eSelectM 2 PH (RX) -CL





ETATRON D.S.

UK OPERATING INSTRUCTIONS AND MAINTENANCE

UNI EN ISO 9001-2015

CERTIFICATE OF CONFORMITY

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AS MANUFACTURER OF CHEMICAL DOSING PUMPS

series: eControl, eSelect, AG-Select, AG-S/Control, ePhoton, Laundry Control System, Flow Meter PN

Under our own responsibility we declare conformity in accordance with the following directives:

2014/30/UE: "Electromagnetic Compatibility"
2014/35/UE: "Low voltage"
2012/19/UE: "RAEE"

In addition, in accordance with the following regulations:
UNI EN ISO 12100:2010, CEI EN 60204-1:2016, CEI EN 55014-1:2017

This certificate confirms equipment supplied CE marked and technical documentation including operating manual and spare parts manual.
This declaration conforms to the above directive an integral part of the manufacturer operating manual.

ETATRON D.S.
Sole Director
Nicola Carbone

(Rome) Italy, Date: 01/01/2019

Warnings

Read the warnings below carefully. They provide important information regarding safe installation, use and maintenance. Store this manual with the utmost care for future reference.

The device is built to a professional standard. Its durability and electrical and mechanical reliability will be more efficient if it is used properly and maintenance is carried out on a regular basis.

ATTENTION: Any work or repairs inside the device must be carried out by qualified and authorised personnel. We assume no liability due to failure to comply with this rule.

WARRANTY: 1 year (excluding parts subject to normal wear where applicable, namely: valves, fittings, pipe clamps, tubes, filter and injection valve). Improper use of the device will void this warranty. The warranty is understood as ex-works or authorised distributors.

Symbols used in the manual

		
FORBIDDEN *Precedes information regarding safety. Indicates a forbidden operation.*	***ATTENTION*** *Precedes very important text to protect the health of exposed persons or the machine itself.*	***INFORMATION NOTE*** *Precedes information concerning use of the device.*

Transport and handling

The device must be transported as indicated on the box. Shipping by any means, even if free of carriage of the purchaser or recipient, is carried out at the purchaser's risk. Complaints for missing materials must be submitted within 10 days of arrival of the goods and within 30 days of receipt for defective material. If the device is to be replaced, this must be agreed upon with authorised personnel or the authorised distributor.

Intended use of the device

The device must be solely employed for the use it has been expressly built for, i.e. to check the pH/Rx measurement. Any other use is considered improper and therefore dangerous. The device is not intended to be used for any applications not foreseen at the design stage. For further explanations, the customer must contact our offices for information on the type of instrument in their possession and its correct use. The manufacturer shall not be held liable for any damage resulting from improper, erroneous or unreasonable use.

Risks

After removing the packaging, check the integrity of the device. If in doubt, do not use it and contact a qualified technician. The packing materials (such as plastic bags, polystyrene, etc.) must not be left within the reach of children since they are potentially dangerous.

Before connecting the device, make sure that the rating corresponds to that of the mains. The rating is displayed on the adhesive label on the device itself

The execution of the electrical system must comply with the standards that define professional workmanship in the country where the system is made.

Use of any electrical device implies observance of some fundamental rules. In particular:

- do not touch the device with wet or damp hands or feet (e.g. swimming pools);
- do not leave the device exposed to atmospheric agents (rain, sun, etc.);
- do not allow the device to be used by children or persons incapable of using it without surveillance.

- In case of failure and/or malfunctioning of the device, switch it off and do not tamper with it. For any repairs, please contact our service centres and request the use of original spare parts. Failure to comply with the above can jeopardise the safety of the pump.
- If you decide to no longer use a device, it is recommended to make it inoperable by unplugging it from the mains.
- Make sure it is switched off electrically (both polarities), disconnecting the conductors from the contact points of the mains by opening the omnipolar switch with at least 3 mm between the contacts.

Assembly of the instrument

All instruments produced are normally supplied already assembled. For wall installation see paragraph "**Wall assembly".**

Disassembly of the instrument

Always pay the utmost attention when disassembling the instrument or before performing maintenance on it. Always disable electrical connections beforehand.

INSTRUMENT ESELCT M2 PH(RX) - CL

General features

eSelect M2 PH(RX)–CL is a multi-purpose measurement instrument with double a measurement parameter suitable for measuring the PH or RX parameter (Redox) and Free (Residual) or Total CHLORINE. The eSelectM2 range, along with the high quality performance and functions, offers many features that make it versatile and easy to use.

- The PH measurement parameter may be changed into RX by simple programming and by using the RX electrode;
- The Residual or Total Chlorine measurements may be chosen based on the type of sensor used relative to the range:
  - ion-selective membrane sensors with operational ranges 0-2 Cl ppm (preset); 0-20 Cl ppm; 0-20 Cl ppm (Total);
  - open type chlorine amperometric cell (model CLC) with operational range 0-10 Cl ppm
- Ethernet connection (LAN) external module, Modbus TCP + memory card with ETACLOUD software.
- Timed AUX outputs programming; Adjustable real-time timer; switch-on time programming.

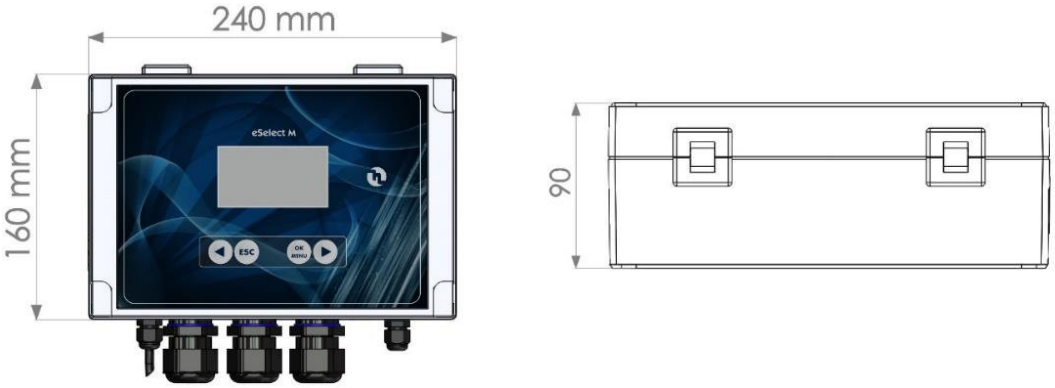
Two types of programming menus:

- **Basic:** simplifies programming for household applications such as small swimming pools or water treatment systems
- **Expert:** in the case of professional applications, makes it possible to fine-tune the measurements and safety functions.

Main features

- Device manufactured according to CE standards
- Case made of: ABS plastic
- Backlit display 126x64
- Can be fitted with level probe (to check chemicals) (not included)
- Output relay for setpoint values
- AUX external unit remote control output
- RS485 / Ethernet external module connection
- PT100 temperature sensor
- 100/240 VAC power supply 50/60 Hz single-phase (maximum ±10% fluctuations are permitted); on demand 12/24 V

Dimensions of the instrument



Setpoint	**Relay outputs 1 - 2 - 3**	3 setpoint ON-OFF	*Independent settings to start up metering pumps or peristaltic dispensers in constant mode or equipment with ON-OFF mode*
		Setpoint	*Adjusts the setpoint value (ON-OFF mode)*
		Hysteresis	*Selects a measurement range around the setpoint value, locking the output relays (ON-OFF)*
		Acid – Alkaline pH Direct - Reverse RX and CL	*Selects the metering direction of the output relay.*
		Proportional modular pulse PWM mode	*Proportional Time/Pause pulse outputs activate metering pumps or peristaltic dispensers with constant mode or ON-OFF equipment.*
		Delay on setpoint value	*Selects a delay time (max 999 sec adjustable) before activating the output relay.*
	AUX Outputs Relay	*The real-time clock controls remote appliances or devices connected to the AUX1 and 2 outputs in a very accurate manner for programming minutes / hours / days / weeks.*	
	Alarm 4 Relay	Min Alarm / Max Alarm	*Alarm function that, on exceeding a minimum or maximum value, switches the alarm relay on or off.*
4-20 mA1-2	**mA devices outputs**	*Controls the data logger, PLC, recorder or devices suited to processing the mA signal*	
	Setpoint metering	*Controls mA metering pumps or devices suited to processing an mA signal*	
Calibration	*Calibration menu for pH or RX electrode (Redox) and Chlorine sensor or cell.*		
System settings	**Flow sensor**	*Switches on or off the flow sensor input (proximity sensor)*	
	Manual temperature	*Selects the manual temperature offset. 0-100°C (Auto-Temp=OFF)*	
	Automatic temperature offset	*Offsets the temperature with the conductivity probe, therefore measuring the exact value against the current temperature.*	
	RS485/Ethernet	*Remote control via external RS485 / ETHERNET module, Modbus protocol with ETACLOUD Software. The operator connects the unit via a PC, a smartphone or a tablet.*	

TECHNICAL SPECIFICATIONS OF THE INSTRUMENT

PH measurement range:	▪ 0 pH .... 14 pH (0...100°C) ▪ Resolution ± 0.01 pH ▪ Precision 0.5% of the electrode input signal ▪ Input resistance > 10^{12} Ohm ▪ Zero calibration: ± 10% adjustment range from the calibration point ▪ "Gain" calibration: ± 10% ▪ Hysteresis: 0.05 pH (programmable) ▪ Timed PWM impulses: activation point: 1.50 pH (programmable)
RX (Redox) measurement range:	▪ – 1000 mV .... +1000 mV ▪ Input resistance > 10^{12} Ohm ▪ Resolution ± 1 mV ▪ Precision 0.5% of the electrode input signal ▪ Hysteresis: 10 mV (programmable) ▪ Timed PWM impulses: activation point: 150 mV (programmable)

Chlorine measurement range Cl ppm (free or total) Membrane type sensors:	▪ 0-2 Cl ppm = Resolution 0.01 Cl ppm	Hysteresis/PWM point = 0.050 Cl ppm
	▪ 0-20 Cl ppm = Resolution 0.10 Cl ppm	Hysteresis/PWM point = 0.50 Cl ppm
	▪ 0-200 Cl ppm = Resolution 1.0 Cl ppm	Hysteresis/PWM point = 5 Cl ppm
Chlorine measurement range Cl ppm (free) Open type cell:	▪ 0-10 Cl ppm (Open type cell) / Resolution 0.10 Cl ppm	
	Hysteresis/PWM point = 0.50 Cl ppm	
Temperature settings:	Manual or automatic offset (auto with temperature probe PT100) ▪ Resolution 0.1% °C ▪ Precision: ± 0.5% °C	
Temperature probe range:	– 20 ....100°C	
Power supply / Consumption:	Universal power supply 100÷250VAC / 5W at 240VAC	
Microprocessor technology:	SMD components with a 6-key digital control keypad	
Linearity, Stability, Reproducibility:	± 0.5% in standard conditions	
Display:	Backlit 126x64 display; Visible display area 70x37 mm	
Delay on Setpoint:	Relay activation delay, programmable for each setpoint (999 sec.)	
Delay on start-up:	Delay in relay when the unit is switched on, programmable	
Consumption / Rated Current:	230Vca 5W = 25mA ▪ 24Vca-cc=5W = 230mA ▪ 12Vcc 5W = 460mA	
Internal electrical protection:	Power supply unit assures electrical protection (instead of fuse)	
Level / Relay remote control:	Chemical additive level (level probe not included) output voltage +5VDC	
Outputs: RELAY A output (setpoint 1):	PH (or RX) ON-OFF / PWM mode voltage-free, relay 5Amax 230Vac	
Outputs: RELAY B output (setpoint 2):	PH (or RX) ON-OFF / PWM mode voltage-free, relay 5Amax 230Vac	
Outputs: RELAY C output (setpoint 3):	CHLORINE ON-OFF / PWM mode voltage-free, relay 5Amax 230Vac	
Outputs: RELAY D Output (ALARM):	ALARM voltage-free contact, relay 5A max 230Vac	
Outputs: RELAY E-F AUX outputs:	AUX outputs ON-OFF external equipment voltage-free, relay 5Amax 230Vac	
Outputs: FLOW sensor:	Blocks outlet operations if there is no flow in the probe socket.	
Outputs: Output 0/4...20 mA1:	Adjustable (500 Ω maximum input impedance), with galvanic separation. Connected to PH (or RX) measurement settings.	
Outputs: Output 0/4...20 mA2:	Adjustable (500 Ω maximum input impedance), with galvanic separation. Connected to CHLORINE measurement settings.	
Outputs: Load:	Resistive load 5A at 230VAC / Inductive load 0.5A at 230VAC	
Outputs: Relay insulation voltage:	> 3000VAC	
Outputs: Contact relay duration:	≥ $5x10^4$ operations (at 5A at 230Vca)	
Operating temperature:	ideal temperature 5°C-40°C, resistance up to 0°C-45°C	
Noise level:	Irrelevant	
Environmental conditions:	Possibly dry environment, altitude up to 2000m, Relative humidity 80% for temperature up to 31°C linearly decreasing to 50% of relative humidity at 40°C. Pollution degree 2.	
Transport / storage conditions:	– 5÷60°C in a dry environment	

INSTALLATION

Install the instrument in a dry place, away from heat sources at a maximum room temperature of 40°C.

Comply with standards in force in the different countries regarding electrical installation (Fig. 2). **If the power cord does not have a plug, the device must be connected to the mains by means of an omnipolar disconnecting switch with at least 3 mm between the contacts. All the power supply circuits must be interrupted before accessing the connection devices**.

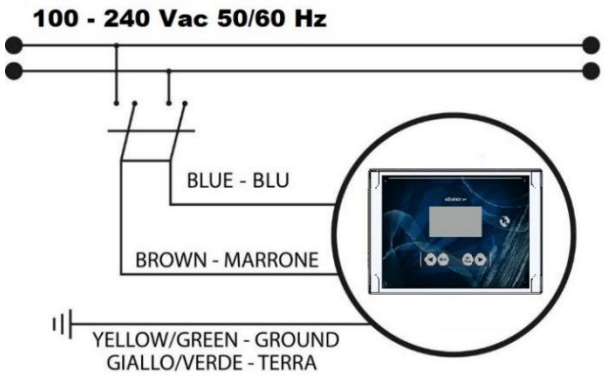


Fig. 1 – Electrical connection

Wall installation

The wall-mounting plugs are supplied with the device. **Always use a plug suitable to the available support.** The layout of the holes to be drilled on the support is displayed in Figure 2.

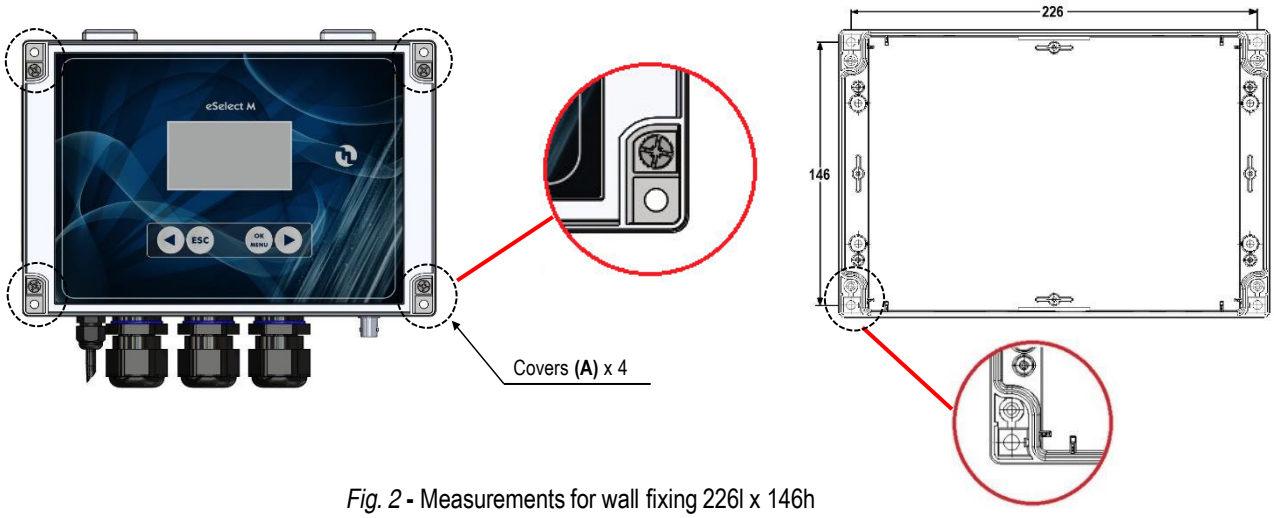


Fig. 2 **-** Measurements for wall fixing 226l x 146h

To access the 4 installation holes, remove the covers on the installation points **(A)** found on each corner of the instrument, use a Phillips screwdriver to loosen the four screws underneath the covers, then open the front panel (see Fig.2).

The casing has 4 captive screws to quickly open/close the cover, thereby allowing for easy access for commissioning and servicing, as well as assuring excellent seal for long-lasting operation

- Install the unit in a dry place away from heat sources. Max room temperature 40°C.
- Strictly comply with the regulations in force in the various countries regarding electrical systems.
- Fit the instrument on the wall using the screws supplied

Diagram of electrical connections

To connect the accessories and peripheral devices to the instrument, remove the front cover screws, using a Phillips screwdriver to reach the connecting terminal boards.

The terminal boards consist of spring terminals for quick coupling of the wires. Press the square “slotted” pin with a small flat headed screwdriver and insert the stripped wire in the corresponding terminal. **ATTENTION: exert slight pressure on the spring pin to avoid irreparably damaging the terminal board.**

Do not connect more than one device to each pin

Run the wires to be connected through the cable glands on the case wall.

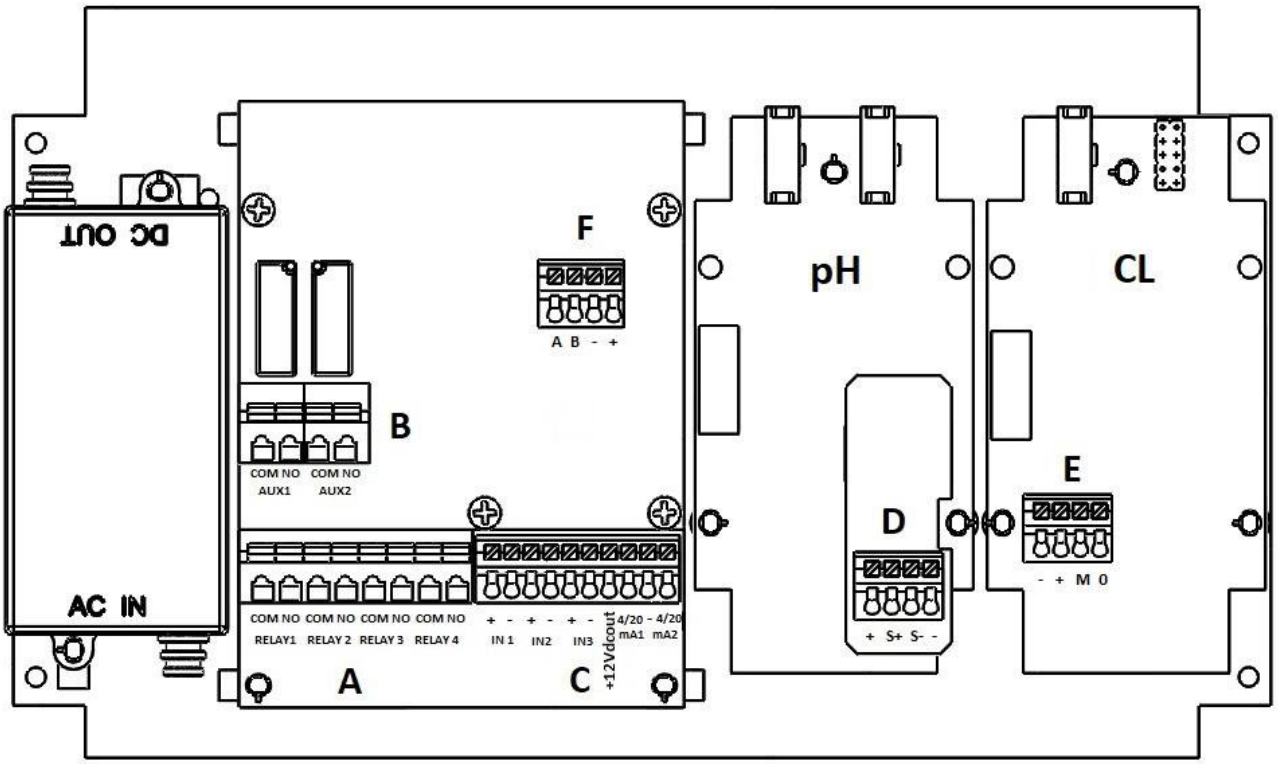


Fig. 3 – Connection diagram

TERMINAL BOARD "A"		
Relay 1	**COM**	Setpoint 1 pH (o RX) ON-OFF / PWM output relay timed pulses
	NO	
Relay 2	**COM**	Setpoint 2 pH (o RX) ON-OFF / PWM output relay timed pulses
	NO	
Relay 3	**COM**	Setpoint 3 CL Chlorine ON-OFF / PWM output relay timed pulses
	NO	
Relay 4	**COM**	ON-OFF ALARM relay output for external signalling device
	NO	
TERMINAL BOARD "B"		
AUX 1	**COM**	Auxiliary ON-OFF AUX output for remote equipment with Timer programming
	NO	
AUX 2	**COM**	Auxiliary ON-OFF AUX output for remote equipment with Timer programming
	NO	
TERMINAL BOARD "C"		
IN 1	+	Digital input level probe 1 for the chemical tank
	-	
IN 2	+	Digital input level probe 2 for the chemical tank
	-	
IN 3	+	Proximity Sensor input BLACK wires
	-	Proximity Sensor input BLUE wires
+12VDC	+	12 VDC output of the Proximity Sensor BROWN wire
4-20 mA1	+	(+)Proportional output pH (or RX) 4-20mA1 for metering pump mA, PLC, data collection
-	-	(-)Proportional output 4-20mA1/mA2 for metering pump mA, PLC, data collection
4-20 mA2	+	(+)Proportional output CL Chlorine 4-20mA2 for metering pump mA, PLC, data collection
TERMINAL BOARD "D"		
+	PT100 temperature probe (RED wire)	
S +	PT100 temperature probe (BLUE wire)	
S -	PT100 temperature probe (GREEN wire)	
-	PT100 temperature probe (YELLOW wire)	

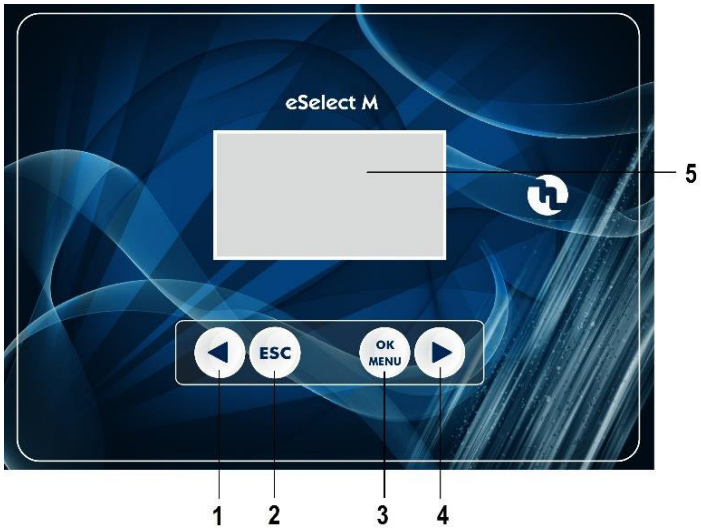
TERMINAL BOARD "E"			
	NEW membrane Chlorine sensor	**Open Chlorine cell**	**OLD membrane Chlorine sensor**
-	Not Connected	Not Connected	White Wire
+	Red Wire	Not Connected	Brown Wire
M	Grey Wire	BLUE Wire	Green Wire
0	Black Wire	Brown Wire	Yellow Wire
TERMINAL BOARD "F"			
A	ORANGE wire	Connection for RS485 / ETHERNET external module. For connection to the **ETACLOUD,** the external **KIT CONNECT** module must be connected (NOT included with the instrument) *code KST0000101 KIT CONNECT X INSTRUMENTS SERIES M*	
B	YELLOW wire		
-	BLACK wire		
+	Not Connected		

REMEMBER: *unit with universal voltage 100-250 VAC (±10%) or 9-24VDC. If the real voltage is constantly at the limit (minimum or maximum), or when the peaks are far above the mentioned range, the unit input is electrically protected against voltage fluctuations; outside the range mentioned above, the instrument does not work and the printed circuit must be replaced.* ***It is recommended*** *to use voltage protections, check the earthing system and, when other equipment is connected in parallel, use a transducer. Furthermore, ETATRON* ***recommends*** *installing a UPS (genset) to assure continuity thus ensuring no data are lost. A system that is set up without following the proper electrical design rules, without an earthing system, with frequent ON/OFF operations, might directly undermine the printed circuit.*

ESELECT M2 PH(RX) - CL

Control Panel

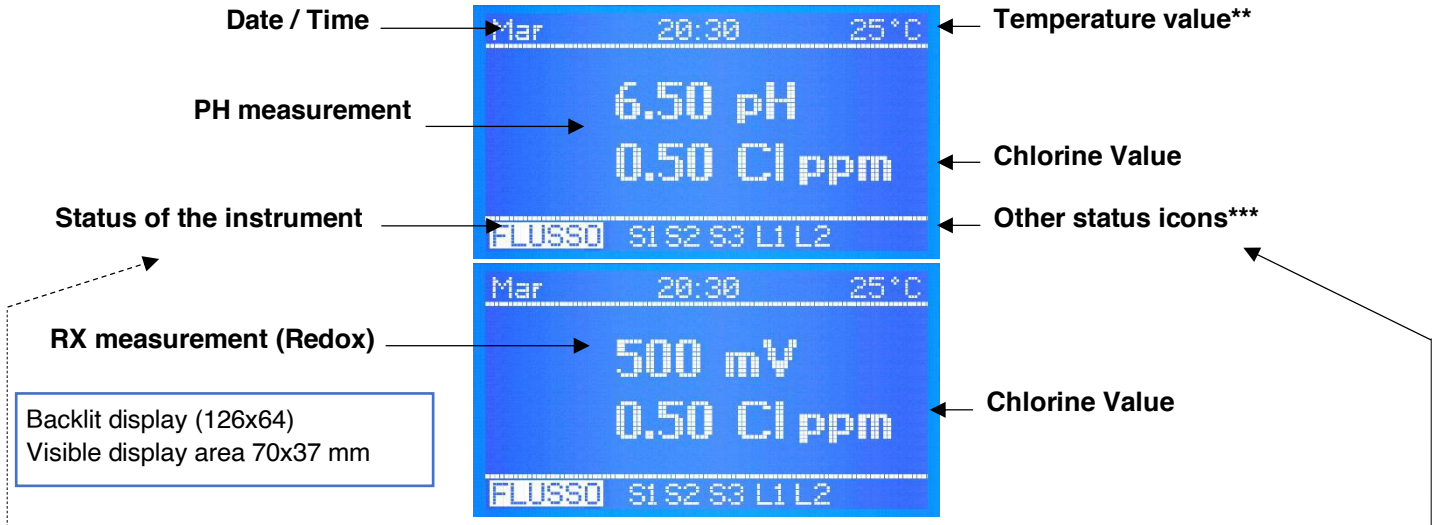
The following figure shows the control panel with the description of the functions of the different keys.



1		Button to scroll the menu to the left and decrease values
2		Button to quit the menu
3		Button to enter the menu and confirm selections
4		Button to scroll the menu to the right and increase values
5	Display	

Fig. 4 – Keypad

DESCRIPTION OF THE DISPLAY



Backlit display (126x64)
Visible display area 70x37 mm

*** Instrument status messages shown as follows:**

MAX ALARM-SETPOINT 1-3	**OVERDOSE-SETPOINT 1**	**OVERDOSE-SETPOINT 3**
MIN ALARM-SETPOINT 1-3	**OVERDOSE-SETPOINT 2**	**AUX / DATE / TIME**
FLOW	**OVERDOSE-4-20mA1**	**TEMPERATURE**
NO MEASUREMENT CONN.	**OVERDOSE-4-20mA2**	**L1 L2 LEVEL MONITORING**

If more than one function is active, the messages are displayed in continuous cycle, each is displayed for 3 seconds. The ALARM or OVERDOSE message disappears once the measurements are again consistent with the programmed settings. To remove the active icons from the display, press and hold **ESC**.
When the messages are displayed, the temperature value is not displayed.

NO MEASUREMENT CONNECTION LINK: communication between instrument or display down.

*The software of the power and control boards of the eSelect M series are connected via the 485 protocol: when instead of the temperature the display shows **NO MEASUREMENT CONN.**, this means there is a problem between the two boards, in that case check the flat electric cable and immediately contact the ETATRON service.*

Other status icons shown at the end of the row ***

Other status messages are as follows:
S1 S2 S3 L1 L2 ALARM AUX DATE/TIME OVERDOSE FLOW *BASIC MENU* *EXPERT MENU*

***BASIC MENU* *EXPERT MENU *** these messages are displayed during the programming steps as reminders.

S1 S2 S3 indicate the corresponding active Setpoint. When the "Proportional" mode is selected (Pulse Width Modulation) during the setpoint step, messages S1…S2 blink during PWM operation, but when the setpoint is NOT active there is no message.

**** FLOW **** shows there is no water flow in the probe socket: this is only valid when using a proximity Sensor and the "Flow Sensor" (step in Settings) is **on,** only possible by using the Expert Menu.

L1 L2 indicates level control of an external tank and is only shown once the level probe is connected to the pins of terminal IN1 and IN3: when the level in the tank is lower than the float of the level probe, it triggers the Status message.

When the instrument is **first** switched on, a list of all key programming functions is displayed.

Temperature value: if the temperature has been set up in manual mode, the temperature value matches the one selected. If the PT100 mode has been selected and a temperature sensor has been connected, the temperature value shown matches the real value in the system and allows for automatic offsetting.

NOTE: when working with the **Basic menu**, the **mA** programming **IS NOT AVAILABLE**:

OPERATING FUNCTIONS

ON-OFF mode

The unit has an ON-OFF mode which switches on (or off if the reverse mode is ON) the output relays to control Constant / ON-OFF metering pumps, peristaltic pumps or other ON-OFF equipment.

DIRECT / REVERSE direction

The setpoint relays are factory set as follows:

Setpoint 1 PH: *ACID mode, the output is active when the measured value is higher than the selected setpoint, the connected pump meters out an acid product.*

Setpoint 2 PH: *ALKALINE mode, the output is active when the measured value is lower than the selected setpoint, the connected pump meters out an alkaline product.*

Setpoint 1 RX: *DIRECT mode, the output is active when the measured value is lower than the selected setpoint, the connected pump meters out an Oxidising product.*

Setpoint 2 RX: *REVERSE, the output is active when the measured value is higher than the selected setpoint, the connected pump meters out a reducing product.*

Setpoint 3 CL: *DIRECT mode, the output is active when the measured value is lower than the selected setpoint. REVERSE mode, the output is active when the measured value is higher than the selected setpoint.*

ALARM MIN / MAX function

The **Alarm** function makes it possible to select the minimum and maximum values outside which the instrument goes into alarm mode.

HYSTERESIS

Hysteresis is useful during operations to adjust the setpoints in ON-OFF mode and is used to enable or disable the output relays when the selected hysteresis has been achieved. Hysteresis is useful when there are too many quick swings around the setpoint, that might damage the connected device. By increasing hysteresis it is possible to move away from the setpoint in accordance with the required value.

*Example **PH**: if the selected set point is 7.00 pH and hysteresis is set at 0.05, the two active points are 6.95 pH and 7.05 pH: within this range, the set point is OFF and the outputs are blocked, outside this range the set point is ON (always in accordance with Acid or alkaline mode). The **RX** parameter (mV) works in the same way indicating values in mV. The chlorine measurement **CL** works according to the values for the selected chlorine range showing values in ppm.*

DELAY output response delay on setpoint

The Delay time blocks the output relays (max 999 sec. programmable) to ensure the outputs are active only when the sensor measurements are stable, thus assuring the best results in terms of chemical balance.

PROPORTIONAL PWM mode: Timed "Pulse Width Modulation"

PWM "pulse width modulation" support a proportional mode on each ON-OFF setpoint activating at the pulse, with a change of the Start/Stop cycle time according to the measured value with respect to the setpoint.

Pulse width: *pulses are timed ON and OFF based on the distance from the selected setpoint, programmable, example: if the selected setpoint is 7.00 pH and the measured value is 9.00 pH, if the selected value of the **PWM** mode is 1.50 pH, the proportional function starts after reaching 8.50 pH with Time/Pause pulses and decreasing the active time while reaching the setpoint.*

Cycle Time: *selected value of the **PWM** mode 1.50 pH with a 60 second cycle (programmable), example: setpoint is 7.00 pH, at measured value 8.50 pH = active time 60 sec - pause time = 0 sec; 7.75 pH active time = 30 sec - pause time = 30 sec… decreasing the active time as a consequence while reaching the setpoint. The cycle time depends on many variables, such as: distance from the injection point of the system to be treated, how fast or slowly the setpoint needs to react, chemical concentration, etc.*

MIN Active Time: *programmable. Defines the minimum time for which PWM is active; prevails over the selected settings. The pulse modulation function is adjusted with 3 functions according to the following formula: Active Time in accordance with the selected formula = (measured value - setpoint) / (period width * cycle time). If the result of the formula is < than that chosen with MIN Active Time, the latter prevails on the former, example: measured value 8.50 pH; setpoint 7.00 pH / Period Width 1.50 * Cycle time 60 sec = active time 4 sec. If the user has selected **Active time min** 5 sec, this will be the minimum PWM time and not 4 sec.*

*The **RX** parameters (mV) work in the same way indicating values in mV.*

*The chlorine measurement **CL** works according to the corresponding values relating to the selected chlorine range indicating the value in Cl ppm.*

ADVANTAGES: the proportional function is more accurate than the ON-OFF mode.

DISADVANTAGES: the user needs to be a professional in order to select the most accurate settings to assure the best results.

ANALOGUE OUTPUTS IN CURRENT 4-20 mA1 / 4-20 mA2

The instrument features 2 outputs with signal in current in mA. The 4-20 mA signal follows the pH or *RX mV* and CL (ppm) settings previously selected. The mA output provides two operating modes to be selected according to the system requirements:

- **mA DEVICE:** this is a programmable function combined with the unit of measure of the pH or RX and CL measurement in real time which makes it therefore possible to remotely monitor devices such as data loggers, PLCs, recorders or other devices suited to processing remote signals in mA.
  Value 4 mA corresponds to the minimum programmed pH or RX mV or CL (ppm) value, **20 mA** corresponds to the maximum measurable pH or mV and CL value, the connected equipment will operate accordingly.
- **METERING ON SETPOINT:** mA outputs control metering pumps suited to processing an input mA signal.
  4 mA corresponds to the minimum pH or RX mV and CL (ppm) value, hence the connected metering pumps will work at their minimum capacity. **20 mA** corresponds to the maximum measured pH or RX mV or CL value hence the connected metering pump will work at its maximum programmed capacity (according to the settings of the device and of the metering pump).

ADVANTAGES: best possible results because the pulses are extremely accurate in relation to measured levels.

DISADVANTAGES: the user requires a specific metering pump or other device suited to processing a remote signal in mA.

OVERDOSE TIME

With the **overdose time** alarm one can select a period during which the setpoint must be reached. If the setpoint is not reached during this period of time, the instrument blocks output operations, including those in mA (metering pumps), the alarm is displayed as ON and triggers a signalling instrument if it is connected to the alarm relay.

ADVANTAGES: preventing excessive doses of chemicals.

MAXIMUM METERING TIME

The **maximum metering time** is an extra function that ensures that metering operations are completed within a certain time limit selected by the operator. The relays connected to the metering pumps activate accordingly. This function makes it possible to eliminate time limits, to meter continuously based on the selected setpoints or, if the operator wishes to change the settings, to choose a given period (up to 999 minutes) within the selected hours.

ADVANTAGES: preventing excessive addition of chemical product not only according to the setpoint, but also cancelling any form of programming of the instrument's setpoint.

TIMER IN REAL TIME / START-STOP TIME

The **Timer in real time** makes it possible to control through a timer the AUX outputs for each remote device for the period selected in the program. The operator may also program the days of activity and the exact time of the unit's operations through the Start/Stop programming.

AUX OUTPUTS

The two AUX auxiliary outputs control various functions connected to any type of remote On-Off device controlled by a timer in real time. Each output may control a device or appliance thanks to very accurate programming of minutes/hours/days/weeks.

ADVANTAGES: this function makes this instrument a very versatile control unit not only to measure chemical physical parameters but also for other functions connected to the system where it is installed.

START-UP DELAY

The **start-up delay** blocks the output relays when the unit is switched on, thus allowing the sensor to polarise assuring correct measurements (programmable).

FLOW SENSOR function "Proximity Sensor"

Flow Sensor (not included): if there is no water flow in the probe socket (and possibly in the system), the flow sensor (proximity sensor) disables all outputs ensuring no chemical substance is added.

TEMPERATURE

Manual / Automatic Temperature offset (the latter with a temperature sensor) 0-100°C, the temperature / conductivity measurements will be offset, always obtaining the exact value against the current temperature.

ETHERNET / RS485 external communication module

The eSelect M series is suitable for remote control thanks to an RS485 expansion board with Modbus protocol using the ETACLOUD software. The ETHERNET connection allows the operator to connect to the unit via a PC, a smartphone or a tablet and change the programming and settings using the ETACLOUD software. The unit sends a message once the alarm level, overdose settings are reached, or when the maximum metering time of the metering pump has elapsed.

INITIAL DISPLAY

NOTE FOR THE PROGRAMMER: *Read the manual before starting programming or always have it at hand to be sure you are making the correct selections.*

IMPORTANT: if no keys are pressed for 60 seconds, the instrument will show the current measurement.
To go forward quickly, **press and hold** one of the ◄► buttons

ETATRON
Model eSelec M2
Rev. X.X

The software version is shown when the instrument is on the lower part of the display.
The software is subject to revisions without notice.

The instrument is prepared for measuring and is then ready to operate.

At this stage some status messages might be displayed, such as: **S1 S2 S3 L1 L2 ALARM AUX DATE/TIME OVERDOSE FLOW *BASIC MENU* *EXPERT MENU*,** *which might be active due to current measurements, just go forward with the programming.*

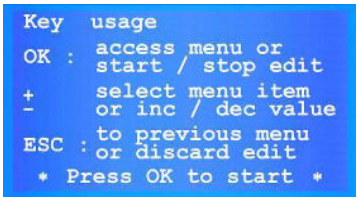
The **INITIAL DISPLAY** shows the measurements according to the selected **Measurement Type** (*SELECT MEASUREMENT TYPE PH OR RX and SELECT THE CHLORINE RANGE)*. If the instrument has already been programmed, the display shows the programs selected previously.

NOTE: if the RX **Measurement Type** is selected, all values are automatically changed to **mV**.

The **CONTINUOUS MEASUREMENT DISPLAY** shows the measurements of the parameter, the status of the functions and the alarm indications.

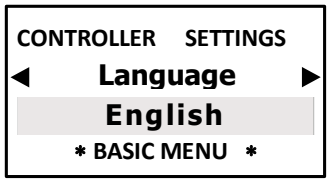
When the instrument is **switched on for the first time**, a list of functions of all keys is displayed. This screen is no longer displayed during subsequent start-up operations.

READ THE MESSAGE CAREFULLY, THEN PRESS ☛ OK TO START.
USE OF THE KEYS
OK: access to the menu, start/stop, selection and editing
± selects the step of the menu or increases / decreases the value
ESC: goes back to the previous menu or does not save the change
*** Press OK to start***
To go forward quickly, ***press*** *and hold one of the ◄ ► buttons*



IN ENGLISH

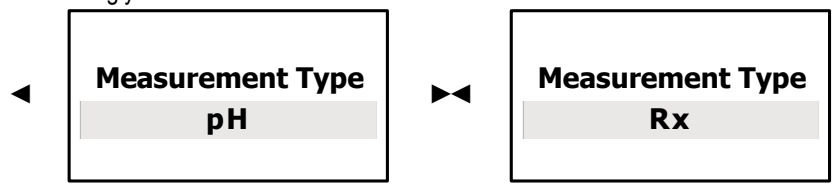
Select the language of the PROGRAMMING MENU



To select the language of the programming menu.
After selecting the Language (ITALIAN, ENGLISH), the programming menu adapts accordingly.

Select MEASUREMENT TYPE PH or RX

The instrument of the eSelect M2 series makes it possible to select the type of measurement to be used, i.e. PH or RX (Redox) in the same unit. The measurement parameter may be changed from PH to RX and the display and resolutions of the measurement change accordingly.



By selecting one of the two types of measurement, programming of the main Menu changes accordingly.

IMPORTANT: after selecting **Measurement Type** PH or RX, **ENSURE** you connect the appropriate electrode.

In case the operator should want **Measurement Type** also during operations, proceed as follows:

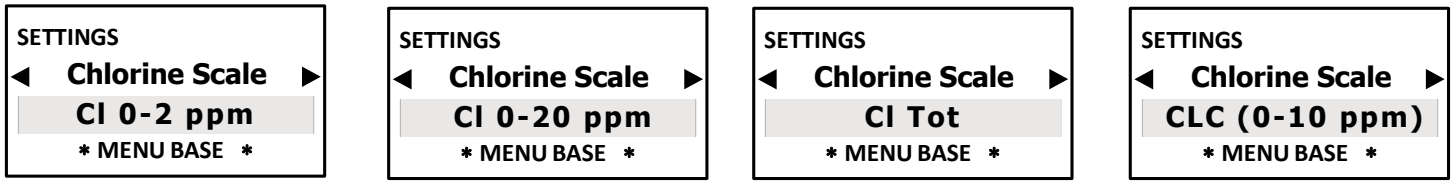
- **BASIC** menu > SETTINGS > MENU EXPERT > MENU SELECTION > SETPOINT1 > **Measurement Type**
- from **EXPERT** menu go into > MENUSELECTION > SETPOINT1 > **Measurement Type**
- Press ESC to go back to MENUSELECTION or press ESC ESC to go back to MEASUREMENT DISPLAYA

Select the CHLORINE Measurement RANGE

The instrument eSelect M2 PH(RX)-CL offers the option of selecting 4 chlorine measurement ranges and related sensors:

- Ion-selective membrane sensors with measurement ranges 0-2 Cl ppm (preset); 0-20 Cl ppm; 0-20 Cl ppm (Total Chlorine);
- Open type amperometric cell (model **CLC**) range 0-10 Cl ppm

After making the selection, the measurement parameters displayed will change accordingly.

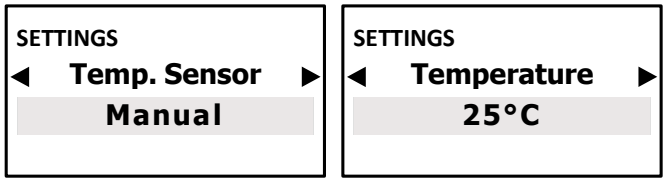


IMPORTANT: after selecting the **CHLORINE SCALE**, **ENSURE** the **adequate** chlorine sensor is connected.

In case the user should wish to change the range via **CHLORINE SCALE**, even during operations:

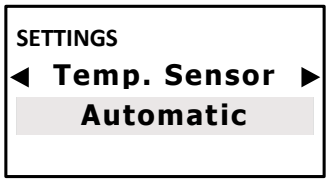
- **BASIC** menu > SETTINGS > EXPERT MENU > MENU SELECTION > SETPOINT1 > **Chlorine Scale**
- from **EXPERT** menu go into > MENUSELECTION > SETPOINT1 > **Chlorine Scale**
- Press ESC to go back to MENUSELECTION or press ESC ESC to go back to MEASUREMENT DISPLAY

TEMPERATURE settings



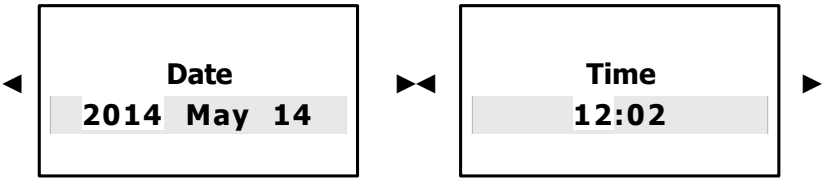
Manual temperature offset 0-100°C.

- Press ◄► to change the ambient temperature.



- Select AUTOMATIC offsetting for measurements and temperature offsetting with PT100 sensor.

DATE AND TIME – TIMER in REAL TIME



Program the date and time by selecting the backlit steps.

The instrument lets you choose between two programming modes:

- **BASIC** programming: simplified mode for non-professional operators.
- **EXPERT** programming: complete programming that includes functions for more accurate control and results.

After selecting the type of programming, the Menus and sub-menus change accordingly.
To help the operator choose the correct menu, the main differences between the two menus are set out below:

Menu Mode
BASIC

Setpoint 1-2-3 <*Setpoint value - Metering - ON/OFF or Proportional mode – MIN/MAX Alarm (only on Setpoint1-3)* > **Calibration** > **Settings** >

Menu Mode
EXPERT

Setpoint 1-2-3 < *Setpoint value - Metering - ON/OFF or Proportional mode - Hysteresis - Setpoint delay - Temp. correction - MIN/MAX Alarm (only on Setpoint1-3) - Overdose - Max Dosage – Start-up delay* > **4-20mA1** > **4-20mA2** > **Calibration** > **Start/Stop** > **Aux Output** > **Settings** >

☛ Press OK/MENU the display shows **BASIC** menu (default)

MAIN MENU > BASIC PROGRAMMING MENU

These are all the steps included in the **Main menu** configuration with the **BASIC** programming menu:

Menu Selection
Setpoint 1(pH)*

Menu Selection
Setpoint 2 (pH)*

Menu Selection
Setpoint 3 (Cl)**

* When **Measurement Type** **RX**, SETPOINT1, SETPOINT2 and CALIBRATION are selected, readings will be RX (mV)

*Selecting the setting **Chlorine Scale**, SETPOINT3 and CALIBRATION will be followed by values in the selected Cl ppm range

Menu Selection
Calibrat.M1(pH)*

Menu Selection
Calibrat.M2(Cl)**

Menu Selection
Start/Stop times

Menu Selection
Settings

☛ Press OK/MENU to confirm the selection and to go to the next sub-menu.

☛ Press ESC to go back to the MEASUREMENT DISPLAY

SETPOINT 1 PH AND SETPOINT 1 RX > BASIC MENU

SETPOINT1 PH

Menu Selection
Setpoint 1 (pH)

MENU SETPOINT 1 (pH)
◄ **Setpoint Value** ►
7.00 pH
* MENU BASE *

The two programming stages are set out below: when **Measurement Type** pH is selected, refer to the left column; when selecting RX refer to the right column.

The setpoints activate the output relays for the metering pumps or other devices until the setpoint is reached.

SETPOINT1 RX

Menu Selection
Setpoint 1 (RX)

MENU SETPOINT 1 (RX)
◄ **Setpoint Value** ►
200 mV
* MENU BASE *

MENU SETPOINT 1 (pH)
◀ Metering ▶
Acid
* MENU BASE *

Setpoint 1 is set for operations in **ACID** mode, the output is active when the measured value is higher than the selected setpoint, the connected pump meters out an acid product.

MENU SETPOINT 1 (RX)
◀ Metering ▶
Direct
* MENU BASE *

Setpoint 1 is set for operations in **DIRECT** mode: if the measured value is lower than the selected setpoint, the connected pump meters out an oxidising product.

MENU SETPOINT 1 (pH)
◀ Metering ▶
Alkaline
* MENU BASE *

MENU SETPOINT 1 (RX)
◀ Metering ▶
Reverse
* MENU BASE *

MENU SETPOINT 1 (pH)
◀ Mode ▶
ON/OFF
* MENU BASE *

The unit has an **ON-OFF** mode which switches on or off (if the reverse mode is ON) the output relays of Constant / ON-OFF metering pumps or other ON-OFF equipment.

MENU SETPOINT 1 (RX)
◀ Mode ▶
ON/OFF
* MENU BASE *

↪ *BY SELECTING "**ON-OFF**" THE NEXT STEP IS ➔ "**MIN ALARM**" (ONLY SET POINT1)*

MENU SETPOINT 1 (pH)
◀ Mode ▶
Proportional
* MENU BASE *

*Modular pulses, also known as PWM "pulse width modulation", support a proportional mode on each setpoint, activating the corresponding pulses on the relays based on the measured value.

Default activation point 1.50 pH

Default activation point 150 mV

MENU SETPOINT 1 (RX)
◀ Mode ▶
Proportional
* MENU BASE *

*For more accurate settings of the **"Modular pulses"** PWM, select the **"Expert"** menu in the initial settings.*

↪ ** GOING BACK TO THE SETPOINT PROGRAMMING STEPS FROM "**ON-OFF**" MODE OR FROM "**PROPORTIONAL**" MODE*

MENU SETPOINT 1 (pH)
◀ MIN Alarm ▶
0.00 pH
* MENU BASE *

The MIN Alarm function selects a **MINIMUM** alarm level, after which the alarm relay is triggered.

MENU SETPOINT 1 (RX)
◀ MIN Alarm ▶
–1500 mV
* MENU BASE *

MENU SETPOINT 1 (pH)
◀ MAX Alarm ▶
14.00 pH
* MENU BASE *

The MAX Alarm function selects a **MAXIMUM** alarm level, after which the alarm relay is triggered.

MENU SETPOINT 1 (RX)
◀ MAX Alarm ▶
1500 mV
* MENU BASE *

MENU SETPOINT 1 pH / RX
◀ Priming ▶
OFF
* MENU BASE *

MENU SETPOINT 1 pH / RX
◀ Priming ▶
ON
* MENU BASE *

The priming function blocks the setpoint value to allow the metering pump to remain primed.

☛ Press ESC to go back to MENU SELECTION or press ESC ESC to go back to MEASUREMENT DISPLAY

SETPOINT 2 PH AND SETPOINT 2 RX > BASIC MENU

SETPOINT2 PH

Menu Selection
Setpoint 2 (pH)

The two programming stages are below: when **Measurement Type** pH is selected, refer to the left column; when selecting RX refer to the right column.

SETPOINT2 RX

Menu Selection
Setpoint 2 (RX)

MENU SETPOINT 2 (pH)
◀ Setpoint Value ▶
7.00 pH
* MENU BASE *

The setpoints activate the output relays for the metering pumps or other devices until the setpoint is reached.

MENU SETPOINT 2 (RX)
◀ Setpoint Value ▶
200 mV
* MENU BASE *

MENU SETPOINT 2 (pH)
◀ Metering ▶
Alkaline
* MENU BASE *

Setpoint 2 is set for operations in **ALKALINE** mode, the output is active when the measured value is lower than the selected setpoint, the connected pump meters out an alkaline product.

MENU SETPOINT 2 (RX)
◀ Metering ▶
Reverse
* MENU BASE *

Setpoint 2 is set for operations in **REVERSE** mode: if the measured value is higher than the selected setpoint, the connected pump meters out a reducing agent.

MENU SETPOINT 2 (pH)
◀ Metering ▶
Acid
* MENU BASE *

MENU SETPOINT 2 (RX)
◀ Metering ▶
Direct
* MENU BASE *

MENU SETPOINT 2 (pH)
◀ Mode ▶
ON/OFF
* MENU BASE *

The unit has an **ON-OFF** mode which switches on or off (if the reverse mode is ON) The output relays of Constant / ON-OFF metering pumps or other ON-OFF equipment.

MENU SETPOINT 2 (RX)
◀ Mode ▶
ON/OFF
* MENU BASE *

↪ *BY SELECTING "***ON-OFF"** *THE NEXT STEP IS* ➔ **"MIN ALARM" (ONLY SET POINT1)**

MENU SETPOINT 2 (pH)
◀ Mode ▶
Proportional
* MENU BASE *

*Modular pulses, also known as PWM "pulse width modulation", support a proportional mode on each ON-OFF setpoint, activating the corresponding pulses on the relays based on the measured value (see pg.11-12).
Default activation point 1.50 pH

Default activation point 150 mV

MENU SETPOINT 2 (RX)
◀ Mode ▶
Proportional
* MENU BASE *

*For more accurate settings of the **"Modular pulses"** PWM, select the **"Expert"** menu in the initial settings.*

↪ ** GOING BACK TO THE SETPOINT PROGRAMMING STEPS FROM THE* **"ON-OFF"** *MODE OR* **"PROPORTIONAL"** *MODE*

MENU SETPOINT 2 pH / RX
◀ Priming ▶
OFF
* MENU BASE *

MENU SETPOINT 2 pH / RX
◀ Priming ▶
ON
* MENU BASE *

The priming function blocks the setpoint value to allow the metering pump to remain primed.

☛ Press ESC to go back to MENU SELECTION or press ESC ESC to go back to MEASUREMENT DISPLAY

SETPOINT 3 CL CHLORINE > BASIC MENU

Menu Selection
Setpoint 3 (Cl)

The instrument is preset by default for a 0÷2 ppm range. By selecting the required chlorine range, the values displayed change accordingly. The setpoints will activate the output relays for the metering pumps or other devices once the setpoint level is selected.
The display shows the values according to the selected Chlorine Scale.

MENU SETPOINT 3 (Cl)
◀ Setpoint Value ▶
0.000 Cl ppm
* MENU BASE *

MENU SETPOINT 3 (Cl)
◀ Setpoint Value ▶
0.00 Cl ppm
* MENU BASE *

MENU SETPOINT 3 (Cl)
◀ Setpoint Value ▶
0.00 Cl ppm*(Tot)
* MENU BASE *

MENU SETPOINT 3 (Cl)
◀ Setpoint Value ▶
0.00 Cl ppm
* MENU BASE *

MENU SETPOINT 3 (Cl) ◀ Metering ▶ Direct * MENU BASE *	MENU SETPOINT 3 (Cl) ◀ Metering ▶ Reverse * MENU BASE *

Direct mode: the output is active when the measured value is **lower** than the one selected in the setpoint, the metering pump injects Chlorine. **Reverse** mode: the output is active also the measured value is **higher** than the one selected in the setpoint, the metering pump injects a Chlorine reducing agent.

MENU SETPOINT 3 (Cl)
◀ Mode ▶
ON/OFF
* MENU BASE *

The unit has an **ON-OFF** mode which switches on or off (if the reverse mode is ON) The output relays of Constant / ON-OFF metering pumps or other ON-OFF equipment.

↪ *BY SELECTING "**ON-OFF**" THE NEXT STEP IS ➔ **"MIN ALARM" (ONLY SET POINT1)***

MENU SETPOINT 3 (Cl)
◀ Mode ▶
Proportional
* MENU BASE *

Modular pulses, also known as PWM "pulse width modulation", support a proportional mode on each ON-OFF setpoint, activating the corresponding pulses on the output relays based on the measured value and always relating to the previous selected settings.
The default activation point is **0.050 ppm** (2 Cl ppm); **0.50 ppm** (range 20 Cl ppm, 20 Cl ppm (Total), 0-10ppm CLC Cell).

*For more accurate settings of the **"Modular pulses"** PWM, select the **"Expert"** menu in the initial settings.*

↪ ** GOING BACK TO THE SETPOINT PROGRAMMING STEPS FROM THE **"ON-OFF"** MODE OR **"PROPORTIONAL"** MODE*

The MIN and MAX Alarm function selects the alarm levels beyond which the alarm relay is triggered on.

MENU SETPOINT 3 (Cl) ◀ Alarm MIN ▶ 0.000 Cl ppm * MENU BASE *	MENU SETPOINT 3 (Cl) ◀ Alarm MIN ▶ 0.00 Cl ppm * MENU BASE *	MENU SETPOINT 3 (Cl) ◀ Alarm MIN ▶ 0.00 Cl ppm*(Tot) * MENU BASE *	MENU SETPOINT 3 (Cl) ◀ Alarm MIN ▶ 0.00 Cl ppm * MENU BASE *
MENU SETPOINT 3 (Cl) ◀ Alarm MAX ▶ 2,000 Cl ppm * MENU BASE *	MENU SETPOINT 3 (Cl) ◀ Alarm MAX ▶ 20.00 Cl ppm * MENU BASE *	MENU SETPOINT 3 (Cl) ◀ Alarm MAX ▶ 20.00 Cl ppm*(Tot) * MENU BASE *	MENU SETPOINT 3 (Cl) ◀ Alarm MAX ▶ 10.00 Cl ppm * MENU BASE *

MENU SETPOINT 3 (Cl) ◀ Priming ▶ OFF * MENU BASE *	MENU SETPOINT 3 (Cl) ◀ Priming ▶ ON * MENU BASE *

ONLY WHEN USING METERING PUMPS
The priming function blocks the setpoint value to allow the metering pump to remain primed, the outputs are not active.

☛ Press ESC to go back to MENU SELECTION or press ESC ESC to go back to MEASUREMENT DISPLAY

SENSOR CALIBRATION

Menu Selection Calibrat.M1(pH)	Menu Selection Calibrat.M1(Rx)*	Menu Selection Calibrat.M2(Cl)**

Press **OK/MENU** to confirm the selection and go to the next sub-menu.

PH ELECTRODE CALIBRATION

Calibration operations follow the type of parameter previously selected in the **Measurement Type** menu

Press OK/MENU to confirm the selection and go to the next sub-menu.

*According to the selected **Measurement Type**, the Calibration menu shows the electrode to be calibrated.*
We suggest using new or however uncontaminated buffer solutions.
As for the length of the pH electrode we advise max 9 m: contact ETATRON for longer distances.
The mV value at the bottom of the screen shows the electrode's efficiency (according to the manufacturer's specifications)

CALIBRAT. MEAS.1 (pH)
◀ Cal. Zero ▶
6.22 pH
46.4 mV

** When Calibration starts, the display shows random values.*

Dip the pH electrode in the buffer solution at pH 7.00 for ZERO calibration, wait 2/3 minutes.
☛ Press ◀▶ and ensure the display shows 7.00 pH.
Rinse the electrode with water (possibly demineralised) and dry with a clean cloth or paper tissues.

CALIBRAT. MEAS.1 (pH)
◀ Cal. Gain ▶
9.50 pH
46.4 mV

Dip the pH electrode in the buffer solution at pH 4 or pH 9 for "Gain" calibration, wait 2/3 min.
☛ Press ◀▶ until the display shows **4.00 pH** or **9.00 pH**.
☛ Press OK/MENU to confirm the selection
☛ Press ESC to go back to the MENU SELECTION
☛ Press ESC ESC to go back to the MEASUREMENT DISPLAY

As the pH measurement is essential for the entire chemical-physical balance, it is recommended to periodically calibrate the pH electrode

RX (REDOX) ELECTRODE CALIBRATION

CALIBRAT. MEAS.1 (RX)
◀ Cal. Zero ▶
25 mV
46.4 mV

** When the Calibration starts, the display shows random values*

Short-circuit the BNC by using a copper wire (for calibration only) to put in contact the internal PIN with the external part of the connector.

☛ Press ◀▶ and ensure the display shows **0 mV**
Connect the BNC of the electrode to the instrument.
Dip the RX electrode in the REDOX buffer solution for "Gain" calibration, wait 2/3 minutes.

CALIBRAT. MEAS.1 (RX)
◀ Cal. Gain ▶
450 mV
420.1 mV

☛ Press ◀▶ and ensure the display shows the mV value corresponding to the buffer solution used.
☛ Press OK/MENU to confirm the selection
☛ Press ESC to go back to the MENU SELECTION
☛ Press ESC ESC to go back to the MEASUREMENT DISPLAY

The mV value at the bottom shows the electrode signal and consequently its efficiency (according to the manufacturer's specifications). Refer to the electrode's instructions and ensure the mV value displayed matches that of the buffer solution with a tolerance of ± 20mV.

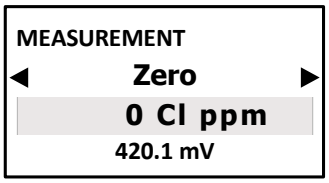
CHLORINE SENSOR CALIBRATION

The chlorine parameter has 3 ranges suitable for **ion-selective membrane** sensors (one of which for the Total chlorine) and 1 range for open type amperometric cells.

NOTE

*During calibration, the **-** (minus) sign might be displayed, which disappears or is removed by correct settings! The mV value in the lower part of the display shows the sensor signal in mV thus indicating the sensor's efficiency. It is recommended to perform constant checks and recalibration of the sensor via DPD1 and DPD3 or, when using Open chlorine cells, to clean the cell's electrodes.*

- ***FOR OPEN CELLS**: add a flow of system water without Chlorine into the Cell, about 40÷50 L/h.*
- ***FOR ION-SELECTIVE MEMBRANE SENSORS**: place the sensor in a container with system water with no chlorine readings and gently stir the sensor (preventing the tip from touching any surface and without any air bubbles) and wait for the measurement to stabilise.*



☛ Wait 5/10 minutes, press ◄► until **0.00** is displayed, press OK/MENU.

*Another **simple** method for ZERO calibration is to perform the instrument's electronic Zero as follows: **DISCONNECT THE SENSOR,** short-circuit the M-0 pins of the internal terminal board, press and hold ▲ ▼ until **0.00** is displayed then con*OK/MENU

*. **The operator must STRICTLY be an expert:***

***NOTE:** this method assures calibration of the instrument's **electronic ZERO**, this might not be equivalent to the real value of the water without chlorine, i.e. the chemical physical Zero of chlorine-free water.*

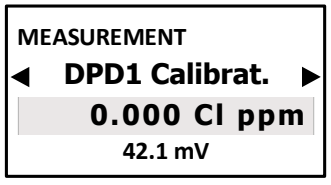
*For this operation **DISCONNCT THE SENSOR !!!!** Press and hold ▲ ▼ until **0.00** is displayed then confirm ►* OK/MENU

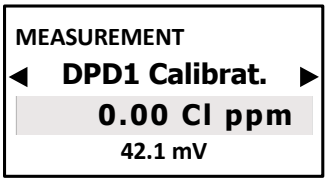
Another way to calibrate Zero, in the case of Open cells, is to use activated carbon filters.

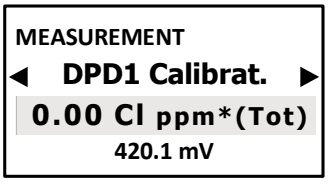
- *Install a by-pass system before the sensor support and run the water at constant flow rate between 40/50 L / h through an Activated Carbon cartridge. Press and hold ▲ ▼* 0.00 *is displayed then confirm ►* OK/MENU

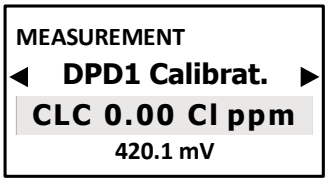
***NOTE**: Activated Carbon tends to reduce the pH reading thus making calibration redundant, it may only be used for one operation and does not guarantee the actual Zero. This is the least recommended method due to its complexity.*

GO TO THE SECOND CALIBRATION POINT









Note: if the Total Chlorine range has been selected, DPD3 will be displayed.

Select the value of the required sample solution and check with the test kit **DPD1** for free chlorine or **DPD3** for total chlorine, or with portable instrument, measure the chlorine concentration in ppm (residual or total) in water, wait for the measurement to stabilise and match the DPD value obtained.

☛ Press OK/MENU to confirm the selection

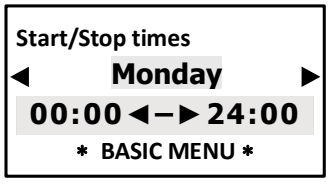
☛ Press ESC to go back to the MENU SELECTION

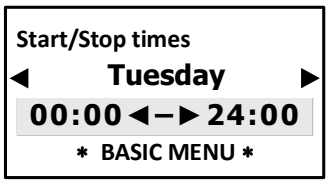
☛ Press ESC ESC to go back to the MEASUREMENT DISPLAY

For CALIBRATION and MAINTENANCE, ALWAYS refer to the manual of the relevant probe

START/STOP TIMES > BASIC MENU

Timer in real time programs the days and exact time of instrument operations.

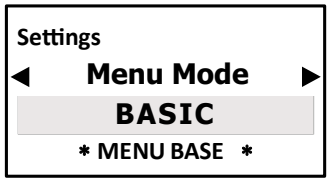




Program the date and time by selecting the backlit steps.

☛ Press ESC to go back to MENU SELECTION or press ESC ESC to go back to MEASUREMENT DISPLAY

SETTINGS > BASIC MENU

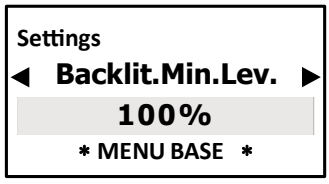


BASIC programming: simplified mode for non-professional operators

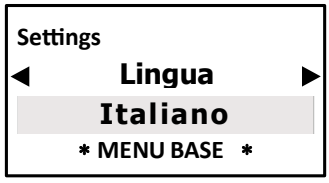
EXPERT Programming**:** complete programming that includes functions for more accurate control and results.

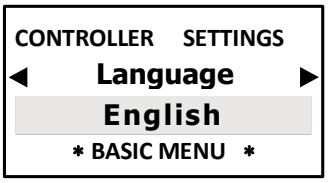
After selecting, e.g. EXPERT, the display first shows BASIC but changes to EXPERT as soon as you start programming, and vice versa.

Program the date and time by selecting the backlit steps.

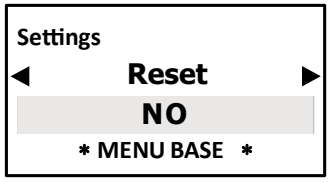


Adjusts display backlighting obtaining energy savings;

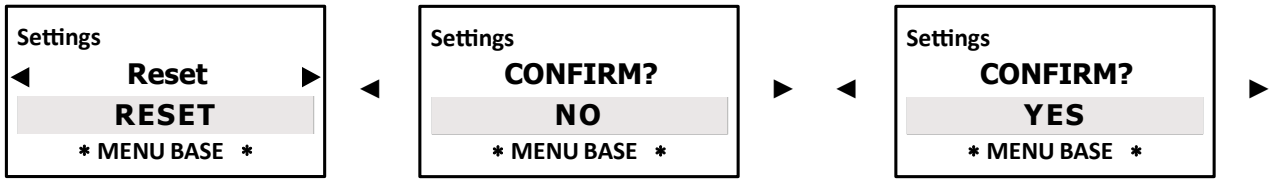




To select the language of the programming menu (ITALIAN/ENGLISH). After selecting the Language, the programming menu adapts accordingly.



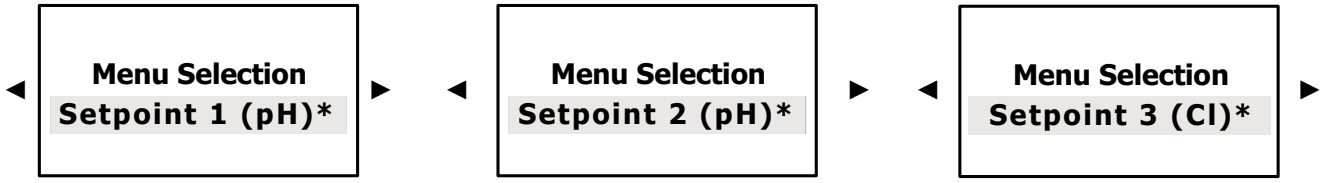
DATA RESET: resets default factory settings. ONLY to be used when the parameters do not match or there are programming issues or when the operator wishes to restart from scratch. **NOT** to be overused as many resets may undermine the instrument's efficiency.



☛ By confirming **YES**, the display goes out for about 1 second, then goes back to the MEASUREMENT DISPLAY

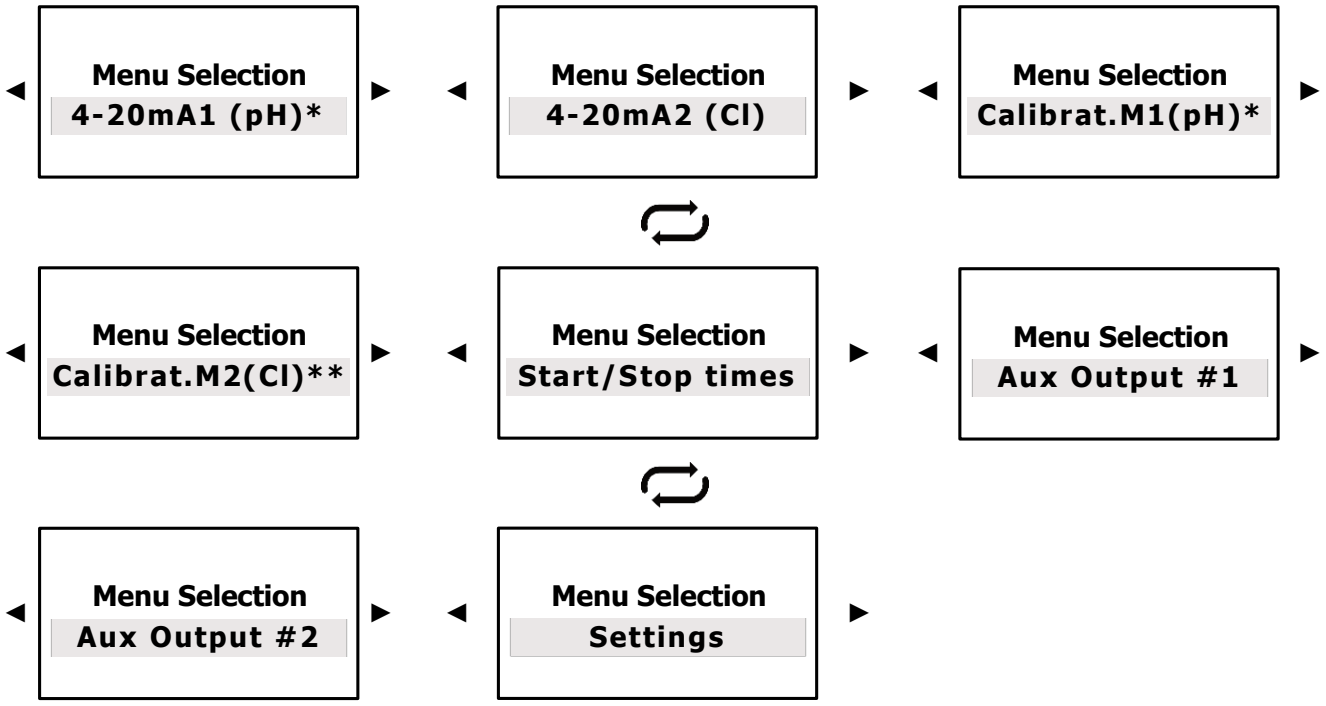
MAIN MENU > EXPERT PROGRAMMING MENU

These are all the steps included in the **Main menu** configuration with the **EXPERT** programming menu:



* By selecting **Measurement Type** **RX**, SETPOINT1, SETPOINT2 and CALIBRATION the reading will be RX (mV)

*Selecting the setting **Chlorine Scale**, SETPOINT3 and CALIBRATION will be followed by values in the previously selected Chlorine scale range.

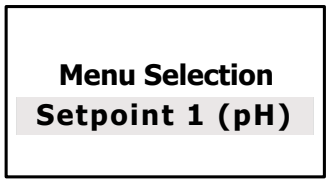


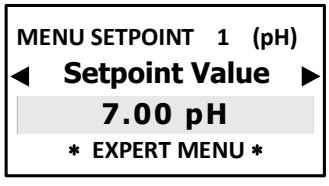
☛ Press OK/MENU to confirm the selection and to go on to the next sub-menu.

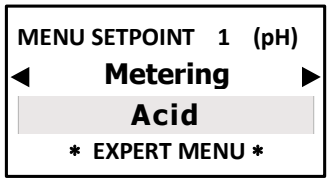
☛ Press ESC to go back to the MEASUREMENT DISPLAY

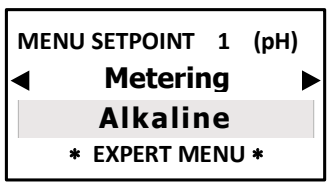
SETPOINT 1 PH AND SETPOINT 1 RX > EXPERT MENU

SETPOINT1 PH









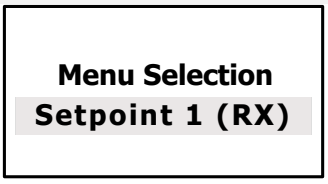
The two programming stages are below: when **Measurement Type** pH is selected, refer to the left column; when selecting RX refer to the right column.

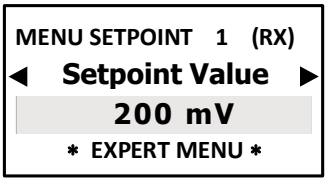
The setpoint activates the output relays for the metering pumps or other devices until the setpoint value is reached.

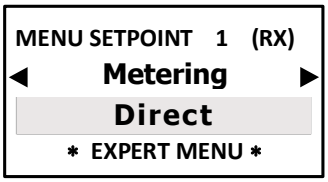
Setpoint 1 is set for operations in **ACID** mode, the output is active when the measured value is higher than the selected setpoint, the connected pump meters out an acid product.

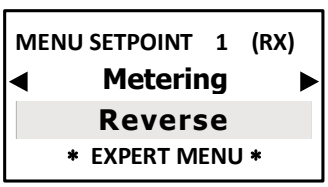
Setpoint 1 is set for operations in **DIRECT** mode: the output is active when the measured value is lower than the selected setpoint, the connected pump meters out an oxidising product.

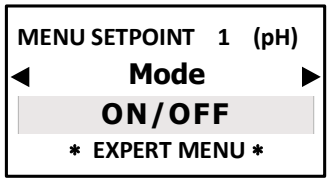
SETPOINT1 RX



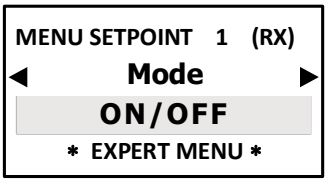


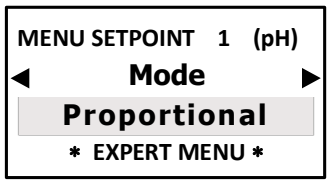




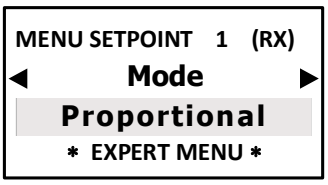


The unit has an **ON-OFF** mode which switches on or off (if the reverse mode is ON) The output relays of Constant / ON-OFF metering pumps or other ON-OFF equipment.





Modular pulses, also known as PWM "pulse width modulation", support a proportional mode on each ON-OFF setpoint, activating the corresponding pulses on the output relays based on the measured value. When the Expert Menu is used, other parameters need to be programmed.

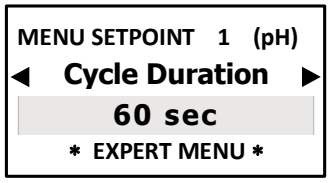


↪ *SELECTING* **"ON-OFF"** *THE NEXT PROGRAMMING STEO IS* ➔ **"HYSTERESIS"**

↪ *SELECTING* **"PROPORTIONAL"** *REQUIRES PROGRAMMING THE NEXT STEPS*

PWM PROPORTIONAL MODE FOR PH WITH TIMED PULSES

Window width: *pulses are timed ON and OFF based on the distance from the selected setpoint, programmable, example: if the selected setpoint is 7.00 pH and the measured value is 9.00 pH, the* ***PWM*** *mode starts after reaching 8.50 pH with Time/Pause pulses and decreasing the active time while reaching the setpoint.*



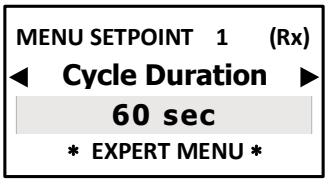
Cycle Duration: *the PWM mode has a 60 second cycle (programmable), example: setpoint is 700 mV, measured value 850 pH = active time 60 sec - pause time = 0 sec; at 7.75 pH active time = 30 sec - pause time = 30 sec… as a consequence the active time decreases while reaching the setpoint. The cycle time depends on many variables, such as: distance from the injection point of the system to be treated, how fast or slowly the setpoint must react, chemical concentration, etc.*

MIN Active Time: *programmable. Defines the minimum time for which PWM is active; prevails over the selected settings. The pulse modulation function is adjusted with 3 functions according to the following formula: Active Time in accordance with the selected formula = (measured value - setpoint) / (period width * cycle time). If the result of the formula is < of that selected with MIN Active Time, the latter prevails on the former.*

PWM PROPORTIONAL MODE FOR RX WITH TIMED PULSES

Window width: *pulses are timed ON and OFF based on the distance from the selected setpoint, programmable. Example: if the selected setpoint is 750 mV and the measured value is 500 mV, the* ***PWM*** *mode starts after reaching 550 mV with Time/Pause pulses and decreasing the active time while reaching the setpoint (see pg.11-13).*

Cycle Duration: *the PWM mode has a 60 second cycle (programmable), example: setpoint is 700 mV, at measured value 550 mV = active time 60 sec - pause time = 0 sec; at 625 mV active time = 30 sec - pause time = 30 sec… as a consequence the active time decreases while reaching the setpoint. The cycle time depends on many variables, such as: distance from the injection point of the system to be treated, how fast or slowly the setpoint must react, chemical concentration, etc.*



MIN Active Time: *programmable. Defines the minimum time for which PWM is active; prevails over the selected settings. The pulse modulation function is adjusted with 3 functions according to the following formula: Active Time in accordance with the selected formula = (measured value - setpoint) / (period width * cycle time). If the result of the formula is < of that selected with MIN Active Time, the latter prevails on the former.*

↪ *BY SELECTING* **"ON-OFF"** *THE NEXT PROGRAMMING STEPS AS FOLLOWS* ***.....***

MENU SETPOINT 1 (pH)
◀ Hysteresis ▶
0.05 pH
* EXPERT MENU *

FUNCTION NOT AVAILABLE WITH PROPORTIONAL MODE

Hysteresis is useful during operations to adjust the setpoints in ON-OFF mode and is used to enable and disable the output relay when the selected hysteresis has been achieved. Hysteresis is useful when there are too many quick swings around the setpoint, that might damage the connected device.

MENU SETPOINT 1 (RX)
◀ Hysteresis ▶
10 mV
* EXPERT MENU *

MENU SETPOINT 1 pH / RX
◀ Set point del. ▶
5 sec
* EXPERT MENU *

FUNCTION NOT AVAILABLE WITH PROPORTIONAL MODE

The Delay time blocks the output relays (max 999 sec. programmable) to ensure the outputs are active only when the measurements are stable, thus assuring the best results in terms of chemical balance.

** GOING BACK TO THE SETPOINT PROGRAMMING STEPS FROM THE* **"ON-OFF"** *MODE OR* **"PROPORTIONAL"** *MODE*

MENU SETPOINT 1 (pH)
◀ Measurement Type ▶
pH
* EXPERT MENU *

The PH measurement parameter may be changed into RX by simple programming and by using the RX electrode

MENU SETPOINT 1 (Rx)
◀ Measurement Type ▶
Rx
* EXPERT MENU *

MENU SETPOINT 1 (pH)
◀ MIN Alarm ▶
0.00 pH
* EXPERT MENU *

The MIN Alarm function selects a **MINIMUM** alarm level after which the alarm relay is triggered.

MENU SETPOINT 1 (RX)
◀ MIN Alarm ▶
–1500 mV
* EXPERT MENU *

MENU SETPOINT 1 (pH)
◀ MAX Alarm ▶
14.00 pH
* EXPERT MENU *

The MAX Alarm function selects a **MAXIMUM** alarm level after which the alarm relay is triggered.

MENU SETPOINT 1 (RX)
◀ MAX Alarm ▶
1500 mV
* EXPERT MENU *

MENU SETPOINT 1 pH / RX
◀ Overdose ▶
00.00 h:m
* EXPERT MENU *

With the **overdose time** alarm one can select a period during which the setpoint must be reached. If the setpoint is not reached during this period of time, the instrument blocks output operations, including those in mA (metering pumps), the alarm is displayed as ON and triggers a signalling instrument if it is connected to the alarm relay.

MENU SETPOINT 1 pH / RX
◀ Max. Metering ▶
000 (no limit)
* EXPERT MENU *

MENU SETPOINT 1 pH / RX
◀ Max. Metering ▶
000 m / 00 h
* EXPERT MENU *

Maximum Metering is an extra safety function that ensures metering is completed in the selected time. This function makes it possible to eliminate time limits (continuous metering according to the selected setpoints) or to select the minutes (up to 999) and the hours, for instance metering for 999 minutes in 24 hours.

MENU SETPOINT 1 pH / RX
◀ Start-up Delay ▶
00.00 h:m
* EXPERT MENU *

The **start-up delay** stops the output relays when the unit is switched on, thus allowing the sensor to polarise assuring reliable measurements (programmable).

MENU SETPOINT 1 pH / RX
◀ Priming ▶
OFF
* EXPERT MENU *

MENU SETPOINT 1 pH / RX
◀ Priming ▶
ON
* EXPERT MENU *

ONLY WHEN USING METERING PUMPS

The priming function blocks the setpoint value to allow the metering pump to remain primed.

☛ Press ESC to go back to MENU SELECTION or press ESC ESC to go back to MEASUREMENT DISPLAY

SETPOINT 2 PH AND SETPOINT 2 RX > EXPERT MENU

SETPOINT2 PH		*SETPOINT2 RX*
Menu Selection **Setpoint 2 (pH)**	The two programming stages are below: when **Measurement Type** pH is selected, refer to the left column; when selecting RX refer to the right column.	**Menu Selection** **Setpoint 2 (RX)**
MENU SETPOINT 2 (pH) ◀ **Setpoint Value** ▶ **7.00 pH** * EXPERT MENU *	The setpoint activates the output relays for the metering pumps or other devices until the setpoint value is reached.	MENU SETPOINT 2 (RX) ◀ **Setpoint Value** ▶ **200 mV** * EXPERT MENU *
MENU SETPOINT 2 (pH) ◀ **Metering** ▶ **Alkaline** * EXPERT MENU *	Setpoint 2 is set for operations in **ALKALINE** mode, the output is active when the measured value is lower than the selected setpoint, the connected pump meters out an alkaline product.	MENU SETPOINT 2 (RX) ◀ **Metering** ▶ **Reverse** * EXPERT MENU *
MENU SETPOINT 1 (pH) ◀ **Metering** ▶ **Acid** * EXPERT MENU *	Setpoint 2 is set for operations in **REVERSE** mode, the output is active when the measured value is higher than the selected setpoint, the connected pump meters out a chlorine reducing agent.	MENU SETPOINT 2 (RX) ◀ **Metering** ▶ **Direct** * EXPERT MENU *
MENU SETPOINT 2 (pH) ◀ **Mode** ▶ **ON/OFF** * EXPERT MENU *	The unit has an **ON-OFF** mode which switches on or off (if the reverse mode is ON) the output relays of Constant / ON-OFF metering pumps or other ON-OFF equipment.	MENU SETPOINT 2 (RX) ◀ **Mode** ▶ **ON/OFF** * EXPERT MENU *
MENU SETPOINT 2 (pH) ◀ **Mode** ▶ **Proportional** * EXPERT MENU *	*Modular pulses, also known as PWM "pulse width modulation", support a proportional mode on each setpoint, activating the corresponding pulses on the output relays based on the measured value and always relating to the previous settings of the selected hysteresis. When the Expert Menu is used, other parameters need to be programmed.	MENU SETPOINT 2 (RX) ◀ **Mode** ▶ **Proportional** * EXPERT MENU *

↪ *SELECTING* **"ON-OFF"** *THE NEXT PROGRAMMING STEO IS* ➔ **"HYSTERESIS"**

↪ *SELECTING* **"PROPORTIONAL"** *REQUIRES PROGRAMMING THE NEXT STEPS*

PWM PROPORTIONAL MODE FOR PH WITH TIMED PULSES

MENU SETPOINT 2 (pH)
◀ **Window width** ▶
1.50 pH
* EXPERT MENU *

Window width: *pulses are timed ON and OFF based on the distance from the selected setpoint (programmable). Example: if the selected setpoint is 7.00 pH and the measured value is 9.00 pH, the* ***PWM*** *mode starts after reaching 8.50 pH with Time/Pause pulses and decreasing the active time while reaching the setpoint.*

MENU SETPOINT 2 (pH)
◀ **Cycle Duration** ▶
60 sec
* EXPERT MENU *

Cycle Duration: *the PWM mode has a 60 second cycle (programmable), example: setpoint is 7.00 pH, measured value 8.50 pH = active time 60 sec - pause time = 0 sec; at 7.75 pH active time = 30 sec - pause time = 30 sec… as a consequence the active time decreases while reaching the setpoint. The cycle time depends on many variables, such as: distance from the injection point of the system to be treated; how fast or slowly the setpoint needs to react, chemical concentration, etc.*

MENU SETPOINT 2 (pH)
◀ Min.Active Time ▶
5 sec
* EXPERT MENU *

MIN Active Time: *programmable. Defines the minimum time for which PWM is active; prevails over the selected settings. The pulse modulation function is adjusted with 3 functions according to the following formula: Active Time in accordance with the selected formula = (measured value - setpoint) / (period width * cycle time). If the result of the formula is < of that selected with MIN Active Time, the latter prevails on the former.*

PWM PROPORTIONAL MODE FOR RX WITH TIMED PULSES

Window width: *pulses are timed ON and OFF based on the distance from the selected setpoint (programmable). Example: if the selected setpoint is 750 mV and the measured value is 500 mV, the **PWM** mode starts after reaching 550 mV with Time/Pause pulses and decreasing the active time while reaching the setpoint.*

MENU SETPOINT 2 (RX)
◀ Window width ▶
150 mV
* EXPERT MENU *

Cycle Duration: *the PWM mode has a 60 second cycle (programmable), example: setpoint is 700 mV, the measured value is 550 mV = active time 60 sec - pause time = 0 sec; at 625 mV active time = 30 sec - pause time = 30 sec… as a consequence the active time decreases while reaching the setpoint. The cycle time depends on many variables, such as: distance from the injection point of the system to be treated; how fast or slowly the setpoint needs to react, chemical concentration, etc.*

MENU SETPOINT 2 (RX)
◀ Cycle Duration ▶
60 sec
* EXPERT MENU *

MIN Active Time: *programmable. Defines the minimum time for which PWM is active; prevails over the selected settings. The pulse modulation function is adjusted with 3 functions according to the following formula: Active Time in accordance with the selected formula = (measured value - setpoint) / (period width * cycle time). If the result of the formula is < of that selected with MIN Active Time, the latter prevails on the former.*

MENU SETPOINT 2 (pH)
◀ Min.Active Time ▶
5 sec
* EXPERT MENU *

↪ *BY SELECTING* **"ON-OFF"** *THE NEXT PROGRAMMING STEPS ARE AS FOLLOWS .....*

MENU SETPOINT 2 (pH)
◀ Hysteresis ▶
0.05 pH
* EXPERT MENU *

FUNCTION NOT AVAILABLE WITH PROPORTIONAL MODE

Hysteresis is useful during operations to adjust the setpoints in ON-OFF mode and is used to enable or disable the output relay when the selected hysteresis has been achieved. Hysteresis is useful when there are too many quick swings around the setpoint, that might damage the connected device.

MENU SETPOINT 2 (RX)
◀ Hysteresis ▶
10 mV
* EXPERT MENU *

MENU SETPOINT 2 pH / RX
◀ Set point del. ▶
5 sec
* EXPERT MENU *

FUNCTION NOT AVAILABLE WITH PROPORTIONAL MODE

The Delay time blocks the output relays (max 999 sec. programmable) to ensure the outputs are active only when measurements are stable, thus assuring the best results in terms of chemical balance.

↪ ** GOING BACK TO THE SETPOINT PROGRAMMING STEPS FROM THE* **"ON-OFF"** *MODE OR* **"PROPORTIONAL"** *MODE*

MENU SETPOINT 2 pH / RX
◀ Overdose ▶
00.00 h:m
* EXPERT MENU *

With the **overdose time** alarm one can select a period during which the setpoint must be reached. If the setpoint is not reached during this period of time, the instrument blocks output operations, including those in mA (metering pumps), the alarm is displayed as ON and triggers a signalling instrument if it is connected to the alarm relay.

MENU SETPOINT 2 pH / RX
◀ Max. Metering ▶
000 (no limit)
* EXPERT MENU *

MENU SETPOINT 2 pH / RX
◀ Max. Metering ▶
000 m / 00 h
* EXPERT MENU *

Maximum Metering is an extra safety function that ensures metering is completed in the selected time. This function makes it possible to eliminate time limits (continuous metering according to the selected setpoints) or to select the minutes (up to 999) and the hours, for instance metering for 999 minutes in 24 hours.

MENU SETPOINT 2 pH / RX
◀ Priming ▶
OFF
* EXPERT MENU *

MENU SETPOINT 2 pH / RX
◀ Priming ▶
ON
* EXPERT MENU *

ONLY WHEN USING METERING PUMPS

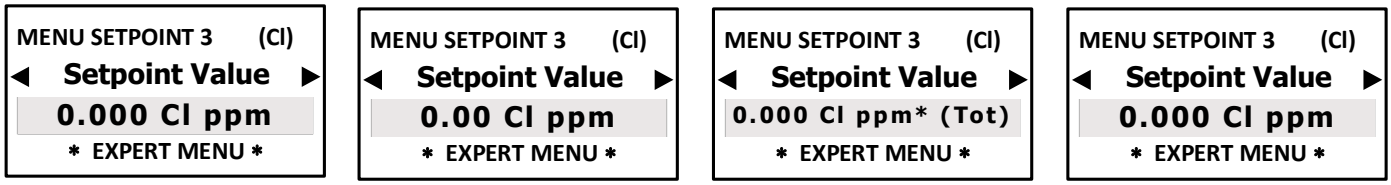
The priming function blocks the setpoint value to allow the metering pump to remain primed.

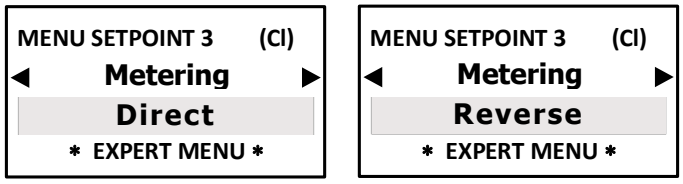
☛ Press ESC to go back to MENU SELECTION or press ESC ESC to go back to MEASUREMENT DISPLAY

SETPOINT 3 CL CHLORINE > EXPERT MENU

Menu Selection
Setpoint 3 (Cl)

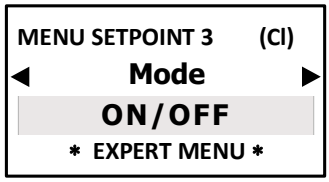
The chlorine instrument is preset by default for a 0-2 ppm range. By selecting the required chlorine range, the values displayed change accordingly. The setpoints will activate the output relays for the metering pumps or other devices once the setpoint level is selected.
The display shows the values according to the selected Chlorine Scale.





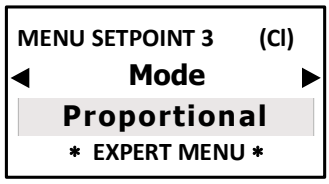
Direct mode: the output is active when the measured value is **lower** than the one selected in the setpoint.

Reverse mode: the output is active even if the measured value is **higher** than the one selected in the setpoint.



The unit has an **ON-OFF** mode which switches on or off (if the reverse mode is ON) the output relays of Constant / ON-OFF metering pumps or other ON-OFF equipment.

↳ *BY SELECTING "***ON-OFF"** *THE NEXT STEP IS* ➔ **"MIN ALARM" (ONLY SET POINT1)**



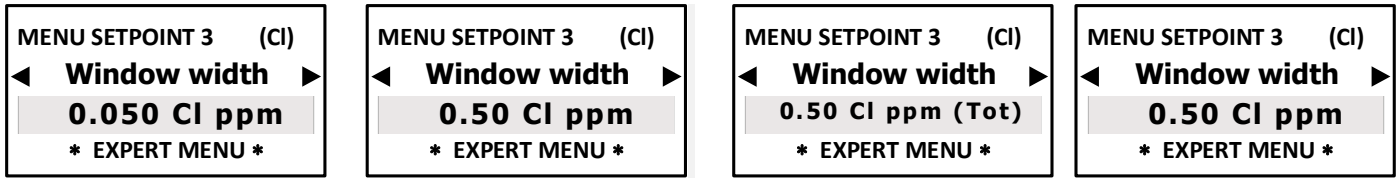
*Modular pulses, also known as PWM "pulse width modulation", support a proportional mode on each ON-OFF setpoint, activating the corresponding pulses on the output relays based on the measured value and always relating to the previous selected settings. The default activation point is **0.050 ppm** (2 Cl ppm); **0.50 ppm** (range 20 Cl ppm, 20 Cl ppm (Total), 0-10ppm CLC Cell)

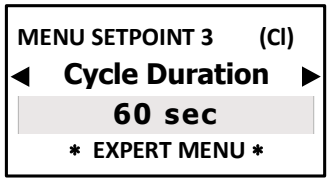
↳ *SELECTING* **"ON-OFF"** *THE NEXT PROGRAMMING STEO IS* ➔ **"HYSTERESIS"**

↳ *SELECTING* **"PROPORTIONAL"** *REQUIRES PROGRAMMING THE NEXT STEPS*

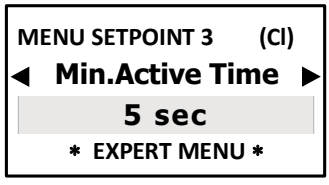
PWM PROPORTIONAL MODE WITH TIMED PULSES

Pulse width: *pulses are timed ON and OFF based on the distance from the selected setpoint, programmable. Example: with a selected chlorine range at 2 Cl ppm, if the selected setpoint is 0.500 Cl ppm and the measured value is 0.400 Cl ppm, the **PWM** mode starts after reaching 0.450 Cl ppm with Time/Pause pulses and decreasing the active time while reaching the setpoint.*



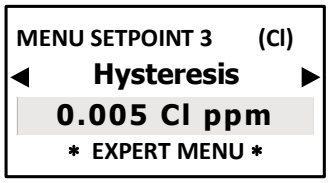


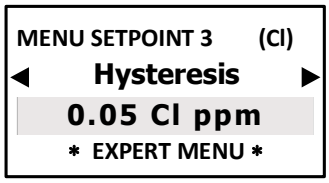
Cycle Duration: *the PWM mode has a 60 second cycle (programmable), example: setpoint is 0.500 Cl ppm = active time 60 sec - pause time = 0 sec; 0.475 Cl ppm active time = 30 sec - pause time = 30 sec… as a consequence the active time decreases while reaching the setpoint. The cycle time depends on many variables, such as: distance from the injection point of the system to be treated, how fast or slowly the setpoint must react, chemical concentration, etc.*

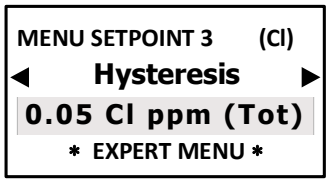


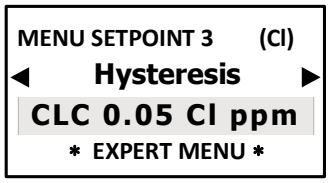
MIN Active Time: *programmable. Defines the minimum time for which PWM is active; prevails over the selected settings. The pulse modulation function is adjusted with 3 functions according to the following formula: Active Time in accordance with the selected formula = (measured value - setpoint) / (period width * cycle time). If the result of the formula is < of that selected with MIN Active Time, the latter prevails on the former.*

↳ *BY SELECTING* **"ON-OFF"** *THE NEXT PROGRAMMING STEPS ARE AS FOLLOWS* ***.....***



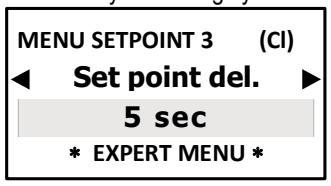






FUNCTION NOT AVAILABLE SIMULTANEOUSLY WITH PROPORTIONAL MODE

Hysteresis is useful during operations to adjust the setpoints in ON-OFF mode and is used to enable or disable the output relay when the selected hysteresis has been achieved. Hysteresis is useful when there are too many quick swings around the setpoint, that might damage the connected device. By increasing hysteresis it is possible to move away from the setpoint in accordance with the required value.



FUNCTION NOT AVAILABLE SIMULTANEOUSLY WITH PROPORTIONAL MODE

The Delay time blocks the output relays (max 999 sec. programmable) to ensure the outputs are active only when the measurements are stable, thus assuring the best results in terms of chemical balance.

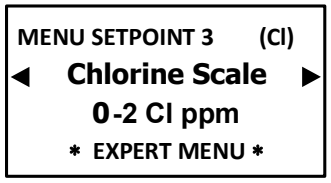
↪ ** GOING BACK TO THE SETPOINT PROGRAMMING STEPS FROM THE* **"ON-OFF"** *MODE OR* **"PROPORTIONAL" MODE**

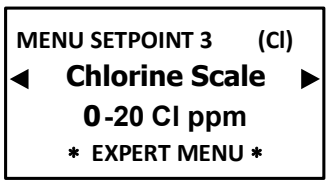
FUNCTION ONLY VALID FOR SET POINT1 TO CHANGE THE PREVIOUSLY SELECTED CHLORINE RANGE

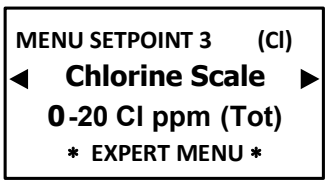
- Ion-selective membrane sensor range 0-2 Cl ppm (**default)**; range 0-20 Cl ppm; range 0-20 Cl ppm (Total);
- Open type amperometric cell (**CLC** model) range 0-10 Cl ppm.

Once the selection is made, the display and measurement resolutions change accordingly.

In the event of changing the range, ensure the appropriate sensor is used!

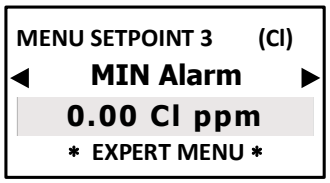


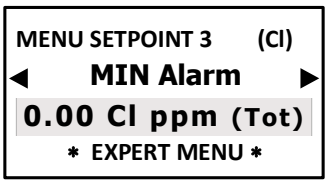


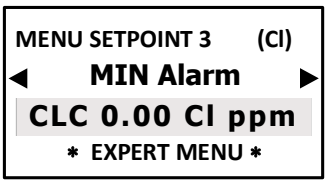


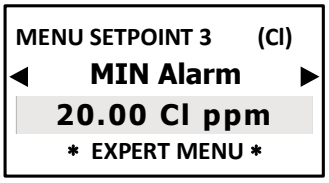
FUNCTION ONLY AVAILABLE WITH SETPOINT 1

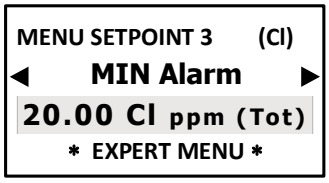
The MIN Alarm function selects a MINIMUM alarm level, after which the alarm relay is triggered.
The MAX Alarm function selects a MAXIMUM alarm level, after which the alarm relay is triggered.

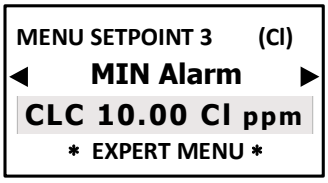


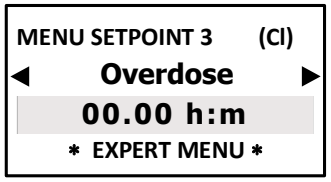




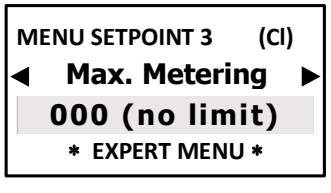






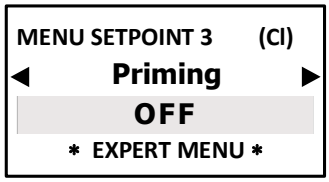


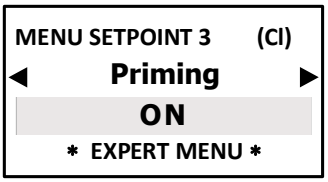
With the **overdose time** alarm one can select a period during which the setpoint must be reached. If the setpoint is not reached during this period of time, the instrument blocks output operations, including those in mA (metering pumps), the alarm is displayed as ON and triggers a signalling instrument if it is connected to the alarm relay.



Maximum Metering is an extra safety function that ensures metering is completed in the selected time. This function makes it possible to eliminate time limits (continuous metering according to the selected setpoints) or to select the minutes (up to 999) and the hours, for instance metering for 999 minutes in 24 hours.

The **start-up delay** stops the output relays when the unit is switched on, thus allowing the sensor to polarise assuring correct measurements (programmable).

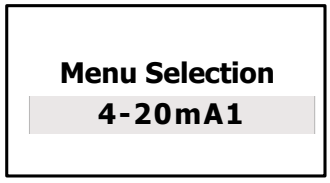


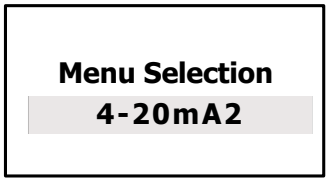


ONLY WHEN USING METERING PUMPS
The priming function blocks the setpoint value to allow the metering pump to remain primed.

☛ Press ESC to go back to MENU SELECTION or press ESC ESC to go back to MEASUREMENT DISPLAY

ANALOGUE 4-20MA OUTPUTS FUNCTION SELECTION > EXPERT MENU





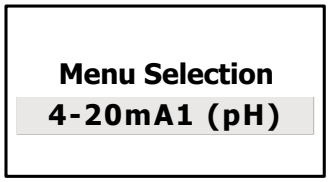
☛ Press **OK/MENU** to go into mA mode. In mA mode the instrument lets you choose two operative functions:

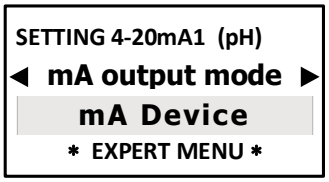
- **EXTERNAL DEVICES** suited to operating with mA signal such as data loggers or data recorders or other mA equipment
- **SETPOINT** through the control of metering pumps suited to controlling an mA external digital signal.

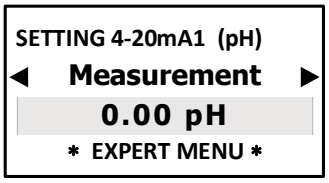
4-20mA1 OUTPUT PH OR RX > Remote Devices Function

The 4-20mA1 analogue output of the instrument follows the options previously selected in **Measurement Type** i.e. **pH** or **RX.**

mA1 pH





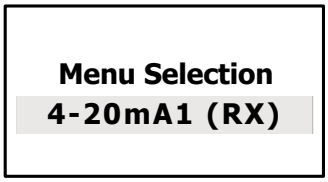


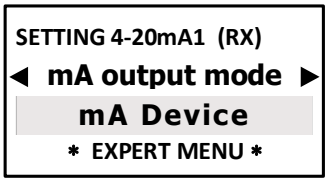
Please note that the value displayed is automatically adjusted according to the **Measurement Type** selected in paragraph 8.2

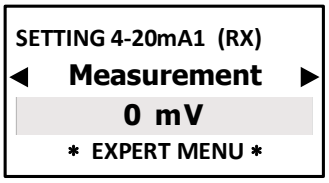
The 4-20mA proportional analogue outputs are related to the CE measurements in real time in order to drive remote equipment such as data loggers, PLCs or graphic recorders or other equipment suited to processing a remote mA signal.

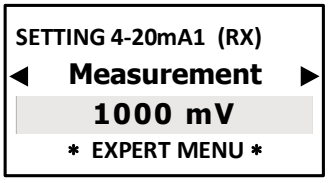
Select the value corresponding to 4 and 20 mA based on Setpoint 1.

mA1 RX









☛ Press **ESC** to go back to MAIN MENU or press **ESC ESC** to go back to the CONTINUOUS MEASUREMENT display

The 4-20mA1 analogue output follows the options previously selected in **Measurement Type** i.e. **pH** or **RX**

mA1 pH

Menu Selection
4-20mA1 (pH)

SETTING 4-20mA1 (pH)
◀ **mA output mode** ▶
Setpoint
*** EXPERT MENU ***

Please note that the value displayed is automatically adjusted according to the **Measurement Type** selected.

SETTING 4-20mA1 (pH)
◀ **Setpoint Value** ▶
7.00 pH
*** EXPERT MENU ***

Select the Set point value to control the metering pump or other equipment suited to processing the mA signal.

SETTING 4-20mA1 (pH)
◀ **Metering** ▶
Acid
*** EXPERT MENU ***

Setpoint mA is set for operations in **ACID** mode, the output is active when the measured value is higher than the selected setpoint, the connected pump meters out an acid product.

SETTING 4-20mA1 (pH)
◀ **Metering** ▶
Alkaline
*** EXPERT MENU ***

Setpoint mA is set for operations in **DIRECT** mode: if the measured value is lower than the selected setpoint, the connected pump meters out an oxidising product.

SETTING 4-20mA1 (pH)
◀ **Window width** ▶
1.50 pH
*** EXPERT MENU ***

The window width sets the distance from the setting point where the 4-20mA mode starts: 4mA = 0 metering pump pulse, 20mA = max impulsive frequency of the metering pump. The window width depends on many variables: distance injection point, reaction time, chemical solution %...

SETTING 4-20mA1 pH/RX
◀ **Overdose** ▶
00.00 h:m
*** EXPERT MENU ***

With the **overdose time** alarm one can select a period during which the setpoint must be reached. If the setpoint is not reached during this period of time, the instrument blocks output operations, including those in mA (metering pumps), the alarm is displayed as ON and triggers a signalling instrument if it is connected to the alarm relay.

SETTING 4-20mA1 pH/RX
◀ **Max. Metering** ▶
000 (no limit)
*** EXPERT MENU ***

SETTING 4-20mA1 pH/RX
◀ **Max. Metering** ▶
000 m / 00 h
*** EXPERT MENU ***

Maximum Metering is a safety function that ensures metering is completed in the selected time. The relays of the metering pumps open accordingly. This function makes it possible to eliminate time limits (continuous metering according to the selected setpoints) or to select the minutes (up to 999) and the hours, for instance metering for 999 minutes in 24 hours.

mA1 RX

Menu Selection
4-20mA1 (RX)

SETTING 4-20mA1 (RX)
◀ **mA output mode** ▶
Setpoint
*** EXPERT MENU ***

SETTING 4-20mA1 (RX)
◀ **Setpoint Value** ▶
200 mV
*** EXPERT MENU ***

SETTING 4-20mA1 (RX)
◀ **Metering** ▶
Direct
*** EXPERT MENU ***

SETTING 4-20mA1 (RX)
◀ **Metering** ▶
Reverse
*** EXPERT MENU ***

SETTING 4-20mA1 (RX)
◀ **Window width** ▶
150 mV
*** EXPERT MENU ***

☛ Press **ESC** to go back to MAIN MENU or press **ESC ESC** to go back to the CONTINUOUS MEASUREMENT display

The analogue 4-20mA2 output of the instrument follows the setting selected in **CHLORINE SCALE**

Menu Selection
4-20mA2 (Cl)

Please note that the displayed value is automatically adjusted according to the **Chlorine Scale** range previously entered.

SETTING 4-20mA2 (Cl)
◀ **mA output mode** ▶
mA device
* EXPERT MENU *

The 4-20mA proportional analogue outputs are related to the Chlorine ppm measurements in real time in order to drive remote equipment such as data loggers, PLCs or graphic recorders or other equipment suited to processing a remote mA signal.

Select the value corresponding to 4 and 20 mA based on Setpoint 3.

SETTING 4-20mA2 (Cl)
◀ **Measurement** ▶
0.000 Cl ppm
* EXPERT MENU *

SETTING 4-20mA2 (Cl)
◀ **Measurement** ▶
0.00 Cl ppm
* EXPERT MENU *

SETTING 4-20mA2 (Cl)
◀ **Measurement** ▶
0.00 Cl ppm (Tot)
* EXPERT MENU *

SETTING 4-20mA2 (Cl)
◀ **Measurement** ▶
CLC 0.00 Cl ppm
* EXPERT MENU *

SETTING 4-20mA2 (Cl)
◀ **Measurement** ▶
2,000 Cl ppm
* EXPERT MENU *

SETTING 4-20mA2 (Cl)
◀ **Measurement** ▶
20.00 Cl ppm
* EXPERT MENU *

SETTING 4-20mA2 (Cl)
◀ **Measurement** ▶
20.00 Cl ppm (Tot)
* EXPERT MENU *

SETTING 4-20mA2 (Cl)
◀ **Measurement** ▶
CLC 10.00 Cl ppm
* EXPERT MENU *

☛ Press ESC to go back to MENU SELECTION or press ESC ESC to go back to MEASUREMENT DISPLAY

4-20mA2 OUTPUT CHLORINE > METERING FUNCTION ON SETPOINT

Menu Selection
4-20mA2 (Cl)

The analogue 4-20mA2 output of the instrument follows the setting selected in the **CHLORINE SCALE**

SETTING 4-20mA2 (Cl)
◀ **mA output mode** ▶
Setpoint metering
* EXPERT MENU *

The proportional analogue 4-20mA outputs are related to the CE measurements in real time in order to drive remote equipment such as data loggers, PLCs or graphic recorders or other equipment suited to processing a remote mA signal.

Select the Set point value to control the metering pump or other equipment suited to processing an mA signal.

SETTING 4-20mA2 (Cl)
◀ **Setpoint Value** ▶
0.000 Cl ppm
* EXPERT MENU *

SETTING 4-20mA2 (Cl)
◀ **Setpoint Value** ▶
0.00 Cl ppm
* EXPERT MENU *

SETTING 4-20mA2 (Cl)
◀ **Setpoint Value** ▶
0.00 Cl ppm (Tot)
* EXPERT MENU *

SETTING 4-20mA2 (Cl)
◀ **Setpoint Value** ▶
CLC 0.00 Cl ppm
* EXPERT MENU *

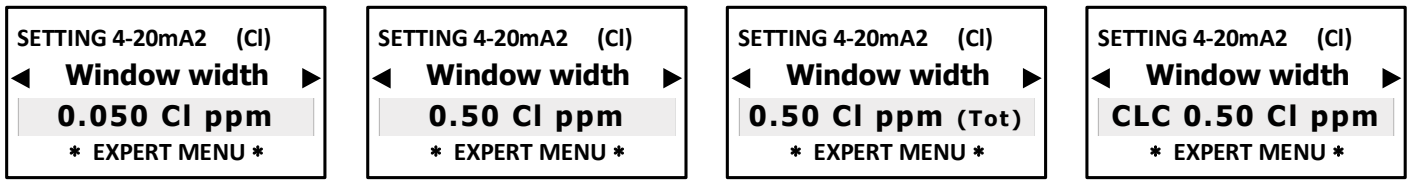
SETTING 4-20mA2 (Cl)
◀ **Metering** ▶
Direct
* EXPERT MENU *

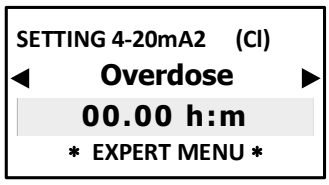
SETTING 4-20mA2 (Cl)
◀ **Metering** ▶
Reverse
* EXPERT MENU *

Direct mode: the output is active when the measured value is lower than the one selected in the setpoint.

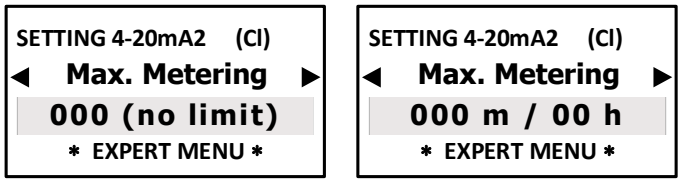
Reverse mode: the output is active even if the measured value is higher than the one selected in the setpoint.

The window width sets the distance from the setting point where the 4-20mA mode starts: 4mA = 0 metering pump pulses, 20mA = max impulsive frequency of the metering pump. The window width depends on many variables: distance injection point, reaction time, chemical solution %





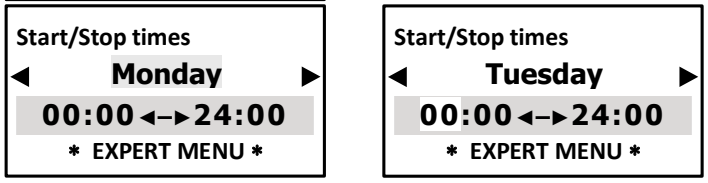
With the **overdose time** alarm one can select a period of time during which the setpoint must be reached. If the setpoint is not reached during this period of time, the instrument blocks output operations, including those in mA (metering pumps), the alarm is displayed as ON and triggers a signalling instrument if it is connected to the alarm relay.



Maximum Metering is a safety function that ensures metering is completed in the selected time. The relays of the metering pumps open accordingly. This function makes it possible to eliminate time limits (continuous metering according to the selected setpoints) or to select the minutes (up to 999) and the hours, for instance metering for 999 minutes in 24 hours.

START/STOP TIMES > EXPERT MENU

Timer in real time programs the days and exact time of instrument operations.



Program the date and time by selecting the backlit steps.

☛ Press ESC to go back to MENU SELECTION or press ESC ESC to go back to MEASUREMENT DISPLAY

AUX OUTPUTS > EXPERT MENU

The **auxiliary outputs** control various functions connected to any type of remote On-Off device controlled by a timer in real time. The AUX output may control a device or appliance thanks to very accurate programming of minutes/hours/days/weeks. ADVANTAGES: this function makes this instrument a very versatile control unit not only to measure chemical physical parameters but also for other functions connected to the system where it is installed.

☛ Press OK/MENU to confirm the selection and to go on to the next sub-menu.

☛ Press **ESC** to go back to MAIN MENU or press **ESC ESC** to go back to the CONTINUOUS MEASUREMENT display

AUX 1 Program 01 Active time (m:s) 01 : 00 Start time (h:s) 10 : 30 Enabl. days Mo: N Tue: N Wed: N Thurs : N Fri : N Sat : N Sun: N Wk. 1 : Y 2 : Y 3 : Y 4 : N	The settings of the program entail many steps, which may be selected to have absolute operating precision (up to 99 programs for each AUX output).	AUX 2 Program 01 Active time (m:s) 01 : 00 Start time (h:s) 10 : 30 Enabl. days Mo: N Tue: N Wed: N Thurs : N Fri : N Sat : N Sun: N Wk. 1 : Y 2 : Y 3 : Y 4 : N

AUX 1 or AUX 2 Program 01	Press ◄ ► select program number (up to 99) Confirm by pressing **OK**, automatically goes to the next step
Active time (m:s) 01:00	Selects the active time of the connected On/Off device Press ◄ ► to select the minutes, confirm **OK** to move to the next digits Press ◄ ► to select the seconds, confirm **OK** to move to the next step
Start time (h:m) 10:30	Selects the start time of the connected On/Off device Press ◄ ► to select the hours, confirm **OK** to move to the next digits Press ◄ ► to select the minutes, confirm **OK** to move to the next step
Enabl. days Mon: N … Y	Selects the days during which the connected equipment is operational Press ◄ ► to select the days of activity ◄ ► **N** no or **Y** yes Confirm by pressing **OK**, automatically goes to the next step
Weeks 1:S 2:N 3:N 4:N	Selects the weeks of the month during which the connected equipment is operational Press ◄ ► to select the weeks of activity ◄ ► **N** no or **Y** yes Confirm by pressing **OK**, automatically goes to the next step

☛ Press ESC to go back to MENU SELECTION or press ESC ESC to go back to MEASUREMENT DISPLAY

SETTINGS > EXPERT MENU

Menu Selection
Settings

SETTINGS
◄ **Menu Mode** ►
BASIC
* EXPERT MENU *

SETTINGS
◄ **Menu Mode** ►
EXPERT
* EXPERT MENU *

BASIC programming: simplified mode for non-professional operators

EXPERT programming: complete programming that includes functions for more accurate control and results.

After selecting, e.g. EXPERT, the display first shows BASIC but changes to EXPERT as soon as you start programming, and vice versa.

SETTINGS
◄ **Date** ►
2017 May 14
* EXPERT MENU *

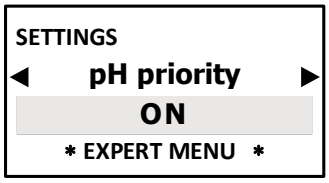
SETTINGS
◄ **Time** ►
12:02
* EXPERT MENU *

Program the date and time by selecting the backlit steps.

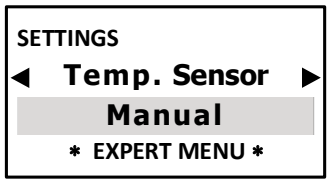
SETTINGS
◄ **Flow Sensor** ►
Disabled
* EXPERT MENU *

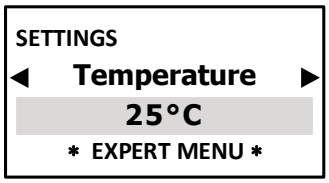
SETTINGS
◄ **Flow Sensor** ►
Enabled
* EXPERT MENU *

Flow Sensor: if there is no water flow in the probe socket (and possibly in the system), the ENABLED flow sensor (proximity sensor) disables all outputs ensuring no chemical substance is added.

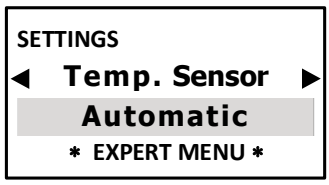


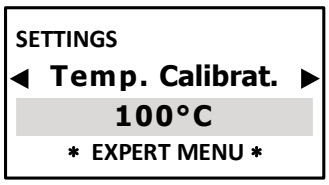
By enabling the pH priority function, the instrument is able to first reach the pH setpoint, then switch to product metering operations (oxidising or reducing agent), thus assuring measurement stability





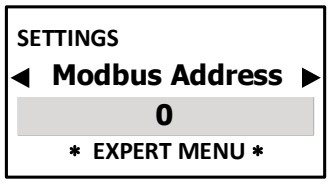
Manual temperature offset 0-100°C.
☛ Press ◄► to show the desired temperature.

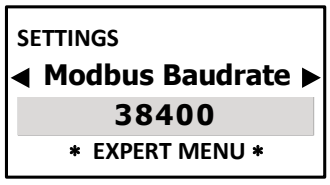


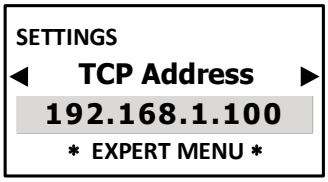


Select AUTOMATIC offsetting for temperature offset measurements via PT100 probe

To calibrate the temperature sensor, press ◄► to edit the desired temperature.

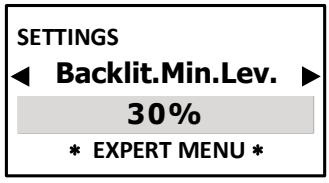






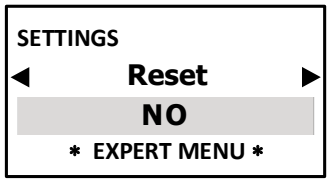
Modbus Address: from 0 to 254
Modbus Baudrate: transmission speed
TCP Address: IP address

The above menus are ONLY displayed if the instrument of the eSelect M series is connected to the external RS485 / ETHERNET module (for the settings, refer to the CONNECTION manual).

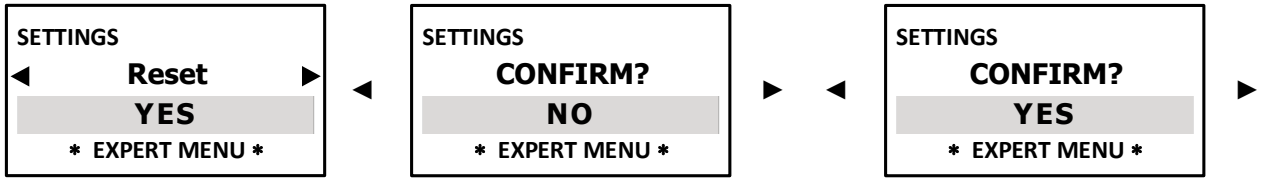


Adjusts display backlighting obtaining energy savings;

To select the language of the programming menu.
After selecting the Language (ITALIAN/ENGLISH), the programming menu adapts accordingly.



DATA RESET: resets default factory settings. ONLY to be used when the parameters do not match or there are programming issues or when the operator wishes to restart from scratch. **NOT** to be overused as many resets may undermine the instrument's efficiency.



By confirming **YES**, the display goes out for about 1 second, then goes back to the MEASUREMENT DISPLAY

SENSOR CLEANING AND MAINTENANCE

Notes on ELECTRODES / pH and RX cleaning and maintenance

The formation of deposits on the electrode produces reading errors. The required cleaning operation depends on the type of deposit in question. In case of thin deposits, shake the electrode or spray it with distilled water. Organic residues or especially stubborn deposits must be removed by means of chemicals. Mechanical cleaning of the bulb should only be performed in extreme cases, but take into account that abrasion may cause irreparable damage. If cleaning does not completely restore effectiveness of the electrode, the electrode might have got old. Ageing will show in a measurement error or in a slow response. Check the mV value displayed at the bottom of the screen during **Calibration** operations: this is a way to check electrode effectiveness, if the value deviates from the values indicated in the electrode specifications (contained in its instructions), change the electrode or contact ETATRON or the authorised dealer

RECONDITIONING VALID FOR PH and RX ELECTRODES

The following chemical treatments may be performed to recondition the electrode until bulb cleaning.

1) Immerse the electrode tip in hydrochloric acid 0.1N (HCl) for 15 seconds, then rinse with water and dip the electrode again in a 0.1 N sodium hydroxide solution (NaOH) for 15 seconds, followed by a second rinse. Repeat this sequence three times, then perform another test measurement. If the reading is still incorrect, go to point 2.
2) Immerse the electrode tip in a 20% ammonium bifluoride solution (NH2F-HF) for two or three minutes, then rinse with water and perform another measurement test. If the reading is still incorrect, proceed to point 3.
3) Immerse the tip of the electrode in 5% hydrofluoric acid (HF) for 10 seconds, then rinse thoroughly in water and very quickly in 5N hydrochloric acid (HCl), followed by a second rinse in water. If the test measurement still gives incorrect results, the only thing to do is change the electrode.

We suggest using new buffer solutions or still in good conditions (not old) or a reliable test kit.
As for the lengths of the pH electrode cable we advise max 9 m: contact ETATRON for longer distances.

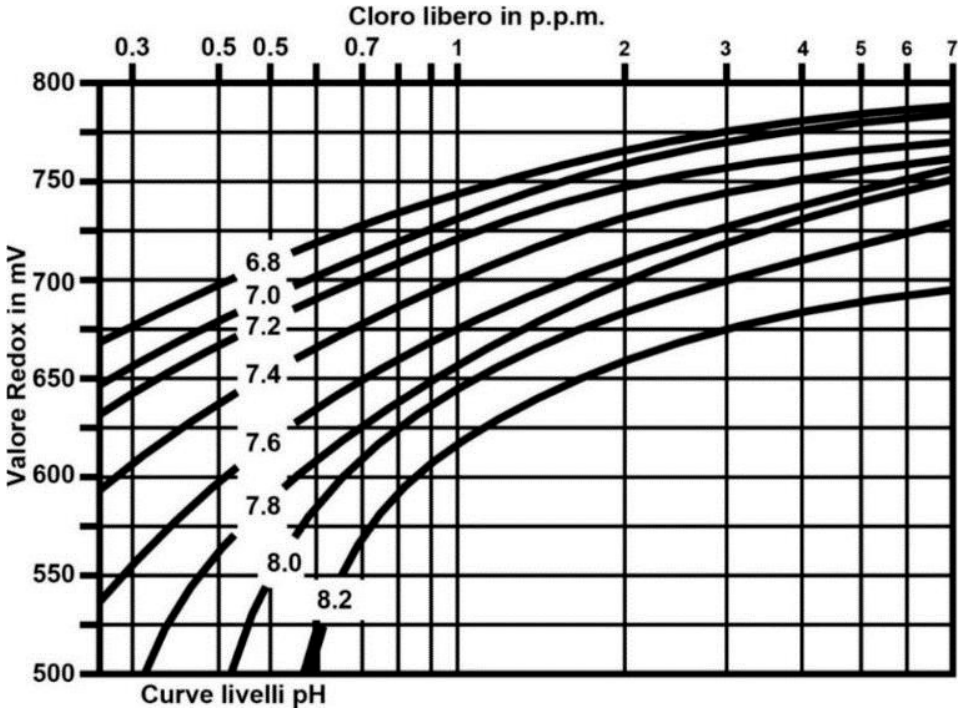
CHLORINE electrodes - Cleaning and Maintenance

For cleaning and maintenance of the chlorine probes, refer to the probe's manual.

CURVE of the OXIDE/REDOX REDUCTION POTENTIAL (ORP)

Redox measurements depend on the stability of the pH level.

To obtain the mV value for programming, the operator must find the exact point that intersects the axis of the required ppm value, the curve of the measured pH = the mV settings (axis on the left):



INSTRUMENT TROUBLESHOOTING

WARNING: *ignoring the safety information may endanger your life or cause severe injuries!*

ATTENTION: *in the presence of gas or in premises saturated with gas, ensure you disconnect the device's power supply for metering the Chlorine gas; also ensure the power supply of other equipment making up the system is secured.*

Before working on the unit, disconnect it from the mains

MALFUNCTION	POSSIBLE CAUSE	*SOLUTION*
1. Display is OFF	No power supply	*a. Check the electrical connections*
		b. Check whether the mains match the power supply printed on the label.
	Burnt smell	*Check the board and replace it following authorisation by ETATRON*
2. The measurement display remains fixed (there are no changes)	pH or RX levels are **NOT** stable	*Check again using a portable instrument.*
	Conductivity levels are **NOT** stable	*Check again using a portable instrument or portable conductivity kit*
	The signal from the sensor does not change	*Repeat sensor calibration and if the problem persists, change the sensor.*
3. The measurement display changes all the time (measurement surges)	Electrical disruption from the local mains	*Check the local mains. Check the earthing system connections*
	Micro-electrical disturbances in the measured fluid	*Check instrument calibration, if the instrument measures correctly eliminate the electrical disturbances and refer to point A*
4. The sensor calibration procedure cannot be completed	Old or contaminated buffer solution kit	*Change buffer solution and use a portable kit*
	Faulty sensor	*Adhere to the recommendations below*
IMPORTANT TESTS: *in cases 2, 3, 4 above always test operation of the unit with the following steps:* ***A.*** *Take down the unit from the system and install it in another room or laboratory without connections to other devices, but directly to the local mains.* ***B.*** *Recreate in a container with fresh water the chemical-physical conditions of the system and relevant conductivity value.* ***C.*** *Program the unit and calibrate the sensor.* ***a.*** *If the results show correct unit operation, this means the issues lie within the system.* ***b.*** *If the problem persists, replace the sensor with a new one; if the problem continues, the unit is faulty, contact the Manufacturer or authorised Dealer.*		
5. The setpoint relay does not close the contact	Incorrect setpoint	*Correct the setpoint*
	Incorrect setpoint mode	*Change the setpoint operating mode, direct or reverse, on the functions menu*

REMEMBER: *unit with universal voltage 100-250 VAC (±10%) or 9-24VDC. If the real voltage is constantly at the limit (minimum or maximum), or when the peaks are far above the mentioned range, the unit input is electrically protected against voltage fluctuations; outside the range mentioned above, the instrument does not work and the printed circuit must be replaced.* ***It is recommended*** *to use voltage protections, check the earthing system and, when other equipment is connected in parallel, use a contactor. Furthermore, ETATRON* ***recommends*** *installing a UPS (genset) to assure continuity thus ensuring no data are lost. A system that is set up without following the proper electrical design rules, without an earthing system, with frequent ON/OFF operations, might directly undermine the printed circuit.*

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