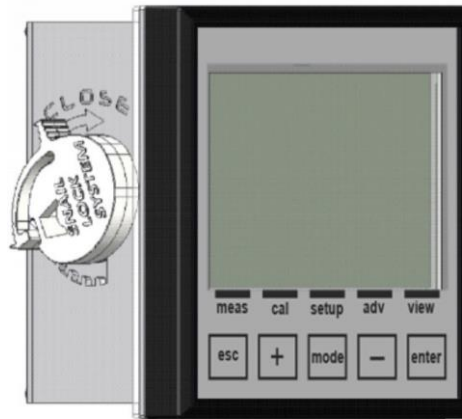


Operation Manual pH/ORP and Temperature Transmitter



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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 centre.
- **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 (1/2 DIN)**

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

For **Panel Mounted (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 analyser'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

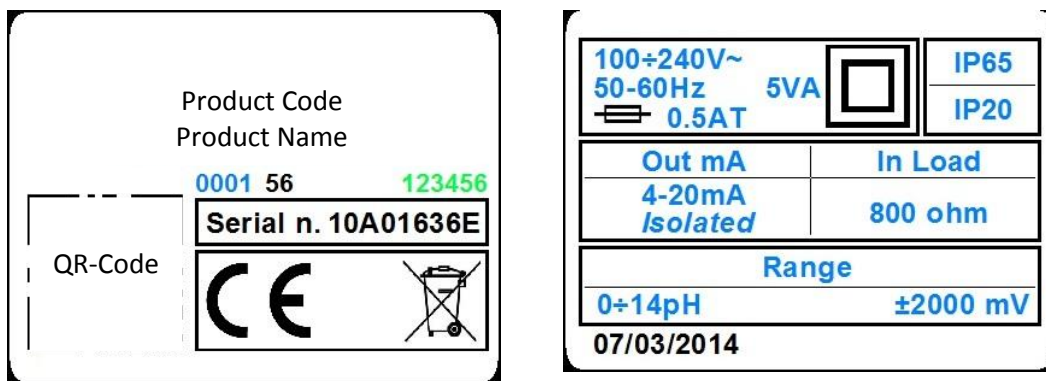
The symbol illustrated below represents the **ATTENTION** symbol and reminds the operator that he should read the user manual for important information, advice and suggestions regarding the correct and safe use of the equipment.



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.

For the position of the ATTENTION symbols on the equipment, refer to Chapter 2 “Controls, Indicators and Connections” and Chapter 3 “Installation” of this user manual. 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. The Control Unit can be either panel mounted or wall mounted, at a maximum distance of 15 meters from the probe.

It is powered from the mains (100 ÷ 240 Vac 50-60 Hz), with a power consumption of 5W, through a switching power supply.

This device has been designed to analyze ON-LINE the pH/ORP values in different applications:

- Biological Oxidation Plants
- Treatment and Discharge of Industrial Water
- Fish Farming
- Primary or Drinking Water

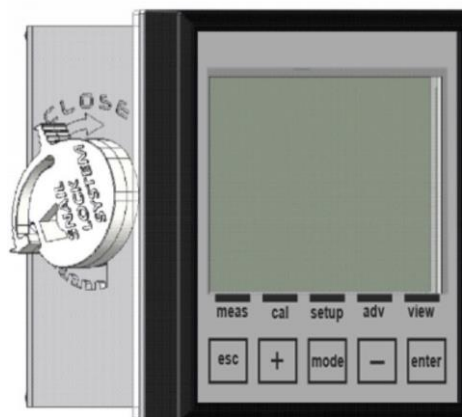


Figure 1 – Wall mounted Central Unit for pH/ORP and Temperature Measures

MEASURING PRINCIPLES

pH METER

Instrument designed to measure the acidity of a liquid, that is to say the ability of a substance to send into solution Hydrogen ions (H^+). The measure unit of this property is the pH (abbreviation for potential Hydrogenium) and represents the inverse of the decimal logarithm of the H^+ ions concentration present into solution. For the pure, water at an ambient temperature, the value described above is equal to 7. Are considered basic solutions those solutions with a pH greater than 7 and acidic solutions the solutions with a pH lower than 7. The extremes of the scale are pH=0 for pure acids and pH=14 for pure bases.

For measuring the pH value there are available electrochemical systems, test strips, indicators or colorimeters. Of all these methods, only the electrochemical measure leads to well-defined results. Such a measure is performed by means of a pH electrode. The pH electrode is an electrochemical sensor consisting of a measuring electrode and a reference electrode. The voltage present on a membrane varies according to the pH value of the test solution.

The pH electrodes currently in use are manufactured to indicate a value of pH=7 in the presence of a voltage equal to 0 mV to the membrane. The more the value deviates from pH=7, the greater is the voltage of the signal. The pH meter determines the pH value according to this signal.

ORP METER

Instrument designed to measure the Oxidation Reduction Potential (ORP) that indicates the ability of a donor element (reducing) to exchange electrons with an acceptor element (oxidant) measured through the potential assumed by an indifferent electrode (platinum/gold) immersed on the solution containing the oxidized or reduced form, compared to an electrode arbitrarily chosen as zero electrode. The measure unit is Volt, but is being commonly used one of its submultiples, millivolt ($\text{mV} = \text{V} \times 10^{-3}$). A few examples of applications of these measures are: the control of the denitrification of wastewaters (determination of the oxidation number), the monitoring of the effect of disinfection of drinking water or swimming pools water and even for decontamination in galvanic processes.

The measure takes place by means of an ORP electrode. As in the case of the pH electrode, this sensor consists of a measuring electrode and a reference electrode. The measuring function is carried out, however, in this case, not by a glass membrane but by a membrane made of platinum (or gold). The tendency of ions in solution to absorb or diffuse electrons determines the potential of the platinum and therefore the voltage of the electrode. The usual electrodes in use nowadays are equipped with a reference electrode of silver/silver chloride (UB), instead of a hydrogen electrode (UH), this means that the voltage indicated is relative to this system.

MAIN CHARACTERISTICS

- pH/ORP Measure
- Temperature Measure with PT100 / PT1000 Probe
- Automatic Temperature Compensation
- 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

The technical specifications of the analyzer are listed in the following table.

TECHNICAL SPECIFICATIONS FOR THE pH MEASURE

Measure Range	0.00 ÷ 14.00pH
Resolution	± 0.01pH
Precision	± 0.01pH

TECHNICAL SPECIFICATIONS FOR THE ORP MEASURE

Measure Range	± 2000mV
Resolution	± 1mV
Precision	± 1mV

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	100÷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	0.00 ÷ 14.00pH / -2000 ÷ +2000 mV
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

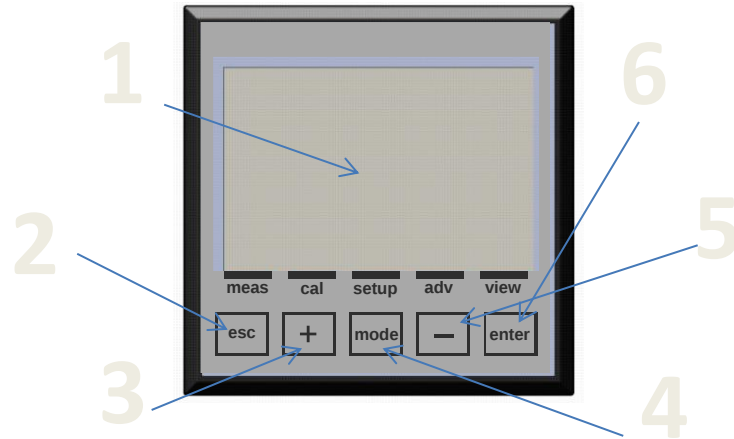


Figure 2 – Instrument

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

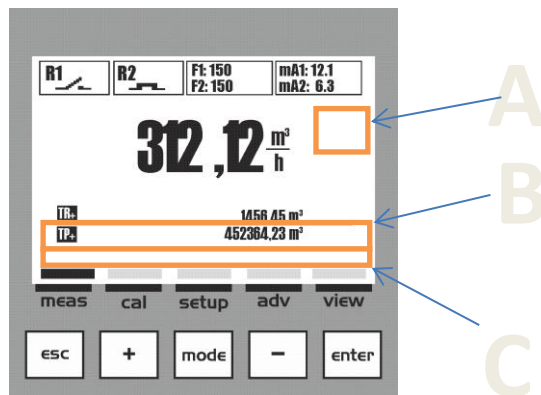


Figure 3 – Graphic Display - Subdivision Areas

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

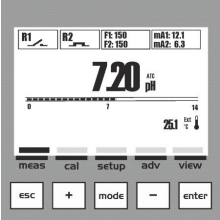
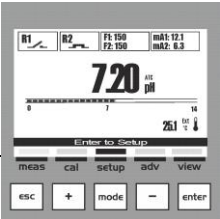
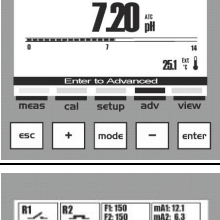
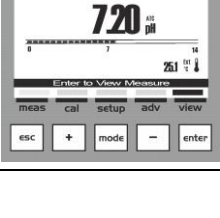
- A) Service icons such as Danger, Maintenance, Wait Time, Data Transmission, Automatic Temperature Compensation ATC or Manual Temperature Compensation MTC.
- B) Text messages for Alarms and operation information or temperature value with external sensor (ext) or manually set value (man).
- C) Menu name 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 Electrode Calibration Procedure
	SETUP MENU Output Parameters Setup Procedure
	ADVANCED MENU Device Setting 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 A WALL

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

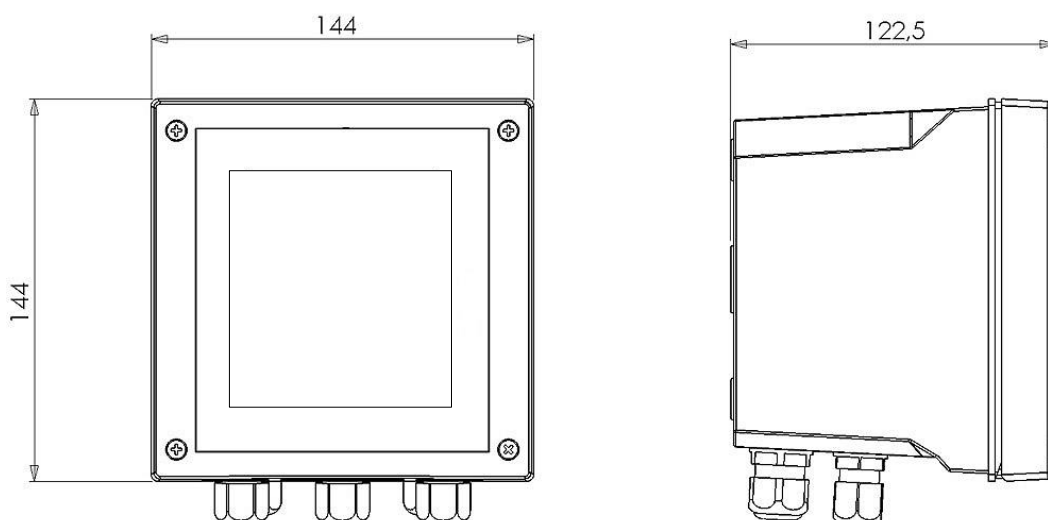


Figure 4 – Dimensions and footprint for wall mounted central unit

Mechanical Dimensions	
Dimensions (L x H x P)	144x144x122,5mm
Fixing depth	122,5mm
Material	ABS
Mounting	Wall
Weight	0,823 Kg
Front Panel	UV Resistant Polycarbonate

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

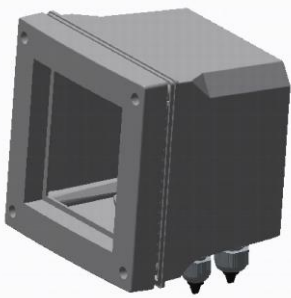
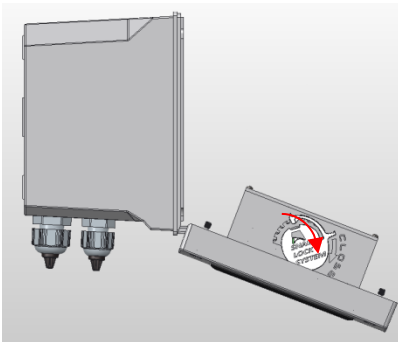
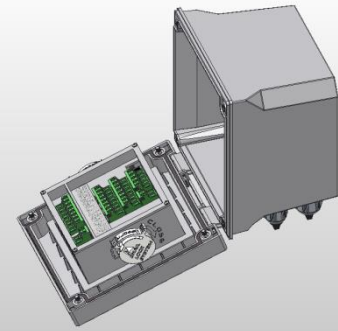
The cable glands for the electrical connections are located on the lower part of the control unit and therefore, in order to facilitate the connections, any other devices must be positioned at least at 15 cm away.

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



Note: The BOX 144x144 is a plastic accessory, an IP65 certified item to be purchased separately.

Example: Assembling the instrument 96x96 into the accessory Box 144x144 with IP65 protection

 Instrument 96x96	 Accessory Box 144x144	 Open the front door
 Secure the instrument and lock the snails	 Verify locking from all sides	 Close the front door

INSTALLING THE CENTRAL UNIT ON AN ELECTRICAL 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.

The thickness of the panel must not exceed 5 mm.

The panel cutout must comply with the following layout:

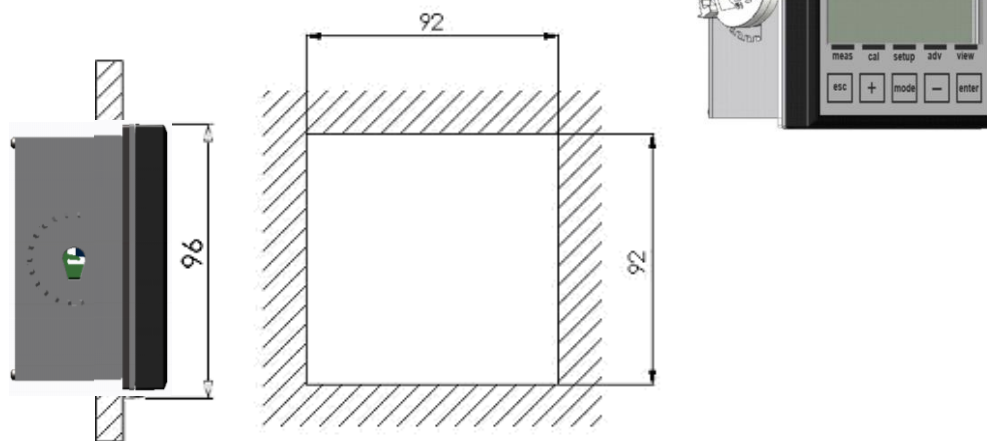


Figure 5 – Panel cutout and dimensions

Mechanical Dimensions	
Dimensions (L x H x P)	96x96x42mm
Fixing depth	130mm
Material	ABS
Mounting	Panel
Weight	0.4 Kg
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 stabilised 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

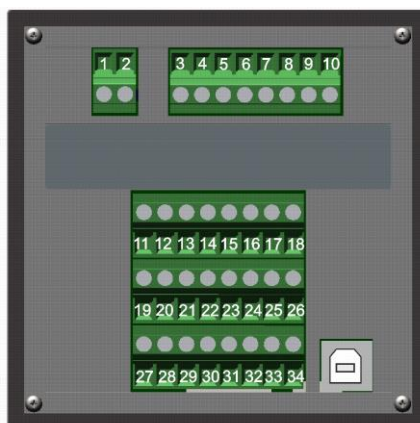


With a resistive load, each relay contact can sustain a maximum current of 5 Ampere at max. 230V.

In case of higher powers, it is advisable to make the connection with the Utilities as indicated in **Annex H**.

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 H**

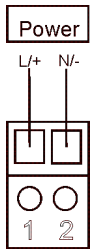
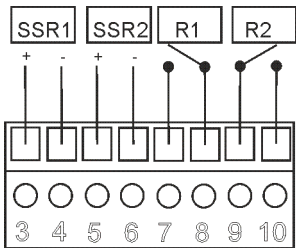
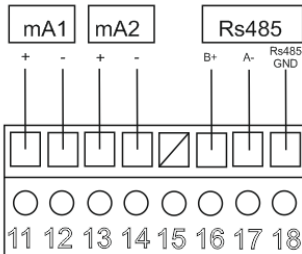
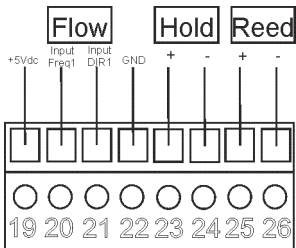
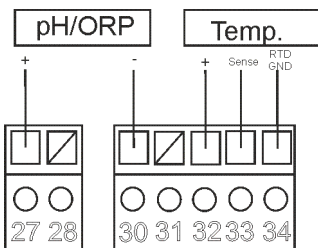
CONNECTION TERMINAL BLOCK FOR THE WALL MOUNTED DEVICE



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 NA	Relay 1 Contact
8	RL1 COM	Relay 1 Contact
9	RL2 COM	Relay 2 Contact
10	RL2 NA	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	pH / ORP (+)	pH/ORP Probe Input (+)
28	NOT USED	NOT USED
29	NOT PRESENT	NOT PRESENT
30	pH / ORP (-)	pH/ORP Probe Input (-)
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
Instrument Power Supply Input: 100÷240 Vac o 12÷32 VDC (24Vac) Note: Check the product label.	
Outputs: SSR1 and SSR2: Solid State Relays (400Vac/dc, 125mA) R1 and R2: Electromechanical Relays (250Vac or 30VDC, 5A Resistive)	
Outputs: mA1 and mA2: Current Outputs 4÷20mA (800 ohm) RS485: Serial Port for Data Communication (upon request)	
Inputs: Flow: Flow Sensor Input (upon request) Hold: 12÷32 Vdc Signal Input Reed: Dry Contact Signal Input	
Inputs: pH/ORP: pH and ORP Measure Input Temp: Temperature Measure Input PT100 or PT1000	

(Note: See ANNEX H for Wiring Examples)

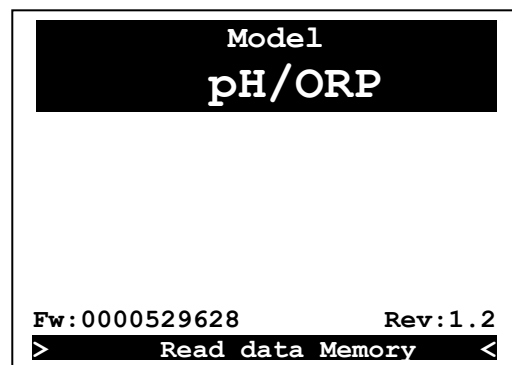
pH/ORP PROBE CONNECTION



Turn off the instrument. Connect the cable of the electrode to the terminal block of the instrument observing the polarity indicated above.
The maximum length of the pH/ORP electrode cable (as a single element) must not exceed **10 meters**. 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.

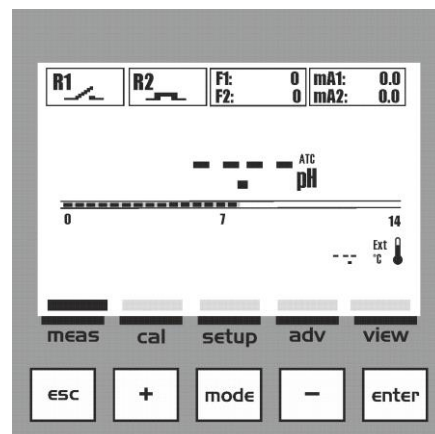
STARTUP

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

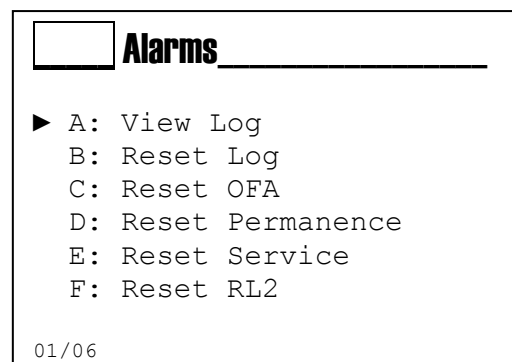
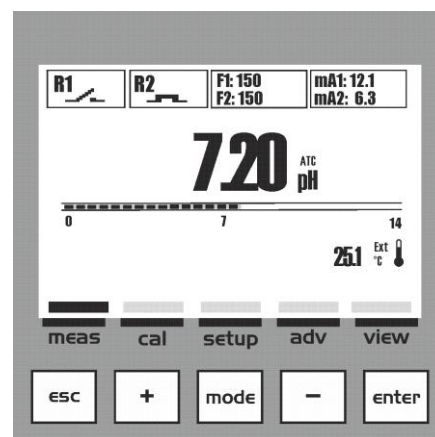


Wait

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 (48 maximum items)

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):

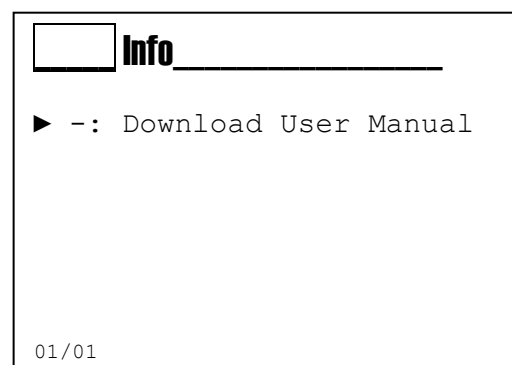
Scroll through the menu using the **(+)** or **(-)** key, select the item and confirm with the **Enter** key.



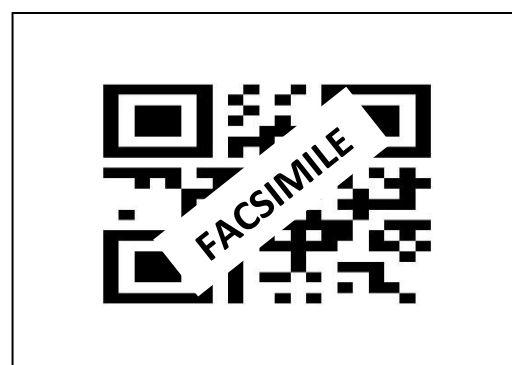
INFO MENU

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

Select the item "Download Manual" and press the Enter key.

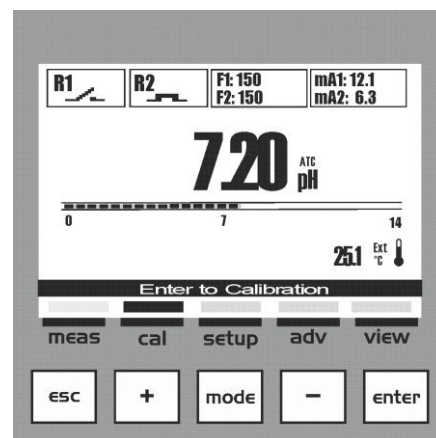


On the screen will be displayed the QR Code with which you can start downloading the user manual in pdf format.



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 and confirm with the **Enter** key.



Menu 1 Calibration

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

- A: pH or Redox Chemical Measure
- B: Temperature

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

1 CALIBRATION

- ▶ A: Chemical Measure
- B: Temperature

01/02

Menu 1 Chemical Measure Calibration (Menu 1A)

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

- 1A1:** Automatic: the instrument requires the standard buffer solutions 7 pH, 4 pH or 9.22 pH.
- 1A2:** Manual: the instrument will suggest the buffer solutions from the default values, but the value can be changed.
- 1A3:** External Reference: the instrument accepts the calibration of one point with a manually set value.
- 1A4:** Report: a summary table of calibrated values with indication of the electrode quality.
- 1A5:** Reset Calibration: the calibrations can be delete and restored the default values.

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

1A Chemical Meas. CAL

- ▶ 1: Automatic
- 2: Manual
- 3: External Reference
- 4: Report
- 5: Reset Calibration

01/05



pH CALIBRATION PROCEDURE

Chemical Measure Calibration Menu (Menu 1A)

Menu 1A1 Automatic pH Calibration

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

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

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

Wash the pH probe with clean water and drain it.

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

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

1A **Chemical Meas.**

► 1: Automatic
2: Manual
3: External Reference
4: Report
5: Reset Calibration

01/05

1A1 **Automatic**

Insert probe into the buffer sol.

7.00pH 0mV

Enter to start calibration

1A1 **Automatic**

WAIT

7.00pH 0mV

Count Down:
59

1A1 **Automatic**

Buffer pH.7.00 100%

Insert probe into the buffer sol.

4.00/9.22pH 0mV

Enter to start calibration

1A1 **Automatic**

Buffer pH.7.00 100%

WAIT

4.00/9.22pH 177mV

Count Down:
59

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

Note:

100%: excellent probe quality

75%: good probe quality

50%: sufficient probe quality

25%: poor probe quality; replacement is recommended

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

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

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

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



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

1A1	Automatic	
Calibration Failed!		
Enter to continue		

Menu 1A2 Manual pH Calibration

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

Press the **Enter** key when ready.

1A2

Manual

Insert probe into the buffer sol.

7.00pH0mV

Enter to start calibration

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

1A2

Manual

WAIT

7.10pH0mV

Count Down:
59

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

Wash the pH probe with clean water and drain it.

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

Press the **Enter** key when ready.

1A2

Manual

Buffer pH.7.10 100%

Insert probe into the buffer sol.

4.00pH0mV

Enter to start calibration

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

1A2

Manual

Buffer pH.7.10 100%

WAIT

4.40pH201.1mV

Count Down:
59

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

Note:

100%: excellent probe quality

75%: good probe quality

50%: sufficient probe quality

25%: poor probe quality; replacement is recommended

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



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

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

1A2 Manual

Buffer pH7.10 100%

Buffer pH4.40 100%

Calibration ok!

1A2 Manual

Buffer pH7.10 100%

Buffer pH4.40 100%

SET CALIB DATE:

12 - 03 -14

ENTER TO CONFIRM

1A2 Manual

Calibration Failed!

Enter to continue

Menu 1A3 External Reference

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

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

1A3

Reference

7.00

pH

ENTER TO CONFIRM

Menu 1A4 Report

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

1A4

Report

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

Calibration type: Automatic
Date of last calibration:

12 - 03 - 14

Menu 1A5 Reset Calibration

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

1A5

Reset Calibration

Procede with the Reset?

NO

YES



ORP CALIBRATION PROCEDURE

Chemical Measure Calibration Menu (Menu 1A)

Menu 1A1 Automatic ORP Calibration

Menu 1A1 Automatic ORP Calibration

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

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

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

Note:

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

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

1A Chemical Meas._____

► 1: Automatic
2: Manual
3: External Reference
4: Report
5: Reset Calibration

01/05

1A1 Automatic_____

Insert probe into the buffer sol.

465mV 0mV

Enter to start calibration

1A1 Automatic_____

WAIT

465mV 0mV

Count Down:
59

1A1 Automatic_____

Buffer mV 465 100%

Calibration ok!

1A1 Automatic_____

Buffer mV 465 100%

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



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

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

Menu 1A2 Manual

Insert the probe into the 475 mV buffer solution and set the value of the buffer solution using the (+) and (-) keys.
Press the **Enter** key when ready.

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

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

Note:

100%: excellent probe quality

75%: good probe quality

50%: sufficient probe quality

25%: poor probe quality; replacement is recommended

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

1A1 Automatic_____

Calibration Failed!

Enter to continue

1A2 Manual_____

Insert probe into the buffer sol.

465mV 465mV

Enter to start calibration

1A2 Manual_____

WAIT

475mV 475mV

Count Down:
59

1A2 Manual_____

Buffer mV 475 100%

Calibration ok!

1A2 Manual_____

Buffer mV 475 100%

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



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

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

Menu 1A3 External Reference

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

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

Menu 1A4 Report

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

Menu 1A5 Reset Calibrazione

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

1A2 Manual_____

Calibraion Failed!

Enter to continue

1A3 Reference_____

465mV

ENTER TO CONFIRM

1A4 Report_____

Buffer mV465 100%

Gain 1.00 Offset 0.00 mV

Type of Calibration: Manual
Last calibration date:

12 - 03 - 14

1A5 Reset Calibration_____

Procede with the Reset?

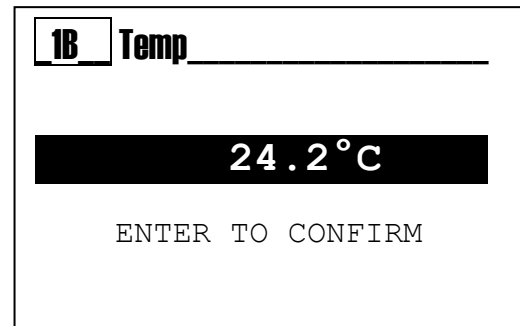
NO
YES

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.



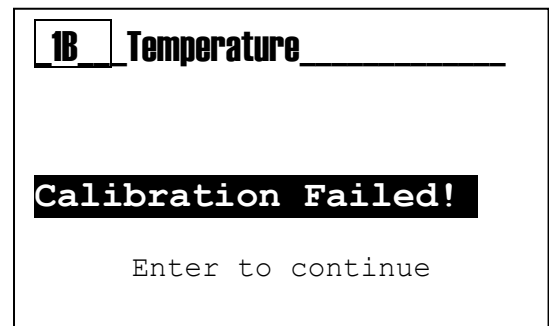
1B Temp_____

24.2°C

ENTER TO CONFIRM

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.



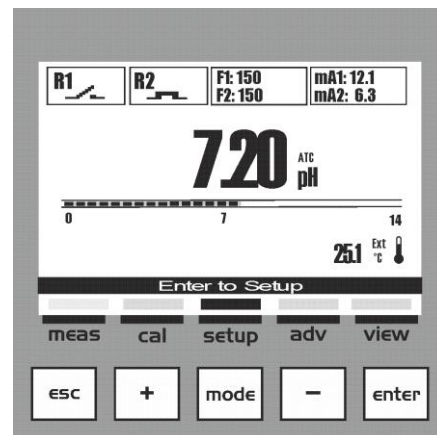
1B Temperature_____

Calibration Failed!

Enter to continue

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.

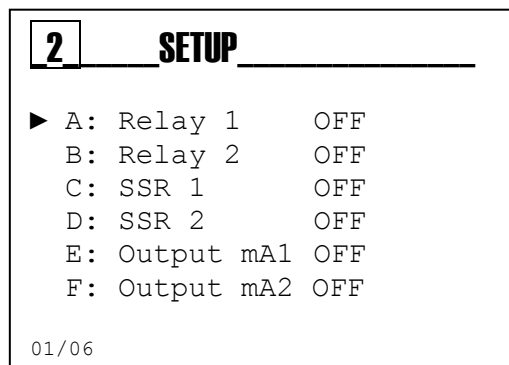


The Setup menu consists of six (6) items or sub-menus:

- 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)



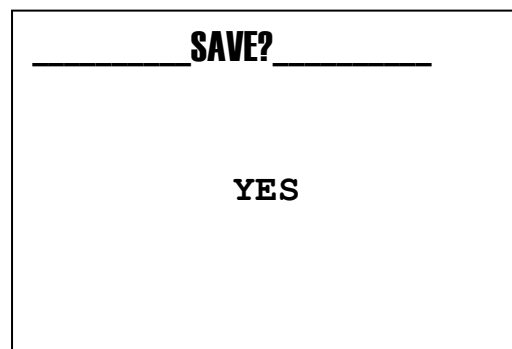
Note: To set the relative function to each output, read the manual at the **Advanced Menu\Outputs Configuration** section (INDEX MENU 3G).



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 Chemical Measure or for Temperature Measure with the following activation methods:

ON/OFF Method

(Activation on threshold, with maintenance of the state)

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

2A2 **Activation Type**: **Low/Alka** as the minimum value to maintain **High/Alcid** 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 chemical 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 **Interval**: 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 chemical measure according to the distance from the SetPoint.



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

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

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 7.20 pH
- 2: Activ. Type Acid
- 3: Hysteresis 0.00 pH
- 4: Hyst. Time 00' 00"
- 5: Delay Start 00' 00"
- 6: Delay End 00' 00"
- 7: OFA OFF
- 8: Over Range OFF
- 9: 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"

01/10

2A RELAY_1_PWM

- 7: OFA OFF
- 8: Over Range OFF
- 9: Permanence OFF
- ▶ 10: Interval 00' 10"
- 11: Prop. Band 0.20pH

01/10

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 Chemical 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: chemical measure out of range Relay 1

2B2 OFA R1: Maximum dosing time expired

2B3 Permanence Measure: chemical 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 Wash	
► 1: Wash Time	00' 00"
2: Delay Meas.	00' 00"
3: Wait New	OFF

01/3

2B 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 Chemical Measure or for Temperature Measure

SSR1 Setup (INDEX MENU 2C)

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

2C2 **Activation Type**:

Low/Alka as the minimum value to maintain

High/Acid 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 chemical measure according to the distance from the SetPoint.



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

SSR2 Setup (INDEX MENU 2D)

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

2D2 **Activation Type**:

Low/Alka as the minimum value to maintain

High/Acid 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 chemical measure according to the distance from the SetPoint.



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

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

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	7.40pH
2: Activ. Type	Acid
3: Pulse Max	400
4: Pulse min	1
5: Prop. Band	0.20pH
01/05	

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	

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 Chemical 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 **Hold**: 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 **Hold**: Freezes the current value in case of 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

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	0.00pH
2: End mA	14.00pH
3: Hold	NO
4: Namur	OFF
01/04	

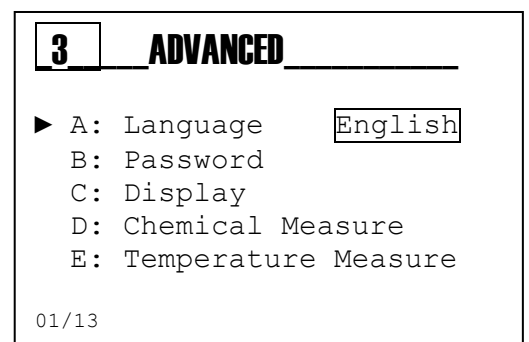
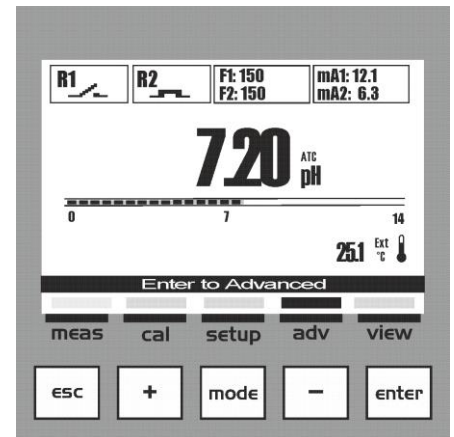
2F	Output_mA2
► 1: Start mA	-50.0°C
2: End mA	150.0°C
3: Hold	NO
4: Namur	OFF
01/04	

ADVANCED MENU (MENU INDEX 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 thirteen (13) items or sub-menus, as follows:

- A: Language
- B: Password
- C: Display
- D: Chemical Measure
- E: Temperature Measure
- F: Alarms Configuration
- G: Outputs Configuration
- H: RS485 Configuration
- I: USB Configuration
- L: Control Panel
- M: Statistics
- N: Reset Instrument
- O: Firmware Revision

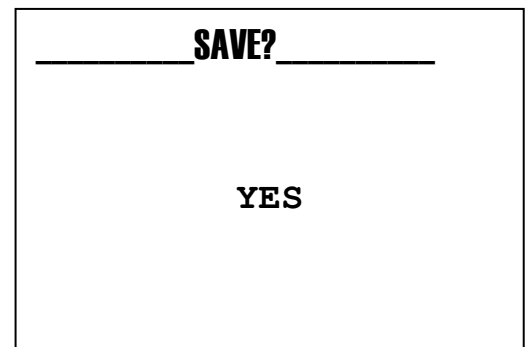


Below are illustrated the settings required for each sub-menu indicated above.

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.

3	Advanced
▶ A: Language English	
B: Password	
C: Display	
D: Chemical Measure	
E: Temperature Measure	
01/13	

3A	LANGUAGE
▶ ☒ English	
☐ French	
☐ Italian	
☐ German	
☐ Spanish	
01/05	

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 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

Scroll through the menu using the **(+)** or **(-)** key, select the next item with **Mode** key.

Menu 3B2

ON= Menu Enabled

OFF= Menu Disabled; can be accessed by entering the password

Menu 3B3

ON= Menu Enabled

OFF= Menu Disabled; can be accessed by entering the password

3 **Advanced**

A: Language English

► B: Password

C: Display

D: Chemical Measure

E: Temperature Measure

01/13

3B **Password**

► 1: Set Password

2: CAL menu Enable

3: SETUP menu Disable

02/03

3B1 **Set_Password**

0 0 0 0

Old Password 1234

3B2 **Enable CAL Menu**

► ☐ OFF

☒ ON

3B3 **Enable_SETUP_Menu**

► ☐ OFF

☒ ON

ADVANCED MENU \ DISPLAY (INDEX MENU 3C)

The menu consists of five (5) items that allow to select Contrast, Mode, Mode On, Mode Off, 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 Negative Display (Reverse): Inverted display, white writings black background.

3	Advanced	
A:	Language	English
B:	Password	
▶ C:	Display	
D:	Chemical Measure	
E:	Temperature Measure	
03/13		

3C	Display	
▶ 1:	Contrast	00
2:	Mode	ECO
3:	ON	100%
4:	ECO	50%
5:	Negative Display	OFF

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

Menu 3C1

Adjusts the background brightness

3C1	Contrast
+ 0 0	

Menu 3C2

Select the Backlight function:

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

3C2	Mode
▶	☐ OFF
	☒ ON
	☐ ECO

Menu 3C3

Select the brightness value for ON mode

3C3	On
0 5 0 %	

Menu 3C4

Select the brightness value for ECO mode

Itself reduce the light after one minutes.

3C4	ECO
0 5 0 %	

Menu 3C5

Invert the writings on the display to obtain a high contrast

3C5	Negative_Display
▶	☒ OFF
	☐ ON

ADVANCED MENU \ CHEMICAL MEASURE (INDEX MENU 3D)

The menu consists of three (3) items that allow to select Measure Unit, Temperature Compensation and Measure Filter.

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

Chemical Measure Function (INDEX MENU 3D)

3D1 Measure Unit: Select the chemical measure, pH or mV

3D2 Temperature Compensation: The measure is compensated for temperature::

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

Note: To set the value manually, access the menu 3E2 Temp. Meas.

3D3 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



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

Menu 3D1

Select the measure pH or mV (Redox).

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

Menu 3D2

Select the temperature compensation mode for the Chemical measure.

Note: For ORP measures has no effect.

Menu 3D3

The measure is filtered with arithmetic mean.

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

3	Advanced	
A:	Language	English
B:	Password	
C:	Display	
►	D: Chemical Measure	
	E: Temperature Measure	
04/13		

3D	Chemical Measure	
►	1: Measure Unit	
	2: Temp. Compensation	
	3: Measure Filter	
01/03		

3D1	Measure_Unit	
►	☒ pH	
	☐ mV (Redox)	
01/02		

3D2	Temp._Compensation	
►	☒ MTC	
	☐ ATC	
01/02		

3D3	Measure_Filter	
►	☒ Low	
	☐ Medium	
	☐ High	
01/03		

ADVANCED MENU \ TEMPERATURE MEASURE (INDEX MENU 3E)

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

Temperature Measure Function (INDEX MENU 3E)

3E1 Select: PT100 or PT1000 temperature sensor connected or using a manual temperature value.

3E2 Measure Unit: Set Celsius (°C) or Fahrenheit (°F) unit

3E3 Manual Value: Set the temperature value without PT100 or PT1000 temperature sensor

3E4 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

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

Menu 3E1

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

Menu 3E2

Select the measure unit.

Menu 3E3

Set the the temperature value as manual value.

Menu 3E4

The measure is filtered with arithmetic mean.

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

3

Advanced

A: Language

English

B: Password

C: Display

D: Chemical Measure

► E: Temperature Measure

05/13

3E

Temperature_Measure

► 1: Select

Manual

2: Measure Unit

°C

3: Manual Value

25°C

4: Filter

Medium

01/04

3E1

Temp._Meas._Enabled

► ☒ Manual

☐ External

01/02

3E2

Temp._Meas._Unit

► ☒ °C

☐ °F

01/02

3E3

T_Manual_Value

27.0

°C

7

8

9

4

5

6

1

2

3

0

.

?

+/-

Canc

Invio

3E4

T_Measure_Filter

► ☒ Low

☐ Medium

☐ High

01/03

ADVANCED MENU \ ALARMS CONFIGURATION (INDEX MENU 3F)

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

Alarms Configuration Function

- 3F1 Reed Logic:** Set the sensor logic
- Reed NO (Normaly Open)
 - Reed NC (Normaly Close)
- 3F2 Delay Reed:** Set the delay time for alarm activation to change REED status
- 3F3 Delay Hold:** Set the delay time for alarm activation for HOLD signal presence
- 3F4 Network Interruption:** Enables a visual alarm in case a power supply interruption took place in precedence.
- 3F5 Instrument blocking:** Enables instrument blocking in case of alarm. The outputs are automatically set on the programmed alarm state.
- 3F6 Temp. Probe Alarm:** Enables a visual or remote alarm in case the temperature probe is broken or disconnected
- 3F7 Service:** Set a value in days to display a message of "Service Required"

3

Advanced

B: Password

C: Display

D: Chemical Measure

E: Temperature Measure

► F: Alarms Config.

06/13

3F

Alarms_Config.

► 1: Reed Logic

2: Delay Reed

3: Delay Hold

4: Network Int.

5: Block

6: T. Probe Alr.

7: Service

NA

00'00"

00'00"

NO

NO

Notif.

OFF

01/07

ADVANCED MENU \ OUTPUTS CONFIGURATION (INDEX MENU 3G)

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

Outputs Configuration Function

3G1 Relay 1: Disabled (Off), On/OFF (threshold), Timed, Proportional PWM, either for Chemical Measure or for Temperature Measure

3G2 Relay 2: Disabled (Off), On/OFF (threshold), Timed, Proportional PWM, either for Chemical Measure or for Temperature Measure, and also Probe Wash, Remote Alarm

3G3 SSR 1: Disabled (Off), Chemical Measure, Temperature Measure

3G4 SSR 2: Disabled (Off), Chemical Measure, Temperature Measure

3G5 mA 1: Disabled (Off), Chemical Measure, Temperature Measure

3G6 mA 2: Disabled (Off), Chemical Measure, Temperature Measure



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

3G1 Relay_1

► ■ Off

- ☐ On/OFF Measure
- ☐ Timed Measure
- ☐ PWM Measure
- ☐ On/OFF Temp.
- ☐ Timed Temp.
- ☐ PWM Temp.

01/07

3G2 Relay_2

► ■ Off

- ☐ On/OFF Measure
- ☐ Timed Measure
- ☐ PWM Measure
- ☐ On/OFF Temp.
- ☐ Timed Temp.
- ☐ PWM Temp.
- ☐ Probe Wash
- ☐ Alarm

01/09

3G3 SSR_1

► ■ Off

- ☐ Measure
- ☐ Temperature

01/03

3G4 SSR_2

► ■ Off

- ☐ Measure
- ☐ Temperature

01/03

3G5 mA_1

► ■ Off

- ☐ Measure
- ☐ Temperature

01/03

3G6 mA_2

► ■ Off

- ☐ Measure
- ☐ Temperature

01/03

ADVANCED MENU \ RS485 PORT CONFIGURATION (INDEX MENU 3H)

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

RS485 Serial Port Configuration Function:

3H1 RS485: Enables the serial port (Enable/Disable)

3H2 Mode: Standard protocol used (RTU/Ascii)

3H3 Address: Communication Address (ID 1÷247)

3H4 Baud rate: Communication speed (1200÷115200 bps)

3H5 Parity: Parity bit for checking transmission (none, odd, even)

3H6 Bit stop: Stop bits to set waiting time (1, 2)



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.

3	Advanced
D: Chemical Measure	
E: Temperature Measure	
F: Alarms Config.	
G: Outputs Config.	
▶	H: RS485 Config.
08/13	

Example:

Relay 1 set as "ON/OFF Measure".

Setpoint to be set [index 2A1]: 7,40pH

Conversion Decimal → Hexadecimal:

740 → 0x2E4

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: 0x02E4 (Setpoint L)

Address 3101: 0x0000 (Setpoint H)

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	CRC H	CRC L
0x01	0x10	0x0C	0x1C	0x00	0x02	0x04	0x02	0xE4	0x00	0x00	0xE6	0x79

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	0x02	0x06	0x9D

The read Setpoint will be formatted as follows:

Address 3100: 0x02E4 (Setpoint L)

Address 3101: 0x0000 (Setpoint H)

Reconstructing the data we will have the following value: 7,40pH

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

ADVANCED MENU \ USB PORT CONFIGURATION (INDEX MENU 3I)

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

3	Advanced
E: Temperature Measure	
F: Alarms Config.	
G: Outputs Config.	
H: RS485 Config.	
► I: USB Config.	
09/13	

ADVANCED MENU \ CONTROL PANEL (INDEX MENU 3L)

Menu 3L Control Panel

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

- 3L1** Chemical Measure: Displays the unfiltered measure in mV.
- 3L2** Temp. Measure: Displays the unfiltered measure in °C/°F
- 3L3** Test Relay 1: Manual closing of the relay contact
- 3L4** Test Relay 2: Manual closing of the relay contact
- 3L5** Simulation Frequency 1: Simulates an output value
- 3L6** Simulation Frequency 2: Simulates an output value
- 3L7** Simulation Current Output 1: Simulates an output value
- 3L8** Simulation Current Output 2: Simulates an output value
- 3L9** Displays the Reed Input status
- 3L10** Displays the Hold Input status
- 3L11** 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 **3L Control Panel**.

3	Advanced
F: Alarms Config.	
G: Outputs Config.	
H: RS485 Config.	
I: USB Config.	
► L: Control Panel	
10/13	

3L	Control_Panel
► 1: Chemical Measure	
2: Temp. Measure	
3: Test Relay 1	
4: Test 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 3M)

Menu 3M Statistics

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

- 3M1 Number of registered Startups
- 3M2 Number of registered Alarms
- 3M3 Number of activations Relay 1
- 3M4 Number of activations Relay 2
- 3M5 Number of activations Reed
- 3M6 Number of activations Hold
- 3M7 Reset all values recorded in the statistics menu

3

Advanced

G: Outputs Config.
H: RS485 Config.
I: USB Config.
L: Control Panel
► M: Statistics

11/13

3M

Statistics

► 1: Startups n.
2: Alarms n.
3: Relay 1 Act.n.
4: Relay 2 Act.n.
5: Reed Act. n.
6: Hold Act. n.
7: Reset Statistics

01/07

ADVANCED MENU \ RESET INSTRUMENT (INDEX MENU 3N)



Menu 3N Reset Instrument

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

3

Advanced

H: RS485 Config.
I: USB Config.
L: Control Panel
M: Statistics
► N: Reset Instrument

12/13

3N

Reset_Instrument

Procede with the Reset?

NO

YES

ADVANCED MENU \ FIRMWARE REVISION (INDEX MENU 30)

Menu 30 Firmware Revision
The instrument displays the Firmware code and revision of the device.

3

Advanced

I: USB Config.
L: Control Panel
M: Statistics
N: Reset Instrument
▶ O: Firmware Revision

13/13

30

Firmware_Revision

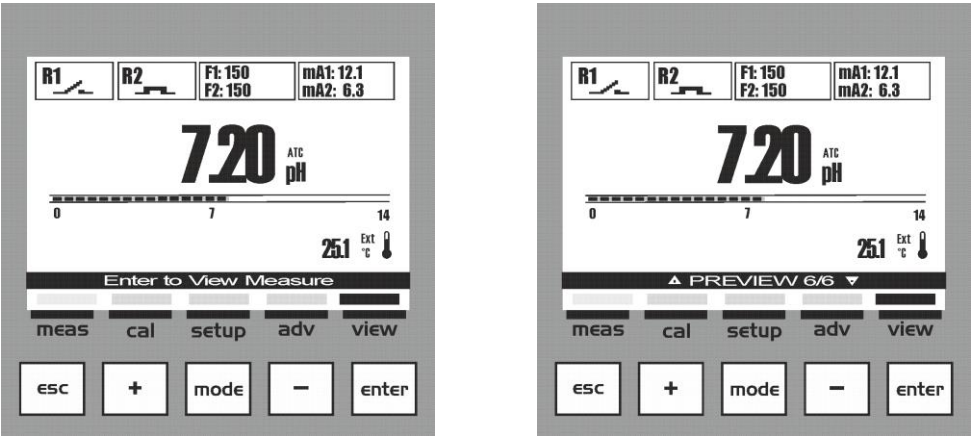
Firmware Code
0000529XXX

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

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

GENERAL SPECIFICATIONS

pH/ORP Specifications	
Range pH	0.00 to 14.00 pH
Range mV	–2000 to 2000 mV
Resolution pH	0.01
Accuracy pH	± 0.01 pH
Resolution mV	1 mV
Accuracy mV	± 1 mV
Input Impedance	> 10 ¹²
Insulation	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 °C (–58.0 to 302.0 °F)
Sensor Maximum Distance	10 to 20 m (33 to 65 ft) depending on sensor
Temperature Resolution	0.1°C (°F)
Temperature Accuracy **	Pt100: ± 0.5°C (± 0.9 °F) - Pt1000: ± 0.2°C (± 0.4 °F)
Insulation	Functional

MECHANICAL SPECIFICATIONS FOR VERSION 1/4DIN

Dimensions (chassis – A x L x P)*	92 x 92 x 57,3 mm
Front Bezel – (A x L)	96 x 96 mm
Max. Depth	42 mm
Weight	400 g (0,88 lb)
Material	ABS/polycarbonate
Protection	IP 65 (front)/IP 20 (chassis)
Relative Humidity	0 to 95% non condensing

* L = larghezza, A = altezza, P = profondità

MECHANICAL SPECIFICATIONS FOR VERSION 1/2DIN

Dimensions (chassis – A x L x P)*	144 x 144 x 122.5 mm
Front Bezel – (A x L)	144 x 144 mm
Weight	823 g (1.81 lb)
Material	ABS/polycarbonate
Protection	IP 65
Relative Humidity	0 to 100% condensing

* L = larghezza, A = altezza, P = profondità

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

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

ELECTRICAL SPECIFICATIONS

Power Supply (versione 100÷240 VCA)	
Electrical requirements	100 to 240 VAC, 5 VA
Frequency	50 to 60 Hz
Power Supply Fuse	500 mA delay not recoverable
Short Circuit Protection	Active
Power Supply (versione 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

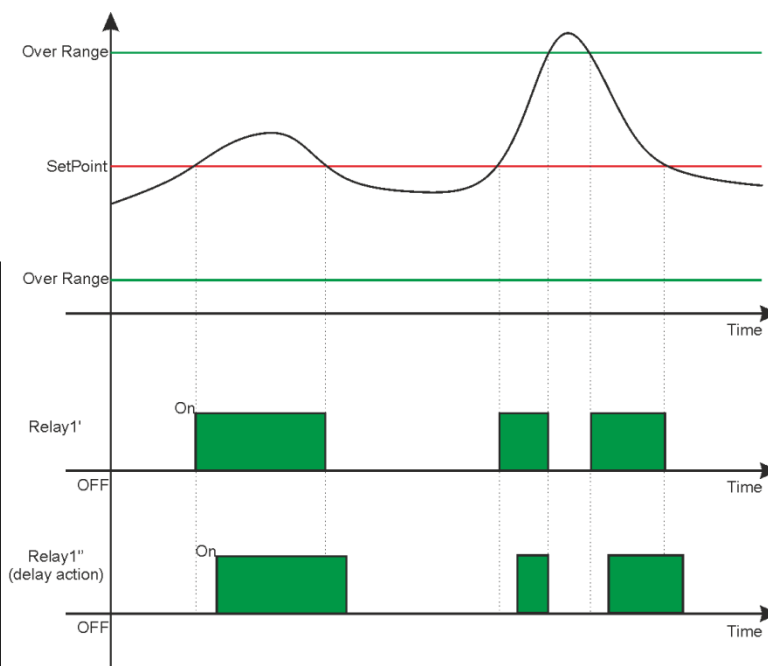
ANNEX A: ON/OFF RELAY SETUP

Below is an example of settings for the Relay 1 or 2 to adjust the pH by dosing acid chemical product using the pulse/pause method (on/off).

Example:

2A RELAY_1_ON/OFF	
1: SetPoint	7.20 pH
2: Activ. Type	Acid
3: Hysteresis	0.00 pH
4: Hyst. Time	00'00"
5: Delay Start	00'00"
6: Delay End	00'00"
7: OFA	OFF
8: Over Range	3 pH
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'').
- **Chemical Measure out of range:** When the measure (black line) exceeds the maximum or minimum Over Range value (green line), the system displays a visual alarm and blocks the dosage by changing the status of the relay 1 or 2.

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

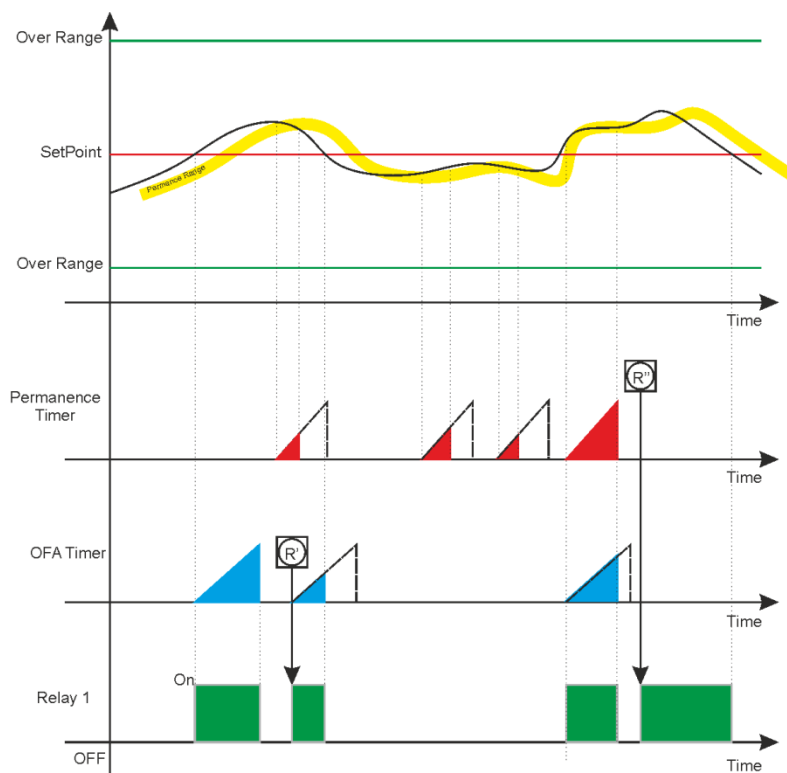
Hysteresis Function: By setting the menu items "3" and "4" the instrument maintains the relay activation status both for the chemical measure value and for the time.

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 pH by dosing acid chemical product using the pulse/pause method (on/off) with OFA timers and Permanence Measure.

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

01/09



All the settings described on the previous page remain valid.

Note:



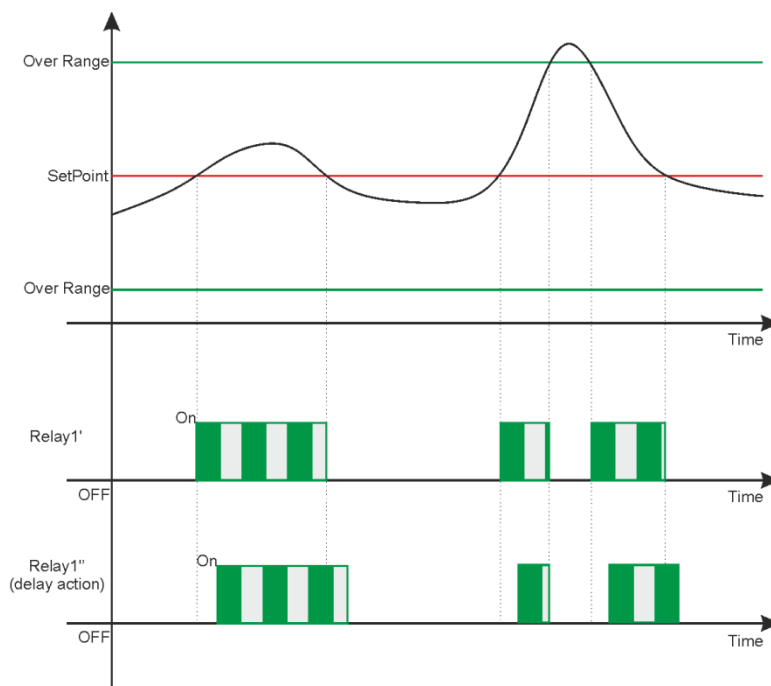
- OFA (Over Feed Alarm):** By setting the function “7” OFA with a time in hours and minutes a control timer is activated in parallel to the relay activation. The function checks the activated relay persistence times and generates a visual prealarm at 70% of set value and a blocking alarm (R') at the 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 pH by dosing acid chemical product using the timed method.

2A RELAY_1_Timed	
1: SetPoint	7.20 pH
2: Activ. Type	Acid
3: Hysteresis	0.00 pH
4: Hyst. Time	00' 00"
5: Delay Start	00' 00"
6: Delay End	00' 00"
7: OFA	OFF
8: Over Range	OFF
9: 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")
- **Chemical Measure out of range:** When the measure (black line) exceeds the maximum or minimum Over Range value (green line), the system displays a visual alarm and blocks the dosage by changing the status of the relay 1 or 2.

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

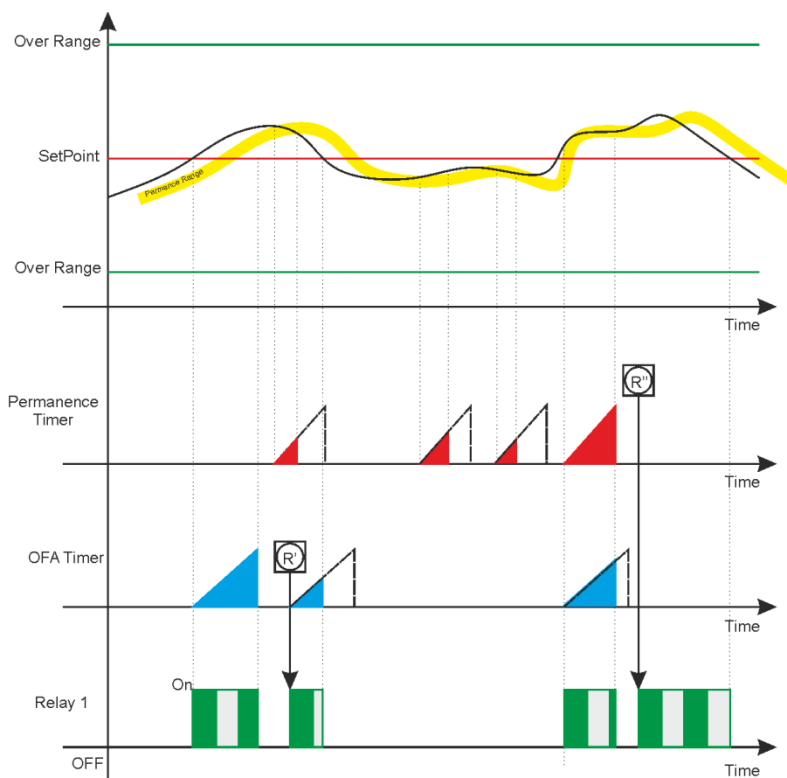
Hysteresis Function: By setting the menu items "3" and "4" the instrument maintains the relay activation status both for the chemical measure value and for the time.

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 pH by dosing acid chemical product using the timed method.

2A RELAY_1 Timed	
1: SetPoint	7.20 pH
2: Activ. Type	Acid
3: Hysteresis	0.00 pH
4: Hyst. Time	00'00"
5: Delay Start	00'00"
6: Delay End	00'00"
7: OFA	OFF
8: Over Range	OFF
9: 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:



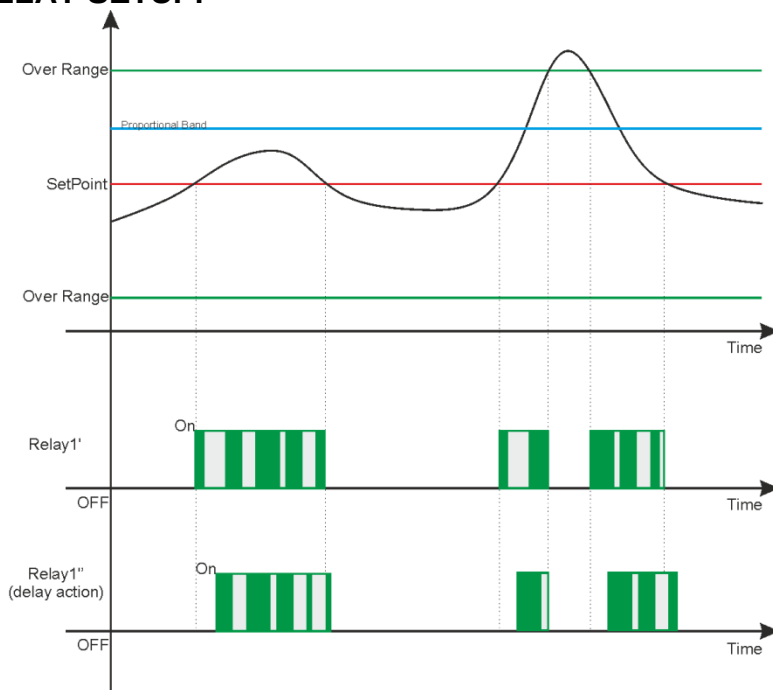
- OFA (Over Feed Alarm):** By setting the function "7" OFA with a time in hours and minutes a control timer is activated in parallel to the relay activation. The function checks the activated relay persistence times and generates a visual prealarm at 70% of set value and a blocking alarm (R') at the 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 pH by dosing acid chemical product using the proportional (PWM) method.

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

01/11



Note:



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

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

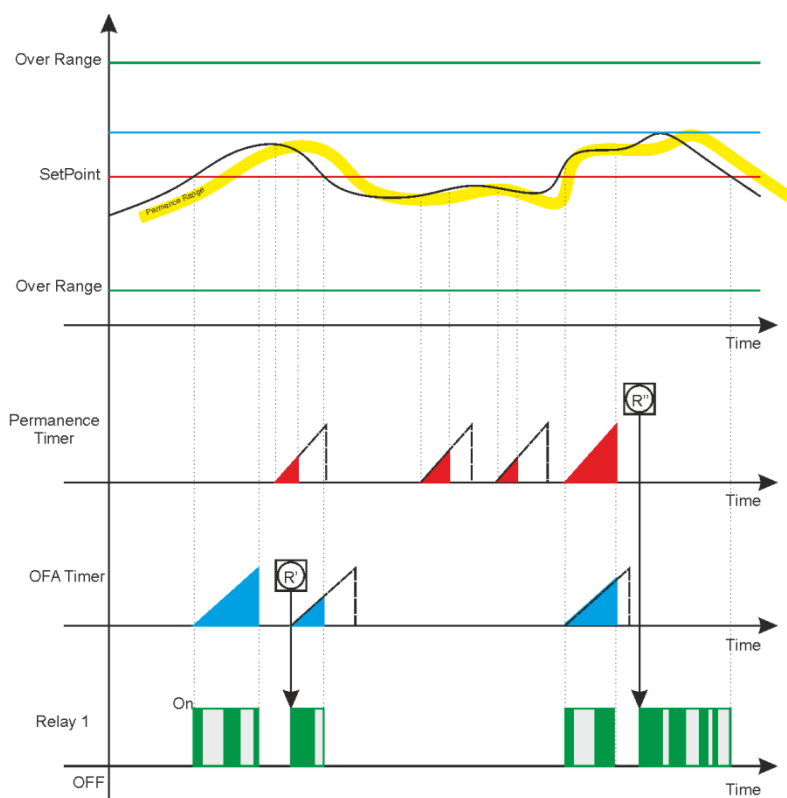
Hysteresis Function: By setting the menu items "3" and "4" the instrument maintains the relay activation status both for the chemical measure value and for the time.

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 pH by dosing acid chemical product using the proportional (PWM) method

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

01/11



All the settings described on the previous page remain valid.

Note:

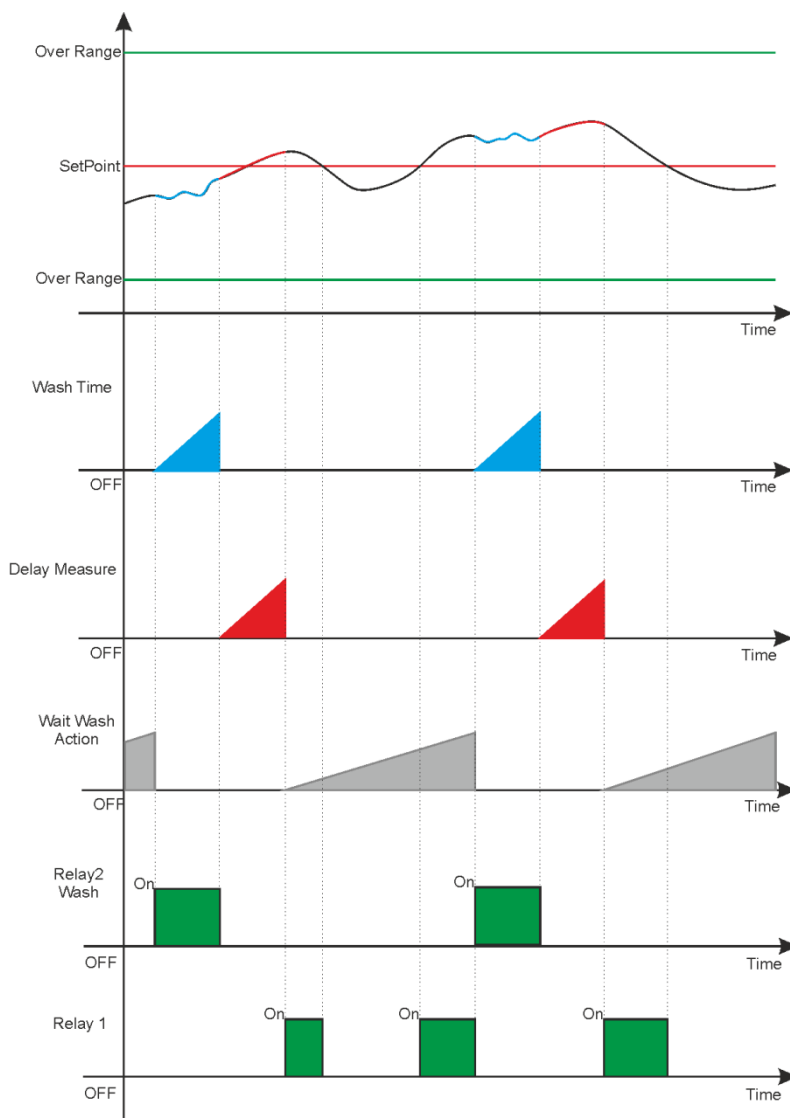


- OFA (Over Feed Alarm):** By setting the function "7" OFA with a time in hours and minutes a control timer is activated in parallel to the relay activation. The function checks the activated relay persistence times and generates a visual prealarm at 70% of set value and a blocking alarm (R') at the end of the set time (100%). A manual intervention will be required to remove the blocking with the reset of the OFA function on the alarms menu (see alarms section).
- Measure 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	Wash
► 1: Wash Time	05' 00"
2: Delay Meas.	05' 00"
3: Wait New	06h 00m
01/3	



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 (Light Green 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.



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

ANNEX E: RELAY 2 SETUP TO REPEAT REMOTE ALARM.

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

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

2B

Relay (Alarm)

► 1: OverRange R1

2: OFA R1

3: Perm.Meas.R1

4: Reed Alarm

5: Hold Alarm

6: Temp. Alarm

NO

NO

NO

NO

NO

NO

01/06

3F

Alarms_Conf.

► 1: Reed Logic

2: Delay Reed

3: Delay Hold

4: Network Int.

5: Instr. Blocking

6: T. Probe Alr.

7: Service

NA

00'00"

00'00"

NO

NO

Notif.

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 2 Timer decreased at 100%	OFA2 R1	Alarm with instrument blocking (*)
10	Chemical Measure outside of working range	Over Range R1	Alarm with instrument blocking (*)
11	Permanent measure to a fixed value	Holding R1	Alarm with instrument blocking (*)
12	Relay 2 Timer decreased at 70%	OFA1 R2	Preliminary Alarm
13	Relay 2 Timer decreased at 100%	OFA2 R2	Alarm with instrument blocking (*)
14	Chemical Measure outside of working range	OverRange R2	Alarm with instrument blocking (*)
15	Permanent measure to a fixed value	Holding R2	Alarm with instrument blocking (*)

(*All the alarms with blocking function are valid if the menu item 3F5 is equal to YES)

(**The temperature sensor breakage alarm blocks the instrument if the menu item 3F6 is equal to YES)

Note:



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

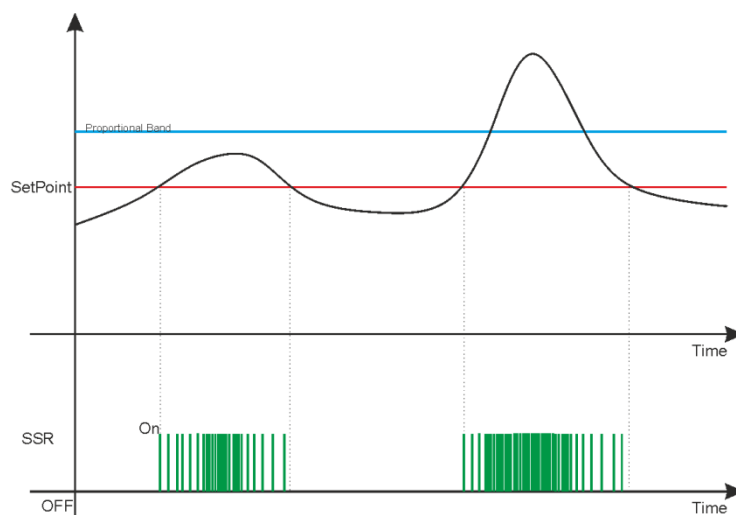


Note: The alarms are stored in memory every 15 minutes, if the instrument is switched off loses alarms displayed in the last 14 minutes.

ANNEX F: SSR1 AND SSR2 SETUP

Proportional frequency output with independent Proportional Band and SetPoint.

2C	SSR1
► 1: SetPoint	7.40pH
2: Activ. Type	Acid
3: Pulse Max	400
4: Pulse min	1
5: Prop. Band	0.20pH
01/05	



Note:

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



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

0.00pH

2: End mA

14.00pH

3: Hold

NO

4: Namur

OFF

01/04

2E

Output_mA1

► 1: Start mA

-2000 mV

2: End mA

+2000 mV

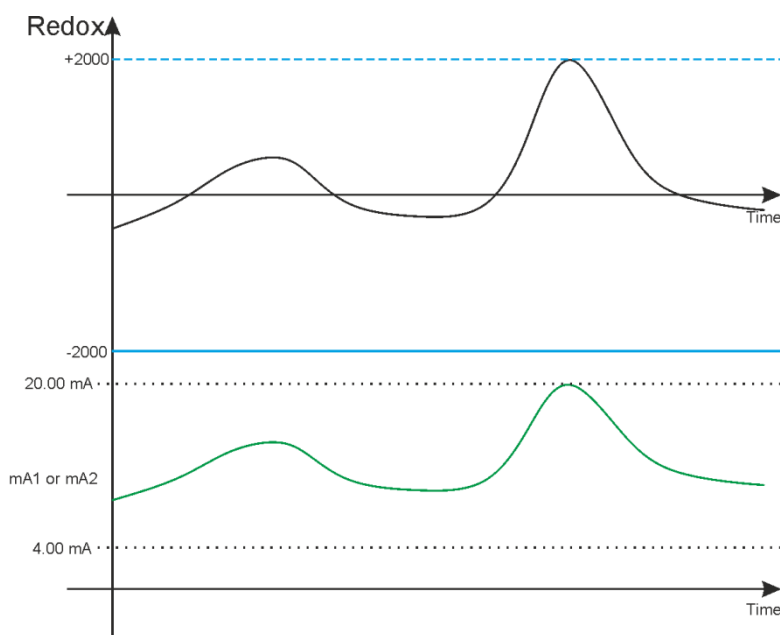
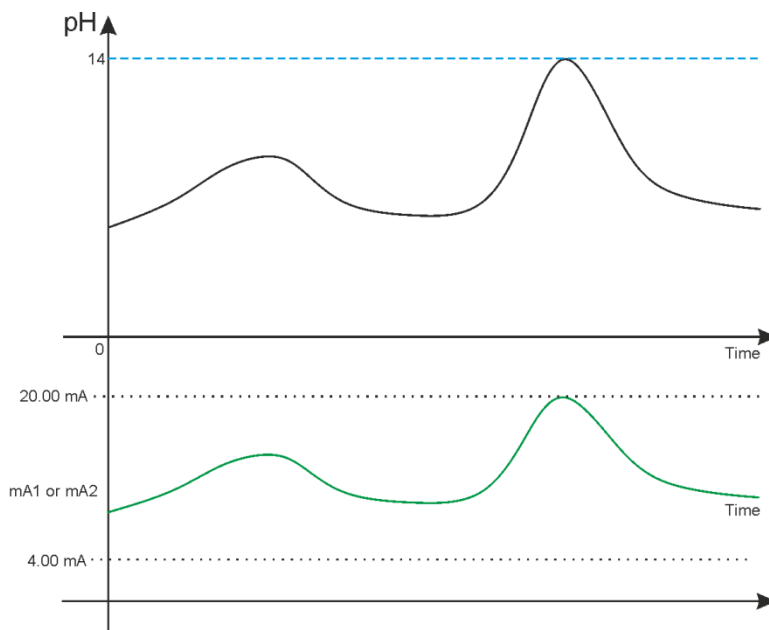
3: Hold

NO

4: Namur

OFF

01/04



Note:



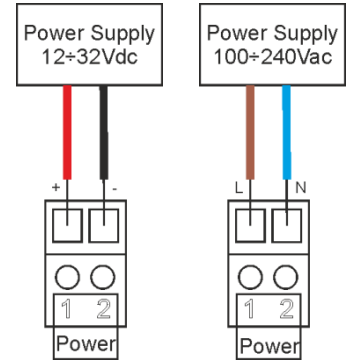
- **Start mA:** Minimum value of chemical measure associated to 4 mA
- **End mA:** Maximum value of chemical measure associated to 20 mA
- **Hold:** By setting the variable to YES, in case of alarm the instrument freezes the mA output to the last calculated value with Holding Alarm.
- **Namur:** By setting 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: WIRING EXAMPLES

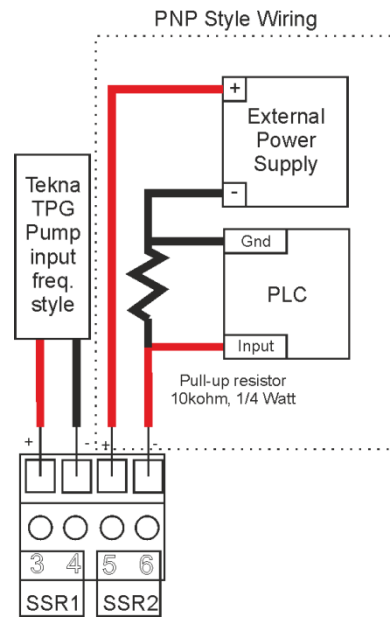
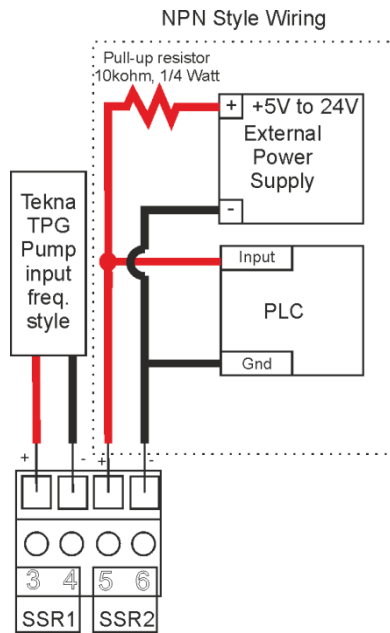
Power Supply:

- 12÷32Vdc or 100÷240Vac; Check the product label
- Observe the polarity
- Maximum Power Consumption 3,5 W or 5W



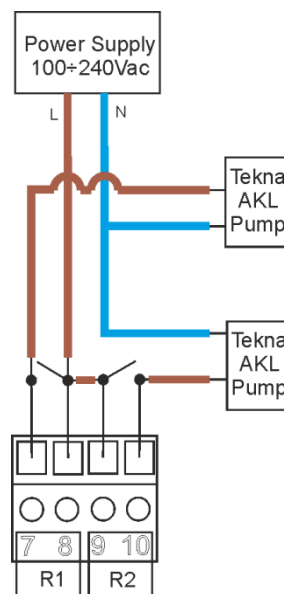
Frequency outputs SSR1 and SSR2:

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



Relay outputs 1 and 2:

- Maximum load 5 A resistive

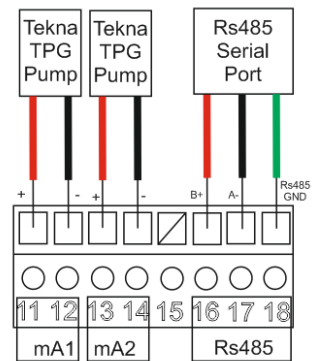


Current outputs mA 1 and 2:

- 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:

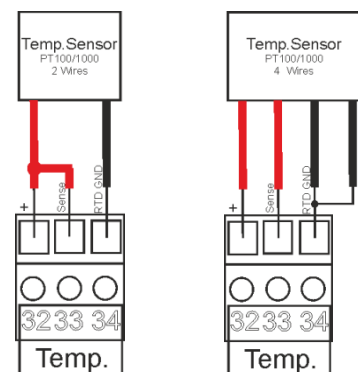
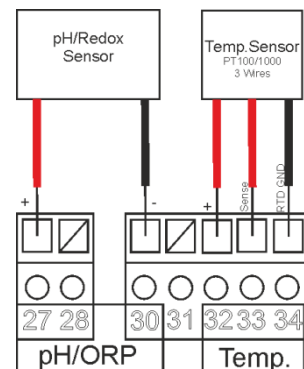
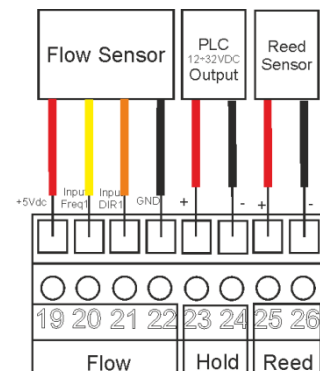
- Voltage signal from 12 to 32 Vdc
- Observe the polarity

pH/ORP measure input:

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

Temperature measure input:

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



USB Port Input:

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

ANNEX I: TROUBLESHOOTING

Problem	Possible Cause
The display shows the symbol 	• See ANNEX E
Calibration	• Contaminated buffer solutions (old) • Probe damaged or old • Probe cables damaged • Measure input of the instrument damaged
Data Memory Error	• Internal memory broken
Password Error	• Error value
Temperature Measure Error the display shows 	• Temperature probe broken or disconnected
Chemical Measure Error	• Sensor not calibrated • Sensor not installed correctly • Temperature compensation incorrectly set or disabled • The sensor or the cable is defective • Electronic measure input damaged • The sensor cable exceeds the maximum length
Measure reading not stable	• Sensors or cables installed too close to devices that generate electrical noise. • Sensor installed on flow with hydraulic turbulence. • Average measure set too low. • Probe cables excessively long
Unable to display the Calibration or Setup menu	• User excluded for safety reasons
The display is turned off	• The instrument does not receive correct power supply. • LCD contrast is not set correctly. • The fuse has blown. • Hardware fault.
The display shows in the upper right corner "Diagnostic"	• Turn the instrument off and then on again; if the problem persists, contact your provider

ANNEX L: 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	%
	Inversion	OFF	OFF	ON	
Chemical Meas.	Measure Unit	pH	pH	mV	
	Temp. Compensation	MTC	MTC	ATC	
	Filter	Medium	Low, Medium, High		
Temperature Meas.	Sensor Type	Manual	Manual	External	
		°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 Config.	Reed Logic	NA	NA	NC	
	Delay Activation REED	OFF	OFF 00':00")	60':59"	min:sec
	Delay Activation HOLD	OFF	OFF (00':00")	60':59"	min:sec
	Network interruption	NO	NO	YES	
	Instrument blocking	NO	NO	YES	
	Temperature Alarm	Notification	Notification	Block	
	Service	OFF	OFF (0)	365	Days
Outputs Config.	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			
	mA1	OFF			
	mA2	OFF			
RS485 Config. Present only for version with RS485	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	1	2	
USB Config.	Reserved for future use				
Control Panel	Chemical Measure	---	-2100	+2100	mV
	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. Startups	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		Chemical Measure Unit: pH				
Parameter	Sub-parameter 1	Sub-parameter 2	Default Value	Min Value	Max Value	Unit
Relay 1 / Relay 2 pH ON/OFF	SetPoint	---	7,40	0,00	14,00	pH
	Type	---	Acid	Acid	Alcalino	
	Hysteresis	---	0,00	0,00	2,00	pH
	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'	ore:min
	Over Range	---	OFF	OFF (0,00)	14,00	pH
	Permanence	Status	OFF	OFF	ON	
		Interval	0,00	0,00	14,00	pH
Relay 1 / Relay 2 pH 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 pH PWM	Interval	---	02':00"	OFF (00':00")	60':59"	min:sec
	Proportional Band	---	0,20	0,20	3,00	pH

SETUP MENU		Chemical Measure Unit: mV				
Parameter	Sub-parameter 1	Sub-parameter 2	Default Value	Min Value	Max Value	Unit
Relay 1 / Relay 2 mV ON/OFF	SetPoint	---	750	-2000	2000	mV
	Type	---	High	Low	High	
	Hysteresis	---	0	0	200	mV
	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'	ore:min
	Over Range	---	OFF	-2000	2000	mV
	Permanence	Status	OFF	OFF	ON	
		Interval	0	OFF (0)	2000	mV
Relay 1 / Relay 2 mV 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 mV PWM	Interval	---	02':00"	OFF (00':00")	60':59"	min:sec
	Proportional Band	---	20	20	300	mV

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		Chemical Measure Unit: pH			
Parameter	Sub-parameter 1	Default Value	Min Value	Max Value	Unit
SSR1 / SSR2 pH	SetPoint	7,40	0,00	14,00	pH
	Type	Acid	Acid	Alkaline	
	Max Pulses	400	20	400	Imp/min
	Min Pulses	1	1	100	Imp/min
	Proportional Band	0,20	0,20	3,00	pH

SETUP MENU		Chemical Measure Unit: mV			
Parameter	Sub-parameter 1	Default Value	Min Value	Max Value	Unit
SSR1 / SSR2 mV	SetPoint	750	-2000	2000	mV
	Type	High	Low	High	
	Max Pulses	400	20	400	Imp/min
	Min Pulses	1	1	100	Imp/min
	Proportional Band	20	20	300	mV

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	Chemical Measure Unit: pH				
Parameter	Sub-parameter 1	Default Value	Min Value	Max Value	Unit
mA1 / mA2 pH	Start mA	0,00	0,00	14,00	pH
	End mA	14,00	0,00	14,00	pH
	Hold Measure	NO	NO	YES	
	Namur	OFF, 3,6mA, 22 mA			

SETUP MENU	Chemical Measure Unit: mV				
Parameter	Sub-parameter 1	Default Value	Min Value	Max Value	Unit
mA1 / mA2 mV	Start mA	-2000	-2000	2000	mV
	End mA	2000	-2000	2000	mV
	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			

RESET THE DEFAULT PARAMETERS OF THE INSTRUMENT

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

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

System_Reset

Are you sure?

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**	0x0000	0x3FFF	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	-	Chemical Measure	Main Measure	0(pH), -2000(ORP)	1400(pH),2000(ORP)	Signed 16bit	
1009	-	Chemical Measure	Dec Main Measure	2(pH),0(ORP)	2(pH),0(ORP)	Unsigned 16bit	
1010	-	Temp Measure	Temp Measure	-500(°C),-580(°F)	1500(°C),3020(°F)	Signed 16bit	
1011	-	Temp Measure	Temp Measure Dec Point	1	1	Unsigned 16bit	
1012	3D1	Chemical Measure	Main Measure Unit	0(pH)	1(ORP)	Unsigned 16bit	
1013	3E2	Temp Measure	Temp Measure Unit	0(°C)	1(°F)	Unsigned 16bit	
1014	3G1	Output Configuration	Relay 1 ****	0	6	Unsigned 16bit	
1015	3G2	Output Configuration	Relay 2 ****	0	8	Unsigned 16bit	
1016	3G3	Output Configuration	SSR1 *****	0	2	Unsigned 16bit	
1017	3G4	Output Configuration	SSR2 *****	0	2	Unsigned 16bit	
1018	3G5	Output Configuration	mA1 *****	0	2	Unsigned 16bit	
1019	3G6	Output Configuration	mA2 *****	0	2	Unsigned 16bit	
1020	3L1	Control Panel	Raw Main Measure L	-2100000	21000000	Signed 32bit	µV
1021		Control Panel	Raw Main Measure H				
1022	3L2	Control Panel	Raw Temp Measure	-500(°C),-580(°F)	1500(°C),3020(°F)	Signed 16bit	Nr. Decimal = 1
1023	3M1	Statistics	Nr. Power On L	0	9999999	Unsigned 32bit	
1024		Statistics	Nr. Power On H				
1025	3M2	Statistics	Nr. Alarms L	0	9999999	Unsigned 32bit	
1026		Statistics	Nr. Alarms H				
1027	3M3	Statistics	Nr. Activations RL1L	0	9999999	Unsigned 32bit	
1028		Statistics	Nr. Activations RL1H				
1029	3M4	Statistics	Nr. Activations RL2L	0	9999999	Unsigned 32bit	
1030		Statistics	Nr. Activations RL2H				
1031	3M5	Statistics	Nr. Activations REEDL	0	9999999	Unsigned 32bit	
1032		Statistics	Nr. Activations REEDH				
1033	3M6	Statistics	Nr. Activations HOLDL	0	9999999	Unsigned 32bit	
1034		Statistics	Nr. Activations HOLDH				
1035	3L9	Control Panel	REED	0(Inactive)	1(Active)	Unsigned 16bit	
1036	3L10	Control Panel	HOLD	0(Inactive)	1(Active)	Unsigned 16bit	
1037	1A4	Calibrations	Day	0	31	Unsigned 16bit	
1038		Calibrations	Month	0	12	Unsigned 16bit	
1039		Calibrations	Year	0	99	Unsigned 16bit	
1040		Calibrations	Calibration Type	0(Auto),1(Manual),2(None)		Unsigned 16bit	
1041		Calibrations	Qty Cal 1	0	100	Unsigned 16bit	%
1042		Calibrations	Qty Cal 2	0	100	Unsigned 16bit	%
1043		Calibrations	Buffer 1	0(pH), -2000(ORP)	1400(pH),2000(ORP)	Signed 16bit	2 Decimals(pH), 0 Decimals(ORP)
1044		Calibrations	Buffer 2	0(pH), -2000(ORP)	1400(pH),2000(ORP)	Signed 16bit	2 Decimals(pH), 0 Decimals(ORP)
1045		Calibrations	Gain L	-9999999	9999999	Signed 32bit	Nr. Decimals = 2
1046		Calibrations	Gain H				
1047		Calibrations	Offset L	-9999999	9999999	Signed 32bit	µV
1048		Calibrations	Offset H				

*	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
*	m A1	Value	Out mA Value
*	m A2	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	Not Used
		15	Not Used
***	Status Register H	Bit	
		0-15	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

Read Write Registers				pH		ORP		°C		°F		Type of Data	Note
Address	Index of Menu	Type of Register	Description	min	max	min	max	min	max	min	max		
3000	3D2	Temp Compensation	Temperature Compensation	0(MTC)	1(ATC)	0(MTC)	1(ATC)	0(MTC)	1(ATC)	0(MTC)	1(ATC)	Unsigned 16bit	
3001	3E1	Temp Sensor Type	Temp Enable	0(manual)	1(probe)	0(manual)	1(probe)	0(manual)	1(probe)	0(manual)	1(probe)	Unsigned 16bit	
3002	3E3	Manual Temp Value	Manual Temperature L	-----	-----	-----	-----	-500	1500	-580	3020	Signed 32bit	Nr. Decimal = 1
3003		Manual Temp Value	Manual Temperature H										
3004	3F5	Alarm Configuration	Instrument Block	0(Disable)	1(Enable)	0(Disable)	1(Enable)	0(Disable)	1(Enable)	0(Disable)	1(Enable)	Unsigned 16bit	
3005	3F6	Alarm Configuration	Temperature Alarm	0(Notify)	1(Block)	0(Notify)	1(Block)	0(Notify)	1(Block)	0(Notify)	1(Block)	Unsigned 16bit	
3100	2A1	RELAY 1	Setpoint L	0	1400	-2000	2000	-500	1500	-580	3020	Signed 32bit	
3101		RELAY 1	Setpoint H										
3102	2A2	RELAY 1	Type	0(Acid)	1(Alka)	0(High)	1(Low)	0(High)	1(Low)	0(High)	1(Low)	Unsigned 16bit	
3103	2A3	RELAY 1	Hysteresis L	0	200	0	200	0	100	0	180	Unsigned 32bit	
3104		RELAY 1	Hysteresis H										
3105	2A4	RELAY 1	Hysteresis Time L	0	120	0	120	0	120	0	120	Unsigned 32bit	Seconds
3106		RELAY 1	Hysteresis Time H										
3107	2A5	RELAY 1	Delay Start L	1	3600	1	3600	1	3600	1	3600	Unsigned 32bit	Seconds
3108		RELAY 1	Delay Start H										
3109	2A6	RELAY 1	Delay End L	1	3600	1	3600	1	3600	1	3600	Unsigned 32bit	Seconds
3110		RELAY 1	Delay End H										
3111	2A7	RELAY 1	OFA L	0	1439	0	1439	0	1439	0	1439	Unsigned 32bit	Minutes
3112		RELAY 1	OFA H										
3113	2A8	RELAY 1	Over Range L	0	1400	0	2000	0	1500	0	2700	Unsigned 32bit	
3114		RELAY 1	Over Range H										
3115	2A9A	RELAY 1	Permanence Status	0(Disable)	1(Enable)	0(Disable)	1(Enable)	0(Disable)	1(Enable)	0(Disable)	1(Enable)	Unsigned 16bit	
3116	2A9B	RELAY 1	Permanence Interval L	0	1400	-2000	2000	-500	1500	-580	3020	Signed 32bit	
3117		RELAY 1	Permanence Interval H										
3118	2A9C	RELAY 1	Permanence Time L	0	3600	0	3600	0	3600	0	3600	Unsigned 32bit	Seconds
3119		RELAY 1	Permanence Time H										
3120	2A10	RELAY 1	Time On L	0	3600	0	3600	0	3600	0	3600	Unsigned 32bit	Seconds
3121		RELAY 1	Time On H										
3122	2A11	RELAY 1	Time Off L	0	3600	0	3600	0	3600	0	3600	Unsigned 32bit	Seconds
3123		RELAY 1	Time Off H										
3124	2A10	RELAY 1	Period L	0	3600	0	3600	0	3600	0	3600	Unsigned 32bit	Seconds
3125		RELAY 1	Period H										
3126	2A11	RELAY 1	Proportional Band L	20	300	20	300	10	500	18	900	Unsigned 32bit	
3127		RELAY 1	Proportional Band H										
3200	2B1	RELAY 2	Setpoint L	0	1400	-2000	2000	-500	1500	-580	3020	Signed 32bit	
3201		RELAY 2	Setpoint H										
3202	2B2	RELAY 2	Type	0(Acid)	1(Alka)	0(High)	1(Low)	0(High)	1(Low)	0(High)	1(Low)	Unsigned 16bit	
3203	2B3	RELAY 2	Hysteresis L	0	200	0	200	0	100	0	180	Unsigned 32bit	
3204		RELAY 2	Hysteresis H										
3205	2B4	RELAY 2	Hysteresis Time L	0	120	0	120	0	120	0	120	Unsigned 32bit	Seconds
3206		RELAY 2	Hysteresis Time H										
3207	2B5	RELAY 2	Delay Start L	1	3600	1	3600	1	3600	1	3600	Unsigned 32bit	Seconds
3208		RELAY 2	Delay Start H										
3209	2B6	RELAY 2	Delay End L	1	3600	1	3600	1	3600	1	3600	Unsigned 32bit	Seconds
3210		RELAY 2	Delay End H										
3211	2B7	RELAY 2	OFA L	0	1439	0	1439	0	1439	0	1439	Unsigned 32bit	Minutes
3212		RELAY 2	OFA H										
3213	2B8	RELAY 2	Over Range L	0	1400	0	2000	0	1500	0	2700	Unsigned 32bit	
3214		RELAY 2	Over Range H										
3215	2B9A	RELAY 2	Permanence Status	0(Disable)	1(Enable)	0(Disable)	1(Enable)	0(Disable)	1(Enable)	0(Disable)	1(Enable)	Unsigned 16bit	
3216	2B9B	RELAY 2	Permanence Interval L	0	1400	-2000	2000	-500	1500	-580	3020	Signed 32bit	
3217		RELAY 2	Permanence Interval H										
3218	2B9C	RELAY 2	Permanence Time L	0	3600	0	3600	0	3600	0	3600	Unsigned 32bit	Seconds
3219		RELAY 2	Permanence Time H										
3220	2B10	RELAY 2	Time On L	0	3600	0	3600	0	3600	0	3600	Unsigned 32bit	Seconds
3221		RELAY 2	Time On H										
3222	2B11	RELAY 2	Time Off L	0	3600	0	3600	0	3600	0	3600	Unsigned 32bit	Seconds
3223		RELAY 2	Time Off H										
3224	2B10	RELAY 2	Period L	0	3600	0	3600	0	3600	0	3600	Unsigned 32bit	Seconds
3225		RELAY 2	Period H										
3226	2B11	RELAY 2	Proportional Band L	20	300	20	300	10	500	18	900	Unsigned 32bit	
3227		RELAY 2	Proportional Band H										
3228	2B1	RELAY 2	Wash Time L	0	3600	0	3600	0	3600	0	3600	Unsigned 32bit	Seconds
3229		RELAY 2	Wash Time H										
3230	2B2	RELAY 2	Delay Stabilization L	0	3600	0	3600	0	3600	0	3600	Unsigned 32bit	Seconds
3231		RELAY 2	Delay Stabilization H										
3232	2B3	RELAY 2	Wait New Wash L	0	5999	0	5999	0	5999	0	5999	Unsigned 32bit	Minutes
3233		RELAY 2	Wait New Wash H										
3234	2B1	RELAY 2	Over Range R1	0(Disable)	1(Enable)	0(Disable)	1(Enable)	0(Disable)	1(Enable)	0(Disable)	1(Enable)	Unsigned 16bit	
3235	2B2	RELAY 2	OFA R1	0(Disable)	1(Enable)	0(Disable)	1(Enable)	0(Disable)	1(Enable)	0(Disable)	1(Enable)	Unsigned 16bit	
3236	2B3	RELAY 2	Measure Permanence R1	0(Disable)	1(Enable)	0(Disable)	1(Enable)	0(Disable)	1(Enable)	0(Disable)	1(Enable)	Unsigned 16bit	
3237	2B4	RELAY 2	REED Alarm	0(Disable)	1(Enable)	0(Disable)	1(Enable)	0(Disable)	1(Enable)	0(Disable)	1(Enable)	Unsigned 16bit	
3238	2B5	RELAY 2	HOLD Alarm	0(Disable)	1(Enable)	0(Disable)	1(Enable)	0(Disable)	1(Enable)	0(Disable)	1(Enable)	Unsigned 16bit	
3239	2B6	RELAY 2	Temperature Probe Alarm	0(Disable)	1(Enable)	0(Disable)	1(Enable)	0(Disable)	1(Enable)	0(Disable)	1(Enable)	Unsigned 16bit	

3300	2C1	SSR 1	Setpoint L	0	1400	-2000	2000	-500	1500	-580	3020	Signed 32bit	
3301		SSR 1	Setpoint H										
3302	2C2	SSR 1	Type	0(Acid)	1(Alka)	0(High)	1(Low)	0(High)	1(Low)	0(High)	1(Low)	Unsigned 16bit	
3303	2C3	SSR 1	Max Pulses	20	400	20	400	20	400	20	400	Unsigned 16bit	Pulse/minutes
3304	2C4	SSR 1	Min Pulses	1	100	1	100	1	100	1	100	Unsigned 16bit	Pulse/minutes
3305	2C5	SSR 1	Proportional Band L	20	300	20	300	10	500	18	900	Unsigned 32bit	
3306		SSR 1	Proportional Band H										
3400	2D1	SSR 2	Setpoint L	0	1400	-2000	2000	-500	1500	-580	3020	Signed 32bit	
3401		SSR 2	Setpoint H										
3402	2D2	SSR 2	Type	0(Acid)	1(Alka)	0(High)	1(Low)	0(High)	1(Low)	0(High)	1(Low)	Unsigned 16bit	
3403	2D3	SSR 2	Max Pulses	20	400	20	400	20	400	20	400	Unsigned 16bit	Pulse/minutes
3404	2D4	SSR 2	Min Pulses	1	100	1	100	1	100	1	100	Unsigned 16bit	Pulse/minutes
3405	2D5	SSR 2	Proportional Band L	20	300	20	300	10	500	18	900	Unsigned 32bit	
3406		SSR 2	Proportional Band H										
3500	2E1	mA1	Start mA	0	1400	-2000	2000	-500	1500	-580	3020	Signed 16bit	
3501	2E2	mA1	End mA	0	1400	-2000	2000	-500	1500	-580	3020	Signed 16bit	
3502	2E3	mA1	Hold Measure	0(Disable)	1(Enable)	0(Disable)	1(Enable)	0(Disable)	1(Enable)	0(Disable)	1(Enable)	Unsigned 16bit	
3503	2E4	mA1	Namur	0(OFF), 1(3,6mA),2(22mA)	0(OFF), 1(3,6mA),2(22mA)	0(OFF), 1(3,6mA),2(22mA)	0(OFF), 1(3,6mA),2(22mA)	0(OFF), 1(3,6mA),2(22mA)	0(OFF), 1(3,6mA),2(22mA)	0(OFF), 1(3,6mA),2(22mA)	0(OFF), 1(3,6mA),2(22mA)	Unsigned 16bit	
3504	2F1	mA2	Start mA	0	1400	-2000	2000	-500	1500	-580	3020	Signed 16bit	
3505	2F2	mA2	End mA	0	1400	-2000	2000	-500	1500	-580	3020	Signed 16bit	
3506	2F3	mA2	Hold Measure	0(Disable)	1(Enable)	0(Disable)	1(Enable)	0(Disable)	1(Enable)	0(Disable)	1(Enable)	Unsigned 16bit	
3507	2F4	mA2	Namur	0(OFF), 1(3,6mA),2(22mA)	0(OFF), 1(3,6mA),2(22mA)	0(OFF), 1(3,6mA),2(22mA)	0(OFF), 1(3,6mA),2(22mA)	0(OFF), 1(3,6mA),2(22mA)	0(OFF), 1(3,6mA),2(22mA)	0(OFF), 1(3,6mA),2(22mA)	0(OFF), 1(3,6mA),2(22mA)	Unsigned 16bit	

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