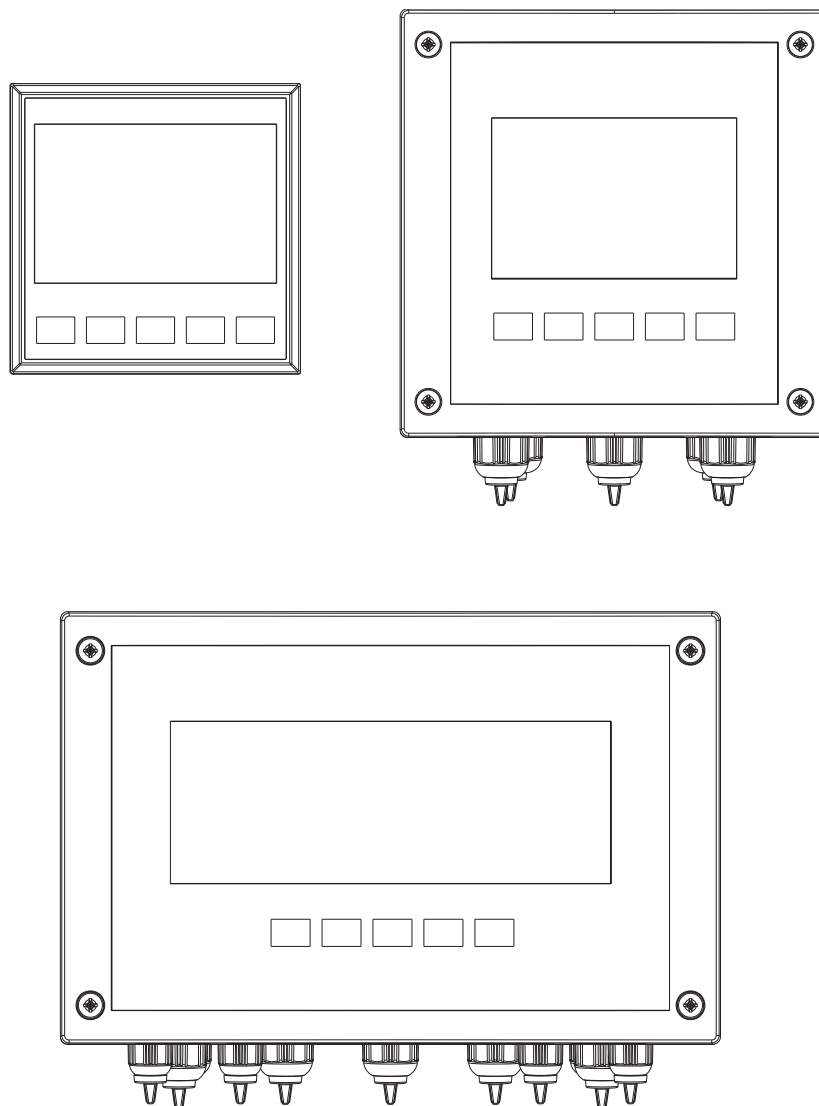


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Note: All the strings representing programming menus in this manual are indicative only. The strings displayed by the instrument have been shortened for proper readability and viewing on the display.

1 GENERAL

1.1 Information regarding the manual

Compliance with the operative procedures and the precautions described in this manual is an essential requirement for the correct operation of the instrument and to guarantee total operator safety.

Before using the instrument, the manual must be read in all of its parts, in the presence of the instrument itself, in order to ensure that the operating modes, the controls, the connections to the peripheral equipment and the precautions for safe and correct use are clearly understood.

The user manual must be stored, integral and legible in all parts, in a safe place which can be quickly and easily accessed by the operator during installation, use and/or installation revision operations.

CONVENTIONS

The present user manual uses the following conventions:

NOTE



The notes contain important information to be highlighted in comparison to the rest of the text. These generally contain information that is useful to the operator to carry out and optimize operating procedures of the equipment in a correct manner.

WARNING



Warning messages appear in the manual before procedures or operations that must be observed in order to avoid any possible losses of data or damages to the equipment.

ATTENTION



Attention messages appear in the manual in correspondence to description of procedures or operations which, if carried out incorrectly, may cause damages to the operator or users.

1.2 Limitations of use and safety precautions

In order to guarantee operator safety and correct device functionality, all of the usage limitations and precautions listed below must be respected:

ATTENTION



Make sure that all the safety requirements have been met before using the device. The device must not be powered on or connected to other devices until all of the safety conditions have been met.

ELECTRICAL SAFETY

ATTENTION



All of the control unit's connections are isolated from the grounding system (non-insulated grounding conductor).
DO NOT connect any of these connections to the grounding connector.

In order to guarantee maximum conditions of safety for the operator, it is recommended to follow all of the indications listed in this manual.

- **Only power the device using a mains power supply that complies with the device's specifications (85÷265Vac 50/60Hz or 24÷48Vdc (24Vac±20%)).**
- **Replace any damaged parts immediately.** Any cables, connectors, accessories or other parts of the device which are damaged or not functioning properly must be replaced immediately. In such cases, contact your nearest authorized technical assistance center.
- **Only use specified accessories and peripherals.** In order to guarantee all of the safety requirements, the device must only be utilized in conjunction with the accessories specified in this manual, which have been tested for use with the device itself. The use of accessories and consumption materials from other manufacturers or not specifically recommended by supplier will not guarantee the safety and correct operation of the equipment. Only use peripherals that comply with the regulations of their specific categories

SAFETY OF THE OPERATING ENVIRONMENT

- The panel of the control unit is resistant to liquids. The device must be protected against drips, sprays and/or immersion and should not be used in environments where such risks are present. Any devices into which liquids may have accidentally penetrated must be immediately shut off, cleaned and inspected by authorized and qualified personnel.
- The transparent panel should be closed once the device has been programmed.

Protection

For **Wall Mounted** device

- IP65 Complete
- EMI /RFI CEI EN55011 - 05/99 Class A

For **Panel Mounted** device

- IP65 Front and IP20 Back
- EMI /RFI CEI EN55011 - 05/99 Class A

The device must be utilized within the specified environmental temperature, humidity and pressure limits. The instrument is designed to operate under the following environmental conditions:

- | | |
|--|-------------------------|
| – Temperature of the working environment | -10 ÷ +50°C |
| – Storage and transport temperature | -25°C ÷ +65°C |
| – Relative Humidity Box Panel Mounted | 0% ÷ 95% Non-Condensing |
| – Relative Humidity Box Wall Mounted | 0% ÷ 100% Condensing |

ATTENTION

The device must be perfectly inserted into the system.

The system must be maintained operational in full compliance with the foreseen safety regulations.

The parameters set on the analyzer's control unit must comply with the current regulations.

The control unit's malfunction signals must be located in an area that is constantly supervised by the system's maintenance personnel or operators.

Failure to respect even just one of these conditions could cause the control unit's "logic" to operate in a potentially dangerous manner for the users of the service.



In order to avoid any potentially dangerous situations, therefore, the system's service and/or maintenance personnel are advised to work with the utmost care and to signal any alterations in the safety parameters in a timely manner.

As the above issues cannot be monitored by the product in question, the manufacturer shall bear no responsibility for any property damage or personal injury which may result from such malfunctions.

ATTENTION SYMBOL

The symbol illustrated below represents the **ATTENTION** symbol and reminds the operator that he should read the user manual for important information, advice and suggestions regarding the correct and safe use of the equipment.



In particular, when it is positioned close to connection points to cables and peripherals, the symbol in question refers to careful reading of the user manual for instructions related to the nature of such cables and peripherals and the methods for correct and safe connection.

The reproductions of equipment panels, with relative commands, connections, symbols and labels are provided in this chapter. Each attention symbol is accompanied by a detailed explanation of its meaning.

PLATE DETAILS EXAMPLE

POWER SUPPLY 1AT		8W		IP65 IP20
2 x Out mA 4-20 mA		In Load 800 ohm		
Slot A: Measure range	Slot B: Measure range			

dd/mm/yy (production date)

LOGO
PRODUCT CODE
DESCRIPTION

Serial n. xxxxxxxxx

1.3 Information on recycling and use of materials

The supplier, in accordance with specific European regulations, aims at constant improvement of development and of production procedures of its equipment with the objective of drastically reducing the negative impact on the environment caused by parts, components, consumption materials, packaging and the equipment itself at the end of its life cycle.

The packages are designed and produced to allow the reuse or recovery, including recycling, of the great part of the materials and to minimize the amount of waste or residues to be disposed. In order to assure a correct environmental impact, the equipment has been designed with the smallest circuit possible, with the lowest differentiation of materials and components, with a selection of substances that guarantee utmost recycling and maximum reuse of the parts and waste disposal free from ecological risks.

The equipment is made in such a way as to guarantee the easy separation or dismantling of the materials containing contaminants in comparison with others, in particular during maintenance operations and the replacement of components.

ATTENTION



The disposal/recycling of packages, consumption materials and of the equipment itself at the end of its life cycle must be carried out in accordance to the standards and regulations currently in force in the country where the equipment is used.

SPECIAL ATTENTION TO CRITICAL COMPONENTS

The instrument is provided with a liquid crystal display LCD, which contains small amounts of toxic materials.

2 GENERAL DESCRIPTION

2.1 Main characteristics

- Input for one or two of the following measures:
 - pH/ORP
 - EC-Cond
 - Input-mA
 - Flow
 - Cl-Amp
- Temperature Measure with PT100 / PT1000 Probe
- Automatic Temperature Compensation
- Programming keyboard with 5 keys
- Graphic Display, 128x128 or 240x128 pixels, with four colors for the backlight (white, green, orange and red)
- Nr.2 Programmable Analog Outputs
- Nr.2 Frequency Programmable Digital Outputs
- Nr.4 Relay Outputs for Intervention Thresholds, Wash and Remote Alarm
- Nr.1 Digital Inputs for alarm function
- Nr.1 Output 24Vdc for Digital probe power supply

2.2 Controls indicators

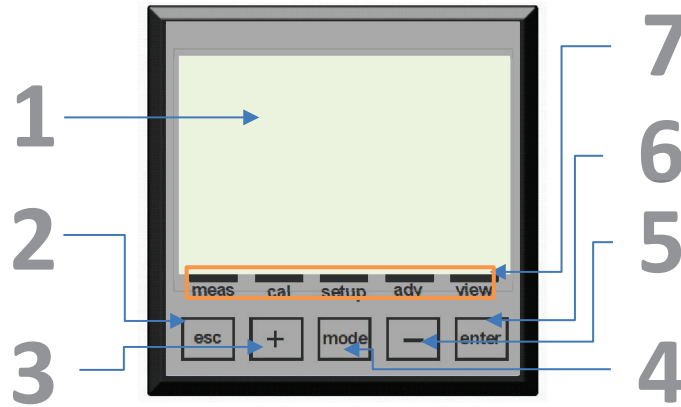


Figure 1 – Instrument

1. Visualizer with LCD Display
2. **ESC** key: Reject parameter or exit the programming menu
3. **UP (+)** key: Increase value
4. **MODE** key: Select menu with icon on the status bar
5. **DOWN (-)** key: Decrease value
6. **ENTER** key: Confirm parameter or access the programming menu
7. **STATUS BAR**: Indicates the active function

GRAPHIC DISPLAY SUBDIVISION AREAS IN RUN MODE

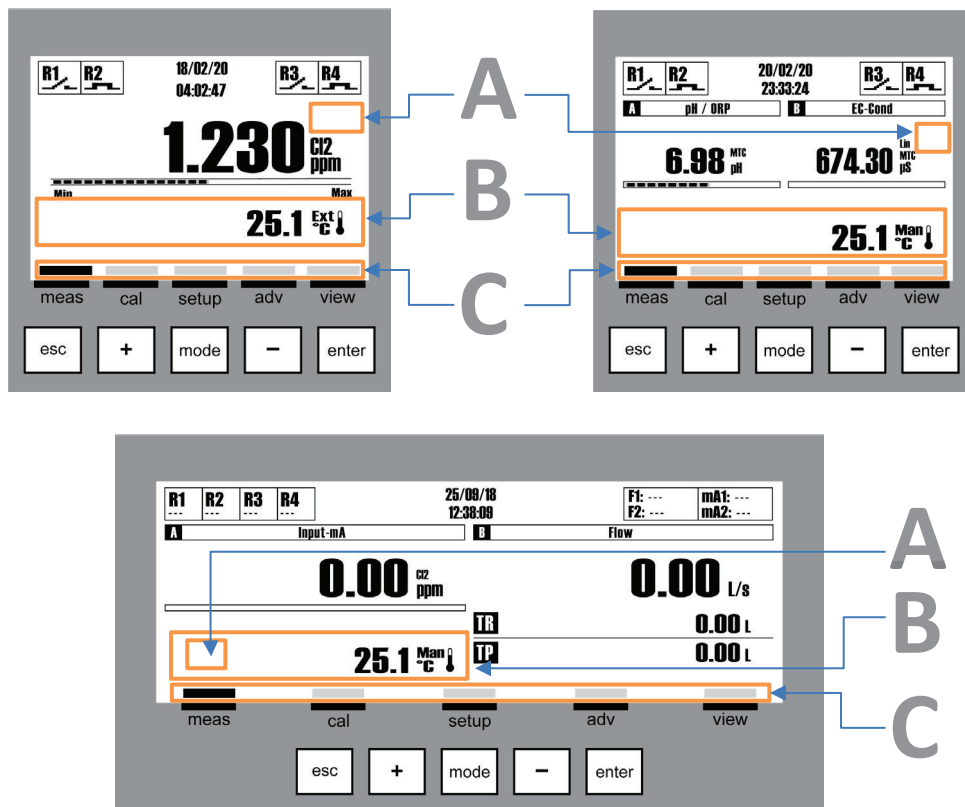


Figure 2 – Graphic Display - Subdivision Areas

In the standard view of the instrument we have three areas, as follows:

- A) Service icons such as Danger, Maintenance, Wait Time, Data Transmission.
- B) Text messages for Alarms and operation information or temperature value with external sensor (ext) or manually set value (man).
- C) Menu name associated to the icon on the status bar

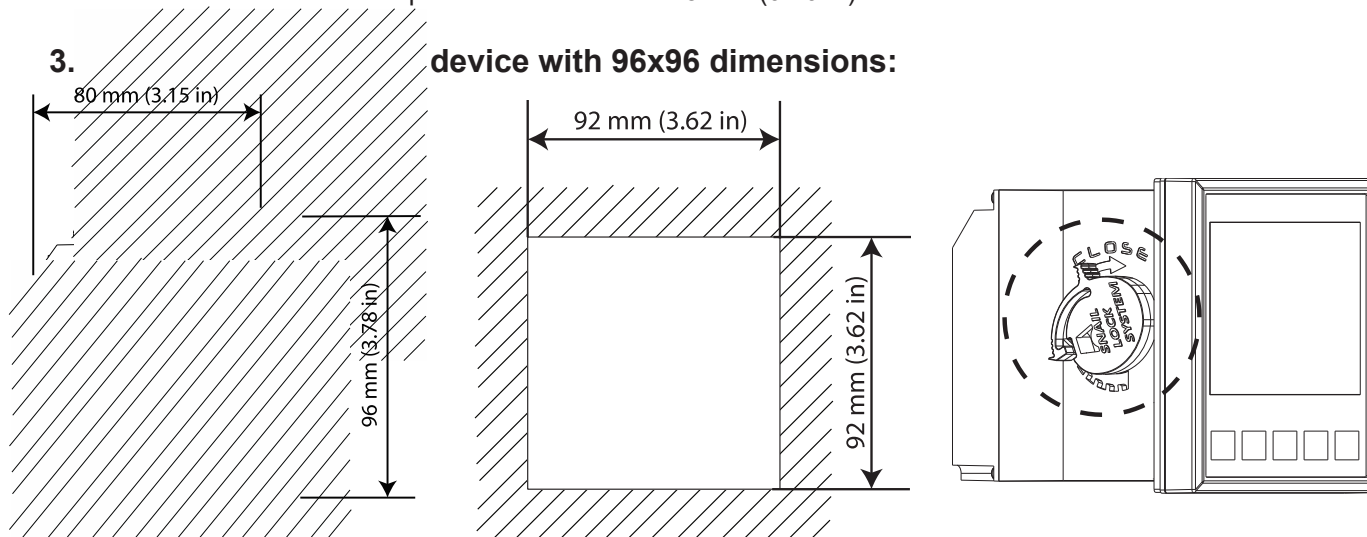
3 INSTALLATION

3.1 Installing device on a panel

The wall must be very smooth to allow the perfect adhesion of the electrical panel where the central unit will be fitted.

The fixing depth of the panel must be at least 130 mm (5.12 in).

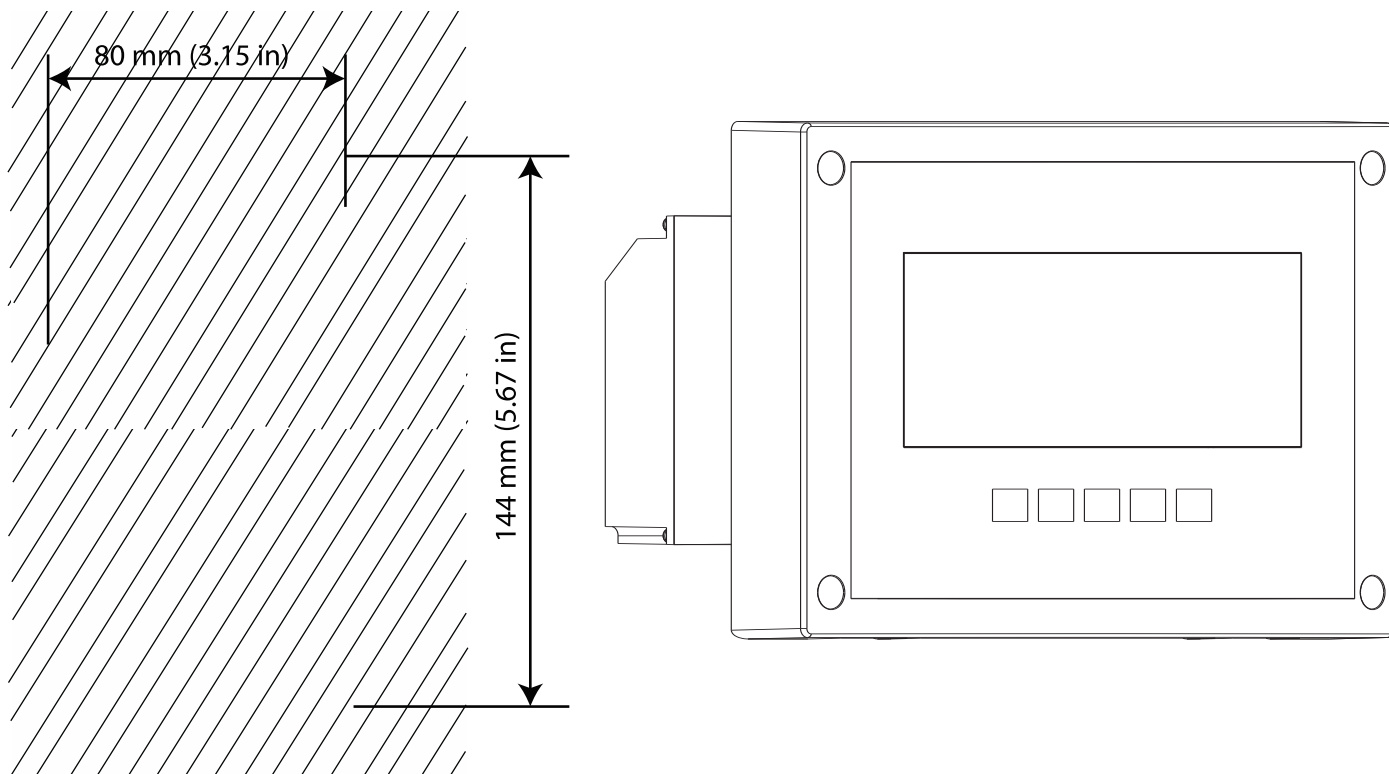
The thickness of the panel must not exceed 5 mm (0.20 in).



3 – Panel cutout and dimensions for Snail Lock System Panel Mounted Device

The device is locked on the panel using the two clamps supplied with the unit, inserted in their seats and locked with corresponding screws.

3.1.2 Panel cutout for device with 220x144 dimensions:



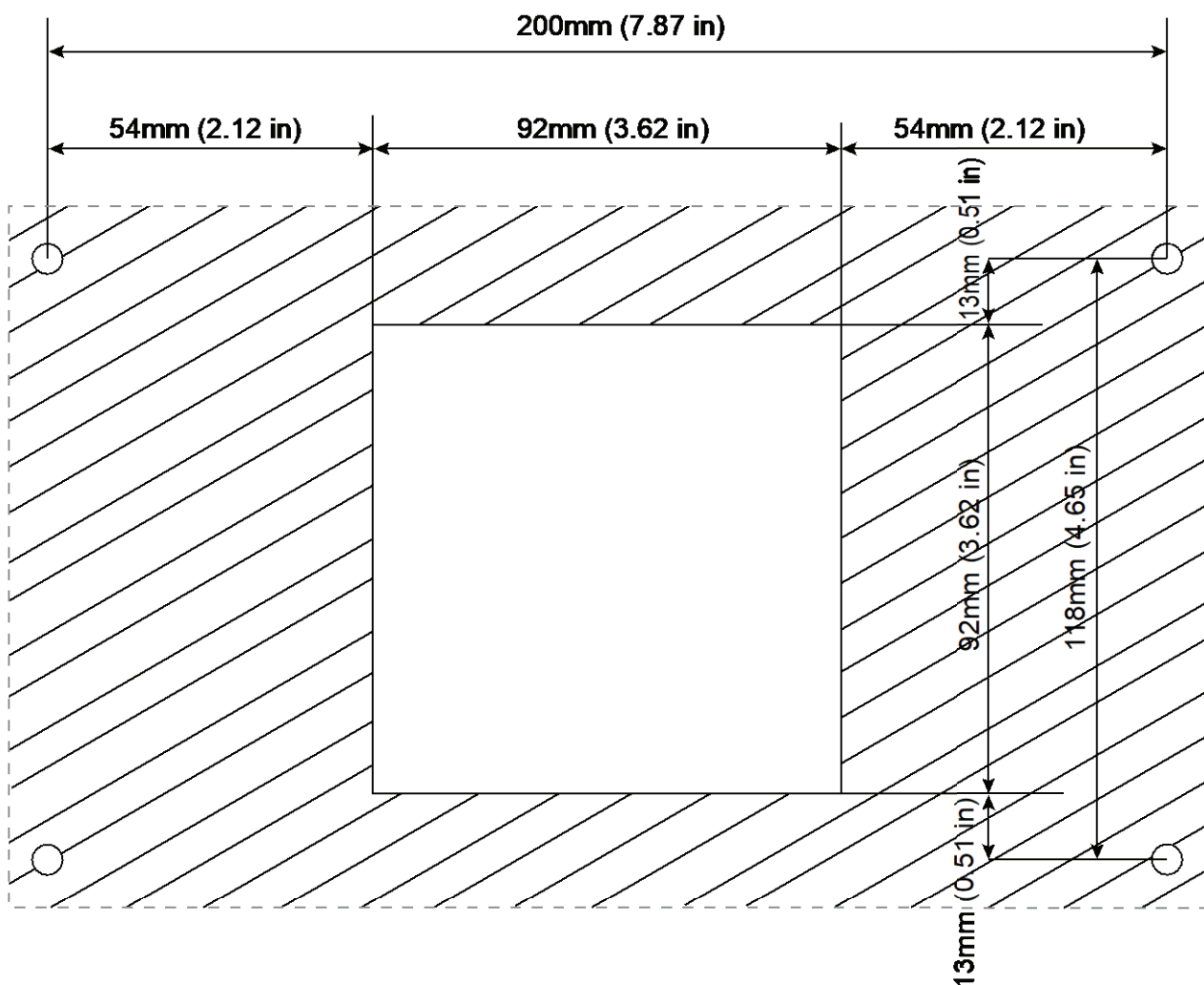


Figure 4 – Panel cutout and dimensions for Panel Mounted Device



The device can be mounted on the panel using the four self-tapping screws supplied with the unit.

Mechanical Dimensions	96x96	220x144
Dimensions (W x H x D)	96 x 96 x 100 mm (3.78 x 3.78 x 3.93 in)	220 x 144 x 100 mm (8.66 x 5.67 x 3.93 in)
Fixing depth	130mm (5.12 in)	
Material	ABS	
Mounting	Panel	
Weight	0.61 Kg (1.34 lb)	0.92 Kg (2.02 lb)
Front Panel	UV Resistant Polycarbonate	

3.2 Installing the device on the wall

The wall must be very smooth to allow the perfect adhesion of the device.

3.2.1 Installing the 144x144 unit on the wall

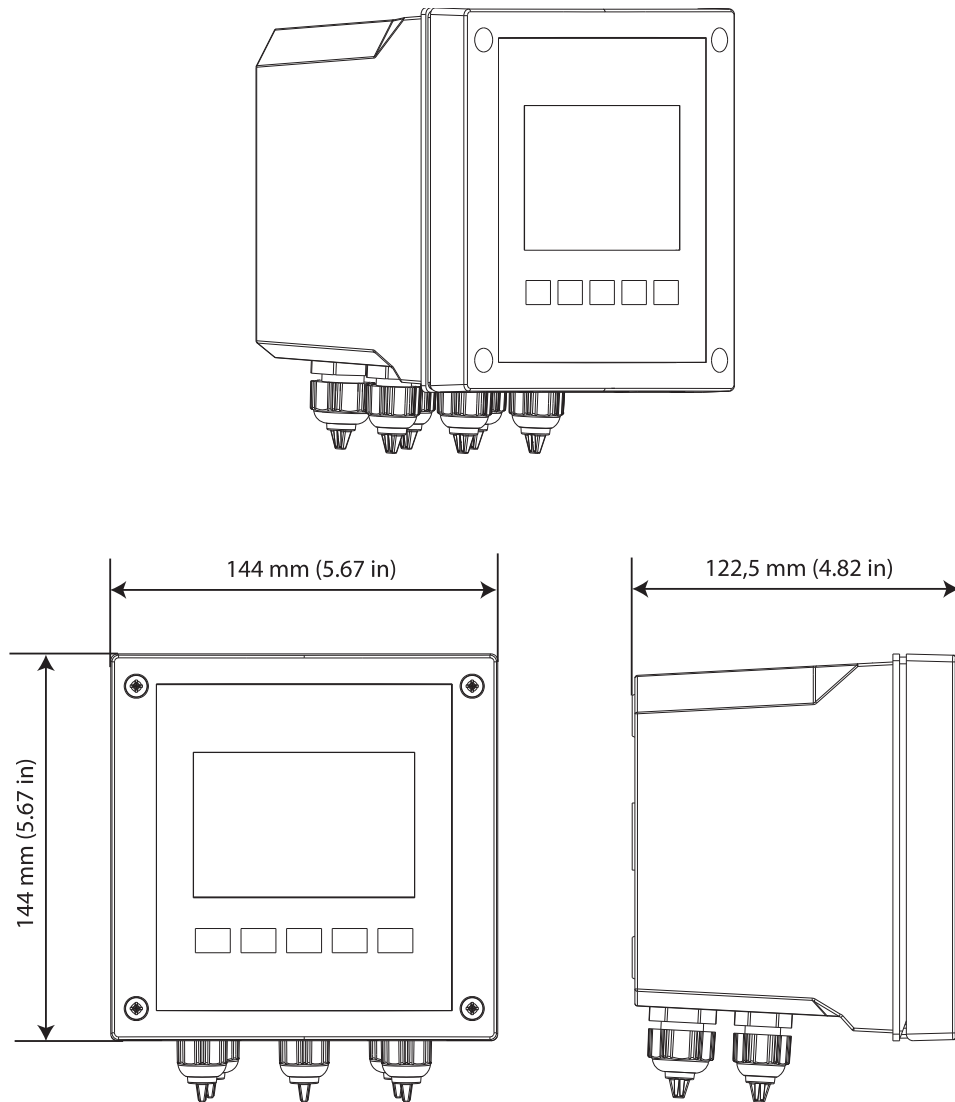


Figure 5 – Dimensions and footprint for wall mounted device

3.2.2 Installing the 220x144 unit on the wall

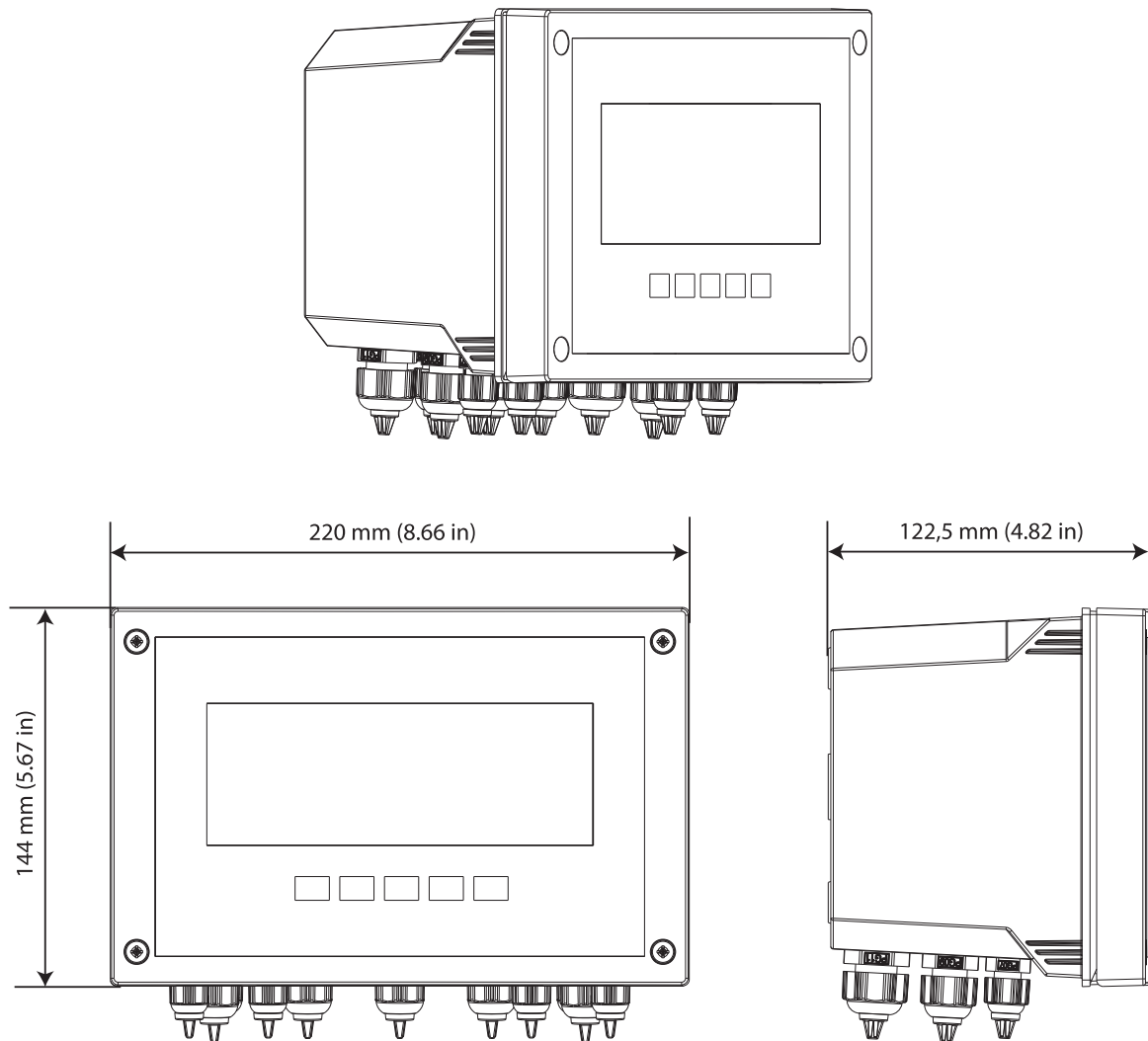


Figure 6 – Dimensions and footprint for wall mounted device

Mechanical Dimensions	144x144	220x144
Dimensions (W x H x D)	144 x 144 x 122.5 mm (5.67 x 5.67 x 4.82 in)	220 x 144 x 122.5 mm (8.66 x 5.67 x 4.82 in)
Fixing depth	122.5mm (4.82 in)	
Material	ABS	
Mounting	Wall	
Weight	1.05 Kg (2.31 lb)	1.36 Kg (3.00 lb)
Front Panel	UV Resistant Polycarbonate	

Open the instrument, drill the necessary holes and fasten the instrument to the wall. Cover the holes internally with the corresponding caps supplied with the instrument.

The cable glands for the electrical connections are located on the lower part of the control unit and therefore, in order to facilitate the connections, any other devices must be positioned at least at 15 cm away.

Protect the device against any drips and/or sprays of water from adjacent areas during the programming and calibration phases.

3.3 Power supply connection

If possible, keep any high-power cables away from the instrument and its connection cable (these could cause inductive disturbances, especially for the analogical part of the system).

Absolutely avoid connecting the device to rebuilt power supplies, using transformers for example, where the same power supply is also used to power other systems (perhaps of an inductive typology); this could lead to the generation of high voltage spikes which, once emitted, are difficult to block and/or eliminate.

ATTENTION



The electrical line must be equipped with an appropriate circuit breaker, in compliance with the proper installation standards

It is nevertheless always a good idea to check the quality of the grounding connector. In industrial facilities, it is not uncommon to find grounding connectors that cause electrical disturbances instead of preventing them; wherever doubts should arise regarding the quality of the facility's grounding connectors, it is better to connect the control unit's electrical system to a dedicated grounding rod.

Electric connections to the dosing systems (Utilities)

ATTENTION



Before connecting the instrument to the external Utilities, make sure that the electrical panel is turned off and that the wires from the Utilities are not live.

The term "Utilities" refers to the relay outputs used in the control unit

- (SET1 to 4) for the operation of dosing pumps or control
- (ALARM) alarm command sent by the instrument to siren and/or flashing light
- (WASH) command to the washing device

WARNING



With a resistive load, each relay contact can sustain a maximum current of 5 Ampere at max. 230V.

In case of higher powers, it is advisable to make the connection with the Utilities as indicated in Section 3.4 Wiring Examples.

If, on the contrary, the load to be controlled is in any case of a low power or of a resistive type, you can proceed as indicated in Section 3.4 Wiring Examples.

3.4 Installation recommendations

ATTENTION



When a relay output is used to drive a 3rd party device with an inductive/capacitive load input (such as contactors, motors, etc.), a transient protection is highly recommended. Check 3rd party device's options. (See Figure 7)



Figure 7 – Transient protection

ATTENTION



Keep relay's output cable segregate from any other cable connected to the unit (see Figure 8a). 90° crossing between cables is allowed (see Figure 8b).

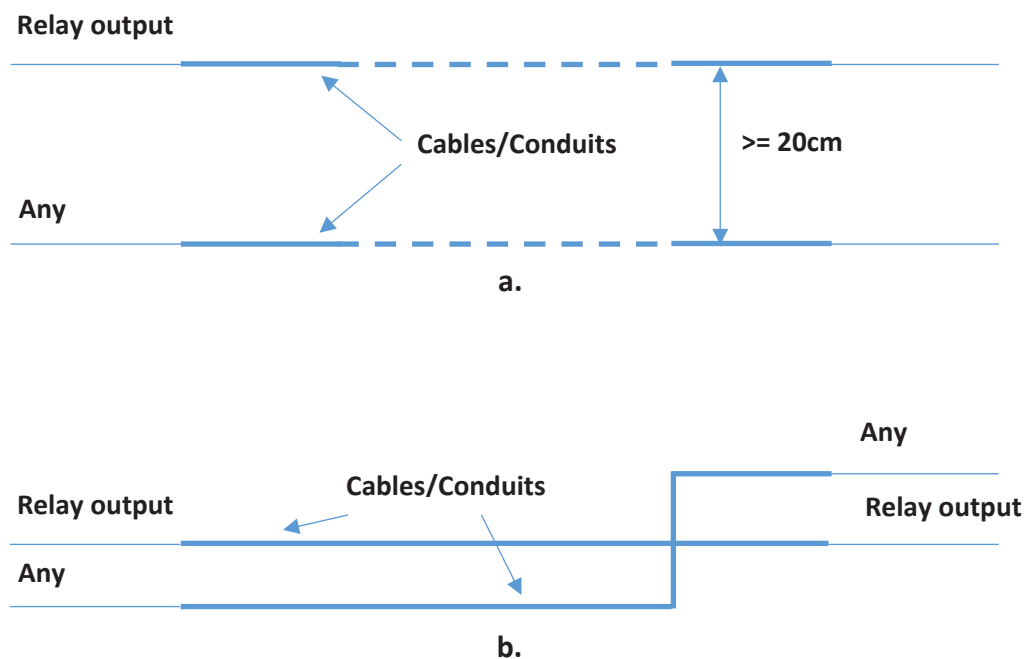


Figure 8 – Relay cable segregation

3.5 Connection 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	NC	NC	NC	NC	NC	NC

19	20	21	22	23	24	25	26
24 Volt	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-

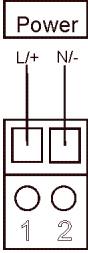
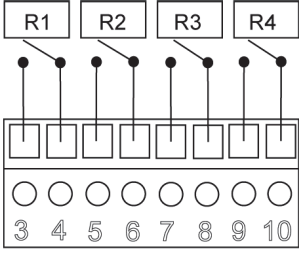
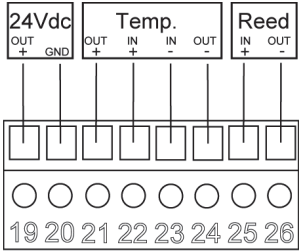
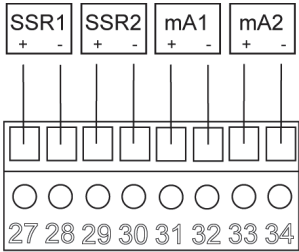
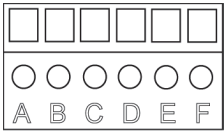
SLOT A	A	B	C	D	E	F

SLOT B	A	B	C	D	E	F

Figure 9 – Terminal block

Terminal N°	Symbols		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÷18	Not used		Not used
19	OUT 24Vdc	+	24Vdc power supply for digital sensors
20		GND	
21	RTD	OUT +	PT100 or PT1000 Temperature Probe Input
22		IN +	
23		IN -	
24		OUT -	
25	REED	+	REED Sensor Input
26		-	
27	SSR1	+	Frequency Output 1
28		-	
29	SSR 2	+	Frequency Output 2
30		-	
31	OUT mA1	+	4-20mA Current output 1
32		-	
33	OUT mA2	+	4-20mA Current output 2
34		-	
A	The connections depending on the module(s) present. For specific connections, refer to the manual section of the specific measurement(s).		
B			
C			
D			
E			
F			

3.5.1 Terminal connections

Description	Graphic
Instrument Power Supply: 100÷240 Vac or 24÷48 VDC (24Vac) Note: Check the product label.	
Outputs: R1, R2, R3 and R4: Electromechanical Relays (250Vac or 30VDC, 5A Resistive)	
Inputs and Outputs: 24 Vout: Power Supply for Digital Probe Temperature: PT100/PT1000 Sensor input Reed: Dry Contact Signal Input	
Outputs: SSR1 and SSR2: Frequency outputs mA1 and mA2: 4-20mA Current sensors	
Slot A / Slot B: The connections depending on the module(s) present. For specific connections, refer to the manual section of the specific measurement(s).	

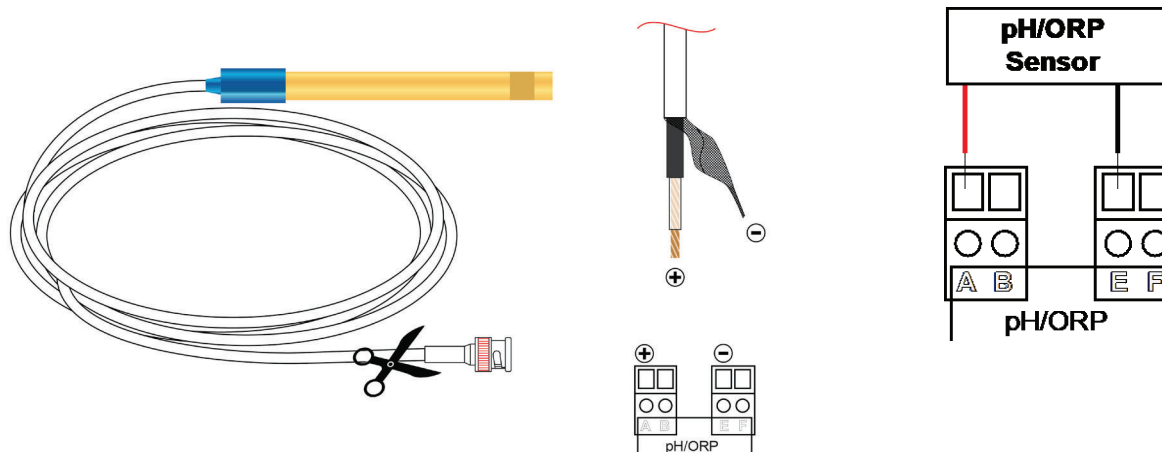
3.5.2 Probes and sensors connections



Turn off the instrument. Connect the cable of the sensor to the terminal block of the instrument. It is also a good idea not to pass the cable near high power or inverter cables in order to avoid interference problems with the measure.

3.5.2.1 pH/ORP probe connection

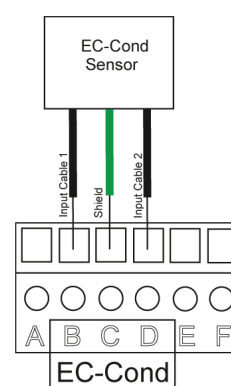
- Attention, connect the probes with metal terminals
- Observe the polarity
- Maximum distance of the pH/ORP sensor 10 meters of cable.



Terminal	Symbols	Description
A	pH / ORP+	pH/ORP Probe Input (+)
B	Not used	Not used
C	Not present	Not present
D	Not present	Not present
E	pH / ORP-	pH/ORP Probe Input (-)
F	Not used	Not used

3.5.2.2 Conductive conductivity probe connection

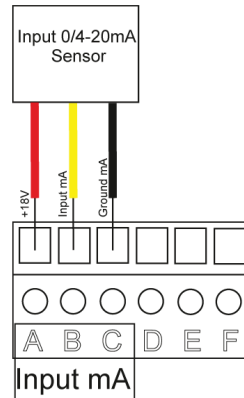
- Attention, connect the probes with metal terminals
- Observe the polarity
- Maximum distance of the Conductivity sensor 50 meters of cable



Terminal	Symbols	Description
A	Not used	Not used
B	CD	Conductivity Input
C	Shield	Conductivity Cable Shield
D	CD	Conductivity Input
E	Not used	Not used
F	Not used	Not used

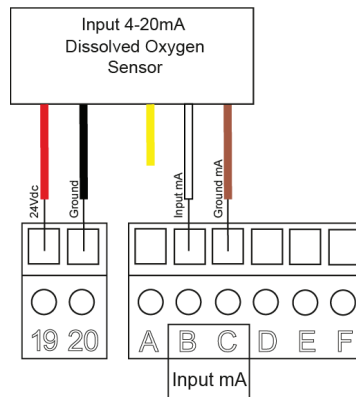
3.5.2.3 Input 0/4-20mA sensor connection

- Attention, connect the probes with metal terminals
- Observe the polarity



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

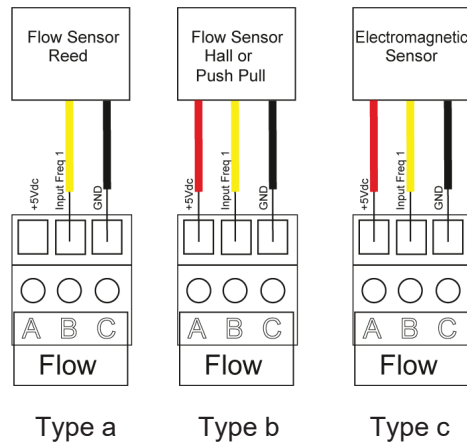
- 5 wires probes such as Dissolved Oxygen or Turbidity sensors are connected as shown below
- The yellow wire is not used



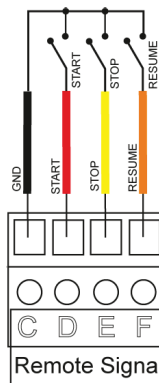
Terminal	Symbols	Description
19	24 Volt	24Vdc power supply for digital sensors and 4-20mA output sensors
20	GND	Ground
A	Not used	Not used
B	IN mA	Current input from sensor (4-20mA)
C	GND mA	Ground mA
D	Not used	Not used
E	Not used	Not used
F	Not used	Not used

3.5.2.4 Flow sensor connection

- Observe the polarity
- Type a: **Reed** sensor typical mechanical counter (Watermeter pulse sender).
- Type b: **Hall** sensor or **Push Pull** counter with mechanical rotor.
- Type c: Sensor with an **Electromagnetic** sensor.



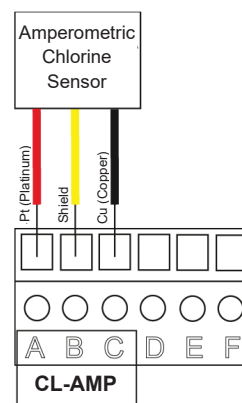
- Input for dry contact or semiconductor (Open Collector) 5Vdc, max 6mA.



Terminal	Symbols	Description
A	+5 Vdc	Flow Sensor Power Supply
B	IN Freq	Flow Measure Input
C	GND	Ground for Flow Sensor Power Supply
D	Start	Start signal input
E	Stop	Stop signal input
F	Resume	Resume signal input

3.5.2.5 Connection of the copper-platinum chlorine amperometric sensor

- Attention, connect the probes with metal terminals
- Observe the polarity



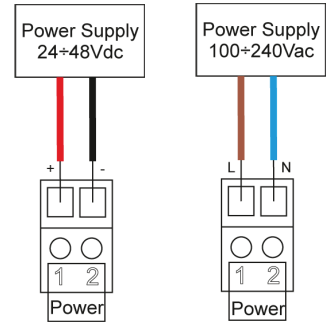
Morsetto	Simboli	Descrizione
A	Pt	Working electrode or measuring electrode (Platinum)
B	Shield	Conductivity Cable Shield
C	Cu	Reference electrode (Copper)
D	Not used	Not used
E	Not used	Not used
F	Not used	Not used

3.5.3 Wiring examples



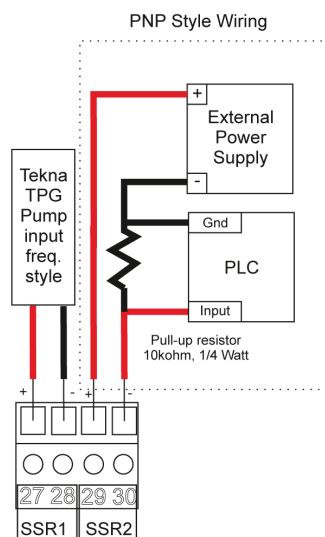
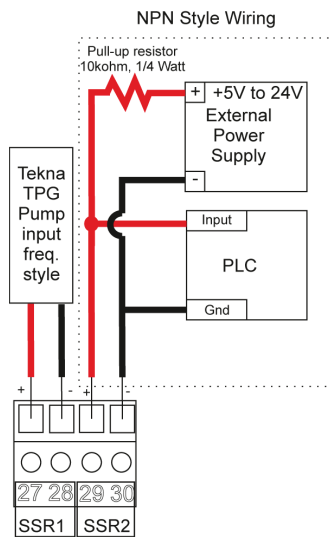
Power Supply:

- 24÷48Vdc or 100÷240Vac; check the product label
- Observe the polarity
- Maximum Power Consumption (see Electrical Specifications)



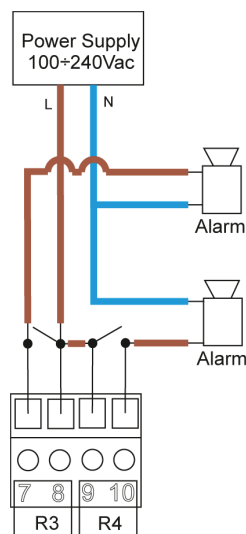
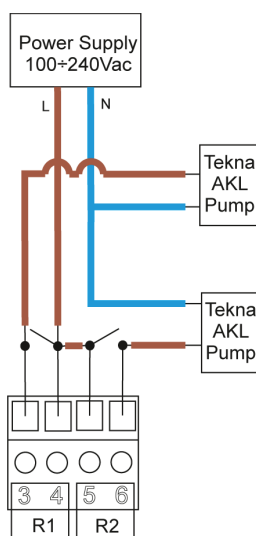
Frequency outputs SSR1 and SSR2:

- Contact closed 5Ω.



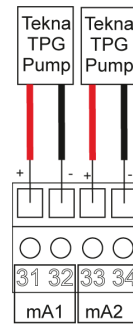
Relay outputs 1, 2, 3 and 4:

- Maximum load 5 A resistive



Current outputs mA 1 and 2:

- 4÷20mA with a maximum load of 800 ohm
- Observe the polarity of the cables



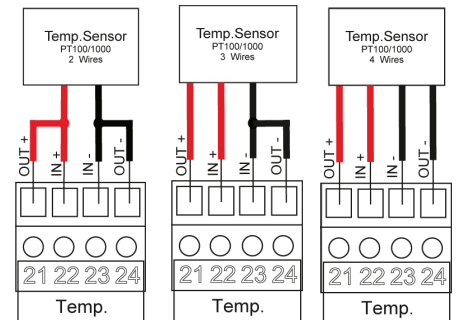
Reed sensor input:

- Input for dry contact or semiconductor (Open Collector) 5Vdc, max 6mA.
- Maximum distance of the Reed sensor 20 meters of cable.



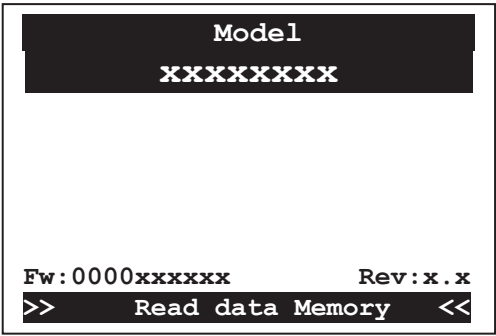
Temperature measure input:

- Attention, connect the probes with metal terminals
- Observe the polarity
- Maximum distance of the PT100/PT1000 sensor 20 meters of cable
- Observe the wiring for the sensor 2, 3 and 4; connect as indicated
- Set 2,4 or 3 wires selection to Advanced menu



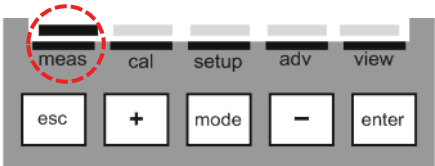
4 STARTUP

The instrument performs a hardware test of the internal memory and displays the message “*Read data memory*”

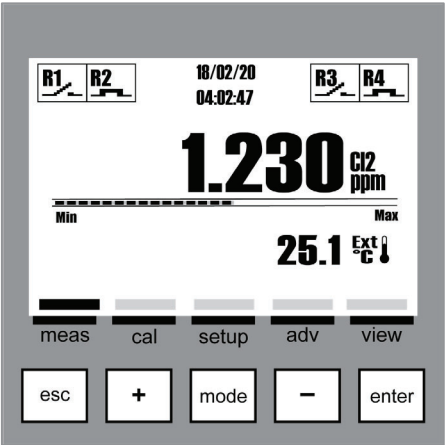


Wait

The instrument enables all the measure functions within 5 seconds.



View Measure and Outputs Activation



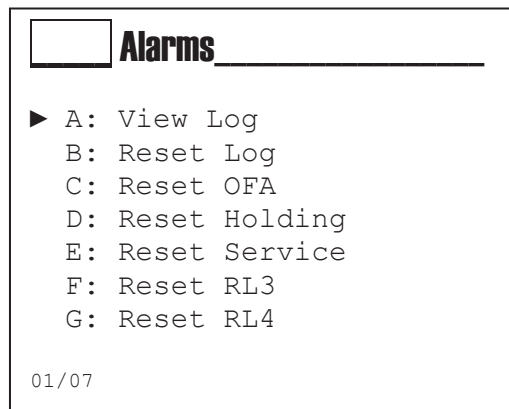
4.1 Alarms menu



On View measure menu there is available an alarm menu which displays the alarm status by pressing the Enter key; the **Alarms Menu** consists of **seven** six **7** (6) items or sub-menus:

- A:** View Log: list of all recorded alarms, starting with the most recent
- B:** Reset Log: deletes all alarm events
- C:** Reset OFA: deletes the OFA alarm and resets the counter
- D:** Reset Holding: deletes the alarm
- E:** Reset Service: deletes the alarm and resets the counter
- F:** Reset RL3 (used as alarm)
- G:** Reset RL4 (used as alarm)

Scroll through the menu using the **(+)** or **(-)** key, select the item and confirm with the **Enter** key.



4.2 Info menu

In view measure mode, press the ESC key to access the **Info** menu.

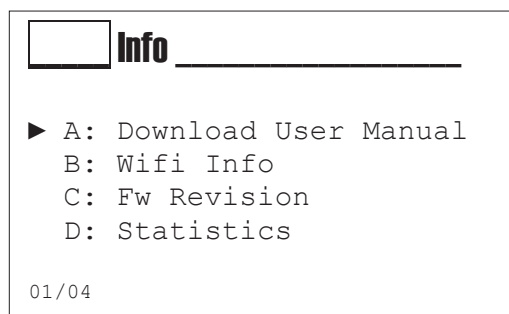
A: Download User Manual: In this section the device will display the QR-Code necessary to download the complete manual which contains the instrument settings.

B: Wifi Info: Contains the name of the Wi-fi network of the device with the corresponding password and the link needed to connect to the web application.

SSID: KOMMSPOT-68947C
PSW: 12345678
IP: 192.168.3.1
HOST: kommspot

C: Fw Revision: Provides the revision number and version for the main components of the device.

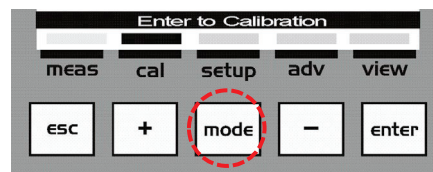
D: Statistics: Displays the statistics regarding the usage of the device such as number of alarms recorded or number of relay activations.



5 CALIBRATION

5.1 pH and ORP calibration

Use the **MODE** key to scroll through the icons on the status bar, from left to right, select the **Calibration** menu and confirm with the **Enter** key.



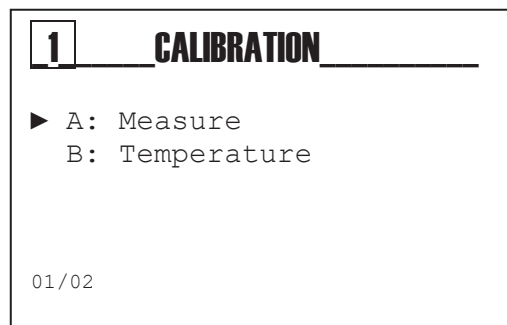
Menu 1 Calibration

The Calibration menu consists of 2 items or sub-menus:

A: pH or ORP Chemical Measure

B: Temperature

Scroll through the menu using the **(+)** or **(-)** key, select the item and confirm with the **Enter** key.



Menu 1A Measure Calibration

The Chemical Measure Calibration menu consists of 5 items or sub-menus:

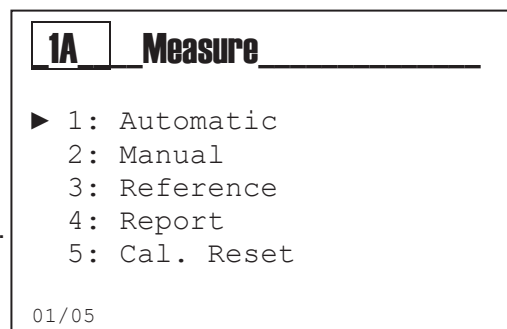
1A1 Automatic: the instrument requires the standard buffer solutions 7 pH, 4 pH or 9.22 pH.

1A2 Manual: the instrument will suggest the buffer solutions from the default values, but the value can be changed.

1A3 Reference: the instrument accepts the calibration of one point with a manually set value.

1A4 Report: a summary table of calibrated values with indication of the electrode quality.

1A5 Cal. Reset: the calibrations can be deleted and restored the default values.



Scroll through the menu using the **(+)** or **(-)** key, select the item and confirm with the **Enter** key.



5.1.1 pH calibration procedure

Chemical Measure Calibration Menu

Menu 1A1 Automatic pH Calibration

Insert the probe into the 7.00 pH buffer solution.
Press the **Enter** key when ready.

Keep the probe firmly into the buffer solution for the whole period indicated by the instrument

The instrument will display the percentage of quality on the 7.00 pH buffer solution.

Wash the pH probe with clean water and drain it.

Insert the probe into the 4.00 pH or 9.22 pH buffer solution. Press the **Enter** key when ready.

Keep the probe firmly into the buffer solution for the whole period indicated by the instrument

1A **Measure**

- 1: Automatic
- 2: Manual
- 3: Reference
- 4: Report
- 5: Cal. Reset

01/05

1A1 **Automatic**

Insert probe into the buffer sol.

7.00pH 0mV

Enter to start calibration

1A1 **Automatic**

WAIT

7.00pH 0mV

Count Down:
59

1A1 **Automatic**

Buffer pH.7.00 100%

Insert probe into the buffer sol.

4.00/9.22pH 0mV

Enter to start calibration

1A1 **Automatic**

Buffer pH.7.00 100%

WAIT

4.00/9.22pH 177mV

Count Down:
59

The instrument will display the percentage of quality on the 7.00 pH and 4.00 or 9.22 pH.

Note:

100%: excellent probe quality

75%: good probe quality

50%: sufficient probe quality

25%: poor probe quality; replacement is recommended

1A1	Automatic	
Buffer pH7.00		100%
Buffer pH4.00		100%
Calibration ok!		

Insert the calibration date and press **Enter** to confirm.

1A1	Automatic	
Buffer pH7.00		100%
Buffer pH4.00		100%
SET CALIB DATE:		
12 - 03 -14		
ENTER TO CONFIRM		



Note: The instrument displays "Calibration Failed" in all cases of wrong measure of the buffer solution.

It is recommended to use always a fresh buffer solution and repeat the calibration procedure; if the message persists, replace the pH probe.

1A1	Automatic	
Calibration Failed!		
Enter to continue		

Menu 1A2 Manual pH Calibration

Insert the probe into the 7.00 pH buffer solution and set the value of the buffer solution using the (+) and (-) keys.

Press the **Enter** key when ready.

1A2	Manual	
Insert probe into the buffer sol.		
7.00pH		0mV
Enter to start calibration		

Keep the probe firmly into the buffer solution for the whole period indicated by the instrument

1A2	Manual	
WAIT		
7.10pH		0mV
Count Down:		
59		

The instrument will display the percentage of quality on the selected pH buffer solution.

Wash the pH probe with clean water and drain it.

Insert the probe into the 4.00 pH buffer solution or select the used value.

Press the **Enter** key when ready.

Keep the probe firmly into the buffer solution for the whole period indicated by the instrument

The instrument will display the percentage of quality on the buffer solutions used for calibration.

Note:

100%: excellent probe quality

75%: good probe quality

50%: sufficient probe quality

25%: poor probe quality; replacement is recommended

Insert the calibration date and press **Enter** to confirm.

Note: The instrument displays "Calibration Failed" in all cases of wrong measure of the buffer solution.

It is recommended to use always a fresh buffer solution and repeat the calibration procedure; if the message persists, replace the pH probe. Keep the probe firmly into the buffer solution for the whole period indicated by the instrument.

1A2 Manual

Buffer pH.7.10 100%

Insert probe into the buffer sol.

4.00pH 0mV

Enter to start calibration

1A2 Manual

Buffer pH.7.10 100%

WAIT

4.40pH 201.1mV

Count Down:
59

1A2 Manual

Buffer pH7.10 100%

Buffer pH4.40 100%

Calibration ok!

1A2 Manual

Buffer pH7.10 100%

Buffer pH4.40 100%

SET CALIB DATE:

12 - 03 -14

ENTER TO CONFIRM

1A2 Manual

Calibration Failed!

Enter to continue



Menu 1A3 Reference

Calibration of the pH measure with an external reference value, manually set.
The instrument performs a correction of the value by adding an offset value to the real measure.

1A3

Reference

7.00 pH

ENTER TO CONFIRM

Menu 1A4 Report

Displays of all the parameters calculated during calibration and the last calibration date.

1A4

Report

Buffer pH.7.00	100%
Buffer pH.4.00	100%
Gain	OffSet
59.39 mV/pH	2.53mV

Calibration type: Automatic
Date of last calibration:

12 - 03 - 14

Menu 1A5 Reset Calibration

This function allows the user to delete all the calibrations and to restore the default values.

1A5

Reset Calibration

Procede with the Reset?

NO

YES



5.1.2 ORP calibration procedure

Chemical Measure Calibration Menu

Menu 1A1 Automatic ORP Calibration

Insert the probe into the 465 mV buffer solution.
Press the **Enter** key when ready.

Keep the probe firmly into the buffer solution for the whole period indicated by the instrument

The instrument will display the percentage of quality on the 465 mV buffer solution.

Note:

100%: excellent probe quality

75%: good probe quality

50%: sufficient probe quality

25%: poor probe quality; replacement
is recommended

Insert the calibration date and press **Enter**
to confirm.

1A1 Measure

- ▶ 1: Automatic
- 2: Manual
- 3: Reference
- 4: Report
- 5: Cal. Reset

01/05

1A1 Automatic

Insert probe into the buffer sol.

465mV

0mV

Enter to start calibration

1A1 Automatic

WAIT

465mV

0mV

Count Down:
59

1A1 Automatic

Buffer mV 465 100%

Calibration ok!

1A1 Automatic

Buffer mV 465 100%

SET CALIB DATE:
12 - 03 -14
ENTER TO CONFIRM



Note: The instrument displays "Calibration Failed" in all cases of wrong measure of the buffer solution.

It is recommended to use always a fresh buffer solution and repeat the calibration procedure; if the message persists, replace the ORP probe.

Menu 1A2 Manual

Insert the probe into the 475 mV buffer solution and set the value of the buffer solution using the (+) and (-) keys.

Press the **Enter** key when ready.

Keep the probe firmly into the buffer solution for the whole period indicated by the instrument

The instrument will display the percentage of quality on the 475 mV buffer solution.

Note:

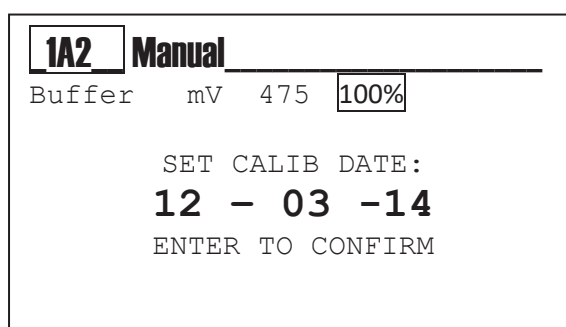
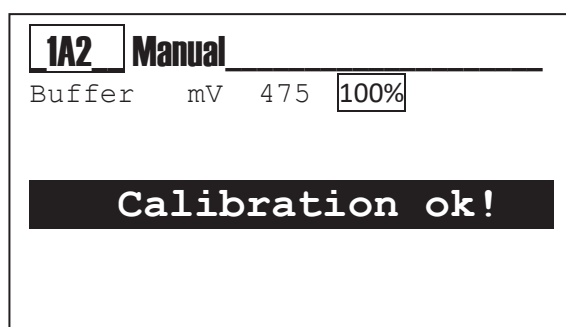
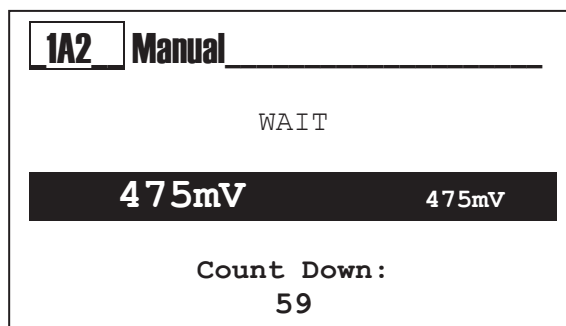
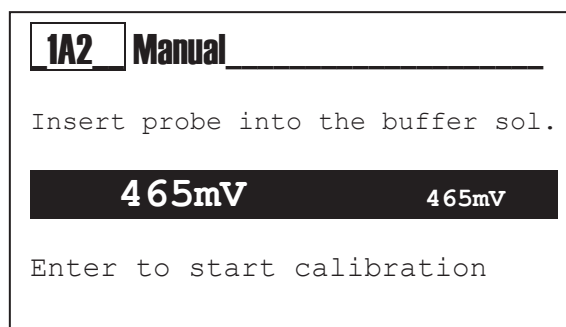
100%: excellent probe quality

75%: good probe quality

50%: sufficient probe quality

25%: poor probe quality; replacement is recommended

Insert the calibration date and press **Enter** to confirm.





Note: The instrument displays "Calibration Failed" in all cases of wrong measure of the buffer solution.

It is recommended to use always a fresh buffer solution and repeat the calibration procedure; if the message persists, replace the ORP probe.

Menu 1A3 Reference

Calibration of the ORP measure with an external reference value, manually set.

The instrument performs a correction of the value by adding an offset value to the real measure.

Menu 1A4 Report

Displaying of all the parameters calculated during calibration and the manually set calibration date.

Menu 1A5 Cal. Reset

This function allows the user to delete all the calibrations and to restore the default values.

1A2 Manual_____

Calibraion Failed!

Enter to continue

1A3 Reference_____

465mV

ENTER TO CONFIRM

1A4 Report_____

Buffer mV465

100%

Gain

1.00

Offset

0.00 mV

Type of Calibration: Manual
Last calibration date:

12 - 03 - 14

1A5 Cal. Reset_____

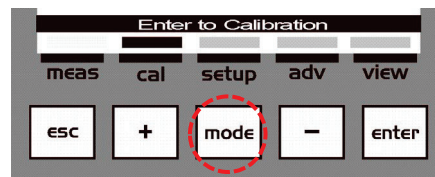
Procede with the Reset?

NO

YES

5.2 Conductivity calibration

Use the MODE key to scroll through the icons on the status bar, from left to right, select the **Calibration** menu.



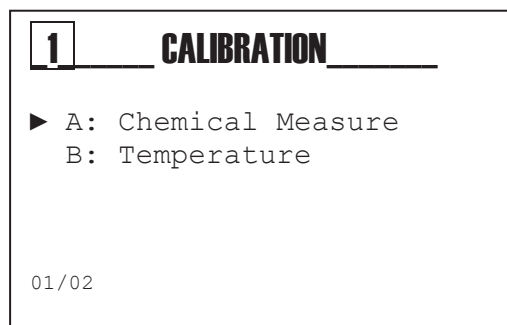
Calibration Menu 1

The Calibration menu consists of 2 items or sub-menus:

A: Conductivity Chemical Measure

B: Temperature

Scroll through the menu using the **(+)** or **(-)** key, select the item and confirm with the **Enter** key.



Calibration Menu 1 Measure

The Chemical Measure Calibration menu consists of 5 items or sub-menus:

1A1 1 Point Cal: One measure point calibration.

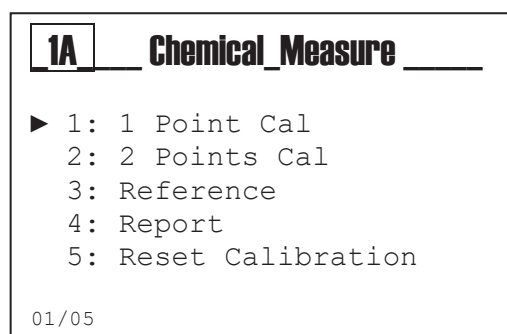
1A2 2 Points Cal: Two measure points calibration.

1A3 Reference: Allows you to refine the calibration by adding or subtracting an offset

1A4 Report: Will be displayed a summary of the last calibration.

1A5 Reset Calibration: The calibrations can be deleted and restored the default values.

Scroll through the menu using the **(+)** or **(-)** key, select the item and confirm with the **Enter** key.



Note: All the calibrations must be performed with absolute conductivity values, that is to say without temperature compensation. If a reference instrument shall be used, disable the temperature compensation function.



5.2.1 Conductivity calibration procedure

Calibration Menu Measure

Menu 1A1 One Point Calibration

Check that the sensor is properly installed and it is measuring.
Press the **Enter** key when ready.
Wait for 60 seconds.

At the end of the countdown, insert the calibration value.

The instrument displays a numeric keypad to insert the known value.

Press the **Enter** key when ready.

The instrument displays:
1: The calibration value used.
2: The calculated Gain value.
3: The calculated Offset value.
4: Enter to confirm and save all the calibration parameters.



The instrument displays the question to confirm and save all the calibration data.

At the end the instrument returns to Calibration menu.

1A

Chemical_Measure

►

1: 1 Point Cal
2: 2 Points Cal
3: Reference
4: Report
5: Reset Calibration

01/05

1A1

1 Point Cal

1: Wait

60 s

1A1

1 Point Cal

1: Point 1

12987µS

1A1

Calibration_Value

12880

µS

789

456

123

0.

?

+/-

Canc

Enter

1A1

1 Point Cal

►

-: Point 1

12880µS

-: Gain

0.9917

-: Offset

0.00µS

-: Save?

-

Save?

Yes

No

Menu 1A2 Two Points Calibration

Check that the sensor is properly installed and it is measuring.
Press the **Enter** key when ready.
Wait for 60 seconds.

1A2

2 Points Cal

1: Wait

60 s

At the end of the countdown, insert the first calibration value.

1A2

2 Points Cal

1: Point 1

147.60µS

The instrument displays a numeric keypad to insert the known value.

Press the **Enter** key when ready.

1A2

Calibration_Value

147.00

µS

7894561230.

Enter

?

+/-

Canc

Prepare the second calibration point of the sensor.
Insert the sensor into the second buffer solution.
Press the **Enter** key when ready.

1A2

2 Points Cal

► : Enter to continue

Wait for 60 seconds.

1A2

2 Points Cal

1: Wait

60 s

At the end of the countdown, insert the second calibration value.

1A2

2 Points Cal

1: Point 2

1430.6 μ S

The instrument displays a numeric keypad to insert the known value.

Press the **Enter** key when ready.

1A2

Calibration_Value

1413

μ S

789

456

123

0.

?

+/-

Canc

Enter

The instrument displays:

- 1: The calibration value used for the first point.
- 2: The calibration value used for the second point.
- 3: The calculated Gain value.
- 4: The calculated Offset value.
- 5: Enter to confirm and save all the calibration parameters.

1A2

2 Points Cal

► -: Point 1

147.00 μ S

-: Point 2

1413 μ S

-: Gain

0.9867

-: Offset

13.55 μ S

-: Save?



The instrument displays the question to confirm and save all the calibration data.

At the end the instrument returns to Calibration menu 1.

-

Save?

Yes

No

Menu 1A3 Reference Calibration

Check that the sensor is properly installed and it is measuring.
Press the **Enter** key when ready.

1A3

Reference

▶ -: Value

332.59µS

-: Save?

The instrument displays a numeric keypad to insert the known value.

Press the **Enter** key when ready.

1A3

Calibration_Value

330.00

µS

789

456

123

0.

?

+/-

Cancel

Enter

The instrument displays:
1: The calibration value.
2: Enter to confirm and save all the calibration parameters.

1A3

Reference

▶ -: Value

330.00µS

-: Save?



The instrument displays the question to confirm and save all the calibration data.

At the end the instrument returns to Calibration menu 1.

-

Save?

Yes

No

Menu 1A4 Report

The calibration report displays all the parameters related to the last calibration.

Calibration Type: Indicates the calibration type,

- None
- 1 Point
- 2 Points

Point 1: Indicates the value entered for point 1.

Point 2: Indicates the value entered for point 2.

Gain: Indicates the calculated angular coefficient.

Offset: Indicates the calculated offset value.

Adjust: Indicates the offset value memorized through the "Reference" calibration type.

1A4 Report	
Cal. Type	2 Points Cal.
Point 1	147.00 μ S
Point 2	1413 μ S
Gain	0.9867
Offset	13.55 μ S
Adjust	-2.59 μ S



Note: When the calibration is performed for 1 Point or 2 Points, the "Adjust" value is automatically reset to zero.

Menu 1A5 Reset Calibration

This function allows the user to delete all the calibrations and to restore the default values.

1A5 Reset_Cal

Are you sure?

NO

YES

5.2.2 Calibration errors



Probe is in Short:

- Damaged wiring
- Foreign body in contact on the electrodes

Calibration_Failed!

Shorted
Probe

ENTER to continue

Probe is in Air:

- Damaged wiring
- Liquid missing

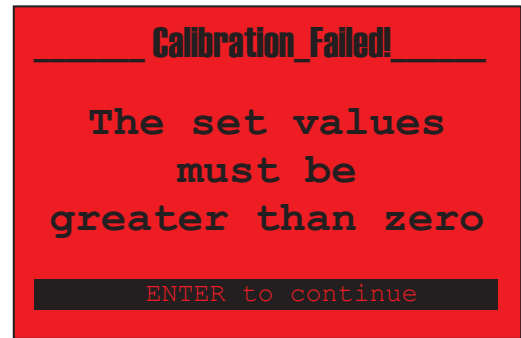
Calibration_Failed!

Probe in Air

ENTER to continue

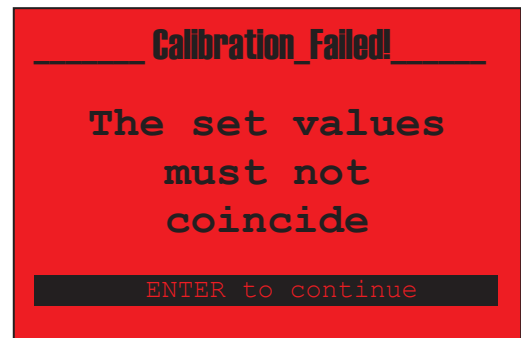
The set values must be greater than zero:

- The values set from numeric keypad must be positive and greater than zero.



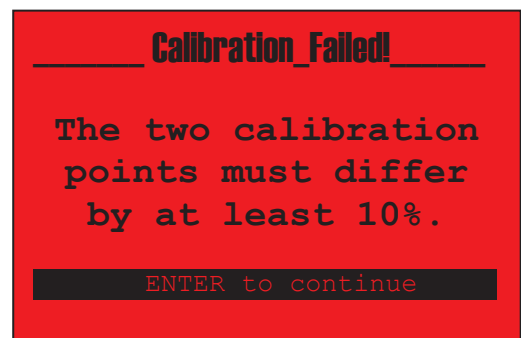
The set values must not coincide:

- Only for the 2 points calibration, the values set from numeric keypad must not coincide.



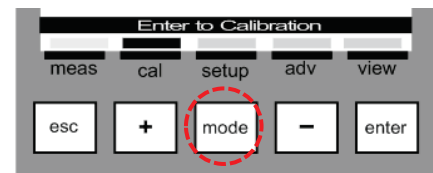
The two calibration points must differ by at least 10%:

- The second calibration point must be greater with at least 10% compared to the first calibration point.



5.3 Input mA calibration

Use the MODE key to scroll through the icons on the status bar, from left to right, select the **Calibration** menu.



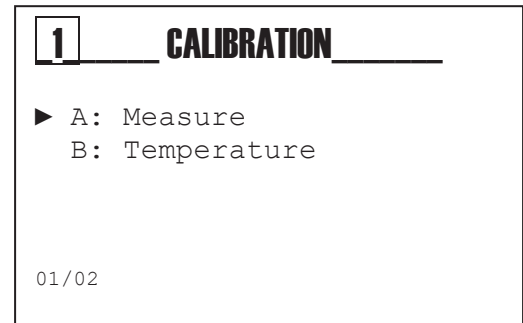
Calibration Menu 1

The Calibration menu consists of 2 items or sub-menus:

A: Measure

B: Temperature

Scroll through the menu using the **(+)** or **(-)** key, select the item and confirm with the **Enter** key.



Calibration Menu 1 Measure

The Measure Calibration menu consists of 5 items or sub-menus:

1A1 1 Point Cal: One measure point calibration.

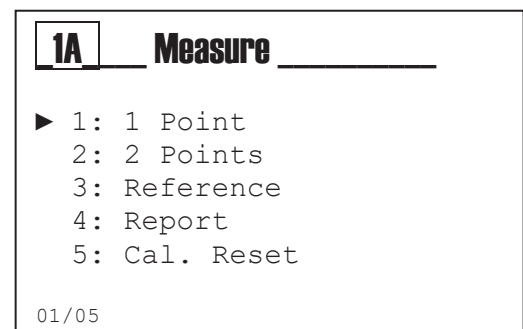
1A2 2 Points Cal: Two measure points calibration.

1A3 Reference: Allows you to refine the calibration by adding or subtracting an offset

1A4 Report: Will be displayed a summary of the last calibration.

1A5 Cal. Reset: The calibrations can be deleted and restored the default values.

Scroll through the menu using the **(+)** or **(-)** key, select the item and confirm with the **Enter** key.





5.3.1 Input mA calibration procedure

Calibration Menu Measure

Menu 1A1 One Point Calibration

Check that the sensor is properly installed and it is measuring.
Press the **Enter** key when ready.
Wait for 60 seconds.

At the end of the countdown, insert the calibration value.

The instrument displays a numeric keypad to insert the known value.

Press the **Enter** key when ready.

The instrument displays:

- 1: The calibration value used.
- 2: The calculated Gain value.
- 3: The calculated Offset value.
- 4: Enter to confirm and save all the calibration parameters.



The instrument displays the question to confirm and save all the calibration data.

At the end the instrument returns to Calibration menu.

1A

Measure

► 1: 1 Point

2: 2 Points

3: Reference

4: Report

5: Cal. Reset

01/05

1A1

1 Point

1: Wait

60 s

1A1

1 Point

1: Point 1

1.07ppm

1A1

Calibration_Value

1.20

ppm

789

456

123

0.

?

+/-

Cancel

Enter

1A1

1 Point

► -: Point 1

-: Gain

-: Offset

-: Save?

1.20 ppm

1.1240

0.0000 ppm

-

Save?

Yes

No

Menu 1A2 Two Points Calibration

Check that the sensor is properly installed and it is measuring.
Press the **Enter** key when ready.
Wait for 60 seconds.

1A2

2 Points

1: Wait

60 s

At the end of the countdown, insert the first calibration value.

1A2

2 Points

1: Point 1

1.17ppm

The instrument displays a numeric keypad to insert the known value.

Press the **Enter** key when ready.

1A2

Calibration_Value

1.00

ppm

789

456

123

0.

?

+/-

Canc

Enter

Prepare the second calibration point of the sensor.
Insert the sensor into the second buffer solution.
Press the **Enter** key when ready.

1A2

2 Points

► : Enter to continue

Wait for 60 seconds.

1A2

2 Points

1: Wait

60 s

At the end of the countdown, insert the second calibration value.

1A2

2 Points

1: Point 2

2.78ppm

The instrument displays a numeric keypad to insert the known value.

Press the **Enter** key when ready.

1A2

Calibration_Value

3.00

ppm

789

456

123

0.

?

+/-

Canc

Enter

- The instrument displays:
- 1: The calibration value used for the first point.
 - 2: The calibration value used for the second point.
 - 3: The calculated Gain value.
 - 4: The calculated Offset value.
 - 5: Enter to confirm and save all the calibration parameters.

1A2

2 Points

► -: Point 1

1.00 ppm

-: Point 2

3.00 ppm

-: Gain

1.2422

-: Offset

-0.4534ppm

-: Save?



The instrument displays the question to confirm and save all the calibration data.

At the end the instrument returns to Calibration menu.

-

Save?

Yes

No

Menu 1A3 Reference Calibration

Check that the sensor is properly installed and it is measuring.
Press the **Enter** key when ready.

1A3

Reference

▶ -: Value

1.07ppm

-: Save?

The instrument displays a numeric keypad to insert the known value.

Press the **Enter** key when ready.

1A3

Calibration_Value

1.20

ppm

789?

456+/-

123

0.Canc

Enter

The instrument displays:
1: The calibration value.
2: Enter to confirm and save all the calibration parameters.

1A3

Reference

▶ -: Value

1.20ppm

-: Save?



The instrument displays the question to confirm and save all the calibration data.

At the end the instrument returns to Calibration menu.

-

Save?

Yes

No

Menu 1A4 Report

The calibration report displays all the parameters related to the last calibration.

Calibration Type: Indicates the calibration type,

- None
- 1 Point
- 2 Points

Point 1: Indicates the value entered for point 1.

Point 2: Indicates the value entered for point 2.

Gain: Indicates the calculated angular coefficient.

Offset: Indicates the calculated offset value.

Adjust: Indicates the offset value memorized through the "Reference" calibration type.



Note: When the calibration is performed for 1 Point or 2 Points, the "Adjust" value is automatically reset to zero.

1A4 Report	
Cal. Type	2 Points Cal.
Point 1	1.00ppm
Point 2	3.00ppm
Gain	1.2422
Offset	-0.453ppm
Adjust	0.130ppm

Menu 1A5 Cal. Reset

This function allows the user to delete all the calibrations and to restore the default values.

1A5 Cal_Reset

Are you sure?

NO

YES

5.3.2 Calibration errors



Power Supply +18V is in Short:

- Damaged wiring
- Sensor is in Short

mA Input less than 3.6mA:

- Damaged wiring
- Sensor missing

Note: This alarm is active only if:

- The input current is lower than 3.6mA
- The input current is set to 4-20mA range
- The Under Range menu is set to 3.6mA



mA Input greater than 22mA:

- Damaged wiring
- Sensor missing

Note: This alarm is active only if:

- The input current is higher than 22mA
- The Over Range menu is set to 22mA



Calibration_Failed!

Fault +18V

ENTER to continue

Calibration_Failed!

Input < 3,6mA

ENTER to continue

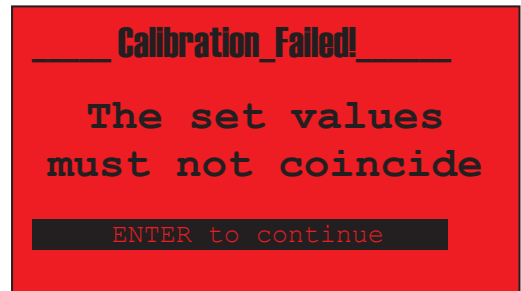
Calibration_Failed!

Input > 22mA

ENTER to continue

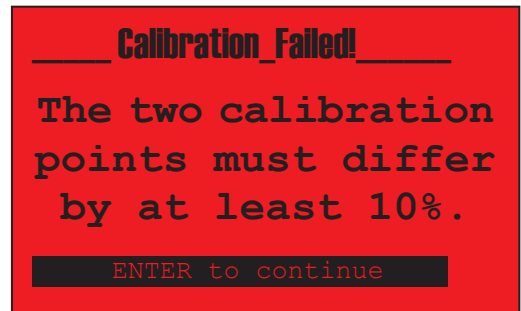
The set values must not coincide:

- Only for the 2 points calibration, the values set from numeric keypad must not coincide.



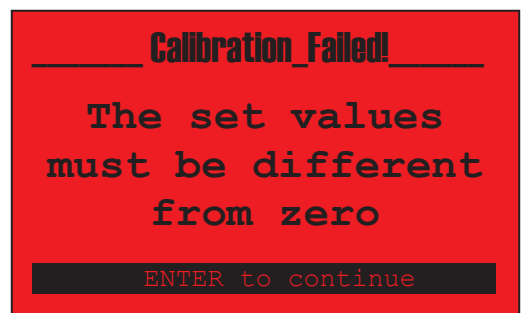
The two calibration points must differ by at least 10%:

- The second calibration point must be greater with at least 10% compared to the first calibration point.



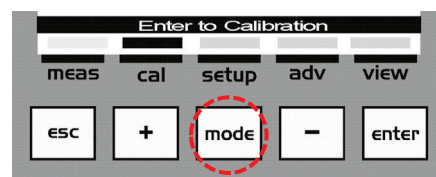
The set values must be different from zero:

- Only for the 1 point calibration, the values set from numeric keypad must be different from zero.



5.4 Flow calibration

Use the **MODE** key to scroll through the icons on the status bar, from left to right, select the **Calibration** menu and confirm with the **Enter** key.

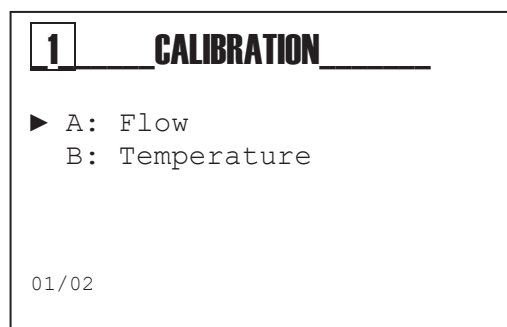


Menu 1 Calibration

Select the sensor you want to calibrate:

A: Flow: Sensor calibration with active flow

B: Temperature:



The Calibration menu consists of 4 items or sub-menus:

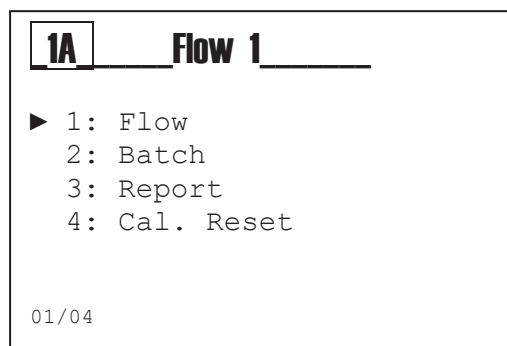
1A Flow: Sensor calibration with active flow

2A Batch: Calibration with measured volume

3A Report:

4A Cal. Reset: Delete all calibrations performed previously.

Scroll through the menu using the **(+)** or **(-)** key, select the item and confirm with the **Enter** key.



Note:

The flow calibration is always recommended.

5.4.1 Flow calibration procedure



Flow Measure Calibration Menu

Set the flow value present into the plant using an external reference instrument.

Note:

Before calibration, make sure that the sensor is properly installed, is in rotation and the flow is present and stable.

Set the flow value measured with an external reference instrument.

The instrument displays a numeric keypad to insert the known value.

Press the **Enter** key when ready.

1A1 Flow

► -: Value 0m³/h

1A1 Flow

6 m³/h

7 8 9 ?
4 5 6 +/-
1 2 3 Canc
0 . Enter

The instrument displays:

1: The calibration value used.

2: The “K” value of the probe calculated according to the calibration expressed in pulses per liter.

3: Enter to confirm and save all the calibration parameters.

1A1 Flow

► -: Set. Val. 6m³/h
-: Custom K 6,06
-: Save?



The instrument displays the question to confirm and save all the calibration data.

At the end the instrument returns to Calibration menu 1.

- Save?

YES
No



Note:

The instrument displays an error message during calibration if the sensor does not generate pulses. Check the sensor wiring or the presence of flow into the pipe.

1A1 Flow

**Input frequency
must be greater
than Zero!**

Flow Calibration Menu with Batch method

Menu 1A2 Batch Function

With the Batch calibration method, the sensor can be calibrated by measuring a specific volume of liquid associated to the received pulses.

Select the **menu 1A2** Batch.

Before activating the pulse count, make sure that the flow is stopped.

Activate the Batch function by pressing the Enter key and make sure the instrument does not count anything when the flow is stopped.

Open the liquid flow; the instrument displays the pulse count while the flow is in transit.

Close the liquid flow and wait for the count to stop, press **Enter** key to stop the count.

Measure the sampled volume and set the value according to the displayed unit of measure.

The instrument displays:

- 1: The calibration value used.
- 2: The “K” value of the probe calculated according to the calibration expressed in pulses per liter.
- 3: Enter to confirm and save all the calibration parameters.

Menu 1A3 Report

Displays of all the parameters calculated during calibration and the last calibration date.

Menu 1A4 Reset Calibration

This function allows the user to delete all the calibrations and to restore the default values.

1A2	CALIBRATION
1: Flow	
▶ 2: Batch	
3: Report	
4: Cal. Reset	
02/04	

1A2	Batch
▶ 1: Enter x Start Batch	

1A2	Batch
▶ 2: Enter x Stop 0	

1A2	Batch
▶ 2: Enter x Stop 20	

1A2	Batch
▶ 3: Value 20 L	

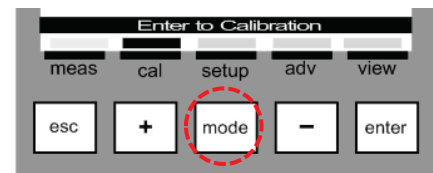
1A2	Batch
▶ -: Set. Val. 20 L	
-: Custom K 1	
-: Save?	

1A3	Report
Cal. Type None	
Last calibration: 12/03/14	

1A4	Cal. Reset
Are you sure?	
NO	
YES	

5.5 CI-Amp/Br Probe calibration

Use the MODE key to scroll through the icons on the status bar, from left to right, select the **Calibration** menu.



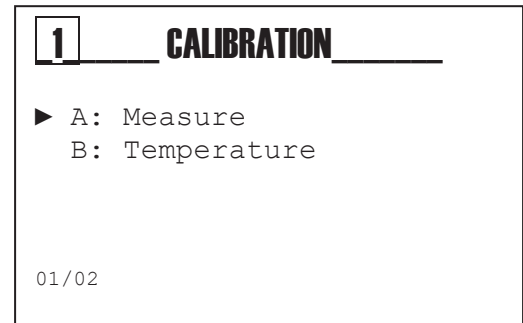
Calibration Menu 1

The Calibration menu consists of 2 items or sub-menus:

A: Measure

B: Temperature

Scroll through the menu using the **(+)** or **(-)** key, select the item and confirm with the **Enter** key.



Calibration Menu 1A Measure

The Measure Calibration menu consists of 5 items or sub-menus:

1A1 1 Point Cal: One measure point calibration.

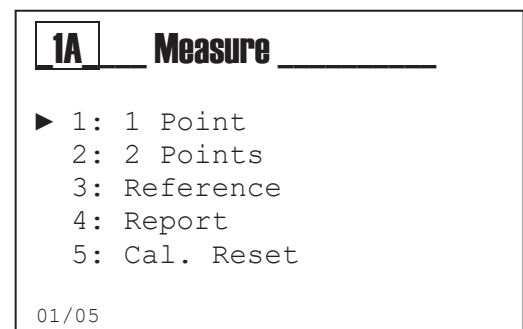
1A2 2 Points Cal: Two measure points calibration.

1A3 Reference: Allows you to refine the calibration by adding or subtracting an offset

1A4 Report: Will be displayed a summary of the last calibration.

1A5 Cal. Reset: The calibrations can be deleted and restored the default values.

Scroll through the menu using the **(+)** or **(-)** key, select the item and confirm with the **Enter** key.





5.5.1 CI-Amp/Br Probe calibration procedure

Calibration Menu Measure

Menu 1A1 One Point Calibration

Check that the sensor is properly installed and it is measuring.
Press the **Enter** key when ready.
Wait for 60 seconds.

At the end of the countdown, insert the calibration value.

The instrument displays a numeric keypad to insert the known value.

Press the **Enter** key when ready.

The instrument displays:

- 1: The calibration value used.
- 2: The calculated Gain value.
- 3: The calculated Offset value.
- 4: Enter to confirm and save all the calibration parameters.



The instrument displays the question to confirm and save all the calibration data.

At the end the instrument returns to Calibration menu.

1A

Measure

► 1: 1 Point

2: 2 Points

3: Reference

4: Report

5: Cal. Reset

01/05

1A1

1 Point

1: Wait

60 s

1A1

1 Point

1: Point 1

1.07ppm

1A1

Calibration_Value

1.20

ppm

789

456

123

0.

?

+/-

Cancel

Enter

1A1

1 Point

► -: Point 1

-: Gain

-: Offset

-: Save?

1.20 ppm

1.1240

0.0000 ppm

-

Save?

Yes

No

Menu 1A2 Two Points Calibration

Check that the sensor is properly installed and it is measuring.
Press the **Enter** key when ready.
Wait for 60 seconds.

1A2

2 Points

1: Wait

60 s

At the end of the countdown, insert the first calibration value.

1A2

2 Points

1: Point 1

1.17ppm

The instrument displays a numeric keypad to insert the known value.

Press the **Enter** key when ready.

1A2

Calibration_Value

1.00

ppm

789

456

123

0.

?

+/-

Canc

Enter

Prepare the second calibration point of the sensor.
Insert the sensor into the second buffer solution.
Press the **Enter** key when ready.

1A2

2 Points

► : Enter to continue

Wait for 60 seconds.

1A2

2 Points

1: Wait

60 s

At the end of the countdown, insert the second calibration value.

1A2

2 Points

1: Point 2

2.78ppm

The instrument displays a numeric keypad to insert the known value.

Press the **Enter** key when ready.

1A2

Calibration_Value

3.00

ppm

7894561230.

?+/-CancEnter

- The instrument displays:
- 1: The calibration value used for the first point.
 - 2: The calibration value used for the second point.
 - 3: The calculated Gain value.
 - 4: The calculated Offset value.
 - 5: Enter to confirm and save all the calibration parameters.

1A2

2 Points

► -: Point 1

1.00 ppm

-: Point 2

3.00 ppm

-: Gain

1.2422

-: Offset

-0.4534ppm

-: Save?



The instrument displays the question to confirm and save all the calibration data.

At the end the instrument returns to Calibration menu.

-

Save?

Yes

No

Menu 1A3 Reference Calibration

Check that the sensor is properly installed and it is measuring.
Press the **Enter** key when ready.

1A3

Reference

▶ -: Value

1.07ppm

-: Save?

The instrument displays a numeric keypad to insert the known value.

Press the **Enter** key when ready.

1A3

Calibration_Value

1.20

ppm

789

456

123

0.

?

+/-

Canc

Enter

The instrument displays:
1: The calibration value.
2: Enter to confirm and save all the calibration parameters.

1A3

Reference

▶ -: Value

1.20ppm

-: Save?



The instrument displays the question to confirm and save all the calibration data.

At the end the instrument returns to Calibration menu.

-

Save?

Yes

No

Menu 1A4 Report

The calibration report displays all the parameters related to the last calibration.

Calibration Type: Indicates the calibration type,

- None
- 1 Point
- 2 Points

Point 1: Indicates the value entered for point 1.

Point 2: Indicates the value entered for point 2.

Gain: Indicates the calculated angular coefficient.

Offset: Indicates the calculated offset value.

Adjust: Indicates the offset value memorized through the "Reference" calibration type.

1A4 Report	
Cal. Type	2 Points Cal.
Point 1	1.00ppm
Point 2	3.00ppm
Gain	1.2422
Offset	-0.453ppm
Adjust	0.130ppm



Note: When the calibration is performed for 1 Point or 2 Points, the "Adjust" value is automatically reset to zero.

Menu 1A5 Cal. Reset

This function allows the user to delete all the calibrations and to restore the default values.

1A5 Cal. Reset

Are you sure?

NO

YES

5.5.2 Calibration errors

The set values must not coincide:

- Only for the 2 points calibration, the values set from numeric keypad must not coincide.

Calibration_Failed!

The set values must not coincide

ENTER to continue

The two calibration points must differ by at least 10%:

- The second calibration point must be greater with at least 10% compared to the first calibration point.

Calibration_Failed!

The two calibration points must differ by at least 10%.

ENTER to continue

The set values must be different from zero:

- Only for the 1 point calibration, the values set from numeric keypad must be different from zero.

Calibration_Failed!

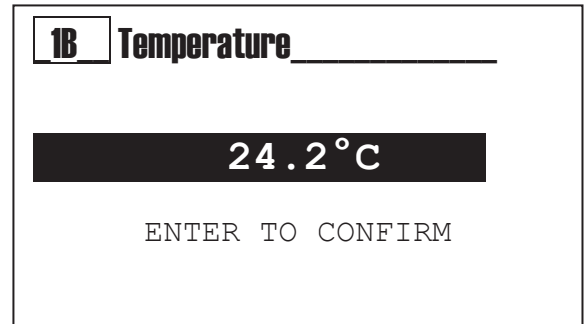
The set values must be different from zero

ENTER to continue

5.6 Temperature calibration

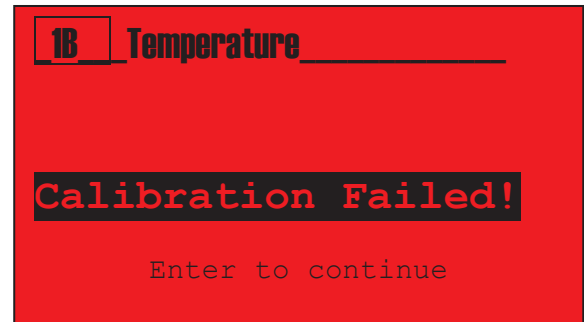
Menu 1B

Calibration of the Temperature Measure with an external reference value, manually set.
The instrument performs a correction of the value by adding an offset value to the real measure.



Menu 1B

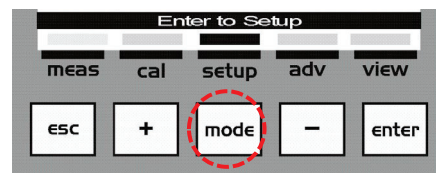
The instrument displays the message "Calibration Failed" if the probe is damaged or disabled from the menu; see manual, the Advanced Menu section.



6 PROGRAMMING

6.1 Setup menu

Use the **MODE** key to scroll through the icons on the status bar, from left to right, select the **setup** menu and confirm with the **Enter** key.

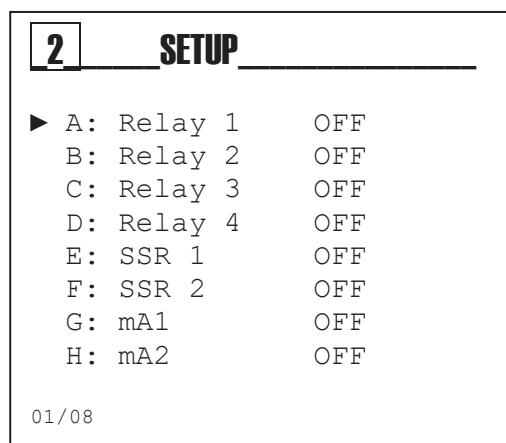


The Setup menu consists of 8 items or sub-menus:

- 2A: Relay 1
- 2B: Relay 2
- 2C: Relay 3
- 2D: Relay 4
- 2E: SSR1 (Solid State Relay)
- 2F: SSR2 (Solid State Relay)
- 2G: Output mA1
- 2H: Output mA2



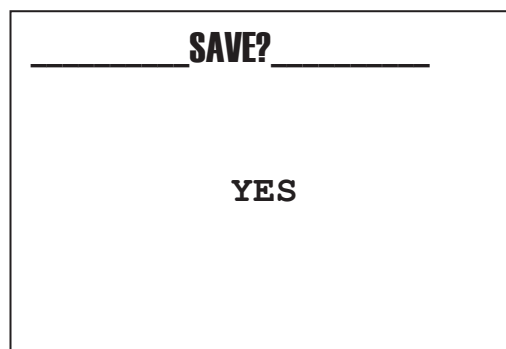
Note: To set the relative function to each output, read the manual at the **Advanced Menu\Output Setting** section.



Below are illustrated the settings required for each sub-menu indicated above.

To exit the menu, press the **Esc** key; when at least one parameter has been changed, the instrument will display the question “save?”; confirm with the **Enter** key.

For not saving, select NO using the (+) or (-) key and confirm with the **Enter** key.



Note: Check the selected unit of measure and set the values in the setup menu within the ranges allowed by the probes used.

6.1.1 Setup menu \ relay 1..4

Scroll through the menu using the **(+)** or **(-)** key, select the item Relay 1 and confirm with the **Enter** key.

Scroll through the menu using the **(+)** or **(-)** key, select the item and confirm with the **Enter** key.

The **Relays 1 - 4** can be set either for any type of measure (pH is used as an example here) or for temperature measure with the following activation methods:

ON/OFF Method

(Activation on threshold, with maintenance of the state)

2A1 **SetPoint**: Chemical value to maintain into the process

2A2 **Type**: **Low** as the minimum value to maintain

High as the maximum value to maintain

2A3 **Hysteresis**: Incremental or decremental value of the SetPoint

2A4 **Hysteresis Time (*)**: Time activated on the hysteresis value

2A5 **Delay Start**: Delay time for relay activation

2A6 **Delay End**: Delay time for relay deactivation

2A7 **OFA**: Relay maximum activation time

2A8 **Over Range**: A value that is subtracted from and added to the SetPoint value and defines a measuring range of operation, outside of which the measure error message is displayed.

2A9 **Persistence**: Control on the variation of chemical measure

2A9A: **Status**: Enables or disables the function

2A9B: **Range**: A value that is subtracted from and added to the value

2A9C: **Time**: Maximum permanence time of the measure

(*The hysteresis time has no effect if it is not set the hysteresis value menu 2A3)

Note: See Section 6.1.5 for a graphical example on using

Timed Method

(Timed activation on threshold)

We have all the items described in the ON/OFF method.

In addition, we have:

2A10 **Time On**: Relay closing time

2A11 **Time Off**: Wait time with the relay open

Note: See Section 6.1.6 for a graphical example on using

Proportional (PWM) Method

(Timed activation on proportional threshold)

We have all the items described in the ON/OFF method.

In addition, we have:

2A10 **Period**: Maximum time to modulate according to the measure

2A11 **Prop. Band**: A value that is subtracted from or added to the SetPoint value, within the range the instrument calculates the relay closing time proportional to the chemical measure according to the distance from the SetPoint.

Note: See Section 6.1.7 for a graphical example on using

2 SETUP

► A: Relay 1 Disabled
B: Relay 2 Disabled
C: Relay 3 Disabled
D: Relay 4 Disabled
E: SSR 1 Disabled

01/08

2A RELAY_1_ON/OFF

► 1: SetPoint 7.20 pH
2: Type High
3: Hysteresis 0.00 pH
4: Hyst. Time 00'00"
5: Delay Start 00'00"
6: Delay End 00'00"
7: OFA OFF
8: Over Range OFF
9: Persistence OFF

01/09

2A RELAY_1_Timed

7: OFA OFF
8: Over Range OFF
9: Persistence OFF
►10: Time On 00'10"
11: Time Off 00'10"

10/11

2A RELAY_1_PWM

7: OFA OFF
8: Over Range OFF
9: Persistence OFF
►10: Period 00'10"
11: Prop. Band 0.20pH

10/11



6.1.2 Setup menu \ relay 3..4

Scroll through the menu using the **(+)** or **(-)** key, select the item Relay 3 and confirm with the **Enter** key.

Scroll through the menu using the **(+)** or **(-)** key, select the item and confirm with the **Enter** key.

Relays 3 and 4 can be set either for a measure as indicated in the relay 1 menu (see the previous page), or it is also possible to set the Wash and Alarm mode as follows:

Wash Method

Activation of a washing system for the probe

2C1 **Time**: Value in minutes and seconds for washing the probe.

2C2 **Delay**: Value in minutes and seconds to wait for the stability of measure.

2C3 **Wait**: Value in hours and minutes of waiting for a new washing action.



Note: See Section 6.1.8 for a graphical example on using

Alarm Method

Remote repetition of the alarm through relay 3.

below is the list of the alarm events:

2D1 **R1 OverRng**: chemical measure out of range Relay 1

2D2 **R1 OFA**: Maximum dosing time expired

2D3 **R1 Persist**: chemical measure blocked (frozen)

2D4 **Reed Alarm**: Alarm for the Reed sensor activation

2D5 **Temp. Alarm**: Alarm for probe disconnected



Note: See Section 6.1.9 for a graphical example on using

2	SETUP
A: Relay 1	Disabled
B: Relay 2	Disabled
► C: Relay 3	Disabled
D: Relay 4	Disabled
E: SSR 1	Disabled
F: SSR 1	Disabled
01/08	

2C	Relay_3_Wash
► 1: Time	00' 00"
2: Delay	00' 00"
3: Wait	OFF
01/03	

2D	Relay_3_Alarms
► 1: R1 OverRng	NO
2: R1 OFA	NO
3: R1 Persist.	NO
4: Reed Alarm	NO
5: Temp. Alarm	NO
01/05	

6.1.3 Setup menu SSR1 and SSR2

Scroll through the menu using the **(+)** or **(-)** key, select the item SSR1 and 2 and confirm with the **Enter** key.

Scroll through the menu using the **(+)** or **(-)** key, select the item and confirm with the **Enter** key.

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

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

SSR1 Setup

2E1 **SetPoint**: Chemical value to maintain into the process

2E2 **Type**: **Low** as the minimum value to maintain

High as the maximum value to maintain

2E3 **Pulse Max**: Maximum value of pulses (range:20÷400)

2E4 **Pulse Min**: Minimum value of pulses (range:1÷100)

2E5 **Prop. Band**: A value that is subtracted from or added to the SetPoint value, within the range the instrument calculates the number of pulses proportional to the chemical measure according to the distance from the SetPoint.

2	SETUP
A: Relay 1	Disabled
B: Relay 2	Disabled
C: Relay 3	Disabled
D: Relay 4	Disabled
► E: SSR 1	Disabled
F: SSR 1	Disabled
01/08	

2E	SSR1
► 1: SetPoint	7.40pH
2: Type	High
3: Pulse Max	400
4: Pulse Min	1
5: Prop. Band	0.20pH
01/05	



Note: See Section 6.1.10 for a graphical example on using (6.1.10 for flow measure)

SSR2 Setup

2F1 **SetPoint**: Chemical value to maintain into the process

2F2 **Type**: **Low** as the minimum value to maintain

High as the maximum value to maintain

2F3 **Pulse Max**: Maximum value of pulses (range: 20÷400)

2F4 **Pulse Min**: Minimum value of pulses (range: 1÷100)

2F5 **Prop. Band**: A value that is subtracted from or added to the SetPoint value, within the range the instrument calculates the number of pulses proportional to the chemical measure according to the distance from the SetPoint.

2F	SSR2
► 1: SetPoint	25.0°C
2: Type	High
3: Pulse Max	400
4: Pulse Min	1
5: Prop. Band	10.0°C
01/05	



Note: See Section 6.1.10 for a graphical example on using

(* If the value **Pulse min** is greater than **Pulse Max** output will have the value of **Pulses min**)

6.1.4 Setup menu \ output mA1 and mA2

Scroll through the menu using the **(+)** or **(-)** key, select the item mA1 and 2 and confirm with the **Enter** key.

Scroll through the menu using the **(+)** or **(-)** key, select the item and confirm with the **Enter** key

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

The **Outputs mA1** and **mA2** can be set either any type of measure or for temperature as follows:

Output mA1 Setup

2G1 **Start**: Measure value associated to the 4 mA value

2G2 **End**: Measure value associated to the 20 mA value

2G3 **Keep**: Freezes the current value in case of Holding Alarm*

2G4 **Namur Alr**: Sets the current value to 3.6 mA or 22 mA in case of Alarm*



Note: See Section 6.1.12 for a graphical example on using
*Only if Alarm Setting→Block menu is enable.

Output mA2 Setup

2H1 **Start mA**: Measure value associated to the 4 mA value

2H2 **End mA**: Measure value associated to the 20 mA value

2H3 **Keep**: Freezes the current value in case of Alarm*

2H4 **Namur Alr**: Sets the current value to 3.6 mA or 22 mA in case of Alarm*



Note: See Section 6.1.12 for a graphical example on using
* Only if Alarm Setting→Block menu is enable.

Setup Output mA1 or mA2 as PID

2H1 **SetPoint**: Chemical value to maintain into the process

2H2 **Type**: **Low** as the minimum value to maintain

High as the maximum value to maintain

2H3 **Algorithm**: The type of PID algorithm that will be used

2H4 **Prop. Band**: The Proportional Range of the PID regulation compared with the bottom of the scale for the instrument.

2H5 **Integ. Time**: The Integrative part is set. The more the programmed time increases, the more the system will mediate with the measuring swings.

2H6 **Deriv. Time**: The Derivative part is set. The more the programmed time increases, the more the system will be ready for variations to the measurement.

2	SETUP
C: Relay 3	Disabled
D: Relay 4	Disabled
E: SSR 1	Disabled
F: SSR 2	Disabled
► G: Output mA1	Disabled
H: Output mA2	Disabled
01/06	

2G	Output_mA1
► 1: Start	0.00pH
2: End	14.00pH
3: Keep	NO
4: Namur Alr	OFF
01/04	

2H	Output_mA2
► 1: Start	-50.0°C
2: End	150.0°C
3: Keep	NO
4: Namur Alr	OFF
01/04	

2H	Output_mA2
► 1: SetPoint	7.40pH
2: Type	High
3: Algorithm	PI
4: Prop. Band	100%
5: Integ. Time	01'00"
6: Deriv. Time	OFF
01/06	

6.1.5 On/off relay setup

Below is an example of settings for the Relays 1 to 4 to adjust the pH by dosing acid chemical product using the pulse/pause method (on/off).

2A

RELAY_1_ON/OFF

► 1: SetPoint

2: Type

3: Hysteresis

4: Hyst. Time

5: Delay Start

6: Delay End

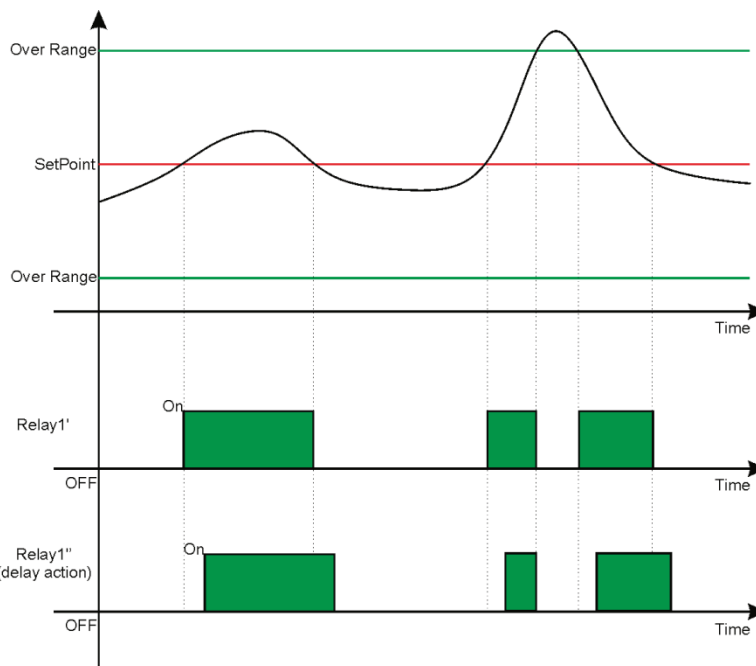
7: OFA

8: Over Range

9: Persistence

7.20 pH
High
0.00 pH
00'00"
00'00"
00'00"
OFF
3 pH
OFF

01/09



Note:



- **Relay Activation:** When the measure (black line) exceeds the SetPoint the relay is activated and this status is maintained until the measure decreases at the SetPoint value (see relay 1').
- **Delay Activation:** By setting the menu items "5" and "6" the relay activation will be delayed equal to the set time (see relay 1").
- **Chemical Measure out of range:** When the measure (black line) exceeds the maximum or minimum Over Range value (green line), the system displays a visual alarm and blocks the dosage by changing the status of the relay 1 or 2.

Type Function: By setting the menu item "2" with the variable High the relays activations are inverted compared to the above diagram.

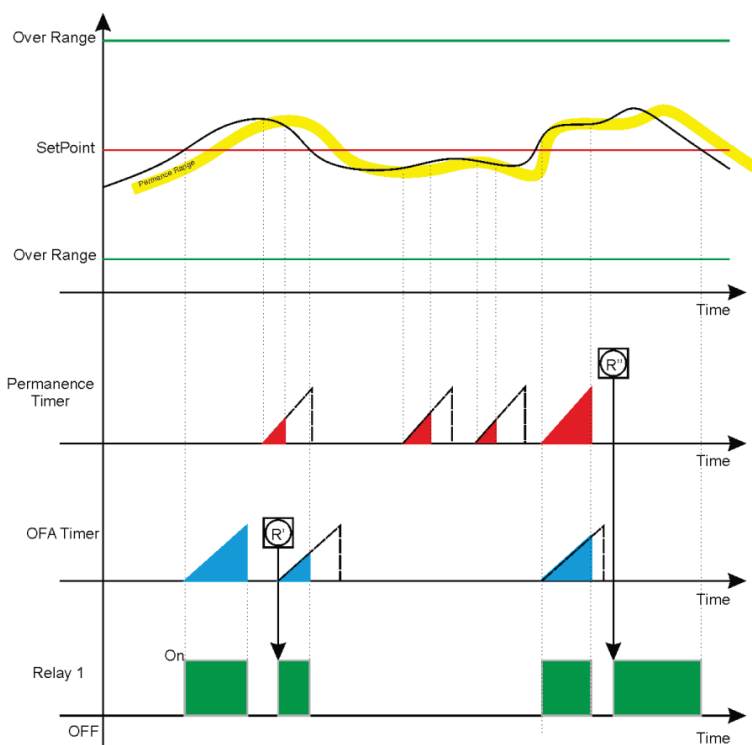
Hysteresis Function: By setting the menu items "3" and "4" the instrument maintains the relay activation status both for the chemical measure value and for the time.

On/off relay setup with persistence time and OFA function

Below is an example of settings for the Relays 1 to 4 to adjust the pH by dosing acid chemical product using the pulse/pause method (on/off) with OFA timers and Persistence Measure.

2A RELAY_1_ON/OFF	
1: SetPoint	7.20 pH
2: Type	High
3: Hysteresis	0.00 pH
4: Hyst. Time	00'00"
5: Delay Start	00'00"
6: Delay End	00'00"
7: OFA	00h 10m
8: Over Range	3 pH
9: Persistence	On

01/09



All the settings described on the previous page remain valid.

Note:



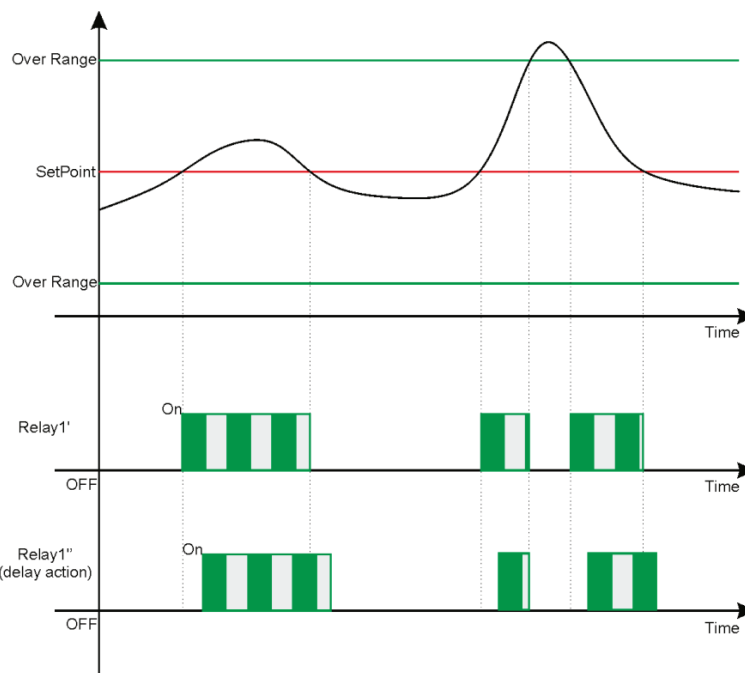
- OFA (Over Feed Alarm):** By setting the function "7" OFA with a time in hours and minutes a control timer is activated in parallel to the relay activation. The function checks the activated relay persistence times and generates a visual prealarm at 70% of set value and a blocking alarm (R') at the end of the set time (100%). A manual intervention will be required to remove the blocking with the reset of the OFA function on the alarms menu (see alarms section).
- Measure Persistence:** By setting the function "9" Persistence, represented on the graph with a yellow line, a function is activated to check the repetitive measure around the set interval. The measure persistence equal to the set time generates an alarm with instrument blocking; the persistence time (R") is represented with the red color. A manual intervention will be required to remove the blocking with the reset of the Persistence function on the alarms menu (see alarms section).

6.1.6 Timed relay setup

Below is an example of settings for the Relays 1 to 4 to adjust the pH by dosing acid chemical product using the timed method.

2A RELAY_1_Timed	
1: SetPoint	7.20 pH
2: Type	High
3: Hysteresis	0.00 pH
4: Hyst. Time	00' 00"
5: Delay Start	00' 00"
6: Delay End	00' 00"
7: OFA	OFF
8: Over Range	OFF
9: Persistence	OFF
10: Time On	01' 00"
11: Time Off	01' 00"

01/11



Note:



- **Relay Activation:** When the measure (black line) exceeds the SetPoint the relay is activated and the times On and Off are executed as set on the menu items "10" and "11"; this status is maintained until the measure decreases at the SetPoint value (see relay 1').
- **Delay Activation:** By setting the menu items "5" and "6" the relay activation will be delayed equal to the set time (see relay 1'')
- **Chemical Measure out of range:** When the measure (black line) exceeds the maximum or minimum Over Range value (green line), the system displays a visual alarm and blocks the dosage by changing the status of the relay 1 or 2.

Type Function: By setting the menu item "2" with the variable High the relays activations are inverted compared to the above diagram.

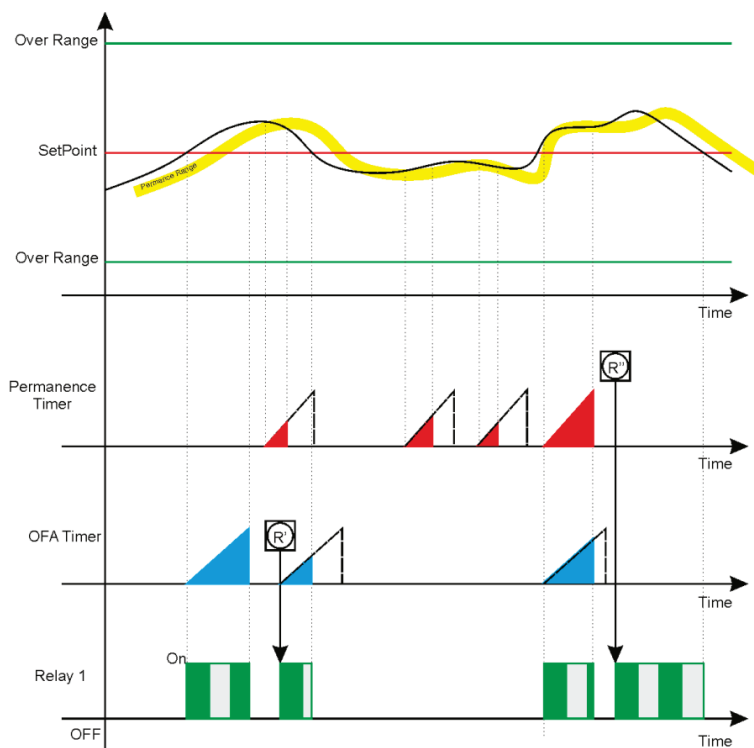
Hysteresis Function: By setting the menu items "3" and "4" the instrument maintains the relay activation status both for the chemical measure value and for the time.

Timed relay setup with persistence time and ofa function

Below is an example of settings for the Relays 1 to 4 to adjust the pH by dosing acid chemical product using the timed method.

2A RELAY_1 Timed	
1: SetPoint	7.20 pH
2: Type	High
3: Hysteresis	0.00 pH
4: Hyst. Time	00' 00"
5: Delay Start	00' 00"
6: Delay End	00' 00"
7: OFA	OFF
8: Over Range	OFF
9: Persistence	OFF
10: Time On	01' 00"
11: Time Off	01' 00"

01/11



All the settings described on the previous page remain valid.

Note:



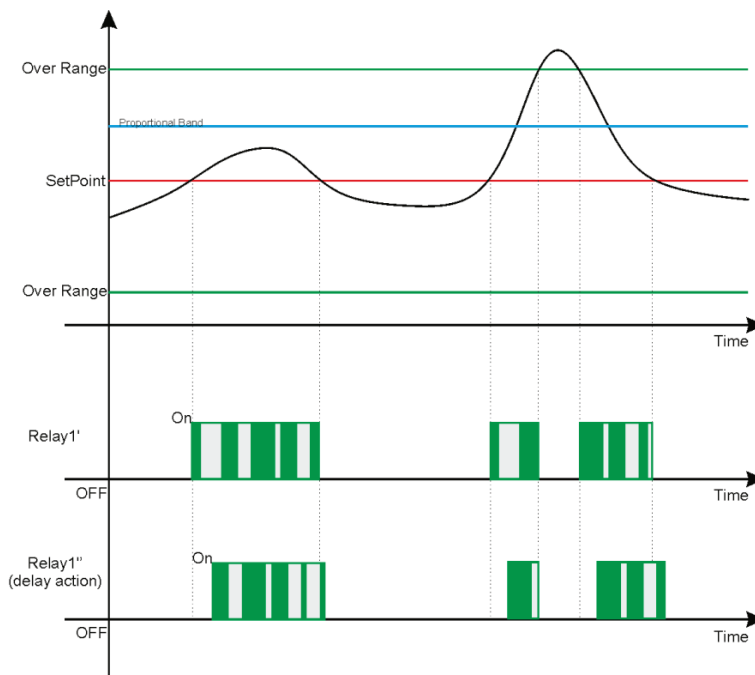
- OFA (Over Feed Alarm):** By setting the function "7" OFA with a time in hours and minutes a control timer is activated in parallel to the relay activation. The function checks the activated relay persistence times and generates a visual prealarm at 70% of set value and a blocking alarm (R') at the end of the set time (100%). A manual intervention will be required to remove the blocking with the reset of the OFA function on the alarms menu (see alarms section).
- Measure Persistence:** By setting the function "9" Persistence, represented on the graph with a yellow line, a function is activated to check the repetitive measure around the set interval. The measure persistence equal to the set time generates an alarm with instrument blocking; the persistence time (R") is represented with the red color. A manual intervention will be required to remove the blocking with the reset of the Persistence function on the alarms menu (see alarms section).

6.1.7 Proportional (pwm) relay setup

Below is an example of settings for the Relays 1 to 4 to adjust the pH by dosing acid chemical product using the proportional (PWM) method.

2A RELAY_1_PWM	
1: SetPoint	7.20 pH
2: Type	High
3: Hysteresis	0.00 pH
4: Hyst. Time	00'00"
5: Delay Start	00'00"
6: Delay End	00'00"
7: OFA	OFF
8: Over Range	OFF
9: Persistence	OFF
10: Interval	02' 00"
11: Prop. Band	1.00pH

01/11



Note:



- **Relay Activation:** When the measure (black line) exceeds the SetPoint the relay is activated and the proportional times On and Off are executed as calculated in relation to the proportional band set in the menu items "10" and "11"; this status is maintained until the measure decreases at the SetPoint value (see relay 1').
- **Delay Activation:** By setting the menu items "5" and "6" the relay activation will be delayed equal to the set time (see relay 1'')
- **Chemical Measure out of range:** When the measure (black line) exceeds the maximum or minimum Over Range value (green line), the system displays a visual alarm and blocks the dosage by changing the status of the relay 1 or 2.

Type Function: By setting the menu item "2" with the variable High the relays activations are inverted compared to the above diagram.

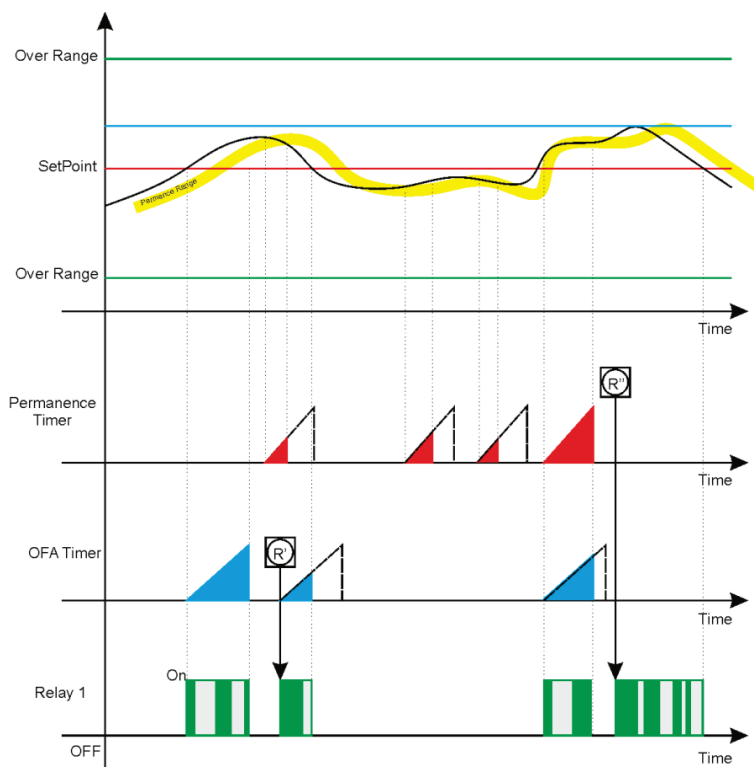
Hysteresis Function: By setting the menu items "3" and "4" the instrument maintains the relay activation status both for the chemical measure value and for the time.

Proportional (pwm) relay setup with persistence time and ofa function

Below is an example of settings for the Relays 1 to 4 to adjust the pH by dosing acid chemical product using the proportional (PWM) method.

2A RELAY_1_PWM	
1: SetPoint	7.20 pH
2: Type	High
3: Hysteresis	0.00 pH
4: Hyst. Time	00'00"
5: Delay Start	00'00"
6: Delay End	00'00"
7: OFA	OFF
8: Over Range	OFF
9: Persistence	OFF
10: Period	02' 00"
11: Prop. Band	1.00pH

01/11



All the settings described on the previous page remain valid.

Note:

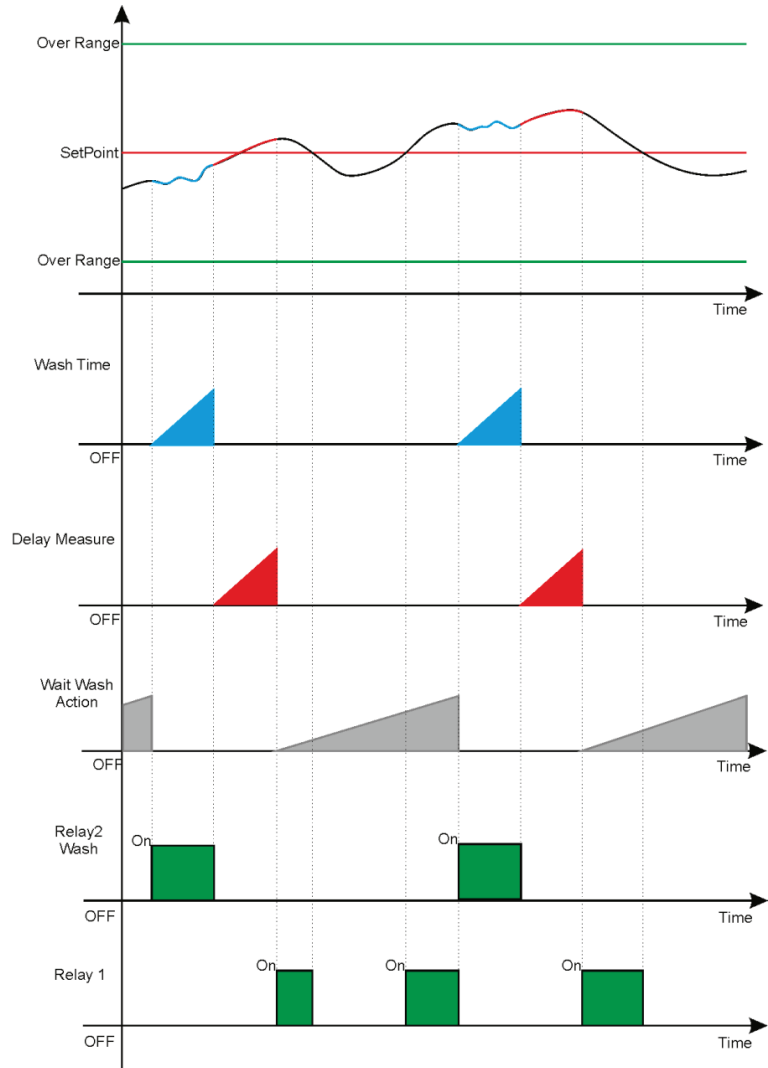


- OFA (Over Feed Alarm):** By setting the function "7" OFA with a time in hours and minutes a control timer is activated in parallel to the relay activation. The function checks the activated relay persistence times and generates a visual prealarm at 70% of set value and a blocking alarm (R') at the end of the set time (100%). A manual intervention will be required to remove the blocking with the reset of the OFA function on the alarms menu (see alarms section).
- Measure Persistence:** By setting the function "9" Persistence, represented on the graph with a yellow line, a function is activated to check the repetitive measure around the set interval. The measure persistence equal to the set time generates an alarm with instrument blocking; the persistence time (R") is represented with the red color. A manual intervention will be required to remove the blocking with the reset of the Persistence function on the alarms menu (see alarms section).

6.1.8 Relay 3 or 4 setup for automatic washing

Below is an example of settings for Relay 3 or 4 with Washing function to automate the probe cleaning with an external device(*).

2B	Wash
► 1: Wash	05' 00"
2: Delay	05' 00"
3: Wait	06h 00m
01/3	



Note:

- **Wash:** Relay 2 is activated at the end of "Wait" timer and starts operating an external device to the set time. The instrument displays a service message by deleting the displayed measure and blocking all the instrument's functions (Amber color Backlight).
- **Delay:** Relay 2 is turned off for the set time by displaying the measure and maintaining all the instrument's functions blocked (Light Green Backlight).
- **Wait:** The instrument counts the set time by performing the normal functions of measure and control; when the time expires, the "Wash" is activated.



Note: If Relay 1 is set to the temperature measurement is independent of the washing function.

6.1.9 Relay 3 or 4 setup to repeat remote alarm

(*To set the Relay 3 or 4 for Remote Alarm see Advanced Setup Menu 3F)

On Setup Menu 2C it is possible to set the alarm conditions to be repeated by Relay 3; attention, check the Advanced Menu "3E" Alarm Setting

2C Relay (Alarm)	
► 1: R1 OverRng	NO
2: R1 OFA	NO
3: R1 Persist.	NO
4: Reed Alarm	NO
5: Temp. Alarm	NO

01/05

3E Alarm_Setting	
► 1: Reed Logic	NO
2: Reed Delay	OFF
3: Switch OFF	NO
4: Block	NO
5: Alarm Temp.	Notify
6: Service	OFF
7: Service Date	

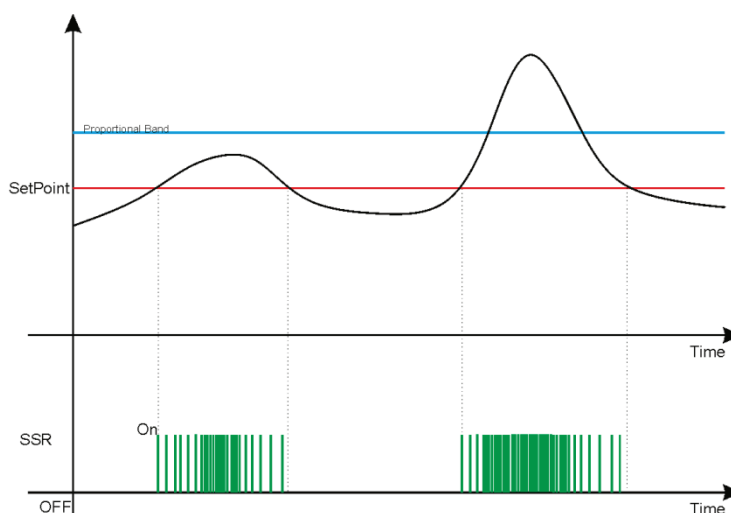
01/07

6.1.10 SSR1 and SSR2 setup

Proportional frequency output with independent Proportional Band and SetPoint.

2C SSR1	
1: SetPoint	7.40pH
2: Type	High
3: Pulse Max	400
4: Pulse Min	1
5: Prop. Band	0.20pH

01/05



Note:

- **Pulse Max:** Set the maximum value of pulses for chemical measure higher than the proportional band value.
- **Pulse Min:** Set the minimum value of pulses for measure near the SetPoint value.
- **Pulse Technical Data:** Pulse On duration is fixed at 100mSeconds and time Off duration varies from 50mS (400 pulses per minute) to 59900mS (1 pulse per minute).



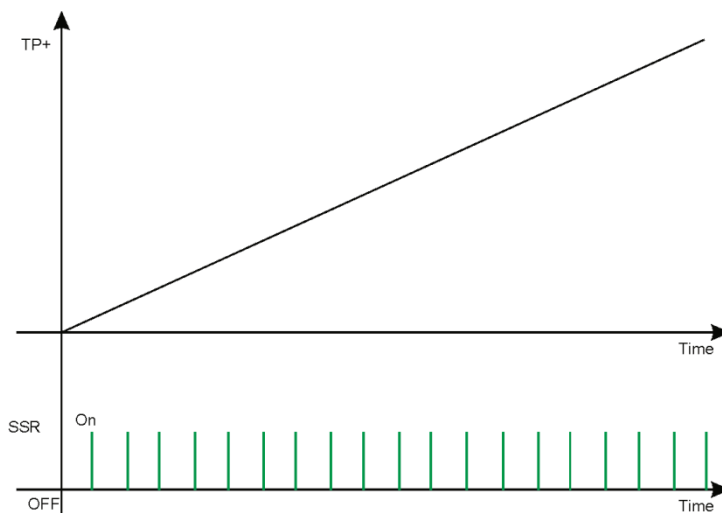
Note: The Alarm Over Range function is not present on frequency output.

6.1.11 Setting SSR1 and SSR2 as volume (flow measure only)

Pulse volumetric output proportional to the totaled volume.

2C SSR1_Volume	
1: Volume	1 L
2: Width	0,1s

01/02



Note:

- **Volume:** Set the volume to generate a pulse.
- **Width:** Set the value of the ON pulse in seconds.
- **Freq: VOL:** on the display the instrument indicates the function associated with the output and not the value of generated pulses.

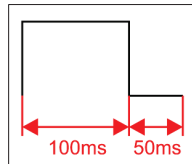
Setting SSR1 and SSR2 as 1:N (flow measure only)

SSR1/SSR2 SETTINGS:

For every input pulse, are generated N output pulses.

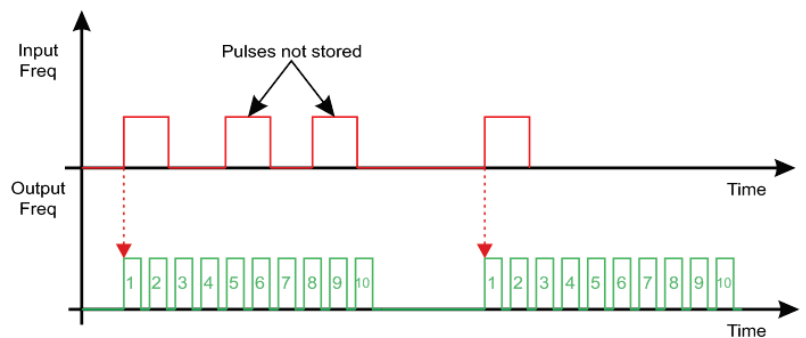
The generated pulse has the following times:

- ON = 100 msec.
- OFF $\geq$ 50 msec.



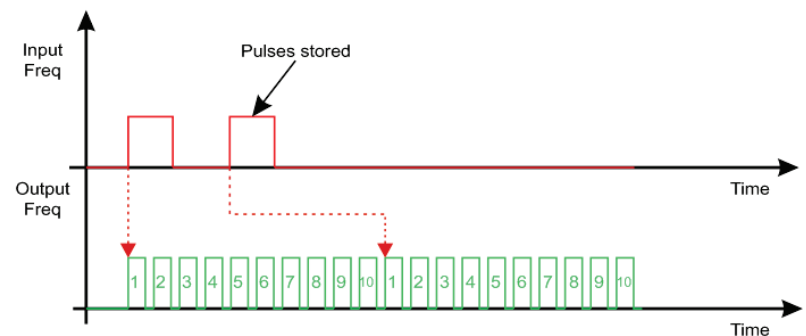
Example No. 1: Memory: Disabled

2C	SSR1_1:N
► 1: N Factor	10
2: Memory	NO
01/02	



Example No. 2: Memory: Enabled

2C	SSR1_1:N
► 1: N Factor	10
2: Memory	YES
01/02	



Note:

- **Freq: 1:N**: on the display the instrument indicates the function associated with the output and not the value of generated pulses.
- The maximum output frequency is 400 pulses/minute.

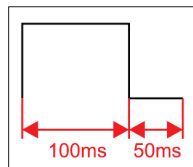
Setting SSR1 and SSR2 as N:1 (flow measure only)

SSR1/SSR2 SETTINGS:

For every N pulses received at the input, a pulse is generated in the output.

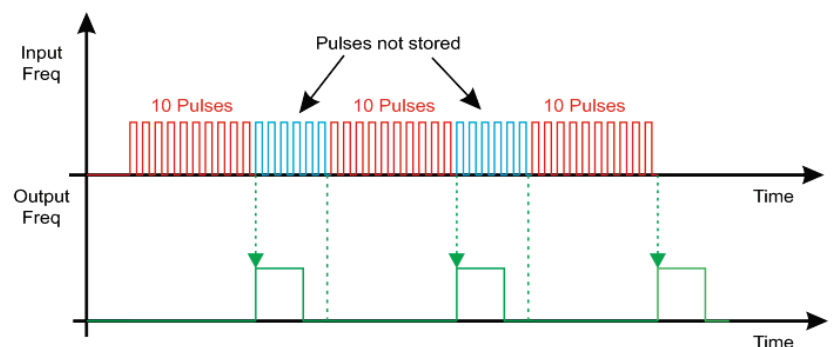
The generated pulse has the following times:

- ON = 100 msec.
- OFF $\geq$ 50 msec.



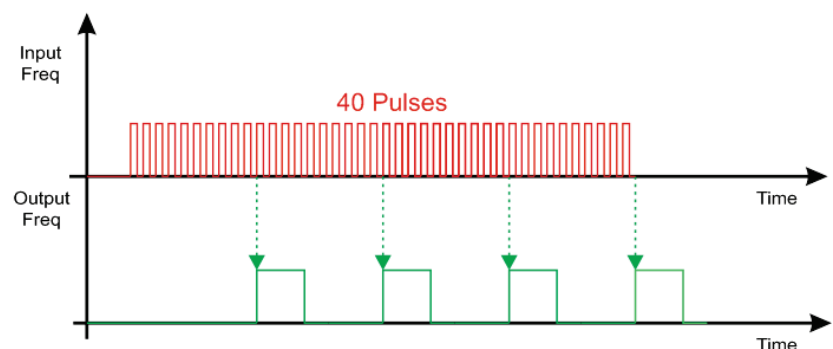
Example No. 1: Memory: Disabled

2C	SSR1_N:1
► 1: N Factor	10
2: Memory	NO
01/02	



Example No. 2: Memory: Enabled

2C	SSR1_N:1
► 1: N Factor	10
2: Memory	YES
01/02	



Note:

- **Freq: N:1**: on the display the instrument indicates the function associated with the output and not the value of generated pulses.
- The maximum output frequency is of 400 pulses/minute.

6.1.12 mA1 and mA2 setup [Repeater]

Current output proportional to the measure with range from 4 mA to 20 mA.

2E

Output_mA1

► 1: Start

0.00pH

2: End

14.00pH

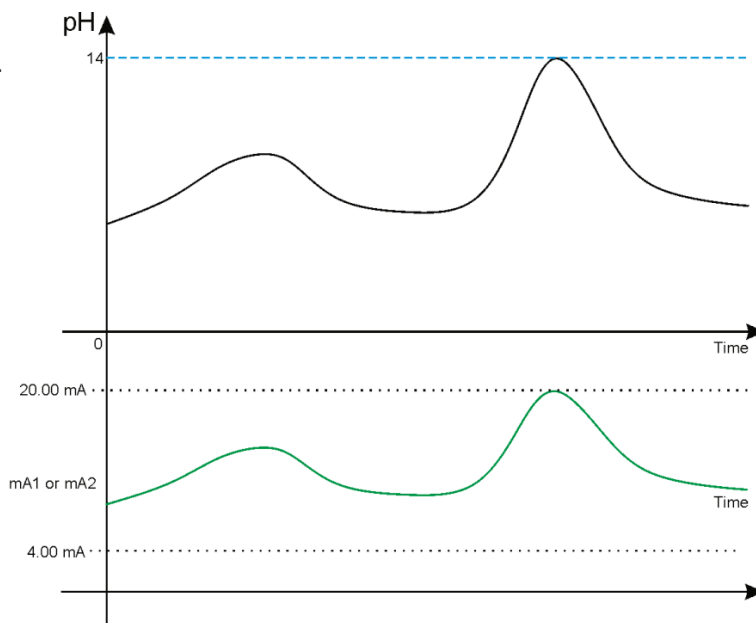
3: Keep

NO

4: Namur Alr

OFF

01/04



2E

Output_mA1

► 1: Start

-2000 mV

2: End

+2000 mV

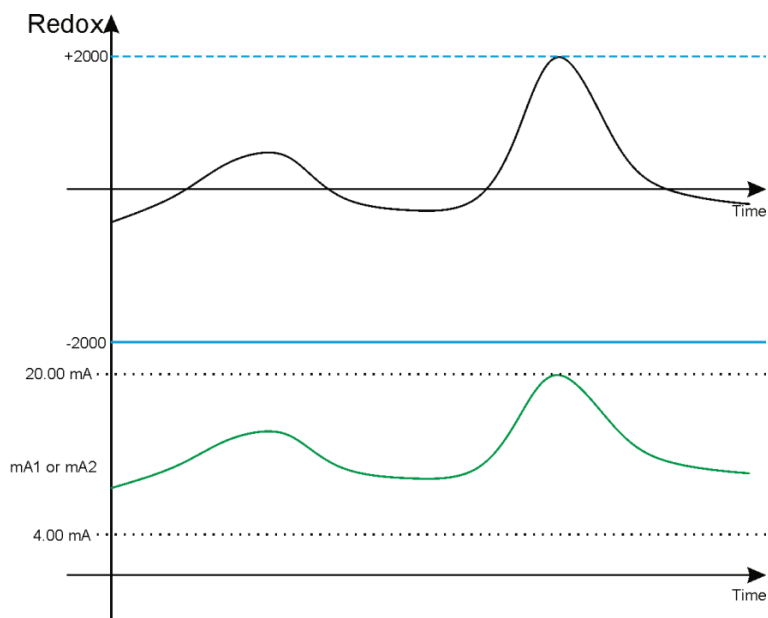
3: Keep

NO

4: Namur Alr

OFF

01/04



Note:



- **Start:** Minimum value of chemical measure associated to 4 mA
- **End:** Maximum value of chemical measure associated to 20 mA
- **Keep:** By setting the variable to YES, in case of alarm the instrument freezes the mA output to the last calculated value with Holding Alarm.
- **Namur Alr:** By setting the variable to the value of 3.6 mA or 22 mA, in case of alarm the instrument sets the current output to the selected value.

6.1.13 mA1 and mA2 setup [PID]

This programming step deals with programming the parameters for PID functionality. The PID adjustment output can be enabled on any mA measures, even on both simultaneously.

The PID function allows for the elimination of oscillations due to ON/OFF dosing. It also allows for the desired threshold to be reached and maintained with excellent precision. PID adjustment is a complex adjustment that must take into account all of the system variables. This PID has been designed for general applications with fast system retroactivity. In fact, the maximum programmable integral and derived times are of 5 minutes.

The PID function provides for three adjustments for managing the dosage:

- the PROPORTIONAL (P) adjustment allows for the increased or decreased amplification of the output quantity
- the DERIVATIVE (D) function allows for the system to be rendered more or less reactive to variations in the measured quantities
- the INTEGRATIVE (I) function allows for the mediation of the oscillations resulting from the derivative part.

2H1 **SetPoint**: Chemical value to maintain into the process

2H2 **Type**: Low or High

2H3 **Algorithm**: The type of PID algorithm that will be used

2H4 **Prop. Band**: The Proportional Range of the PID regulation compared with the bottom of the scale for the instrument.

2H5 **Integ. Time**: The Integrative part is set. The more the programmed time increases, the more the system will mediate with the measuring swings.

2H6 **Deriv. Time**: The Derivative part is set. The more the programmed time increases, the more the system will be ready for variations to the measurement.

2H Output_mA2	
1: SetPoint	7.40pH
2: Type	High
3: Algorithm	PI
4: Prop. Band	100%
5: Integ. Time	01'00"
6: Deriv. Time	OFF

01/06

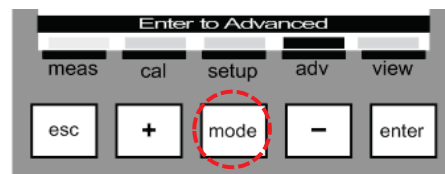
Note:

- **Type**: This function is used to program the type of PID action. If set to LOW, the PID value will decrease as the measured value increases with respect to the set threshold. If set to HIGH, on the other hand, the PID value will increase as the measured value increases with respect to the set threshold. By default, the algorithm sign is set to HIGH.
- **Algorithm**: The types of algorithms managed by the instrument include: P = Proportional, PI = Proportional – Integral and PID = Proportional – Integral – Derivative. The algorithm is selected based on the required application. The default algorithm is set to P.
- **Prop. Band**: This function represents the Proportional Range of the PID adjustment with respect to the bottom of the instrument's scale.
Example: for pH / ORP with a Range of 0-14pH, if Proportional 100% is programmed, this means there will be an adjustment range of ± 14 pH with respect to the set threshold. Therefore, the proportional value is inversely proportional to the output amplification, or rather, increasing the proportional percentage decreases the effects on the output. The proportional value can be adjusted from 1 to 500%, in increments of 1%. By default, this value is set to 100%.
- **Integ. Time**: This function sets the Integrative part. The higher the programmed time, the more the system will mediate the measurement oscillations. The derived time can be programmed from 0 to 5 minutes, in increments of 1 second. By default, this value is set to 1 minute.
- **Deriv. Time**: This function sets the Derivative part. The higher the programmed time, the more the system will be ready for measurement variations. The derived time can be programmed from 0 to 5 minutes, in increments of 1 second. By default, this value is set to OFF (0 minutes).



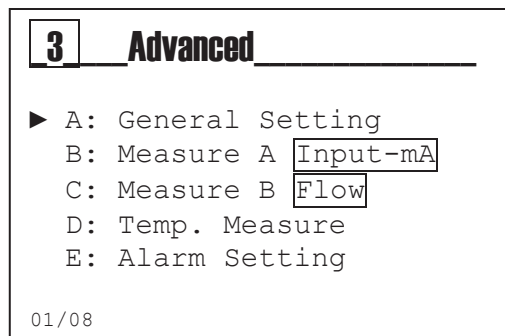
7 ADVANCED MENU

Use the **MODE** key to scroll through the icons on the status bar, from left to right, select the **adv** menu and confirm with the **Enter** key.



The **Advanced** menu consists of ten (10) items or sub-menus, as follows:

- A: **General Setting**
- B: **Measure A**
- C: **Measure B**
- D: **Temperature Measure**
- E: **Alarm Setting**
- F: **Output Setting**
- G: **Control Panel**
- H: **System Reset**

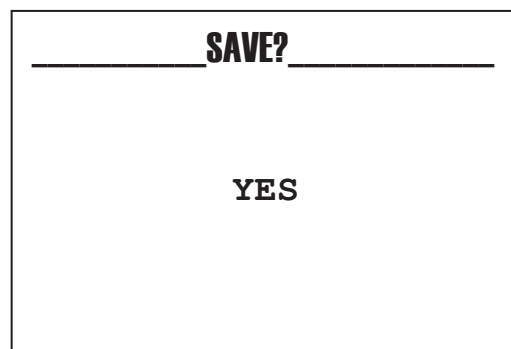


Below are illustrated the settings required for each sub-menu indicated above.

To exit the menu, press the **Esc** key; when the parameters have been changed, the instrument will display the question "save?"; confirm with the **Enter** key.



For not saving, select NO using the **(+)** or **(-)** key and confirm with the **Enter** key.



7.1 Advanced menu \ general setting

The **General Setting** menu consists of five (5) items:

1. **Language**
2. **Password**
3. **Set Date**
4. **Display**
5. **SetPoint**

Scroll through the menu using the **(+)** or **(-)** key, select the item you want to edit and confirm with the **Enter** key.

3A

GENERAL SETTING

►

1: Language

English

2: Password

3: Set Date

4: Display

5: SetPoint

01/05

7.1.1 Advanced menu \ general setting \ language

The menu consists of five (5) items that allow to select the dialog language for the instrument's menus and messages.

Scroll through the menu using the **(+)** or **(-)** key, select the item Language and confirm with the **Enter** key.

Scroll through the menu using the **(+)** or **(-)** key, select the item and confirm with the **Enter** key.

3A

GENERAL SETTING

►

1: Language

English

2: Password

3: Set Date

4: Display

5: SetPoint

01/05

The instrument automatically changes the menu language and returns to the previous level.

3A1

LANGUAGE

►

☒ English

☐ French

☐ Italian

☐ German

☐ Spanish

01/05

7.1.2 Advanced menu \ general setting \ password

The menu consists of four (4) items that allows to select the menu protection Password, enable the Calibration menu, access the Setup menu or Reset totalizer.

Scroll through the menu using the **(+)** or **(-)** key, select the item and confirm with the **Enter** key.

Password Function

3A2A Set Password: set the numeric value

Note: If the password is present it will be displayed
Example: "Old Password 1234"

3A2B Calibration Menu: Enable or Disable the Calibration menu

3A2C Setup Menu: Enable or Disable the Setup Menu

3A2D Totalizer Reset: Enable or Disable the Totalizer Reset



Note: To remove the password set four zeros (0000) and confirm with the **Enter** key.

The following are examples of the sub-menus shown above.



Menu 3A2A

Set the value for password, other than 0000 using **(+)** and **(-)** keys and move to the right using the **Mode** key.

Menu 3A2B

YES= Menu Enabled

NO= Menu Disabled; can be accessed by using the password

Menu 3A2C

YES= Menu Enabled

NO= Menu Disabled; can be accessed by using the password

Menu 3A2D

YES= Menu Enabled

NO= Menu Disabled; can be accessed by using the password

3A **GENERAL SETTING**

1: Language

2: Password

3: Set Date

4: Display

5: SetPoint

English

01/05

3A2 **Password**

A: Set Password

B: CAL menu

C: Setup menu

D: Totalizer Reset

NO

NO

NO

01/04

3A2 **Set_Password**

0

0

0

0

Old Password 1234

3A2 **CAL_Menu**

☐ NO

☒ YES

3A2 **SETUP_Menu**

☐ NO

☒ YES

3A2 **Totalizer_Reset**

☐ NO

☒ YES

7.1.3 Advanced menu \ general setting \ set date

Scroll through the menu using the **(+)** or **(-)** key, select the item **Set Date** and confirm with the **Enter** key.

3A	GENERAL SETTING
1:	Language English
2:	Password
▶ 3:	Set Date
4:	Display
5:	SetPoint
01/05	

Use **Mode** and **(+)** or **(-)** keys to set the correct time and date then press **Enter** to confirm.

The instrument saves the data and returns to the previous menu.

3A3	Set Date
DD / MM / YY	
04 / 03 / 19	
hh : mm	
13 : 30	
ENTER to confirm	

7.1.4 Advanced menu \ general setting \ display

The menu consists of five (5) items that allow to select **Contrast**, **Mode**, **Mode ON**, **Mode ECO**, **Reverse**.

Scroll through the menu using the **(+)** or **(-)** key, select the item and confirm with the **Enter** key.

Display Function:

3A4A Contrast: Balance value between the menu writings and the background brightness

3A4B Mode: Turned on, Turned off, "ECO" Adjustment

3A4C On: Light value function always on

3A4D ECO: Light value function of electronic regulation

3A4E Reverse: Inverted display, white writings on black background.

3A	GENERAL SETTING
1:	Language English
2:	Password
3:	Set Date
▶ 4:	Display
5:	SetPoint
01/05	

3A4	Display
▶ A:	Contrast 00
B:	Mode ECO
C:	ON 100%
D:	ECO 50%
E:	Reverse OFF
01/05	

The following are examples of the sub-menus shown above.

Menu 3A4A

Adjusts the background brightness

3A4

Contrast

+

0

0

Menu 3A4B

Select the Backlight function:

OFF= Turned off; ON= Turned on; ECO= Fade

3A4

Mode

▶

☐ OFF

☒ ON

☐ ECO

Menu 3A4C

Select the brightness value for ON mode

3A4

On

0

5

0

%

Menu 3A4D

Select the brightness value for ECO mode

3A4

ECO

0

5

0

%

Menu 3A4E

Invert the writings on the display to obtain a high contrast

3A4

Negative_Dispaly

▶

☒ OFF

☐ ON

7.1.5 Advanced menu \ general setting \ setpoint

The menu consists of two (2) items that allow to turn the SetPoint function On or Off.

Scroll through the menu using the (+) or (-) key, select the item and confirm with the **Enter** key.

The instrument saves the data and returns to the previous menu.

3A

GENERAL SETTING

1: Language

2: Password

3: Set Date

4: Display

▶ 5: SetPoint

01/05

3A5

SetPoint

▶

☒ Hist.

☐ On/Off

7.2 Advanced menu \ Measure A

The menu structure of **Measure A** and **Measure B** changes according to the parameter to be measured.

7.2.1 pH/ORP measure

For the **pH/ORP** measure, the menu consists of three (3) items that allow to select **Measure Unit**, **Temperature Compensation** and **Filter**.

Scroll through the menu using the **(+)** or **(-)** key, select the item and confirm with the **Enter** key.

3B1 Measure Unit: Select the chemical measure, pH or mV

3B2 Temperature Compensation: The measure is compensated for temperature:

- MTC= Manual, with a fixed value manually set.
- ATC= Automatic, with temperature sensor

Note: To set the value manually, access the Section 5.4 Advanced Menu\ Temp. Measure.

3B3 Measure Filter: The measure is filtered with arithmetic mean.

- Low= arithmetic mean every 4 seconds
- Medium= arithmetic mean every 8 seconds
- High= arithmetic mean every 16 seconds



3 **Advanced**

A: General Setting
▶ B: Measure A **pH/ORP**
C: Measure B
D: Temp. Measure
E: Alarm Setting

02/08

3B **Measure_A**

▶ 1: Meas. Unit
2: Temp. Compensation
3: Filter

01/03

The following are examples of the sub-menus shown above.

Menu 3B1

Select the measure pH or mV (Redox).

Note: The change of measure unit provides a parameter reset with the default values.

3B1 **Measure_Unit**

▶ ☒ pH
☐ mV

01/02

Menu 3B2

Select the temperature compensation mode for the measure

Note: For ORP measures it has no effect.

3B2 **Temp_Compensation**

▶ ☒ MTC
☐ ATC

01/02

Menu 3B3

The measure is filtered with arithmetic mean.

- Low= arithmetic mean every 4 seconds
- Medium= arithmetic mean every 8 seconds
- High= arithmetic mean every 16 seconds

3B3 **Measure_Filter**

▶ ☒ Low
☐ Medium
☐ High

01/03

7.2.2 EC-CONDUCTivity measure

For the **Conductivity** measure, the menu consists of nine (9) items that allow to setup the measure.

Scroll through the menu using the **(+)** or **(-)** key, select the item and confirm with the **Enter** key.

3C1 Measure Unit: Select the measure unit for Conductivity.

3C2 Temperature Compensation: The measure is compensated for temperature:

- OTC= Compensation disabled.
- MTC= Manual, with a fixed value manually set.
- ATC= Automatic, with temperature sensor.

Note: To set the value manually, access the Section 5.4 Advanced Menu\ Temp. Measure.

3C3 Filter: The measure is filtered with arithmetic mean.

- Low= arithmetic mean every 4 seconds
- Medium= arithmetic mean every 8 seconds
- High= arithmetic mean every 16 seconds

3C4 TDS: Total Dissolved Solids, the conductivity can be used as an indicator of the amount of material dissolved in a solution. It is expressed in ppm/ μ S.

3C5 Decimal Point: set the position of the decimal point for the measure.

3C6 Compensation Type: Set the compensation method:

- Ultra-Pure Water (H_2O)
- Linear to 25°C
- Linear to 20°C

3C7 Linear Coefficient: set the increment percentage (SLOPE) used in the linear compensation.

3C8 Cell Constant: Set the Cell Constant parameters

3C9 Cal. Type:

- High
- Medium
- Low

The following are examples of the sub-menus shown above.

Menu 3C1

Select the measure unit for Conductivity.

Note:

- The change of measure unit provides a parameter reset with the default values.
- The units of measure PPM (parts per million) and PPB (parts per billion) can be used by setting the TDS value (menu 3D4).

3 Advanced

- A: General Setting
- B: Measure A
- C: Measure B
- D: Temp. Measure
- E: Alarm Setting

03/08

3C Measure_A

- 1: Measure Unit
- 2: Temp. Comp.
- 3: Filter
- 4: TDS
- 5: Decimal Point

01/09

3C1 Measure_Unit

- ☒ μ S
- ☐ mS
- ☐ K Ω
- ☐ M Ω
- ☐ ppm
- ☐ ppb

01/06

Menu 3C2

Select the temperature compensation of the chemical measure.

- **OTC**= Function disabled
- **MTC**= Temperature compensation with a Manual value, see menu 3E
- **ATC**= Temperature compensation with an Automatic value, see menu 3E

3C2	Temp. Compensation
▶ ☒	OTC
☐	MTC
☐	ATC
01/03	

Menu 3C3

The measure is filtered with arithmetic mean.

- Low= arithmetic mean every 4 seconds
- Medium= arithmetic mean every 8 seconds
- High= arithmetic mean every 16 seconds

3C3	Filter
▶ ☒	Low
☐	Medium
☐	High
01/03	

Menu 3C4 TDS Total Dissolved Solids

To view the conductivity measure in Total Dissolved Solids you must set a conversion factor between 0.3 and 2. The measure will be converted to PPM or PPB per μS .

The typical TDS value in water is 0.7 and it is given by the subtraction of **Total Suspended Solids (TSS)** from the **Total Solids (TS)**

Below is a calculation example:

Total Solids (TS)

All the materials dissolved and suspended in a natural or drained water are indicated as total solids. The determination of the total solids is performed by evaporating the water from the sample into a thermostated oven at 105°C.

The Total Solids content is given by:

Total Solids (mg/L) = $(M1 - M0) \times 1000 / VProbe$ where:

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

M0= mass in mg of the empty capsule;

VProbe = volume in mL of analyzed sample.

Example:

$$\begin{aligned}M1 &= 10023,6 \text{ mg} \\M0 &= 10000 \text{ mg} \\VProbe &= 100 \text{ mL} \\10023,6 - 10000 &= 23,6 \text{ mg} \\23,6 \times 1000 / 100 &= 236 \text{ mg/L}\end{aligned}$$

Total Suspended Solids (TSS) represent that part of material suspended in a water sample which can be separated by filtration through a membrane filter with a porosity of 0.45 μm (micrometer μm).

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

The Total Suspended Solids content is given by:

Suspended Solids (mg/L) = $(M1 - M0) \times 1000 / VProbe$ where:

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

M0= mass in mg of the capsule+filter;

VProbe= volume in mL of filtered sample.

Menu 3C5

Set the position of the decimal point for the measure to highlight the decimal value.

Scroll through the menu using the **(+)** or **(-)** key, select the item and confirm with the **Enter** key.

3C5	Decimal_Point
▶ ■	XXXXX,
□	XXXX,X
□	XXX,XX
□	XX,XXX
□	X,XXXX
01/05	

Menu 3C6 Compensation Type: Set the compensation method for the measure

- Ultra-Pure Water (H₂O)
 - Select this item for conductivity measures in ultra-pure water or lower than 0.2 μS (from 5MΩ to 18MΩ). The compensation function is in compliance with ASTM D1125 and D5391 standard.
- Linear to 25°C
 - Select this item for conductivity measures greater than 0.2 μS (lower than 5MΩ). The measure compensation is linear, referred to the temperate of 25°C. The compensation function requires the use of the **linear coefficient** menu 3E6.
- Linear to 20°C
 - Select this item for conductivity measures greater than 0.2 μS (lower than 5MΩ). The measure compensation is linear, referred to the temperate of 20°C. The compensation function requires the use of the **linear coefficient** menu 3E6.

Menu 3C7 Linear Coefficient

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 Linear Coefficient value, proceed as follows:

Obtain a container and an electric or gas stove.

Connect the PT100/PT1000 sensor to the K100 instrument or obtain a thermometer.

Place the sample solution in the container.

Note: This method is valid only for conductivity greater than 84μS.

Set the temperature compensation function to OTC (menu 3D2)

Take a measure of the sample at room temperature and record the conductivity and temperature value.

Example:

$$\begin{aligned}C' &= 200\mu\text{S} \\ T' &= 23^\circ\text{C}\end{aligned}$$

Heat the sample and increasing its temperature to 50°C.

Note: Wait for the temperature change to slow down and stabilize.

Take a second measure of conductivity (C'') and temperature (T'').

Example:

$$\begin{aligned}C'' &= 600\mu\text{S} \\ T'' &= 50^\circ\text{C}\end{aligned}$$

To calculate the Linear Coefficient for 25°C complete the following function:

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

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

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

Menu 3C8 Cell Constant

3C8A Type: Select Standard or Custom

3C8B Standard: List of cell constant values for standard measure.

3C8C Custom: Adjustable cell constant value for custom measure.

3C8D Actual: View the cell constant in use.

The following are examples of the sub-menus shown above.

Menu 3C8A Probe Type

Select the type of probe used, standard or custom;
Set the used value by accessing the menu 3F2 or 3F3.

Menu 3C8B Standard

Set the measure cell constant by selecting it from the list.

Menu 3C8C Custom

Set manually the measure cell constant by editing the value.

Menu 3C8D Actual

The instrument displays the set value or the value calculated during the calibration.

7.2.3 Input mA measure

For the **Input mA** measure, the menu consists of eleven (11) items that allow to setup the measure.

Scroll through the menu using the **(+)** or **(-)** key, select the item and confirm with the **Enter** key.

3B1 Measure Unit: Select the measure unit.

3B2 Custom Unit: Possibility to write any custom measure unit. Maximum 4 characters/symbols.

Note: This measure unit will be displayed only if the menu 3D1 is set as **Custom**.

3B3 Unit Name: Select the measure name.

3B4 Custom Name: Possibility to write any custom name to match the measure. Maximum 4 characters/symbols.

Note: This name will be displayed only if the menu 3D3 is set as **Custom**.

3B5 Filter: The measure is filtered with arithmetic mean.

- Low= arithmetic mean every 4 seconds
- Medium= arithmetic mean every 8 seconds
- High= arithmetic mean every 16 seconds

3B6 Decimal Point: set the position of the decimal point for the measure.

3B7 Sensor Type: Select the type of sensor used, 0/20mA or 4/20mA.

3B8 Min Range: Set the value corresponding to 0 mA or 4 mA. Value between -99999 and 99999.

3B9 Max Range: Set the value corresponding to 20 mA. Value between -99999 and 99999.

3B10 Over Range:

- OFF: Over Range Alarm disabled.
- 22mA: If the input current to the instrument is higher than 22mA, the Over range alarm is activated.

3B11 Under Range:

- OFF: Over Range Alarm disabled.
- 3.6mA: If the input current to the instrument is lower than 3.6mA, the Under-Range alarm is activated.

The following are examples of the sub-menus shown above.

Menu 3B1

Select the measure unit. By selecting "**Custom**" the measure unit is displayed as set in the menu 3D2.

3	Advanced
A: General Setting	
► B: Measure A	Input-mA
C: Measure B	
D: Temp. Measure	
E: Alarm Setting	
02/08	

3B	Measure_A
► 1: Meas. Unit	ppm
2: Unit.Custom	
3: Meas. Name	C12
4: Custom Name	
5: Filter	Medium
6: Dec. Point	XXX,XX
01/11	

3B1	Measure_Unit
► ☒ ppm	
☐ ppb	
☐ mg/l	
☐ mA	
☐ Custom	
☐ NTU	
01/06	

Menu 3B2

Possibility to write the custom measure unit,
max. 4 characters.

3B2 Custom_Unit_____

U n i t

Menu 3B3

Select the measure name. By selecting **Custom** the
measure name is displayed as set in the menu 3D4.

3B3 Measure_Name_____

► ■ c12

☐ PAA

☐ H2O2

☐ O3

☐ Custom

☐ O2

☐ Turb

01/07

Menu 3B4

Possibility to write the custom measure name, max. 4
characters.

3B4 Custom_Name_____

N a m e

Menu 3B5

The measure is filtered with arithmetic mean.

- Low= arithmetic mean every 4 seconds
- Medium= arithmetic mean every 8 seconds
- High= arithmetic mean every 16 seconds

3B5 Filter_____

► ■ Low

☐ Medium

☐ High

01/03

Menu 3B6

Set the position of the decimal point for the measure to
highlight the decimal value.

Scroll through the menu using the **(+)** or **(-)** key, select the
item and confirm with the **Enter** key.

3B6 Decimal_Point_____

► ■ XXXXX,

☐ XXXX,X

☐ XXX,XX

☐ XX,XXX

☐ X,XXXX

01/05

Menu 3B7

Select the type of sensor used, 0/20mA or 4/20mA.

3B7 **Sensor**

► ☐ 0-20mA

☒ 4-20mA

01/02

Menu 3B8

Set the value corresponding to 0 mA or 4 mA.
Value between -99999 and 99999.

3B8 **Min**

0.00 ppm

7894561230.

?

+/-

Canc

Enter

Menu 3B9

Set the value corresponding to 20 mA.
Value between -99999 and 99999.

3B9 **Max**

5.00 ppm

7894561230.

?

+/-

Canc

Enter

Menu 3B10

Set the Over Range Alarm.

- OFF: Over Range Alarm disabled.
- 22mA: If the input current to the instrument is higher than 22mA, the Over range alarm is activated.

3B10 **Over_Range**

► ☒ OFF

☐ 22mA

01/02

Menu 3B11

Set the Under-Range Alarm.

- OFF: Under-Range Alarm disabled.
- 3.6mA: If the input current to the instrument is lower than 3.6mA, the Under-range alarm is activated.

3B11 **Under_Range**

► ☒ OFF

☐ 3.6mA

01/02



Note: The Under-Range Alarm can only be activated if the menu 3B7 is set as 4-20mA. If the menu 3B7 is set as 0-20mA, the Under-Range menu is configured to OFF and cannot be changed.

7.2.4 Flow measure

For the **Flow** measure, the menu consists of five (5) items that allow to setup the measure.

Scroll through the menu using the **(+)** or **(-)** key, select the item and confirm with the **Enter** key.



3C1 Measure Unit: Select the measure unit for instantaneous flow.

3C2 Filter: The measure is filtered with arithmetic mean.

- Low= arithmetic mean every 12 seconds
- Medium= arithmetic mean every 40 seconds
- High= arithmetic mean every 120 seconds

3C3 Decimal Point: Set the position of the decimal point for the instantaneous measure.

3C4 Vol. Unit: Select the measure unit for all the totalizers

3C5 K Factor: Display the pulses/liter value for the Flow sensor according to the selected diameter or the set value.

3	Advanced
A: General Setting	
► B:	Measure A Flow
C:	Measure B
D: Temp. Measure	
E: Alarm Setting	
03/08	

3C	Measure_A
► 1:	Meas. Unit L/h
2:	Filter Low
3:	Decimal Flow x,xxxx
4:	Vol. Unit L
5:	K Factor 1,0000
01/05	

3C1	Measure_Unit
► ☒	L/s
☐	L/min
☐	L/h
☐	m ³ /h
☐	GPM
01/05	

The following are examples of the sub-menus shown above.

Menu 3C1

Select the Flow measure unit

Menu 3C2

The measure is filtered with arithmetic mean.

- Low= arithmetic mean every 12 seconds
- Medium= arithmetic mean every 40 seconds
- High= arithmetic mean every 120 seconds

3C2	Measure_Filter
► ☒	Low
☐	Medium
☐	High
01/03	

Menu 3C3

Set the position of the decimal point for the measure, to highlight the decimal value.

3C3	Dec. Point
► ☒	XXXXX,
☐	XXXX,X
☐	XXX,XX
☐	XX,XXX
☐	X,XXXX
01/05	

Menu 3C4

Select the measure unit for all the totalizers.

3C4

Vol. Unit

▶

☒ L

☐ GAL

☐ m³

01/03

Menu 3C5

Set manually the measure cell constant by editing the value.

3C5

K Factor

1,000

789

456

123

0.

?

+/-

Canc

Enter

7.2.5 Amperometric Chlorine measure

For the **Amperometric Chlorine** measure, the menu consists of seven (7) items that allow to setup the measure.

Scroll through the menu using the **(+)** or **(-)** key, select the item and confirm with the **Enter** key.

3	Advanced
A: General Setting	
► B: Measure A	CL-AMP/Br
C: Measure B	
D: Temp. Measure	
E: Alarm Setting	
02/08	

Measure A Function (Index menu 3B)

3B1 **Measure Unit**: Select the measure unit.

3B2 **Unit Name**: Select the measure name.

3B3 **Temperature Compensation**: The measure is compensated for temperature:

- **OTC**= Compensation disabled.
- **MTC**= Manual, with a fixed value manually set.
- **ATC**= Automatic, with temperature sensor.

3B4 **Measure Filter**: The measure is filtered with arithmetic mean.

- **Low**= arithmetic mean every 4 seconds
- **Medium**= arithmetic mean every 8 seconds
- **High**= arithmetic mean every 16 seconds

3B5 **Decimal Point**: set the position of the decimal point for the measure.

3B6 **Compensation Type**: Set the compensation method:

- Linear to 25°C
- Linear to 20°C

3B7 **Linear Coefficient**: set the increment percentage (SLOPE) used in the linear compensation.

The following are examples of the sub-menus shown above.

Menu 3B1

Select the measure unit.

3B1	Mesure_Unit
► ☒ ppm	
☐ mg/l	
01/02	

Menu 3B2

Select the measure name.

3B2	Unit_Name
► ☒ Cl2	
☐ Br	
01/01	

Menu 3B3

Select the temperature compensation of the chemical measure.

OTC= Function disabled

MTC= Temperature compensation with a Manual value

ATC= Temperature compensation with an Automatic value

3B3	Temp. Compensation
▶ ☒ OTC (OFF)	
☐ MTC	
☐ ATC	
01/03	

Menu 3B4

The measure is filtered with arithmetic mean.

- **Low**= arithmetic mean every 4 seconds
- **Medium**= arithmetic mean every 8 seconds
- **High**= arithmetic mean every 16 seconds

3B4	Meas. Filter
▶ ☒ Low	
☐ Medium	
☐ High	
01/03	

Menu 3B5

Set the position of the decimal point for the measure to highlight the decimal value.

Scroll through the menu using the **(+)** or **(-)** key, select the item and confirm with the **Enter** key.

3B5	Decimal Point
▶ ☒ XXXXX,	
☐ XXXX, X	
☐ XXX, XX	
☐ XX, XXX	
☐ X, XXXX	
01/05	

Menu 3B6

Set the compensation method for the measure

- Linear to 25°C
The measure compensation is linear, referred to the temperate of 25°C. The compensation function requires the use of the **linear coefficient** menu 3B7.
- Linear to 20°C
The measure compensation is linear, referred to the temperate of 20°C. The compensation function requires the use of the **linear coefficient** menu 3B7.

3B6	Comp. Type
▶ ☒ Lin25°C	
☐ Lin20°C	
01/02	

Menu 3B7

Select the temperature coefficient according to the solution to be measured

3B7	LIn. Coeff.																				
<table border="1"><tr><td colspan="3">1.00</td><td>%/C</td></tr><tr><td>7</td><td>8</td><td>9</td><td>?</td></tr><tr><td>4</td><td>5</td><td>6</td><td>+/-</td></tr><tr><td>1</td><td>2</td><td>3</td><td>Canc</td></tr><tr><td>0</td><td>.</td><td></td><td>Enter</td></tr></table>		1.00			%/C	7	8	9	?	4	5	6	+/-	1	2	3	Canc	0	.		Enter
1.00			%/C																		
7	8	9	?																		
4	5	6	+/-																		
1	2	3	Canc																		
0	.		Enter																		

7.3 Advanced menu \ Measure B

For more details, see Section 7.2 ADVANCED MENU \ MEASURE A.

Scroll through the menu using the (+) or (-) key, select the item and confirm with the **Enter** key.

3 **Advanced**

A: General Setting
B: Measure A
▶ C: Measure B
D: Temp. Measure
E: Alarm Setting

03/08

7.4 Advanced menu \ temperature measure

Scroll through the menu using the (+) or (-) key, select the item and confirm with the **Enter** key.

Temperature Measure Function

3D1 Selection: PT100 or PT1000 temperature sensor connected or using a manual temperature value.

3D2 Measure Unit: Set Celsius (°C) or Fahrenheit (°F) unit

3D3 Manual Value: Set the temperature value without PT100 or PT1000 temperature sensor.

3D4 Filter: The measure is filtered with arithmetic mean.

- Low= arithmetic mean every 4 seconds
- Medium= arithmetic mean every 8 seconds
- High= arithmetic mean every 16 seconds

3 **Advanced**

A: General Setting
B: Measure A
C: Measure B
▶ D: Temp. Measure
E: Alarm Setting

04/08

3D **Temperature_Measure**

▶ 1: Selection
2: Measure Unit
3: Manual Value
4: Filter

01/04

The following are examples of the sub-menus shown above.

Menu 3D1

Select between manual temperature value function and external temperature measure through PT100 or PT1000 temperature sensor.

3D1 **Temp._Meas._Enabled**

▶ ☒ Manual
☐ External

01/02

Menu 3D2

Select the measure unit.

3D2 **Temp._Meas._Unit**

▶ ☒ °C
☐ °F

01/02

Menu 3D3

Set the temperature value as manual value.

3D3 T_Manual_Value

27.0 °C

7 8 9
4 5 6
1 2 3
0 .

?
+/-
Canc
Enter

Menu 3D4

The measure is filtered with arithmetic mean.

- Low= arithmetic mean every 4 seconds
- Medium= arithmetic mean every 8 seconds
- High= arithmetic mean every 16 seconds

3D4 T_Measure_Filter

► ☒ Low
☐ Medium
☐ High

01/03

7.5 Advanced menu \ alarm setting

Scroll through the menu using the (+) or (-) key, select the item and confirm with the **Enter** key.

Alarm Setting Function

3E1 Reed Logic: Set the sensor logic

- Reed NO (Normally Open)
- Reed NC (Normally Close)

3E2 Reed Delay: Set the delay time for alarm activation to change REED status

3E3 Switch OFF: Enables a visual alarm in case a power supply interruption took place in precedence.

3E4 Block: Enables instrument blocking in case of alarm. The outputs are automatically set on the programmed alarm state.

3E5 Alarm Temp.: Enables a visual alarm or an instrument block in case the temperature probe is broken or disconnected.

3E6 Service: Enable or Disable the Service Required alarm.

3E7 Service Date: Set the day to display a message of **Service Required**.

3 Advanced

► E: Alarm Setting
F: Output Setting
G: Control Panel
H: System Reset

05/08

3E Alarm_Setting

► 1: Reed Logic NO
2: Reed Delay 00'00"
3: Switch OFF YES
4: Block NO
5: Alarm Temp. Notify
6: Service OFF
7: Service Date

01/07

7.6 Advanced menu \ outputs setting

Scroll through the menu using the **(+)** or **(-)** key, select the item and confirm with the **Enter** key.

Output Setting Function

- 3F1 Relay 1: OFF, Temp., Measure A, Measure B
- 3F2 Relay 2: OFF, Temp., Measure A, Measure B
- 3F3 Relay 3: OFF, Temp., Measure A, Measure B, Wash,Alarm
- 3F4 Relay 4: OFF, Temp., Measure A, Measure B, Wash,Alarm
- 3F5 SSR 1: OFF, Temp., Measure A, Measure B
- 3F6 SSR 2: OFF, Temp., Measure A, Measure B
- 3F7 mA 1: OFF, Temp., Measure A, Measure B
- 3F8 mA 2: OFF, Temp., Measure A, Measure B



Note: On the **Setup Menu** it is possible to set the parameters for each selected function.

3

Advanced

E: Alarm Setting

► F: Output Setting

G: Control Panel

H: System Reset

06/08

3F

Outputs Setting

► 1: Relay 1

2: Relay 2

3: Relay 3

4: Relay 4

5: SSR 1

6: SSR 2

7: mA 1

8: mA 2

OFF

OFF

OFF

OFF

OFF

OFF

OFF

OFF

01/08

3F1

Relay_1

► ☒ OFF

☐ Temp.

3F2

Relay_2

► ☒ OFF

☐ Temp.

☐ Measure A

☐ Measure B

01/04

3F3

Relay_3

► ☒ OFF

☐ Temp.

3F4

Relay_4

► ☒ OFF

☐ Temp.

☐ Measure A

☐ Measure B

☐ Alarm

01/05

3F5

SSR_1

► ☒ OFF

☐ Temp.

3F6

SSR_2

► ☒ OFF

☐ Temp.

☐ Measure A

☐ Measure B

01/04

3F7

mA_1

► ☒ OFF

☐ Temp.

3F8

mA_2

► ☒ OFF

☐ Temp.

☐ Measure A

☐ Measure B

01/04

7.7 Advanced menu \ control panel

Menu 3G Control Panel

Scroll through the menu using the (+) or (-) key, select the item and confirm with the **Enter** key.

3G1 Measure A: Displays the unfiltered measure according to the selected measure parameter.

3G2 Measure B: Displays the unfiltered measure according to the selected measure parameter.

3G3 Temp. Measure: Displays the unfiltered measure in °C/°F

3G4 Relay 1 Sim.: Manual closing of the relay contact

3G5 Relay 2 Sim.: Manual closing of the relay contact

3G6 Relay 3 Sim.: Manual closing of the relay contact

3G7 Relay 4 Sim.: Manual closing of the relay contact

3G8 Frequency 1 Sim.: Simulates an output value

3G9 Frequency 2 Sim.: Simulates an output value

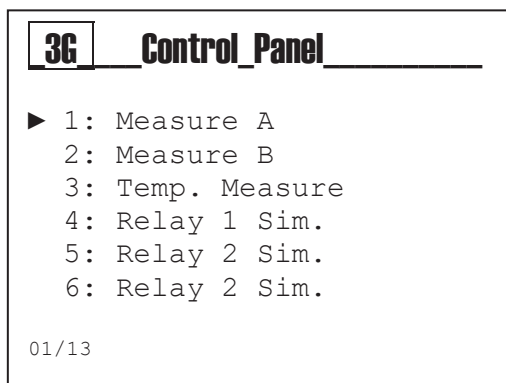
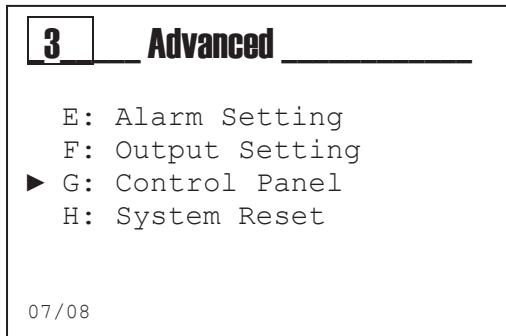
3G10 Out mA 1 Sim.: Simulates an output value

3G11 Out mA 2 Sim.: Simulates an output value

3G12 Input Reed: Displays the Reed Input status



Note: The instrument allows the simultaneously simulation of multiple outputs, all the set values will be cleared on exiting the menu **3G Control Panel**.

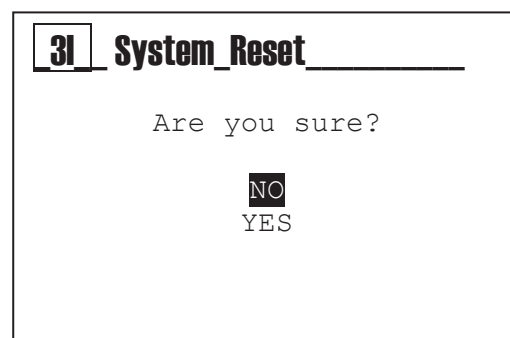
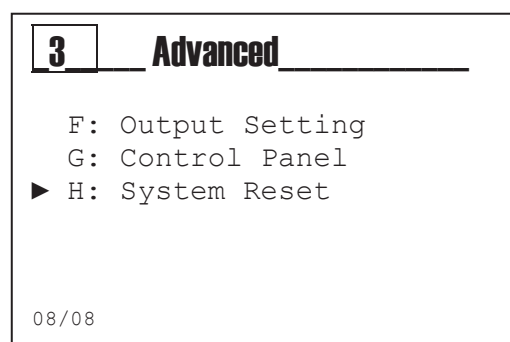


7.8 Advanced menu \ system reset



Menu 3H System Reset

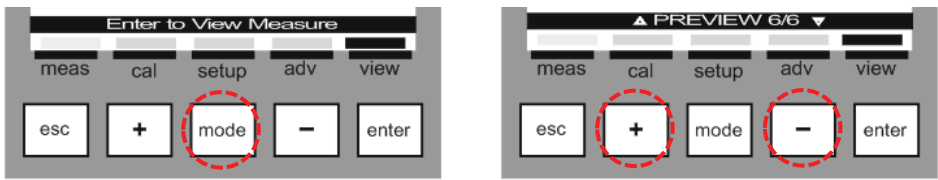
The instrument allows to reset all the parameters and restore the default values.



8 VIEW MENU

Use the **MODE** key to scroll through the icons on the status bar, from left to right, select the **view** menu and confirm with the **Enter** key.

The **Preview Menu** consists of 6 views. Scroll through the menu using the **(+)** or **(-)** key, select the item and confirm with the **Enter** key.



Views Table single parameter (96x96 or 144x144 Version)

Preview 1/6 Standard	Preview 2/6 Complete	Preview 3/6 Two Big Measures
Preview 4/6 One Big Measure	Preview 5/6 Analog	Preview 6/6 Outputs and Inputs Table

Views Table double parameter (96x96 or 144x144 Version)

Preview 1/6
Standard

Preview 2/6
Complete

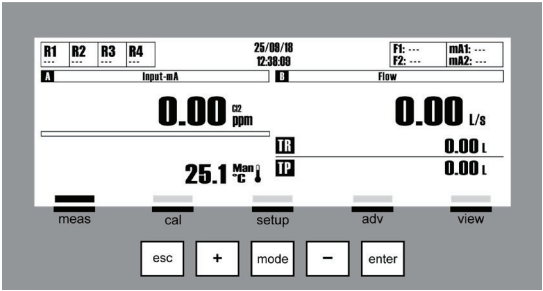
Preview 3/6
Two Big Measures

Preview 4/6
One Big Measure (Slot A)

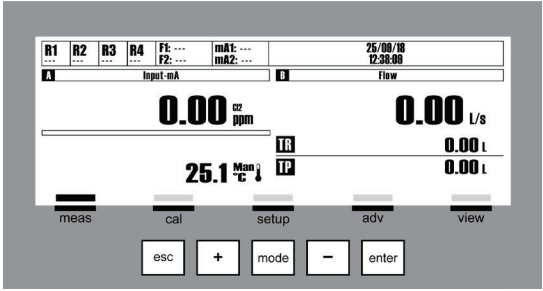
Preview 5/6
One Big Measure (Slot B)

Preview 6/6
Outputs and Inputs Table

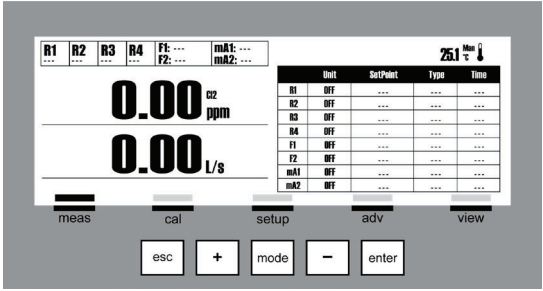
Views Table double parameter (220x144 Version)



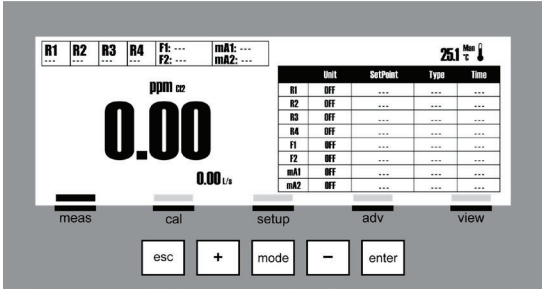
Preview 1/6
Standard



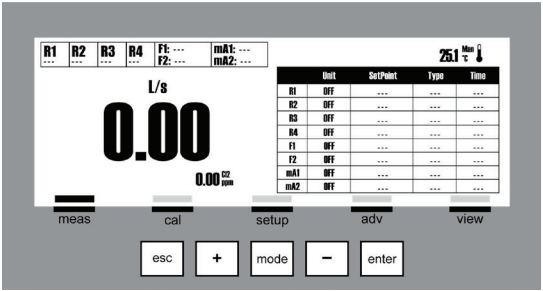
Preview 2/6
Complete



Preview 3/6
Two Big Measures + Table



Preview 4/6
One Big Measure (Slot A) + Table



Preview 5/6
One Big Measure (Slot B) + Table

10 ALARMS TABLE

The table with the alarm messages displayed depends on the selected measure.

Common

Number	Alarm	Message	Status
1	Not Present	No Item	
3	External Reed Input Active	Reed	Alarm with instrument blocking (*)
4	Temperature Sensor Broken or Disconnected	Alarm Fault Temp	Alarm with instrument blocking (*)
6	Registered the absence of Power Supply	Switch OFF	Visual alarm
7	Service Timer Expired	Service	Visual alarm
8	Relay 1 Timer decreased at 70%	OFA1 R1	Preliminary Alarm
9	Relay 2 Timer decreased at 100%	OFA2 R1	Alarm with instrument blocking (*)
10	Chemical Measure outside of working range	Over Range R1	Alarm with instrument blocking (*)
11	Permanent measure to a fixed value	Holding R1	Alarm with instrument blocking (*)
12	Relay 2 Timer decreased at 70%	OFA1 R2	Preliminary Alarm
13	Relay 2 Timer decreased at 100%	OFA2 R2	Alarm with instrument blocking (*)
14	Chemical Measure outside of working range	OverRange R2	Alarm with instrument blocking (*)
15	Permanent measure to a fixed value	Holding R2	Alarm with instrument blocking (*)
16	Measure A and/or Measure B Broken or Disconnected	Measure A/B Error	Alarm with measure fail blocking

Conductivity

Number	Alarm	Message	Status
17	Probe in the Air	Probe in the Air	Alarm with instrument blocking
18	Probe in Short Circuit	Probe in Short C	Alarm with instrument blocking

Input mA

Number	Alarm	Message	Status
17	Output 18V in short	Fault Vout mA	Alarm with instrument blocking
18	Input current higher than 22mA	Over Range Input mA	Alarm with instrument blocking (**)
19	Input current lower than 3.6mA	Under Range Input mA	Alarm with instrument blocking (**)

Flow

Number	Alarm	Message	Status
17	Output 5V in short	Fault 5V	Visual alarm

*All the alarms with blocking function are valid if the Alarm→Block menu item is equal to YES

**The temperature sensor breakage alarm blocks the instrument if the menu item 3E5 is equal to Hold

***The alarm blocks the instrument if the menu items 3E4 and 3E5 are different than OFF.

Note:

- **Backlight:** In case of alarm the instrument turns on the Red backlight.
- **Reset Alarms:** On view Measure (Meas Icon) there is available an Alarm status menu; by pressing the **Enter** key, the **Alarms Menu** will be displayed.

Note: The alarms are stored in memory every 15 minutes, if the instrument is switched off loses alarms displayed in the last 14 minutes.

11 TROUBLESHOOTING

Problem	Possible Cause
The display shows the symbol 	• See Section 7.2.1 for pH/ORP measure • See Section 7.2.2 for conductivity measure • See Section 7.2.3 for Input-mA measure • See Section 7.2.4 for Flow measure
Calibration Errors	• Contaminated buffer solutions (old) • Probe damaged or old • Probe cables damaged • Measure input of the instrument damaged
Data Memory Error	• Internal memory broken
Password Error	• Error value
Temperature Measure Error the display shows 	• Temperature probe broken or disconnected
Chemical Measure Error 	• Sensor not calibrated • Sensor not installed correctly • Temperature compensation incorrectly set or disabled • The sensor or the cable is defective • Electronic measure input damaged • The sensor cable exceeds the maximum length
Measure reading not stable	• Sensors or cables installed too close to devices that generate electrical noise. • Sensor installed on flow with hydraulic turbulence. • Average measure set too low. • Probe cables excessively long
Unable to display the Calibration or Setup menu	• User excluded for safety reasons
The display is turned off	• The instrument does not receive correct power supply. • LCD contrast is not set correctly. • The fuse has blown. • Hardware fault.
The display shows in the upper right corner "Diagnostic"	• Turn the instrument off and then on again; if the problem persists, contact your provider
Probe in Air Alarm (*only for conductivity measure)	• Wiring damaged • Liquid is missing
Probe in Short Circuit Alarm (*only for conductivity measure)	• Wiring damaged • Foreign object in contact with the electrodes
Output 18V in short (*only for Input-mA measure)	• Wiring damaged

12 DEFAULT PARAMETERS TABLE

ADVANCED MENU					
Parameter	Sub-parameter	Default Value	Min Value	Max Value	Unit
Language	---	EN (English)	EN,FR,IT,DE,ES		
Password	SetPassword	0000	0000	9999	
	Cal Menu	NO	NO	YES	
	Setup Menu	NO	NO	YES	
	Reset Totalizers Menu (only for flow measure)	NO	NO	YES	
Set Date	Date and time	---			DD/MM/YY hh:mm
Display	Contrast	0	-25	+35	
	Mode	ECO	OFF, ON, ECO		
	ON	100	10	100	%
	ECO	50	0	50	%
	Reverse	OFF	OFF	ON	
SetPoint		Hist.	Hist, On/Off		
Measure	For details see specific section of each measure.				
Temp. Measure	Selection	Manual	Manual, Pt100/0		
	Unit Meas.	°C	°C	°F	
	Manual	25,0 (77,0)	-50,0 (-58,0)	+150,0 (302,0)	°C (°F)
	Filter	Medium	Low, Medium, High		
Alarm Setting	Reed Logic	NO	NO	NC	
	Reed Delay	OFF	OFF (00':00")	60':59"	min:sec
	Power Supply Down	NO	NO	YES	
	Blocking Alarms	NO	NO	YES	
	Alarm Temperature	Notify	Notify	Hold	
	Service	OFF	OFF	ON	
	Service Date	DD/MM/YY hh:mm	Change Servece Date and Hour		
Outputs Setting	Relay 1	OFF	OFF, Temp. ON/OFF, Temp. Timed, Temp. PWM, Meas ON/OFF, Meas Timed, Meas. PWM		
	Relay 2	OFF	OFF, Temp. ON/OFF, Temp. Timed, Temp. PWM, Meas ON/OFF, Meas Timed, Meas. PWM,		
	Relay 3	OFF	OFF, Temp. ON/OFF, Temp. Timed, Temp. PWM, Meas ON/OFF, Meas Timed, Meas. PWM, Probe Wash, Alarm		
	Relay 4	OFF	OFF, Temp. ON/OFF, Temp. Timed, Temp. PWM, Meas ON/OFF, Meas Timed, Meas. PWM, Probe Wash, Alarm		
	SSR1	OFF	OFF, Temp., Measure (1:N, N:1, Volume, only for FLOW measure)		
	SSR2	OFF			
	mA1	OFF			
	mA2	OFF	OFF, Temp., Measure (PID Off/On)		
Control Panel	Measure ph/ORP	---	-2100	2100	mV
	Measure EC-Cond	---	0	2000	KΩ
	Measure input-mA	---	0	24000	μA
	Measure Flow	---	0	10000	Hz
	Measure Cl-Amp	---	0	500000	uA
	Temp. Measure	---	0	1800	Ω
	Relay 1 Sim.	OFF	OFF	ON	
	Relay 2 Sim.	OFF	OFF	ON	
	Relay 3 Sim.	OFF	OFF	ON	
	Relay 4 Sim.	OFF	OFF	ON	
	Freq. 1 Sim.	0	0	400	Imp/min
	Freq. 2 Sim.	0	0	400	Imp/min
	Out mA 1 Sim.	4,00	3,00	23,00	mA
	Out mA 2 Sim.	4,00	3,00	23,00	mA
	Input REED	---	OFF	ON	
Data Logger	Data Logger	OFF	OFF	ON	
	Period	5 min	1	120	Min
	Mode	Circular	Linear	Circular	
	DataLogs Reset	NO	NO	YES	
System Reset	---	NO	NO	YES	

12.1 Advanced menu default parameters for measures

12.1.1 pH/ORP

ADVANCED MENU					
Parameter	Sub-parameter	Default Value	Min Value	Max Value	Unit
pH / ORP Measure	Meas. Unit	pH	pH, mV		
	Temp. Comp	MTC	MTC, ATC		
	Filter	Medium	Low, Medium, High		

12.1.2 EC-COND

ADVANCED MENU						
Parameter	Sub-parameter 1	Sub-parameter 2	Default Value	Min Value	Max Value	Unit
EC-Cond Measure	Measure Unit		μS	μS, mS, KΩ, MΩ, ppm, ppb		
	Temp. Compensation		OTC	OTC, MTC, ATC		
	Filter		Medium	Low, Medium, High		
	TDS		0,7	0,3	2,0	ppm/μS
	Decimal Point		XXX,XX	XXXXX, / XXXX,X / XXX,XX / XX,XXX / X,XXXX		
	Comp. Type		Lin25°C	Pure H ₂ O, Lin25°C, Lin20°C		
	Lin. Coeff.		2,00	0,01	10,0	%/°C
	Cell Constant	Type	Standard	Standard	Custom	cm ⁻¹
		Standard	1,00	0,01 / 0,10 / 0,20 / 1,00 / 10,0		cm ⁻¹
		Custom	---	0,005	20,000	cm ⁻¹

12.1.3 Input-mA

ADVANCED MENU					
Parameter	Sub-parameter	Default Value	Min Value	Max Value	Unit
Input-mA Measure	Measure Unit	ppm	ppm, ppb, mg/l, mA, Custom, NTU		
	Custom unit	(4 spaces)	up to 4 characters can be edited		
	Unit Name	Cl2	Cl2, PAA, H2O2, O3, Custom, O2, Turb		
	Custom Name	(4 spaces)	up to 4 characters can be edited		
	Filter	Medium	Low, Medium, High		
	Decimal Point	XXX,XX	XXXXX, / XXXX,X / XXX,XX / XX,XXX / X,XXXX		
	Sensor	4-20mA	0-20mA	4-20mA	
	Min	0	-99999	99999	*note1
	Max	99999	-99999	99999	*note1
	Over Range	OFF	OFF	22 mA	
	Under Range	OFF	OFF	3,6 mA	

*note1: ppm, ppb, mg/l, mA, Custom, NTU

12.1.4 Flow

ADVANCED MENU					
Parameter	Sub-parameter	Default Value	Min Value	Max Value	Unit
Flow Measure	Flow Measure Unit	L/s	L/s, L/m, L/h, m ³ /h, GPM		
	Filter	Medium	Low, Medium, High		
	Decimal Point	XXX,XX	XXXXX, / XXXX,X / XXX,XX / XX,XXX / X,XXXX		
	Volume Measure Unit	L	L, Gal, m ³		
	K Factor	1,0000	0,0001	99999	

12.1.5 CL-AMP/Br

ADVANCED MENU					
Parameter	Sub-parameter	Default Value	Min Value	Max Value	Unit
Cl-Amp Measure	Measure Unit	ppm	ppm, mg/l		
	Measure Name	Cl2	Cl2		
	Temp. Compensation	OTC	OTC, MTC, ATC		
	Filter	Medium	Low, Medium, High		
	Decimal Point	XXX,XX	XXXXX, / XXXX,X / XXX,XX / XX,XXX / X,XXXX		
	Comp. Type	Lin25°C	Lin25°C, Lin20°C		
	Lin. Coeff.	1,00	0,01	10,0	%/°C

12.2 Setup menu default parameters

12.2.1 General parameters

SETUP MENU					
Parameter	Sub-parameter	Default Value	Min Value	Max Value	Unit
Relay 1	---	OFF	---	---	
Relay 2	---	OFF	---	---	
Relay 3	---	OFF	---	---	
Relay 4	---	OFF	---	---	
SSR1	---	OFF	---	---	
SSR2	---	OFF	---	---	
mA1	---	OFF	---	---	
mA2	---	OFF	---	---	

SETUP MENU	Temperature Measure Unit: °C					
Parameter	Sub-parameter 1	Sub-parameter 2	Default Value	Min Value	Max Value	Unit
Relay Temp On/Off	SetPoint	---	25,0	-50,0	150,0	°C
	Type	---	Low	Low	High	
	Hyst.	---	0,0	0,0	10,0	°C
	Hyst. Time	---	OFF	OFF (00':00")	2':59"	min:sec
	Delay Start	---	00':01"	OFF (00':00")	60':59"	min:sec
	Delay End	---	00':01"	OFF (00':00")	60':59"	min:sec
	OFA	---	OFF	OFF (00h:00')	23h:59'	hours:min
	Over R.	---	0,0	0,0	150,0	°C
	Persistence	Status	OFF	OFF	ON	
		Range	0,0	-50,0	150,0	°C
	Time	01':00"	OFF (00':00")	60':59"	min:sec	
Relay Temp Timed	Time On	---	00':10"	00':01"	60':59"	min:sec
	Time Off	---	00':10"	00':01"	60':59"	min:sec
Relay Temp PWM	Period	---	02':00"	00':01"	60':59"	min:sec
	PropBand	---	10,0	1,0	50,0	°C

SETUP MENU	Temperature Measure Unit: °F					
Parameter	Sub-parameter 1	Sub-parameter 2	Default Value	Min Value	Max Value	Unit
Relay Temp On/Off	SetPoint	---	77,0	-58,0	302,0	°F
	Type	---	Low	Low	High	
	Hyst.	---	0,0	0,0	18,0	°F
	Hyst. Time	---	OFF	OFF (00':00")	2':59"	min:sec
	Delay Start	---	00':01"	OFF (00':00")	60':59"	min:sec
	Delay End	---	00':01"	OFF (00':00")	60':59"	min:sec
	OFA	---	OFF	OFF (00h:00')	23h:59'	hours:min
	Over R.	---	0,0	0,0	270,0	°F
	Persistence	Status	OFF	OFF	ON	
		Range	0,0	-58,0	302,0	°F
	Time	01':00"	OFF (00':00")	60':59"	min:sec	
Relay Temp Timed	Time On	---	00':10"	00':01"	60':59"	min:sec
	Time Off	---	00':10"	00':01"	60':59"	min:sec
Relay Temp PWM	Period	---	02':00"	00':01"	60':59"	min:sec
	PropBand	---	18,0	1,8	90,0	°F

SETUP MENU	Relay 3 = Probe Washing					
Parameter	Sub-parameter 1	Sub-parameter 2	Default Value	Min Value	Max Value	Unit
Relay 3 Wash	Time	---	OFF	OFF (00':00")	60':59"	min:sec
	Delay	---	01':00"	OFF (00':00")	60':59"	min:sec
	Wait	---	24h:00'	00h:01'	99h:59'	hours:min

SETUP MENU		Relay 4 = Alarm				
Parameter	Sub-parameter 1	Sub-parameter 2	Default Value	Min Value	Max Value	Unit
Relay 4 Alrm	R2 OverRng	---	NO	NO	YES	
	R2 OFA	---	NO	NO	YES	
	R2 Persist.	---	NO	NO	YES	
	REED Alarm	---	NO	NO	YES	
	Temp. Alarm	---	NO	NO	YES	

SETUP MENU		Temperature Measure Unit: °C			
Parameter	Sub-parameter	Default Value	Min Value	Max Value	Unit
SSR	SetPoint	25,0	-50,0	150,0	°C
	Type	Low	Low	High	
	Pulse Max	400	20	400	Imp/min
	Pulse Min	1	1	100	Imp/min
	PropBand	10,0	1,0	50,0	°C

SETUP MENU		Temperature Measure Unit: °F			
Parameter	Sub-parameter	Default Value	Min Value	Max Value	Unit
SSR	SetPoint	77,0	-58,0	302,0	°F
	Type	Low	Low	High	
	Pulse Max	400	20	400	Imp/min
	Pulse Min	1	1	100	Imp/min
	PropBand	18,0	1,8	90,0	°F

SETUP MENU		Temperature Measure Unit: °C			
Parameter	Sub-parameter	Default Value	Min Value	Max Value	Unit
mA [PID OFF]	Start	-50,0	-50,0	150,0	°C
	End	150,0	-50,0	150,0	°C
	Keep	NO	NO	YES	
	Namur Alr	OFF	OFF, 3,6mA, 22 mA		

SETUP MENU		Temperature Measure Unit: °C			
Parameter	Sub-parameter	Default Value	Min Value	Max Value	Unit
mA [PID ON]	Setpoint	25,0	-50,0	150,0	°C
	Type	Low	Low	High	
	Algorithm	PI	P, PI, PID		
	PropBand	100	1	500	%
	Integ. Time	01':00"	00':01"	05':59"	min:sec
	Deriv. Time	OFF	OFF (00':00")	05':59"	min:sec

SETUP MENU		Temperature Measure Unit: °F			
Parameter	Sub-parameter	Default Value	Min Value	Max Value	Unit
mA [PID OFF]	Start	-58,0	-58,0	302,0	°F
	End	302,0	-58,0	302,0	°F
	Keep	NO	NO	YES	
	Namur Alr	OFF	OFF, 3,6mA, 22 mA		

SETUP MENU		Temperature Measure Unit: °F			
Parameter	Sub-parameter	Default Value	Min Value	Max Value	Unit
mA [PID ON]	Setpoint	77,0	-58,0	302,0	°F
	Type	Low	Low	High	
	Algorithm	PI	P, PI, PID		
	PropBand	100	1	500	%
	Integ. Time	01':00"	00':01"	05':59"	min:sec
	Deriv. Time	OFF	OFF (00':00")	05':59"	min:sec

12.2.2 pH and ORP parameters

SETUP MENU		Chemical Measure Unit: pH				
Parameter	Sub-parameter 1	Sub-parameter 2	Default Value	Min Value	Max Value	Unit
Relay On/Off	SetPoint	---	7,40	0,00	14,00	pH
	Type	---	High	Low	High	
	Hyst.	---	0,00	0,00	2,00	pH
	Hyst. Time	---	OFF	OFF (00':00")	2':59"	min:sec
	Delay Start	---	00':01"	OFF (00':00")	60':59"	min:sec
	Delay End	---	00':01"	OFF (00':00")	60':59"	min:sec
	OFA	---	OFF	OFF (00h:00')	23h:59'	ore:min
	Over R.	---	0,00	0,00	14,00	pH
	Persistence	Status	OFF	OFF	ON	
Relay Timed		Range	0,00	0,00	14,00	pH
		Time	01':00"	OFF (00':00")	60':59"	min:sec
	Time On	---	00':10"	00':01"	60':59"	min:sec
Relay PWM	Time Off	---	00':10"	00':01"	60':59"	min:sec
	Period	---	02':00"	00':01"	60':59"	min:sec
	PropBand	---	0,20	0,20	3,00	pH

SETUP MENU		Chemical Measure Unit: mV				
Parameter	Sub-parameter 1	Sub-parameter 2	Default Value	Min Value	Max Value	Unit
Relay mV On/Off	SetPoint	---	750	-2000	2000	mV
	Type	---	High	Low	High	
	Hyst.	---	0	0	200	mV
	Hyst. Time	---	OFF	OFF (00':00")	2':59"	min:sec
	Delay Start	---	00':01"	OFF (00':00")	60':59"	min:sec
	Delay End	---	00':01"	OFF (00':00")	60':59"	min:sec
	OFA	---	OFF	OFF (00h:00')	23h:59'	ore:min
	Over R.	---	0	-2000	2000	mV
	Persistence	Status	OFF	OFF	ON	
Relay mV Timed		Range	0	OFF (0)	2000	mV
		Time	01':00"	OFF (00':00")	60':59"	min:sec
	Time On	---	00':10"	00':01"	60':59"	min:sec
Relay mV PWM	Time Off	---	00':10"	00':01"	60':59"	min:sec
	Period	---	02':00"	00':01"	60':59"	min:sec
	PropBand	---	20	20	300	mV

SETUP MENU		Chemical Measure Unit: pH			
Parameter	Sub-parameter	Default Value	Min Value	Max Value	Unit
SSR pH	SetPoint	7,40	0,00	14,00	pH
	Type	High	Low	High	
	Pulse Max	400	20	400	Imp/min
	Pulse Min	1	1	100	Imp/min
	PropBand	0,20	0,20	3,00	pH

SETUP MENU		Chemical Measure Unit: mV			
Parameter	Sub-parameter	Default Value	Min Value	Max Value	Unit
SSR mV	SetPoint	750	-2000	2000	mV
	Type	High	Low	High	
	Pulse Max	400	20	400	Imp/min
	Pulse Min	1	1	100	Imp/min
	PropBand	20	20	300	mV

SETUP MENU		Chemical Measure Unit: pH			
Parameter	Sub-parameter	Default Value	Min Value	Max Value	Unit
mA [PID OFF]	Start	0,00	0,00	14,00	pH
	End	14,00	0,00	14,00	pH
	Keep	NO	NO	YES	
	Namur Alr	OFF	OFF, 3,6mA, 22 mA		

SETUP MENU		Chemical Measure Unit: pH			
Parameter	Sub-parameter	Default Value	Min Value	Max Value	Unit
mA [PID ON]	SetPoint	7,40	0,00	14,00	pH
	Type	High	Low	High	
	Algorithm	PI	P, PI, PID		
	PropBand	100	1	500	%
	Integ. Time	01':00"	00':01"	05':59"	min:sec
	Deriv. Time	OFF	OFF (00':00")	05':59"	min:sec

SETUP MENU		Chemical Measure Unit: mV			
Parameter	Sub-parameter	Default Value	Min Value	Max Value	Unit
mA [PID OFF]	Start	-2000	-2000	2000	mV
	End	2000	-2000	2000	mV
	Keep	NO	NO	YES	
	Namur Alr	OFF	OFF, 3,6mA, 22 mA		

SETUP MENU		Chemical Measure Unit: mV			
Parameter	Sub-parameter	Default Value	Min Value	Max Value	Unit
mA [PID ON]	SetPoint	750	-2000	2000	mV
	Type	High	Low	High	
	Algorithm	PI	P, PI, PID		
	PropBand	100	1	500	%
	Integ. Time	01':00"	00':01"	05':59"	min:sec
	Deriv. Time	OFF	OFF (00':00")	05':59"	min:sec

12.2.3 Conductivity parameters

SETUP MENU		Chemical Measure Unit: μ S, mS, K Ω , M Ω , ppm, ppb				
Parameter	Sub-parameter 1	Sub-parameter 2	Default Value	Min Value	Max Value	Unit
Relay On/Off	SetPoint	---	0	0,0000	99999	*note1
	Type	---	Low	Low	High	
	Hyst.	---	0	0,0000	99999	*note1
	Hyst. Time	---	OFF	OFF (00':00")	2':59"	min:sec
	Delay Start	---	00':01"	OFF (00':00")	60':59"	min:sec
	Delay End	---	00':01"	OFF (00':00")	60':59"	min:sec
	OFA	---	OFF	OFF (00h:00')	23h:59'	hours:min
	Over R.	---	0	0,0000	99999	*note1
	Persistence	Status	OFF	OFF	ON	
Relay Timed		Range	0	0,0000	99999	*note1
		Time	01':00"	OFF (00':00")	60':59"	min:sec
	Time On	---	00':10"	00':01"	60':59"	min:sec
Relay PWM	Time Off	---	00':10"	00':01"	60':59"	min:sec
	Period	---	02':00"	00':01"	60':59"	min:sec
	PropBand	---	0	0,0000	99999	*note1

*note1: μ S, mS, K Ω , M Ω , ppm, ppb

SETUP MENU		Chemical Measure Unit: μ S, mS, K Ω , M Ω , ppm, ppb			
Parameter	Sub-parameter	Default Value	Min Value	Max Value	Unit
SSR	SetPoint	0	0,0000	99999	*note1
	Type	Low	Low	High	
	Pulse Max	400	20	400	Imp/min
	Pulse Min	1	1	100	Imp/min
	PropBand	0	0,0000	99999	*note1

*note1: μ S, mS, K Ω , M Ω , ppm, ppb

SETUP MENU		Chemical Measure Unit: μ S, mS, K Ω , M Ω , ppm, ppb			
Parameter	Sub-parameter	Default Value	Min Value	Max Value	Unit
mA [PID OFF]	Start	0	0,0000	99999	*note1
	End	99999	0,0000	99999	*note1
	Keep	NO	NO	YES	
	Namur Alr	OFF	OFF, 3,6mA, 22 mA		

*note1: μ S, mS, K Ω , M Ω , ppm, ppb

SETUP MENU		Chemical Measure Unit: μ S, mS, K Ω , M Ω , ppm, ppb			
Parameter	Sub-parameter	Default Value	Min Value	Max Value	Unit
mA [PID ON]	SetPoint	0	0,0000	99999	*note
	Type	High	Low	High	
	Algorithm	PI	P, PI, PID		
	PropBand	100	1	500	%
	Integ. Time	01':00"	00':01"	05':59"	min:sec
	Deriv. Time	OFF	OFF (00':00")	05':59"	min:sec

*note1: μ S, mS, K Ω , M Ω , ppm, ppb

12.2.4 Input mA parameters

Measure Unit: ppm, ppb, mg/l, mA, Custom, NTU						
Parameter	Sub-parameter 1	Sub-parameter 2	Default Value	Min Value	Max Value	Unit
Relay ON/OFF	SetPoint	---	0	-99999	99999	*note1
	Type	---	Low	Low	High	
	Hyst.	---	0	0,0000	99999	*note1
	Hyst. Time	---	OFF	OFF (00':00")	2':59"	min:sec
	Delay Start	---	00':01"	OFF (00':00")	60':59"	min:sec
	Delay End	---	00':01"	OFF (00':00")	60':59"	min:sec
	OFA	---	OFF	OFF (00h:00')	23h:59'	hours:min
	Over R.	---	0	0,0000	99999	*note1
	Persistence	Status	OFF	OFF	ON	
Relay TIMED		Range	0	-99999	99999	*note1
		Time	01':00"	OFF (00':00")	60':59"	min:sec
	Time On	---	00':10"	00':01"	60':59"	min:sec
Relay PWM	Time Off	---	00':10"	00':01"	60':59"	min:sec
	Period	---	02':00"	00':01"	60':59"	min:sec
	PropBand	---	0	0,0000	99999	*note1

*note1: ppm, ppb, mg/l, mA, Custom, NTU

Measure Unit: ppm, ppb, mg/l, mA, Custom, NTU						
Parameter	Sub-parameter	Default Value	Min Value	Max Value	Unit	
SSR	SetPoint	0	-99999	99999	*note1	
	Type	Low	Low	High		
	Pulse Max	400	20	400	Imp/min	
	Pulse Min	1	1	100	Imp/min	
	PropBand	0	0,0000	99999	*note1	

*note1: ppm, ppb, mg/l, mA, Custom, NTU

Measure Unit: ppm, ppb, mg/l, mA, Custom, NTU						
Parameter	Sub-parameter	Default Value	Min Value	Max Value	Unit	
mA [PID OFF]	Start	0	-99999	99999	*note1	
	End	99999	-99999	99999	*note1	
	Keep	NO	NO	YES		
	Namur Alr	OFF	OFF, 3,6mA, 22 mA			

*note1: ppm, ppb, mg/l, mA, Custom, NTU

Measure Unit: ppm, ppb, mg/l, mA, Custom, NTU						
Parameter	Sub-parameter	Default Value	Min Value	Max Value	Unit	
mA [PID ON]	SetPoint	0	-99999	99999	*note1	
	Type	High	Low	High		
	Algorithm	PI	P, PI, PID			
	PropBand	100	1	500	%	
	Integ. Time	01':00"	00':01"	05':59"	min:sec	
	Deriv. Time	OFF	OFF (00':00")	05':59"	min:sec	

*note1: ppm, ppb, mg/l, mA, Custom, NTU

12.2.5 Flow parameters

SETUP MENU		Flow Measure Unit: L/s, L/m, L/h, m³/h, GPM				
Parameter	Sub-parameter 1	Sub-parameter 2	Default Value	Min Value	Max Value	Unit
Relay On/Off	SetPoint		0	0,0000	99999	*note
	Type		Low	Low	High	
	Hyst.		0	0,0000	99999	*note
	Hyst. Time		OFF	OFF (00':00")	2':59"	min:sec
	Delay Start	---	00':01"	OFF (00':00")	60':59"	min:sec
	Delay End	---	00':01"	OFF (00':00")	60':59"	min:sec
	OFA	---	OFF	OFF (00h:00')	23h:59'	hours:min
	Over R.	---	0	0,0	99999	*note
	Persistence	Status	OFF	OFF	ON	
Relay Timed		Range	0	0,0	99999	*note
		Time	01':00"	OFF (00':00")	60':59"	min:sec
	Time On		00':10"	00':01"	60':59"	min:sec
Relay PWM	Time Off		00':10"	00':01"	60':59"	min:sec
	Period		02':00"	00':01"	60':59"	min:sec
	PropBand		0	0,0000	99999	*note

*note: L/s, L/m, L/h, m³/h, GPM

SETUP MENU	Flow Measure Unit: L/s, L/m, L/h, m³/h, GPM				
Parameter	Sub-parameter	Default Value	Min Value	Max Value	Unit
SSR 1:N	N Factor	1	1	9999	
	Memory	ON	OFF	ON	
SSR N:1	N Factor	1	1	9999	
	Memory	ON	OFF	ON	
SSR Volume	Set Volume	0	0,0000	99999	*note
	Width	0,1	0,1	9999,9	sec

*note: L/s, L/m, L/h, m³/h, GPM

SETUP MENU		Flow Measure Unit: L/s, L/m, L/h, m³/h, GPM			
Parameter	Sub-parameter	Default Value	Min Value	Max Value	Unit
mA [PID OFF]	Start	0	0,0000	99999	*note
	End	99999	0,0000	99999	*note
	Keep	NO	NO	YES	
	Namur Alr	OFF	OFF, 3,6mA, 22 mA		

*note: L/s, L/m, L/h, m³/h, GPM

SETUP MENU		Flow Measure Unit: L/s, L/m, L/h, m³/h, GPM; PID: On			
Parameter	Sub-parameter	Default Value	Min Value	Max Value	Unit
mA [PID ON]	SetPoint	0	-99999	99999	*note
	Type	High	Low	High	
	Algorithm	PI	P, PI, PID		
	PropBand	100	1	500	%
	Integ. Time	01':00"	00':01"	05':59"	min:sec
	Deriv. Time	OFF	OFF (00':00")	05':59"	min:sec

*note: L/s, L/m, L/h, m³/h, GPM

12.2.6 CL-AMP/Br parameters

Measure Unit: ppm, mg/l						
Parameter	Sub-parameter 1	Sub-parameter 2	Default Value	Min Value	Max Value	Unit
Relay ON/OFF	SetPoint	---	0	0	99999	*note1
	Type	---	Low	Low	High	
	Hyst.	---	0	0,0000	99999	*note1
	Hyst. Time	---	OFF	OFF (00':00")	2':59"	min:sec
	Delay Start	---	00':01"	OFF (00':00")	60':59"	min:sec
	Delay End	---	00':01"	OFF (00':00")	60':59"	min:sec
	OFA	---	OFF	OFF (00h:00')	23h:59'	hours:min
	Over R.	---	0	0,0000	99999	*note1
	Persistence	Status	OFF	OFF	ON	
		Range	0	0	99999	*note1
		Time	01':00"	OFF (00':00")	60':59"	min:sec
Relay TIMED	Time On	---	00':10"	00':01"	60':59"	min:sec
	Time Off	---	00':10"	00':01"	60':59"	min:sec
Relay PWM	Period	---	02':00"	00':01"	60':59"	min:sec
	PropBand	---	0	0,0000	99999	*note1

*note1: ppm, mg/l

Measure Unit: ppm, mg/l					
Parameter	Sub-parameter	Default Value	Min Value	Max Value	Unit
SSR	SetPoint	0	0	99999	*note1
	Type	Low	Low	High	
	Pulse Max	400	20	400	Imp/min
	Pulse Min	1	1	100	Imp/min
	PropBand	0	0,0000	99999	*note1

*note1: ppm, mg/l

Measure Unit: ppm, mg/l					
Parameter	Sub-parameter	Default Value	Min Value	Max Value	Unit
mA [PID OFF]	Start	0	0	99999	*note1
	End	99999	0	99999	*note1
	Keep	NO	NO	YES	
	Namur Alr	OFF	OFF, 3,6mA, 22 mA		

*note1: ppm, mg/l

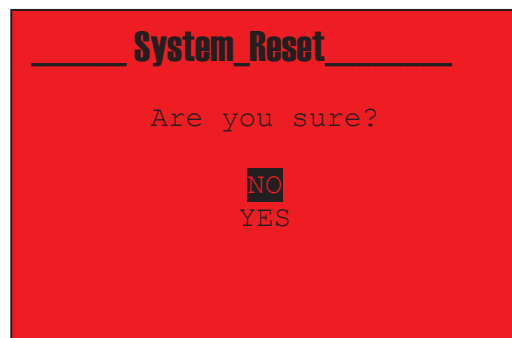
Measure Unit: ppm, mg/l					
Parameter	Sub-parameter	Default Value	Min Value	Max Value	Unit
mA [PID ON]	SetPoint	0	0	99999	*note1
	Type	High	Low	High	
	Algorithm	PI	P, PI, PID		
	PropBand	100	1	500	%
	Integ. Time	01':00"	00':01"	05':59"	min:sec
	Deriv. Time	OFF	OFF (00':00")	05':59"	min:sec

*note1: ppm, mg/l

12.3 Reset the instrument to default parameters

To load all the default parameters of the instrument and also remove the password, proceed as follows:

- A) Disconnect the instrument from the power supply
- B) Press and hold simultaneously **Down** and **Enter** and power the instrument.
- C) At startup the instrument will execute a hidden menu
- D) Will be displayed the following message (picture on the A) Side)
- B) Select “YES” to perform the **RESET TO DEFAULT**.
- C) The instrument turns on and performs the **STARTUP** function.



13 GENERAL SPECIFICATION

13.1 Measure specifications

pH/ORP Specifications	
Range pH	0.00 to 14.00 pH
Range mV	–2000 to 2000 mV
Resolution pH	0.01 pH
Accuracy pH	± 0.01 pH
Resolution mV	1 mV
Accuracy mV	± 1 mV
Input Impedance	> 10 ¹²
Insulation	Functional
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 0.05 sensor	10 µS/cm to 400 mS/cm (2,5 Ω x cm to 100 KΩ x cm)
Resolution Cond/Res	0.0001 / 0.001 / 0.01 / 0.1 / 1 (adjustable from menu)
Accuracy Cond/Res	± 2% on the measuring point
Maximum distance of the sensor	up to 50 m (up to 164 ft)
TDS Range	0.3 to 2.0 ppm/µS
Insulation	Functional
mA Input Specifications	
Sensor type	Sensor with two or three wires
Sensor power supply 4/20mA 2 wires	(*)18Vdc ±5%, max 30mA
Short circuit protection	Active
Measure Range	from 0 to 20 mA or from 4 to 20 mA
Error Condition	OFF, 3.6 mA, 22 mA
Resolution	1 µA
Accuracy	± 0,2 %
Isolation	Functional
Flow Measure Specifications	
Input frequency range	from 0.5 Hz to 1500 Hz
Sensor Type	Hall Effect, Reed Contact or Push-Pull
Resolution	0.0001 / 0.001 / 0.01 / 0.1 / 1 (adjustable from menu)
Sensor Maximum Distance	up to 300 m (up to 984 ft)
Insulation	Functional
Amperometric Chlorine Measure Specifications	
Sensor type	Amperometric Probe
Measure Range	from 0 to 5 ppm
Resolution	± 0.01 ppm
Accuracy	± 0.10 ppm
Isolation	Functional

** DO NOT exceed the maximum allowable current limit, RISK of damaging the apparatus

Pt100/ Pt1000 Specifications	
Temperature Input	Pt100/Pt1000
Pt100/Pt1000 Detection	Automatic
Error Condition	Automatic detection of disconnected/damaged probe
Driving Current	1 mA
Temperature Measure Range	–50.0 to 150.0 °C (–58.0 to 302.0 °F)
Sensor Maximum Distance	10 to 20 m (33 to 65 ft) depending on sensor
Temperature Resolution	0.1°C (°F)
Temperature Accuracy	Pt100: ± 0.5°C (± 0.9 °F) - Pt1000: ± 0.2°C (± 0.4 °F)
Insulation	Functional

13.2 Mechanical specifications for version 96x96 (Panel)

Dimensions (chassis – W x H x D)*	92 x 92 x 100 mm (3.62 x 3.62 x 3.94 in)
Front Bezel – (W x H)	96 x 96 mm (3.78 x 3.78 in)
Max. Depth	83 mm (3.27 in)
Weight	610 g (1.34 lb)
Material	ABS/polycarbonate
Protection	IP 65 (front)/IP 20 (chassis)
Relative Humidity	0 to 95% non-condensing

* W = Width, H = Height, D = Depth

13.3 Mechanical specifications for version 144x144 (Wall)

Dimensions (chassis – W x H x D)*	144 x 144 x 122.5 mm (5.67 x 5.67 x 4.82 in)
Front Bezel – (W x H)	144 x 144 mm (5.67 x 5.67 in)
Weight	1.05 Kg (2.31 lb)
Material	ABS/polycarbonate
Protection	IP 65
Relative Humidity	0 to 100% condensing

* W = Width, H = Height, D = Depth

13.4 Mechanical specifications for version 220x144 (Panel)

Dimensions (chassis – W x H x D)*	220 x 144 x 100 mm (8.66 x 5.67 x 3.93 in)
Front Bezel – (W x H)	220 x 144 mm (8.66 x 5.67 in)
Weight	920 g (2.02 lb)
Material	ABS/polycarbonate
Protection	IP 65
Relative Humidity	0 to 100% condensing

* W = Width, H = Height, D = Depth

13.5 Mechanical specifications for version 220x144 (Wall)

Dimensions (chassis – W x H x D)*	220 x 144 x 122.5 mm (8.66 x 5.67 x 4.82 in)
Front Bezel – (W x H)	220 x 144 mm (8.66 x 5.67 in)
Weight	1.36 Kg (3.00 lb)
Material	ABS/polycarbonate
Protection	IP 65
Relative Humidity	0 to 100% condensing

* W = Width, H = Height, D = Depth

13.6 Environmental specifications for all version

Storage Temperature	– 25 to 65 °C (– 13 to 149 °F)
Environmental temperature range of operation	–10 to 50 °C (14 to 122 °F)
Emissions	According to EN55011 Class A specifications

13.7 Electrical specifications

Power Supply (version 100÷240 Vac)	
Electrical requirements	from 100 to 240 VAC $\pm 10\%$, 8 W ^(note 1)
Frequency	50 to 60 Hz
Power Supply Fuse	Fuse Glass Body 5x20mm T1.25AL250V
Short Circuit Protection	Active
Power Supply (version 24÷48 Vdc)	
Electrical requirements	from 24 to 48 Vdc, or 24Vac $\pm 20\%$, 8 W ^(note 1)
Power Supply Fuse	Fuse Glass Body 5x20mm T1.25AL250V
Short Circuit Protection	Active
Reverse Polarity Protection	Active
Relay Outputs	
RL1, RL2, RL3 and RL4	2-SPST mechanical 250 VAC/5A, 30 VCC/3 A
Relay RL1, RL2 Configuration	Load Activation
Relay RL3, RL4 Configuration	Load Activation, Probe Wash, Alarm Repetition
Cycle time	1sec to 3600sec
Delay time	1sec to 3600sec
Test Mode	ON, OFF
SSR Outputs (Solid State Relays)	
SSR1 and SSR2	2-SPST 60 V, max 100 mA, Bidirectional, NPN, PNP
Resistance in ON State	5 ohm max
Leakage Current in OFF State	1 uA max
SSR1 and SSR2 Configuration	Pulse output
Frequency Range	0 to 400 imp/min
Pulse Duration	100 msec
Test Mode	0 to 400 imp/min
Outputs 4÷20 mA	
Analog Output Signals	2 outputs 4÷20 mA, galvanically isolated from one another and from the power supply.
Measure Error	$\pm 0,01$ mA
Load	max. 800 Ω
Error Condition	NAMUR: OFF, 3.6 mA, 22 mA
Test Mode	3 to 23 mA
Digital Inputs	
REED Digital Input	Input for dry contact 5 Vdc, max 6 mA
Output 24 Vdc	
Voltage	^(note 2) 24 V CC $\pm 5\%$, max. 250 mA
Short Circuit Protection	Self-Resettable fuse
User Interface	
Connection Terminals	Removable screw terminals AWG 14 < 2.5 mm ²
Machine Cycle Time	ca. 1 s
Keyboard	5 tactile feedback keys
Display	Graphic LCD 128x128 or 240x128 pixels, FSTN, Transflective
Display Refresh	500 msec
Backlight	White, Green and Red with energy saving function

^(note 1) Only Instrument: 8W; Instrument + 1 Digital probe: 10,5W; Instrument + 2 Digital probes: 13,5W;

^(note 2) DO NOT exceed the maximum allowable current limit, RISK of damaging the apparatus

14 MODBUS PROFILE

14.1 Alarms Status Register

Address	Read Command	Type of Register	Description	Min	Max	Type of Data
1000	Read Input Register [Function 04]	Alarms Status Register	5V Fault	0	1	Unsigned 16bit
1001			Reed Status	0	1	Unsigned 16bit
1002			Service	0	1	Unsigned 16bit
1003			Power Line Interruption	0	1	Unsigned 16bit
1004			Temp Probe Fault	0	1	Unsigned 16bit
1005			Relay 1 Over Range	0	1	Unsigned 16bit
1006			Relay 2 Over Range	0	1	Unsigned 16bit
1007			Relay 3 Over Range	0	1	Unsigned 16bit
1008			Relay 4 Over Range	0	1	Unsigned 16bit
1009			Relay 1 OFA 1	0	1	Unsigned 16bit
1010			Relay 2 OFA 1	0	1	Unsigned 16bit
1011			Relay 3 OFA 1	0	1	Unsigned 16bit
1012			Relay 4 OFA 1	0	1	Unsigned 16bit
1013			Relay 1 OFA 2	0	1	Unsigned 16bit
1014			Relay 2 OFA 2	0	1	Unsigned 16bit
1015			Relay 3 OFA 2	0	1	Unsigned 16bit
1016			Relay 4 OFA 2	0	1	Unsigned 16bit
1017			Relay 1 Holding Alarm	0	1	Unsigned 16bit
1018			Relay 2 Holding Alarm	0	1	Unsigned 16bit
1019			Relay 3 Holding Alarm	0	1	Unsigned 16bit
1020			Relay 4 Holding Alarm	0	1	Unsigned 16bit
1099			Logic OR of all Alarms	0	1	Unsigned 16bit

14.2 Output Registers

Address	Read Command	Type of Register	Description					
1100	Read Input Register [Function 04]	Output Register	Status RELAY 1	Value	Description	Type of Data		
				0	OFF	Unsigned 16bit		
				1	ON			
1101			Status RELAY 2	Value	Description	Type of Data		
				0	OFF	Unsigned 16bit		
				1	ON			
1102			Status RELAY 3	Value	Description	Type of Data		
				0	OFF	Unsigned 16bit		
				1	ON			
1103			Status RELAY 4	Value	Description	Type of Data		
				0	OFF	Unsigned 16bit		
				1	ON			
1104			Status SSR 1	Range		Type of Data		Note
				min	max	Unsigned 16bit		Pulse/minute
				0	400			
1105			Status SSR 2	Range		Type of Data		Note
				min	max	Unsigned 16bit		Pulse/minute
				0	400			
1106			Status mA 1	Range		Type of Data		Note
				min	max	Unsigned 16bit		Decimal = 2
				360(mA)	2200(mA)			
1107			Status mA 2	Range		Type of Data		Note
				min	max	Unsigned 16bit		Decimal = 2
				360(mA)	2200(mA)			

14.3 Input Module Type

Address SLOT A	Address SLOT B	Read Command	Type of Register	Description	Value	Module Type	Type of Data
1500	2000	Read Input Register [Function 04]	Measure	Module Type	0	NONE	Unsigned 16bit
					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	

14.4 Temperature Input Measure

Address	Read Command	Type of Register	Description	Min	Max	Type of Data	Note
1108	Read Input Register [Function 04]	Temperature Measure	Temp Measure Unit	0(°C)	1(°F)	Unsigned 16bit	
1109			Temp Measure	-500(°C) -580(°F)	1500(°C) 3020(°F)	Signed 16bit	Decimal = 1

14.5 pH/ORP Input Measure

Address SLOT A	Address SLOT B	Read Command	Type of Register	Description	Value	Unit	Type of Data
1501	2001	Read Input Register [Function 04]	Measure	Unit Measure	0	pH	Unsigned 16bit
					1	mV	
Address SLOT A	Address SLOT B	Read Command	Type of Register	Description	min	max	Type of Data
1502	2002	Read Input Register [Function 04]	Measure	Main Measure L	0(pH)	1400(pH)	Signed 32bit
1503	2003			Main Measure H	-2000(mV)	+2000(mV)	
1504	2004			Decimal Main Measure	0	4	Unsigned 16bit
1505	2005		Calibrations	Calibration Type	0(None) 1(One Point) 2(Two Points)		Unsigned 16bit
1506	2006			Point 1 L	-99999	99999	Signed 32bit
1507	2007			Point 1 H			
1508	2008			Decimal Point 1	0	4	Unsigned 16bit
1509	2009			Point 2 L	-99999	99999	Signed 32bit
1510	2010			Point 2 H			
1511	2011			Decimal Point 2	0	4	Unsigned 16bit
1512	2012			Gain L	0	99999	Unsigned 32bit
1513	2013			Gain H			
1514	2014			Decimal Gain	0	4	Unsigned 16bit
1515	2015			Offset L	-99999	99999	Signed 32bit
1516	2016			Offset H			
1517	2017			Decimal Offset	0	4	Unsigned 16bit
1518	2018			Adjust L	-99999	99999	Signed 32bit
1519	2019			Adjust H			
1520	2020			Decimal Adjust	0	4	Unsigned 16bit
1521	2021			Day Calibration	1	31	Unsigned 16bit
1522	2022			Month Calibration	1	12	Unsigned 16bit
1523	2023			Year Calibration	0	99	Unsigned 16bit
1524	2024		Advanced	Temp. Compensation	0(MTC) 1(ATC)		Unsigned 16bit
1525	2025			Filter	0(Low) 1(Medium) 2(High)		Unsigned 16bit

14.6 EC-COND Input Measure

Address SLOT A	Address SLOT B	Read Command	Type of Register	Description	Value	Unit	Type of Data	Note	
1501	2001	Read Input Register [Function 04]	Measure	Unit Measure	0	uS	Unsigned 16bit		
					1	mS			
					2	kOhm			
					3	Mohm			
					4	ppm			
					5	ppb			
Address SLOT A	Address SLOT B	Read Command	Type of Register	Description	min	max	Type of Data		
1502	2002	Read Input Register [Function 04]	Measure	Main Measure L	0	99999	Signed 32bit		
1503	2003			Main Measure H					
1504	2004			Decimal Main Measure	0	4	Unsigned 16bit		
1505	2005		Calibrations	Calibration Type	0(None) 1(One Point) 2(Two Points)		Unsigned 16bit		
1506	2006			Point 1 L	0	99999	Signed 32bit		
1507	2007			Point 1 H					
1508	2008			Decimal Point 1	0	4	Unsigned 16bit		
1509	2009			Point 2 L	0	99999	Signed 32bit		
1510	2010			Point 2 H					
1511	2011			Decimal Point 2	0	4	Unsigned 16bit		
1512	2012			Gain L	0	99999	Unsigned 32bit		
1513	2013			Gain H					
1514	2014			Decimal Gain	0	4	Unsigned 16bit		
1515	2015			Offset L	-99999	99999	Signed 32bit		
1516	2016			Offest H					
1517	2017			Decimal Offset	0	4	Unsigned 16bit		
1518	2018			Adjust L	-99999	99999	Signed 32bit		
1519	2019			Adjust H					
1520	2020			Decimal Adjust	0	4	Unsigned 16bit		
1521	2021			Day Calibration	1	31	Unsigned 16bit		
1522	2022			Month Calibration	1	12	Unsigned 16bit		
1523	2023			Year Calibration	0	99	Unsigned 16bit		
1524	2024			Advanced	Temp. Compensation	0(OTC) 1(MTC) 2(ATC)			Unsigned 16bit
1525	2025		Filter		0(Low) 1(Medium) 2(High)		Unsigned 16bit		
1526	2026		TDS		3	20	Unsigned 16bit	ppm/μS Decimal = 1	
1527	2027		Compensation Type		0(Pure H2O) 1(Lin25°C) 2(Lin20°C)		Unsigned 16bit	% / °C Decimal = 2	
1528	2028		Linear Coefficient		1	1000	Unsigned 16bit		
1529	2029		Cell Constant type		0(Standard) 1(Custom)		Unsigned 16bit		
1530	2030		Cell Costant Standard		0 (0,01 cm-1) 1 (0,10 cm-1) 2 (0,20 cm-1) 3 (1,00 cm-1) 4 (10,0 cm-1)		Unsigned 16bit		
1531	2031		Cell Constant L		5	20000	Unsigned 32bit		cm-1
1532	2032		Cell Constant H						
1533	2033		Cell Constant Decimal Point		0	4	Unsigned 16bit		
1534	2034		Status Register	Shorted Probe	0	1	Unsigned 16bit		
1535	2035			Probe in Air	0	1	Unsigned 16bit		

14.7 Input-mA Input Measure

Address SLOT A	Address SLOT B	Read Command	Type of Register	Description	Value	Unit	Type of Data
1501	2001	Read Input Register [Function 04]	Measure	Unit Measure	0	ppm	Unsigned 16bit
					1	ppb	
					2	mg/l	
					3	mA	
					4	Custom	
					5	NTU	
Address SLOT A	Address SLOT B	Read Command	Type of Register	Description	min	max	Type of Data
1502	2002	Read Input Register [Function 04]	Measure	Main Measure L	-99999	99999	Signed 32bit
1503	2003			Main Measure H			
1504	2004			Decimal Main Measure	3	3	Unsigned 16bit
1505	2005		Calibrations	Calibration Type	0(None) 1(One Point) 2(Two Points)		Unsigned 16bit
1506	2006			Point 1 L	-99999	99999	Signed 32bit
1507	2007			Point 1 H			
1508	2008			Decimal Point 1	0	4	Unsigned 16bit
1509	2009			Point 2 L	-99999	99999	Signed 32bit
1510	2010			Point 2 H			
1511	2011			Decimal Point 2	0	4	Unsigned 16bit
1512	2012			Gain L	0	99999	Unsigned 32bit
1513	2013			Gain H			
1514	2014			Decimal Gain	4	4	Unsigned 16bit
1515	2015			Offset L	-99999	99999	Signed 32bit
1516	2016			Offset H			
1517	2017			Decimal Offset	0	4	Unsigned 16bit
1518	2018			Adjust L	-99999	99999	Signed 32bit
1519	2019			Adjust H			
1520	2020			Decimal Adjust	0	4	Unsigned 16bit
1521	2021			Day Calibration	1	31	Unsigned 16bit
1522	2022			Month Calibration	1	12	Unsigned 16bit
1523	2023			Year Calibration	0	99	Unsigned 16bit
1524	2024		Advanced	Measure Unit Custom L	0x2020	0x7A7A	Unsigned 32bit
1525	2025			Measure Unit Custom H	0x2020	0x7A7A	
1526	2026			Main Measure Name	0(CI2) 1(PAA) 2(H2O2) 3(O3) 4(Custom) 5(O2) 6(Turb)		Unsigned 16bit
1527	2027			Measure Name Custom L	0x2020	0x7A7A	Unsigned 32bit
1528	2028			Measure Name Custom H	0x2020	0x7A7A	
1529	2029			Filter	0(Low) 1(Medium) 2(High)		Unsigned 16bit
1530	2030			Sensor Type	0(0-20mA)	1(4-20mA)	Unsigned 16bit
1531	2031			Range Min L	-99999	99999	Signed 32bit
1532	2032			Range Min H			
1533	2033			Decimal Range Min	0	4	Unsigned 16bit
1534	2034			Range Max L	-99999	99999	Signed 32bit
1535	2035			Range max H			
1536	2036			Decimal Range Max	0	4	Unsigned 16bit
1537	2037			Over Current Alarm	0(OFF) 1(ON)		Unsigned 16bit
1538	2038			Under Current Alarm	0(OFF) 1(ON)		Unsigned 16bit
1539	2039		Status Register	Input mA > 22 mA	0	1	Unsigned 16bit
1540	2040			Fault +18V	0	1	Unsigned 16bit

14.8 Flow Input Measure

Address SLOT A	Address SLOT B	Read Command	Type of Register	Description	Value	Unit	Type of Data
1501	2001	Read Input Register [Function 04]	Measure	Unit Measure	0	l/s	Unsigned 16bit
					1	l/m	
					2	l/h	
					3	m3/h	
					4	GPM	
Address SLOT A	Address SLOT B	Read Command	Type of Register	Description	min	max	Type of Data
1502	2002	Read Input Register [Function 04]	Measure	Main Measure L	0	99999	Signed 32bit
1503	2003			Main Measure H			
1504	2004			Decimal Main Measure	0	4	Unsigned 16bit
1505	2005			Tot Perm LL	0	999.999.999.999.999	Unsigned 64bit
1506	2006			Tot Perm L			
1507	2007			Tot Perm H			
1508	2008			Tot Perm HH			
1509	2009			Decimal Tot Perm	5	5	Unsigned 16bit
1510	2010			Tot Reset LL	0	999.999.999.999.999	Unsigned 64bit
1511	2011			Tot Reset L			
1512	2012			Tot Reset H			
1513	2013			Tot Reset HH			
1514	2014			Decimal Tot Reset	5	5	Unsigned 16bit
1515	2015		Calibrations	Calibration Type	0(None) 1(Flow) 2(Batch)		Unsigned 16bit
1516	2016			K-FACTOR L	0,0001	99999	Signed 32bit
1517	2017			K-FACTOR H			
1518	2018			Decimal Point K-FACTOR	0	4	Unsigned 16bit
1519	2019			Day Calibration	1	31	Unsigned 16bit
1520	2020			Month Calibration	1	12	Unsigned 16bit
1521	2021			Year Calibration	0	99	Unsigned 16bit
1522	2022		Advanced	Volume Unit Measure	0(L) 1(Gal) 2(m3)		Unsigned 16bit
1523	2023			Filter	0(Low) 1(Medium) 2(High)		Unsigned 16bit

14.9 CL-AMP/Br Input Measure

Address SLOT A	Address SLOT B	Read Command	Type of Register	Description	Value	Unit	Type of Data	Note
1501	2001	Read Input Register [Function 04]	Measure	Unit Measure	0	ppm	Unsigned 16bit	
					1	mg/l		
Address SLOT A	Address SLOT B	Read Command	Type of Register	Description	min	max	Type of Data	
1502	2002	Read Input Register [Function 04]	Measure	Main Measure L	0	99999	Signed 32bit	
1503	2003			Main Measure H				
1504	2004			Decimal Main Measure	0	4	Unsigned 16bit	
1505	2005		Calibrations	Calibration Type	0(None) 1(One Point) 2(Two Points)		Unsigned 16bit	
1506	2006			Point 1 L	0	99999	Signed 32bit	
1507	2007			Point 1 H				
1508	2008			Decimal Point 1	0	4	Unsigned 16bit	
1509	2009			Point 2 L	0	99999	Signed 32bit	
1510	2010			Point 2 H				
1511	2011			Decimal Point 2	0	4	Unsigned 16bit	
1512	2012			Gain L	0	99999	Unsigned 32bit	
1513	2013			Gain H				
1514	2014			Decimal Gain	0	4	Unsigned 16bit	
1515	2015			Offset L	-99999	99999	Signed 32bit	
1516	2016			Offset H				
1517	2017			Decimal Offset	0	4	Unsigned 16bit	
1518	2018			Adjust L	-99999	99999	Signed 32bit	
1519	2019			Adjust H				
1520	2020			Decimal Adjust	0	4	Unsigned 16bit	
1521	2021			Day Calibration	1	31	Unsigned 16bit	
1522	2022			Month Calibration	1	12	Unsigned 16bit	
1523	2023			Year Calibration	0	99	Unsigned 16bit	
1524	2024		Advanced	Temp. Compensation	0(OTC) 1(MTC) 2(ATC)		Unsigned 16bit	
1525	2025			Filter	0(Low) 1(Medium) 2(High)		Unsigned 16bit	
1526	2026			Not Present				
1527	2027			Compensation Type	0(Lin25°C) 1(Lin20°C)		Unsigned 16bit	
1528	2028			Linear Coefficient	1	1000	Unsigned 16bit	%/°C Decimal = 2

14.10 Relay 1 Output Configuration

Address	Read Command	Description	Value	Description	Type of Data	Note
3000	Read Input Register [Function 04]	Link Function Relay	0	OFF	Unsigned 16bit	
			1	TEMPERATURE		
			2	MEASURE SLOT A		
			3	MEASURE SLOT B		
3001		Type Function Relay	0	ON_OFF	Unsigned 16bit	if LINK = OFF Return error
			1	Timed		
			2	PWM		

14.10.1 Setpoint Type Register

Address	Read Command	Description	min	max	Type of Data
1210	Read Input Register [Function 04]	Setpoint Type	0(Hysteresis)	1(On/Off)	Unsigned 16bit

14.10.2 Relay 1 Link Function Measure Temperature

14.10.2.1 Setpoint Type [Hysteresis]

Address	Read Command	Write Command	Description	°C		°F		Type of Data
				min	max	min	max	
3100	Read Input Register [Function 04]	Write Multiple Register [Function 16] Lenght = 3	Setpoint L	-500	1500	-580	3020	Signed 32bit
3101			Setpoint H					
3102			Decimal Setpoint	1	1	1	1	Unsigned 16bit
3103		Write Multiple Register [Function 16] Lenght = 1	Type	0(High)	1(Low)	0(High)	1(Low)	Unsigned 16bit

14.10.2.2 Setpoint Type [On/Off]

Address	Read Command	Write Command	Description	°C		°F		Type of Data
				min	max	min	max	
3133	Read Input Register [Function 04]	Write Multiple Register [Function 16] Lenght = 3	Setpoint ON L	-500	1500	-580	3020	Signed 32bit
3134			Setpoint ON H					
3135			Decimal Setpoint ON	1	1	1	1	Unsigned 16bit
3136			Setpoint OFF L	-500	1500	-580	3020	Signed 32bit
3137			Setpoint OFF H					
3138			Decimal Setpoint OFF	1	1	1	1	Unsigned 16bit

14.10.3 Relay 1 Link Function Measure pH/ORP

14.10.3.1 Setpoint Type [Hysteresis]

Address	Read Command	Write Command	Description	pH		mV		Type of Data
				min	max	min	max	
3100	Read Input Register [Function 04]	Write Multiple Register [Function 16] Lenght = 3	Setpoint L	0	1400	-2000	2000	Signed 32bit
3101			Setpoint H					
3102			Decimal Setpoint	2	2	0	0	Unsigned 16bit
3103		Write Multiple Register [Function 16] Lenght = 1	Type	0(Acid)	1(Alka)	0(High)	1(Low)	Unsigned 16bit

14.10.3.2 Setpoint Type [On/Off]

Address	Read Command	Write Command	Description	pH		mV		Type of Data
				min	max	min	max	
3133	Read Input Register [Function 04]	Write Multiple Register [Function 16] Lenght = 3	Setpoint ON L	0	1400	-2000	2000	Signed 32bit
3134			Setpoint ON H					
3135			Decimal Setpoint ON	2	2	0	0	Unsigned 16bit
3136			Setpoint OFF L	0	1400	-2000	2000	Signed 32bit
3137			Setpoint OFF H					
3138			Decimal Setpoint OFF	2	2	0	0	Unsigned 16bit

14.10.4 Relay 1 Link Function Measure EC-COND

14.10.4.1 Setpoint Type [Hysteresis]

Address	Read Command	Write Command	Description	min	max	Type of Data
3100	Read Input Register [Function 04]	Write Multiple Register [Function 16] Lenght = 3	Setpoint L	0	99999	Signed 32bit
3101			Setpoint H			
3102			Decimal Setpoint	0	4	Unsigned 16bit
3103		Write Multiple Register [Function 16] Lenght = 1	Type	0(High)	1(Low)	Unsigned 16bit

14.10.4.2 Setpoint Type [On/Off]

Address	Read Command	Write Command	Description	min	max	Type of Data
3133	Read Input Register [Function 04]	Write Multiple Register [Function 16] Lenght = 3	Setpoint ON L	0	99999	Signed 32bit
3134			Setpoint ON H			
3135			Decimal Setpoint ON	0	4	Unsigned 16bit
3136			Setpoint OFF L	0	99999	Signed 32bit
3137			Setpoint OFF H			
3138			Decimal Setpoint OFF	0	4	Unsigned 16bit

14.10.5 Relay 1 Link Function Measure Input-mA

14.10.5.1 Setpoint Type [Hysteresis]

Address	Read Command	Write Command	Description	min	max	Type of Data
3100	Read Input Register [Function 04]	Write Multiple Register [Function 16] Lenght = 3	Setpoint L	-99999	99999	Signed 32bit
3101			Setpoint H			
3102			Decimal Setpoint	0	4	Unsigned 16bit
3103		Write Multiple Register [Function 16] Lenght = 1	Type	0(High)	1(Low)	Unsigned 16bit

14.10.5.2 Setpoint Type [On/Off]

Address	Read Command	Write Command	Description	min	max	Type of Data
3133	Read Input Register [Function 04]	Write Multiple Register [Function 16] Lenght = 3	Setpoint ON L	-99999	99999	Signed 32bit
3134			Setpoint ON H			
3135			Decimal Setpoint ON	0	4	Unsigned 16bit
3136			Setpoint OFF L	-99999	99999	Signed 32bit
3137			Setpoint OFF H			
3138			Decimal Setpoint OFF	0	4	Unsigned 16bit

14.10.6 Relay 1 Link Function Measure Flow

14.10.6.1 Setpoint Type [Hysteresis]

Address	Read Command	Write Command	Description	min	max	Type of Data
3100	Read Input Register [Function 04]	Write Multiple Register [Function 16] Lenght = 3	Setpoint L	0	99999	Signed 32bit
3101			Setpoint H			
3102			Decimal Setpoint	0	4	Unsigned 16bit
3103		Write Multiple Register [Function 16] Lenght = 1	Type	0(High)	1(Low)	Unsigned 16bit

14.10.6.2 Setpoint Type [On/Off]

Address	Read Command	Write Command	Description	min	max	Type of Data
3133	Read Input Register [Function 04]	Write Multiple Register [Function 16] Lenght = 3	Setpoint ON L	0	99999	Signed 32bit
3134			Setpoint ON H			
3135			Decimal Setpoint ON	0	4	Unsigned 16bit
3136			Setpoint OFF L	0	99999	Signed 32bit
3137			Setpoint OFF H			
3138			Decimal Setpoint OFF	0	4	Unsigned 16bit

14.10.7 Relay 1 Link Function Measure CL-AMP/Br

14.10.7.1 Setpoint Type [Hysteresis]

Address	Read Command	Write Command	Description	min	max	Type of Data
3100	Read Input Register [Function 04]	Write Multiple Register [Function 16] Lenght = 3	Setpoint L	0	99999	Signed 32bit
3101			Setpoint H			
3102			Decimal Setpoint	0	4	Unsigned 16bit
3103		Write Multiple Register [Function 16] Lenght = 1	Type	0(High)	1(Low)	Unsigned 16bit

14.10.7.2 Setpoint Type [On/Off]

Address	Read Command	Write Command	Description	min	max	Type of Data
3133	Read Input Register [Function 04]	Write Multiple Register [Function 16] Lenght = 3	Setpoint ON L	0	99999	Signed 32bit
3134			Setpoint ON H			
3135			Decimal Setpoint ON	0	4	Unsigned 16bit
3136			Setpoint OFF L	0	99999	Signed 32bit
3137			Setpoint OFF H			
3138			Decimal Setpoint OFF	0	4	Unsigned 16bit

14.11 Relay 2 Output Configuration

Address	Read Command	Description	Value	Description	Type of Data	Note
3002	Read Input Register [Function 04]	Link Function Relay	0	OFF	Unsigned 16bit	
			1	TEMPERATURE		
			2	MEASURE SLOT A		
			3	MEASURE SLOT B		
3003		Type Function Relay	0	ON_OFF	Unsigned 16bit	if LINK = OFF Return error
			1	Timed		
			2	PWM		

14.11.1 Setpoint Type Register

Address	Read Command	Description	min	max	Type of Data
1210	Read Input Register [Function 04]	Setpoint Type	0(Hysteresis)	1(On/Off)	Unsigned 16bit

14.11.2 Relay 2 Link Function Measure Temperature

14.11.2.1 Setpoint Type [Hysteresis]

Address	Read Command	Write Command	Description	°C		°F		Type of Data
				min	max	min	max	
3200	Read Input Register [Function 04]	Write Multiple Register [Function 16] Lenght = 3	Setpoint L	-500	1500	-580	3020	Signed 32bit
3201			Setpoint H					
3202			Decimal Setpoint	1	1	1	1	Unsigned 16bit
3203		Write Multiple Register [Function 16] Lenght = 1	Type	0(High)	1(Low)	0(High)	1(Low)	Unsigned 16bit

14.11.2.2 Setpoint Type [On/Off]

Address	Read Command	Write Command	Description	°C		°F		Type of Data
				min	max	min	max	
3233	Read Input Register [Function 04]	Write Multiple Register [Function 16] Lenght = 3	Setpoint ON L	-500	1500	-580	3020	Signed 32bit
3234			Setpoint ON H					
3235			Decimal Setpoint ON	1	1	1	1	Unsigned 16bit
3236			Setpoint OFF L	-500	1500	-580	3020	Signed 32bit
3237			Setpoint OFF H					
3238			Decimal Setpoint OFF	1	1	1	1	Unsigned 16bit

14.11.3 Relay 2 Link Function Measure pH/ORP

14.11.3.1 Setpoint Type [Hysteresis]

Address	Read Command	Write Command	Description	pH		mV		Type of Data
				min	max	min	max	
3200	Read Input Register [Function 04]	Write Multiple Register [Function 16] Lenght = 3	Setpoint L	0	1400	-2000	2000	Signed 32bit
3201			Setpoint H					
3202			Decimal Setpoint	2	2	0	0	Unsigned 16bit
3203		Write Multiple Register [Function 16] Lenght = 1	Type	0(Acid)	1(Alka)	0(High)	1(Low)	Unsigned 16bit

14.11.3.2 Setpoint Type [On/Off]

Address	Read Command	Write Command	Description	pH		mV		Type of Data
				min	max	min	max	
3233	Read Input Register [Function 04]	Write Multiple Register [Function 16] Lenght = 3	Setpoint ON L	0	1400	-2000	2000	Signed 32bit
3234			Setpoint ON H					
3235			Decimal Setpoint ON	2	2	0	0	Unsigned 16bit
3236			Setpoint OFF L	0	1400	-2000	2000	Signed 32bit
3237			Setpoint OFF H					
3238			Decimal Setpoint OFF	2	2	0	0	Unsigned 16bit

14.11.4 Relay 2 Link Function Measure EC-COND

14.11.4.1 Setpoint Type [Hysteresis]

Address	Read Command	Write Command	Description	min	max	Type of Data
3200	Read Input Register [Function 04]	Write Multiple Register [Function 16] Lenght = 3	Setpoint L	0	99999	Signed 32bit
3201			Setpoint H			
3202			Decimal Setpoint	0	4	Unsigned 16bit
3203		Write Multiple Register [Function 16] Lenght = 1	Type	0(High)	1(Low)	Unsigned 16bit

14.11.4.2 Setpoint Type [On/Off]

Address	Read Command	Write Command	Description	min	max	Type of Data
3233	Read Input Register [Function 04]	Write Multiple Register [Function 16] Lenght = 3	Setpoint ON L	0	99999	Signed 32bit
3234			Setpoint ON H			
3235			Decimal Setpoint ON	0	4	Unsigned 16bit
3236			Setpoint OFF L	0	99999	Signed 32bit
3237			Setpoint OFF H			
3238			Decimal Setpoint OFF	0	4	Unsigned 16bit

14.11.5 Relay 2 Link Function Measure Input-mA

14.11.5.1 Setpoint Type [Hysteresis]

Address	Read Command	Write Command	Description	min	max	Type of Data
3200	Read Input Register [Function 04]	Write Multiple Register [Function 16] Lenght = 3	Setpoint L	-99999	99999	Signed 32bit
3201			Setpoint H			
3202			Decimal Setpoint	0	4	Unsigned 16bit
3203		Write Multiple Register [Function 16] Lenght = 1	Type	0(High)	1(Low)	Unsigned 16bit

14.11.5.2 Setpoint Type [On/Off]

Address	Read Command	Write Command	Description	min	max	Type of Data
3233	Read Input Register [Function 04]	Write Multiple Register [Function 16] Lenght = 3	Setpoint ON L	-99999	99999	Signed 32bit
3234			Setpoint ON H			
3235			Decimal Setpoint ON	0	4	Unsigned 16bit
3236			Setpoint OFF L	-99999	99999	Signed 32bit
3237			Setpoint OFF H			
3238			Decimal Setpoint OFF	0	4	Unsigned 16bit

14.11.6 Relay 2 Link Function Measure Flow

14.11.6.1 Setpoint Type [Hysteresis]

Address	Read Command	Write Command	Description	min	max	Type of Data
3200	Read Input Register [Function 04]	Write Multiple Register [Function 16] Lenght = 3	Setpoint L	0	99999	Signed 32bit
3201			Setpoint H			
3202			Decimal Setpoint	0	4	Unsigned 16bit
3203		Write Multiple Register [Function 16] Lenght = 1	Type	0(High)	1(Low)	Unsigned 16bit

14.11.6.2 Setpoint Type [On/Off]

Address	Read Command	Write Command	Description	min	max	Type of Data
3233	Read Input Register [Function 04]	Write Multiple Register [Function 16] Lenght = 3	Setpoint ON L	0	99999	Signed 32bit
3234			Setpoint ON H			
3235			Decimal Setpoint ON	0	4	Unsigned 16bit
3236			Setpoint OFF L	0	99999	Signed 32bit
3237			Setpoint OFF H			
3238			Decimal Setpoint OFF	0	4	Unsigned 16bit

14.11.7 Relay 2 Link Function Measure CL-AMP/Br

14.11.7.1 Setpoint Type [Hysteresis]

Address	Read Command	Write Command	Description	min	max	Type of Data
3200	Read Input Register [Function 04]	Write Multiple Register [Function 16] Lenght = 3	Setpoint L	0	99999	Signed 32bit
3201			Setpoint H			
3202			Decimal Setpoint	0	4	Unsigned 16bit
3203		Write Multiple Register [Function 16] Lenght = 1	Type	0(High)	1(Low)	Unsigned 16bit

14.11.7.2 Setpoint Type [On/Off]

Address	Read Command	Write Command	Description	min	max	Type of Data
3233	Read Input Register [Function 04]	Write Multiple Register [Function 16] Lenght = 3	Setpoint ON L	0	99999	Signed 32bit
3234			Setpoint ON H			
3235			Decimal Setpoint ON	0	4	Unsigned 16bit
3236			Setpoint OFF L	0	99999	Signed 32bit
3237			Setpoint OFF H			
3238			Decimal Setpoint OFF	0	4	Unsigned 16bit

14.12 Relay 3 Output Configuration

Addr.	Read Command	Description	Value	Description	Type of Data	Note						
3004	Read Input Register Function 04	Link Function Relay	0	OFF	Unsigned 16bit							
			1	TEMP.								
			2	MEASURE SLOT A								
			3	MEASURE SLOT B								
			4	ALARM								
3005		Type Function Relay	TEMPERATURE		MEASURE SLOT A		MEASURE SLOT B		ALARM		Type of Data	Note
			0	ON_OFF	0	ON_OFF	0	ON_OFF	0	Relay 1	Unsigned 16bit	if LINK = OFF Return error
			1	Timed	1	Timed	1	Timed	1	Relay 2		
			2	PWM	2	PWM	2	PWM				
					3	Probe Washing						

14.12.1 Setpoint Type Register

Address	Read Command	Description	min	max	Type of Data
1210	Read Input Register [Function 04]	Setpoint Type	0(Hysteresis)	1(On/Off)	Unsigned 16bit

14.12.2 Relay 3 Link Function Measure Temperature

14.12.2.1 Setpoint Type [Hysteresis]

Address	Read Command	Write Command	Description	°C		°F		Type of Data
				min	max	min	max	
3300	Read Input Register [Function 04]	Write Multiple Register [Function 16] Lenght = 3	Setpoint L	-500	1500	-580	3020	Signed 32bit
3301			Setpoint H					
3302			Decimal Setpoint	1	1	1	1	Unsigned 16bit
3303		Write Multiple Register [Function 16] Lenght = 1	Type	0(High)	1(Low)	0(High)	1(Low)	Unsigned 16bit

14.12.2.2 Setpoint Type [On/Off]

Address	Read Command	Write Command	Description	°C		°F		Type of Data
				min	max	min	max	
3344	Read Input Register [Function 04]	Write Multiple Register [Function 16] Lenght = 3	Setpoint ON L	-500	1500	-580	3020	Signed 32bit
3345			Setpoint ON H					
3346			Decimal Setpoint ON	1	1	1	1	Unsigned 16bit
3347			Setpoint OFF L	-500	1500	-580	3020	Signed 32bit
3348			Setpoint OFF H					
3349			Decimal Setpoint OFF	1	1	1	1	Unsigned 16bit

14.12.3 Relay 3 Link Function Measure pH/ORP

14.12.3.1 Setpoint Type [Hysteresis]

Address	Read Command	Write Command	Description	pH		mV		Type of Data
				min	max	min	max	
3300	Read Input Register [Function 04]	Write Multiple Register [Function 16] Lenght = 3	Setpoint L	0	1400	-2000	2000	Signed 32bit
3301			Setpoint H					
3302			Decimal Setpoint	2	2	0	0	Unsigned 16bit
3303		Write Multiple Register [Function 16] Lenght = 1	Type	0(Acid)	1(Alka)	0(High)	1(Low)	Unsigned 16bit

14.12.3.2 Setpoint Type [On/Off]

Address	Read Command	Write Command	Description	pH		mV		Type of Data
				min	max	min	max	
3344	Read Input Register [Function 04]	Write Multiple Register [Function 16] Lenght = 3	Setpoint ON L	0	1400	-2000	2000	Signed 32bit
3345			Setpoint ON H					
3346			Decimal Setpoint ON	2	2	0	0	Unsigned 16bit
3347			Setpoint OFF L	0	1400	-2000	2000	Signed 32bit
3348			Setpoint OFF H					
3349			Decimal Setpoint OFF	2	2	0	0	Unsigned 16bit

14.12.4 Relay 3 Link Function Measure EC-COND

14.12.4.1 Setpoint Type [Hysteresis]

Address	Read Command	Write Command	Description	min	max	Type of Data
3300	Read Input Register [Function 04]	Write Multiple Register [Function 16] Lenght = 3	Setpoint L	0	99999	Signed 32bit
3301			Setpoint H			
3302			Decimal Setpoint	0	4	Unsigned 16bit
3303		Write Multiple Register [Function 16] Lenght = 1	Type	0(High)	1(Low)	Unsigned 16bit

14.12.4.2 Setpoint Type [On/Off]

Address	Read Command	Write Command	Description	min	max	Type of Data
3344	Read Input Register [Function 04]	Write Multiple Register [Function 16] Lenght = 3	Setpoint ON L	0	99999	Signed 32bit
3345			Setpoint ON H			
3346			Decimal Setpoint ON	0	4	Unsigned 16bit
3347			Setpoint OFF L	0	99999	Signed 32bit
3348			Setpoint OFF H			
3349			Decimal Setpoint OFF	0	4	Unsigned 16bit

14.12.5 Relay 3 Link Function Measure Input-mA

14.12.5.1 Setpoint Type [Hysteresis]

Address	Read Command	Write Command	Description	min	max	Type of Data
3300	Read Input Register [Function 04]	Write Multiple Register [Function 16] Lenght = 3	Setpoint L	-99999	99999	Signed 32bit
3301			Setpoint H			
3302			Decimal Setpoint	0	4	Unsigned 16bit
3303		Write Multiple Register [Function 16] Lenght = 1	Type	0(High)	1(Low)	Unsigned 16bit

14.12.5.2 Setpoint Type [On/Off]

Address	Read Command	Write Command	Description	min	max	Type of Data
3344	Read Input Register [Function 04]	Write Multiple Register [Function 16] Lenght = 3	Setpoint ON L	-99999	99999	Signed 32bit
3345			Setpoint ON H			
3346			Decimal Setpoint ON	0	4	Unsigned 16bit
3347			Setpoint OFF L	-99999	99999	Signed 32bit
3348			Setpoint OFF H			
3349			Decimal Setpoint OFF	0	4	Unsigned 16bit

14.12.6 Relay 3 Link Function Measure Flow

14.12.6.1 Setpoint Type [Hysteresis]

Address	Read Command	Write Command	Description	min	max	Type of Data
3300	Read Input Register [Function 04]	Write Multiple Register [Function 16] Lenght = 3	Setpoint L	0	99999	Signed 32bit
3301			Setpoint H			
3302			Decimal Setpoint	0	4	Unsigned 16bit
3303		Write Multiple Register [Function 16] Lenght = 1	Type	0(High)	1(Low)	Unsigned 16bit

14.12.6.2 Setpoint Type [On/Off]

Address	Read Command	Write Command	Description	min	max	Type of Data
3344	Read Input Register [Function 04]	Write Multiple Register [Function 16] Lenght = 3	Setpoint ON L	0	99999	Signed 32bit
3345			Setpoint ON H			
3346			Decimal Setpoint ON	0	4	Unsigned 16bit
3347			Setpoint OFF L	0	99999	Signed 32bit
3348			Setpoint OFF H			
3349			Decimal Setpoint OFF	0	4	Unsigned 16bit

14.12.7 Relay 3 Link Function Measure CL-AMP/Br

14.12.7.1 Setpoint Type [Hysteresis]

Address	Read Command	Write Command	Description	min	max	Type of Data
3300	Read Input Register [Function 04]	Write Multiple Register [Function 16] Lenght = 3	Setpoint L	0	99999	Signed 32bit
3301			Setpoint H			
3302			Decimal Setpoint	0	4	Unsigned 16bit
3303		Write Multiple Register [Function 16] Lenght = 1	Type	0(High)	1(Low)	Unsigned 16bit

14.12.7.2 Setpoint Type [On/Off]

Address	Read Command	Write Command	Description	min	max	Type of Data
3344	Read Input Register [Function 04]	Write Multiple Register [Function 16] Lenght = 3	Setpoint ON L	0	99999	Signed 32bit
3345			Setpoint ON H			
3346			Decimal Setpoint ON	0	4	Unsigned 16bit
3347			Setpoint OFF L	0	99999	Signed 32bit
3348			Setpoint OFF H			
3349			Decimal Setpoint OFF	0	4	Unsigned 16bit

14.12.8 Relay 3 Link Function Probe Washing on Measure A

Address	Read Command	Write Command	Description	min	max	Type of Data	Note
3333	Read Input Register [Function 04]	Write Multiple Register [Function 16] Lenght = 2	Wash Time L	0	3659	Unsigned 32bit	Seconds
3334			Wash Time H				
3335		Write Multiple Register [Function 16] Lenght = 2	Delay Stabilization L	0	3659	Unsigned 32bit	Seconds
3336			Delay Stabilization H				
3337		Write Multiple Register [Function 16] Lenght = 2	Wait New Wash L	0	5999	Unsigned 32bit	Minutes
3338			Wait New Wash H				

14.13 Relay 4 Output Configuration

Addr.	Read Command	Description	Value	Description	Type of Data	Note							
3006	Read Input Register Function 04	Link Function Relay	0	OFF	Unsigned 16bit								
			1	TEMP.									
			2	MEASURE SLOT A									
			3	MEASURE SLOT B									
			4	ALARM									
3007		Type Function Relay	TEMPERATURE		MEASURE SLOT A		MEASURE SLOT B		ALARM		Type of Data	Note	
			0	ON_OFF	0	ON_OFF	0	ON_OFF	0	Relay 1	Unsigned 16bit	if LINK = OFF Return error	
			1	Timed	1	Timed	1	Timed	1	Relay 2			
			2	PWM	2	PWM	2	PWM					
							3	Probe Washing					

14.13.1 Setpoint Type Register

Address	Read Command	Description	min	max	Type of Data
1210	Read Input Register [Function 04]	Setpoint Type	0(Hysteresis)	1(On/Off)	Unsigned 16bit

14.13.2 Relay 4 Link Function Measure Temperature

14.13.2.1 Setpoint Type [Hysteresis]

Address	Read Command	Write Command	Description	°C		°F		Type of Data
				min	max	min	max	
3400	Read Input Register [Function 04]	Write Multiple Register [Function 16] Lenght = 3	Setpoint L	-500	1500	-580	3020	Signed 32bit
3401			Setpoint H					
3402			Decimal Setpoint	1	1	1	1	Unsigned 16bit
3403		Write Multiple Register [Function 16] Lenght = 1	Type	0(High)	1(Low)	0(High)	1(Low)	Unsigned 16bit

14.13.2.2 Setpoint Type [On/Off]

Address	Read Command	Write Command	Description	°C		°F		Type of Data
				min	max	min	max	
3444	Read Input Register [Function 04]	Write Multiple Register [Function 16] Lenght = 3	Setpoint ON L	-500	1500	-580	3020	Signed 32bit
3445			Setpoint ON H					
3446			Decimal Setpoint ON	1	1	1	1	Unsigned 16bit
3447			Setpoint OFF L	-500	1500	-580	3020	Signed 32bit
3448			Setpoint OFF H					
3449			Decimal Setpoint OFF	1	1	1	1	Unsigned 16bit

14.13.3 Relay 4 Link Function Measure pH/ORP

14.13.3.1 Setpoint Type [Hysteresis]

Address	Read Command	Write Command	Description	pH		mV		Type of Data
				min	max	min	max	
3400	Read Input Register [Function 04]	Write Multiple Register [Function 16] Lenght = 3	Setpoint L	0	1400	-2000	2000	Signed 32bit
3401			Setpoint H					
3402			Decimal Setpoint	2	2	0	0	Unsigned 16bit
3403		Write Multiple Register [Function 16] Lenght = 1	Type	0(Acid)	1(Alka)	0(High)	1(Low)	Unsigned 16bit

14.13.3.2 Setpoint Type [On/Off]

Address	Read Command	Write Command	Description	pH		mV		Type of Data
				min	max	min	max	
3444	Read Input Register [Function 04]	Write Multiple Register [Function 16] Lenght = 3	Setpoint ON L	0	1400	-2000	2000	Signed 32bit
3445			Setpoint ON H					
3446			Decimal Setpoint ON	2	2	0	0	Unsigned 16bit
3447			Setpoint OFF L	0	1400	-2000	2000	Signed 32bit
3448			Setpoint OFF H					
3449			Decimal Setpoint OFF	2	2	0	0	Unsigned 16bit

14.13.4 Relay 4 Link Function Measure EC-COND

14.13.4.1 Setpoint Type [Hysteresis]

Address	Read Command	Write Command	Description	min	max	Type of Data
3400	Read Input Register [Function 04]	Write Multiple Register [Function 16] Lenght = 3	Setpoint L	0	99999	Signed 32bit
3401			Setpoint H			
3402			Decimal Setpoint	0	4	Unsigned 16bit
3403		Write Multiple Register [Function 16] Lenght = 1	Type	0(High)	1(Low)	Unsigned 16bit

14.13.4.2 Setpoint Type [On/Off]

Address	Read Command	Write Command	Description	min	max	Type of Data
3444	Read Input Register [Function 04]	Write Multiple Register [Function 16] Lenght = 3	Setpoint ON L	0	99999	Signed 32bit
3445			Setpoint ON H			
3446			Decimal Setpoint ON	0	4	Unsigned 16bit
3447			Setpoint OFF L	0	99999	Signed 32bit
3448			Setpoint OFF H			
3449			Decimal Setpoint OFF	0	4	Unsigned 16bit

14.13.5 Relay 4 Link Function Measure Input-mA

14.13.5.1 Setpoint Type [Hysteresis]

Address	Read Command	Write Command	Description	min	max	Type of Data
3400	Read Input Register [Function 04]	Write Multiple Register [Function 16] Lenght = 3	Setpoint L	-99999	99999	Signed 32bit
3401			Setpoint H			
3402			Decimal Setpoint	0	4	Unsigned 16bit
3403		Write Multiple Register [Function 16] Lenght = 1	Type	0(High)	1(Low)	Unsigned 16bit

14.13.5.2 Setpoint Type [On/Off]

Address	Read Command	Write Command	Description	min	max	Type of Data
3444	Read Input Register [Function 04]	Write Multiple Register [Function 16] Lenght = 3	Setpoint ON L	-99999	99999	Signed 32bit
3445			Setpoint ON H			
3446			Decimal Setpoint ON	0	4	Unsigned 16bit
3447			Setpoint OFF L	-99999	99999	Signed 32bit
3448			Setpoint OFF H			
3449			Decimal Setpoint OFF	0	4	Unsigned 16bit

14.13.6 Relay 4 Link Function Measure Flow

14.13.6.1 Setpoint Type [Hysteresis]

Address	Read Command	Write Command	Description	min	max	Type of Data
3400	Read Input Register [Function 04]	Write Multiple Register [Function 16] Lenght = 3	Setpoint L	0	99999	Signed 32bit
3401			Setpoint H			
3402			Decimal Setpoint	0	4	Unsigned 16bit
3403		Write Multiple Register [Function 16] Lenght = 1	Type	0(High)	1(Low)	Unsigned 16bit

14.13.6.2 Setpoint Type [On/Off]

Address	Read Command	Write Command	Description	min	max	Type of Data
3444	Read Input Register [Function 04]	Write Multiple Register [Function 16] Lenght = 3	Setpoint ON L	0	99999	Signed 32bit
3445			Setpoint ON H			
3446			Decimal Setpoint ON	0	4	Unsigned 16bit
3447			Setpoint OFF L	0	99999	Signed 32bit
3448			Setpoint OFF H			
3449			Decimal Setpoint OFF	0	4	Unsigned 16bit

14.13.7 Relay 4 Link Function Measure CL-AMP/Br

14.13.7.1 Setpoint Type [Hysteresis]

Address	Read Command	Write Command	Description	min	max	Type of Data
3400	Read Input Register [Function 04]	Write Multiple Register [Function 16] Lenght = 3	Setpoint L	0	99999	Signed 32bit
3401			Setpoint H			
3402			Decimal Setpoint	0	4	Unsigned 16bit
3403		Write Multiple Register [Function 16] Lenght = 1	Type	0(High)	1(Low)	Unsigned 16bit

14.13.7.2 Setpoint Type [On/Off]

Address	Read Command	Write Command	Description	min	max	Type of Data
3444	Read Input Register [Function 04]	Write Multiple Register [Function 16] Lenght = 3	Setpoint ON L	0	99999	Signed 32bit
3445			Setpoint ON H			
3446			Decimal Setpoint ON	0	4	Unsigned 16bit
3447			Setpoint OFF L	0	99999	Signed 32bit
3448			Setpoint OFF H			
3449			Decimal Setpoint OFF	0	4	Unsigned 16bit

14.13.8 Relay 4 Link Function Probe Washing on Measure B

Address	Read Command	Write Command	Description	min	max	Type of Data	Note
3433	Read Input Register [Function 04]	Write Multiple Register [Function 16] Lenght = 2	Wash Time L	0	3659	Unsigned 32bit	Seconds
3434			Wash Time H				
3435		Write Multiple Register [Function 16] Lenght = 2	Delay Stabilization L	0	3659	Unsigned 32bit	Seconds
3436			Delay Stabilization H				
3437		Write Multiple Register [Function 16] Lenght = 2	Wait New Wash L	0	5999	Unsigned 32bit	Minutes
3438			Wait New Wash H				

14.14 SSR1 Output Configuration

Address	Read Command	Description	Value	Description	Type of Data	Note
3008	Read Input Register [Function 04]	Link Function SSR	0	OFF	Unsigned 16bit	
			1	TEMPERATURE		
			2	MEASURE SLOT A		
			3	MEASURE SLOT B		
3009		Type Function SSR	ONLY IF MEASURE SLOT = FLOW		Unsigned 16bit	If MEASURE SLOT A/B is different from FLOW Return error
			0	1:N		
			1	N:1		
			2	Volume		

14.14.1 SSR1 Link Function Measure Temperature

Address	Read Command	Write Multiple Register [Function 16]	Description	°C		°F		Type of Data	Note
				min	max	min	max		
3500	Read Input Register [Function 04]	Lenght = 3	Setpoint L	-500	1500	-580	3020	Signed 32bit	
3501			Setpoint H						
3502			Decimal Setpoint	1	1	1	1	Unsigned 16bit	
3503		Lenght = 1	Type	0(High)	1(Low)	0(High)	1(Low)	Unsigned 16bit	Pulse/minutes
3504		Lenght = 1	Max Pulses	20	400	20	400	Unsigned 16bit	
3505		Lenght = 1	Min Pulses	1	100	1	100	Unsigned 16bit	
3506		Lenght = 3	Proportional Band L	10	500	18	900	Signed 32bit	
3507			Proportional Band H						
3508			Decimalimal Proportional Band	1	1	1	1	Unsigned 16bit	

14.14.2 SSR1 Link Function Measure pH/ORP

Address	Read Command	Write Multiple Register [Function 16]	Description	pH		mV		Type of Data	Note
				min	max	min	max		
3500	Read Input Register [Function 04]	Lenght = 3	Setpoint L	0	1400	-2000	2000	Signed 32bit	
3501			Setpoint H						
3502			Decimal Setpoint	2	2	0	0	Unsigned 16bit	
3503		Lenght = 1	Type	0(Acid)	1(Alka)	0(High)	1(Low)	Unsigned 16bit	Pulse/minutes
3504		Lenght = 1	Max Pulses	20	400	20	400	Unsigned 16bit	
3505		Lenght = 1	Min Pulses	1	100	1	100	Unsigned 16bit	
3506		Lenght = 3	Proportional Band L	20	300	20	300	Signed 32bit	
3507			Proportional Band H						
3508			Decimal Proportional Band	2	2	2	2	Unsigned 16bit	

14.14.3 SSR1 Link Function Measure EC-COND

Address	Read Command	Write Multiple Register [Function 16]	Description	min	max	Type of Data	Note
3500	Read Input Register [Function 04]	Lenght = 3	Setpoint L	0	99999	Signed 32bit	
3501			Setpoint H				
3502			Decimal Setpoint				
3503		Lenght = 1	Type	0(High)	1(Low)	Unsigned 16bit	Pulse/minutes
3504		Lenght = 1	Max Pulses	20	400	Unsigned 16bit	
3505		Lenght = 1	Min Pulses	1	100	Unsigned 16bit	
3506		Lenght = 3	Proportional Band L	0	99999	Signed 32bit	
3507			Proportional Band H				
3508			Decimal Proportional Band				

14.14.4 SSR1 Link Function Measure Input-mA

Address	Read Command	Write Multiple Register [Function 16]	Description	min	max	Type of Data	Note
3500	Read Input Register [Function 04]	Lenght = 3	Setpoint L	-99999	99999	Signed 32bit	
3501			Setpoint H				
3502			Decimal Setpoint				
3503		Lenght = 1	Type	0(High)	1(Low)	Unsigned 16bit	Pulse/minutes
3504		Lenght = 1	Max Pulses	20	400	Unsigned 16bit	
3505		Lenght = 1	Min Pulses	1	100	Unsigned 16bit	
3506		Lenght = 3	Proportional Band L	0	99999	Signed 32bit	
3507			Proportional Band H				
3508			Decimal Proportional Band				

14.14.5 SSR1 Link Function Measure Flow

Address	Read Command	Write Multiple Register [Function 16]	Description	min	max	Type of Data	Note
3509	Read Input Register [Function 04]	Lenght = 3	Set Volume L	0	99999	Unsigned 32bit	
3510			Set Volume H				
3511			Decimal Volume				
3512		Lenght = 2	Pulse Duration L	1	99999	Unsigned 32bit	Seconds Decimal = 1
3513			Pulse Duration H				
3514		Lenght = 1	N Factor	1	9999	Unsigned 16bit	
3515		Lenght = 1	Memory	0 (No)	1 (Yes)	Unsigned 16bit	

14.14.6 SSR1 Link Function Measure CL-AMP/Br

Address	Read Command	Write Multiple Register [Function 16]	Description	min	max	Type of Data	Note
3500	Read Input Register [Function 04]	Lenght = 3	Setpoint L	0	99999	Signed 32bit	
3501			Setpoint H				
3502			Decimal Setpoint				
3503		Lenght = 1	Type	0(High)	1(Low)	Unsigned 16bit	Pulse/minutes
3504		Lenght = 1	Max Pulses	20	400	Unsigned 16bit	
3505		Lenght = 1	Min Pulses	1	100	Unsigned 16bit	
3506		Lenght = 3	Proportional Band L	0	99999	Signed 32bit	
3507			Proportional Band H				
3508			Decimal Proportional Band				

14.15 SSR2 Output Configuration

Address	Read Command	Description	Value	Description	Type of Data	Note
3010	Read Input Register [Function 04]	Link Function SSR	0	OFF	Unsigned 16bit	
			1	TEMPERATURE		
			2	MEASURE SLOT A		
			3	MEASURE SLOT B		
3011		Type Function SSR	ONLY IF MEASURE SLOT = FLOW		Unsigned 16bit	If MEASURE SLOT A/B is different from FLOW Return error
			0	1:N		
			1	N:1		
			2	Volume		

14.15.1 SSR2 Link Function Measure Temperature

Address	Read Command	Write Multiple Register [Function 16]	Description	°C		°F			
				min	max	min	max	Type of Data	Note
3600	Read Input Register [Function 04]	Lenght = 3	Setpoint L	-500	1500	-580	3020	Signed 32bit	
3601			Setpoint H						
3602			Decimal Setpoint	1	1	1	1	Unsigned 16bit	
3603		Lenght = 1	Type	0(High)	1(Low)	0(High)	1(Low)	Unsigned 16bit	Pulse/minutes
3604		Lenght = 1	Max Pulses	20	400	20	400	Unsigned 16bit	
3605		Lenght = 1	Min Pulses	1	100	1	100	Unsigned 16bit	
3606		Lenght = 3	Proportional Band L	10	500	18	900	Signed 32bit	
3607			Proportional Band H						
3608			Decimal Proportional Band	1	1	1	1	Unsigned 16bit	

14.15.2 SSR2 Link Function Measure pH/ORP

Address	Read Command	Write Multiple Register [Function 16]	Description	pH		mV		Type of Data	Note
				min	max	min	max		
3600	Read Input Register [Function 04]	Lenght = 3	Setpoint L	0	1400	-2000	2000	Signed 32bit	
3601			Setpoint H						
3602			Decimal Setpoint	2	2	0	0	Unsigned 16bit	
3603		Lenght = 1	Type	0(Acid)	1(Alka)	0(High)	1(Low)	Unsigned 16bit	Pulse/minutes
3604		Lenght = 1	Max Pulses	20	400	20	400	Unsigned 16bit	
3605		Lenght = 1	Min Pulses	1	100	1	100	Unsigned 16bit	
3606		Lenght = 3	Proportional Band L	20	300	20	300	Signed 32bit	
3607			Proportional Band H						
3608			Decimal Proportional Band	2	2	2	2	Unsigned 16bit	

14.15.3 SSR2 Link Function Measure EC-COND

Address	Read Command	Write Multiple Register [Function 16]	Description	min	max	Type of Data	Note
3600	Read Input Register [Function 04]	Lenght = 3	Setpoint L	0	99999	Signed 32bit	
3601			Setpoint H				
3602			Decimal Setpoint	0	4	Unsigned 16bit	
3603		Lenght = 1	Type	0(High)	1(Low)	Unsigned 16bit	Pulse/minutes
3604		Lenght = 1	Max Pulses	20	400	Unsigned 16bit	
3605		Lenght = 1	Min Pulses	1	100	Unsigned 16bit	
3606		Lenght = 3	Proportional Band L	0	99999	Signed 32bit	
3607			Proportional Band H				
3608			Decimal Proportional Band	0	4	Unsigned 16bit	

14.15.4 SSR2 Link Function Measure Input-mA

Address	Read Command	Write Multiple Register [Function 16]	Description	min	max	Type of Data	Note
3600	Read Input Register [Function 04]	Lenght = 3	Setpoint L	-99999	99999	Signed 32bit	
3601			Setpoint H				
3602			Decimal Setpoint				
3603		Lenght = 1	Type	0(High)	1(Low)	Unsigned 16bit	Pulse/minutes
3604		Lenght = 1	Max Pulses	20	400	Unsigned 16bit	
3605		Lenght = 1	Min Pulses	1	100	Unsigned 16bit	
3606		Lenght = 3	Proportional Band L	0	99999	Signed 32bit	
3607			Proportional Band H				
3608			Decimal Proportional Band				

14.15.5 SSR2 Link Function Measure Flow

Address	Read Command	Write Multiple Register [Function 16]	Description	min	max	Type of Data	Note
3609	Read Input Register [Function 04]	Lenght = 3	Set Volume L	0	99999	Unsigned 32bit	
3610			Set Volume H				
3611			Decimal Volume				
3612		Lenght = 2	Pulse Duration L	1	99999	Unsigned 32bit	Seconds Decimal = 1
3613			Pulse Duration H				
3614		Lenght = 1	N Factor	1	9999	Unsigned 16bit	
3615		Lenght = 1	Memory	0 (No)	1 (Yes)	Unsigned 16bit	

14.15.6 SSR2 Link Function Measure CL-AMP/Br

Address	Read Command	Write Multiple Register [Function 16]	Description	min	max	Type of Data	Note
3600	Read Input Register [Function 04]	Lenght = 3	Setpoint L	0	99999	Signed 32bit	
3601			Setpoint H				
3602			Decimal Setpoint				
3603		Lenght = 1	Type	0(High)	1(Low)	Unsigned 16bit	Pulse/minutes
3604		Lenght = 1	Max Pulses	20	400	Unsigned 16bit	
3605		Lenght = 1	Min Pulses	1	100	Unsigned 16bit	
3606		Lenght = 3	Proportional Band L	0	99999	Signed 32bit	
3607			Proportional Band H				
3608			Decimal Proportional Band				

14.16 mA1 Output Configuration

Address	Read Command	Description	Value	Description	Type of Data
3012	Read Input Register [Function 04]	Link Function mA	0	OFF	Unsigned 16bit
			1	TEMPERATURE	
			2	MEASURE SLOT A	
			3	MEASURE SLOT B	
3013		Type Function mA	0	Repeater [PID Off]	Unsigned 16bit
			1	PID On	

14.16.1 mA1 Link Function Measure Temperature

14.16.1.1 Type Function Repeater

Address	Read Command	Write Multiple Register [Function 16]	Description	°C		°F		Type of Data
				min	max	min	max	
3700	Read Input Register [Function 04]	Lenght = 3	Start mA L	-500	1500	-580	3020	Signed 32bit
3701			Start mA H					
3702			Decimal Start mA					Unsigned 16bit
3703		Lenght = 3	End mA L	-500	1500	-580	3020	Signed 32bit
3704			End mA H					
3705			Decimal End mA					Unsigned 16bit

14.16.1.2 Type Function PID

Address	Read Command	Write Multiple Register [Function 16]	Description	°C		°F		Type of Data
				min	max	min	max	
3708	Read Input Register [Function 04]	Lenght = 3	Setpoint L	-500	1500	-580	3020	Signed 32bit
3709			Setpoint H					
3710			Decimal Setpoint					Unsigned 16bit
3711		Lenght = 1	Type	0(High)	1(Low)	0(High)	1(Low)	Unsigned 16bit

14.16.2 mA1 Link Function Measure pH/ORP

14.16.2.1 Type Function Repeater

Address	Read Command	Write Multiple Register [Function 16]	Description	pH		mV		Type of Data
				min	max	min	max	
3700	Read Input Register [Function 04]	Lenght = 3	Start mA L	0	1400	-2000	2000	Signed 32bit
3701			Start mA H					
3702			Decimal Start mA					Unsigned 16bit
3703		Lenght = 3	End mA L	0	1400	-2000	2000	Signed 32bit
3704			End mA H					
3705			Decimal End mA					Unsigned 16bit

14.16.2.2 Type Function PID

Address	Read Command	Write Multiple Register [Function 16]	Description	pH		mV		Type of Data
				min	max	min	max	
3708	Read Input Register [Function 04]	Lenght = 3	Setpoint L	0	1400	-2000	2000	Signed 32bit
3709			Setpoint H					
3710			Decimal Setpoint					Unsigned 16bit
3711		Lenght = 1	Type	0(Acid)	1(Alka)	0(High)	1(Low)	Unsigned 16bit

14.16.3 mA1 Link Function Measure EC-COND

14.16.3.1 Type Function Repeater

Address	Read Command	Write Multiple Register [Function 16]	Description	min	max	Type of Data
3700	Read Input Register [Function 04]	Lenght = 3	Start mA L	0	99999	Signed 32bit
3701			Start mA H			
3702			Decimal Start mA			Unsigned 16bit
3703		Lenght = 3	End mA L	0	99999	Signed 32bit
3704			End mA H			
3705			Decimal End mA			Unsigned 16bit

14.16.3.2 Type Function PID

Address	Read Command	Write Multiple Register [Function 16]	Description	min	max	Type of Data
3708	Read Input Register [Function 04]	Lenght = 3	Setpoint L	0	99999	Signed 32bit
3709			Setpoint H			
3710			Decimal Setpoint	0	4	Unsigned 16bit
3711		Lenght = 1	Type	0(High)	1(Low)	Unsigned 16bit

14.16.4 mA1 Link Function Measure Input-mA

14.16.4.1 Type Function Repeater

Address	Read Command	Write Multiple Register [Function 16]	Description	min	max	Type of Data
3700	Read Input Register [Function 04]	Lenght = 3	Start mA L	-99999	99999	Signed 32bit
3701			Start mA H			
3702			Decimal Start mA	0	4	Unsigned 16bit
3703		Lenght = 3	End mA L	-99999	99999	Signed 32bit
3704			End mA H			
3705			Decimal End mA	0	4	Unsigned 16bit

14.16.4.2 Type Function PID

Address	Read Command	Write Multiple Register [Function 16]	Description	min	max	Type of Data
3708	Read Input Register [Function 04]	Lenght = 3	Setpoint L	-99999	99999	Signed 32bit
3709			Setpoint H			
3710			Decimal Setpoint	0	4	Unsigned 16bit
3711		Lenght = 1	Type	0(High)	1(Low)	Unsigned 16bit

14.16.5 mA1 Link Function Measure Flow

14.16.5.1 Type Function Repeater

Address	Read Command	Write Multiple Register [Function 16]	Description	min	max	Type of Data
3700	Read Input Register [Function 04]	Lenght = 3	Start mA L	0	99999	Signed 32bit
3701			Start mA H			
3702			Decimal Start mA	0	4	Unsigned 16bit
3703		Lenght = 3	End mA L	0	99999	Signed 32bit
3704			End mA H			
3705			Decimal End mA	0	4	Unsigned 16bit

14.16.5.2 Type Function PID

Address	Read Command	Write Multiple Register [Function 16]	Description	min	max	Type of Data
3708	Read Input Register [Function 04]	Lenght = 3	Setpoint L	0	99999	Signed 32bit
3709			Setpoint H			
3710			Decimal Setpoint	0	4	Unsigned 16bit
3711		Lenght = 1	Type	0(High)	1(Low)	Unsigned 16bit

14.16.6 mA1 Link Function Measure CL-AMP/Br

14.16.6.1 Type Function Repeater

Address	Read Command	Write Multiple Register [Function 16]	Description	min	max	Type of Data
3700	Read Input Register [Function 04]	Lenght = 3	Start mA L	0	99999	Signed 32bit
3701			Start mA H			
3702			Decimal Start mA	0	4	Unsigned 16bit
3703		Lenght = 3	End mA L	0	99999	Signed 32bit
3704			End mA H			
3705			Decimal End mA	0	4	Unsigned 16bit

14.16.6.2 Type Function PID

Address	Read Command	Write Multiple Register [Function 16]	Description	min	max	Type of Data
3708	Read Input Register [Function 04]	Lenght = 3	Setpoint L	0	99999	Signed 32bit
3709			Setpoint H			
3710			Decimal Setpoint	0	4	Unsigned 16bit
3711		Lenght = 1	Type	0(High)	1(Low)	Unsigned 16bit

14.17 mA2 Output Configuration

Address	Read Command	Description	Value	Description	Type of Data
3014	Read Input Register [Function 04]	Link Function mA	0	OFF	Unsigned 16bit
			1	TEMPERATURE	
			2	MEASURE SLOT A	
			3	MEASURE SLOT B	
3015		Type Function mA	0	Repeater [PID Off]	Unsigned 16bit
			1	PID On	

14.17.1 mA2 Link Function Measure Temperature

14.17.1.1 Type Function Repeater

Address	Read Command	Write Multiple Register [Function 16]	Description	°C		°F		Type of Data
				min	max	min	max	
3800	Read Input Register [Function 04]	Lenght = 3	Start mA L	-500	1500	-580	3020	Signed 32bit
3801			Start mA H					
3802			Decimal Start mA	1	1	1	1	Unsigned 16bit
3803		Lenght = 3	End mA L	-500	1500	-580	3020	Signed 32bit
3804			End mA H					
3805			Decimal End mA	1	1	1	1	Unsigned 16bit

14.17.1.2 Type Function PID

Address	Read Command	Write Multiple Register [Function 16]	Description	°C		°F		Type of Data
				min	max	min	max	
3808	Read Input Register [Function 04]	Lenght = 3	Setpoint L	-500	1500	-580	3020	Signed 32bit
3809			Setpoint H					
3810			Decimal Setpoint	1	1	1	1	Unsigned 16bit
3811		Lenght = 1	Type	0(High)	1(Low)	0(High)	1(Low)	Unsigned 16bit

14.17.2 mA2 Link Function Measure pH/ORP

14.17.2.1 Type Function Repeater

Address	Read Command	Write Multiple Register [Function 16]	Description	pH		mV		Type of Data
				min	max	min	max	
3800	Read Input Register [Function 04]	Lenght = 3	Start mA L	0	1400	-2000	2000	Signed 32bit
3801			Start mA H					
3802			Decimal Start mA	2	2	0	0	Unsigned 16bit
3803		Lenght = 3	End mA L	0	1400	-2000	2000	Signed 32bit
3804			End mA H					
3805			Decimal End mA	2	2	0	0	Unsigned 16bit

14.17.2.2 Type Function PID

Address	Read Command	Write Multiple Register [Function 16]	Description	pH		mV		Type of Data
				min	max	min	max	
3808	Read Input Register [Function 04]	Lenght = 3	Setpoint L	0	1400	-2000	2000	Signed 32bit
3809			Setpoint H					
3810			Decimal Setpoint	2	2	0	0	Unsigned 16bit
3811		Lenght = 1	Type	0(Acid)	1(Alka)	0(High)	1(Low)	Unsigned 16bit

14.17.3 mA2 Link Function Measure EC-COND

14.17.3.1 Type Function Repeater

Address	Read Command	Write Multiple Register [Function 16]	Description	min	max	Type of Data
3800	Read Input Register [Function 04]	Lenght = 3	Start mA L	0	99999	Signed 32bit
3801			Start mA H			
3802			Decimal Start mA	0	4	Unsigned 16bit
3803		Lenght = 3	End mA L	0	99999	Signed 32bit
3804			End mA H			
3805			Decimal End mA	0	4	Unsigned 16bit

14.17.3.2 Type Function PID

Address	Read Command	Write Multiple Register [Function 16]	Description	min	max	Type of Data
3808	Read Input Register [Function 04]	Lenght = 3	Setpoint L	0	99999	Signed 32bit
3809			Setpoint H			
3810			Decimal Setpoint	0	4	Unsigned 16bit
3811		Lenght = 1	Type	0(High)	1(Low)	Unsigned 16bit

14.17.4 mA2 Link Function Measure Input-mA

14.17.4.1 Type Function Repeater

Address	Read Command	Write Multiple Register [Function 16]	Description	min	max	Type of Data
3800	Read Input Register [Function 04]	Lenght = 3	Start mA L	-99999	99999	Signed 32bit
3801			Start mA H			
3802			Decimal Start mA	0	4	Unsigned 16bit
3803		Lenght = 3	End mA L	-99999	99999	Signed 32bit
3804			End mA H			
3805			Decimal End mA	0	4	Unsigned 16bit

14.17.4.2 Type Function PID

Address	Read Command	Write Multiple Register [Function 16]	Description	min	max	Type of Data
3808	Read Input Register [Function 04]	Lenght = 3	Setpoint L	-99999	99999	Signed 32bit
3809			Setpoint H			
3810			Decimal Setpoint	0	4	Unsigned 16bit
3811		Lenght = 1	Type	0(High)	1(Low)	Unsigned 16bit

14.17.5 mA2 Link Function Measure Flow

14.17.5.1 Type Function Repeater

Address	Read Command	Write Multiple Register [Function 16]	Description	min	max	Type of Data
3800	Read Input Register [Function 04]	Lenght = 3	Start mA L	0	99999	Signed 32bit
3801			Start mA H			
3802			Decimal Start mA	0	4	Unsigned 16bit
3803		Lenght = 3	End mA L	0	99999	Signed 32bit
3804			End mA H			
3805			Decimal End mA	0	4	Unsigned 16bit

14.17.5.2 Type Function PID

Address	Read Command	Write Multiple Register [Function 16]	Description	min	max	Type of Data
3808	Read Input Register [Function 04]	Lenght = 3	Setpoint L	0	99999	Signed 32bit
3809			Setpoint H			
3810			Decimal Setpoint	0	4	Unsigned 16bit
3811		Lenght = 1	Type	0(High)	1(Low)	Unsigned 16bit

14.17.6 mA2 Link Function Measure CL-AMP/Br

14.17.6.1 Type Function Repeater

Address	Read Command	Write Multiple Register [Function 16]	Description	min	max	Type of Data
3800	Read Input Register [Function 04]	Lenght = 3	Start mA L	0	99999	Signed 32bit
3801			Start mA H			
3802			Decimal Start mA	0	4	Unsigned 16bit
3803		Lenght = 3	End mA L	0	99999	Signed 32bit
3804			End mA H			
3805			Decimal End mA	0	4	Unsigned 16bit

14.17.6.2 Type Function PID

Address	Read Command	Write Multiple Register [Function 16]	Description	min	max	Type of Data
3808	Read Input Register [Function 04]	Lenght = 3	Setpoint L	0	99999	Signed 32bit
3809			Setpoint H			
3810			Dec Setpoint	0	4	Unsigned 16bit
3811		Lenght = 1	Type	0(High)	1(Low)	Unsigned 16bit