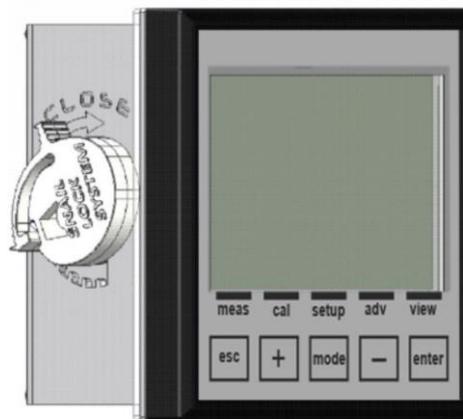


Operation Manual 0/4-20mA Input and Temperature Transmitter



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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.

GENERAL

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.

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 12÷32Vdc (24Vac±10%)).**
- **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 (1/2 DIN)

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

For **Panel Mounted** device (1/4 DIN)

- 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 96x96 (1/4 DIN) | 0% ÷ 95% Non-Condensing |
| - Relative Humidity Box 144x144 (1/2 DIN) | 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

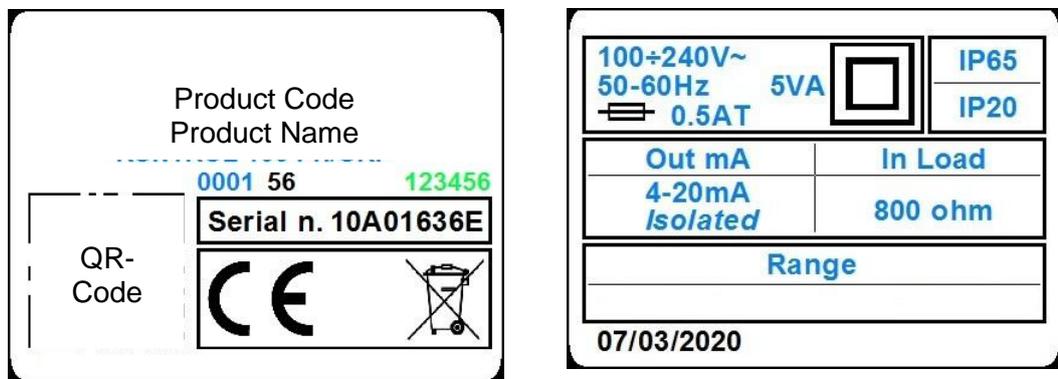
The symbol illustrated below represents the **ATTENTION** symbol and reminds the operator that he should read the user manual for important information, advice and suggestions regarding the correct and safe use of the equipment.



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



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.

GENERAL DESCRIPTION

The analyzer treated in this manual consists of an Electronic Control Unit and a Technical Manual. It is powered from the mains (100 ÷ 240 Vac 50-60 Hz), with a power consumption of 5W, through a switching power supply.

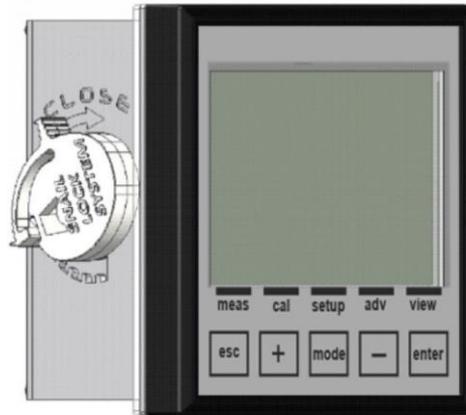


Figure 1 – Wall mounted Central Unit

MAIN CHARACTERISTICS

- mA input for 0/20mA or 4/20mA sensors with two or three wires.
- Temperature Measure with PT100 / PT1000 Probe
- Programming keyboard with 5 keys
- Graphic Display, 128x128 pixels, with three colors backlight (white, green and red)
- Serial Output RS485 MODBUS RTU/ASCII (upon request)
- 2 Programmable Analog Outputs
- 2 Frequency Programmable Digital Outputs
- 2 Relay Outputs for Intervention Thresholds, Wash and Remote Alarm
- 2 Digital Inputs for blocking the dosages

TECHNICAL SPECIFICATIONS FOR THE mA MEASURE (PRIMARY)

Sensor	Current Sensor with 2 or 3 wires
Measure Range	0/20mA or 4/20mA
Resolution	±1µA
Precision	±10µA

TECHNICAL SPECIFICATIONS FOR THE TEMPERATURE MEASURE (SECONDARY)

Sensor	PT100/PT1000
Measure Range	-50 ÷ +150°C
Resolution	± 0.1°C (°F)
Precision	PT100: ±0.5°C (±0.9°F) – PT1000: ±0.2°C (±0.4°F)

OPERATING SPECIFICATIONS

Power Supply	00÷240 Vac 50-60 Hz or 12÷32 Vdc (24Vac ±10%)
Power Consumption	< 5W (@100÷240Vac) and <3.5W (@12÷32Vdc)
Relay Outputs:	
Alarms:	
Function	Delay, Faults and Min./Max
Delay Time	1÷3600sec
Threshold disabling	Enable / Disable
Relay function	Closed / Open
Permanence Interval	-99999 ÷ 99999
Permanence Time	1÷3600sec
	For Alarm and Wash it is used the relay n. 2 with normally open contact.
HOLD Digital Input:	
Input Voltage	12÷32 Vdc
Absorption	10mA max
Analog Outputs:	
Outputs	n.2 4-20mA Programmable
Maximum Load	800 Ohm
NAMUR Alarm Output	3.6 mA or 22 mA
Hold Alarm Value	

CONTROLS, INDICATORS AND CONNECTIONS

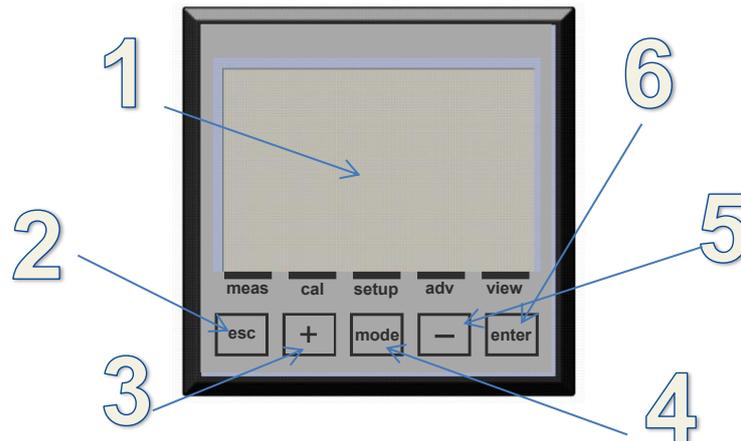


Figure 2 – Instrument

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

GRAPHIC DISPLAY SUBDIVISION AREAS IN RUN MODE

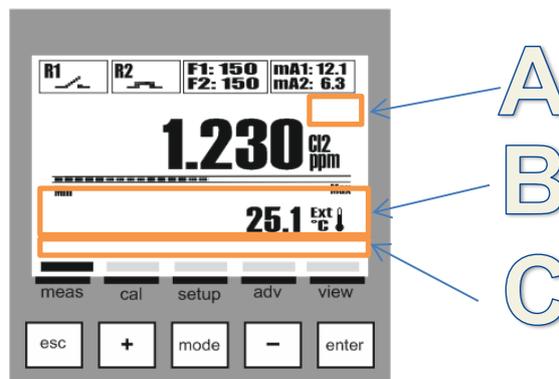


Figure 3 – Graphic Display - Subdivision Areas

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

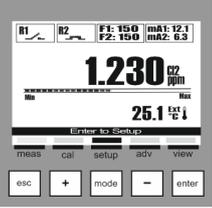
- A) Service icons such as Danger, Maintenance, Wait Time, Data Transmission.
- B) Text messages for Alarms and operation information or temperature value with external sensor (ext) or manually set value (man).
- C) Menu name associated to the icon on the status bar

GRAPHIC DISPLAY

The graphic display allows a series of views for the various menus, for programming and for viewing during operation (run).

LIST OF THE MAIN MENUS

The following table shows the screens visualized on the display representing the different menus

VISUALIZATION ON THE GRAPHIC DISPLAY	DESCRIPTION
	VIEW MEASURE
	CALIBRATION MENU Sensor Calibration Procedure
	SETUP MENU Output Parameters Setup
	ADVANCED MENU Device Configuration Menu
	VIEW MENU Measure Visualization Setting



Note: Automatic exit from menu after 5 minutes of inactivity without saving data.

INSTALLATION

Before installing, read carefully what is written below.



INSTALLING THE CENTRAL UNIT ON THE WALL

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

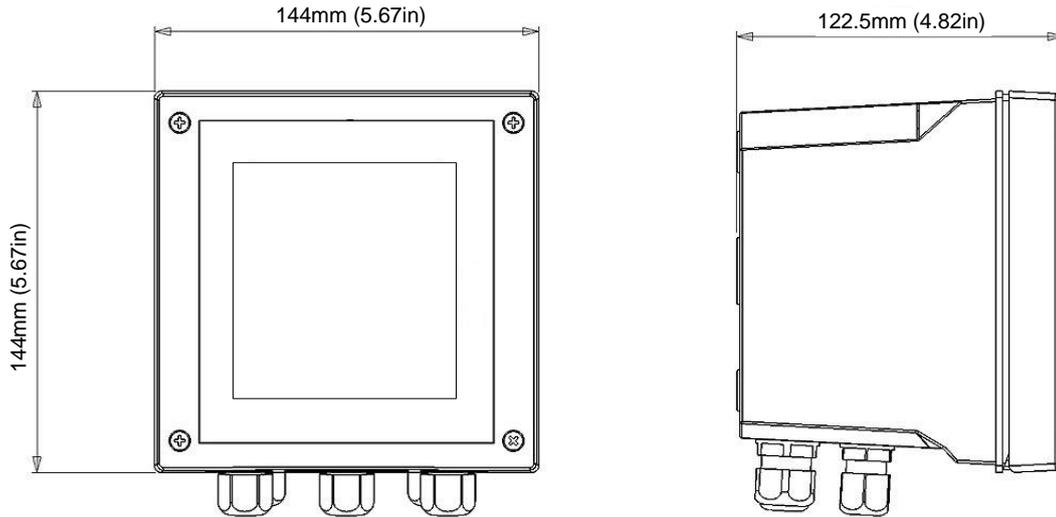
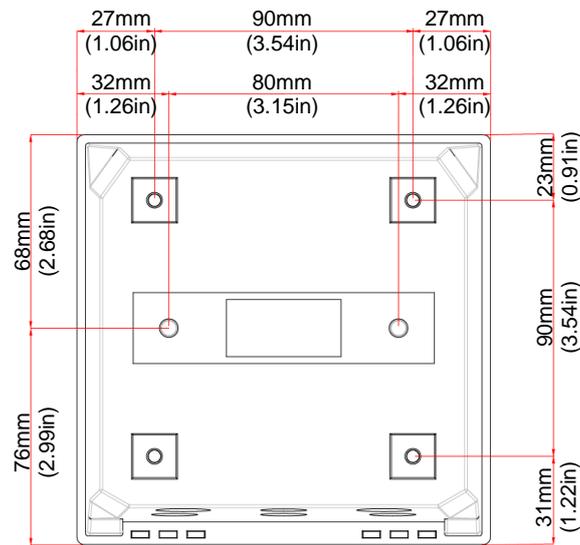


Figure 4 – Dimensions and footprint for wall mounted central unit

Mechanical Dimensions	
Dimensions (W x H x D)	144 x 144 x 122.5 mm (5.67 x 5.67 x 4.82 in)
Fixing depth	122.5 mm (4.82 in)
Material	ABS
Mounting	Wall
Weight	0.823 Kg (1.81 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.

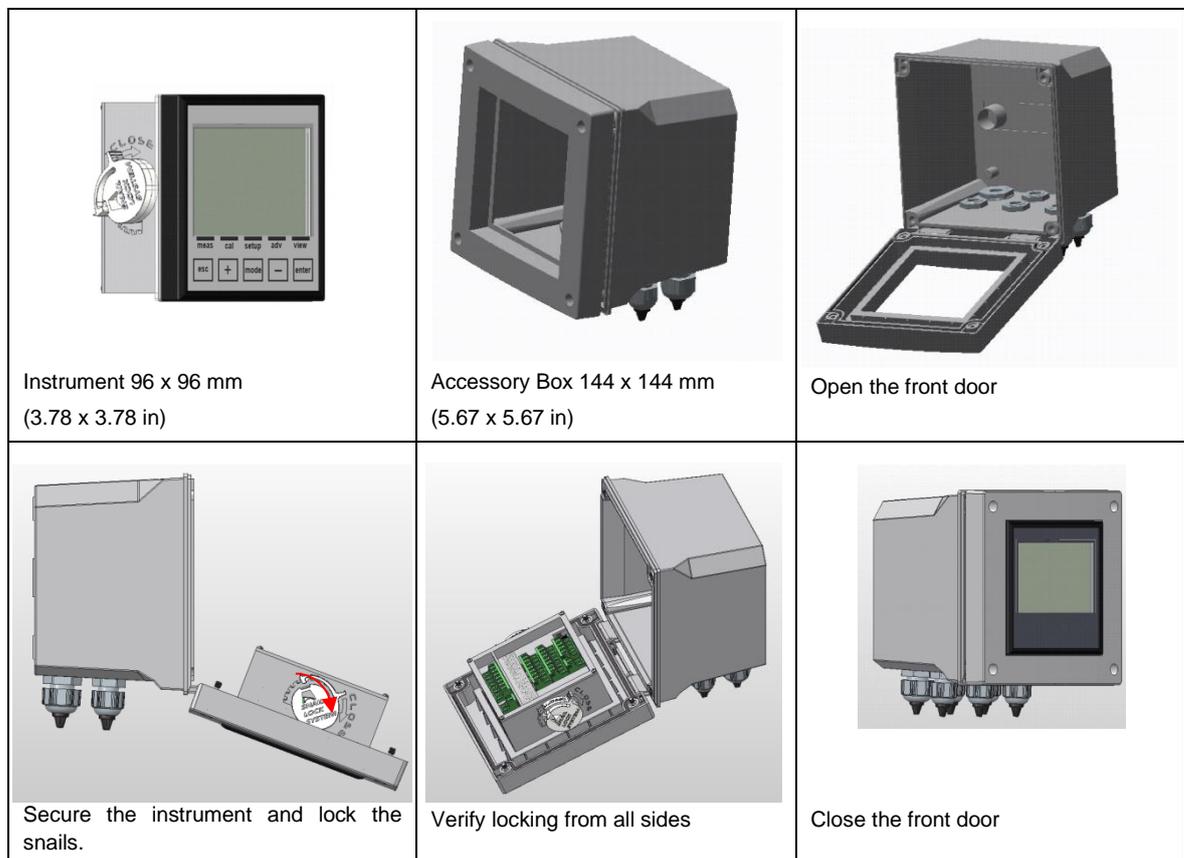
The cable glands for the electrical connections are located on the lower part of the control unit and therefore, in order to facilitate the connections, any other devices must be positioned at least at 15 cm (5.91 in) away.

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



Note: The BOX 144x144 mm (5.67 x 5.67 in) is a plastic accessory, an IP65 certified item to be purchased separately.

Example: Assembling the instrument 96x96 mm (3.78 x 3.78 in) into the accessory Box 144x144 mm (5.67 x 5.67 in) with IP65 protection



INSTALLING THE CENTRAL UNIT 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).

The panel cutout must comply with the following layout:

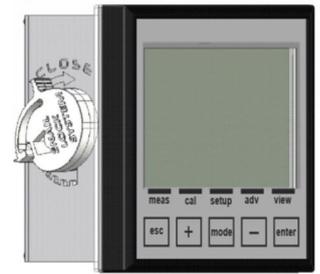
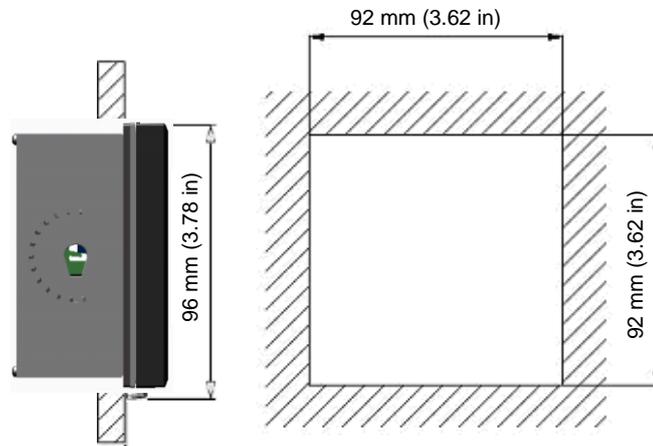


Figure 5 – Panel cutout and dimensions

Mechanical Dimensions	
Dimensions (W x H x D)	96 x 96 x 42 mm (3.78 x 3.78 x 1.65 in)
Fixing depth	130mm (5.12 in)
Material	ABS
Mounting	Panel
Weight	0.4 Kg (0.88 lb)
Front Panel	UV Resistant Polycarbonate



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



Figure 6 – Panel Mounted Central Unit with Snail Lock System

CONNECTION TO THE POWER SUPPLY

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).

Use an alternating 100Vac to 240Vac-50/60Hz power supply – or as specified on the plate. The power supply must be as stabilized as possible.

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) for the operation of dosing pumps or control
- (SET2) 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 Annex I.

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 Annex I.

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).

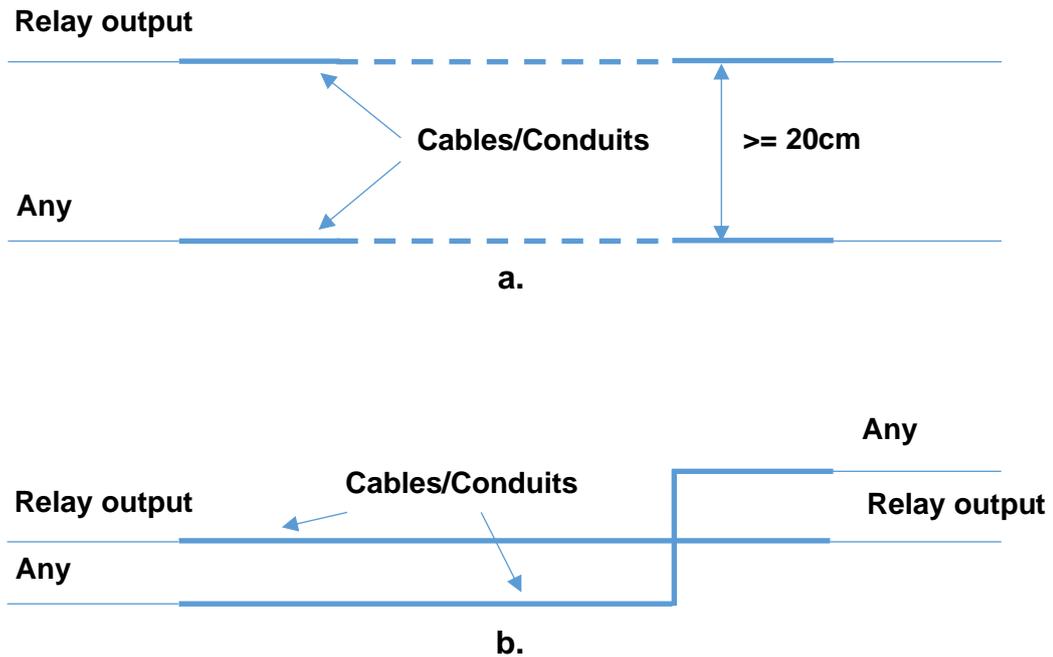
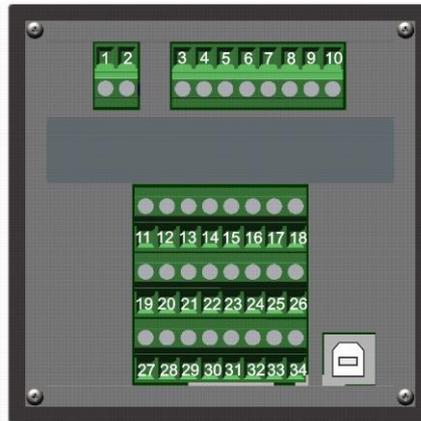


Figure 8 – Relay cable segregation

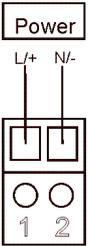
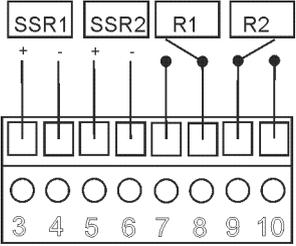
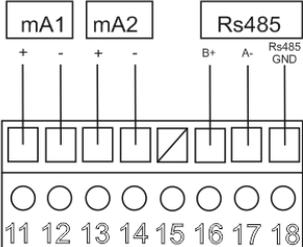
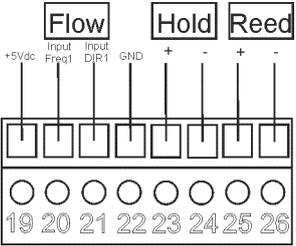
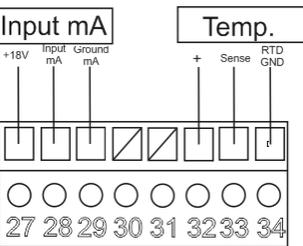
CONNECTION TERMINAL BLOCK FOR THE WALL MOUNTED DEVICE



N° (TERMINAL)	Symbols	DESCRIPTION
1	L / +	Power supply (Phase)
2	N / -	Power supply (Neutral)
3	SSR1 (+)	Frequency output 1 (SSR1 +)
4	SSR1 (-)	Frequency output 1 (SSR1 -)
5	SSR 2 (+)	Frequency output 2 (SSR 2 +)
6	SSR 2 (-)	Frequency output 2 (SSR 2 -)
7	RL1 NO	Relay 1 Contact
8	RL1 COM	Relay 1 Contact
9	RL2 COM	Relay 2 Contact
10	RL2 NO	Relay 2 Contact
11	OUT mA1 (+)	Current output 1 (OUT mA1 +)
12	OUT mA1 (-)	Current output 1 (OUT mA1 -)
13	OUT mA2 (+)	Current output 2 (OUT mA2 +)
14	OUT mA2 (-)	Current output 2 (OUT mA2 -)
15	NOT USED	Not Used
16	RS485 (B+)	Serial Port for Data (RS485 B+) (optional on request)
17	RS485 (A-)	Serial Port for Data (RS485 A-) (optional on request)
18	RS485 (GND)	Serial Port for Data (RS485 GND) (optional on request)
19	+ 5VDC	(* Flow Sensor Power Supply (+ 5VDC)
20	INPUT Freq1	(* Flow Measure Input (INPUT Freq1)
21	INPUT DIR1	(* Flow Measure Input (INPUT DIR1)
22	GND	(* Flow Sensor Power Supply (GND)
23	HOLD (+)	12÷32 VDC HOLD Signal Input (+)
24	HOLD (-)	12÷32 VDC HOLD Signal Input (-)
25	REED (+)	REED Sensor Input (+)
26	REED (-)	REED Sensor Input (-)
27	+18V	Power supply output for sensor (Max. 50mA)
28	IN mA	Current input for sensor (0/20mA or 4/20mA)
29	GND mA	Used to connect the three-wire sensors
30	NOT USED	NOT USED
31	NOT USED	NOT USED
32	RTD (+)	PT100 or PT1000 Temperature Probe Input
33	RTD SENSE	PT100 or PT1000 Temperature Probe Input
34	RTD GND	PT100 or PT1000 Temperature Probe Input
USB	USB PORT	(* USB Port for Software Update

(*Input or Output unavailable)

Terminal block connections

Description	Graphic
<p>Instrument Power Supply Input: 100÷240 Vac or 12÷32 VDC (24Vac) Note: Check the product label.</p>	
<p>Outputs: SSR1 and SSR2: Solid State Relays (400Vac/dc, 125mA) R1 and R2: Electromechanical Relays (250Vac or 30VDC, 5A Resistive)</p>	
<p>Outputs: mA1 and mA2: Current Outputs 4÷20mA (800 ohm) RS485: Serial Port for Data Communication (upon request)</p>	
<p>Inputs: Flow: Flow Sensor Input (upon request) Hold: 12÷32 Vdc Signal Input Reed: Dry Contact Signal Input</p>	
<p>Inputs: mA Input: Current Sensor with 2 or 3 wires Temp: Temperature Measure Input PT100 or PT1000</p>	

(Note: See ANNEX I for Wiring Examples)

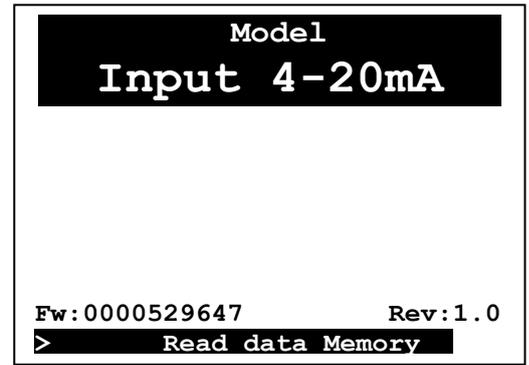
SENSOR CONNECTION



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.

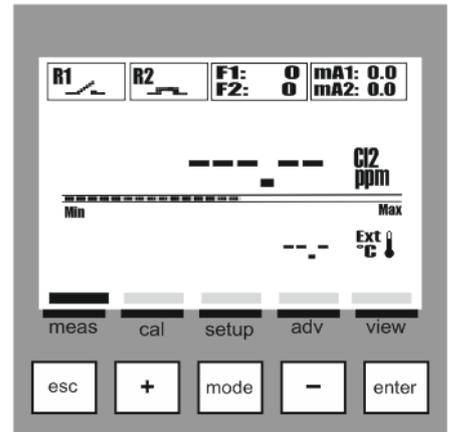
STARTUP

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

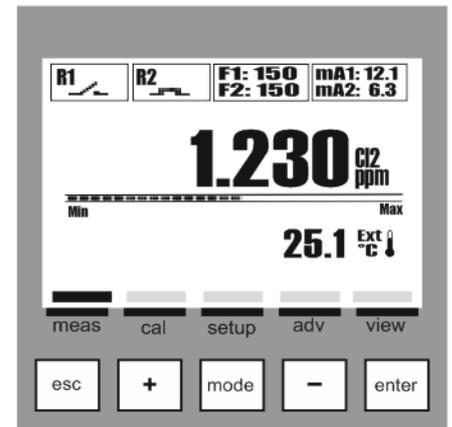


Wait

The instrument enables all the measure functions within 5 seconds.



View Measure and Outputs Activation



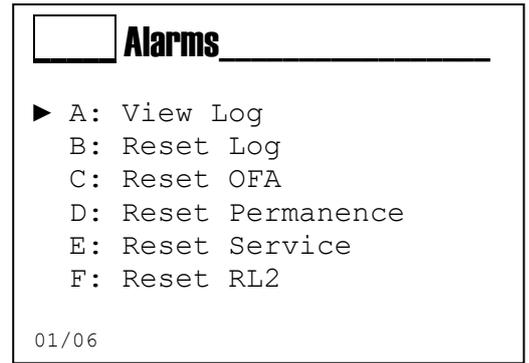
ALARMS MENU



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 six (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 Permanence: deletes the alarm
- E:** Reset Service: deletes the alarm and resets the counter
- F:** Reset RL2 (used as alarm):

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

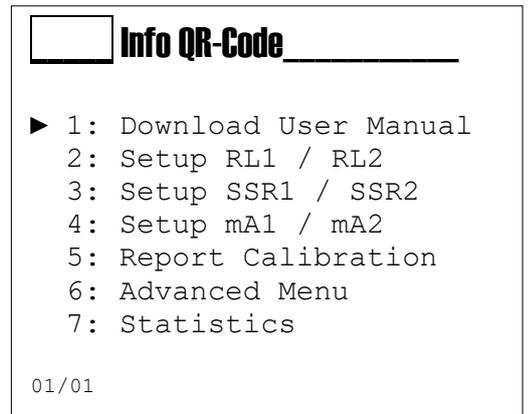


INFO MENU

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

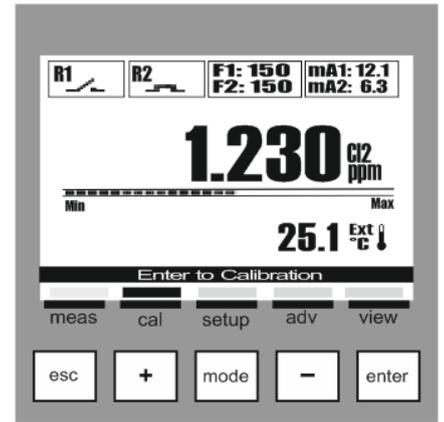
In this section you can download the complete manual or the instrument settings.

The QR-Code will be displayed on the screen, with which it will be possible to start the download.



CALIBRATION MENU (INDEX MENU 1)

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

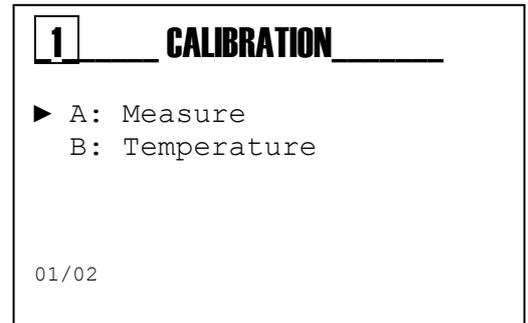


Calibration Menu 1

The Calibration menu consists of two (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.

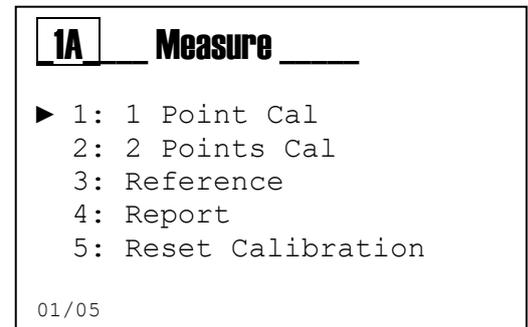


Calibration Menu 1 Measure (Menu 1A)

The Measure Calibration menu consists of five (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.





CALIBRATION PROCEDURE

Calibration Menu Measure (Menu 1A)

1A	Measure
▶	1: 1 Point Cal
	2: 2 Points Cal
	3: Reference
	4: Report
	5: Reset Calibration
01/05	

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.

1A1	1 Point Cal
1: Wait	60 s

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

1A1	1 Point Cal
1: Point 1	1.07ppm

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

Press the **Enter** key when ready.

1A1	Calibration Value
1.20	ppm
7 8 9	?
4 5 6	+/-
1 2 3	Canc
0 .	Enter

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.

1A1	1 Point Cal
▶ -: Point 1	1.20 ppm
-: Gain	1.1240
-: Offset	0.0000 ppm
-: Save?	



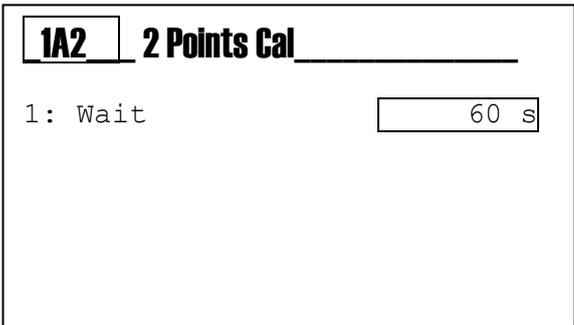
The instrument displays the question to confirm and save all the calibration data.

At the end the instrument returns to Calibration menu 1.

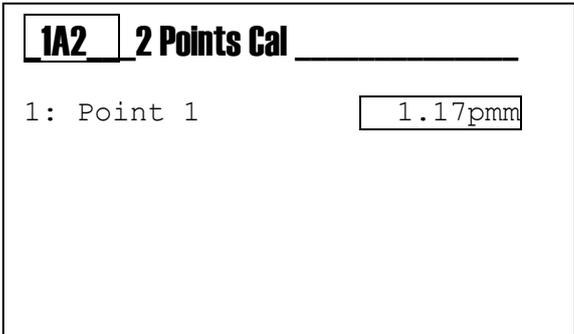
-	Save?
	Yes
	No

Menu 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.

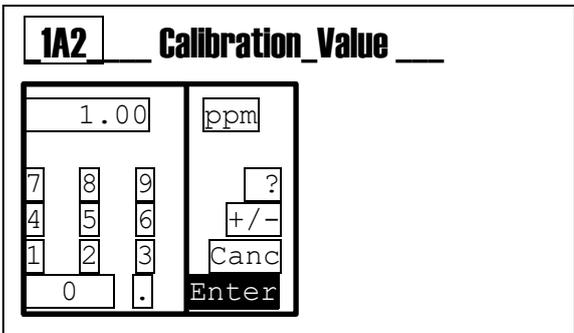


At the end of the countdown, insert the first calibration value.

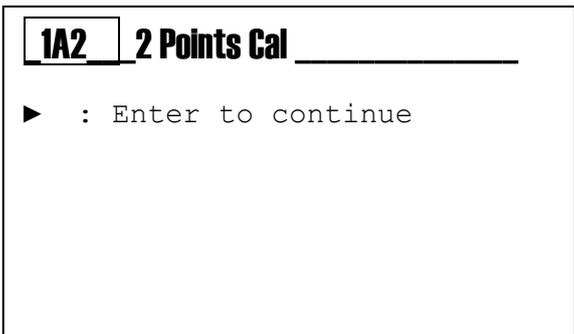


The instrument displays a numeric keypad to insert the known value.

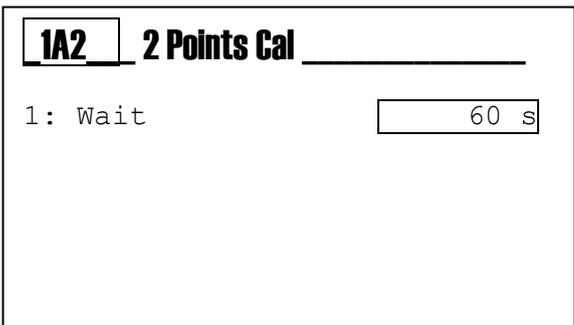
Press the **Enter** key when ready.



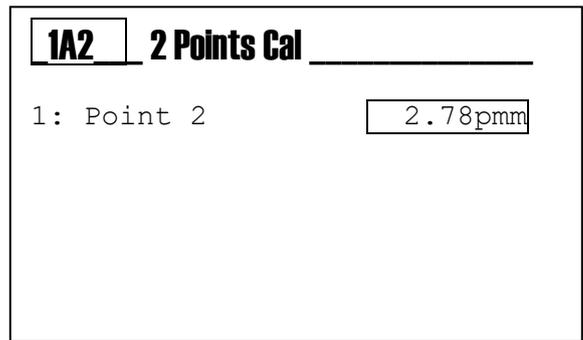
Prepare the second calibration point of the sensor.
Insert the sensor into the second buffer solution.
Press the **Enter** key when ready.



Wait for 60 seconds.

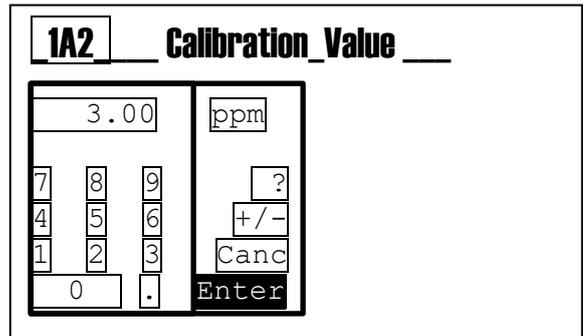


At the end of the countdown, insert the second calibration value.



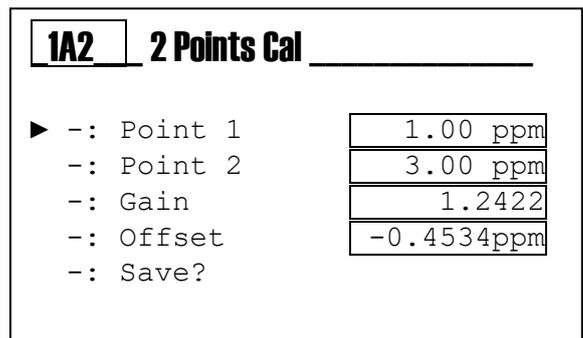
The instrument displays a numeric keypad to insert the known value.

Press the **Enter** key when ready.



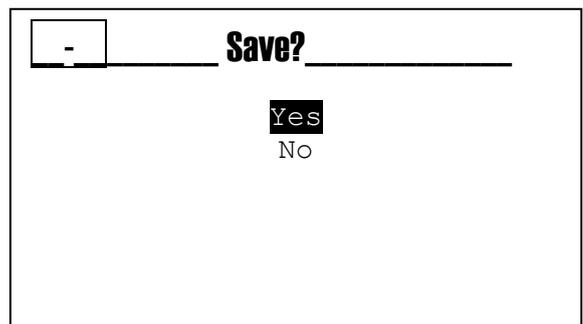
The instrument displays:

- 1: The calibration value used 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.



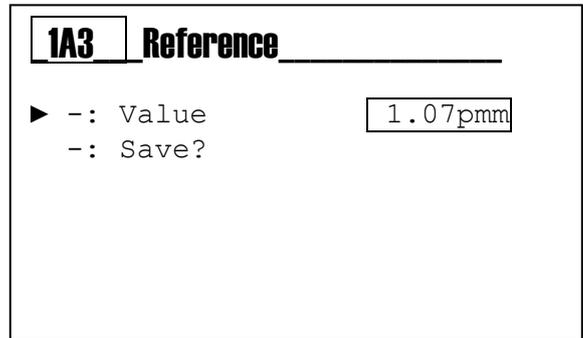
The instrument displays the question to confirm and save all the calibration data.

At the end the instrument returns to Calibration menu 1.



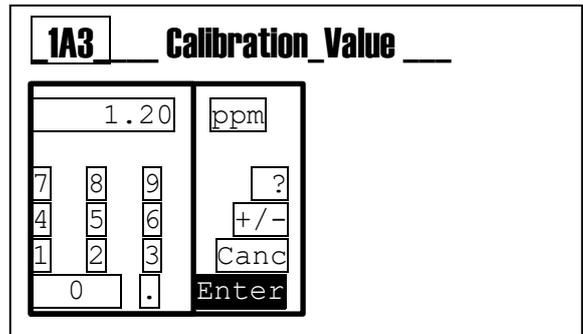
Menu 1A3 Reference Calibration

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

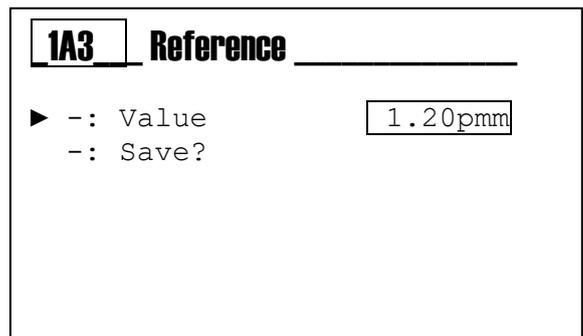


The instrument displays a numeric keypad to insert the known value.

Press the **Enter** key when ready.

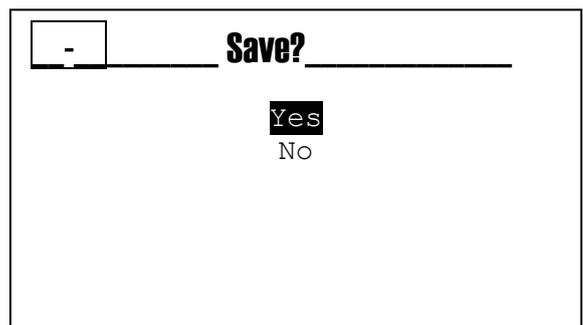


The instrument displays:
1: The calibration value.
2: Enter to confirm and save all the calibration parameters..



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

At the end the instrument returns to Calibration menu 1.



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 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	

CALIBRATION ERRORS



Power Supply +18V is in Short:

- Damaged wiring
- Sensor is in Short

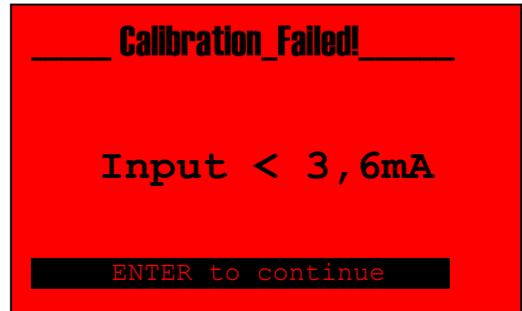


mA Input less than 3.6mA:

- Damaged wiring
- Sensor missing

Note: This alarm is active only if:

- The input current is lower than 3.6mA
- The menu 3E1 is set to 4-20mA
- The menu 3E5 is set to 3.6mA

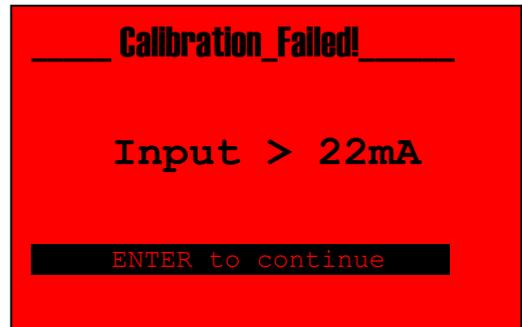


mA Input greater than 22mA:

- Damaged wiring
- Sensor missing

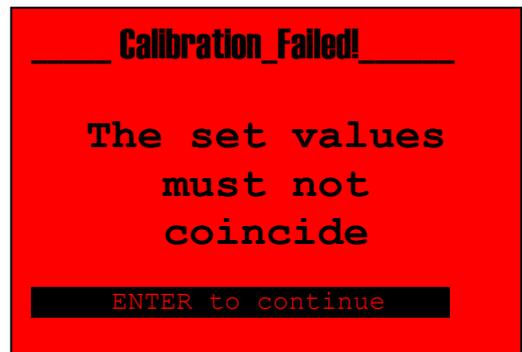
Note: This alarm is active only if:

- The input current is higher than 22mA
- The menu 3E4 is set to 22mA



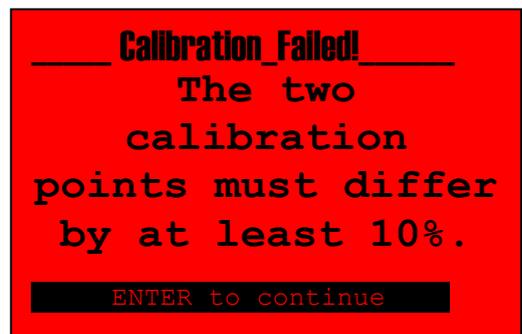
The set values must not coincide:

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



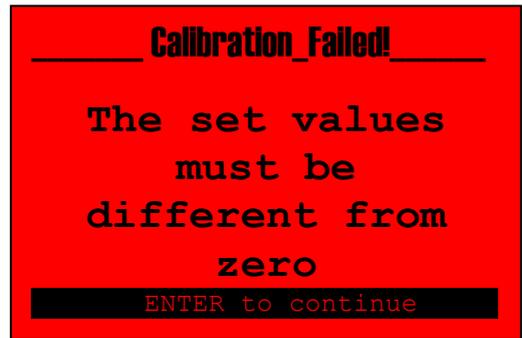
The two calibration points must differ by at least 10%:

- 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:

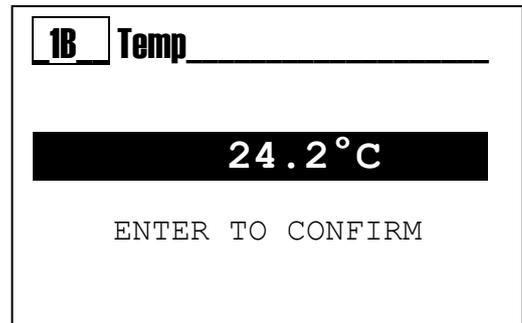
- Only for the 1 point calibration, the values set from numeric keypad must be different from zero.



Temperature Measure Calibration Menu (Menu 1B)

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.



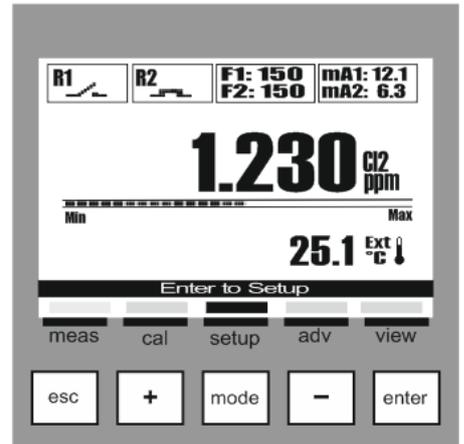
Menu 1B

The instrument displays the message "Calibration Failed" if the probe is damaged or disabled from the menu 3E1; see manual, the Advanced Menu section.



SETUP MENU (INDEX MENU 2)

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 six (6) items or sub-menus:

- 2A: Relay 1
- 2B: Relay 2
- 2C: SSR1 (Solid State Relay)
- 2D: SSR2 (Solid State Relay)
- 2E: Output mA1 (Range 4÷20 mA)
- 2F: Output mA2 (Range 4÷20 mA)

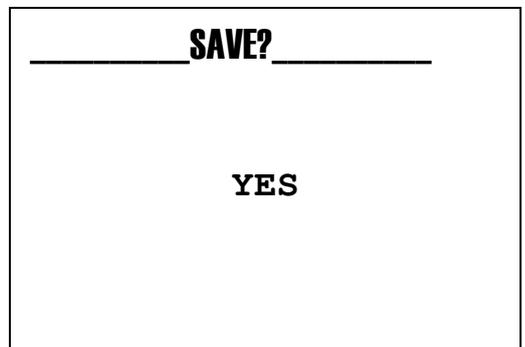


Note: To set the relative function to each output, read the manual at the **Advanced Menu\Outputs Configuration** section (INDEX MENU 3H).

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.



SETUP MENU \ RELAY 1 (ONE) (INDEX MENU 2A)

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** and **2** can be set either for mA Measure or for Temperature Measure with the following activation methods:

ON/OFF Method

(Activation on threshold, with maintenance of the state)

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

2A2 **Activation 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 **Permanence**: Control on the variation of measure

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

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

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

Note: See **ANNEX A** 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 **ANNEX B** 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 **Proportional 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 measure according to the distance from the SetPoint.

Note: See **ANNEX C** for a graphical example on using

2 SETUP	
▶ A: Relay 1	Disabled
B: Relay 2	Disabled
C: SSR 1	Disabled
D: SSR 2	Disabled
E: Output mA1	Disabled
01/06	

2A RELAY_1_ON/OFF	
▶ 1: SetPoint	1.20 ppm
2: Activ. Type	High
3: Hysteresis	0.00 ppm
4: Hyst. Time	00' 00"
5: Delay Start	00' 00"
6: Delay End	00' 00"
7: OFA	OFF
8: Over Range	OFF
9: Permanence	OFF
01/09	

2A RELAY_1_Timed	
7: OFA	OFF
8: Over Range	OFF
9: Permanence	OFF
▶ 10: Time On	00' 10"
11: Time Off	00' 10"
01/11	

2A RELAY_1_PWM	
7: OFA	OFF
8: Over Range	OFF
9: Permanence	OFF
▶ 10: Interval	00' 10"
11: Prop. Band	0.20 ppm
01/11	



SETUP MENU \RELAY 2 (TWO) (INDEX MENU 2B)

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

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

Relay 2 (two) can be set for the mA Measure or Temperature as indicated in the relay 1 menu (see the previous page), it is also possible to set the Wash and Alarm mode as follows:

Wash Method

Activation of a washing system for the probe

2B1 **Wash Time**: Value in minutes and seconds for washing the probe.

2B2 **Delay Measure**: Value in minutes and seconds to wait for the stability of measure.

2B3 **Wait New Wash**: Value in hours and minutes of waiting for a new washing action.



Note: See **ANNEX D** for a graphical example on using

Alarm Method

Remote repetition of the alarm through relay 2 (two). below is the list of the alarm events:

2B1 Over Range R1: measure out of range Relay 1

2B2 OFA R1: Maximum dosing time expired

2B3 Permanence Measure: measure blocked (frozen)

2B4 Reed Alarm: Alarm for the Reed sensor activation

2B5 Hold Alarm: Alarm for the Hold signal activation

2B6 Temperature Probe Alarm: Alarm for probe disconnected



Note: See **ANNEX E** for a graphical example on using

2 SETUP	
A: Relay 1	Disabled
▶ B: Relay 2	Disabled
C: SSR 1	Disabled
D: SSR 2	Disabled
E: Output mA1	Disabled
01/06	

2B Relay_2_Wash	
▶ 1: Wash Time	00' 00"
2: Delay Meas.	00' 00"
3: Wait New	OFF
01/3	

2B Relay_2_Alarms	
▶ 1: OverRange R1	NO
2: OFA R1	NO
3: Perm. Meas.R1	NO
4: Alarm Reed	NO
5: Alarm Hold	NO
6: Alarm Probe	NO
01/06	

SETUP MENU \ SSR1 AND SSR2 (INDEX MENU 2C AND 2D)

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 (one) and SSR2 (two) are two solid state relays used as frequency outputs.

The outputs SSR1 and SSR2 can be set either for mA Measure or for Temperature Measure

SSR1 Setup (INDEX MENU 2C)

2C1 **SetPoint**: value to maintain into the process

2C2 **Activation Type**:

Low as the minimum value to maintain

High as the maximum value to maintain

2C3 **Pulse Max**: Maximum value of pulses (range:20÷400)

2C4 **Pulse min**: Minimum value of pulses (range:1÷100)

2C5 **Proportional 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 measure according to the distance from the SetPoint.

2 SETUP	
A: Relay 1	Disabled
B: Relay 2	Disabled
▶ C: SSR 1	Disabled
D: SSR 2	Disabled
E: Output mA1	Disabled
01/06	

2C SSR1	
▶ 1: SetPoint	1.20 ppm
2: Activ. Type	High
3: Pulse Max	400
4: Pulse min	1
5: Prop. Band	0.20 ppm
01/05	



Note: See ANNEX F for a graphical example on using

SSR2 Setup (INDEX MENU 2D)

2D1 **SetPoint**: value to maintain into the process

2D2 **Activation Type**:

Low as the minimum value to maintain

High as the maximum value to maintain

2D3 **Pulse Max**: Maximum value of pulses (range:20÷400)

2D4 **Pulse min**: Minimum value of pulses (range:1÷100)

2D5 **Proportional 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 measure according to the distance from the SetPoint.

2D SSR2	
▶ 1: SetPoint	25.0°C
2: Activ. Type	High
3: Pulse Max	400
4: Pulse min	1
5: Prop. Band	10.0°C
01/05	



Note: See ANNEX F for a graphical example on using

SETUP MENU \ OUTPUT mA1 AND mA2 (INDEX MENU 2E AND 2F)

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 (one) and mA2 (two) 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 for mA Measure or for Temperature Measure.

Output mA1 Setup (INDEX MENU 2E)

- 2E1 **Start mA**: Measure value associated to the 4 mA value
- 2E2 **End mA**: Measure value associated to the 20 mA value
- 2E3 **Keep**: Freezes the current value in case of Holding Alarm
- 2E4 **Namur**: Sets the current value to 3.6 mA or 22 mA in case of Alarm



Note: See **ANNEX G** for a graphical example on using

Output mA2 Setup (INDEX MENU 2F)

- 2F1 **Start mA**: Measure value associated to the 4 mA value
- 2F2 **End mA**: Measure value associated to the 20 mA value
- 2F3 **Keep**: Freezes the current value in case of Holding Alarm
- 2F4 **Namur**: Sets the current value to 3.6 mA or 22 mA in case of Alarm



Note: See **ANNEX G** for a graphical example on using

Setup Output mA1 or mA2 as PID

- 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 **Algorithm**: The type of PID algorithm that will be used
- 2F4 **Prop. Band**: The Proportional Range of the PID regulation compared with the bottom of the scale for the instrument.
- 2F5 **Integ. Time**: The Integrative part is set. The more the programmed time increases, the more the system will mediate with the measuring swings.
- 2F6 **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.



Note: See **ANNEX H** for PID explanation

2 SETUP	
A: Relay 1	Disabled
B: Relay 2	Disabled
C: SSR 1	Disabled
D: SSR 2	Disabled
▶ E: Output mA1	Disabled
F: Output mA2	Disabled

2E Output_mA1	
▶ 1: Start mA	0.00 ppm
2: End mA	5.00 ppm
3: Keep	NO
4: Namur	OFF
01/04	

2F Output_mA2	
▶ 1: Start mA	-50.0°C
2: End mA	150.0°C
3: Keep	NO
4: Namur	OFF
01/04	

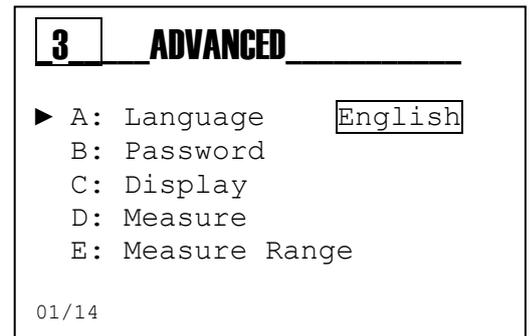
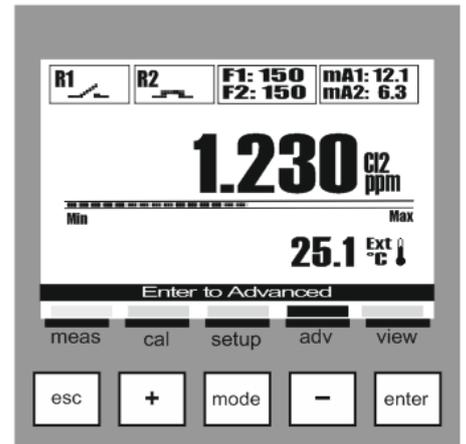
2F Output_mA2	
▶ 1: SetPoint	7.40pH
2: Type	High
3: Algorithm	PI
4: Prop. Band	100%
5: Integ. Time	01'00"
6: Deriv. Time	OFF
01/06	

ADVANCED MENU (INDEX MENU 3)

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 fourteen (14) items or sub-menus, as follows:

- A: Language
- B: Password
- C: Display
- D: Measure
- E: Measure Range
- F: Temperature Measure
- G: Alarms Setting
- H: Outputs Setting
- I: RS485 Setting
- J: USB Setting
- K: Control Panel
- L: Statistics
- M: System Reset
- N: Firmware Revision

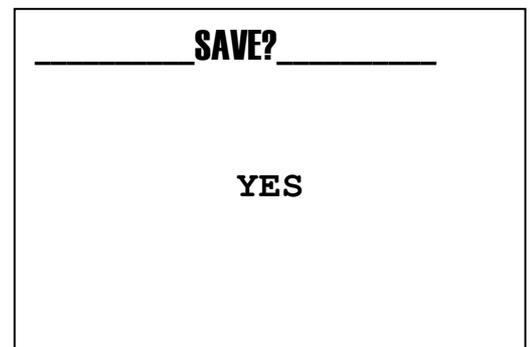


Below are illustrated the settings required for each sub-menu indicated above.

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.



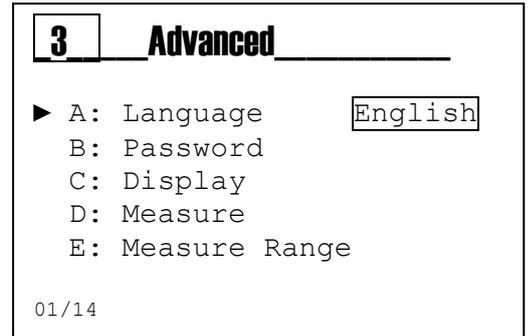
ADVANCED MENU \ LANGUAGE (INDEX MENU 3A)

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.

The instrument automatically changes the language of the menu and returns to the previous level, menu 3.



ADVANCED MENU \ PASSWORD (INDEX MENU 3B)

The menu consists of three (3) items that allows to select the menu protection Password and enable the Calibration menu or the Setup menu.

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

Password Function

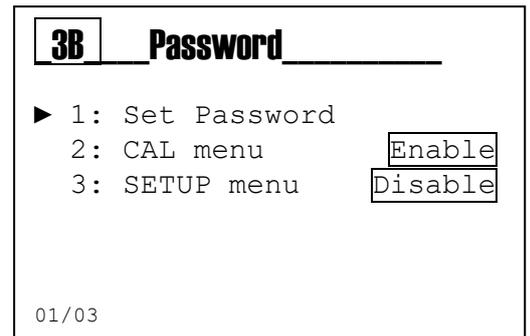
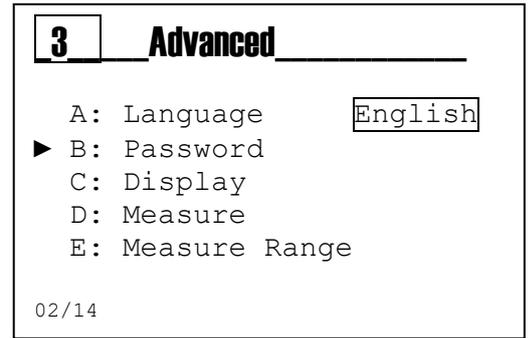
3B1 Set Password: set the numeric value

Note: If the password is present it will be displayed

Example: "Old Password 1234"

3B2 Calibration Menu: Enable or Disable the Calibration menu

3B3 Setup Menu: Enable or Disable the Setup menu



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 3B1

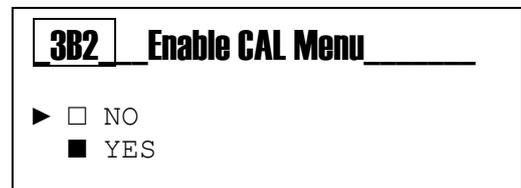
Set the value for password, other than 0000 using **(+)** and **(-)** keys and move to the right using the **Mode** key.



Menu 3B2

YES= Menu Enabled

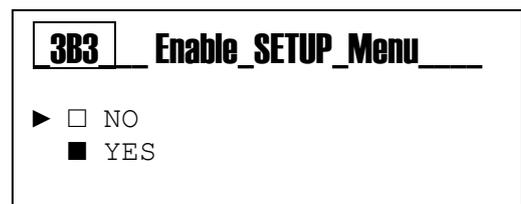
NO= Menu Disabled; can be accessed by entering the password



Menu 3B3

YES= Menu Enabled

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



ADVANCED MENU \ DISPLAY (INDEX MENU 3C)

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:

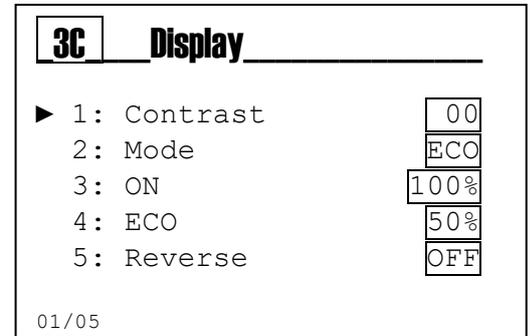
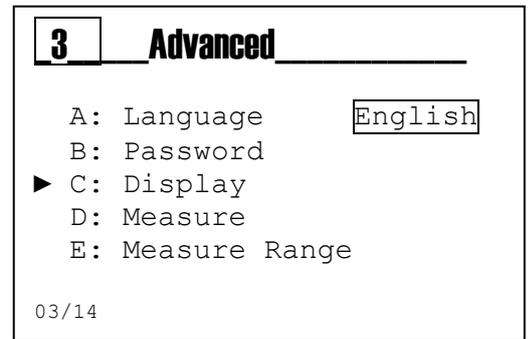
3C1 Contrast: Balance value between the menu writings and the background brightness

3C2 Mode: Turned on, Turned off, "ECO" Adjustment

3C3 On: Light value function always on

3C4 ECO: Light value function of electronic regulation

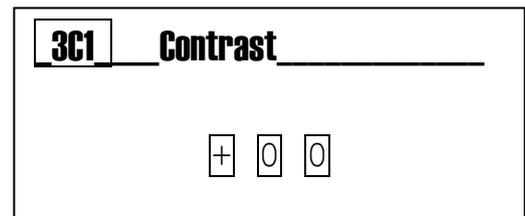
3C5 Reverse: Inverted display, white writings on black background.



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

Menu 3C1

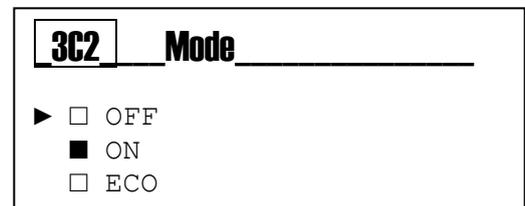
Adjusts the background brightness



Menu 3C2

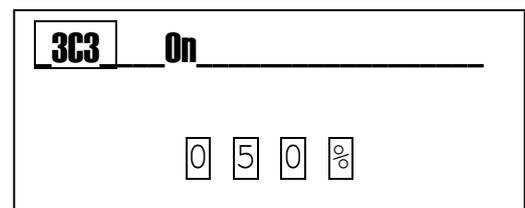
Select the Backlight function:

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



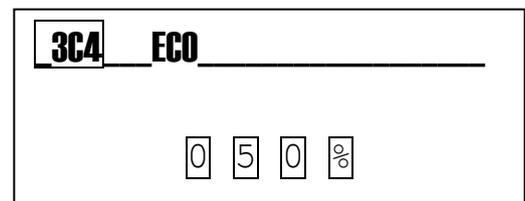
Menu 3C3

Select the brightness value for ON mode



Menu 3C4

Select the brightness value for ECO mode



Menu 3C5

Invert the writings on the display to obtain a high contrast



ADVANCED MENU \ MEASURE (INDEX MENU 3D)

The menu consists of six (6) items that allow to select Measure.

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

Measure Function (Index menu 3D)

3D1 **Measure Unit:** Select the measure unit.

3D2 **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".

3D3 **Measure Name:** Select the measure name.

3D4 **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".

3D5 **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

3D6 **Decimal Point:** set the position of the decimal point for the measure.

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

Menu 3D1

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

Menu 3D2

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

3	Advanced
A:	Language English
B:	Password
C:	Display
▶ D:	Measure
E:	Measure Range
04/14	

3D	Measure
▶ 1:	Meas. Unit ppm
2:	Unit.Custom
3:	Meas. Name Cl2
4:	Name Custom
5:	Filter Medio
6:	Dec. Point XXX,XX

3D1	Measure_Unit
▶ <input checked="" type="checkbox"/>	ppm
<input type="checkbox"/>	ppb
<input type="checkbox"/>	mg/l
<input type="checkbox"/>	mA
<input type="checkbox"/>	Custom
<input type="checkbox"/>	NTU
01/06	

3D2	Custom_Unit
U n i t	

Menu 3D3

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

3D3	Measure_Name _____
▶	<input checked="" type="checkbox"/> c12
	<input type="checkbox"/> PAA
	<input type="checkbox"/> H2O2
	<input type="checkbox"/> O3
	<input type="checkbox"/> Custom
	<input type="checkbox"/> O2
	<input type="checkbox"/> Turb
01/07	

Menu 3D4

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

3D4	Custom_Name _____
N a m e	

Menu 3D5

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

3D5	Meas. Filter _____
▶	<input checked="" type="checkbox"/> Low
	<input type="checkbox"/> Medium
	<input type="checkbox"/> High
01/03	

Menu 3D6

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**.

3D6	Decimal_Point _____
▶	<input checked="" type="checkbox"/> XXXXX,
	<input type="checkbox"/> XXXX, X
	<input type="checkbox"/> XXX, XX
	<input type="checkbox"/> XX, XXX
	<input type="checkbox"/> X, XXXX
01/05	

ADVANCED MENU \ MEASURE RANGE (INDEX MENU 3E)

The menu consists of five (5) items that allow to select Measure.

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

Measure Range Function (Index menu 3E)

3E1 Sensor Type: Select the type of sensor used, 0/20mA or 4/20mA.

3E2 Min Range: Set the value corresponding to 0 mA or 4 mA. Value between -99999 and 99999.

3E3 Max Range: Set the value corresponding to 20 mA. Value between -99999 and 99999.

3E4 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.

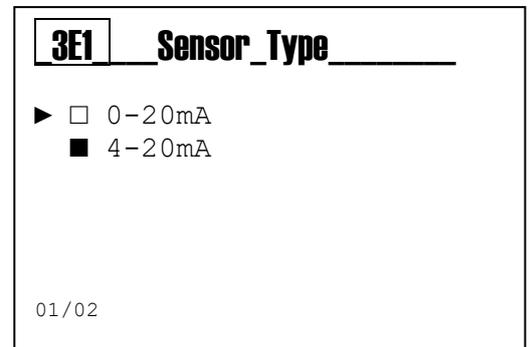
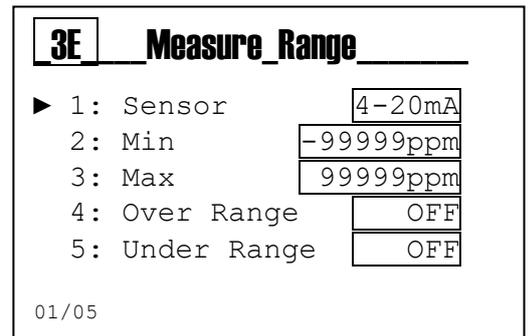
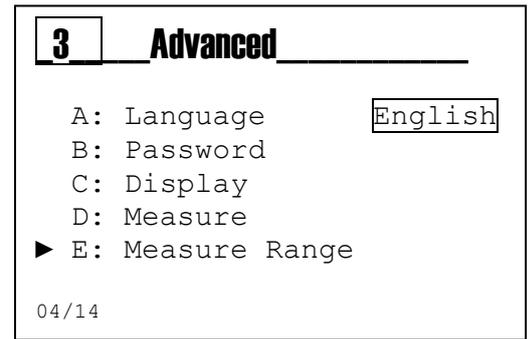
3E5 Under Range:

- 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.

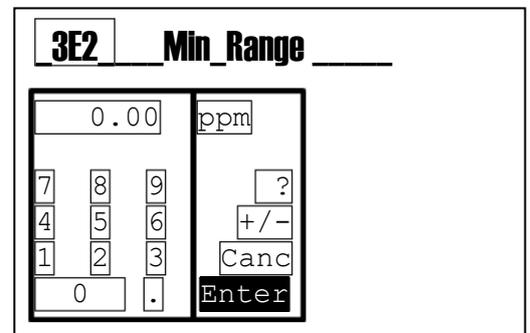
Menu 3E1

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



Menu 3E2

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



Menu 3E3

Set the value corresponding to 20 mA.

Value between -99999 and 99999.

The screenshot shows the '3E3 Max_Range' menu. At the top, the menu title is '3E3 Max_Range'. Below it is a numeric keypad with digits 0-9 and a decimal point. The display shows '5.00' and 'ppm'. To the right of the keypad are buttons for '?', '+/-', 'Canc', and 'Enter'.

Menu 3E4

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.

The screenshot shows the '3E4 Over Range' menu. The title is '3E4 Over Range'. Below the title are two radio button options: a selected radio button next to 'OFF' and an unselected radio button next to '22mA'. At the bottom left, it shows '01/02'.

Menu 3E5

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.



Note: The Under Range Alarm can only be activated if the menu 3E1 is set as 4-20mA. If the menu 3E1 is set as 0-20mA, the Under Range menu is configured to OFF and cannot be changed.

The screenshot shows the '3E4 Under Range' menu. The title is '3E4 Under Range'. Below the title are two radio button options: a selected radio button next to 'OFF' and an unselected radio button next to '3.6mA'. At the bottom left, it shows '01/02'.

ADVANCED MENU \ TEMPERATURE MEASURE (INDEX MENU 3F)

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

Temperature Measure Function (INDEX MENU 3F)

3F1 Selection: PT100 or PT1000 temperature sensor connected or using a manual temperature value.

3F2 Measure Unit: Set Celsius (°C) or Fahrenheit (°F) unit

3F3 Manual Value: Set the temperature value without PT100 or PT1000 temperature sensor.

3F4 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

B: Password
 C: Display
 D: Measure
 E: Measure Range
 ▶ F: Temperature Measure

06/14

3F
Temperature_Measure

▶ 1: Selection Manual
 2: Measure Unit °C
 3: Manual Value 25°C
 4: Filter Medium

01/04

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

Menu 3F1

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

3F1
Temp._Meas._Enabled

▶ Manual
 External

01/02

Menu 3F2

Select the measure unit.

3F2
Temp._Meas._Unit

▶ °C
 °F

01/02

Menu 3F3

Set the temperature value as manual value.

3F3
T_Manual_Value

27.0

°C

7

8

9

?

4

5

6

+/-

1

2

3

Canc

0

.

Enter

Menu 3F4

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

3F4
T_Measure_Filter

▶ Low
 Medium
 High

01/03

ADVANCED MENU \ ALARMS SETTING (INDEX MENU 3G)

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

Alarms Setting Function

3G1 Reed Logic: Set the sensor logic

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

3G2 Delay Reed: Set the delay time for alarm activation to change REED status

3G3 Delay Hold: Set the delay time for alarm activation for HOLD signal presence

3G4 Power Supply Interruption: Enables a visual alarm in case a power supply interruption took place in precedence.

3G5 Instrument blocking: Enables instrument blocking in case of alarm. The outputs are automatically set on the programmed alarm state.

3G6 Alarm Temp.: Enables a visual alarm or a instrument block in case the temperature probe is broken or disconnected.

3G7 Service: Set a value in days to display a message of "Service Required".

3	Advanced
C:	Display
D:	Measure
E:	Measure Range
F:	Temperature Measure
▶ G:	Alarms Setting
07/14	

3G	Alarms_Setting	
▶ 1:	Reed Logic	NO
2:	Delay Reed	00'00"
3:	Delay Hold	00'00"
4:	Switch OFF	NO
5:	Block	NO
6:	Alarm Temp.	Notif.
7:	Service	OFF
01/07		

ADVANCED MENU \ OUTPUTS SETTING (INDEX MENU 3H)

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

Outputs Setting Function

3H1 Relay 1: Disabled, On/OFF (threshold), Timed, Proportional PWM, either for Measure or for Temperature Measure

3H2 Relay 2: Disabled, On/OFF (threshold), Timed, Proportional PWM, either for Measure or for Temperature Measure, and also Probe Wash, Remote Alarm

3H3 SSR 1: Disabled, Measure, Temperature Measure

3H4 SSR 2: Disabled, Measure, Temperature Measure

3H5 mA 1: Disabled, Measure, Temperature Measure, PID Measure, PID Temperature

3H6 mA 2: Disabled, Measure, Temperature Measure, PID Measure, PID Temperature



Note: On the Setup menu (INDEX MENU 2) it is possible to set the parameters for each selected function.

3 Advanced

D: Measure
 E: Measure Range
 F: Temperature Measure
 G: Alarms Setting
 ► H: Outputs Setting

08/14

3H Outputs Setting

► 1: Relay 1 Disabled
 2: Relay 2 Disabled
 3: SSR 1 Disabled
 4: SSR 2 Disabled
 5: mA 1 Disabled
 6: mA 2 Disabled

01/06

3H1 Relay_1

► Disabled
 On/OFF Measure
 Timed Measure
 PWM Measure
 On/OFF Temp.
 Timed Temp.
 PWM Temp.

01/07

3H2 Relay_2

► Disabled
 On/OFF Measure
 Timed Measure
 PWM Measure
 On/OFF Temp.
 Timed Temp.
 PWM Temp.
 Probe Wash
 Alarm

01/09

3H3 SSR_1

► Disabled
 Measure
 Temperature Measure

01/03

3H4 SSR_2

► Disabled
 Measure
 Temperature Measure

01/03

3H5 mA_1

► Disabled
 Measure
 Temperature Measure
 PID Measure
 PID Temperature

01/03

3H6 mA_2

► Disabled
 Measure
 Temperature Measure
 PID Measure
 PID Temperature

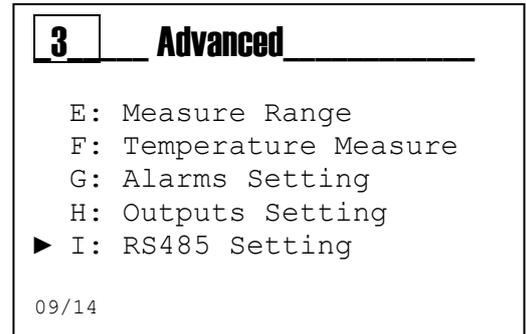
01/03

ADVANCED MENU \ RS485 PORT SETTING (INDEX MENU 3I)

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

RS485 Serial Port Setting Function:

- 311 RS485:** Enables the serial port (Enable/Disable)
- 312 Mode:** Standard protocol used (RTU/Ascii)
- 313 Address:** Communication Address (ID 1÷247)
- 314 Baud rate:** Communication speed (1200÷115200 bps)
- 315 Parity:** Parity bit for checking transmission (none, odd, even)
- 316 Bit stop:** Stop bits to set waiting time (1, 2)
- 317 DOA:** Enables/Disables the Serial Port (Enable/Disable)



Note: The RS485 function on the standard code is not available.

Note: the communication always takes place (RTU/ASCII) with 8 data bits

- The minimum polling time is set to 200ms.
- The accepted commands are:
 - a) Report Slave ID
 - b) Write Multiple Registers (max 4 registers per interrogation)
 - c) Read Holding Registers (max 4 registers per interrogation)
- The system always responds to these commands.
- If you are not in View Level mode or in RS485 Control Panel, cases in which you receive in response an error code and the command is not executed.
- Each writing operation which occurs in the registers with positive results, writes on the specific register a certain value.

To save on the memory of the instrument the value written into the register you must execute a write memory command realized with a Write Multiple Registers operation (amount of data to be written 1) at the address of the command register (4000), with parameter 2.

Alternatively, if you exit the programming, the system itself will ask you to save the changes you made to the parameters in memory because the system automatically reveals that the parameters in memory have been modified and it proposes to save them.

If the instrument is turned off WITHOUT having saved the written registers, the system will restart with the values previously set in memory.

Example:

Relay 1 set as "ON/OFF Measure".

Setpoint to be set [index 2A1]: 950,52ppm

Conversion Decimal → Hexadecimal:

95052 → 0x1734C

Number of decimals for Setpoint: 2

Below are the values to be written in the registers related to Setpoint RL1 [index menu 2A1]:

Address 3100: 0x734C (Setpoint L)

Address 3101: 0x0001 (Setpoint H)

Address 3102: 0x0002 (Decimal Setpoint)

Write Multiple Registers command

Addr	Func	Start Addr H	Start Addr L	Data Word H	Data Word L	Data Byte Count	Data 3100 H	Data 3100 L	Data 3101 H	Data 3101 L	Data 3102 H	Data 3102 L	CRC H	CRC L
0x01	0x10	0x0C	0x1C	0x00	0x03	0x06	0x73	0x4C	0x00	0x01	0x00	0x02	0xD2	0xB6

To complete the writing operation of the Setpoint RL1 into the EEPROM of the instrument, run the following command:

Address 4000: 0x02 (Write to Eeprom)*

Write Multiple Registers command

Addr	Func	Start Addr H	Start Addr L	Data Word H	Data Word L	Data Byte Count	Data 4000 H	Data 4000 L	CRC H	CRC L
0x01	0x10	0x0F	0xA0	0x00	0x01	0x02	0x00	0x02	0xC0	0x31

* In case of setting more parameters, it is recommended to run the command 4000 only once after the set parameters.

To read the Setpoint RL1, run the following command:

Read Holding Registers command

Addr	Func	Start Addr H	Start Addr L	Data Word H	Data Word L	CRC H	CRC L
0x01	0x03	0x0C	0x1C	0x00	0x03	0xC7	0x5D

The read Setpoint will be formatted as follows:

Address 3100: 0x734C (Setpoint L)

Address 3101: 0x0001 (Setpoint H)

Address 3102: 0x0002 (Decimal Setpoint)

Reconstructing the data we will have the following value: 950,52ppm

To verify the set data, check the menu item Setpoint RL1 to the index 2A1.

ADVANCED MENU \ USB PORT SETTING (INDEX MENU 3J)

The function is intended for internal use, to test and verify the instrument

3 Advanced

F: Temperature Measure
G: Alarms Setting
H: Outputs Setting
I: RS485 Setting
▶ J: USB Setting

10/14

ADVANCED MENU \ CONTROL PANEL (INDEX MENU 3K)

Menu 3K Control Panel

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

- 3K1** Measure: Displays the unfiltered measure in μA .
- 3K2** Temp. Measure: Displays the unfiltered measure in $^{\circ}\text{C}/^{\circ}\text{F}$
- 3K3** Sim. Relay 1: Manual closing of the relay contact
- 3K4** Sim. Relay 2: Manual closing of the relay contact
- 3K5** Simulation Frequency 1: Simulates an output value
- 3K6** Simulation Frequency 2: Simulates an output value
- 3K7** Simulation Current Output 1: Simulates an output value
- 3K8** Simulation Current Output 2: Simulates an output value
- 3K9** Reed Input: Displays the Reed Input status
- 3K10** Hold Input: Displays the Hold Input status
- 3K11** View the sent and received Modbus frames.



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

3 Advanced

G: Alarms Setting
H: Outputs Setting
I: RS485 Setting
J: USB Config.
▶ K: Control Panel

11/14

3K Control_Panel

▶ 1: Measure
2: Temp. Measure
3: Sim. Relay 1
4: Sim. Relay 2
5: Sim. Freq. 1
6: Sim. Freq. 2
7: Sim. Out mA 1
8: Sim. Out mA 2
9: Reed Input
10: Hold Input
11: RS485

01/11

ADVANCED MENU \ STATISTICS (INDEX MENU 3L)

Menu 3L Statistics

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

3L1 Number of registered Power On

3L2 Number of registered Alarms

3L3 Number of activations Relay 1

3L4 Number of activations Relay 2

3L5 Number of activations Reed

3L6 Number of activations Hold

3L7 Reset all values recorded in the statistics menu

3	Advanced
H: Outputs Setting I: RS485 Setting J: USB Setting K: Control Panel ► L: Statistics	
12/14	

3L	Statistics
► 1: Power On n. <input type="text" value="0"/> 2: Alarms n. <input type="text" value="0"/> 3: Relay 1 Act.n. <input type="text" value="0"/> 4: Relay 2 Act.n. <input type="text" value="0"/> 5: Reed Act. n. <input type="text" value="0"/> 6: Hold Act. n. <input type="text" value="0"/> 7: Reset Statistics	
01/07	

ADVANCED MENU \ SYSTEM RESET (INDEX MENU 3M)



Menu 3M Reset Instrument

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

3	Advanced
I: RS485 Setting J: USB Setting K: Control Panel L: Statistics ► M: System Reset	
13/14	

3M	System_Reset
Are you sure? <input type="checkbox"/> NO <input type="checkbox"/> YES	

ADVANCED MENU \ FIRMWARE REVISION (INDEX MENU 3N)

Menu 3N Firmware Revision

The instrument displays the Firmware code and revision of the device.

3	Advanced
J:	USB Setting
K:	Control Panel
L:	Statistics
M:	Reset Instrument
▶ N:	Firmware Revision
14/14	

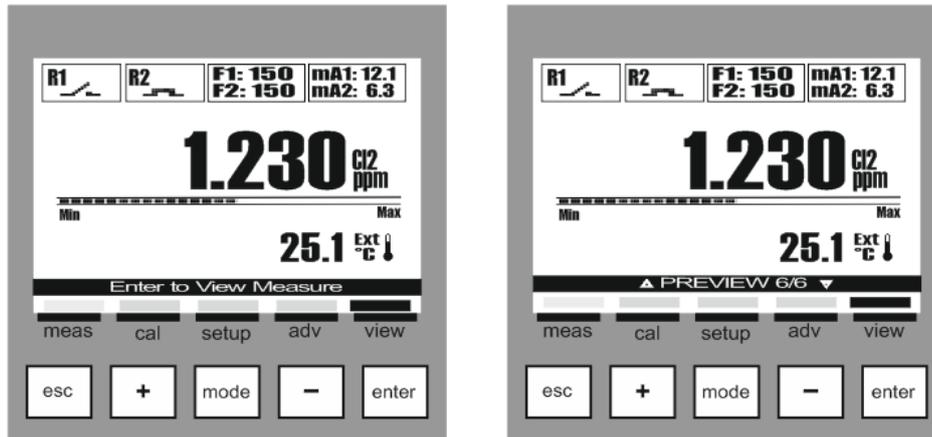
3N	Firmware_Revision
Firmware Code	
0000529XXX	
Firmware Revision	
X.X	

VIEW MENU (INDEX MENU 4)

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

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

WEB APPLICATION USAGE

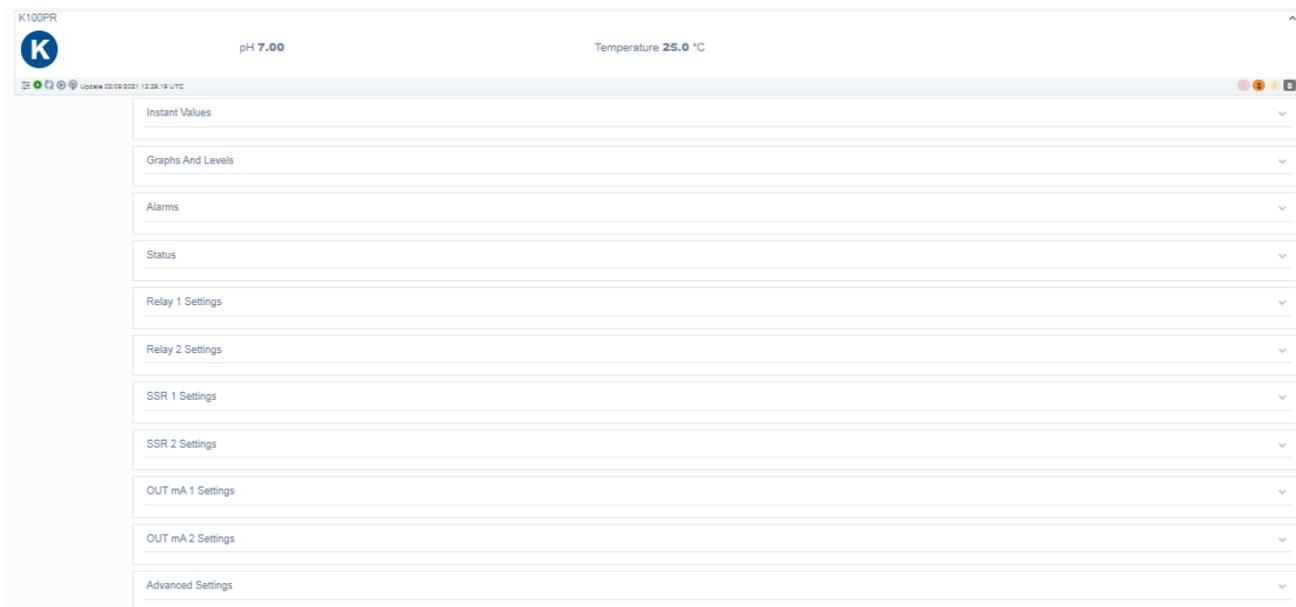
The system can be controlled by the new Device Web Interface. This allows the user to program and manage the system through a web browser, which can be done locally on a PC, notebook, tablet or smartphone.

For details about the connection via Kommbox it's recommended to read the Instruction Manual for the KommBox (SN 0000138153).

1 DASHBOARD

The **Dashboard** screen allows the view as follows:

- Header** bar with the indication for the main measurements.
- Collapsed bars** indicating the main sections of the controller.
- Main Sections** containing all the widgets to consent to check, monitor and apply new parameters to the controller.



2 INSTANT VALUES

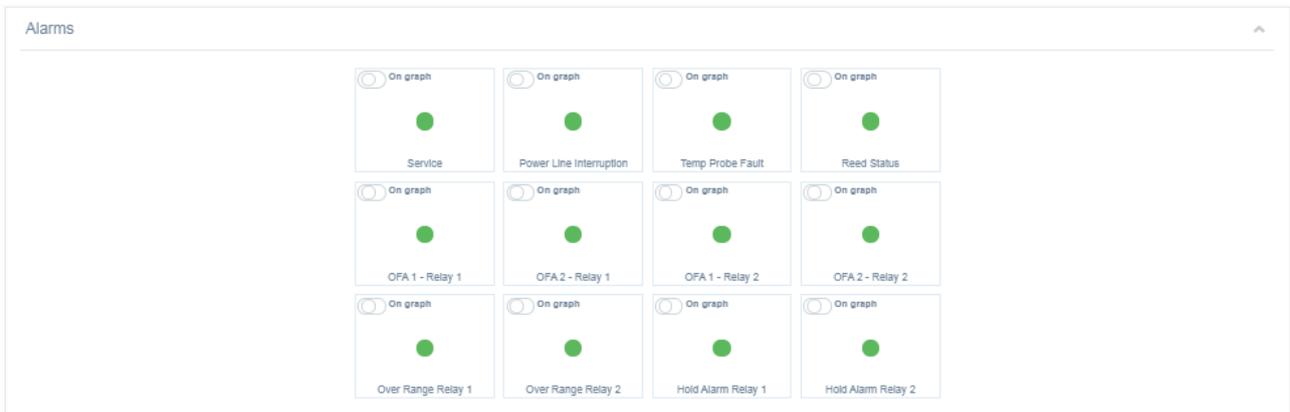
In the Instant Values section have been represented all the Widgets related to the Measurements of the controller.





3 ALARMS

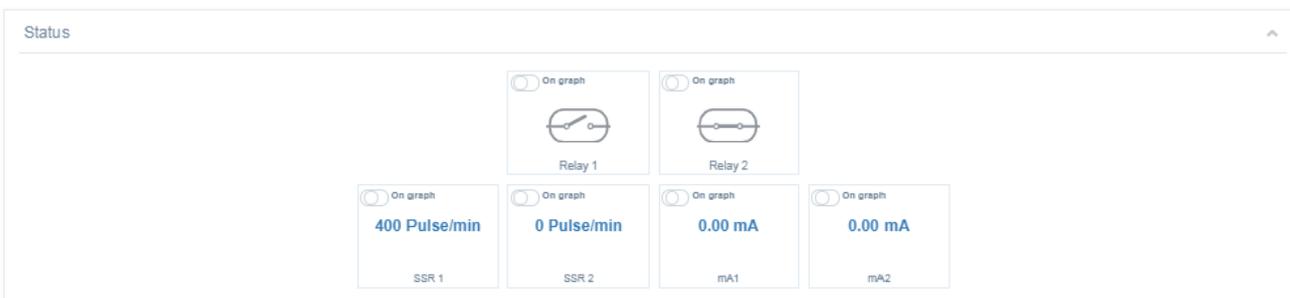
In the Alarm section have been represented all the Widgets related to the Alarms of the controller.



4 STATUS

In the Status Values section have been represented all the Widgets related to the Status of the controller.

- a) status ON or OFF of the Relays;
- b) status of number of Pulse/min of the SSR1 and SSR2;
- c) status of the mA1 and mA2 analog Output.

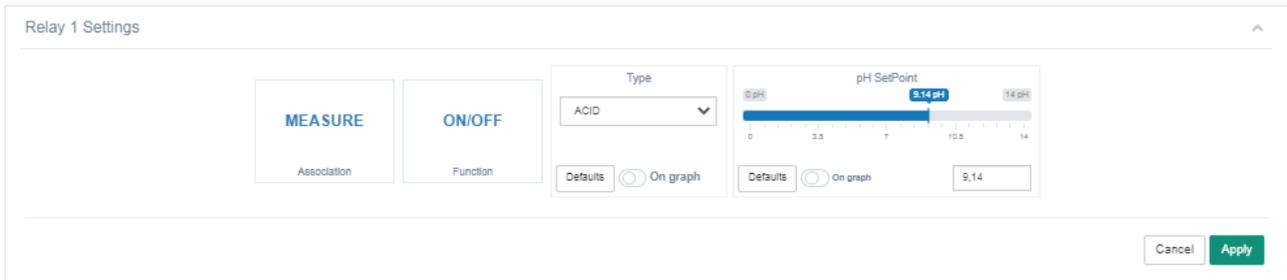


5 RELAY AND SSR

The Relay 1 Settings:

In the Relay 1 Settings section have been represented all the Widgets related to the parameters for the Relay 1 of the controller.

- a) **Association:** means to which Measurement the Relay 1 has been assigned;
- b) **Function:** means to which activation timing method as ON/OFF, Timed or PWM the Relay 1 has been assigned.
- c) **Type:** means as the minimum or maximum value to maintain into the process;
- d) **SetPoint:** means the value to maintain into the process.

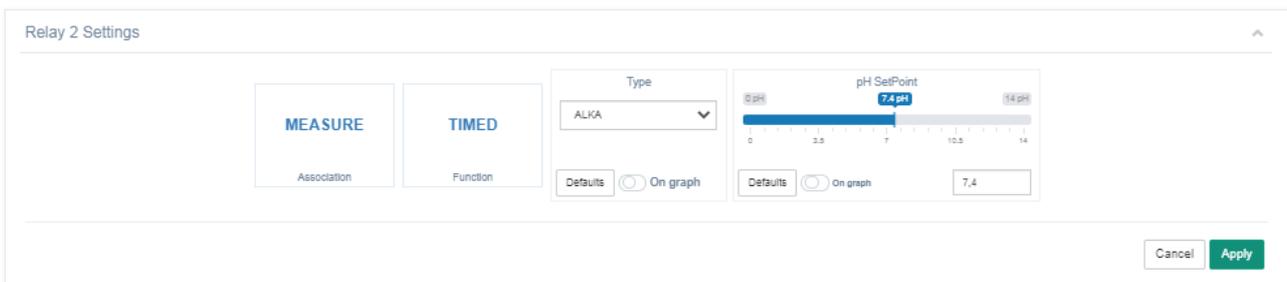


The screenshot shows the 'Relay 1 Settings' window. It features two buttons for Association: 'MEASURE' and 'ON/OFF'. The 'ON/OFF' button is selected. The 'Type' dropdown is set to 'ACID'. A 'pH SetPoint' slider is positioned at 9.14 pH. There are 'Defaults' and 'On graph' radio buttons for both the Type and SetPoint sections. 'Cancel' and 'Apply' buttons are at the bottom right.

The Relay 2 Settings:

In the Relay 2 Settings section have been represented all the Widgets related to the parameters for the Relay 2 of the controller.

- a) **Association:** means to which Measurement the Relay 2 has been assigned;
- b) **Function:** means to which activation timing method as ON/OFF, Timed, PWM or Probe Washing the Relay 2 has been assigned.
- c) **Type:** means as the minimum or maximum value to maintain into the process;
- d) **SetPoint:** means the value to maintain into the process.



The top part of the 'Relay 2 Settings' window shows the Association and Function buttons. 'MEASURE' is selected for Association, and 'TIMED' is selected for Function. The 'Type' dropdown is set to 'ALKAL'. The 'pH SetPoint' slider is positioned at 7.4 pH. There are 'Defaults' and 'On graph' radio buttons for both the Type and SetPoint sections. 'Cancel' and 'Apply' buttons are at the bottom right.



The bottom part of the 'Relay 2 Settings' window shows the Association and Function buttons. 'MEASURE' is selected for Association, and 'PROBE WASHING' is selected for Function. There are three 'On graph' radio buttons with corresponding values: 'Wash Time (ss)' is 0, 'Delay Time (ss)' is 60, and 'Wait Time (mm)' is 1440.

The SSR 1 Settings:

In the SSR 1 Settings section have been represented all the Widgets related to the parameters for the SSR 1 of the controller.

- Association:** means to which Measurement the SSR 1 has been assigned;
- Type:** means as the minimum or maximum value to maintain into the process;
- SetPoint:** means the value to maintain into the process;
- PropBand:** means the value that is subtracted from or added to the SetPoint;
- Pulse min:** means the Minimum value of pulses (range: 1÷100);
- Pulse max:** means the Maximum value of pulses (range: 20÷400).

SSR 1 Settings

MEASURE

Association

Type: ACID

pH SetPoint: 2.75 pH (input: 2,75)

pH PropBand: 0.2 pH (input: 0,2)

Pulse min: 1 Pulse/min (input: 1)

Pulse max: 400 Pulse/min (input: 400)

The SSR 2 Settings:

In the SSR 2 Settings section have been represented all the Widgets related to the parameters for the SSR 2 of the controller.

- Association:** means to which Measurement the SSR 2 has been assigned;
- Type:** means as the minimum or maximum value to maintain into the process;
- SetPoint:** means the value to maintain into the process;
- PropBand:** means the value that is subtracted from or added to the SetPoint;
- Pulse min:** means the Minimum value of pulses (range: 1÷100);
- Pulse max:** means the Maximum value of pulses (range: 20÷400).

SSR 2 Settings

MEASURE

Association

Type: ACID

pH SetPoint: 12.11 pH (input: 12,11)

pH PropBand: 0.2 pH (input: 0,2)

Pulse min: 1 Pulse/min (input: 1)

Pulse max: 400 Pulse/min (input: 400)

Cancel Apply

6 OUTPUT SETTINGS

In the OUT mA1 Settings section have been represented all the Widgets related to the parameters for the OUT mA1 of the controller.

- a) **Association:** means to which Measurement the OUT mA1 has been assigned;
- b) **PID:** means if PID algorithm is enabled (ON) or disabled (OFF).
- c) **Start:** measure value associated to the 4 mA;
- d) **End:** measure value associated to the 20 mA.

OUT mA1 Settings

MEASURE A Association

OFF PID

pH Start 0,00

pH End 14,00

Cancel Apply

The OUT mA2 Settings:

In the OUT mA2 Settings section have been represented all the Widgets related to the parameters for the OUT mA2 of the controller.

- a) **Association:** means to which Measurement the OUT mA2 has been assigned;
- b) **PID:** means if PID algorithm is enabled (ON) or disabled (OFF).
- c) **PID Type:** means as the minimum or maximum value to maintain into the process;
- g) **SetPoint:** means the value to maintain into the process;

OUT mA2 Settings

MEASURE B Association

ON PID

PID Type LOW

mA SetPoint 0

Cancel Apply

7 ADVANCED SETTINGS

In the Advanced Settings section have been represented all the Widgets related to the parameters for the Advanced Settings of the controller.

- a) **Temp Comp (A)**: The measure is compensated for temperature;
- b) **Filter (A)**: the type of the is filter used into calculation for the Measure A;
- c) **Filter (B)**: the type of the is filter used into calculation for the Measure B;
- d) **Sensor Type**: the type of sensor used, 0/20mA or 4/20mA;
- e) **Minimum Value**: the value corresponding to 0 mA or 4 mA;
- f) **Unit**: the measure unit used for the measurement on the controller;
- g) **Maximum Value**: the value corresponding to 20 mA;
- h) **Unit**: the measure unit used for the measurement on the controller;
- i) **Over Range Setting**: ON if enabled; OFF if disabled.
- j) **Under Range Setting**: ON if enabled; OFF if disabled.

Advanced Settings

MEDIUM Temperature Filter	MEDIUM Input-mA Filter	4-20 mA Sensor Type	
-222.900 Minimum Value	z Unit	9997 Maximum Value	z Unit
OFF Over Range Setting	OFF Under Range Setting		

Advanced Settings

MANUAL Temp Compensation	MEDIUM Measure Filter
-----------------------------	--------------------------

GENERAL SPECIFICATIONS

Specifications mA Input	
Sensor type	Sensor with two or three wires
Sensor power supply 4/20mA 2 wires	(*)18Vdc $\pm 5\%$, 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	$\pm 1 \mu\text{A}$
Accuracy	$\pm 0,2 \%$
Isolation	Functional
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 $150.0 \text{ }^\circ\text{C}$ (-58.0 to $302.0 \text{ }^\circ\text{F}$)
Sensor Maximum Distance	10 to 20 m (33 to 65 ft) depending on sensor
Temperature Resolution	0.1°C ($^\circ\text{F}$)
Temperature Accuracy	Pt100: $\pm 0.5^\circ\text{C}$ ($\pm 0.9 \text{ }^\circ\text{F}$) - Pt1000: $\pm 0.2^\circ\text{C}$ ($\pm 0.4 \text{ }^\circ\text{F}$)
Insulation	Functional

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

MECHANICAL SPECIFICATIONS FOR VERSION 1/4DIN

Dimensions (chassis – W x H x D)*	92 x 92 x 57,3 mm (3.62 x 3.62 x 2.26 in)
Front Bezel – (W x H)	96 x 96 mm (3.78 x 3.78 in)
Max. Depth	42 mm (1.65 in)
Weight	400 g (0,88 lb)
Material	ABS/polycarbonate
Protection	IP 65 (front)/IP 20 (chassis)
Relative Humidity	0 to 95% non-condensing

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

MECHANICAL SPECIFICATIONS FOR VERSION 1/2DIN

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	823 g (1.81 lb)
Material	ABS/polycarbonate
Protection	IP 65
Relative Humidity	0 to 100% condensing

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

ENVIRONMENTAL SPECIFICATIONS FOR VERSION 1/2DIN & 1/4DIN

Storage Temperature	-25 to $65 \text{ }^\circ\text{C}$ (-13 to $149 \text{ }^\circ\text{F}$)
Environmental temperature range of operation	-10 to $50 \text{ }^\circ\text{C}$ (14 to $122 \text{ }^\circ\text{F}$)
Emissions	According to EN55011 Class A specifications

ELECTRICAL SPECIFICATIONS

Power Supply (version 100÷240 VCA)	
Electrical requirements	from 100 to 240 VAC ±10%, 5 W
Frequency	50 to 60 Hz
Power Supply Fuse	500 mA delay not recoverable
Short Circuit Protection	Active
Power Supply (version 12÷32 VCC)	
Electrical requirements	from 12 to 32 VCC, or 24Vac ±10%, 3,5W
Power Supply Fuse	1 A delay not recoverable
Short Circuit Protection	Active
Reverse Polarity Protection	Active
Relay Outputs	
RL1 and RL2	2-SPST mechanical 250 VAC/5A, 30 VCC/3 A
Relay RL1 Configuration	Load Activation
Relay RL2 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 400 VAC, max 125 mA, Bidirectional, NPN, PNP
Resistance in ON State	26 ohm @ 50mA
Leakage Current in OFF State	200 nA 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	+/- 0,01 mA
Load	max. 800 Ω
Error Condition	NAMUR: OFF, 3.6 mA, 22 mA
Test Mode	3 to 23 mA
Digital Inputs	
FREQ1 Digital Input	(*) Input for external counter
DIR1 Digital Input	(*) Digital input direction for external counter
REED Digital Input	Input for dry contact 5 VCC, max 6 mA
HOLD Digital Input	Powered Input 12÷32 VCC, max 10 mA
Communication Ports	
USB Digital Communication Port	(*)USB Port, type B connector
RS485 Digital Communication Port	Optional (on request)
Output 5 Vdc	
Voltage	(**) 5 V CC ±2%, max. 20 mA
Short Circuit Protection	Active
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 pixels, Transflective, Backlit
Display Refresh	500 msec
Backlight	White, Green and Red with energy saving function

* This function is currently not used

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

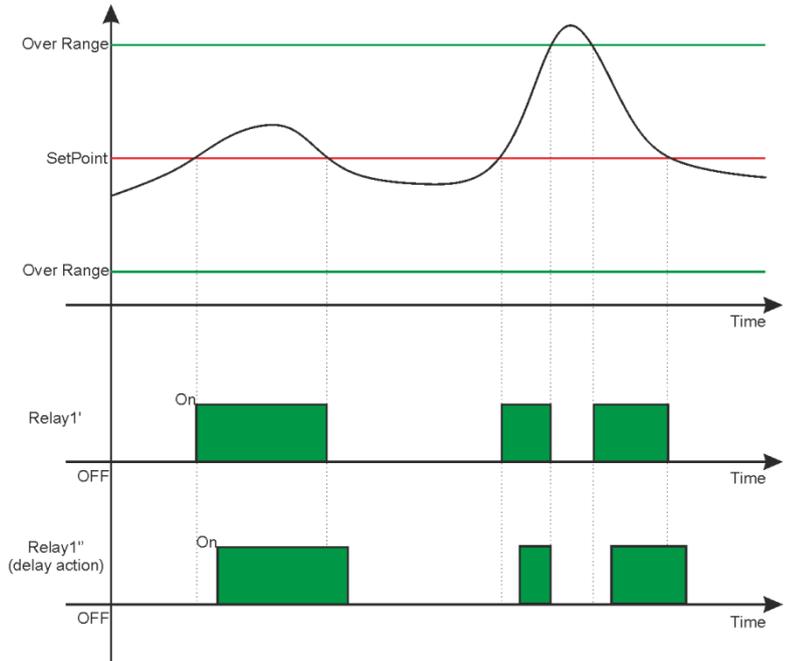
ANNEX A: ON/OFF RELAY SETUP

Below is an example of settings for the Relay 1 or 2 to adjust the Measure using the pulse/pause method (on/off).

Example:

2A RELAY_1_ON/OFF	
1: SetPoint	1.20ppm
2: Activ. Type	High
3: Hysteresis	0.00ppm
4: Hyst. Time	00'00"
5: Delay Start	00'00"
6: Delay End	00'00"
7: OFA	OFF
8: Over Range	0.50ppm
9: Permanence	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").
- **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.

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

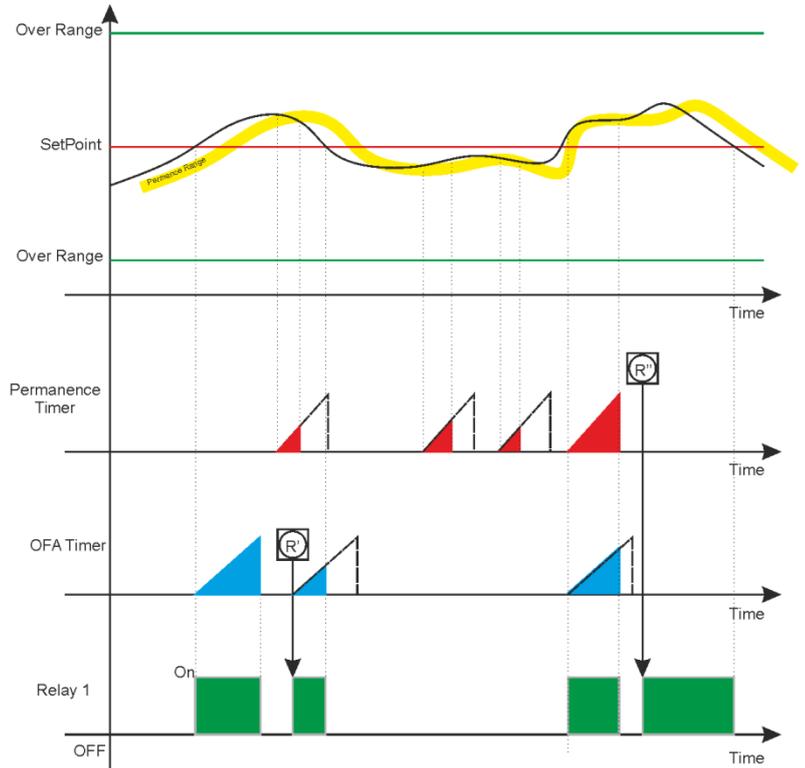
Hysteresis Function: By setting the menu items "3" and "4" the instrument maintains the relay activation status both for the measure value and for the time.

ANNEX A: ON/OFF RELAY SETUP WITH PERMANENCE TIME AND OFA FUNCTION.

Below is an example of settings for the Relay 1 or 2 to adjust the Measure using the pulse/pause method (on/off) with OFA timers and Permanence Measure.

2A RELAY_1_ON/OFF	
1: SetPoint	1.20ppm
2: Activ. Type	High
3: Hysteresis	0.00ppm
4: Hyst. Time	00'00"
5: Delay Start	00'00"
6: Delay End	00'00"
7: OFA	00h 10m
8: Over Range	0.50ppm
9: Permanence	On

01/09



All the settings described on the previous page remain valid.

Note:



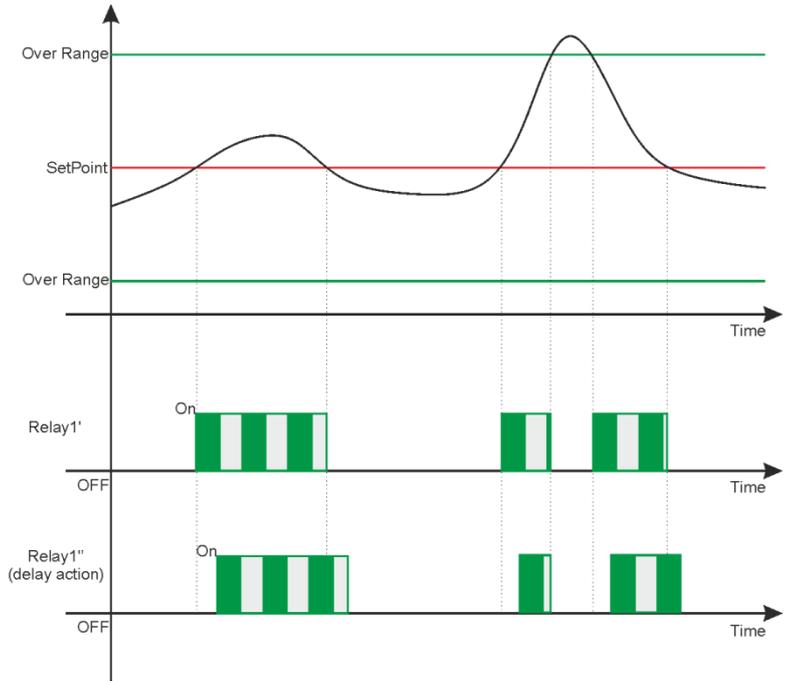
- OFA (Over Feed Alarm):** By setting the function “7” OFA with a time in hours and minutes a control timer is activated in parallel to the relay activation. The function checks the activated relay persistence times and generates a visual prealarm at 70% of set value and a blocking alarm (R') at the 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 Permanence:** By setting the function “9” Permanence, 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 permanence time (R”) is represented with the red color. A manual intervention will be required to remove the blocking with the reset of the Permanence function on the alarms menu (see alarms section).

ANNEX B: TIMED RELAY SETUP

Below is an example of settings for the Relay 1 or 2 to adjust the Measure using the timed method.

2A RELAY_1 Timed	
1: SetPoint	1.20ppm
2: Activ. Type	High
3: Hysteresis	0.00ppm
4: Hyst. Time	00' 00"
5: Delay Start	00' 00"
6: Delay End	00' 00"
7: OFA	OFF
8: Over Range	0.50ppm
9: Permanence	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'')
- **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.

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

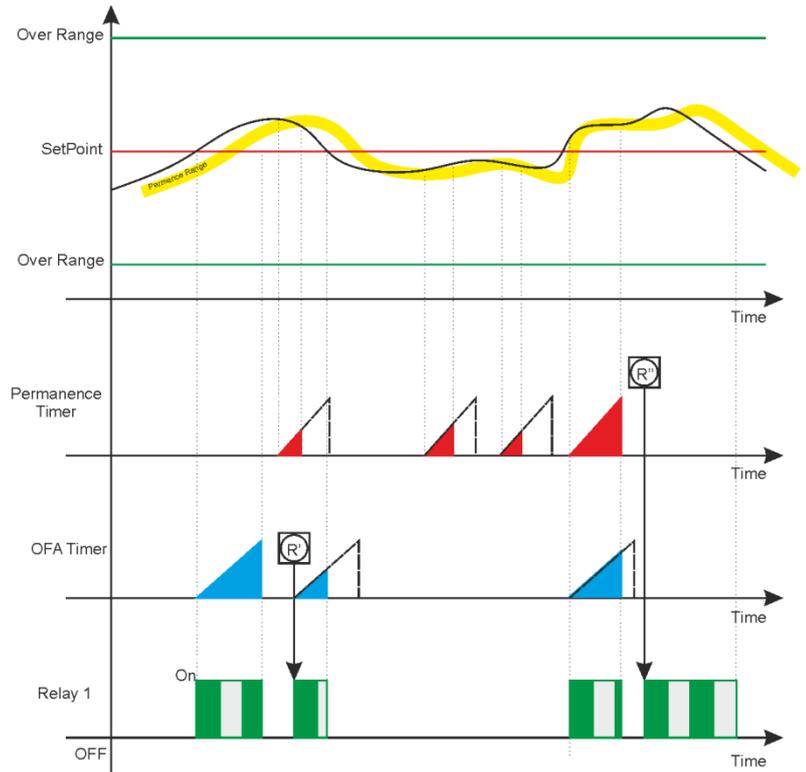
Hysteresis Function: By setting the menu items "3" and "4" the instrument maintains the relay activation status both for the measure value and for the time.

ANNEX B: TIMED RELAY SETUP WITH PERMANENCE TIME AND OFA FUNCTION

Below is an example of settings for the Relay 1 or 2 to adjust the Measure using the timed method with OFA timers and Permanence Measure.

2A RELAY_1 Timed	
1: SetPoint	1.20ppm
2: Activ. Type	High
3: Hysteresis	0.00ppm
4: Hyst. Time	00' 00"
5: Delay Start	00' 00"
6: Delay End	00' 00"
7: OFA	OFF
8: Over Range	0.50ppm
9: Permanence	OFF
10: Time On	01' 00"
11: Time Off	01' 00"

01/11



All the settings described on the previous page remain valid.

Note:



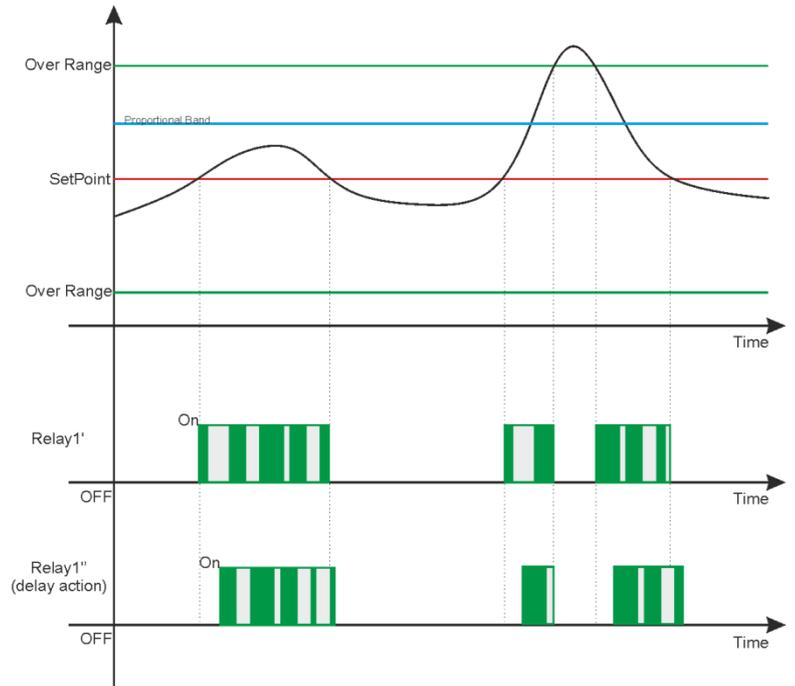
- OFA (Over Feed Alarm):** By setting the function “7” OFA with a time in hours and minutes a control timer is activated in parallel to the relay activation. The function checks the activated relay persistence times and generates a visual prealarm at 70% of set value and a blocking alarm (R) at the end 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 Permanence:** By setting the function “9” Permanence, 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 permanence time (R) is represented with the red color. A manual intervention will be required to remove the blocking with the reset of the Permanence function on the alarms menu (see alarms section).

ANNEX C: PROPORTIONAL (PWM) RELAY SETUP

Below is an example of settings for the Relay 1 or 2 to adjust the Measure using the proportional (PWM) method.

2A RELAY_1_PWM	
1: SetPoint	1.20ppm
2: Activ. Type	High
3: Hysteresis	0.00ppm
4: Hyst. Time	00' 00"
5: Delay Start	00' 00"
6: Delay End	00' 00"
7: OFA	OFF
8: Over Range	0.50ppm
9: Permanence	OFF
10: Interval	02' 00"
11: Prop. Band	0.25ppm

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'')
- **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.

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

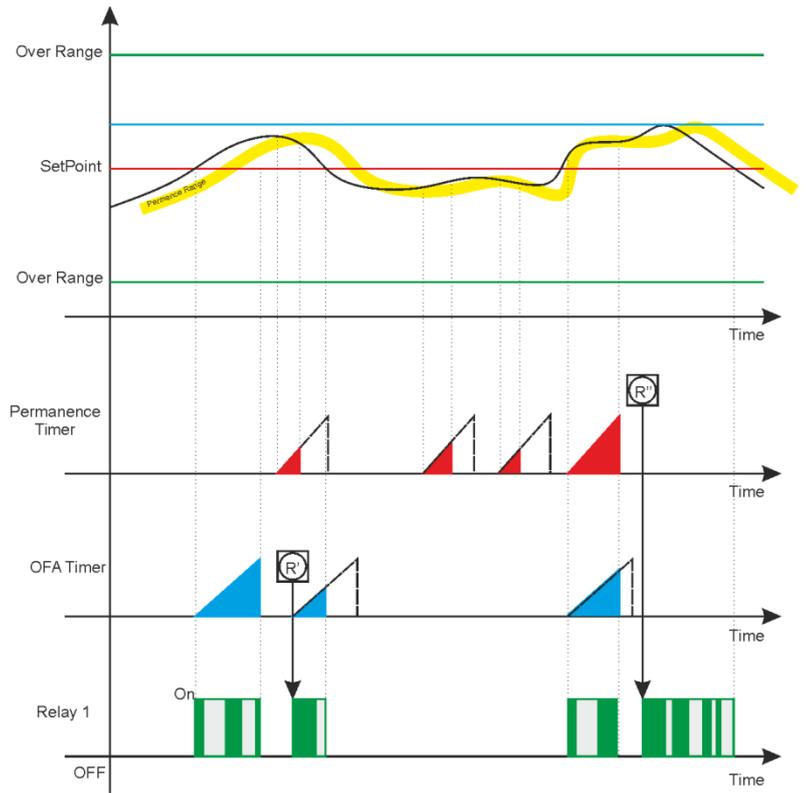
Hysteresis Function: By setting the menu items "3" and "4" the instrument maintains the relay activation status both for the measure value and for the time.

ANNEX C: PROPORTIONAL (PWM) RELAY SETUP WITH PERMANENCE TIME AND OFA FUNCTION

Below is an example of settings for the Relay 1 or 2 to adjust the Measure using the proportional (PWM) method with OFA timers and Permanence Measure.

2A RELAY_1_PWM	
1: SetPoint	1.20ppm
2: Activ. Type	High
3: Hysteresis	0.00ppm
4: Hyst. Time	00' 00"
5: Delay Start	00' 00"
6: Delay End	00' 00"
7: OFA	OFF
8: Over Range	0.50ppm
9: Permanence	OFF
10: Interval	02' 00"
11: Prop. Band	0.25ppm

01/11



All the settings described on the previous page remain valid.

Note:

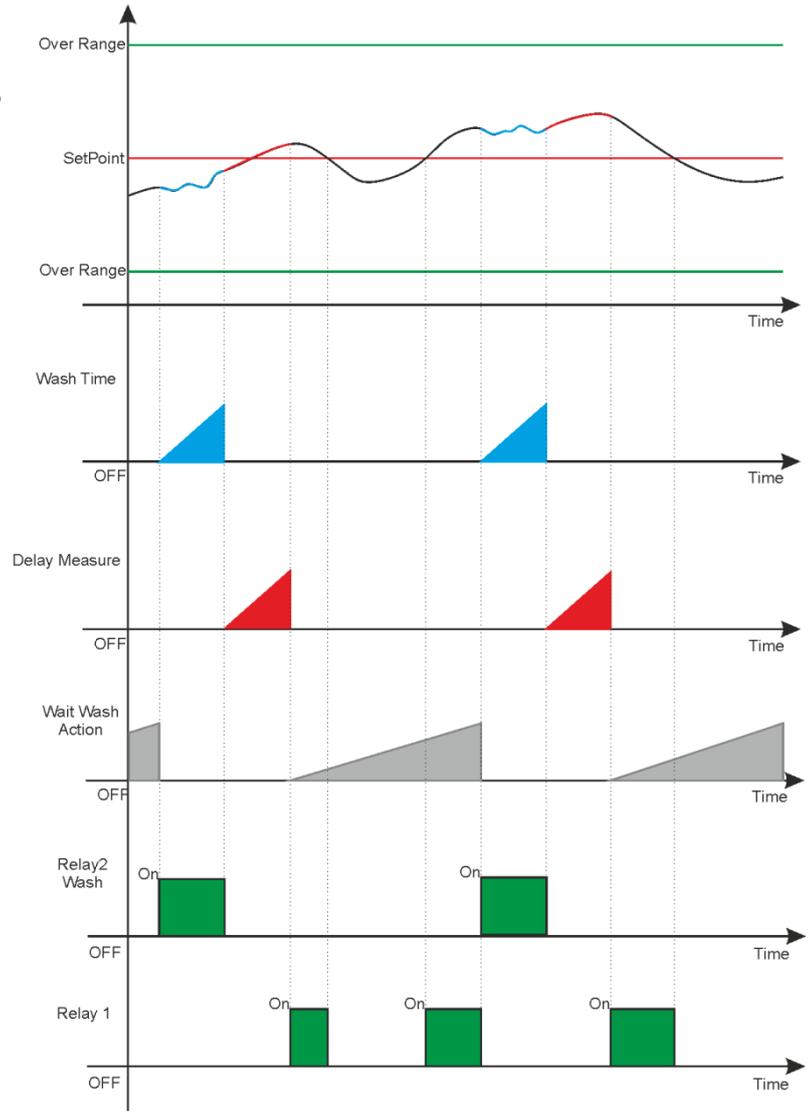


- OFA (Over Feed Alarm):** By setting the function “7” OFA with a time in hours and minutes a control timer is activated in parallel to the relay activation. The function checks the activated relay persistence times and generates a visual prealarm at 70% of set value and a blocking alarm (R') at the 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 Permanence:** By setting the function “9” Permanence, 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 permanence time (R”) is represented with the red color. A manual intervention will be required to remove the blocking with the reset of the Permanence function on the alarms menu (see alarms section).

ANNEX D: RELAY 2 SETUP FOR AUTOMATIC WASHING

Below is an example of settings for Relay 2 with Washing function to automate the probe cleaning with an external device(*).

2B Relay_2_Wash	
▶ 1: Wash Time	05' 00"
2: Delay Meas.	05' 00"
3: Wait New	06h 00m
01/03	



Note:



- **Wash Time:** Relay 2 is activated at the end of "Wait New Wash" 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 Measure:** Relay 2 is turned off for the set time by displaying the measure and maintaining all the instrument's functions blocked (Amber color Backlight).
- **Wait New Wash:** The instrument counts the set time by performing the normal functions of measure and control; when the time expires, the "Wash Time" is activated.

(* The external washing system is not supplied with the instrument)

ANNEX E: RELAY 2 SETUP TO REPEAT REMOTE ALARM.

(*To set the Relay 2 for Remote Alarm see Advanced Setup Menu 3H)

On Setup Menu 2B it is possible to set the alarm conditions to be repeated by Relay 2; attention, check the Advanced Menu "3G" Alarms Configuration.

2B Alarm	
▶ 1: OverRange R1	NO
2: OFA R1	NO
3: Perm.Meas.R1	NO
4: Reed Alarm	NO
5: Hold Alarm	NO
6: Probe Alarm	NO

01/06

3G Alarms_Setting	
▶ 1: Reed Logic	NO
2: Delay Reed	00'00"
3: Delay Hold	00'00"
4: Switch OFF	NO
5: Instr. Blocking	NO
6: Alarm Temp.	Notif.
7: Service	OFF

01/07

Table with the alarm messages displayed by the instrument.

Number	Alarm	Message	Status
1	Not Present	No Item	
2	External Hold Input Active	Hold	Alarm with instrument blocking (*)
3	External Reed Input Active	Reed	Alarm with instrument blocking (*)
4	Temperature Sensor Broken or Disconnected	Alarm Fault Temp.	Alarm with instrument blocking (**)
5	5V Output in Short Circuit	Fault 5V	Visual alarm
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 1 Timer decreased at 100%	OFA2 R1	Alarm with instrument blocking (*)
10	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	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	Output 18V in short	Fault Vout mA	Alarm with instrument blocking
17	Input current higher than 22mA	Over Range Input mA	Alarm with instrument blocking (***)
18	Input current lower than 3.6mA	Under Range Input mA	Alarm with instrument blocking (***)

(*All the alarms with blocking function are valid if the menu item 3G5 is equal to YES)

(**The temperature sensor breakage alarm blocks the instrument if the menu item 3G6 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 Log:** On view Measure (Meas Icon) there is available an Alarm status menu; by pressing the **Enter** key, the **Alarms Menu** will be displayed.



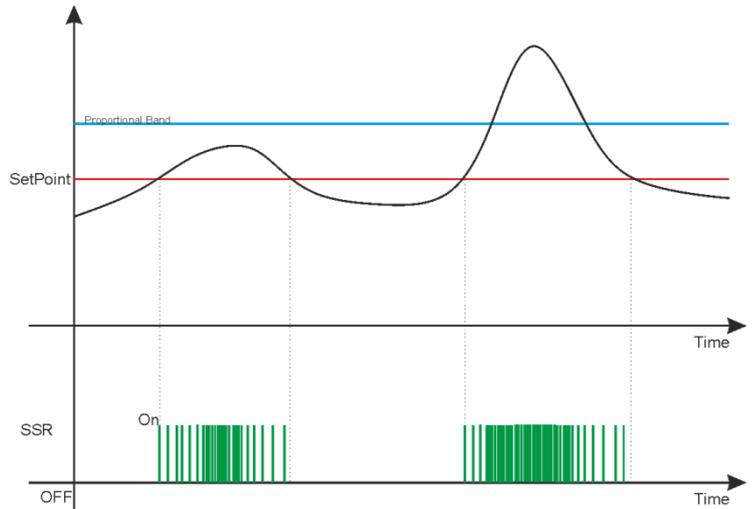
Nota: Note: Alarms are stored in memory every 15 minutes, watch if the instrument is switched off loses alarms displayed in the last 14 minutes.

ANNEX F: SSR1 AND SSR2 SETUP

Proportional frequency output with independent Proportional Band and SetPoint.

2C SSR1	
1: SetPoint	1.20ppm
2: Activ. Type	High
3: Pulse Max	400
4: Pulse min	1
5: Prop. Band	0.25ppm

01/05



Note:



- **Pulse Max:** Set the maximum value of pulses for 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).

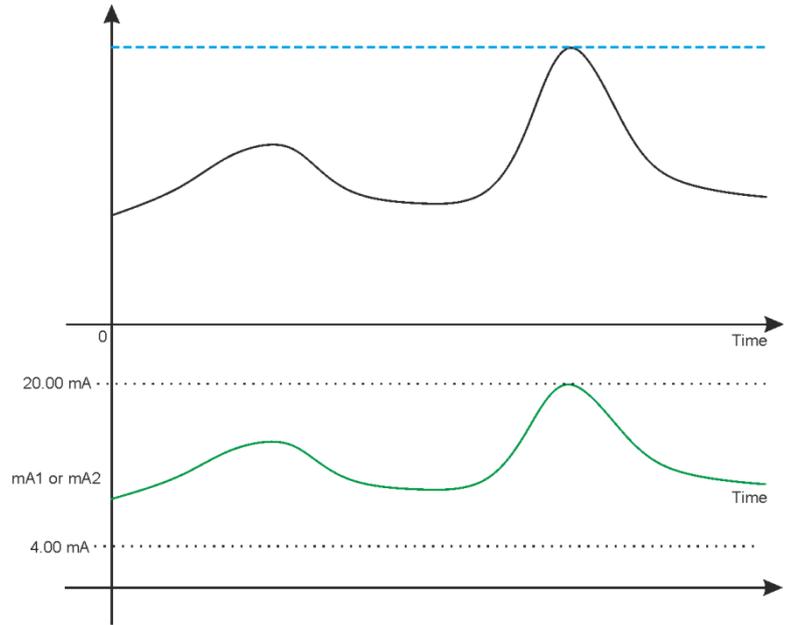


Notes: The Alarm Over Range function is not present on frequency output.

ANNEX G: mA1 AND mA2 SETUP

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

2E Output_mA1	
▶ 1: Start mA	0.00ppm
2: End mA	5.00ppm
3: Hold	NO
4: Namur	OFF
01/04	



Note:



- **Start mA:** Minimum value of measure associated to 4 mA
- **End mA:** Maximum value of 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.
- **Namur:** 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.

ANNEX H: mA1 AND mA2 SETUP [PID]

The Working Principle of a PID Controller

The use of simple low cost ON-OFF controllers allows the control of two states: completely ON or completely OFF. It is used for limited control applications where these two control states are enough to keep the system under control. PID controllers (PID stands for Proportional-Integral-Derivative) are used in a wide range of industrial process control applications. Infact, these three different control functions are combined to produce a single system control signal at desired levels. This programming step provides a set of programming parameters for PID functionality. The PID adjustment output can be enabled on any mA measures, even on both simultaneously. The PID function allows to eliminate the oscillations due to ON-OFF dosage system. It also allows for the desired threshold to be reached and maintained with excellent precision. PID adjustment is a complex algorithm that must take into account all of the system variables. The PID has been designed for general applications where a fast system retroactivity is requested (the maximum programmable integrative and derived times to be set is: 5 minutes and 59 seconds).

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 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.

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

2F2 **Type**: Low or High

2F3 **Algorithm**: The type of PID algorithm that will be used

2F4 **Prop. Band**: The Proportional Range of the PID regulation compared with the bottom of the scale for the instrument.

2F5 **Integ. Time**: The Integrative Time is set: as the time related to the integration function increases, the system compensates for measurement fluctuations.

2F6 **Deriv. Time**: The Derivative Time is set: as the time related to the derivative function increases, the system reacts to measurement variations faster.

2F	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, 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 pH 0-14, if Proportional 100% is programmed, this means there will be an adjustment range of pH ± 14 with respect to the set threshold. The proportional value is inversely proportional to the output amplification, vice versa, increasing the proportional percentage decreases the effects on the output. The proportional value can be adjusted from 1 to 500% (step of 1%). By default, this value is set to 100%.



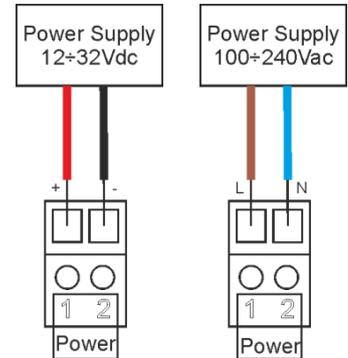
- **Integrative Time:** This function sets the Integrative function. The higher the programmed time, the more the system will mediate the measurement oscillations. The integrative time can be programmed from 0 to 5 minutes and from 0 to 59 seconds (step of 1 second). By default, this value is set to 1 minute.
- **Derivative Time:** This function sets the Derivative function. 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 and from 0 to 59 seconds (step of 1 second). By default, this value is set to OFF (0 minutes).

ANNEX I: WIRING EXAMPLES



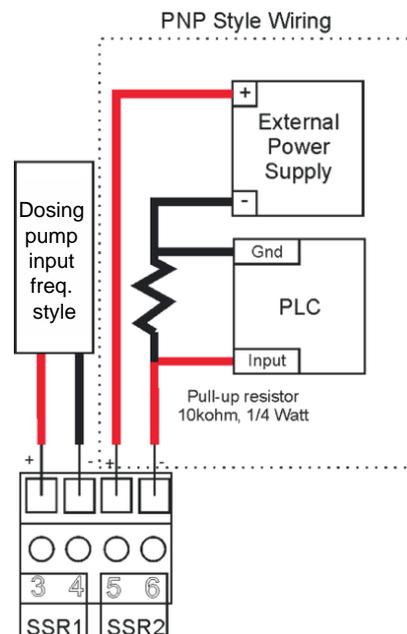
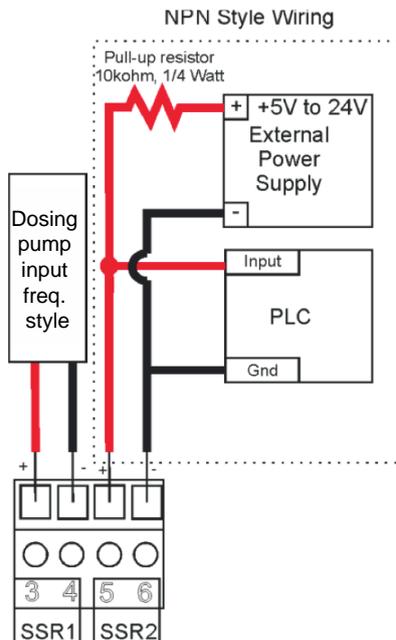
Power Supply:

- 12÷32Vdc or 100÷240Vac; Check the product label
- Observe the polarity
- Maximum Power Consumption 3.5 W or 5W



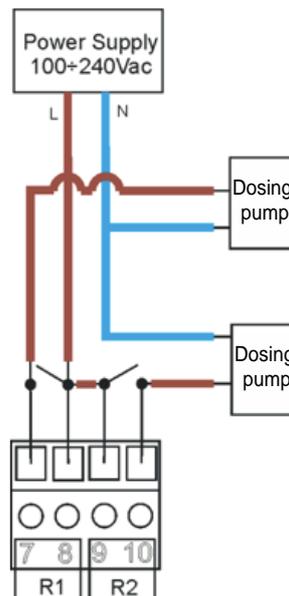
Frequency outputs SSR1 and SSR2:

- Contact closed 26Ω to 50mA, 125mA maximum load with an impedance of 36Ω.



Relay outputs 1 and 2:

- Maximum load 5 A resistive

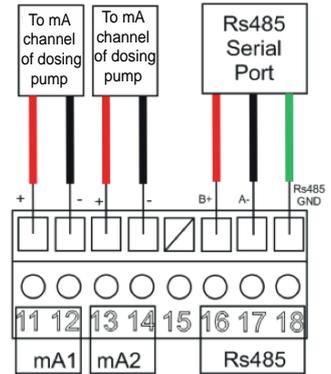


Current outputs mA 1 and 2:

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

RS485 serial port output:

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



Rotor flow sensor input:

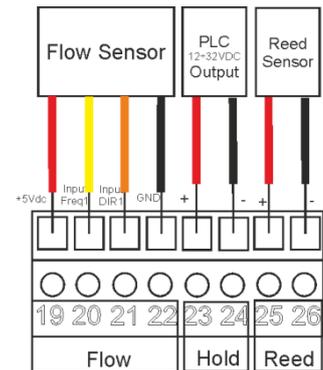
- Observe the polarity

Reed sensor input:

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

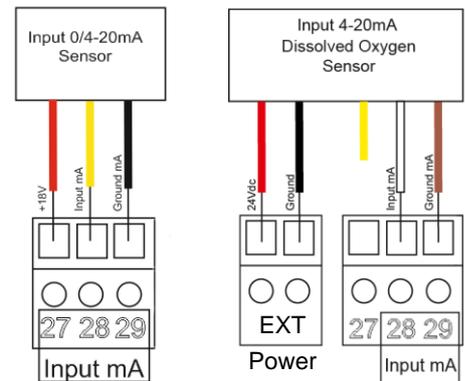
Hold signal input:

- Voltage signal from 12 to 32 Vdc
- Observe the polarity



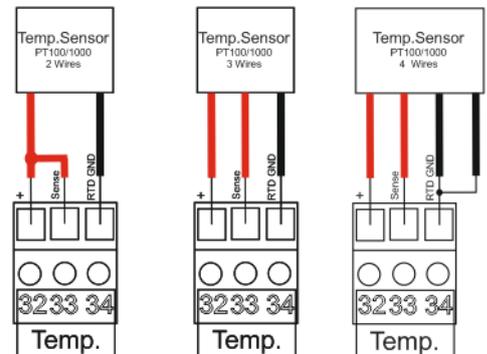
Sensor Measure input:

- Attention, connect the probes with metal terminals
- Observe the polarity
- 5 wires probes such as Dissolved Oxygen or Turbidity sensors are connected and powered using an External Power Supply (24VDC 10Watt Din-Rail box code RIC0151550, ordered separately); the yellow wire is not used



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, with 2, 3 and 4 wires; connect as indicated.



USB Port Input:

- USB Type B
- Power via USB port with activation of the microprocessor and display without back light.

ANNEX L: TROUBLESHOOTING.

Problem	Possible Cause
The display shows the symbol 	<ul style="list-style-type: none"> • See ANNEX E
Calibration Errors	<ul style="list-style-type: none"> • Contaminated buffer solutions (old) • Probe damaged or old • Probe cables damaged • Measure input of the instrument damaged
Data Memory Error	<ul style="list-style-type: none"> • Internal memory broken
Password Error	<ul style="list-style-type: none"> • Error value
Temperature Measure Error the display shows <input type="text" value="----.°C"/>	<ul style="list-style-type: none"> • Temperature probe broken or disconnected
Measure Error	<ul style="list-style-type: none"> • Sensor not calibrated • Sensor not installed correctly • The sensor or the cable is defective • Electronic measure input damaged • The sensor cable exceeds the maximum length
Measure reading not stable	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • User excluded for safety reasons
The display is turned off	<ul style="list-style-type: none"> • 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"	<ul style="list-style-type: none"> • Turn the instrument off and then on again; if the problem persists, contact your provider
Output 18V in short	<ul style="list-style-type: none"> • Wiring damaged

ANNEX M: DEFAULT PARAMETERS TABLE AND RESET TO DEFAULT

ADVANCED MENU					
Parameter	Sub-parameter	Default Value	Min Value	Max Value	Unit
Language	---	EN (English)	EN,FR,IT,DE,ES		
Password	Password	0000	0000	9999	
	Cal Menu	NO	NO	YES	
	Setup Menu	NO	NO	YES	
Display	Contrast	0	-15	+15	
	Mode	ECO	OFF, ON, ECO		
	ON	100	10	100	%
	ECO	50	0	50	%
Measure	Inversion	OFF	OFF	ON	
	Measure Unit	ppm	ppm, ppb, mg/l, mA, Custom, NTU		
	Custom unit	(4 spaces)	up to 4 characters can be edited		
	Measure 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		
Measure Range	Sensor Type	4-20mA	0-20mA	4-20mA	
	Range Min	0	-99999	99999	xxxx
	Range Max	99999	-99999	99999	xxxx
	Over Range	OFF	OFF	22 mA	
	Under Range	OFF	OFF	3,6 mA	
	Temperature Meas.	Sensor Type	Manual	Manual	External
Measure Unit		°C	°C	°F	
Manual Value		25,0 (77,0)	-50,0 (-58,0)	+150,0 (302,0)	°C (°F)
Filter		Medium	Low, Medium, High		
Alarms Setting	Reed Logic	NO	NO	NC	
	Delay Activation REED	OFF	OFF (00':00")	60':59"	min:sec
	Delay Activation HOLD	OFF	OFF (00':00")	60':59"	min:sec
	Power Supply Interruption	NO	NO	YES	
	Instrument blocking	NO	NO	YES	
	Temperature Alarm	Notification	Notification	Block	
	Service	OFF	OFF (0)	365	Days
Outputs Setting	Relay 1	OFF	OFF, Meas ON/OFF, Meas Timed, Meas. PWM, Temp. ON/OFF, Temp. Timed, Temp. PWM		
	Relay 2	OFF	OFF, Meas ON/OFF, Meas Timed, Meas. PWM, Temp. ON/OFF, Temp. Timed, Temp. PWM, Probe Wash, Alarm		
	SSR1	OFF	OFF, Measure, Temp.		
	SSR2	OFF	OFF, Measure, Temp.		
	mA1	OFF	OFF, Measure, Temp.		
	mA2	OFF	PID Measure, PID Temperature.		
RS485 Setting	Activation	ON	OFF	ON	
	Mode	RTU	RTU	ASCII	
	Address	1	1	247	
	Speed	19200	1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200		bps
	Parity	Even	None, Odd, Even		
	Stop Bit	1			
USB Setting	Reserved for future use				
Control Panel	Measure	---	0	24000	µA
	Temperature Measure	---	-50,0	+150,0	°C
	Simul. Relay 1	OFF	OFF	ON	
	Simul. Relay 2	OFF	OFF	ON	
	Simul. Freq 1	0	0	400	Imp/min
	Simul. Freq 2	0	0	400	Imp/min
	Simul. Out mA 1	4,00	3,00	23,00	mA
	Simul. Out mA 2	4,00	3,00	23,00	mA
	REED Input	---	OFF	ON	
	HOLD Input	---	OFF	ON	
Statistics	No. Powen ON	0	0	9999999	Activations
	No. Alarms	0	0	9999999	Activations
	No. RL1 Activations	0	0	9999999	Activations
	No. RL2 Activations	0	0	9999999	Activations
	No. REED Activations	0	0	9999999	Activations
	No. HOLD Activations	0	0	9999999	Activations
Reset Statistics	NO	NO	YES		
System Reset	---	NO	NO	YES	
Firmware Revision	---	---	---	---	

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

SETUP MENU		Measure Unit: xxxx				
Parameter	Sub-parameter 1	Sub-parameter 2	Default Value	Min Value	Max Value	Unit
Relay 1 / Relay 2 xxxx ON/OFF	SetPoint	---	0	-99999	99999	xxxx
	Type	---	Low	Low	High	
	Hysteresis	---	0	0,0000	99999	xxxx
	Hysteresis 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 Range	---	0	0,0000	99999	xxxx
	Permanence	Status	OFF	OFF	ON	
		Interval	0	-99999	99999	xxxx
	Time	01':00"	OFF (00':00")	60':59"	min:sec	
Relay 1 / Relay 2 xxxx TIMED	Time On	---	00':10"	OFF (00':00")	60':59"	min:sec
	Time Off	---	00':10"	OFF (00':00")	60':59"	min:sec
Relay 1 / Relay 2 xxxx PWM	Interval	---	02':00"	OFF (00':00")	60':59"	min:sec
	Proportional Band	---	0	0,0000	99999	xxxx

SETUP MENU		Temperature Measure Unit: °C				
Parameter	Sub-parameter 1	Sub-parameter 2	Default Value	Min Value	Max Value	Unit
Relay 1 / Relay 2 °C ON/OFF	SetPoint	---	25,0	-50,0	150,0	°C
	Type	---	Low	Low	High	
	Hysteresis	---	0,0	0,0	10,0	°C
	Hysteresis 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 Range	---	OFF	OFF (0,0)	150,0	°C
	Permanence	Status	OFF	OFF	ON	
		Interval	0,0	-50,0	150,0	°C
	Time	01':00"	OFF (00':00")	60':59"	min:sec	
Relay 1 / Relay 2 °C TIMED	Time On	---	00':10"	OFF (00':00")	60':59"	min:sec
	Time Off	---	00':10"	OFF (00':00")	60':59"	min:sec
Relay 1 / Relay 2 °C PWM	Interval	---	02':00"	OFF (00':00")	60':59"	min:sec
	Proportional Band	---	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 1 / Relay 2 °F ON/OFF	SetPoint	---	77,0	-58,0	302,0	°F	
	Type	---	Low	Low	High		
	Hysteresis	---	0,0	0,0	18,0	°F	
	Hysteresis 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 Range	---	OFF	OFF (0,0)	270,0	°F	
	Permanence	Status		OFF	OFF	ON	
		Interval		0,0	-58,0	302,0	°F
Time			01':00"	OFF (00':00")	60':59"	min:sec	
Relay 1 / Relay 2 °F TIMED	Time On	---	00':10"	OFF (00':00")	60':59"	min:sec	
	Time Off	---	00':10"	OFF (00':00")	60':59"	min:sec	
Relay 1 / Relay 2 °F PWM	Interval	---	02':00"	OFF (00':00")	60':59"	min:sec	
	Proportional Band	---	18,0	1,8	90,0	°F	

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

SETUP MENU		Relay 2 = Alarm				
Parameter	Sub-parameter 1	Sub-parameter 2	Default Value	Min Value	Max Value	Unit
Relay 2 Alrm	Over Range R1	---	NO	NO	YES	
	OFA R1	---	NO	NO	YES	
	Measure Permanence R1	---	NO	NO	YES	
	Alarm REED	---	NO	NO	YES	
	Alarm HOLD	---	NO	NO	YES	
	Alarm Temperature Probe	---	NO	NO	YES	

SETUP MENU		Measure Unit: ppm				
Parameter	Sub-parameter 1	Default Value	Min Value	Max Value	Unit	
SSR1 / SSR2 xxxx	SetPoint	0	-99999	99999	xxxx	
	Type	Low	Low	High		
	Max Pulses	400	20	400	Imp/min	
	Min Pulses	1	1	100	Imp/min	
	Proportional Band	0	0,0000	99999	xxxx	

SETUP MENU		Temperature Measure Unit: °C				
Parameter	Sub-parameter 1	Default Value	Min Value	Max Value	Unit	
SSR1 / SSR2 °C	SetPoint	25,0	-50,0	150,0	°C	
	Type	Low	Low	High		
	Max Pulses	400	20	400	Imp/min	
	Min Pulses	1	1	100	Imp/min	
	Proportional Band	10,0	1,0	50,0	°C	

SETUP MENU		Temperature Measure Unit: °F				
Parameter	Sub-parameter 1	Default Value	Min Value	Max Value	Unit	
SSR1 / SSR2 °F	SetPoint	77,0	-58,0	302,0	°F	
	Type	Low	Low	High		
	Max Pulses	400	20	400	Imp/min	
	Min Pulses	1	1	100	Imp/min	
	Proportional Band	18,0	1,8	90,0	°F	

SETUP MENU		Measure Unit: xxxx			
Parameter	Sub-parameter 1	Default Value	Min Value	Max Value	Unit
mA1 / mA2 xxxx	Start mA	-99999	-99999	99999	xxxx
	End mA	99999	-99999	99999	xxxx
	Hold Measure	NO	NO	YES	
	Namur	OFF, 3,6mA, 22 mA			

SETUP MENU		Temperature Measure Unit: °C			
Parameter	Sub-parameter 1	Default Value	Min Value	Max Value	Unit
mA1 / mA2 °C	Start mA	-50,0	-50,0	150,0	°C
	End mA	150,0	-50,0	150,0	°C
	Hold Measure	NO	NO	YES	
	Namur	OFF, 3,6mA, 22 mA			

SETUP MENU		Temperature Measure Unit: °F			
Parameter	Sub-parameter 1	Default Value	Min Value	Max Value	Unit
mA1 / mA2 °F	Start mA	-58,0	-58,0	302,0	°F
	End mA	302,0	-58,0	302,0	°F
	Hold Measure	NO	NO	YES	
	Namur	OFF, 3,6mA, 22 mA			

SETUP MENU		Chemical Measure Unit			
Parameter	Sub-parameter 1	Default Value	Min Value	Max Value	Unit
mA1/mA2 PID Measure	Setpoint	0	0	99999	xxxx
	Type	High	Low	High	
	Algorithm	PI	P, PI, PID		
	Proportional Band	100	1	500	Proportional Band
	Integral time	01':00"	00':00" (OFF)	05':59"	Integral time
	Derivative time	OFF	00':00" (OFF)	05':59"	Derivative time

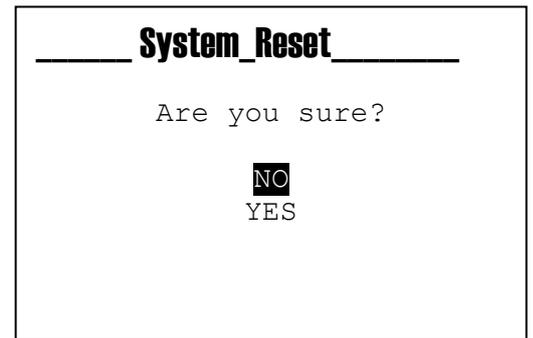
SETUP MENU		Temperature Measure Unit: °C			
Parameter	Sub-parameter 1	Default Value	Min Value	Max Value	Unit
mA1/mA2 PID Temperature	Setpoint	25,0	-50,0	150,0	°C
	Type	Low	Low	High	
	Algorithm	PI	P, PI, PID		
	Proportional Band	100	1	500	Proportional Band
	Integral time	01':00"	00':00" (OFF)	05':59"	Integral time
	Derivative time	OFF	00':00" (OFF)	05':59"	Derivative time

SETUP MENU		Temperature Measure Unit: °F			
Parameter	Sub-parameter 1	Default Value	Min Value	Max Value	Unit
mA1/mA2 PID Temperature	Setpoint	77,0	-58,0	302,0	°F
	Type	Low	Low	High	
	Algorithm	PI	P, PI, PID		
	Proportional Band	100	1	500	Proportional Band
	Integral time	01':00"	00':00" (OFF)	05':59"	Integral time
	Derivative time	OFF	00':00" (OFF)	05':59"	Derivative time

RESET THE DEFAULT PARAMETERS OF THE INSTRUMENT

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 Side)
- E) Select "YES" to perform the **RESET TO DEFAULT**.
- F) The instrument turns on and performs the **STARTUP** function .



MODBUS PROFILE

Read Only Registers				Range of Data			
Address	Index Menu	Type of Register	Description	min	max	Type of data	Note
1000	-	Status Register	Status Register L **	0x00000000	0x0001FFFF	Unsigned 32bit	
1001	-	Status Register	Status Register H ***				
1002	-	Output Register	Relay 1 *	0	3	Unsigned 16bit	
1003	-	Output Register	Relay 2 *	0	3	Unsigned 16bit	
1004	-	Output Register	SSR 1 *	0	400	Unsigned 16bit	Pulse/minute
1005	-	Output Register	SSR 2 *	0	400	Unsigned 16bit	Pulse/minute
1006	-	Output Register	mA 1 *	360	2200	Unsigned 16bit	Nr. Decimals = 2
1007	-	Output Register	mA 2 *	360	2200	Unsigned 16bit	Nr. Decimals = 2
1008	-	Measure	Main Measure L	-99999	99999	Signed 32bit	
1009	-	Measure	Main Measure H				
1010	-	Measure	Dec Main Measure	0	4	Unsigned 16bit	
1011	-	Temp Measure	Temp Measure	-500(°C),-580(°F)	1500(°C),3020(°F)	Signed 16bit	Nr. Decimal = 1
1012	-	Temp Measure	Temp Measure Dec Point	1	1	Unsigned 16bit	
1013	3D1	Measure	Main Measure Unit	0-5(ppm, ppb, mg/l, mA, Custom, NTU)		Unsigned 16bit	
1014	3F2	Temp Measure	Temp Measure Unit	0(°C)	1(°F)	Unsigned 16bit	
1015	3H1	Output Configuration	Relay 1 ****	0	6	Unsigned 16bit	
1016	3H2	Output Configuration	Relay 2 ****	0	8	Unsigned 16bit	
1017	3H3	Output Configuration	SSR1 *****	0	2	Unsigned 16bit	
1018	3H4	Output Configuration	SSR2 *****	0	2	Unsigned 16bit	
1019	3H5	Output Configuration	mA1 *****	0	2	Unsigned 16bit	
1020	3H6	Output Configuration	mA2 *****	0	2	Unsigned 16bit	
1021	3M1	Control Panel	Raw Main Measure L	0	24000	Unsigned 32bit	µA
1022		Control Panel	Raw Main Measure H				
1023	3M2	Control Panel	Raw Temp Measure	-500(°C),-580(°F)	1500(°C),3020(°F)	Signed 16bit	Nr. Decimal = 1
1024	3N1	Statistics	Nr. Power On L	0	9999999	Unsigned 32bit	
1025		Statistics	Nr. Power On H				
1026	3N2	Statistics	Nr. Alarms L	0	9999999	Unsigned 32bit	
1027		Statistics	Nr. Alarms H				
1028	3N3	Statistics	Nr. Activations RL1L	0	9999999	Unsigned 32bit	
1029		Statistics	Nr. Activations RL1H				
1030	3N4	Statistics	Nr. Activations RL2L	0	9999999	Unsigned 32bit	
1031		Statistics	Nr. Activations RL2H				
1032	3N5	Statistics	Nr. Activations REEDL	0	9999999	Unsigned 32bit	
1033		Statistics	Nr. Activations REEDH				
1034	3N6	Statistics	Nr. Activations HOLDL	0	9999999	Unsigned 32bit	
1035		Statistics	Nr. Activations HOLDH				
1036	3M9	Control Panel	REED	0(Inactive)	1(Active)	Unsigned 16bit	
1037	3M10	Control Panel	HOLD	0(Inactive)	1(Active)	Unsigned 16bit	
1038	-	Not Used	Not Used	0	0	Unsigned 16bit	
1039							
1040							
1041							
1041	1A4	Calibrations	Calibration Type	0(None), 1(One Point), 2(Two Points)		Unsigned 16bit	
1042		Calibrations	Point 1 L	-99999	99999	Signed 32bit	
1043		Calibrations	Point 1 H				
1044		Calibrations	Dec Point 1	0	4	Unsigned 16bit	
1045		Calibrations	Point 2 L	-99999	99999	Signed 32bit	
1046		Calibrations	Point 2 H				
1047		Calibrations	Dec Point 2	0	4	Unsigned 16bit	
1048		Calibrations	Gain L	0	99999	Unsigned 32bit	
1049		Calibrations	Gain H				
1050		Calibrations	Dec Gain	0	4	Unsigned 16bit	
1051		Calibrations	Offset L	-99999	99999	Signed 32bit	
1052		Calibrations	Offset H				
1053		Calibrations	Dec Offset	0	4	Unsigned 16bit	
1054		Calibrations	Adjust L	-99999	99999	Signed 32bit	
1055		Calibrations	Adjust H				
1056		Calibrations	Dec Adjust	0	4	Unsigned 16bit	
1057	3D2	Measure	Measure Unit Custom L	0x2020	0x7A7A	Unsigned 32bit	View Example 1
1058		Measure	Measure Unit Custom H	0x2020	0x7A7A		
1059	3D3	Measure	Main Measure Name	0-6(Cl2,PAA,H2O2,O3, Custom,O2,Turb)		Unsigned 16bit	
1060	3D4	Measure	Measure Name Custom L	0x2020	0x7A7A	Unsigned 32bit	View Example 2
1061		Measure	Measure Name Custom H	0x2020	0x7A7A		
1062	3E1	Measure	Sensor Type	0(0-20mA)	1(4-20mA)	Unsigned 16bit	
1063	3E2	Measure	Range Min L	-99999	99999	Signed 32bit	
1064		Measure	Range Min H				
1065		Measure	Dec Range Min	0	4	Unsigned 16bit	
1066	3E3	Measure	Range Max L	-99999	99999	Signed 32bit	
1067		Measure	Range max H				
1068		Measure	Dec Range Max	0	4	Unsigned 16bit	
1069	3E4	Measure	Over Current Alarm	0(OFF)	1(ON)	Unsigned 16bit	
1070	3E5	Measure	Under Current Alarm	0(OFF)	1(ON)	Unsigned 16bit	

*	Relay 1	Value	
		0	OFF
		1	ON
		2	OFF (timed)
		3	ON (timed)
*	Relay 2	Value	
		0	OFF
		1	ON
		2	OFF (timed)
		3	ON (timed)
*	SSR1	Value	Pulse Minute
*	SSR2	Value	Pulse Minute
*	mA1	Value	Out mA Value
*	mA2	Value	Out mA Value

**	Status Register L	Bit	
		0	5V Fault
		1	Hold Status
		2	Reed Status
		3	Service
		4	Power Line Interruption
		5	Temp Probe Fault
		6	OUT 1 Over Range
		7	OUT 2 Over Range
		8	OUT 1 OFA 1
		9	OUT 2 OFA 1
		10	OUT 1 OFA 2
		11	OUT 2 OFA 2
		12	OUT 1 Holding Alarm
		13	OUT 2 Holding Alarm
		14	Input mA < 3,6 mA
		15	Input mA > 22 mA
***	Status Register H	Bit	
		0	Fault +18V
		1-15	Not Used

****	Relay Configuration	Value	
		0	Disable
		1	ON_OFF Measure
		2	Timed Measure
		3	PWM Measure
		4	ON_OFF Temp
		5	Timed Temp
		6	PWM Temp
	ONLY RELE 2	7	Probe Washing
	ONLY RELE 2	8	Alarm

*****	SSR/mA Configuration	Value	
		0	Disable
		1	Measure
		2	Temp

Example 1, Measure Unit Custom

es. m3/h

Character 4	Character 3	Character 2	Character 1
h	/	3	m
0x68	0x2F	0x33	0x6D

Measure Unit Custom L = 0x336D

Measure Unit Custom H = 0x682F

Measure Unit Custom = 0x682F336D (m3/h)

Example 2, Measure Name Custom

es. Flow

Character 4	Character 3	Character 2	Character 1
w	o	l	F
0x77	0x6F	0x6C	0x46

Measure Name Custom L = 0x6C46

Measure Name Custom H = 0x776F

Measure Name Custom = 0x776F6C46 (Flow)

ASCII Table

Symbol	Dec	Hex	Symbol	Dec	Hex	Symbol	Dec	Hex
(space)	32	20	>	62	3E	\	92	5C
!	33	21	?	63	3F	]	93	5D
"	34	22	@	64	40	^	94	5E
#	35	23	A	65	41	_	95	5F
\$	36	24	B	66	42	`	96	60
%	37	25	C	67	43	a	97	61
&	38	26	D	68	44	b	98	62
'	39	27	E	69	45	c	99	63
(	40	28	F	70	46	d	100	64
)	41	29	G	71	47	e	101	65
*	42	2A	H	72	48	f	102	66
+	43	2B	I	73	49	g	103	67
,	44	2C	J	74	4A	h	104	68
-	45	2D	K	75	4B	i	105	69
.	46	2E	L	76	4C	j	106	6A
/	47	2F	M	77	4D	k	107	6B
0	48	30	N	78	4E	l	108	6C
1	49	31	O	79	4F	m	109	6D
2	50	32	P	80	50	n	110	6E
3	51	33	Q	81	51	o	111	6F
4	52	34	R	82	52	p	112	70
5	53	35	S	83	53	q	113	71
6	54	36	T	84	54	r	114	72
7	55	37	U	85	55	s	115	73
8	56	38	V	86	56	t	116	74
9	57	39	W	87	57	u	117	75
:	58	3A	X	88	58	v	118	76
;	59	3B	Y	89	59	w	119	77
<	60	3C	Z	90	5A	x	120	78
=	61	3D	[	91	5B	y	121	79
						z	122	7A

Read Write Registers			uS/mS/KOHm/MOHm/ppm/ppb		°C		°F	
Address	Type of Register	Description	min	max	min	max	min	max
3000	Temp Compenation	Temperature Compensation	0(OTC),1(MTC),2(ATC)		0(OTC),1(MTC),2(ATC)		0(OTC),1(MTC),2(ATC)	
3001	TDS	TDS	3	20	---	---	---	---
3002	Temp Type Comp	Temp Type Comp	0(Pure H2O), 1(Lin25),2(lin20)		0(Pure H2O), 1(Lin25),2(lin20)		0(Pure H2O), 1(Lin25),2(lin20)	
3003	Temp Coeff Lin	Temp Coeff Lin	1	1000	---	---	---	---
3004	Temp Sensor Type	Temp Enalbe	0(manual)	1(probe)	0(manual)	1(probe)	0(manual)	1(probe)
3005	Manual Temp Value	Manual Temperature L	-500(°C)	1500(°C)	-500(°C)	1500(°C)	-500(°C)	1500(°C)
3006	Manual Temp Value	Manual Temperature H	-580(°F)	3020(°F)	-580(°F)	3020(°F)	-580(°F)	3020(°F)
3007	Alarm Configuration	Instrument Block	0(Disable)	1(Enable)	0(Disable)	1(Enable)	0(Disable)	1(Enable)
3008	Alarm Configuration	Temperature Alarm	0(Notify)	1(Block)	0(Notify)	1(Block)	0(Notify)	1(Block)
3100	RELAY 1	Setpoint tL	0	99999	-500	1500	-580	3020
3101	RELAY 1	Setpoint H						
3102	RELAY 1	Dec Setpoint	0	4	1	1	1	1
3103	RELAY 1	Type	0(High)	1(Low)	0(High)	1(Low)	0(High)	1(Low)
3104	RELAY 1	Hysteresis L	0	99999	0	100	0	180
3105	RELAY 1	Hysteresis H						
3106	RELAY 1	Decimal Hysteresis	0	4	1	1	1	1
3107	RELAY 1	Hysteresis Time L	0	120	0	120	0	120
3108	RELAY 1	Hysteresis Time H						
3109	RELAY 1	Delay Start L	1	3600	1	3600	1	3600
3110	RELAY 1	Delay Start H						
3111	RELAY 1	Delay End L	1	3600	1	3600	1	3600
3112	RELAY 1	Delay End H						
3113	RELAY 1	OFA L	0	1439	0	1439	0	1439
3114	RELAY 1	OFA H						
3115	RELAY 1	Over Range L	0	99999	0	1500	0	2700
3116	RELAY 1	Over Range H						
3117	RELAY 1	Decimal Over Range	0	4	1	1	1	1
3118	RELAY 1	Permanece Status	0(Disable)	1(Enable)	0(Disable)	1(Enable)	0(Disable)	1(Enable)
3119	RELAY 1	Permanece Range L	0	99999	-500	1500	-580	3020
3120	RELAY 1	Permanece Range H						
3121	RELAY 1	Holding Range Dec	0	4	1	1	1	1
3122	RELAY 1	Permanece Time L	0	3600	0	3600	0	3600
3123	RELAY 1	Permanece Time H						
3124	RELAY 1	Time On L	0	3600	0	3600	0	3600
3125	RELAY 1	Time On H						
3126	RELAY 1	Time Off L	0	3600	0	3600	0	3600
3127	RELAY 1	Time Off H						
3128	RELAY 1	Interval L	0	3600	0	3600	0	3600
3129	RELAY 1	Interval H						
3130	RELAY 1	Proportional Band L	0	99999	10	500	18	900
3131	RELAY 1	Proportional Band H						
3132	RELAY 1	Proportional Band Dec	0	4	1	1	1	1
3200	RELAY 2	Setpoint tL	0	9999	-500	1500	-580	3020
3201	RELAY 2	Setpoint H						
3202	RELAY 2	Dec Setpoint	0	4	1	1	1	1
3203	RELAY 2	Type	0(High)	1(Low)	0(High)	1(Low)	0(High)	1(Low)
3204	RELAY 2	Hysteresis L	0	99999	0	100	0	180
3205	RELAY 2	Hysteresis H						
3206	RELAY 2	Decimal Hysteresis	0	4	1	1	1	1
3207	RELAY 2	Hysteresis Time L	0	120	0	120	0	120
3208	RELAY 2	Hysteresis Time H						
3209	RELAY 2	Delay Start L	1	3600	1	3600	1	3600
3210	RELAY 2	Delay Start H						
3211	RELAY 2	Delay End L	1	3600	1	3600	1	3600
3212	RELAY 2	Delay End H						
3213	RELAY 2	OFA L	0	1439	0	1439	0	1439
3214	RELAY 2	OFA H						
3215	RELAY 2	Over Range L	0	99999	0	1500	0	2700
3216	RELAY 2	Over Range H						
3217	RELAY 2	Decimal Over Range	0	4	1	1	1	1
3218	RELAY 2	Permanece Status	0(Disable)	1(Enable)	0(Disable)	1(Enable)	0(Disable)	1(Enable)
3219	RELAY 2	Permanece Range L	0	99999	-500	1500	-580	3020
3220	RELAY 2	Permanece Range H						
3221	RELAY 2	Holding Range Dec	0	4	1	1	1	1
3222	RELAY 2	Permanece Time L	0	3600	0	3600	0	3600
3223	RELAY 2	Permanece Time H						
3224	RELAY 2	Time On L	0	3600	0	3600	0	3600
3225	RELAY 2	Time On H						
3226	RELAY 2	Time Off L	0	3600	0	3600	0	3600
3227	RELAY 2	Time Off H						
3228	RELAY 2	Interval L	0	3600	0	3600	0	3600
3229	RELAY 2	Interval H						

3230	RELAY 2	Proportional Band L	0	99999	10	500	18	900
3231	RELAY 2	Proportional Band H						
3232	RELAY 2	Proportional Band Dec	0	4	1	1	1	1
3233	RELAY 2	Wash Time L	0	3600	0	3600	0	3600
3234	RELAY 2	Wash Time H						
3235	RELAY 2	Delay Stabilization L	0	3600	0	3600	0	3600
3236	RELAY 2	Delay Stabilization H						
3237	RELAY 2	Over Range R1	0(Disable)	1(Enable)	0(Disable)	1(Enable)	0(Disable)	1(Enable)
3238	RELAY 2	OFA R1	0(Disable)	1(Enable)	0(Disable)	1(Enable)	0(Disable)	1(Enable)
3239	RELAY 2	Measure Permanence R1	0(Disable)	1(Enable)	0(Disable)	1(Enable)	0(Disable)	1(Enable)
3240	RELAY 2	REED Alarm	0(Disable)	1(Enable)	0(Disable)	1(Enable)	0(Disable)	1(Enable)
3241	RELAY 2	HOLD Alarm	0(Disable)	1(Enable)	0(Disable)	1(Enable)	0(Disable)	1(Enable)
3242	RELAY 2	Temperature Probe Alarm	0(Disable)	1(Enable)	0(Disable)	1(Enable)	0(Disable)	1(Enable)
3300	SSR 1	Setpoint L	0	99999	-500	1500	-580	3020
3301	SSR 1	Setpoint H						
3302	SSR 1	Decimal Setpoint	0	4	1	1	1	1
3303	SSR 1	Type	0(High)	1(Low)	0(High)	1(Low)	0(High)	1(Low)
3304	SSR 1	Max Pulses	20	400	20	400	20	400
3305	SSR 1	Min Pulses	1	100	1	100	1	100
3306	SSR 1	Proportional Band L	0	99999	10	500	18	900
3307	SSR 1	Proportional Band H						
3308	SSR 1	Decimal Proportional Band	0	4	1	1	1	1
3400	SSR 2	Setpoint L	0	99999	-500	1500	-580	3020
3401	SSR 2	Setpoint H						
3402	SSR 2	Decimal Setpoint	0	4	1	1	1	1
3403	SSR 2	Type	0(High)	1(Low)	0(High)	1(Low)	0(High)	1(Low)
3404	SSR 2	Max Pulses	20	400	20	400	20	400
3405	SSR 2	Min Pulses	1	100	1	100	1	100
3406	SSR 2	Proportional Band L	0	99999	10	500	18	900
3407	SSR 2	Proportional Band H						
3408	SSR 2	Decimal Proportional Band	0	4	1	1	1	1
3500	mA1	Start mA L	0	99999	-500	1500	-580	3020
3501	mA1	Start mA H			---	---	---	---
3502	mA1	Decimal Start mA	0	4	1	1	1	1
3503	mA1	End mA L	0	99999	-500	1500	-580	3020
3504	mA1	End mA H			---	---	---	---
3505	mA1	Decimal End mA	0	4	1	1	1	1
3506	mA1	Hold Measure	0(Disable)	1(Enable)	0(Disable)	1(Enable)	0(Disable)	1(Enable)
3507	mA1	Namur	0(OFF), 1(3.6mA),2(22mA)		0(OFF), 1(3.6mA),2(22mA)		0(OFF), 1(3.6mA),2(22mA)	
3508	mA2	Start mA L	0	99999	-500	1500	-580	3020
3509	mA2	Start mA H			---	---	---	---
3510	mA2	Decimal Start mA	0	4	1	1	1	1
3511	mA2	End mA L	0	99999	-500	1500	-580	3020
3512	mA2	End mA H			---	---	---	---
3513	mA2	Decimal End mA	0	4	1	1	1	1
3514	mA2	Hold Measure	0(Disable)	1(Enable)	0(Disable)	1(Enable)	0(Disable)	1(Enable)
3515	mA2	Namur	0(OFF), 1(3.6mA),2(22mA)		0(OFF), 1(3.6mA),2(22mA)		0(OFF), 1(3.6mA),2(22mA)	
3516	mA1 PID	Setpoint L	0	99999	-500	1500	-580	3020
3517	mA1 PID	Setpoint H						
3518	mA1 PID	Decimal Setpoint	0	4	1	1	1	1
3519	mA1 PID	Type	0(High)	1(Low)	0(High)	1(Low)	0(High)	1(Low)
3520	mA2 PID	Setpoint L	0	99999	-500	1500	-580	3020
3521	mA2 PID	Setpoint H						
3522	mA2 PID	Decimal Setpoint	0	4	1	1	1	1
3523	mA2 PID	Type	0(High)	1(Low)	0(High)	1(Low)	0(High)	1(Low)

Write Only Register

4000	Command Register	Command	MODBUS_REG_CMD ***
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***	MODBUS_REG_CMD	Value to send to request a command execution	
		0	None
		1	Read Eeprom and copy in Ram
		2	Write in Eeprom the Ram Data
		3	Reset Statistics Data