper)
D	Not used
E	Not used
F	Not used

Tab. 31: Connecting an amperometric copper-platinum chlorine sensor

7.7.3 Connection examples

7.7.3.1 Power supply

- ✓ 24 – 48 V DC or 100 – 240 V AC; see product label
- ✓ Observe the polarity.
- ✓ Observe maximum power consumption (see 5.3 „Electrical specifications“ on page 11).

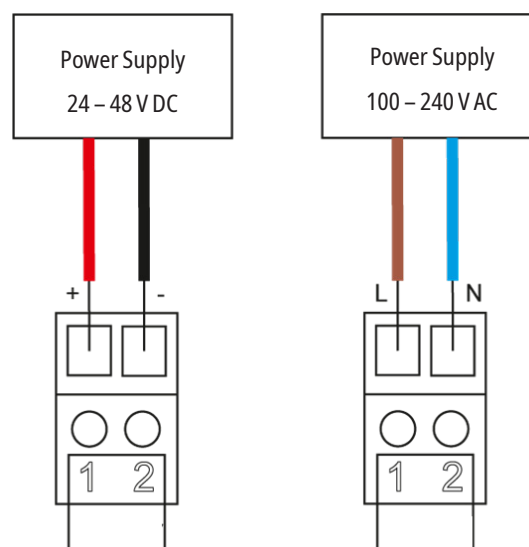


Fig. 18: Connection example for the power supply

7.7.3.2 Frequency outputs SSR1 and SSR2

✓ Contact closed 5 Ω.

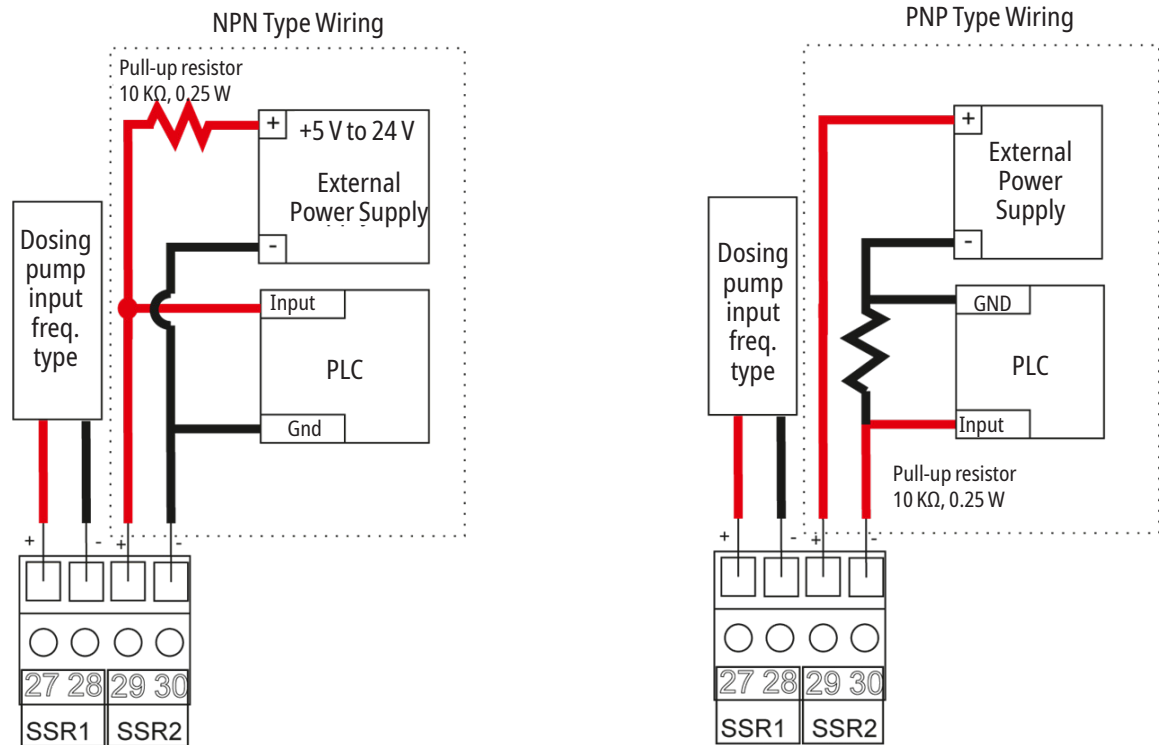


Fig. 19: Connection example for frequency outputs SSR1 and SSR2

7.7.3.3 Relay outputs 1, 2, 3 and 4

✓ Maximum load 5 A resistive.

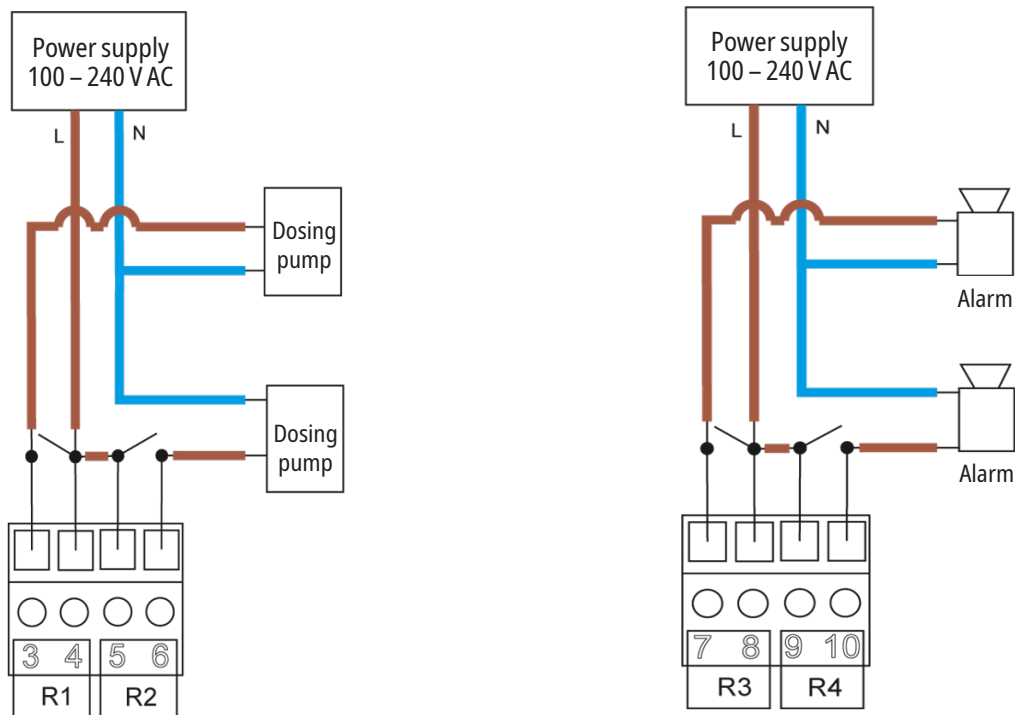


Fig. 20: Connection example for relay outputs 1, 2, 3 and 4

7.7.3.4 Current outputs mA 1 and 2

- ✓ 4 – 20 mA with a maximum load of 800 K Ω .
- ✓ Observe the polarity of the cables.

7.7.3.5 RS485 communication port

- ✓ Communication protocol ModBus RTU/ASCII.
- ✓ Add 120 Ω termination resistor between A and B.
- ✓ Observe the polarity of the cables.

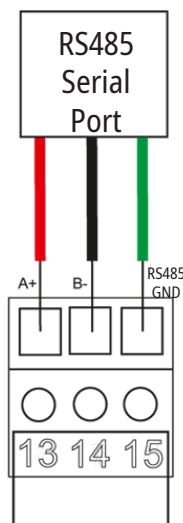


Fig. 21: Connection example for RS485 communication

7.7.3.6 Reed sensor input

- ✓ Input for dry contact or semiconductor (open collector) 5 V DC, max. 6 mA.
- ✓ Observe the maximum cable length (20 m) for the reed sensor.

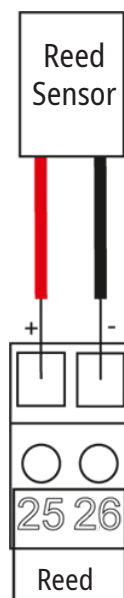


Fig. 22: Connection example for reed sensor

7.7.3.7 Input for temperature measurement

- ✓ Connect the sensor to the connecting terminals.
- ✓ Observe the polarity.
- ✓ Observe the maximum cable length (20 m) for the Pt100/Pt1000 sensor.
- ✓ Note the wiring of the sensor (2, 3 or 4 wires).
- ✓ Select 2/4 or 3 wires in sub-menu 2C1.

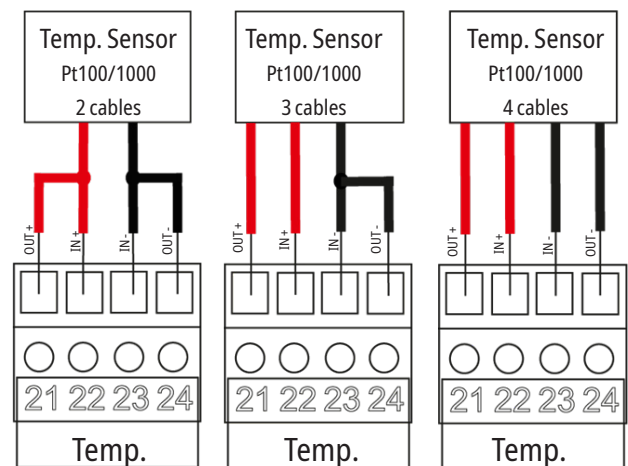


Fig. 23: Connection example for temperature measurement input

8 Start-up

The device performs a hardware test of the internal memory and displays the message "Read Data Memory".

The device activates all measuring functions within 5 seconds.

8.1 Displaying measured values and outputs

In view mode, you can toggle between the following views by pressing the **VIEW** button:

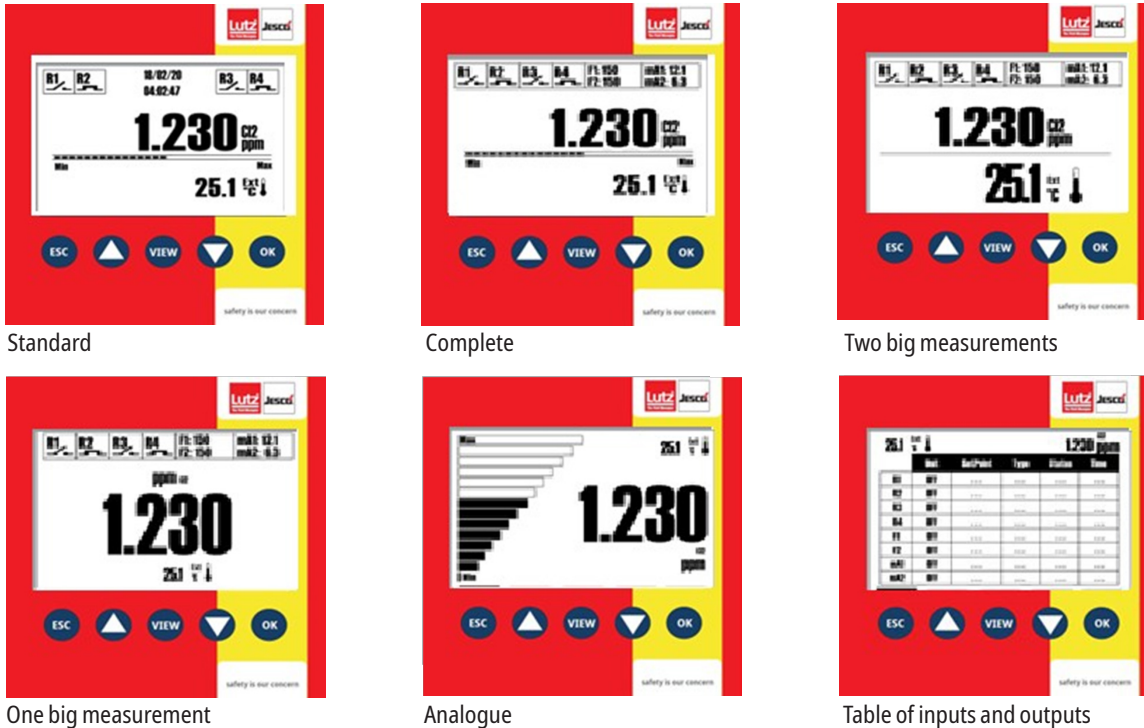


Fig. 24: View types

8.2 Displaying the menu

In view mode, you can display the menu as follows:

1. Press the **ESC** button.
 - ▶ The device displays a message asking whether you want to deactivate the outputs.
 2. Press the **ESC** button again.
- ✓ **The menu is displayed.**



When an alarm is displayed, briefly press the **OK** button to navigate to sub-menu 4B **Alarm**.

1. Open the inflow tap (item 5 in Fig. 1 on page 8) and the outflow tap (item 8 in Fig. 1 on page 8) on the water sampling station.
2. Adjust the flow volume using the setting screw of the flow controller.

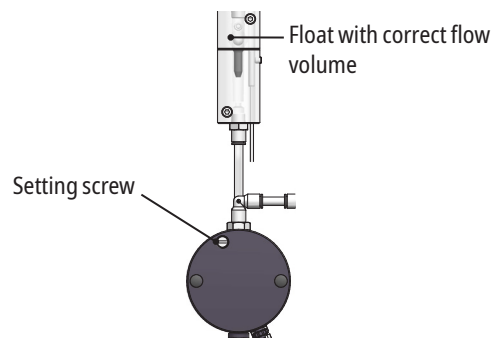


Fig. 25: Setting the flow controller

8.3 Setting the flow controller

The first step during start-up is the setting of the flow volume on the flow controller. Proceed as follows.

Pre-conditions for actions:

- ✓ The installations of the water sampling station, the electrics, the hydraulics and the measuring cell have been performed successfully.

3. Read off the flow volume on the flow control (item 2 in Fig. 1 on page 8). It has been set correctly if the upper level of the float lies against the notched marking.

- ✓ **Flow controller set.**

Perform the following work steps:

9 Calibration

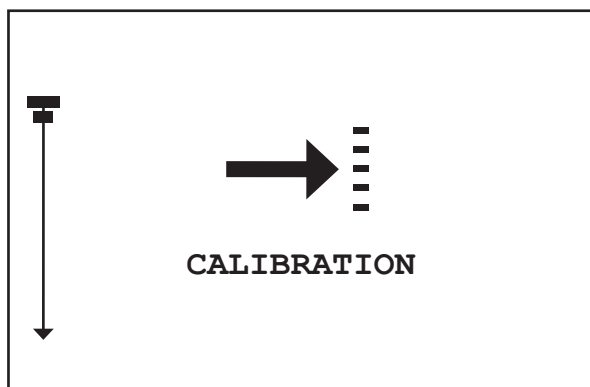


Fig. 26: Menu 1 Calibration



In view mode, press and hold the **OK** button for 3 seconds to go directly to the calibration menu.

9.1 Calibrating a pH and Redox measurement (1A)

Menu 1 **Calibration** enables the calibration of pH and Redox measurements.

Choose **Measure A** to access the following sub-menus:

Sub-menu		Description
1A1	Automatic	The device requires the standard buffer solutions 7 pH, 4 pH or 9.22 pH.
1A2	Manual	The device proposes the buffer solutions from the default values, but the value can be changed.
1A3	Reference	The calibration of the pH or Redox measurement can be set manually with an external reference value. The device corrects the value by adding an offset value to the real measurement.
1A4	Report	Displays a summary of the last calibration.
1A5	Cal. Reset	The calibrations can be deleted and the default values restored.

Tab. 32: Measure A sub-menus for calibrating a pH/Redox measurement

9.1.1 Calibrating a pH measurement

Pre-conditions for actions:

- ✓ Two buffer solutions are ready.



It is best to select your buffer solution to include the subsequent setpoint. Standard buffer solutions with pH 4 and pH 7 are included in the scope of delivery for the sampling stations to perform initial adjustment during commissioning.

- ✓ The sensor is ready to operate.

Perform the following work steps:

1. Choose the sub-menu for manual pH calibration (1A2).
2. Shut off the sample water.
3. Unscrew the pH single-rod measuring cell from the water sampling station.
4. Rinse the pH single-rod measuring cell with water and dab it dry. Rubbing can cause electrical discharge on the glass membrane, which results in a delayed display.
5. Introduce the dry pH single-rod measuring chain in the 7.00 pH buffer solution.
6. Set the buffer solution value using the **▲** and **▼** buttons.
7. After setting the value, press **OK**.
8. Hold the pH single-rod measuring cell firmly in the buffer solution.
 - ▶ The device displays the quality percentage for the selected buffer solution.
9. Wash the pH single-rod measuring cell with clear water and let it drip off.
10. Insert the dry pH single-rod measuring cell into the 4.00 pH buffer solution or select the value used.
11. After setting the value, press **OK**.
12. Hold the pH single-rod measuring cell firmly in the buffer solution.
13. The device displays the percentage of quality of the buffer solution used for calibration.



100 %: excellent sensor quality
75 %: good sensor quality
50 %: sufficient sensor quality
25%: poor sensor quality; replacement is recommended

14. Enter the calibration date and confirm with **OK**.

✓ pH measurement calibrated.



The device displays a calibration error for all invalid measurements of the buffer solution. It is recommended to always use a new buffer solution and repeat the calibration procedure. If the message is still displayed, replace the pH sensor. Hold the sensor firmly in the buffer solution for the entire time period indicated by the device.

9.1.2 Calibrating a Redox measurement

Pre-conditions for actions:

- ✓ A buffer solution is on hand for calibration.

Perform the following work steps:

1. Choose the sub-menu for manual Redox calibration (1A2).
2. Shut off the sample water.
3. Unscrew the Redox single-rod measuring cell from the water sampling station.

4. Rinse the Redox single-rod measuring cell with water and dab it dry. Abrasion can generate electrical charges.
5. Hold the Redox single-rod measuring cell in the 468 mV buffer solution and move back and forth for a short time.
6. Set the buffer solution value using the ▲ and ▼ buttons.
7. After setting the value, press **OK**.
8. Hold the redox single-rod measuring cell firmly in the buffer solution for the entire time period indicated by the device.
 - ▶ The device displays the quality percentage for the 468 mV buffer solution.



100 %: excellent sensor quality
 75 %: good sensor quality
 50 %: sufficient sensor quality
 25%: poor sensor quality; replacement is recommended

9. Enter the calibration date and confirm with **OK**.

✓ **Redox measurement calibrated.**



The device displays a calibration error for all invalid measurements of the buffer solution.
 It is recommended to always use a new buffer solution and repeat the calibration procedure.
 If the message is still displayed, replace the Redox sensor.

Perform the following work steps:

1. Choose the sub-menu for 1-point calibration (1A1).
2. Shut off the sample water.
3. Unscrew the conductivity measuring cell from the measuring cell housing.
4. Dry the electrode with the cloth to prevent dilution of the buffer solution.
5. Hold the conductivity measuring cell in the buffer solution and move back and forth for a short time.
6. Check whether the sensor has been connected properly and is measuring.
7. Press **OK** to calibrate.
8. Set the calibration value using the ▲ and ▼ buttons.
9. Confirm by pressing **OK**.
 - ▶ The device displays the following:
 - Point 1: calibration value used
 - Gain: gain value calculated
 - Offset: offset value calculated
10. Select "Save" and press **OK**.
11. Select "Yes" and press **OK**.
 - ▶ The device saves the calibration parameters and returns to the calibration menu.

✓ **Conductivity measurement calibrated.**

9.2 Calibrating a conductivity measurement (1A)

Menu 1 **Calibration** enables the calibration of conductivity measurements.

Choose **Measure A** to access the following sub-menus:

Sub-menu		Description
1A1	1 point	1-point calibration
1A2	Reference	The conductivity measurement can be calibrated manually with an external reference value. The device corrects the value by adding an offset value to the real measurement.
1A3	Report	Displays a summary of the last calibration.
1A4	Cal. Reset	The calibrations can be deleted and the default values restored.

Tab. 33: Measure A sub-menus for calibrating a conductivity measurement



All calibrations must be made with absolute conductivity values, i.e. without temperature compensation.

9.2.2 Calibration report

In sub-menu 1A3, you can view all parameters for the last calibration:

Sub-menu 1A3	
Parameter	Description
Cal. Type	Displays the calibration type: ■ None ■ 1 point ■ 2 points
Point 1	Shows the value entered for point 1
Gain	Displays the angle coefficient calculated
Offset	Displays the offset value calculated
Calibration	Displays the offset value that was saved using the "Reference" calibration type. If the calibration is performed for 1 point or 2 points, the "Adjust" value is automatically set to zero.
Last calibration	Displays the date of the last calibration

Tab. 34: Explanation of parameters in calibration report

9.2.1 Calibrating a conductivity measurement

Pre-conditions for actions:

- ✓ A buffer solution is on hand for calibration.

9.2.3 Calibration errors (conductivity measurement)

Calibration error	Possible cause
Sensor shorted.	■ Damaged wiring ■ Foreign body in contact with the electrodes
Sensor is in the air.	■ Damaged wiring ■ Liquid missing
The values set must be greater than zero.	The values set using the ▲ and ▼ buttons must be positive and greater than zero.
The values set must not match.	The values set using the ▲ and ▼ buttons must not match only in the case of 2-point calibration.
The two calibration points must differ by at least 10%.	The second calibration point must be at least 10 % larger than the first calibration point.

Tab. 35: Calibration errors (conductivity measurement)

9.3 Calibrating an mA input (1A)

Menu 1 **Calibration** enables the calibration of an mA input.

Choose **Measure A** to access the following sub-menus:

Sub-menu	Description
1A1	1 point
1A2	2 points
1A3	Reference
1A4	Report
1A5	Cal. Reset

Tab. 36: Measure A sub-menus for calibrating an mA input

9.3.1 Calibrating an mA input

9.3.1.1 1-point calibration

Perform the following work steps:

1. Choose the sub-menu for 1-point calibration (1A1).
2. Check whether the sensor has been connected properly and is measuring.
3. Press **OK** to calibrate.
4. Set the calibration value using the ▲ and ▼ buttons.
5. Confirm by pressing **OK**.
 - ▶ The device displays the following:
 - Point 1: calibration value used
 - Gain: gain value calculated
 - Offset: offset value calculated
6. Select "Save" and press **OK**.

7. Select "Yes" and press **OK**.
 - ▶ The device saves the calibration parameters and returns to the calibration menu.

✓ **1-point calibration completed.**

9.3.1.2 2-point calibration

Perform the following work steps:

1. Choose the sub-menu for 2-point calibration (1A2).
2. Check whether the sensor has been connected properly and is measuring.
3. Press **OK** to calibrate.
4. Set the calibration value using the ▲ and ▼ buttons.
5. Confirm by pressing **OK**.
6. Repeat steps 4 to 9 for the second buffer solution.
 - ▶ The device displays the following:
 - Point 1: calibration value used for the first point
 - Point 2: calibration value used for the second point
 - Gain: gain value calculated
 - Offset: offset value calculated
7. Select "Save" and press **OK**.
8. Select "Yes" and press **OK**.
 - ▶ The device saves the calibration parameters and returns to the calibration menu.

✓ **2-point calibration completed.**

9.3.2 Entering a calibration reference

Perform the following work steps:

1. Choose the Reference sub-menu (1A3).
2. Check whether the sensor has been connected properly and is measuring.
3. Press **OK** to adjust the value.
4. Set the reference value using the ▲ and ▼ buttons.
5. Confirm by pressing **OK**.
6. Select "Save" and press **OK**.
7. Select "Yes" and press **OK**.
 - ▶ The device saves the reference value and returns to the calibration menu.

✓ **Calibration reference value entered.**

9.3.3 Calibration report

In sub-menu 1A3, you can view all parameters for the last calibration in the calibration report:

Sub-menu 1A3	
Parameter	Description
Cal. Type	Displays the calibration type: ■ None ■ 1 point ■ 2 points
Point 1	Shows the value entered for point 1
Point 2	Shows the value entered for point 2
Gain	Displays the angle coefficient calculated
Offset	Displays the offset value calculated
Calibration	Displays the offset value that was saved using the "Reference" calibration type. If the calibration is performed for 1 point or 2 points, the "Adjust" value is automatically set to zero.
Last calibration	Displays the date of the last calibration

Tab. 37: Explanation of parameters in calibration report

9.3.4 Calibration errors (mA input)

Calibration error	Possible cause
Power supply +18 V short circuited.	■ Damaged wiring ■ Sensor shorted
mA input less than 3.6 mA.	■ Damaged wiring ■ Sensor missing Note: This alarm is active only if: ■ The input current is less than 3.6 mA ■ The input current is set to a range of 4 – 20 mA ■ The underrange menu is set to 3.6 mA
mA input greater than 22 mA.	■ Damaged wiring ■ Sensor missing Note: This alarm is active only if: ■ The input current is less than 22 mA ■ The sub-menu is set to 22 mA
The values set must not match.	The values set using the ▲ and ▼ buttons must not match only in the case of 2-point calibration.
The two calibration points must differ by at least 10%.	The second calibration point must be at least 10 % larger than the first calibration point.

Calibration error	Possible cause
The values set must not be zero.	The values set using the ▲ and ▼ buttons must not be equal to zero only in the case of 1-point calibration.

Tab. 38: Calibration errors (mA input)

9.4 Calibrating an amperometric measuring cell (1A)

Menu 1 **Calibration** enables the calibration of an amperometric disinfection measuring cell, e.g. CS120.

Choose **Measure A** to access the following sub-menus:

Sub-menu		Description
1A1	2 points	2-point calibration
1A2	Reference	The calibration can be refined through addition or subtraction of an offset value.
1A3	Report	Displays a summary of the last calibration
1A4	Cal. Reset	The calibrations can be deleted and the default values restored

Tab. 39: Measure A sub-menus for calibrating an amperometric measuring cell

9.4.1 Calibrating an amperometric disinfection measuring cell

Perform the following work steps:

1. Choose the sub-menu for 2-point calibration (1A1).



In the case of an oxygen sensor, enter the password (1310) to calibrate the first point at 0 %.

2. Check whether the sensor has been connected properly and is measuring.
3. Press **OK** to calibrate.
4. Set the calibration value using the ▲ and ▼ buttons.
5. Confirm by pressing **OK**.
6. Repeat steps 4 to 9 for the second buffer solution. For the oxygen sensor, the air saturation is 100 %.
 - The device displays the following:
 - Point 1: calibration value used for the first point
 - Point 2: calibration value used for the second point.
 - Gain: calculated gain.
 - Offset: calculated offset value.
7. Select "Save" and press **OK**.
8. Select "Yes" and press **OK**.
 - The device saves the calibration parameters and returns to the calibration menu.

✓ **Amperometric disinfection measuring cell calibrated.**

9.4.2 Entering a calibration reference

Perform the following work steps:

1. Choose the Reference sub-menu (1A2).
2. Check whether the sensor has been connected properly and is measuring.
3. Press **OK** to adjust the value.
4. Set the reference value using the **▲** and **▼** buttons.
5. Confirm by pressing **OK**.
6. Select "Save" and press **OK**.
7. Select "Yes" and press **OK**.
 - ▶ The device saves the reference value and returns to the calibration menu.

✓ **Calibration reference value entered.**

9.4.3 Calibration report

In sub-menu 1A3, you can view all parameters for the last calibration in the calibration report:

Sub-menu 1A3	
Parameter	Description
Cal. Type	Displays the calibration type: ■ None ■ 1 point ■ 2 points
Point 1	Shows the value entered for point 1
Point 2	Shows the value entered for point 2
Gain	Displays the angle coefficient calculated
Offset	Displays the offset value calculated
Calibration	Displays the offset value that was saved using the "Reference" calibration type. If the calibration is performed for 1 point or 2 points, the "Adjust" value is automatically set to zero.
Slope	Indicates the calibrated slope of the electrode
Last calibration	Displays the date of the last calibration

Tab. 40: Explanation of parameters in calibration report

9.4.4 Calibration errors (amperometric measuring cell)

Calibration error	Possible cause
The values set must not match.	The values set using the ▲ and ▼ buttons must not match only in the case of 2-point calibration.
The two calibration points must differ by at least 10%.	The second calibration point must be at least 10 % larger than the first calibration point.
The values set must not be zero.	The values set using the ▲ and ▼ buttons must not be equal to zero only in the case of 1-point calibration.

Tab. 41: Calibration errors (amperometric disinfection measuring cell)

9.5 Calibrating the temperature (1B)

Menu **1 Calibration** also allows the temperature to be calibrated.

Choose **Temperature** to enter the sub-menu (1B). Here you can calibrate the temperature measurement manually using an external reference value. The device corrects the value by adding an offset value to the real measurement.



The device displays a calibration error if the sensor is damaged or has been deactivated in the menu.

9.5.1 Calibrating a temperature measurement

Pre-conditions for actions:

- ✓ A thermometer is available.
- ✓ A temperature sensor is connected.

Perform the following work steps:

1. Select the sub-menu temperature (1B).
2. Check whether the sensor has been connected properly and is measuring.
3. Press **OK** to adjust the value.
4. Measure the reference temperature with the thermometer provided.
5. Set the reference value using the **▲** and **▼** buttons.
6. Confirm by pressing **OK**.
7. Select "Save" and press **OK**.
8. Select "Yes" and press **OK**.
 - ▶ The device saves the reference value and returns to the calibration menu.

✓ **Temperature measurement calibrated.**

10 Setup

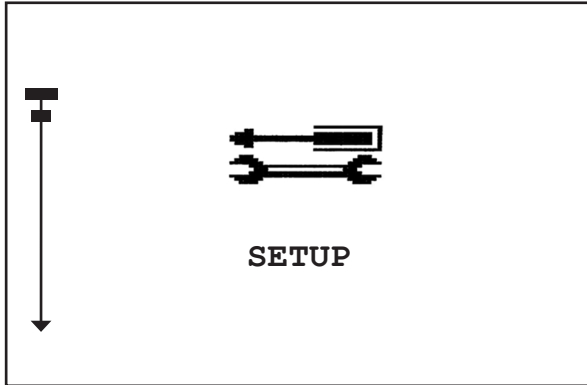


Fig. 27: Menu 2 Setup

Menu 2 **Setup** allows you to configure the following settings:

- General settings
- Measurement value
- Temperature measurement

10.1 General settings (2A)

You can configure the following settings here:

- Language
- Password
- Date/time
- Display
- RS485 setting
- Default settings

10.1.1 Language (2A1)

Here you can set the dialogue language for the menus and messages of the device by using the ▲ and ▼ buttons. The device automatically changes the menu language and returns to the previous level.

10.1.2 Password (2A2)

Here you can configure password protection for the **Calibration** and **Setup** menus.

Sub-menu 2A2	
Parameter	Description
Set password	Enter a numeric value. Note: If a password exists, it is displayed (e.g. "old password 1234"). To remove the existing password, enter four zeros (0000) and confirm with OK .
Calibration Menu	Select "Yes" or "No" to activate or deactivate password protection for the Calibration menu.
Setup Menu	Select "Yes" or "No" to activate or deactivate password protection for the Setup menu.

Tab. 42: Configuring password protection

10.1.3 Set date (2A3)

You can set the date and time here using the ▲ and ▼ buttons. Press **OK** to confirm. The device saves the changes and returns to the previous level.

10.1.4 Display (2A4)

You can configure the following settings here:

Sub-menu 2A4	
Parameter	Description
Contrast	Adjust the backlight
Mode	Switch the backlight on/off (ON/OFF/ECO)
ON	Brightness setting for ON mode
ECO	Brightness setting for ECO mode
Reverse	Inverts the display (white font on a black background)

Tab. 43: Display Settings

10.1.5 RS485 setting (2A5)

You can configure the serial interface settings here:

Sub-menu 2A5	
Parameter	Description
Mode	Standard protocol used (RTU/ASCII)
Address	Communication address (ID 1 – 247)
Baude rate	Communication speed (1,200 – 115,200 bps)
Parity bit	Parity bit for checking the transmission (none, odd, even)
Stop bit	Stop bits for setting the wait time (1, 2)

Tab. 44: RS485 settings



Communication is always (RTU/ASCII) with 8 data bits.

The minimum transmission time is set to 200 ms.

The permitted commands are:

- Report Slave ID
- Write multiple registers (max. 4 registers per query)
- Read hold registers (max. 4 registers per query)

The system always responds to these commands.

If you are not in view mode or in the RS485 control panel, you receive an error code as a response and the command is not executed.

Each write operation with positive results in the registers writes a certain value to the respective register. To store the value written to the register in the device's memory, execute a write memory command that is executed with a Write Multiple Registers operation (amount of data to be written 1) at the address of the command register (4000) with parameter 2. Alternatively, if you exit programming, the system prompts you to save the changes that you made to the parameters because the system automatically detects that the stored parameters have been modified. If you switch off the device WITHOUT saving the written registers, the system restarts with the values that were previously set in the memory.

Example:

Relay 1 set as "Measure ON/OFF". Setpoint to be set [Index 2A1]: 950.52 ppm

Conversion decimal -> hexadecimal:

95052 -> 0 x 1734 C

Number of decimal points for the setpoint: 2

The following values are to be written to the registers for the setpoint RL1:

Address 3100: 0 x 734 C (setpoint L)

Address 3101: 0 x 0001 (setpoint H)

Address 3102: 0 x 0002 (decimal setpoint)

Command: write multiple registers

Ad- dress	Func- tion	Start address H	Start address L	Data word H	Data word L	Num- ber of data bytes	Data 3100 H	Data 3100 L	Data 3101 H	Data 3101 L	Data 3102 H	Data 3102 L	CRC H	CRC L
0x01	0x10	0x0C	0x1C	0x00	0x03	0x06	0x73	0x4C	0x00	0x01	0x00	0x02	0xD2	0xB6

Tab. 45: Command: write multiple registers

To read the setpoint RL1, execute the following command:

Command: read input register

Address	Function	Start address H	Start address L	Data word H	Data word L	CRC H	CRC L
0x01	0x04	0x0C	0x1C	0x00	0x03	0xC7	0x5D

Tab. 46: Command: read input register

The setpoint read is formatted as follows:

Address 3100: 0 x 734 C (setpoint L)

Address 3101: 0 x 0001 (setpoint H)

Address 3102: 0 x 0002 (decimal setpoint)

The reconstructed data gives the following value: 950.52 ppm

To check the data configured, check the menu item Setpoint RL1 for index 2A1.

10.1.6 System reset (2A6)

Here you can reset the device to the factory settings.

10.2 Setting the measured value (2B)

The settings for the measured value depend on the parameter to be measured.

10.2.1 pH/Redox measurement

You can make the following settings for the pH/Redox measurement:

Sub-menu 2B1	
Parameter	Description
Meas. Unit	Select the unit of the chemical measured value: pH or mV (Redox). Note: If you change the unit of measure, the parameters are reset to the default values.
Temp Comp	The measurement is temperature compensated: ■ MTC = Manually with a fixed value set ■ ATC = Automatically with a temperature sensor Note: It has no effect on Redox measurements.
Filter	The measurement is filtered based on an arithmetic mean: ■ Low = arithmetic mean every 4 s ■ Medium = arithmetic mean every 8 s ■ High = arithmetic mean every 16 s

Tab. 47: Explanation of parameters for pH/Redox measurement

10.2.2 Conductivity measurement

You can make the following settings for measuring conductivity:

Sub-menu 2B1	
Parameter	Description
Meas. Unit	Select the unit of measurement for conductivity. Note: If you change the unit of measure, the parameters are reset to the default values. You can use the units of measurement ppm (parts per million) and ppb (parts per billion) by setting the TDS value (sub-menu 2B1).
Temperature Compensation	The measurement is temperature compensated: ■ OTC = Compensation deactivated ■ MTC = Manually with a fixed value set ■ ATC = Automatically with a temperature sensor

Sub-menu 2B1	
Parameter	Description
Filter	The measurement is filtered based on an arithmetic mean: ■ Low = arithmetic mean every 4 s ■ Medium = arithmetic mean every 8 s ■ High = arithmetic mean every 16 s
TDS	Conductivity can be used as an indicator for total dissolved solids (TDS) in a solution. It is expressed in ppm/ μ S.
Decimal Point	Set the position of the decimal point for the measurement to highlight the decimal value.
Compensation Type	Set the compensation procedure: ■ Pure H₂O Select this element for conductivity measurements in pure water or below 0.2 μS (from 5 MΩ to 18 MΩ). The compensation function complies with ASTM D1125 and D5391 standards. ■ Linear up to 25 °C Select this element for conductivity measurements greater than 0.2 μS (lower than 5 MΩ). The measurement compensation is linear, in relation to the temperature of 25 °C. ■ Linear up to 20 °C Select this element for conductivity measurements greater than 0.2 μS (lower than 5 MΩ). The measurement compensation is linear, in relation to the temperature of 20 °C.
Linear Coefficient	Set the percentage increase (SLOPE) used for linear compensation.
Cell constant	Set the parameters of the cell constant: ■ Type: type of sensor used (standard or custom). ■ Standard: list of values of the cell constants for the standard measurement. ■ Custom: adjustable cell constant for a custom measurement. ■ Actual: displays the cell constant used, i.e. the setpoint or the value calculated during calibration.

Tab. 48: Explanation of parameters for conductivity measurement

10.2.3 Examples of settings in sub-menu 2B1

10.2.3.1 Example: TDS

To view the measured conductivity value as total dissolved solids (TDS), you have to set a conversion factor between 0.3 and 2. The measurement is converted into ppm or ppb per μ S.

The typical TDS value in water is 0.7 and is given by subtracting the total suspended solids (TSS) from the total solids (TS).

Calculation example for total solids:

All substances dissolved and suspended in natural or drained water are given as total solids. Total solids are determined by evaporating the water from the sample into a thermostated oven at 105 °C.

The total solids are equal to:

Total solids (mg/L) = $(M1 - M0) \times 1000 / V_{\text{Sample}}$ where:

M1 = mass in mg of the capsule and the residual material after evaporation

M0 = mass in mg of the empty capsule

V_{Sample} = amount in mL of the analysed sample

Example:

$$M1 = 10023.6 \text{ mg}$$

$$M0 = 10000 \text{ mg}$$

$$V_{\text{Sample}} = 100 \text{ ml}$$

$$10023.6 - 10000 = 23.6 \text{ mg}$$

$$23.6 \times 1000 / 100 = 236 \text{ mg/l}$$

Total suspended solids (TSS) represent the part of the substances suspended in a water sample that are separated by filtration through a membrane filter with a porosity of 0.45 µm (micrometre µm).

The solids collected on the filter are dried at a temperature of 103 – 105 °C to a constant weight.

Total suspended solids are calculated as follows:

Total solids (mg/L) = $(M1 - M0) \times 1000 / V_{\text{Sample}}$ where:

M1 = Mass in mg of capsule + filter and residual material after evaporation

M0 = mass in mg of the capsule + filter

V_{Sample} = quantity in ml of the filtered sample

10.2.3.2 Example: setting the linear coefficient (2B1)

Select the temperature coefficient according to the solution to be measured. Typical indications are:

- Water with neutral pH value (7 pH) = 2.00 %/°C
- Alkaline solution, pH value greater than 7 pH = 1.9 %/°C
- Acidic solution, pH value lower than 7 pH = 1.8 %/°C

To determine the value of the linear coefficient, proceed as follows:

1. Get a container and an electric or gas cooker.
2. Connect the Pt100/Pt1000 sensor to the K100 unit or get a thermometer.
3. Put the sample solution into the container.



This procedure is valid only for conductivity greater than 84 µS.

4. Set the temperature compensation function to OTC.
5. Measure the sample at room temperature and measure the conductivity and the temperature value.

Example: C' = 200 µS T' = 23 °C

6. Heat the sample and increase its temperature to 50 °C.



Wait until the temperature change has slowed down and stabilised.

7. Take a second measurement for conductivity (C'') and temperature (T'').

Example: C'' = 600 µS T'' = 50 °C

8. To calculate the linear coefficient for 25 °C, perform the following calculation:

$$\text{Linear coefficient} = 100 \cdot (CC'' - C') / (C'' \cdot (T'' - 25^\circ\text{CC}) - (CC' \cdot (T' - 25^\circ\text{CC})))$$

$$\text{Linear coefficient} = 100 \cdot (600\mu\text{SS} - 200\mu\text{S}) / (600\mu\text{S} \cdot (50^\circ\text{C} - 25^\circ\text{CC}) - (200\mu\text{SS} \cdot (23^\circ\text{CC} - 25^\circ\text{CC})))$$

$$\text{Linear coefficient for } 25^\circ\text{C} = 2.59\% / ^\circ\text{CC}$$

10.2.4 mA input measurement (2B1)

You can make the following settings for measuring an mA input:

Sub-menu 2B1	
Parameter	Description
Meas. Unit	Select the unit of measurement. If you select "Custom", the custom unit of measurement is displayed.
Custom Unit	You can enter a custom unit of measurement (max. 4 characters/symbols). It is displayed only if the previous unit of measurement setting has been set to "Custom".
Unit Name	Select the name of the measurement. If you select "Custom", the custom name of the measurement is displayed.
Custom Name	You can enter a custom name (max. 4 characters/symbols) for the measurement. Note: This name is displayed only if the unit of measurement setting has been set to "Custom".
Filter	The measurement is filtered based on an arithmetic mean: ■ Low = arithmetic mean every 4 s ■ Medium = arithmetic mean every 8 s ■ High = arithmetic mean every 16 s
Decimal Point	Set the position of the decimal point for the measurement to highlight the decimal value.
Sensor Type	Select the type of sensor used: 0/20 mA or 4/20 mA.
Min. Range	Set the value to 0 mA or 4 mA accordingly. Value between -99,999 and 99,999.
Max. Range	Set the value to 20 mA accordingly. Value between -99,999 and 99,999
Overrange	■ OFF: Overrange alarm deactivated. ■ 22 mA: If the input current to the device is higher than 22 mA, the overrange alarm is activated.

Sub-menu 2B1	
Parameter	Description
Underrange	■ OFF: Underrange alarm deactivated. ■ 3.6 mA: If the input current to the device is lower than 3.6 mA, the underrange alarm is activated. Note: The underrange alarm can be activated only if the Y alarm in menü 3B is set to 4 – 20 mA. If the Y alarm is set to 0 – 20 mA, the underrange is configured with OFF and cannot be changed.

Tab. 49: Explanation of parameters for mA input measurement

10.2.5 Amperometric measurement with a measuring cell (2B1)

You can make the following settings for amperometric measurement:

Sub-menu 2B1	
Parameter	Description
Meas. Unit	Select the unit of measurement.
Unit Name	Select the name of the measurement.
Temperature compensation	The measurement is temperature compensated: ■ OTC = Compensation deactivated ■ MTC = Manually with a set fixed value ■ ATC = Automatically with a temperature sensor
Filter	The measurement is filtered based on an arithmetic mean: ■ Low = arithmetic mean every 4 s ■ Medium = arithmetic mean every 8 s ■ High = arithmetic mean every 16 s
Decimal Point	Set the position of the decimal point for the measurement to highlight the decimal value.
Compensation Type	Set the compensation procedure: ■ Linear up to 25 °C The measurement compensation is linear, in relation to the temperature of 25 °C. ■ Linear up to 20 °C The measurement compensation is linear, in relation to the temperature of 20 °C.
Linear Coefficient	Set the percentage increase (SLOPE) used for linear compensation. Select the temperature coefficient according to the solution to be measured.

Tab. 50: Explanation of parameters for amperometric measurement

10.3 Temperature measurement (2C)

You can make the following settings for the temperature measurement:

Sub-menu		Description
2C1	Selection	Pt100 or Pt1000 temperature sensor connected or with a manual temperature value.
2C2	Unit Meas.	Set the unit to Celsius (°C) or Fahrenheit (°F).
2C3	Manual Value	Set the temperature value without a Pt100 or Pt1000 temperature sensor.
2C4	Filter	The measurement is filtered based on an arithmetic mean: ■ Low = arithmetic mean every 4 s ■ Medium = arithmetic mean every 8 s ■ High = arithmetic mean every 16 s

Tab. 51: Sub-menus for temperature measurement (2C)

To exit the menu, press **Esc**; if at least one parameter has been changed, the device prompts you to save; confirm by choosing **OK**.

To not save, select "NO" and confirm by choosing **OK**.

11 Output

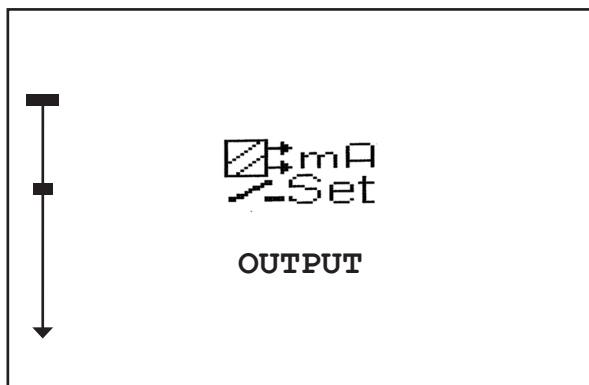


Fig. 28: Menu 3 Output

Menu 3 **Output** allows you to configure the following settings:

- Relay output
- Currents output
- Alarm setting



Check the selected unit of measurement and set the values in the **Setup** menu within the ranges allowed by the sensors used.

11.1 Relay output (3A)

Relays 1 – 4 can be set either for each type of measurement (pH is used here as an example) or for temperature measurement with the following activation methods:

- OFF: relay is deactivated
- Temp.: temperature is assigned
- Measure A: measurement is assigned to the main measurement

11.1.1 Activation method: Measure A

If you select Measure A as the activation method, you have the following options:

- On/Off
- Timed
- Impulse length

On/Off

If a value is exceeded, the output switches with a configurable hysteresis:

Sub-menus 3A1, 3A2, 3A3 and 3A4	
Parameter	Description
Setpoint	Chemical value that must be maintained during the process
Type	Lower: control direction to reach a minimum value.
	Lift: control direction to reach a maximum value
Hist.	Incremental or decremental value of the setpoint

Sub-menus 3A1, 3A2, 3A3 and 3A4	
Parameter	Description
OFA	Maximum activation time for the relay
Delay Start	Delay time for activating the relay
Relay End	Delay time for deactivating the relay
OverRng	Here, you set a value that the device subtracts from the setpoint and adds to the setpoint in order to define a measuring range outside of which a measurement error message is displayed.

Tab. 52: Explanation of parameters for on/off

Timed method

The same parameters as for "On/Off" can be configured here. In addition, relay closing time and wait time with the relay open can be configured:

Sub-menus 3A1, 3A2, 3A3 and 3A4	
Parameter	Description
Setpoint	Chemical value that must be maintained during the process
Type	Lower: control direction to reach a minimum value.
	Lift: control direction to reach a maximum value
Hist.	Incremental or decremental value of the setpoint
OFA	Maximum activation time for the relay
Delay Start	Delay time for activating the relay
Relay End	Delay time for deactivating the relay
OverRng	A value that is subtracted from and added to the setpoint and defines a measuring range outside of which the measurement error message is displayed
Time ON	Relay closing time
Time OFF	Wait time with relay open

Tab. 53: Explanation of parameters for timed method

Impulse length

Sub-menus 3A1, 3A2, 3A3 and 3A4	
Parameter	Description
Setpoint	Chemical value that must be maintained during the process
Type	Lower: control direction to reach a minimum value.
	Lift: control direction to reach a maximum value

Sub-menus 3A1, 3A2, 3A3 and 3A4	
Parameter	Description
Algorithm	Select the controller type (P, PI or PID)
Xp	The proportional range of the PID control compared to the bottom of the scale for the device
Y alarm	If the PID control remains at 100% for alarm time Y, an alarm is triggered.
Imp. length	The total period for which the PID calculation is performed.
Tn	Integral time
Tv	Derivative time
Max Perc.	Maximum percentage of PID control

Tab. 54: Explanation of parameters for impulse length

11.1.2 Relays 3 and 4

Relays 3 and 4 can be set either for a measurement displayed in the Relay 1 menu or it is also possible to set the cleaning and alarm mode.

11.1.2.1 Cleaning the measuring cell (wash)

With relay 3, you can activate sensor cleaning. Set the following parameters:

Sub-menu 3A3	
Parameter	Description
Cleaning time	Value in minutes and seconds for cleaning the sensor.
Delay	Value in minutes and seconds to wait for the stability of the measurement.
Wait time	Wait time in minutes and seconds for the next cleaning action.

Tab. 55: Settings for sensor cleaning

11.1.2.2 Alarms

You can use relays 3 and 4 as an alarm. First select for which relay (1 or 2) the alarm events are to be determined. By selecting "Yes" or "No", you then specify for each alarm event whether the alarm is to be output.



To block the outputs, see "Block" under Fig. 12 „Relay cable segregation" on page 18.

Sub-menu 3A3 / 3A4	
Alarm	Description
R1/R2 OverRng	Chemical measurement out of range of relay 1/2
R1/R2 OFA	Maximum dosing time expired

Sub-menu 3A3 / 3A4	
Alarm	Description
R1/R2 Persist.	Chemical measure blocked (frozen)
Reed Alarm	Alarm for reed sensor activation
Temp. Alarm	Alarm for sensor disconnected
Y alarm	PID control remains at 100% for alarm time Y

Tab. 56: Alarm events

11.1.3 SSR1 and SSR2

The SSR1 and SSR2 outputs are two solid state relays used as frequency outputs.

The outputs SSR1 and SSR2 can be set for any type of measurement or for temperature as follows:

Sub-menu 3A5 / 3A6	
Parameter	Description
Setpoint	Chemical value that must be maintained during the process
Type	Lower: control direction to reach a minimum value
	Lift: control direction to reach a maximum value
Algorithm	Select the controller type (P, PI or PID)
Xp	The proportional range of the PID control compared to the bottom of the scale for the device.
Integ. Time	Integral time
Tv	Derivative time
Imp. freq.	Chemical value that must be maintained during the process
Pulse Width	Maximum width of the pulse
Max Perc.	Maximum percentage of PID control
Y alarm	If the PID control remains at 100% for alarm time Y, an alarm is triggered.

Tab. 57: Explanation of parameters for outputs SSR1 and SSR2

11.2 Current output (3B)

11.2.1 Output mA1 and mA2

The mA1 and mA2 outputs are two current outputs in mA (milliamps), in active configuration with the range 4 – 20 mA.

The mA1 and mA2 outputs can be set to any type of measurement or temperature as follows:

- PID off
- PID on
- Mirror (only for mA)

PID off

Sub-menu 3B1 / 3B2	
Parameter	Description
Start	Measurement assigned to the 4 mA value
End	Measurement assigned to the 20 mA value
Keep	Freezes the actual value in the case of a hold alarm
Namur Alr	Sets the current value to 3.6 mA or to 22 mA for an alarm
Type	4 – 20 mA or 0 – 20 mA type of current output

Tab. 58: Explanation of parameters (PID off)

PID on

Sub-menu 3B1 / 3B2	
Parameter	Description
Setpoint	Chemical value that must be maintained during the process
Type	Lower: control direction to reach a minimum value
	Lift: control direction to reach a maximum value
Algorithm	Select the controller type (P, PI or PID)
Xp	The proportional range of the PID control compared to the bottom of the scale for the device.
Integ. Time	Set the integral time The longer the time set, the more the system mediates the measurement fluctuations.
Deriv. Time	Set the derivative time. The longer the time set, the more the system is ready for deviations from the measurement.
Type	4 – 20 mA or 0 – 20 mA
Y alarm	If the PID control remains at 100% for alarm time Y, an alarm is triggered.
Keep	Freeze the 4 – 20 mA input
Namur Alr	Set the namur output function

Tab. 59: Explanation of parameters (PID on)

Mirror (output inversion)

Sub-menu 3C1/3C3	
Parameter	Description
C factor	Set the conversion factor between the input current and the output current.

Sub-menu 3C1/3C3	
Parameter	Description
Type	4 – 20 mA or 0 – 20 mA type of current output

Tab. 60: Explanation of parameters (output inversion)

11.3 Alarm settings (3C)

You can configure the alarm settings as follows:

Sub-menu 3C	
Parameter	Description
Reed Logic	Set the sensor logic: ■ NO (normally open) ■ NC (normally closed)
Reed Delay	Set the delay time for alarm activation to change the REED status.
Switch OFF	Set a visual alarm if the power supply is interrupted.
Block	Block the device in the event of an alarm. The outputs are automatically set to the programmed alarm state.
Alarm Temp.	Set a visual alarm or block the device if the temperature sensor is broken or disconnected.
Service	Activate or deactivate the service alarm.
Service Date	Specify a time and date to display the service notification.

Tab. 61: Alarm settings (3C)

12 Archive



Fig. 29: Menu 4 Archive

Menu 4 **Archive** enables you to:

- Activate, configure and reset the data logger.
- View, configure and reset the alarm log.

12.1 Data logger (4A)

You have the following options here:

Sub-menu		Description
4A1	Data Logger	Activate/deactivate the data logger
4A2	Period	Set the logging interval in minutes
4A3	Mode	Set the logging mode to circular or linear
4A4	DataLogs Reset	Reset the data logger to the default settings

Tab. 62: Data logger settings in menu 4 Archive

12.2 Alarm (4B)

You can configure the following settings here:

Sub-menu		Description
4B1	View Log	Display all registered alarms, starting with the most recent.
4B2	Reset Log	Reset log to clear all alarm events
4B3	Reset OFA	Clear the overfeed alarm and reset the counter
4B4	Reset Holding	Reset measurement persistence alarm and reset the counter
4B5	Reset Service	Clear the service alarm and reset the counter
4B6	Reset RL3	Reset RL3 if used as an alarm
4B7	Reset RL4	Reset RL4 if used as an alarm
4B8	Reset Y Alarm	Reset Y alarm
4B9	Hold alarm	Switch on or off

Tab. 63: Alarm settings in Menu 4 archive

13 Manual control

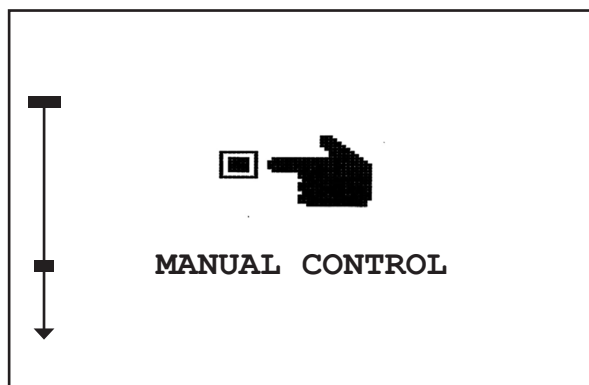


Fig. 30: Menu 5 Manual Control

Menu 5 **Manual Control** enables the following options:

Sub-menu		Description
5A	Analogue input	View real-time data of the measurements; for digital measurements only the communication errors
5B	Digital inputs	Test the digital input
5C	Analog outputs	Simulate the two current outputs separately
5D	Relay outputs	Simulate the closing of each relay and simulate the pulse hours of the frequency outputs
5E	Download User Manual	Display the QR code for the operating instructions
5F	Start-up time	Set a start-up time to start the controls (relays, mA, etc.) on power-up only after this freely programmable time has elapsed.

Tab. 64: Options in menu 5 Manual Control

14 WiFi

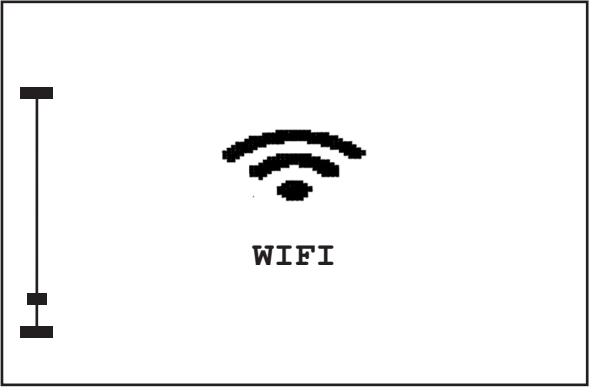


Fig. 31: Menu 6 WiFi

Menu 6 **WiFi** allows you to configure the WLAN settings:

Sub-menu		Description
6A	Wifi	Activate or deactivate the internal WLAN module
6B	Reset Wifi	Reset the WiFi connection
6C	Restore Default	Reload the default parameters
6D	Wifi Info	Display the QR code to obtain information about the IP of the internal WLAN device.

Tab. 65: Settings in Menu 6 WiFi

15 Using the web application

The device contains a built-in web server that is located in the control panel. This allows the user to program and manage the device through a web browser, which can be done locally on a PC, notebook, tablet or smartphone.

A web-based application refers to a program that is accessed over an HTTP network connection rather than existing within a device's memory. A web-based application runs in a web browser.

A device with Wifi connectivity is required to access the web-based application. Windows, Android and iOS-based devices are supported.

15.1 Connecting to the web application

To connect to the web application, proceed as follows:

1. Activate the WLAN connection and connect your device (PC, notebook, smartphone or other) to the system's WLAN network (default name SSID-xxxx).



The default password for the WLAN connection is 1234567890. This information can be called up via the Wifi Info menu (see section 14 „WiFi“ on page 42).

2. Open an Internet browser on your device and call up the following IP address: <https://192.168.4.1/>
3. Wait until the authentication web page has loaded.
4. On the authentication page, enter the user name and password and press the login button. The factory default user name/password is admin/0000.

15.2 Dashboard

The dashboard shows the actual values for most of the controller's parameters.

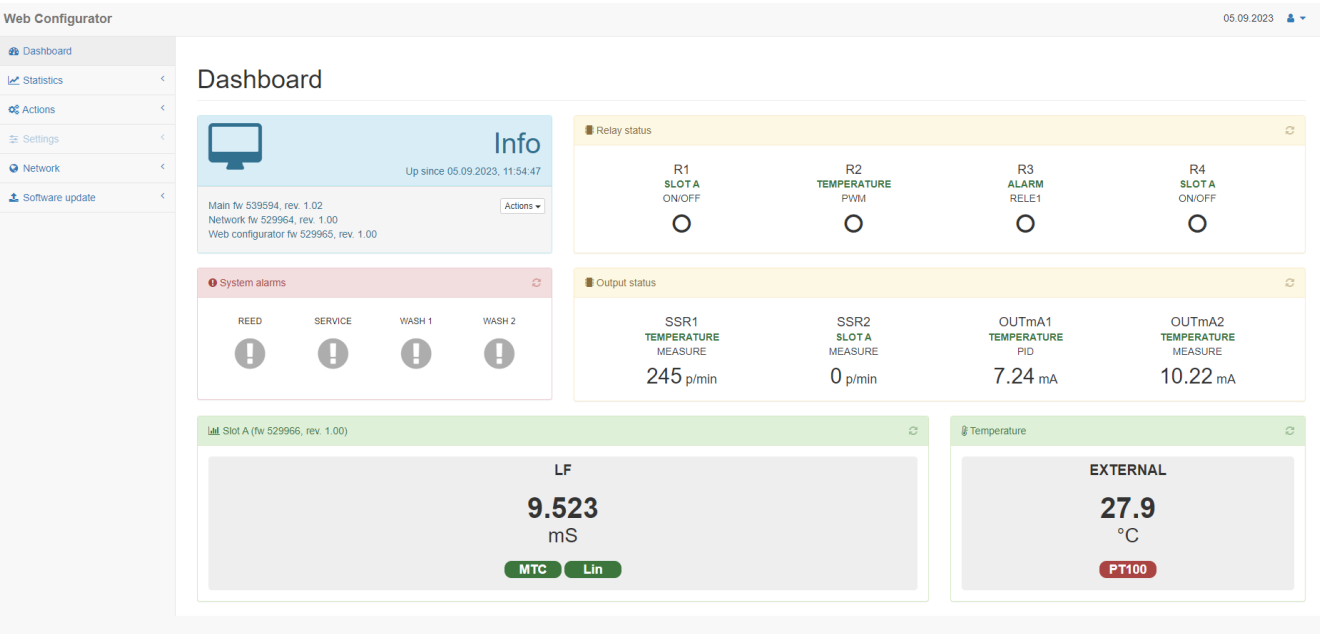


Fig. 32: Dashboard

Screen area	Description
Settings (top right)	Open the drop-down menu to set the date and time of the device or to change the password for the web configurator.
Info (Information)	Displays the operating time of the device, the firmware version and the revision of the main components of the device. The "Actions" drop-down menu contains the following functions: - Refresh - Auto refresh - Use as Control Panel: is used to activate/deactivate temporary and manual relays of the device. Please note that for the time that "Use as control panel" is active, the buttons on the device are inactive.
Relay status	Displays the status of each relay and the type of measurement currently assigned.
System alarms	Indicates whether alarms have been triggered on the device.
Output status	Contains information about the device's SSR and OUTmA outputs, such as the currently assigned function for each and its actual values.
Measurements and temperature (lower area)	Visualisation of the values for the main measurements installed on the device: Slot A and temperature.

Tab. 66: Explanation of screen areas on the dashboard

15.3 Statistics

Under **Statistics**, you can find three menus, which are described in the following sub-sections.

15.3.1 General

The **General** menu summarises the counters for switching on the device, counters for each of the relays and counters for service.

You can find buttons to reset the statistics and to download this information as a *.csv file.

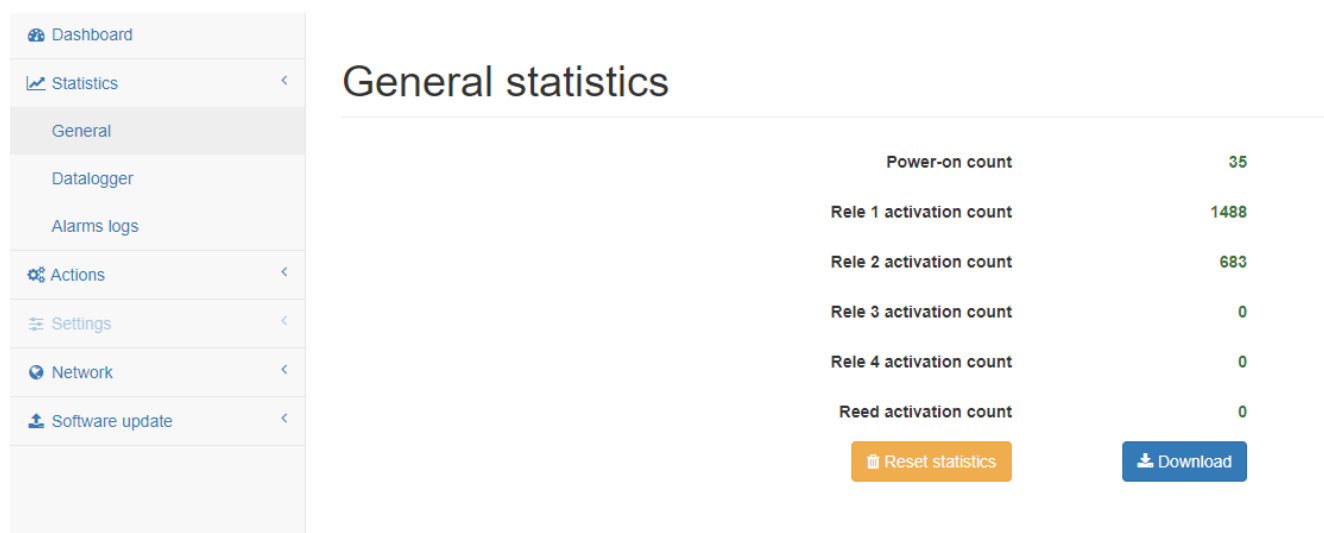


Fig. 33: General Statistics

15.3.2 Data logger

The **Datalogger** menu provides a graphical representation of the values measured by the sensors connected to the device over a certain period of time. The page contains the **Reset logs**, **Refresh** and **Download** buttons, which allow you to reset the logs, refresh the data or download the logs as a file.

With the buttons **Prev** and **Next**, you can scroll through the graph of recorded data.

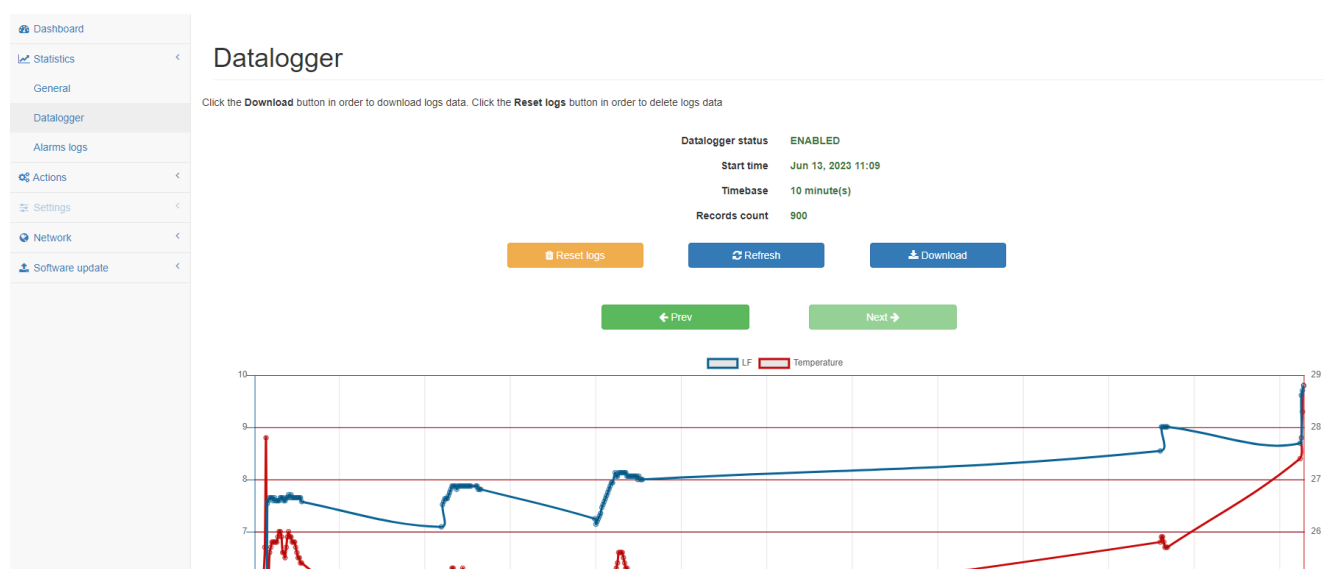


Fig. 34: Data logger

15.3.3 Alarm logs

Under **Alarms Logs** , you can view and reset the alarm logs.

15.4 Actions

Under **Actions**, you can find the options for loading and saving the settings and for restarting the system.

15.4.1 Load settings

Under **Load settings**, you can load the current settings from the device or the settings from an external file.

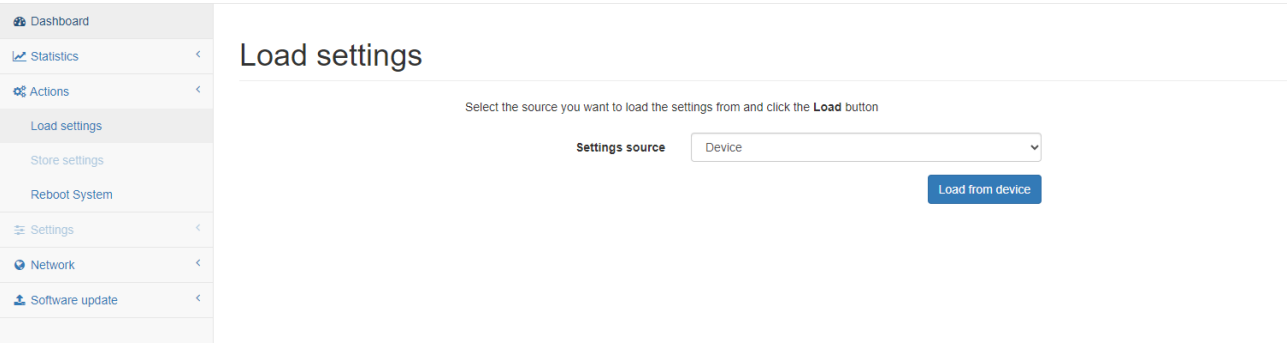


Fig. 35: Load settings

When you load the settings from the device, the **Settings** menu on the left becomes active and you can modify the device settings.

15.4.2 Store settings

Under **Store settings**, you can transfer modified settings back to the device or save them as an external file.

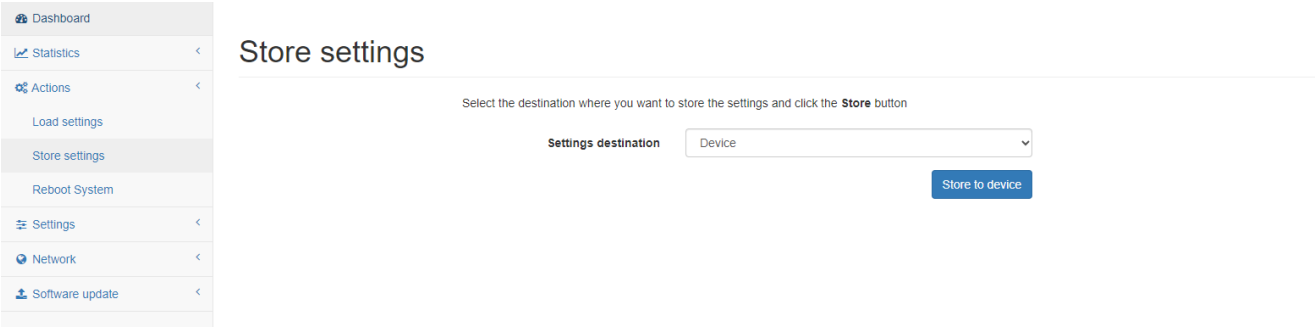


Fig. 36: Store settings

15.4.3 Reboot system

Under **Reboot System**, you can perform a remote reboot of the system.

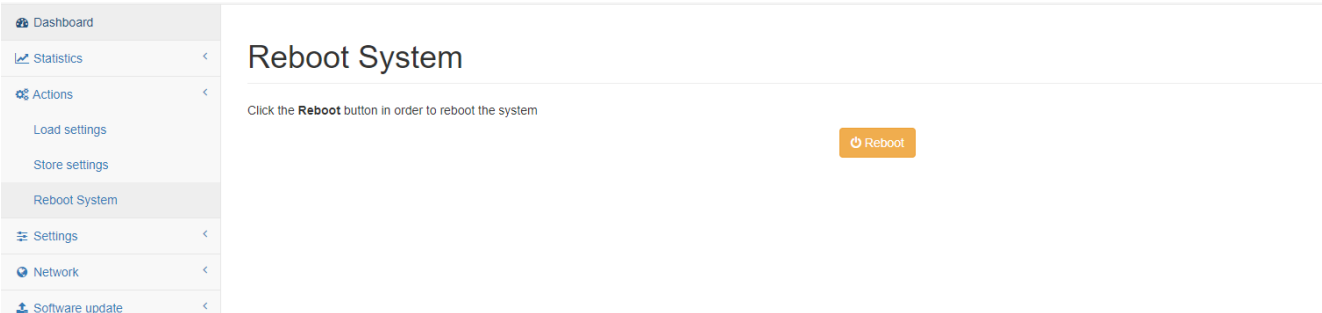


Fig. 37: Reboot system

15.5 Settings

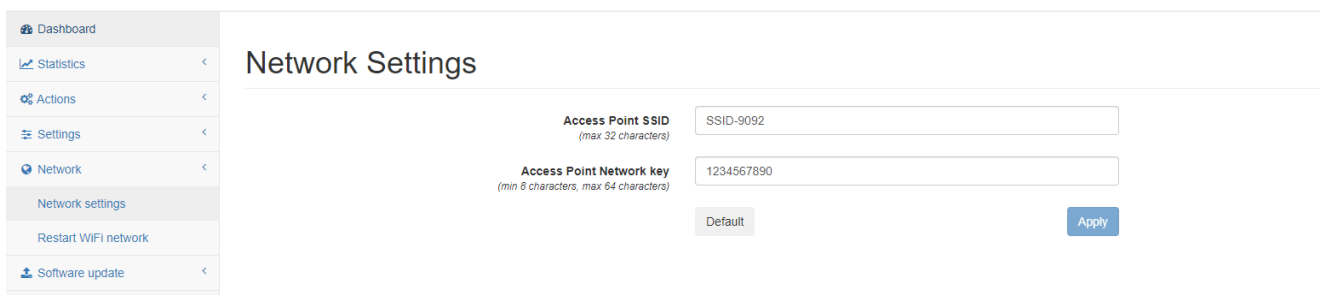
Under **Settings**, you can adjust the settings loaded from the device.

15.6 Network

Under **Network**, you can manage the network settings.

15.6.1 Network settings

You can view, change or reset the name and password of the WLAN access point here.



The screenshot shows the 'Network Settings' page of the EASYPRO 1 web interface. On the left is a sidebar menu with options: Dashboard, Statistics, Actions, Settings, Network, Network settings (selected), Restart WiFi network, and Software update. The main content area is titled 'Network Settings' and contains two input fields: 'Access Point SSID' (max 32 characters) with the value 'SSID-9092' and 'Access Point Network key' (min 8 characters, max 64 characters) with the value '1234567890'. Below these fields are two buttons: 'Default' and 'Apply'.

Fig. 38: Network settings

15.6.2 Restart WiFi network

Under **Restart WIFI network**, you can restart the WLAN network.

15.7 Software update

Under **Software update**, you can update the different types of firmware used by the device:

- Main firmware
- Slot firmware
- Network firmware
- Web Configurator: here you can update the web application.

16 Shut-down

16.1 Short-term shut-down

Short-term shutdown involves deactivation for the calibration of the measured values or for maintenance work, for example. For long-term shutdown, see section 16.2.

Perform the following work steps:

1. Close the inflow tap (item 5 in Fig. 1 on page 8) of the water sampling station or switch off the sample water supply externally. This interrupts the measurement and the control of the **TOPAX® L** controller, and the sample water circuit can be opened.
2. Disconnect the **TOPAX® L** controller's external power supply.
3. Perform the planned work on the water sampling station.
4. Reconnect the **TOPAX® L** controller's external power supply.
5. Open the inflow tap of the water sampling station or switch the sample water supply back on externally. It starts the measurement and regulation.

- ✓ **The water sampling station was deactivated and re-activated (short term).**

16.2 Long-term shut-down

This section describes the required actions in the event of long-term shutdown in order to ensure the functionality of the water sampling station.

Perform the following work steps:

1. Close the inflow tap (item 5 in Fig. 1 on page 8) of the water sampling station or switch off the sample water supply externally. This interrupts the measurement and the control of the **TOPAX® L** controller, and the sample water circuit can be opened.
2. Disconnect the **TOPAX® L** controller's external power supply.
3. Pinch off all cables in the **TOPAX® L** controller.
4. Uncouple the ingoing hose connection from the inflow tap and from the sample water filter (item 3 in Fig. 1 on page 8), as well as the outgoing hose connection from the outflow tap (item 8 in Fig. 1 on page 8) and the measuring cell valve.
5. Unscrew the black screw caps from the underside of the valve and allow the sample water to drain out of the valve.
6. With a measuring cell filled with electrolyte, we recommend removing it from the fitting and storing it upright in a 3-molar potassium chloride solution.

- ✓ **The water sampling station has been shut down over the long term.**

16.3 Storage

Pre-conditions for actions:

- ✓ The product was shut down in accordance with section 16.2.

Storing the water sampling station correctly extends its service life. You should avoid negative influences such as extreme temperatures, high humidity, dust, chemicals, etc.

Unscrew the water sampling station from the wall bracket and store it.

Ensure ideal storage conditions where possible:

- The storage place must be cold, dry, dust-free and generously ventilated
- Temperatures between + 0 °C and + 50 °C
- Relative air humidity must not exceed 90 %

16.4 Transportation

Pre-conditions for actions:

- ✓ The water sampling station has been shut down in accordance with section 16.2.

- The water sampling station may only be transported in an empty state.
- Avoid heavy blows at all costs.

If the device is sent back to the manufacturer, please follow section 23 „Decontamination declaration“ on page 84 and section 24 „Warranty claim“ on page 85.

16.5 Disposal

- The product must be disposed of in accordance with applicable local laws and regulations. It should not be disposed of as domestic waste!
- As the disposal regulations may differ from country to country, please consult your supplier.
- In Germany, the manufacturer must provide free-of-charge disposal. Provided the product has been safely returned along with a decontamination declaration (section 23 on page 84).

17 Maintenance

DANGER

Mortal danger from electric shock!

Only work on electrical systems while the device is disconnected from the power supply.

- ⇒ Switch the system voltage-free.
- ⇒ Secure the system to prevent it from being switched on again.
- ⇒ Measure the absence of voltage in the system with a measuring instrument.
- ⇒ Earth the system and then short-circuit it.
- ⇒ Cover adjacent live parts.

WARNING

Increased risk of accidents due to insufficient qualification of personnel!

The system and its accessories may only be installed, operated and maintained by personnel with sufficient qualifications. Insufficient qualification will increase the risk of accidents.

- ⇒ Ensure that all action is taken only by personnel with sufficient and corresponding qualifications.

17.1 Maintenance intervals

The product require regular maintenance to prevent errors. This table gives you an overview of the maintenance work.

Interval	Maintenance
Daily	■ Visual inspection of all components
Weekly	■ Check measured values ■ Recalibrate sensor input if necessary ■ Visual inspection of the sample water filter ■ If necessary, cleaning of the sample water filter
Monthly	■ Function test of the (TOPAX® L) operating panel ■ Calibrating the measured values (TOPAX® L) ■ Control of the flow controller
Annually	■ Cleaning the fitting ■ Replacing the measuring cell ■ Replacing the sample water filter ■ Cleaning of water guiding components ■ Seal replacement ■ Maintenance of the flow controller ■ Replacing the O-rings of the flow controller ■ Replacing the diaphragm of the flow controller

Tab. 67: Maintenance intervals

17.2 Setting a service alarm

You can set a service alarm so that the device displays a service message on a specific date. In this way, the device can remind you for example to replace a sensor or carry out maintenance.

Perform the following work steps:

1. Working in Menu 3 **Output**, navigate to "Alarm setting" (sub-menu 3C) and working under "Service", activate the service alarm.
2. Enter the date and time for the service message in the next parameter "Service date".
3. Confirm with **OK**.
4. Press the **ESC** button repeatedly until you are asked to save.
5. Select "Yes" and press **OK**.

✓ **The service alarm is configured.**

17.3 Measuring cell

PLEASE NOTE

Note the service life of the measuring cell.

The service life of the measuring cell is approx. 12 to 15 months, whereby the storage time must be taken into account at 50 %. If the service life is exceeded, this may distort measurement results.

- ⇒ Note the printed date of manufacture and replace an obsolete measuring cell in good time.

The service life of the single-rod measuring cell depends on the operating conditions and the water properties (e.g. corrosiveness, grease etc.). In normal conditions the service life will be 12 – 15 months, which includes 50 % storage time. The counter electrode of the disinfection measuring cell can have a service life of up to several years, depending on the corrosiveness and the abrasiveness of the water. It must only be replaced when heavy signs of wear appear.

The following features indicate a used pH single-rod measuring cell:

- The pH single-rod measuring cell takes an extraordinarily long time during the pH 7 adjustment process to reach the value of the buffer solution.
- The deviation of the pH single-rod measuring cell is too wide; the pH 7 adjustment is not possible.
- The white potassium chloride salt rings in the pH single-rod measuring cell are exhausted or discoloured.

17.4 Flow controller

The flow controller is fitted with a switching function via a reed switch. To check the switch function, check the electrical conductivity of the reed switch. The reed switch and the float must be located at the level of the marking. If the switch function is not working properly, the reed switch can be displaced in the compression fitting to perform fine tuning.

17.4.1 Performing the annual maintenance

The flow controller must be subject to annual maintenance in order to guarantee its functionality.

Pre-conditions for actions:

- ✓ Throughflow was deactivated.

Resources required:

- ✂ A maintenance set is available.
- ✂ Suitable tools (e.g. a Ø 3 mm face spanner and a socket wrench AD19) are available.
- ✂ Silicone grease for the O-rings is provided

Perform the following work steps:

1. Deinstall the inflow and outflow pipes from the flow controller.
 2. Dismantle the flow controller using the four fixing screws (item 4 in Tab. 4 „Legend for the water sampling station“ on page 8).
 3. Loosen the four housing screws on the rear-side of the flow controller and open carefully.
 4. Replace all the O-rings in the flow controller. Lightly grease all the new O-rings with silicone grease before insertion.
 5. Replace the diaphragm.
 6. Check all further components for visible wear and replace if necessary.
 7. Clean the components and the housing interior carefully using clear warm water.
 8. Close the flow controller using the four housing screws.
 - ▶ You have completed the annual maintenance.
 9. Re-install the flow controller (see section 8.3 „Setting the flow controller“ on page 26).
 10. Adjust the throughflow volume again (see section 8.3 „Setting the flow controller“ on page 26).
- ✓ **You have successfully maintained, installed and re-commissioned the flow controller.**

17.4.2 Cross-sectional view of the flow controller

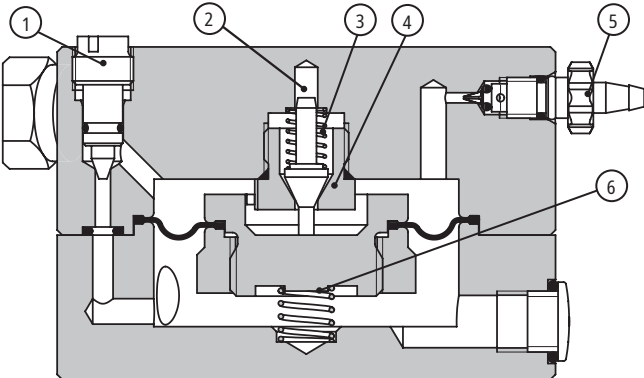


Fig. 39: Cross-sectional view of the flow controller

No.	Item
1	Setting screw
2	Control cone
3	Compression spring
4	Control nozzle
5	Valve at the extraction point
6	Compression spring

Tab. 68: Legend for the cross-sectional view of the flow controller

17.5 Cleaning the sample water filter

Perform the following work steps:

1. Close the shut-off taps of the water sampling station.
 - ▶ Now no more water is conveyed. The float of the flow switch sinks to the bottom.
 2. Unscrew the transparent cover of the sample water filter.
 3. Clean the filter sieve thoroughly. Then rinse it with clear water.
 4. Re-insert the filter sieve.
 5. Screw the filter cup back on.
- ✓ **The sample water filter has been cleaned successfully.**

17.6 Resetting to factory settings

You can reset the device to its factory settings either using Menu 2 **Settings** or when switching on the device.

Resetting to the factory settings using the menu

Perform the following work steps:

1. In Menu 2, navigate to “General settings”.
 2. Select “Factory settings” and press **OK**.
 3. Confirm with “Yes”.
- ✓ **Reset to factory settings.**

Resetting to the factory settings when switching on the device

If you are unable to reset the device to the factory settings using menu 2, there is the following alternative.

Perform the following work steps:

1. Disconnect the device from the voltage supply or shut down the voltage supply.
2. Press and hold the  and **OK** buttons simultaneously and switch the voltage supply on again.
 - ▶ On start-up, the device displays a hidden menu.
3. Select "Yes" to reset the device to the default parameters.
 - ▶ The device switches on and loads the factory settings.

✓ **All factory default settings will be reset.**

17.7 Finishing maintenance

Perform the following work steps:

1. Make a note of the date and scope of the maintenance performed.
2. Set the service alarm for the next maintenance (see 17.2).
3. To restart the system, proceed in accordance with the instructions in section 8 „Start-up“ on page 26.

✓ **Maintenance completed.**

18 Fault resolution

See below for information about how to rectify faults on the product or the system. If you cannot eliminate the fault, please consult with the manufacturer on further measures or return the product for repair.

18.1 General faults

Fault	Possible causes	Measures for resolution
Balls in the disinfection measuring cell rotate too weakly or float does not float	Water inflow pressure too low	■ Lay sample water line with larger cross-section. ■ Installation of a sample water pump.
	Sample water filter soiled	Clean or replace the filter sieve.
Float floats but reed switch does not switch upon connection	Harmonisation between float and reed contact not correct	Calibrate the reed switch.
	Reed contact defective	Replace reed contact.
Display fluctuates during the excess chlorine measurement of the connected measurement amplifier	Fluctuating pH value influences the chlorine measurement	Stabilise the pH value in the water (e.g. optimise control path, controller parameters)
Measured value fluctuates constantly	Loose measurement cable connections	Check measurement cable; re-attach if necessary
Measurement is very slow	Diaphragm blocked	Clean electrode
	Electrode becoming obsolete	Replace electrode
	Buffer solution becoming obsolete	Check the expiration date and replace if necessary.
Measurement deviates or is unstable	Measuring cell defective	Replace measuring cell
	Diaphragm is dry and/or soiled	Clean measuring cell
Display deviates by a constant value	Measuring cell not correctly installed	Check correct installation; check correct calibration
	External potential in the system	Remove external potential.
The TOPAX® L controller constantly displays a pH value of "7.00".	Short circuit	Check measuring cell for damage and replace if necessary
No reaction to pH buffer solution	Measuring cell not correctly installed	Check correct installation; check correct calibration
	Measuring cell defective	Check measuring cell for damage and replace if necessary
Value for "free chlorine" fluctuates heavily	pH-value instability	Check pH value measurement.
The chlorine measuring cell displays too much with respect to the DPD-1 measurement	May occur when using "water fining agents". Chlorine-oxygen bonds are contained in some of these agents which react with chlorine to make chlorine dioxide, thus distorting the measuring signal by greater values	Refrain from dosing this agent. A change of water might be required.
The DPD-1 method displays excessive chlorine content to which the measuring cell cannot be adjusted	Use of "organic chlorine". When using organic chlorine products, cyanuric acid accumulates in the swimming pool water.	Replace the water completely and use other chemicals for disinfection

Tab. 69: Fault resolution

Fault	Possible causes	Measures for resolution
The TOPAX® L controller has been switched off	Current supply interrupted	Reconnect the current supply
	The fuse of the TOPAX® L controller is defective	Contact the manufacturer.
The display shows the symbol 	Sensor connected incorrectly	See 7.7.2.1 „Connecting a pH/Redox sensor (TOPAX L PH/RD)“ on page 22 See 7.7.2.2 „Connecting a conductivity sensor (TOPAX L LF)“ on page 22 See 7.7.2.3 „Connecting a 0/4 – 20 mA sensor (TOPAX L MA)“ on page 22 See 7.7.2.4 „Connecting an amperometric copper-platinum chlorine sensor (TOPAX L CH/CD)“ on page 23
Calibration error	- Contaminated buffer solutions (old) - Sensor damaged or old - Sensor cable damaged - Measuring input of the device damaged	- Replace the buffer solution - Replace the sensor - Replace the sensor cable - Check the sensor input
Data memory error	Internal memory defective	Contact the manufacturer.
Password error	Error value	- Check the password protection settings - If necessary, reset the device to works settings (see “17.6 Resetting to factory settings” on page 50)
Temperature measurement error ---. °C	Temperature sensor broken or disconnected	Check the temperature sensor and replace if necessary.
Chemical measurement error ---. °C	- Sensor not calibrated - Sensor not connected correctly - Temperature compensation incorrectly set or deactivated - The sensor or the cable is defective - Input of electrical measurement damaged - The sensor cable exceeds the maximum length	- Calibrate the sensor again - Check the sensor connection - Replace the sensor or sensor cable
Measurement not stable	- Sensors or cables are installed too close to equipment causing electrical interference - Sensor installed for flow with hydraulic turbulence - Average measurement set too low - Sensor cable too long	- Check the installation of the sensors and cable - Check the length of the sensor cable
The Calibration or Setup menu cannot be displayed	User has no access to these menus for security reasons	Adjust the password protection settings
The display is switched off	- Incorrect power supply to the device - The LCD contrast is not set correctly - The fuse has blown - Hardware error	- Check the mains voltage - Adjust the display settings (see “10.1.4 Display (2A4)” on page 32) - Contact the manufacturer
The display shows "Diagnosis" in the upper-right corner		Switch the device off and then on again. If the problem persists, contact the manufacturer.

Tab. 69: Fault resolution

Fault	Possible causes	Measures for resolution
"Probe in air" alarm (*only for conductivity measurement)	■ Cable damaged or connected incorrectly ■ Liquid missing	■ Check the sensor connection and replace the sensor or the sensor cable if necessary ■ Check the sample water flow
"Shorted Probe" alarm (*only for conductivity measurement)	■ Cable damaged ■ Foreign body in contact with the electrodes	■ Replace the sensor cable ■ Remove foreign bodies and clean the electrode
Output 18 V too low (*only for measuring an mA input)	Cable damaged	Replace the cable

Tab. 69: Fault resolution

18.2 Alarms and messages

18.2.1 General

Alarm	Message	Status
None	No entry	
External reed input active	Reed	Alarm with device block (*)
Temperature sensor broken or disconnected	Alarm Temp Fault	Alarm with device block (*)
No power supply registered	Switch off	Visual alarm
Service timer expired	Service	Visual alarm
Timer for relay 1 reduced by 70%	OFA1 R1	Pre-alarm
Timer for relay 2 reduced by 100 %	OFA2 R1	Alarm with device block (*)
Chemical measurement outside working range	Overrange R1	Alarm with device block (*)
Permanent measurement to a fixed value	Hold R1	Alarm with device block (*)
Timer for relay 2 reduced by 70%	OFA1 R2	Pre-alarm
Timer for relay 2 reduced by 100 %	OFA2 R2	Alarm with device block (*)
Chemical measurement outside working range	Overrange R2	Alarm with device block (*)
Permanent measurement to a fixed value	Hold R2	Alarm with device block (*)
Measurement A defective or disconnected	Measure A Error	Alarm with measurement error block

Tab. 70: Alarm table (general)

Conductivity

Alarm	Message	Status
Probe in the air	Probe in the air	Alarm with device block
Probe short circuited	Probe short circuited	Alarm with device block

Tab. 71: Alarm table (conductivity)

mA input

Alarm	Message	Status
Output 18 V too low	Fault V from mA	Alarm with device block
Input current higher than 22 mA	Overrange mA input	Alarm with device block (***)
Input current less than 3.6 mA	Underrange mA input	Alarm with device block (***)

Tab. 72: Alarm table (mA input)

*All alarms with a block function are valid if the menu item Alarm -> Block is set to "YES".

**The alarm triggered on interruption of the temperature sensor blocks the device if the parameter "Alarm Temp." in sub-menu 3C5 is set to "Hold".

***The alarm blocks the device if the parameters "Switch OFF" and "Block" in the sub-menus 3C3 and 3C4 are set to a value other than "NO".



Backlight: In the event of an alarm, the device switches on the red backlight.

Resetting the alarms: Press the **OK** button during an alarm to display the alarm menu. You can reset the alarms in that menu (see 12.2 „Alarm (4B)“ on page 40).

Note: The alarms are saved every 15 minutes. If the device is switched off, the alarms displayed in the last 14 minutes are lost.

19 Modbus profile

Address	Read command	Register type	Description	Min.	Max.	Data type
1000	Read input register [Function 04]	Alarm status register	5 V Fault	0	1	Unsigned 16 bit
1001			Reed Status	0	1	Unsigned 16 bit
1002			Service	0	1	Unsigned 16 bit
1003			Power Line Interruption	0	1	Unsigned 16 bit
1004			Temp Probe Fault	0	1	Unsigned 16 bit
1005			Relay 1 Overrange	0	1	Unsigned 16 bit
1006			Relay 2 Overrange	0	1	Unsigned 16 bit
1007			Relay 3 Overrange	0	1	Unsigned 16 bit
1008			Relay 4 Overrange	0	1	Unsigned 16 bit
1009			Relay 1 OFA 1	0	1	Unsigned 16 bit
1010			Relay 2 OFA 1	0	1	Unsigned 16 bit
1011			Relay 3 OFA 1	0	1	Unsigned 16 bit
1012			Relay 4 OFA 1	0	1	Unsigned 16 bit
1013			Relay 1 OFA 2	0	1	Unsigned 16 bit
1014			Relay 2 OFA 2	0	1	Unsigned 16 bit
1015			Relay 3 OFA 2	0	1	Unsigned 16 bit
1016			Relay 4 OFA 2	0	1	Unsigned 16 bit
1017			Relay 1 Hold Alarm	0	1	Unsigned 16 bit
1018			Relay 2 Hold Alarm	0	1	Unsigned 16 bit
1019			Relay 3 Hold Alarm	0	1	Unsigned 16 bit
1020			Relay 4 Hold Alarm	0	1	Unsigned 16 bit
1021			Relay 1 Y Alarm	0	1	Unsigned 16 bit
1022			Relay 2 Y Alarm	0	1	Unsigned 16 bit
1023			Relay 3 Y Alarm	0	1	Unsigned 16 bit
1024			Relay 4 Y Alarm	0	1	Unsigned 16 bit
1025			SSR 1 Y Alarm	0	1	Unsigned 16 bit
1026			SSR 2 Y Alarm	0	1	Unsigned 16 bit
1027			mA 1 Y Alarm	0	1	Unsigned 16 bit
1028			mA 2 Y Alarm	0	1	Unsigned 16 bit
1099			Logic or All Alarms	0	1	Unsigned 16 bit

Tab. 73: Alarm status register

19.1 Output register

Address	Read command	Register type	Description				
1100	Read input register [Function 04]	Output register	Status RELAY 1	Value	Description	Data type	
				0	OFF	Unsigned 16 bit	
				1	ON		
1101			Status RELAY 2	Value	Description	Data type	
				0	OFF	Unsigned 16 bit	
				1	ON		
1102			Status RELAY 3	Value	Description	Data type	
				0	OFF	Unsigned 16 bit	
				1	ON		
1103			Status RELAY 4	Value	Description	Data type	
				0	OFF	Unsigned 16 bit	
				1	ON		
1104			Status SSR 1	Value	Description	Data type	Notes
				Min.	Max.	Unsigned 16 bit	Pulse/minute
				0	400		
1105			Status SSR 2	Value	Description	Data type	Notes
				Min.	Max.	Unsigned 16 bit	Pulse/minute
				0	400		
1106			Status mA 1	Value	Description	Data type	Notes
				Min.	Max.	Unsigned 16 bit	No. Decimals = 2
				360 (mA)	2200 (mA)		
1107			Status mA 2	Value	Description	Data type	Notes
				Min.	Max.	Unsigned 16 bit	No. Decimals = 2
				360 (mA)	2200 (mA)		

Tab. 74: Output register

19.2 Type of input module

Address SLOT A	Read command	Register type	Description	Value	Module type	Data type
1500	Read input register [Function 04]	Measure- ment	Module type	0	NONE	Unsigned 16 bit
				1	INPUT_mA	
				2	PH_ORP	
				3	EC_COND	
				4	TURBIDITY	
				5	FLOW	
				6	DIGITAL OXYGEN	
				7	DIGITAL SUSP. SOLID	
				8	DIGITAL TURBIDITY-LT	
				9	DIGITAL TURBIDITY-TN	
				10	AMPEROMETRIC	

Tab. 75: Type of input module

19.3 Input measurement (temperature)

Address	Read command	Register type	Description	Min.	Max.	Data type	Notes
1108	Read input register [Function 04]	Temperature measurement	Temp. Unit of Measurement	0 (°C)	1 (°F)	Unsigned 16 bit	
1109			Temp. Measure- ment	-500 (°C) -580 (°F)	1500 (°C) 3020 (°F)	Unsigned 16 bit	No. Decimals = 1

Tab. 76: Input measurement (temperature)

19.4 Input measurement (pH/Redox)

Address SLOT A	Read command	Register type	Description	Value	Unit	Data type
1501	Read input register [Function 04]	Measurement	Measurement Unit	0	pH	Unsigned 16 bit
				1	mV	

Address SLOT A	Read command	Register type	Description	Min.	Max.	Data type
1502	Read input register [Function 04]	Measurement	Main Measurement L	0 (pH)	1400 (pH)	Signed 32 bit
1503			Main measurement H	-2000 (mV)	+2000 (mV)	
1504			Dec. Main Measure- ment	3	3	Unsigned 16 bit

Address SLOTA	Read command	Register type	Description	Min.	Max.	Data type
1505	Read input register [Function 04]	Calibrations	Calibration Type	0 (None) 1 (One Point) 2 (Two Point)		Unsigned 16 bit
1506			Point 1 L	-99999	99999	Signed 32 bit
1507			Point 1 H			
1508			Dec. Point 1	0	4	Unsigned 16 bit
1509			Point 2 L	-99999	99999	Signed 32 bit
1510			Point 2 H			
1511			Dec. Point 2	0	4	Unsigned 16 bit
1512			Gain L	0	99999	Signed 32 bit
1513			Gain H			
1514			Dec. Gain	0	4	Unsigned 16 bit
1515			Offset L	-99999	99999	Signed 32 bit
1516			Offset H			
1517			Dec. Offset	0	4	Unsigned 16 bit
1518			Adjustment L	-99999	99999	Signed 32 bit
1519			Adjustment H			
1520			Dec. Adjustment	0	4	Unsigned 16 bit
1521			Calibration Day	1	31	Unsigned 16 bit
1522			Calibration Month	1	12	Unsigned 16 bit
1523			Calibration Year	0	99	Unsigned 16 bit
1524		Advanced Function	Temp. Compensation	0 (OTC) 1 (MTC) 2 (ATC)		Unsigned 16 bit
1525			Filter	0 (Low) 1 (Medium) 2 (High)		Unsigned 16 bit

Tab. 77: Input measurement (pH/Redox)

19.5 Input measurement (conductivity)

Address SLOT A	Read command	Register type	Description	Value	Unit	Data type	Note
1501	Read input register [Function 04]	Measurement	Measurement Unit	0	uS	Unsigned 16 bit	
				1	mS		
				2	kOhm		
				3	MOhm		
				4	ppm		
				5	ppb		

Address SLOT A	Read command	Register type	Description	Min	Max	Data type	Note
1502	Read input register [Function 04]	Measurement	Main Measure- ment L	0	99999	Signed 32 bit	
1503			Main measure- ment H				
1504			Dec. Main Measurement	3	3	Unsigned 16 bit	
1505		Calibrations	Calibration Type	0 (None)		Unsigned 16 bit	
				1 (One Point)			
				2 (Two Points)			
1506			Point 1 L	0	99999	Signed 32 bit	
1507			Point 1 H				
1508			Dec. Point 1	0	4	Unsigned 16 bit	
1509			Point 2 L	0	99999	Signed 32 bit	
1510			Point 2 H				
1511			Dec. Point 2	0	4	Unsigned 16 bit	
1512			Gain L	0	99999	Unsigned 32 bit	
1513			Gain H				
1514			Dec. Gain	0	4	Unsigned 16 bit	
1515			Offset L	-99999	99999	Signed 32 bit	
1516			Offset H				
1517			Dec. Offset	0	4	Unsigned 16 bit	
1518			Adjustment L	-99999	99999	Signed 32 bit	

Address SLOT A	Read command	Register type	Description	Min	Max	Data type	Note
1519	Read input register [Function 04]	Calibrations	Adjust H	-99999	99999		
1520			Dec. Adjustment	0	4	Unsigned 16 bit	
1521			Calibration Day	1	31	Unsigned 16 bit	
1522			Calibration Month	1	12	Unsigned 16 bit	
1523			Calibration Year	0	99	Unsigned 16 bit	
1524		Advanced Function	Temp. Compens- ation	0 (OTC) 1 (MTC) 2 (ATC)		Unsigned 16 bit	
1525			Filter	0 (Low) 1 (Medium) 2 (High)		Unsigned 16 bit	
1526			TDS	3	20	Unsigned 16 bit	No. Decimals = 1
1527			Compensation Type	0 (Pure H2O) 1 (Lin 25 °C) 2 (Lin 20 °C)		Unsigned 16 bit	
1528			Linear Coefficient	1	1000	Unsigned 16 bit	%/°C No. Decimals = 2
1529	Read input register [Function 04]	Advanced Function	Type of Cell Constant	0 (Standard) 1 (Custom)		Unsigned 16 bit	
1530			Standard Cell Constant	0 (0.01) 1 (0.10) 2 (0.20) 3 (1.00) 4 (10.0)		Unsigned 16 bit	cm-1
1531			Cell Constant L	5		Unsigned 32 bit	
1532			Cell Constant H	20000			
1533			Dec. Point of Cell Constant	0	4	Unsigned 16 bit	
1534			Status Register	Shorted Probe	0	1	Unsigned 16 bit
1535		Probe in Air		0	1	Unsigned 16 bit	

Tab. 78: Input measurement (conductivity)

19.6 Input measurement (mA input)

Address SLOT A	Read command	Register type	Description	Value	Unit	Data type
1501	Read input register [Function 04]	Measurement	Measurement Unit	0	ppm	Unsigned 16 bit
				1	ppb	
				2	mg/l	
				3	mA	
				4	Custom	
				5	NTU	

Address SLOT A	Read command	Register type	Description	Min	Max	Data type
1502	Read input register [Function 04]	Measurement	Main Measurement L	-99999	99999	Signed 32 bit
1503			Main measurement H			
1504			Dec. Main Measurement	3	3	Unsigned 16 bit
1505	Read input register [Function 04]	Calibrations	Calibration Type	0 (None) 1 (One Point) 2 (Two Points)		Unsigned 16 bit
1506			Point 1 L	-99999	99999	Signed 32 bit
1507			Point 1 H			
1508	Read input register [Function 04]	Calibrations	Dec. Point 1	0	4	Unsigned 16 bit
1509			Point 2 L	-99999	99999	Signed 32 bit
1510			Point 2 H			
1511			Dec. Point 2	0	4	Unsigned 16 bit
1512			Gain L	0	99999	Unsigned 32 bit
1513			Gain H			
1514			Dec. Gain	4	4	Unsigned 16 bit
1515			Offset L	-99999	99999	Signed 32 bit
1516			Offset H			
1517			Dec. Offset	0	4	Unsigned 16 bit
1518			Adjustment L	-99999	99999	Signed 32 bit
1519			Adjustment H			
1520			Dec. Adjustment	0	4	Unsigned 16 bit
1521			Calibration Day	1	31	Unsigned 16 bit
1522			Calibration Month	1	12	Unsigned 16 bit
1523			Calibration Year	0	99	Unsigned 16 bit

Address SLOT A	Read command	Register type	Description	Min	Max	Data type
1524	Read input register [Function 04]	Advanced Function	Custom Unit of Measurement L	0x2020	0x7A7A	Unsigned 32 bit
1525			Custom Unit of Measurement H	0x2020	0x7A7A	
1526			Main Measurement Name	0 (Cl2) 1 (PAA) 2 (H2O2) 3 (O3) 4 (Custom) 5 (O2) 6 (Turb)		Unsigned 16 bit
1527			Custom Name of Measurement L	0x2020	0x7A7A	
1528			Custom Name of Measurement H	0x2020	0x7A7A	Unsigned 32 bit
1529			Filter	0 (Low) 1 (Medium) 2 (High)		Unsigned 16 bit
1530			Sensor Type	0 (0 – 20 mA)	1 (4 – 20 mA)	Unsigned 16 bit
1531			Min. Range L	-99999	99999	Signed 32 bit
1532			Min. Range H			
1533			Min. Dec. Range	0	4	Unsigned 16 bit
1534			Max. Range L	-99999	99999	Signed 32 bit
1535			Max. Range H			
1536			Max. Dec. Range	0	4	Unsigned 16 bit
1537			Overcurrent Alarm	0 (OFF) 1 (ON)		Unsigned 16 bit
1538			Undercurrent Alarm	0 (OFF) 1 (ON)		Unsigned 16 bit
1539		Status Register	Input mA > 22 mA	0	1	Unsigned 16 bit
1540			Fault +18 V	0	1	Unsigned 16 bit

Tab. 79: Input measurement (mA input)

19.7 Configuration relay 1 output

Address	Read command	Description	Value	Description	Data type	Notes
3000	Read input register [Function 04]	Link function relay	0	OFF	Unsigned 16 bit	
			1	TEMPERATURE		
			2	MEASUREMENT SLOT A		
3001		Type function relay	0	ON_OFF	Unsigned 16 bit	if LINK = OFF Return error
			1	Timed		
			2	Pulse length		

19.7.1 Relay 1 link function (temperature measurement)

Address	Read command	Write command	Description	°C		°F		Data type
				Min.	Max.	Min.	Max.	
3100	Read input register [Function 04]	Write multiple registers [Function 16] Length = 3	Setpoint L	-500	1500	580	3020	Signed 32 bit
3101			Setpoint H					
3102			Setpoint Dec.	1	1	0	0	Unsigned 16 bit
3103		Write multiple registers [Function 16] Length = 1	Type	0 (High)	1 (Low)	0 (High)	1 (Low)	Unsigned 16 bit

19.7.2 Relay 1 link function (pH/Redox measurement)

Address	Read command	Write command	Description	pH		mV		Data type
				Min.	Max.	Min.	Max.	
3100	Read input register [Function 04]	Write multiple registers [Function 16] Length = 3	Setpoint L	0	1400	-2000	2000	Signed 32 bit
3101			Setpoint H					
3102			Setpoint Dec.	2	2	0	0	Unsigned 16 bit
3103		Write multiple registers [Function 16] Length = 1	Type	0 (Acid)	1 (Alka)	0 (High)	1 (Low)	Unsigned 16 bit

19.7.3 Relay 1 link function (conductivity measurement)

Address	Read command	Write command	Description	Min.	Max.	Data type
3100	Read input register [Function 04]	Write multiple registers [Function 16] Length = 3	Setpoint L	0	99999	Signed 32 bit
3101			Setpoint H			
3102			Setpoint Dec.	0	4	Unsigned 16 bit
3103		Write multiple registers [Function 16] Length = 1	Type	0 (High)	1 (Low)	Unsigned 16 bit

19.7.4 Relay 1 link function (mA input measurement)

Address	Read command	Write command	Description	Min.	Max.	Data type
3100	Read input register [Function 04]	Write multiple registers [Function 16] Length = 3	Setpoint L	-99999	99999	Signed 32 bit
3101			Setpoint H			
3102			Setpoint Dec.	0	4	Unsigned 16 bit
3103		Write multiple registers [Function 16] Length = 1	Type	0 (High)	1 (Low)	Unsigned 16 bit

19.8 Configuration relay 2 output

Address	Read command	Description	Value	Description	Data type	Notes
3002	Read input register [Function 04]	Link function relay	0	OFF	Unsigned 16 bit	
			1	TEMPERATURE		
			2	MEASUREMENT SLOT A		
3003		Type function relay	0	ON_OFF	Unsigned 16 bit	if LINK = OFF Return error
			1	Timed		
			2	Pulse length		

19.8.1 Relay 2 link function (temperature measurement)

Address	Read command	Write command	Description	°C		°F		Data type
				Min.	Max.	Min.	Max.	
3200	Read input register [Function 04]	Write multiple registers [Function 16] Length = 3	Setpoint L	-500	1500	-580	3020	Signed 32 bit
3201			Setpoint H					
3202		Write multiple registers [Function 16] Length = 1	Setpoint Dec.	1	1	0	0	Unsigned 16 bit
3203			Type	0 (High)	1 (Low)	0 (High)	1 (Low)	Unsigned 16 bit

19.8.2 Relay 2 link function (pH/Redox measurement)

Address	Read command	Write command	Description	pH		mV		Data type
				Min.	Max.	Min.	Max.	
3200	Read input register [Function 04]	Write multiple registers [Function 16] Length = 3	Setpoint L	0	1400	-2000	2000	Signed 32 bit
3201			Setpoint H					
3202		Write multiple registers [Function 16] Length = 1	Setpoint Dec.	2	2	0	0	Unsigned 16 bit
3203			Type	0 (Acid)	1 (Alka)	0 (High)	1 (Low)	Unsigned 16 bit

19.8.3 Relay 2 link function (conductivity measurement)

Address	Read command	Write command	Description	Min.	Max.	Data type
3200	Read input register [Function 04]	Write multiple registers [Function 16] Length = 3	Setpoint L	0	99999	Signed 32 bit
3201			Setpoint H			
3202		Write multiple registers [Function 16] Length = 1	Setpoint Dec.	0	4	Unsigned 16 bit
3203			Type	0 (High)	1 (Low)	Unsigned 16 bit

19.8.4 Relay 2 link function (mA input measurement)

Address	Read command	Write command	Description	Min.	Max.	Data type
3200	Read input register [Function 04]	Write multiple registers [Function 16] Length = 3	Setpoint L	-99999	99999	Signed 32 bit
3201			Setpoint H			
3202			Setpoint Dec.	0	4	Unsigned 16 bit
3203		Write multiple registers [Function 16] Length = 1	Type	0 (High)	1 (Low)	Unsigned 16 bit

19.9 Configuration relay 3 output

Address	Read command	Description	Value	Description	Data type	Notes				
3004		Link function relay	0	OFF	Unsigned 16 bit					
			1	TEMP.						
			2	MEASURE- MENT SLOT A						
			4	ALARM						
3005	Read input register [Function 04]	Type function relay	TEMPERATURE		MEASUREMENT SLOT A		ALARM		Data type	Notes
			0	ON_OFF	0	ON_OFF	0	Relay1	Unsigned 16 bit	if LINK = OFF Return error
			1	Timed	1	Timed	1	Relay 2		
			2	Pulse length	2	Pulse length				
					3	Sensor cleaning				

19.9.1 Relay 3 link function (temperature measurement)

Address	Read command	Write command	Description	°C		°F		Data type
				Min.	Max.	Min.	Max.	
3300	Read input register [Function 04]	Write multiple registers [Function 16] Length = 3	Setpoint L	-500	1500	-580	3020	Signed 32 bit
3301			Setpoint H					
3302			Setpoint Dec.	1	1	0	0	Unsigned 16 bit
3303		Write multiple registers [Function 16] Length = 1	Type	0 (High)	1 (Low)	0 (High)	1 (Low)	Unsigned 16 bit

19.9.2 Relay 3 link function (pH/Redox measurement)

Address	Read command	Write command	Description	pH		mV		Data type
				Min.	Max.	Min.	Max.	
3300	Read input register [Function 04]	Write multiple registers [Function 16] Length = 3	Setpoint L	0	1400	-2000	2000	Signed 32 bit
3301			Setpoint H					
3302			Setpoint Dec.	2	2	0	0	Unsigned 16 bit
3303		Write multiple registers [Function 16] Length = 1	Type	0 (Acid)	1 (Alka)	0 (High)	1 (Low)	Unsigned 16 bit

19.9.3 Relay 3 link function (conductivity measurement)

Address	Read command	Write command	Description	Min.	Max.	Data type
3300	Read input register [Function 04]	Write multiple registers [Function 16] Length = 3	Setpoint L	0	99999	Signed 32 bit
3301			Setpoint H			
3302			Setpoint Dec.	0	4	Unsigned 16 bit
3303		Write multiple registers [Function 16] Length = 1	Type	0 (High)	1 (Low)	Unsigned 16 bit

19.9.4 Relay 3 link function (mA input measurement)

Address	Read command	Write command	Description	Min.	Max.	Data type
3200	Read input register [Function 04]	Write multiple registers [Function 16] Length = 3	Setpoint L	-99999	99999	Signed 32 bit
3201			Setpoint H			
3202			Setpoint Dec.	0	4	Unsigned 16 bit
3203		Write multiple registers [Function 16] Length = 1	Type	0 (High)	1 (Low)	Unsigned 16 bit

19.9.5 Relay 3 link function (cleaning the sensor for measurement A)

Address	Read command	Write command	Description	Min.	Max.	Data type
3333	Read input register [Function 04]	Cleaning Time L	0	3659	Unsigned 32 bit	Seconds
3334		Cleaning Time H				
3335		Stabilisation Delay L	0	3659	Unsigned 32 bit	Seconds
3336		Stabilisation Delay H				
3337		Wait for New Cleaning L	0	5999	Unsigned 32 bit	Minutes
3338		Wait for Next Cleaning H				

19.10 Configuration relay 4 output

Address	Read command	Description	Value	Description	Data type	Notes				
3006	Read input register [Function 04]	Link function relay	0	OFF	Un-signed16 bit					
			1	TEMP.						
			2	MEASUREMENT SLOTA						
			4	ALARM						
3007	Read input register [Function 04]	Type function relay	TEMPERATURE		MEASUREMENT SLOT A		ALARM		Data type	Notes
			0	ON_OFF	0	ON_OFF	0	Relay 1	Un-signed 16 bit	if LINK = OFF Return error
			1	Timed	1	Timed	1	Relay 2		
			2	Pulse length	2	Pulse length				

19.10.1 Relay 4 link function (temperature measurement)

Address	Read command	Write command	Description	°C		°F		Data type
				Min.	Max.	Min.	Max.	
3400	Read input register [Function 04]	Write multiple registers [Function 16] Length = 3	Setpoint L	-500	1500	-580	3020	Signed 32 bit
3401			Setpoint H					
3402			Setpoint Dec.	1	1	0	0	Unsigned 16 bit
3403		Write multiple registers [Function 16] Length = 1	Type	0 (High)	1 (Low)	0 (High)	1 (Low)	Unsigned 16 bit

19.10.2 Relay 4 link function (pH/Redox measurement)

Address	Read command	Write command	Description	pH		mV		Data type
				Min.	Max.	Min.	Max.	
3400	Read input register [Function 04]	Write multiple registers [Function 16] Length = 3	Setpoint L	0	1400	-2000	2000	Signed 32 bit
3401			Setpoint H					
3402			Setpoint Dec.	2	2	0	0	Unsigned 16 bit
3403		Write multiple registers [Function 16] Length = 1	Type	0 (Acid)	1 (Alka)	0 (High)	1 (Low)	Unsigned 16 bit

19.10.3 Relay 4 link function (conductivity measurement)

Address	Read command	Write command	Description	Min.	Max.	Data type
3400	Read input register [Function 04]	Write multiple registers [Function 16] Length = 3	Setpoint L	0	99999	Signed 32 bit
3401			Setpoint H			
3402			Setpoint Dec.	0	4	Unsigned 16 bit
3403		Write multiple registers [Function 16] Length = 1	Type	0 (High)	1 (Low)	Unsigned 16 bit

19.10.4 Relay 4 link function (mA input measurement)

Address	Read command	Write command	Description	Min.	Max.	Data type
3400	Read input register [Function 04]	Write multiple registers [Function 16] Length = 3	Setpoint L	-99999	99999	Signed 32 bit
3401			Setpoint H			
3402			Setpoint Dec.	0	4	Unsigned 16 bit
3403		Write multiple registers [Function 16] Length = 1	Type	0 (High)	1 (Low)	Unsigned 16 bit

19.11 Configuration SSR1 output

Address	Read command	Write command	Value	Description	Data type	Notes
3008	Read input register [Function 04]	Link function SSR	0	OFF	Unsigned 16 bit	
			1	TEMPERATURE		
			2	MEASUREMENT SLOTA		

19.11.1 SSR1 link function (temperature measurement)

Address	Read command	Write multiple registers [Function 16]	Description	°C		°F		Data type	Notes
				Min.	Max.	Min.	Max.		
3500	Read input register [Function 04]	Length = 3	Setpoint L	-500	1500	-580	3020	Signed 32 bit	
3501			Setpoint H						
3502			Setpoint Dec.	1	1	1	1	Unsigned 16 bit	
3503		Length = 1	Type	0 (High)	1 (Low)	0 (High)	1 (Low)	Unsigned 16 bit	Pulse/ minute
3504		Length = 1	Max. Pulses	20	400	20	400	Unsigned 16 bit	
3505		Length = 1	Max. Pulses	1	100	1	100	Unsigned 16 bit	

19.11.2 SSR1 link function (pH/Redox measurement)

Address	Read command	Write multiple registers [Function 16]	Description	pH		mV		Data type	Notes
				Min.	Max.	Min.	Max.		
3500	Read input register [Function 04]	Length = 3	Setpoint L	0	1400	-2000	2000	Signed 32 bit	
3501			Setpoint H						
3502			Setpoint Dec.	2	2	0	0	Unsigned 16 bit	
3503		Length = 1	Type	0 (Acid)	1 (Alka)	0 (High)	1 (Low)	Unsigned 16 bit	
3504		Length = 1	Max. Pulses	20	400	20	400	Unsigned 16 bit	Pulse/minute
3505		Length = 1	Max. Pulses	1	100	1	100	Unsigned 16 bit	Pulse/minute

19.11.3 SSR1 link function (conductivity measurement)

Address	Read command	Write multiple registers [Function 16]	Description	Min.	Max.	Data type	Notes
3500	Read input register [Function 04]	Length = 3	Setpoint L	0	99999	Signed 32 bit	
3501			Setpoint H				
3502			Setpoint Dec.	0	4	Unsigned 16 bit	
3503		Length = 1	Type	0 (High)	1 (Low)	Unsigned 16 bit	
3504		Length = 1	Max. Pulses	20	400	Unsigned 16 bit	Pulse/minute
3505		Length = 1	Max. Pulses	1	100	Unsigned 16 bit	Pulse/minute

19.11.4 SSR1 link function (mA input measurement)

Address	Read command	Write multiple registers [Function 16]	Description	Min.	Max.	Data type	Notes
3500	Read input register [Function 04]	Length = 3	Setpoint L	-99999	99999	Signed 32 bit	
3501			Setpoint H				
3502			Setpoint Dec.	0	4	Unsigned 16 bit	
3503		Length = 1	Type	0 (High)	1 (Low)	Unsigned 16 bit	
3504		Length = 1	Max. Pulses	20	400	Unsigned 16 bit	Pulse/minute
3505		Length = 1	Max. Pulses	1	100	Unsigned 16 bit	Pulse/minute

19.12 Configuration SSR2 output

Address	Read command	Write command	Value	Description	Data type	Notes
3010	Read input register [Function 04]	Link Function SSR	0	OFF	Unsigned 16 bit	
			1	TEMPERATURE		
			2	MEASUREMENT SLOT A		

19.12.1 SSR2 link function (temperature measurement)

Address	Read command	Write multiple registers [Function 16]	Description	°C		°F		Data type	Notes
				Min.	Max.	Min.	Max.		
3600	Read input register [Function 04]	Length = 3	Setpoint L	-500	1500	-580	3020	Signed 32 bit	
3601			Setpoint H						
3602			Setpoint Dec.	1	1	1	1	Unsigned 16 bit	
3603		Length = 1	Type	0 (High)	1 (Low)	0 (High)	1 (Low)	Unsigned 16 bit	Pulse/ minute
3604		Length = 1	Max. Pulses	20	400	20	400	Unsigned 16 bit	
3605		Length = 1	Max. Pulses	1	100	1	100	Unsigned 16 bit	

19.12.2 SSR2 link function (pH/Redox measurement)

Address	Read command	Write multiple registers [Function 16]	Description	pH		mV		Data type	Notes
				Min.	Max.	Min.	Max.		
3600	Read input register [Function 04]	Length = 3	Setpoint L	0	1400	-2000	2000	Signed 32 bit	
3601			Setpoint H						
3602			Setpoint Dec.	2	2	0	0	Unsigned 16 bit	
3603		Length = 1	Type	0 (Acid)	1 (Alka)	0 (High)	1 (Low)	Unsigned 16 bit	Pulse/ minute
3604		Length = 1	Max. Pulses	20	400	20	400	Unsigned 16 bit	
3605		Length = 1	Max. Pulses	1	100	1	100	Unsigned 16 bit	

19.12.3 SSR2 link function (conductivity measurement)

Address	Read command	Write multiple registers [Function 16]	Description	Min.	Max.	Data type	Notes
3600	Read input register [Function 04]	Length = 3	Setpoint L	0	99999	Signed 32 bit	
3601			Setpoint H				
3602			Setpoint Dec.	0	4	Unsigned 16 bit	
3603		Length = 1	Type	0 (High)	1 (Low)	Unsigned 16 bit	Pulse/minute
3604		Length = 1	Max. Pulses	20	400	Unsigned 16 bit	
3605		Length = 1	Max. Pulses	1	100	Unsigned 16 bit	

19.12.4 SSR2 link function (mA input measurement)

Address	Read command	Write multiple registers [Function 16]	Description	Min.	Max.	Data type	Notes
3600	Read input register [Function 04]	Length = 3	Setpoint L	-99999	99999	Signed 32 bit	
3601			Setpoint H				
3602			Setpoint Dec.	0	4	Unsigned 16 bit	
3603		Length = 1	Type	0 (High)	1 (Low)	Unsigned 16 bit	Pulse/minute
3604		Length = 1	Max. Pulses	20	400	Unsigned 16 bit	
3605		Length = 1	Max. Pulses	1	100	Unsigned 16 bit	

19.13 Configuration mA1 output

Address	Read command	Description	Value	Description	Data type
3012	Read input register [Function 04]	Link Function mA	0	OFF	Unsigned 16 bit
			1	TEMPERATURE	
			2	MEASUREMENT SLOT A	
3013		Type function mA	0	Repeater [PID Off]	Unsigned 16 bit
			1	PID On	

19.13.1 mA1 link function (temperature measurement)

19.13.1.1 Type function repeater

Address	Read command	Write multiple registers [Function 16]	Description	°C		°F		Data type
				Min.	Max.	Min.	Max.	
3700	Read input register [Function 04]	Length = 3	Start mA L	-500	1500	-580	3020	Signed 32 bit
3701			Start mA H					
3702			Decimal Start mA	1	1	1	1	Unsigned 16 bit
3703		Length = 3	End mA L	-500	1500	-580	3020	Signed 32 bit
3704			End mA H					
3705			Decimal End mA	1	1	1	1	Unsigned 16 bit

19.13.1.2 Type function PID

Address	Read command	Write multiple registers [Function 16]	Description	°C		°F		Data type
				Min.	Max.	Min.	Max.	
3708	Read input register [Function 04]	Length = 3	Setpoint L	-500	1500	-580	3020	Signed 32 bit
3709			Setpoint H					
3710			Setpoint Dec.	1	1	1	1	Unsigned 16 bit
3711		Length = 1	Type	0 (High)	1 (Low)	0 (High)	1 (Low)	Unsigned 32 bit

19.13.2 mA1 link function (pH/Redox measurement)

19.13.2.1 Type function repeater

Address	Read command	Write multiple registers [Function 16]	Description	pH		mV		Data type
				Min.	Max.	Min.	Max.	
3700	Read input register [Function 04]	Length = 3	Start mA L	0	1400	-2000	2000	Signed 32 bit
3701			Start mA H					
3702			Decimal Start mA	2	2	0	0	Unsigned 16 bit
3703		Length = 3	End mA L	0	1400	-2000	2000	Signed 32 bit
3704			End mA H					
3705			Decimal End mA	2	2	0	0	Unsigned 16 bit

19.13.2.2 Type function PID

Address	Read command	Write multiple registers [Function 16]	Description	pH		mV		Data type
				Min.	Max.	Min.	Max.	
3708	Read input register [Function 04]	Length = 3	Setpoint L	0	1400	-2000	2000	Signed 32 bit
3709			Setpoint H					
3710			Setpoint Dec.	2	2	0	0	Unsigned 16 bit
3711		Length = 1	Type	0 (Acid)	1 (Alka)	0 (High)	1 (Low)	Unsigned 16 bit

19.13.3 mA1 link function (conductivity measurement)**19.13.3.1 Type function repeater**

Address	Read command	Write multiple registers [Function 16]	Description	Min.	Max.	Data type
3700	Read input register [Function 04]	Length = 3	Start mA L	0	99999	Signed 32 bit
3701			Start mA H			
3702			Decimal Start mA	0	4	Unsigned 16 bit
3703		Length = 3	End mA L	0	99999	Signed 32 bit
3704			End mA H			
3705			Decimal End mA	0	4	Unsigned 16 bit

19.13.3.2 Type function PID

Address	Read command	Write multiple registers [Function 16]	Description	Min.	Max.	Data type
3708	Read input register [Function 04]	Length = 3	Setpoint L	0	999999	Signed 32 bit
3709			Setpoint H			
3710			Setpoint Dec.	0	4	Unsigned 16 bit
3711		Length = 1	Type	0 (High)	1 (Low)	Unsigned 16 bit

19.13.4 mA1 link function (mA input measurement)

19.13.4.1 Type function repeater

Address	Read command	Write multiple registers [Function 16]	Description	Min.	Max.	Data type
3700	Read input register [Function 04]	Length = 3	Start mA L	-99999	99999	Signed 32 bit
3701			Start mA H			
3702			Decimal Start mA	0	4	Unsigned 16 bit
3703		Length = 3	End mA L	-99999	99999	Signed 32 bit
3704			End mA H			
3705			Decimal End mA	0	4	Unsigned 16 bit

19.13.4.2 Type function PID

Ad- dress	Read command	Write multiple registers [Function 16]	Description	Min.	Max.	Data type
3708	Read input register [Function 04]	Length = 3	Setpoint L	-99999	999999	Signed 32 bit
3709			Setpoint H			
3710			Setpoint Dec.	0	4	Unsigned 16 bit
3711		Length = 1	Type	0 (High)	1 (Low)	Unsigned 16 bit

19.14 Configuration mA2 output

Address	Read command	Description	Value	Description	Data type
3014	Read input register [Function 04]	Link Function mA	0	OFF	Unsigned 16 bit
			1	TEMPERATURE	
			2	MEASUREMENT SLOT A	
3015		Type function mA	0	Repeater [PID Off]	Unsigned 16 bit
			1	PID On	

19.14.1 mA2 link function (temperature measurement)

19.14.1.1 Type function repeater

Ad- dress	Read command	Write multiple registers [Function 16]	Description	°C		°F		Data type
				Min.	Max.	Min.	Max.	
3800	Read input register [Function 04]	Length = 3	Start mA L	-500	1500	-580	3020	Signed 32 bit
3801			Start mA H					
3802			Decimal Start mA	1	1	1	1	Unsigned 16 bit
3803		Length = 3	End mA L	-500	1500	-580	3020	Signed 32 bit
3804			End mA H					
3805			Decimal End mA	1	1	1	1	Unsigned 16 bit

19.14.1.2 Type function PID

Address	Read command	Write multiple registers [Function 16]	Description	°C		°F		Data type
				Min.	Max.	Min.	Max.	
3808	Read input register [Function 04]	Length = 3	Setpoint L	-500	1500	-580	3020	Signed 32 bit
3809			Setpoint H					
3810			Setpoint Dec.	1	1	1	1	Unsigned 16 bit
3811		Length = 1	Type	0 (High)	1 (Low)	0 (High)	1 (Low)	Unsigned 32 bit

19.14.2 mA2 link function (pH/Redox measurement)

19.14.2.1 Type function repeater

Address	Read command	Write multiple registers [Function 16]	Description	pH		mV		Data type
				Min.	Max.	Min.	Max.	
3800	Read input register [Function 04]	Length = 3	Start mA L	0	1400	-2000	2000	Signed 32 bit
3801			Start mA H					
3802			Decimal Start mA	2	2	0	0	Unsigned 16 bit
3803		Length = 3	End mA L	0	1400	-2000	2000	Signed 32 bit
3804			End mA H					
3805			Decimal End mA	2	2	0	0	Unsigned 16 bit

19.14.2.2 Type function PID

Ad- dress	Read command	Write multiple registers [Function 16]	Description	pH		mV		Data type
				Min.	Max.	Min.	Max.	
3808	Read input register [Function 04]	Length = 3	Setpoint L	0	1400	-2000	2000	Signed 32 bit
3809			Setpoint H					
3810			Setpoint Dec.	2	2	0	0	Unsigned 16 bit
3811		Length = 1	Type	0 (Acid)	1 (Alka)	0 (High)	1 (Low)	Unsigned 16 bit

19.14.3 mA2 link function (conductivity measurement)

19.14.3.1 Type function repeater

Ad- dress	Read command	Write multiple registers [Function 16]	Description	Min.	Max.	Data type
3800	Read input register [Function 04]	Length = 3	Start mA L	0	99999	Signed 32 bit
3801			Start mA H			
3802			Decimal Start mA	0	4	Unsigned 16 bit
3803		Length = 3	End mA L	0	99999	Signed 32 bit
3804			End mA H			
3805			Decimal End mA	0	4	Unsigned 16 bit

19.14.3.2 Type function PID

Address	Read command	Write multiple registers [Function 16]	Description	Min.	Max.	Data type
3808	Read input register [Function 04]	Length = 3	Setpoint L	0	999999	Signed 32 bit
3809			Setpoint H			
3810			Setpoint Dec.	0	4	Unsigned 16 bit
3811		Length = 1	Type	0 (High)	1 (Low)	Unsigned 16 bit

19.14.4 mA2 link function (mA input measurement)

19.14.4.1 Type function repeater

Address	Read command	Write multiple registers [Function 16]	Description	Min.	Max.	Data type
3800	Read input register [Function 04]	Length = 3	Start mA L	-99999	99999	Signed 32 bit
3801			Start mA H			
3802			Decimal Start mA	0	4	Unsigned 16 bit
3803		Length = 3	End mA L	-99999	99999	Signed 32 bit
3804			End mA H			
3805			Decimal End mA	0	4	Unsigned 16 bit

19.14.4.2 Type function PID

Address	Read command	Write multiple registers [Function 16]	Description	Min.	Max.	Data type
3808	Read input register [Function 04]	Length = 3	Setpoint L	0	999999	Signed 32 bit
3809			Setpoint H			
3810			Setpoint Dec.	0	4	Unsigned 16 bit
3811		Length = 1	Type	0 (High)	1 (Low)	Unsigned 16 bit

20 Glossary

Due to the size of the display, some abbreviations are used, which are explained in the following table:

Abbreviation	Explanation
Gain	Gain
Xp	Proportional range (P)
Tn	Integral time (I)
Tv	Derivative time (D)
Hist.	Hysteresis
OFA	Overfeed alarm
Delay Start	Delay time for relay activation
Relay End	Delay time for relay deactivation
OverRng	Overrange
Namur Alr	NAMUR alarm
OFA (t)	Overrange alarm (time)
Persist.	Measurement persistence alarm (time)

Tab. 80: Glossary

21 Note on EU conformity EASYPRO 1

The **EASYPRO** water sampling station does not fall under the purview of the Machinery directive 2006/42/EG.

The **EASYPRO** water sampling station falls under the purview of the pressure equipment directive 2014/68/EU.

The values stated below do not exceed the limit values according to article 4, paragraph 1. As such, the **EASYPRO** water sampling station is designed and manufactured in accordance with valid good engineering practice. In accordance with article 4 section 3, as a pressure device, the **EASYPRO** does not carry CE marking and cannot be issued with a EU declaration of conformity.

Product description: Water sampling station

Type:	EASYPRO
Pressure stage:	PN6
Nominal diameter:	<DN20
Max. temperature:	65 °C
Medium:	Water (H ₂ O)

The **EASYPRO** water sampling station corresponds to the requirements of the Pressure equipment directive 2014/68/EU.

The electronic controller installed on the **EASYPRO** water sampling station is fitted with a CE mark and holds a EU declaration of conformity.

The manufacturer and distributor of the **EASYPRO** water sampling station is:

Lutz-Jesco GmbH / Am Bostelberge 19 / 30900 Wedemark / Germany

22 EU declaration of conformity TOPAX®L



(DE) EU-Konformitätserklärung

Hiermit erklären wir, dass das nachfolgend bezeichnete Gerät aufgrund seiner Konzipierung und Bauart sowie in der von uns in Verkehr gebrachten Ausführung den einschlägigen grundlegenden Sicherheits- und Gesundheitsanforderungen der aufgeführten EU-Richtlinien entspricht. Bei einer nicht mit uns abgestimmten Änderung am Gerät verliert diese Erklärung ihre Gültigkeit.

(EN) EU Declaration of Conformity

We hereby certify that the device described in the following complies with the relevant fundamental safety and sanitary requirements and the listed EU regulations due to the concept and design of the version sold by us.

If the device is modified without our consent, this declaration loses its validity.

(FR) Déclaration de conformité UE

Nous déclarons sous notre propre responsabilité que le produit ci-dessous mentionné répond aux exigences essentielles de sécurité et de santé des directives UE énumérées aussi bien sur le plan de sa conception et de son type de construction que du modèle que nous avons mis en circulation.

Cette déclaration perdra sa validité en cas d'une modification effectuée sur le produit sans notre accord explicite.

(ES) Declaración de conformidad UE

Por la presente declaramos que, dados la concepción y los aspectos constructivos del modelo puesto por nosotros en circulación, el aparato mencionado a continuación cumple con los requisitos sanitarios y de seguridad vigentes de las directivas de la U.E. citadas a continuación.

Esta declaración será invalidada por cambios en el aparato realizados sin nuestro consentimiento.

(PT) Declaração de conformidade UE

Declaramos pelo presente documento que o equipamento a seguir descrito, devido à sua concepção e ao tipo de construção daí resultante, bem como a versão por nós lançada no mercado, cumpre as exigências básicas aplicáveis de segurança e de saúde das diretivas CE indicadas.

A presente declaração perde a sua validade em caso de alteração ao equipamento não autorizada por nós.

Bezeichnung des Gerätes:

Einkanalregler

Description of the unit:

Single-Channel Controller

Désignation du matériel:

Régulateur monocanal

Descripción de la mercancía:

Regulador de un canal

Designação do aparelho:

Regulador de canal único

Typ:

TOPAX L

Type:

EU-Richtlinien:

2014/30/EU LVD

2014/30/EU LVD

EU directives:

2014/35/EU EMC

2014/35/EU EMC

2011/65/EU ROHS und 2015/863/EU zur Änderung des Anhangs II der Richtlinie 2011/65/EU des Europäischen Parlaments und des Rates in Bezug auf Stoffe mit Nutzungseinschränkungen.

2011/65/EU ROHS and 2015/863/EU amending Annex II of Directive 2011/65/EU of the European Parliament and of the Council regarding the list of substances with usage restrictions.

Der Regler samt seiner Teile und seinem Zubehör entspricht den Anforderungen der Richtlinie 2011/65/EU, Anhang II, mit besonderem Hinweis auf die Begrenzung der folgenden Stoffe: Blei (Pb), Quecksilber (Hg), Cadmium (Cd), sechswertiges Chrom (Cr VI), polybromierte Biphenyle (PBB), polybromierte Diphenylether (PBDE), Bis(2-Ethylhexyl)phthalat (DEHP), Benzylbutylphthalat (BBP), Dibutylphthalat (DBP) und Diisobutylphthalat (DIBP).

The controller, incl. its parts and accessories, is built to the requirements of the directive 2011/65/EU, Annex II, with particular reference to the limitation of the following substances: Lead (Pb), Mercury (Hg), Cadmium (Cd), Hexavalent chromium (Cr VI), Polybrominated biphenyls (PBB), Polybrominated diphenyl ethers (PBDE), Bis(2-Ethylhexyl) phthalate (DEHP), Benzyl butyl phthalate (BBP), Dibutyl phthalate (DBP) and Diisobutyl phthalate (DIBP).

Harmonisierte Normen:

EN 61010-1: 2010 + A1:2019

Harmonized standards:

EN 61326-1: 2021

Dokumentationsbevollmächtigter:

Lutz-Jesco GmbH

Authorized person for documentation:

Heinz Lutz
Geschäftsführer / Chief Executive Officer
Lutz-Jesco GmbH
Wedemark, 04.09.2023

Lutz-Jesco GmbH
Am Bostelberge 19
30900 Wedemark
Germany

23 Decontamination declaration

Decontamination declaration

Please fill out a separate form for each appliance!

We forward the following device for repairs:

Device and device type: Part-no.:

Order No.: Date of delivery:

Reason for repair:

.....

.....

Dosing medium

Description: Irritating: ☐ Yes ☐ No

Properties: Corrosive: ☐ Yes ☐ No

We hereby certify, that the product has been cleaned thoroughly inside and outside before returning, that it is free from hazardous material (i.e. chemical, biological, toxic, flammable, and radioactive material) and that the lubricant has been drained.

If the manufacturer finds it necessary to carry out further cleaning work, we accept the charge will be made to us.

We assure that the aforementioned information is correct and complete and that the unit is dispatched according to the legal requirements.

Company / address: Phone:

..... Fax:

..... Email:

Customer No.: Contact person:

Date, Signature:

24 Warranty claim

Warranty claim

Please copy and send it back with the unit!

If the device breaks down within the period of warranty, please return it in a cleaned condition with the complete warranty claim.

Sender

Company: Phone: Date:

Address:

Contact person:

Manufacturer order no.: Date of delivery:

Device type: Serial number:

Nominal capacity / nominal pressure:

Description of fault:

.....
.....
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.....

Service conditions of the device

Point of use / system designation:

.....
.....

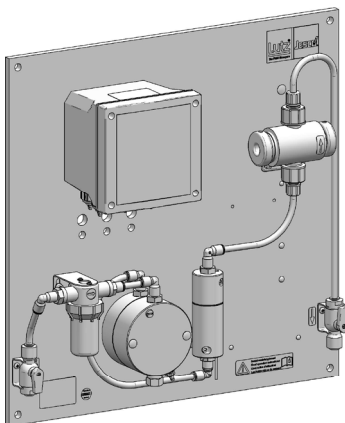
Accessories used (suction line etc.):

.....
.....
.....
.....

Commissioning (date):

Duty period (approx. operating hours):

Please describe the specific installation and enclose a simple drawing or picture of the chemical feed system, showing materials of construction, diameters, lengths and heights of suction and discharge lines.



Lutz-Jesco GmbH

Am Bostelberge 19
D-30900 Wedemark

Phone: +49 5130 5802-0
info@lutz-jesco.com
www.lutz-jesco.com

Operating instructions
Water sampling station **EASYPRO 1**