FWT systems
fluid and water technology

CTRL+ CL (PPM)

MULTIFUNCTION SINGLE MEASURE PARAMETER CONTROLLER

CHLORINE or PPM MEASUREMENTS
(Free and Total Chlorine, Chlorine Dioxide, Bromine, Ozone, and others)

OPERATING INSTRUCTIONS AND MAINTENANCE

CE

CTRL+ CL (PPM)   *CTRL+ B CL (PPM)*

INDEX

CTRL+ SERIES INCLUDES SCREWS AND WALL BRACKETS FOR MOUNTING

*CTRL+ series is **NOT** provided with sensors, which are available upon request.*

FWT declines any responsibility in case the controller is used with other brand probes and sensors

USER INFORMATION SIGNS

WARNING: *ignoring safety information can endanger life or result in serious injury !*

CAUTION: *ignoring safety information can result in injuries to persons or damage systems or materials !*
HIGH VOLTAGE: *ignoring this sign can result in death or serious injuries to persons !*

NOTE *or* **INFORMATION SOURCE**

- this symbol "pointing finger" indicates programming steps.
- if no keys are pressed within 60 seconds, controller will display current measurements

Qualified and authorized personnel must carry out any work or repair on the unit: manufacturer declines any responsibility for consequences in case this rule is not complied.
Unqualified personnel should keep away from the plant and/or hazard areas.
The official operator of the system or the plant, when installing the unit, is responsible to fulfil the above rules.

CERTIFICATE OF CONFORMITY CE

FWT SYSTEMS S.r.l., head office in Via Cancelliera 16, ARICCIA (RM), 00072, ITALIA, **VAT no. IT 12757091009**,
hereby declares that, under our exclusive responsibility, controller series **CTRL+** specified in the present booklet, complies and is conformed with the relevant, fundamental safety and health regulations contained in the following European directives and norms: **EMC Directive 2014/30/UE and Standards**:
- Electronic equipment for measurement and control of physical-chemical parameters (EMC General requirements);
- CEI EN 55011: 2013. Limits and methods of measurement for radio disturbance characteristics;
- Low Voltage Directive 2014/35/EU;

Standard: CEI EN 60950-1: 2007 Safety of information technology equipment (and similar)

This declaration conforms to the above directive and forms an integral part of the manufacturer operating manual. **Any modification at the product not approved in writing by authorized FWT personnel, will automatically invalidate this declaration.**

Rome, 14th of November 2019   *Managing director*

CERTIFICATE OF TESTING AND PRODUCTION PROTOCOL

FWT SYSTEMS S.r.l., head office in Via Cancelliera 16, ARICCIA (RM), 00072, ITALIA, **VAT no. IT 12757091009**,
hereby certifies that the controller series **CTRL+** mentioned in the present booklet:
- have been each **TESTED** before packing;
- respond to the technical characteristics listed in the technical data table chart listed in the present booklet.

Rome, 14th of November 2019   *Managing director*

WARRANTY CERTIFICATE

FWT SYSTEMS S.r.l., head office in Via Cancelliera 16, ARICCIA (RM), 00072, ITALIA, **VAT no. IT 12757091009**,
hereby certifies that the controller series **CTRL+** mentioned in the present booklet are covered by a WARRANTY per the policy herein below listed. The company provides a guarantee on its products for a limited period of 1 year, **EX-WORKS**.
Furthermore, the present warranty does not cover goods damaged due to:
a) Use of the equipment contrary to the Manufacturing Company indication.
b) Improper installation, commissioning and programming not in compliance with the herein instructions.
c) Repair, tampering and improper opening of the equipment without the Company written authorization.
d) Damages caused by natural events and/or unexpected circumstances (e.g. lightnings, fire, freeze, etc.).
- **Improper use or tampering with the equipment without FWT written permission will cancel the warranty.**

Rome, 14th of November 2019   *Managing director*

CONTROLLER DESCRIPTION

The CTRL+ CL(PPM) is a single measure parameter **multifunction** controller suitable for CHLORINE measurements, Free or Total or PPM measurements such as: Chlorine Dioxide, Bromine, Ozone, Peracetic Acid, and all parameters measured in ppm. CTRL+ series, along with high quality performance in terms of measurements and functions thus satisfying most of the requirements for an instrument, it offers many features making it extremely versatile and easy to operate:

● Chlorine parameter features 5 chlorine ranges suitable for: free Chlorine (residual) or Total chlorine or PPM measurement parameters, using the corresponding membrane type ion selective sensor 0÷2 CL ppm (**default)**; 20 CL ppm; 5 Cl ppm; Total chlorine 0÷20 Cl ppm; **Open chlorine cell** (**CLC** model) ranges 0÷10 Cl ppm; **PPM** ranges 0÷2…20…200…2000 ppm.

● Special output AUX driven by a programmable timer controlling any type of On/Off external equipment.

● **Optional** ETHERNET / RS485 connection EXTERNAL module + micro SD memory card; FWT SmartApp® software

BENEFIT: the above feature allows dealers to stock one type for all controller thus reducing stock value or saving problems when issuing orders to manufacturer, making this unit extremely versatile to control also other functions of the system to service. Two types of programming menu:

● **Basic** making life easier for those home applications such small swimming pool or water treatment systems;
● **Expert** for professionals giving the opportunity to refine measurements and safety functions.

A friendly user menu programming it is almost self-explanatory and the elegant wide display allows easy vision.

1.0   HINTS AND WARNINGS

Please read the warning notices given in this section very carefully, because they provide important information regarding safety in installation, use and maintenance of the unit.
• Keep this manual in a safe place, so that it will always be available for further consultation.
• The company manufactured the unit in accordance with best practice. Both its lifetime and electrical and mechanical
  reliability will be enhanced if it is correctly used and subjected to regular maintenance.

1.1 - WARNING: any handling or repair for the unit must be carried out by qualified and authorised personnel only: manufacturer declines any responsibility for consequences in case this rule is not complied.

1.2 - SHIPPING AND TRANSPORTING: shipment is always at the purchaser's risk. Claims for any missing materials must be made within 15 (fifteen) days of goods arrival, while claims for defective materials will be considered within 30 (thirty) days from the same date. FWT SYSTEMS Srl authorized personnel must previously agree the return of the equipment or other materials.

1.3 - PROPER USE OF THE CONTROLLER

• Controller must be used only for the purpose for which it has been expressly designed, namely the controlling and measuring physical-chemical values. Any different use of it must be considered improper therefore dangerous.
• All other applications or modifications are prohibited.
• The equipment is NOT designed for use in explosion-hazardous locations.
• The unit can only be used for applications where technical requirements meet the ones of FWT characteristics and specification data shown in the present operating booklet.
• The vendor is not liable for damage deriving from improper and/or unreasonable use of the unit.

1.4 - RISKS

• After unpacking the equipment, ensure it is in good shape and form. In case of doubt, do not use it and contact qualified personnel. Keep out of reach of children packing materials (plastics bags, polystyrene, etc.) being potential sources of danger. However, save packaging: it can be useful for future shipments.
• Before connecting the equipment ensure voltage ratings corresponds to local power supply. You will find these data in the product label placed on the equipment and packing and the present booklet.
• The electrical installation must comply with the standards and rules in force in the country where it is utilised.
• Use of electrical equipment always implies observance of some basic rules:
  1. do not touch the equipment with wet or damp hands or feet;
  2. do not operate the equipment with bare feet (example: swimming pool equipment);
  3. do not leave the equipment exposed to the action of the atmospheric agents;
  4. do not allow the equipment to be touched by children or used by unskilled individuals without supervision;
• **When commissioning the controller or in case of emergencies or improper functioning, the unit should be switched OFF immediately. Disconnect the power cable from the main power supply !**
  Contact our FWT assistance for any necessary repairs, **use only original spares !**
  Failure to respect this condition could render the equipment unsafe to use.
• When carrying out any repairs or opening the unit, ensure to disconnect it from power supply.
• When there is no longer use requirement of installed equipment, ensure to disconnect it from power supply.
  1. Disconnect power from mains or from the single-pole switch-contact.
  2. Take all due safety precautions during unit service (gloves, goggles, overalls, etc.).

1.5 - ASSEMBLING AND DISMANTLING THE EQUIPMENT

1.5.1. ASSEMBLY: all FWT SYSTEMS Srl controllers are fully assembled. Please refer to view drawings shown in the present Booklet showing all details and a complete overview of all components. These drawings are useful whenever there is the need of spare parts or for our support staff.

1.5.2. DISMANTLEMENT: before dismantling the unit or carrying any operation, disconnect power.

2.0 CTRL+ SERIES ENCLOSURES MOUNTING AND COMMISSIONING

CTRL+ series is available with **2** housing enclosures: **CTRL** and **CTRL B**

2.1 - WALL MOUNTING ENCLOSURE CTRL+ P66

CTRL enclosure IP66
ABS plastic – UL94 V0 (self-extinguish)
231w x 145,6h x 91

In the lid the enclosure has an area recessed by 2 mm for the mounting of membrane keypads

By using the hinged quick-release catch, the enclosures can easily be closed by hand
- use a standard screwdriver to open

Instead of the hinged quick release catch, enclosures can be screwed
- suitable screws are available as accessories and are concealed by the hinged catch
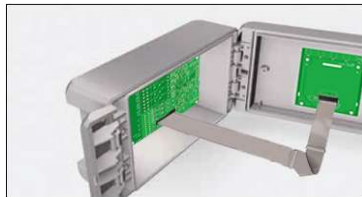

The hinged quick-release catch ensures that the lid cannot be lost

With the hinged quick-release catch, the lid can be opened to the left or right, in case the enclosure is used just NOT as a controller

2.1.1 - WALL MOUNTING OPERATION

a. - Install the unit in a dry place and well away from heat sources; max environmental temperatures 40°C.
b. - Carefully observe regulations in force in the various countries as in regards electrical installations.
c. - Mount the controller on the wall using the screws and dibbles provided with the unit
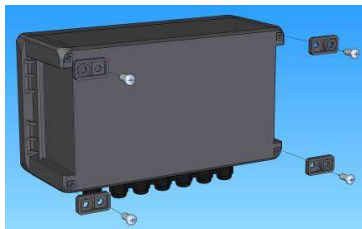
Step 1: use 4 screws 2,9 x 6,5 to mount the 4 brackets onto the rear of the enclosure. Ensure to place the screws in the right place, marking the correct spot with a pencil before drilling
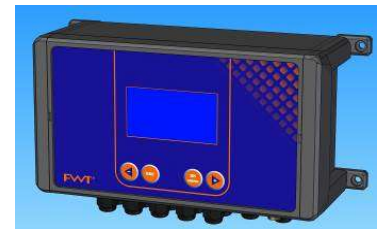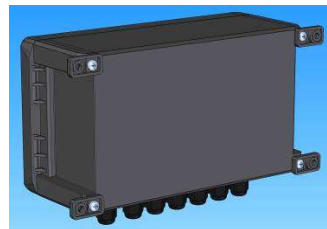
Above images show the final assembly of the wall brackets.

Step 2: use 4 wall inserts Ø6, drive in the screws to fix the enclosure on the wall

⚠️ CAUTION ℹ️ ***VERY IMPORTANT NOTE FOR ENCLOSURE:*** *when handling the unit bear in mind not to pull, drag, or mistreat the flat cable connecting the pcb display placed on the lid with main pcb.*

5

2.2 - WALL MOUNTING ENCLOSURE CTRL+ B IP56

CTRL B enclosure IP56
ABS plastic - UL94 HB (self-extinguish)
163,3w x 142,1h x 82,7
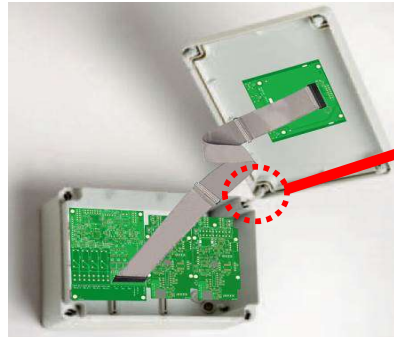
The enclosure features 1 captive screw (1/4 turn) for a quick opening/closing of the lid thus allowing easy access for commissioning and service and guarantees a perfect seal for long time operation

Open enclosure with lid secured by captive screw. The captive screw position can be moved to the other three fixing points by forcing it from original place.

Captive screw detail.

2.1.2 - WALL MOUNTING OPERATION

a. - Install the unit in a dry place and well away from heat sources; max environmental temperatures 40°C.
b. - Carefully observe regulations in force in the various countries as in regards electrical installations.
c. - Mount the controller on the wall using the screws and dibbles provided with the unit
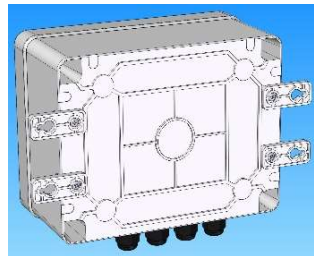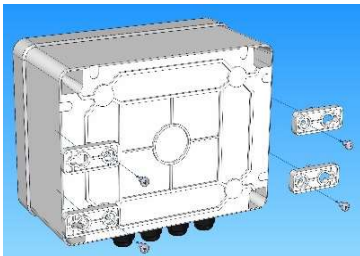
Step 1: use 4 screws 2,9 x 6,5 to mount the 4 brackets onto the rear of the enclosure. Ensure to place the screws in the right place, marking the correct spot with a pencil before drilling.

Above images show the final assembly of the wall brackets.
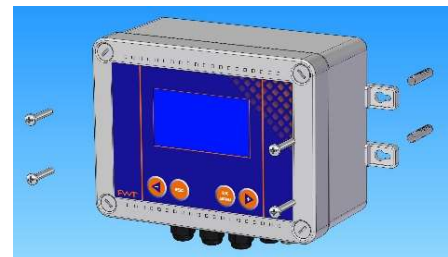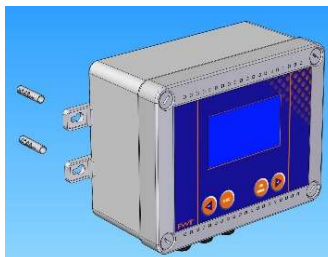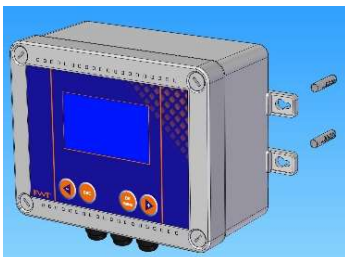
Step 2: use 4 wall inserts Ø6 and drive in the screws to fix the enclosure on the wall.
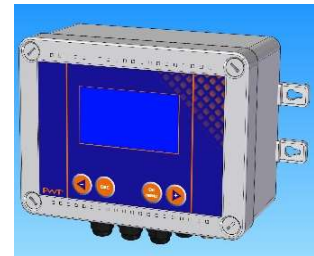
⚠ CAUTION ℹ **VERY IMPORTANT NOTE FOR ENCLOSURE:** *when handling the unit bear in mind not to pull, drag, or mistreat the flat cable connecting the pcb display placed on the lid with main pcb.*

2.3 - ELECTRICAL WIRING CONNECTORS

CTRL+ is provided with 8 cable glands connectors for various input and output cable wirings. Complying with International electrical wiring rules, we **advice** not to connect more then one equipment on each pin.
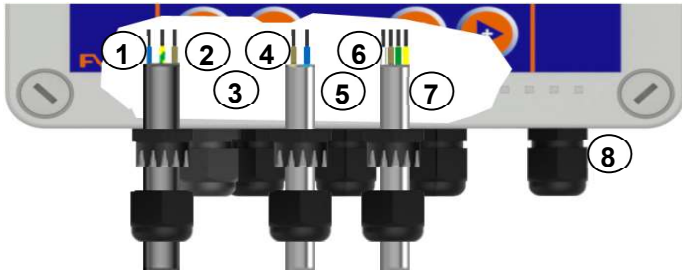
CONNECTORS GLANDS USE:
1 - Use for Power cable
2…6 - Recommended use for:
- Set-points relay outputs / mA outputs
- AUX output for remote control of external unit
- RS485 / ETHERNET external module connection
- Level probe for chemical tank / Flow sensor
7 - Temperature Sensor PT100
8 - Chlorine sensor or ppm sensor

WHEN OPENING THE LID FOR SERVICING THE UNIT, ALWAYS DISCONNECT POWER SUPPLY !!!

2.4 - CONNECTING MEMBRANE CHLORINE_PPM SENSOR "CLS" SERIES

PLEASE NOTE: CTRL+ CL offers various chlorine ranges by adapting the controller to the different type of sensors characteristic. The most used sensors are:

CLS membrane type ion selective: **Chlorine** range 0÷2 Cl ppm; 0÷20 Cl ppm; 0÷20 Cl ppm (Total chlorine); 0÷5 Cl ppm

CLS membrane type for **PPM** measurements such as: Chlorine Dioxide, Bromine, Ozone, Peracetic Acid and others:

CLC amperometric open chorine cell: range Free Chlorine range CLC 0÷10 Cl ppm (CLC is FWT Systems chlorine open cell);

*NOTE: the user must be careful of the sensor in his possession when he **must wire** the probe to the terminal board as shown in **paragraph 4 on page 10÷11**.*

Place sensor into off-line holder and connect to Terminal board and check sensor wires configuration before connecting to mains.

SENSOR CABLE WIRINGS: FOR MORE COMMISSIONING DETAILS GO TO PAGE 26÷27

Sensor connector 4 or 16 poles
Cable

CLS series wirings

Brown
White
Yellow
Green
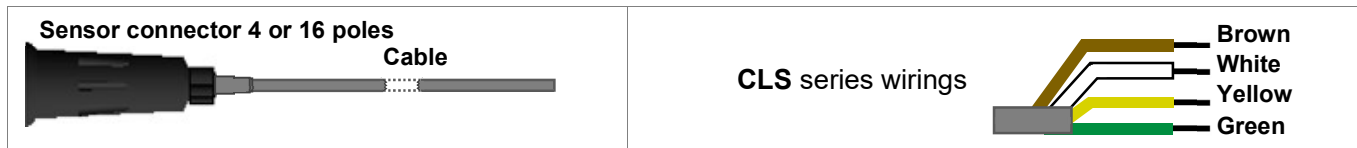
CLS series
Pin **11** (**–**) = **–** 12Vdc **white** wire
Pin **12** (**+**) = **+**12Vdc **brown** wire

- Pin **13** (**M**) = Measurement **IN green** wire
- Pin **14** (**0**) = GROUND **yellow** wire

VERY IMPORTANT NOTE: when using sensors for other PPM measurements, wiring parameters may change, therefore, please contact and advice FWT SYSTEMS customer service.
If the ion-selective membrane sensors are incorrectly connected and / or have a wrong configuration, they can easily be damaged irreparably

2.5 - CONNECTING CHLORINE OPEN CELL

Mount chlorine open cell and connect to internal Terminal board (see pages 10÷11) before connecting to mains. **ENSURE** to mount a water filter before chlorine cell

CHLORINE Open Cell

PIN 13 = BLUE WIRE

PIN 14 = BROWN WIRE

Blue   **Brown**
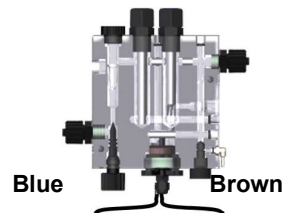
2.6 - CONNECTION RS485 / ETHERNET EXTERNAL MODULE (UPON REQUEST)

ETHERNET configuration
Micro SD 16 GB
Power supplier 5V
EXTERNAL MODULE
Lan port   USB port
Connection RS485/USB
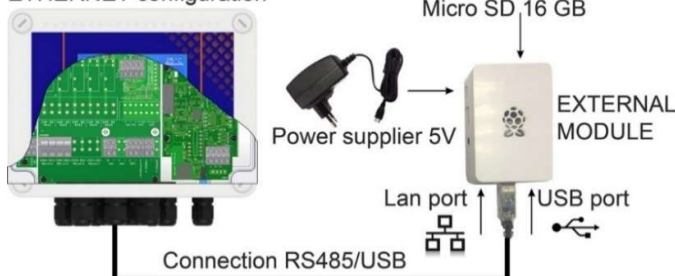
Connect the RS485 / USB cable provided with the controller to external module. Connect a LAN cable (not provided) from modem router to external module LAN port. Connect 5V supplier to external module by micro USB.
Please also refer to software **FWT@smartApp**

For remote control via "**Internet**", upon request, is available through FWT server "**CLOUD**" System.

2.7 - CONNECTING TO MAIN POWER SUPPLY / PARALLEL CONNECTIONS

PARALLEL CONNECTIONS: when connecting the unit to main power supply in parallel with other inductive equipment (motors, pumps, blowers, solenoid and motorized valves), these gears must be electrically isolated and with a proper Ground system, to prevent damages from inductive voltages when switching ON-OFF.
- try to use a power switch in order to have separate connections via contact relay or relay.
- when this is not possible, contact FWT technical service.

EXAMPLE CONNECTION OUTPUTS

OUT 1. Dosing pump,Peristaltic or other device
OUT 2. Dosing pump,Peristaltic or other device
OUT 3. Auxiliary output for remote control
        via Timer for On/Off equipment
OUT 4. Alarm or other device

CAUTION *ℹ* **NOTE FOR CONNECTING OTHER EQUIPMENT**
REFER TO PARAGRAPH 4.0 "TERMINAL BOARD ELECTRICAL WIRING" PAGE 10

EXAMPLE CONNECTION CONTROLLER-MOTOR DOSING PUMP RELAYS OUT 1-2-3

1	CONTROLLER	**3**	SINGLE PHASE MOTOR METERING PUMP
2	REMOTE CONTROL SWITCH 230V MAX 10A	**4**	TRI-PHASE MOTOR METERING PUMP

L = one phase of mains network   **N** = neutral   **r - s - t** = represent each phase of tri-phase mains system

SINGLE-PHASE CONNECTIONS DIAGRAM THROUGH REMOTE CONTROL CONTACT SWITCH
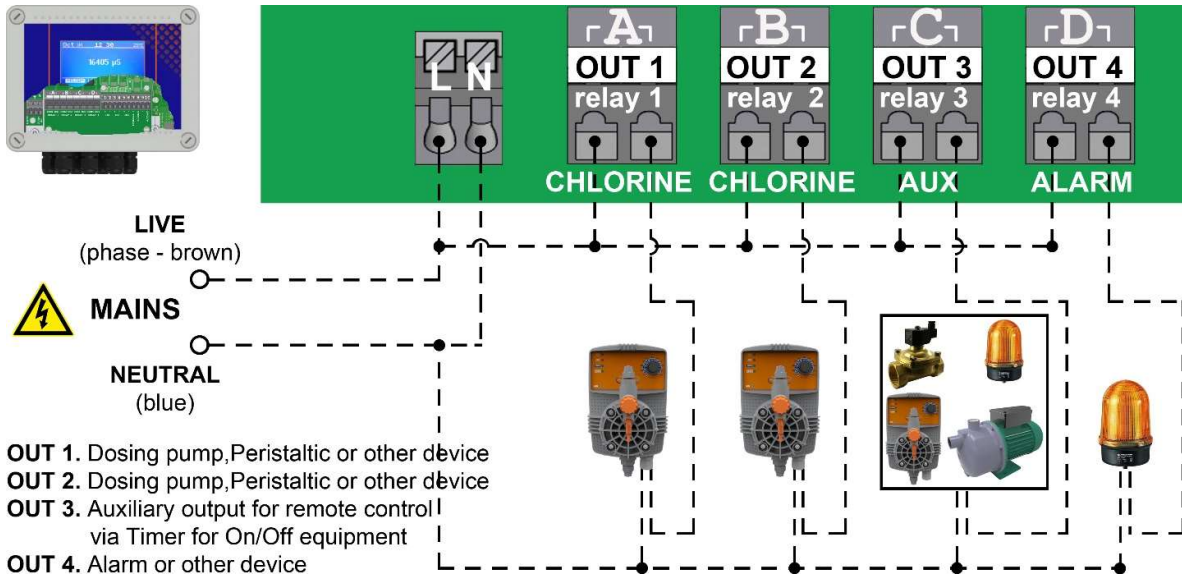

THREE-PHASE CONNECTIONS DIAGRAM THROUGH REMOTE CONTROL CONTACT SWITCH

CAUTION **KEEP IN MIND:** *unit with universal voltage 100÷250Vac (±10%) or 9÷24Vdc. If the actual voltage is constantly at the limit (lower or higher), or when spikes are much higher than mentioned range, the unit pcb is electronically protected against Voltage fluctuations; outside the above-mentioned ranges, controller will not work and circuit boards must be replaced. We **RECOMMEND** using voltage protections, checking system ground and, when connecting in parallel other units, using remote contact switch. A plant not built according to correct electrical rules, without a ground system, with frequent ON/OFF operations, could directly affect the circuit boards. It is also suggested installing a UPS (Uninterruptible Power Supply) to ensure power continuity. A discontinuous voltage along with many On/Off operations, could affect the pcb's integrity and Data loss.*

3.0   DISPLAY DESCRIPTION
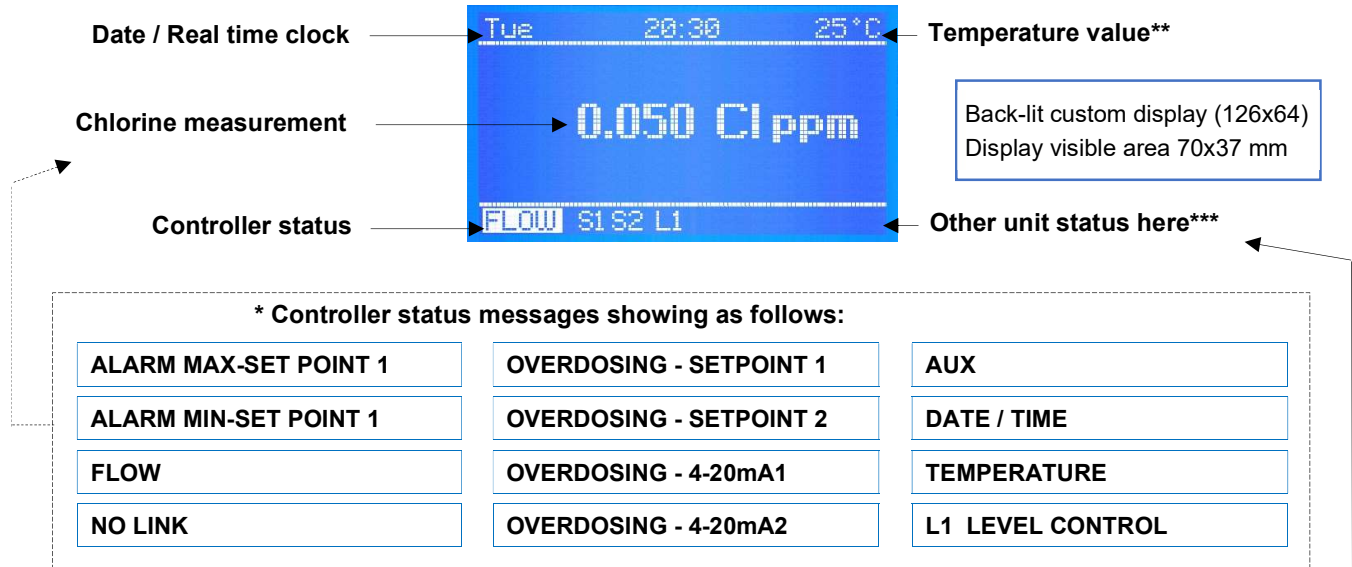
Date / Real time clock ────────→

Chlorine measurement ────────→

Controller status ────────→

```
Tue        20:30        25°C

           0.050 Cl ppm

FLOW  S1 S2 L1
```

←──── **Temperature value****

Back-lit custom display (126x64)
Display visible area 70x37 mm

←──── **Other unit status here*****

---

* Controller status messages showing as follows:

ALARM MAX-SET POINT 1	OVERDOSING - SETPOINT 1	AUX
ALARM MIN-SET POINT 1	OVERDOSING - SETPOINT 2	DATE / TIME
FLOW	OVERDOSING - 4-20mA1	TEMPERATURE
NO LINK	OVERDOSING - 4-20mA2	L1 LEVEL CONTROL

If there are more than one function active, messages appear in a continuous cycle lasting 3 sec. for each item. ALARM or OVERDOSING messages will disappear once measurements are restored according to programmed settings whilst Overdosing icon will remain; to delete activated icons from the display, keep pressing on **ESC**.
When messages appear, temperature status will NOT be shown.

NO LINK: communication break down between controller and display

Error displayed: "NO LINK WITH METER": the two circuit boards, measuring and I/O, are linked together via RS485 protocol: in this case check the electrical flat cable or the two circuit boards connecting pins alignment or the measuring board two side selectors position; contact immediately FWT SYSTEMS service.

*other status icons shown at bottom line****

here are displayed some other messages status such as:
S1   S2   L1   DATE/TIME   AUX   ALARM   mA   OVERDOSING   MAX DOSING   FLOW

* BASIC MENU*   *EXPERT MENU * these messages appear during programming steps as reminders.

S1   S2 indicating the correspondent active Set point.
When selecting "Mode Timed Pulses" (Pulse Width Modulation) during set point step, the message S1.. S2 will flash during PWM operations but when the set point is NOT active there will not be any message.

** FLOW ** shows the absence of water flow into the sensor holder: this is valid only when using a Proximity switch and the "Flow sensor" is **enable** which is possible only when using "Menu Expert".

L1 indicates the "Level" control of external chemical tanks and are only shown once the floating level probe/s are connected to the terminal block pins IN1 and IN3: when the level into the tank is lower than the level probe floater, this will enable the Status message.

When switching ON the controller for the **first time**, it will appear a list of all the programming keys function.

If there are more than one function active, messages appear in a continuous cycle lasting 3 sec. for each item. ALARM or OVERDOSING messages will disappear once measurements are restored according to the programmed settings. When messages appear, temperature status will NOT be shown.

Temperature value: in case the temperature has been set with Manual mode, the temperature value will correspond to the one selected. In case has been selected the PT100 probe and such temperature sensor has been connected, the temperature value shown will correspond to the actual value in the system and will make automatic compensation.

PLEASE NOTE: when working with **"Basic menu" mA** programming is **NOT AVAILABLE**:

4.0   TERMINAL BOARD ELECTRICAL WIRING
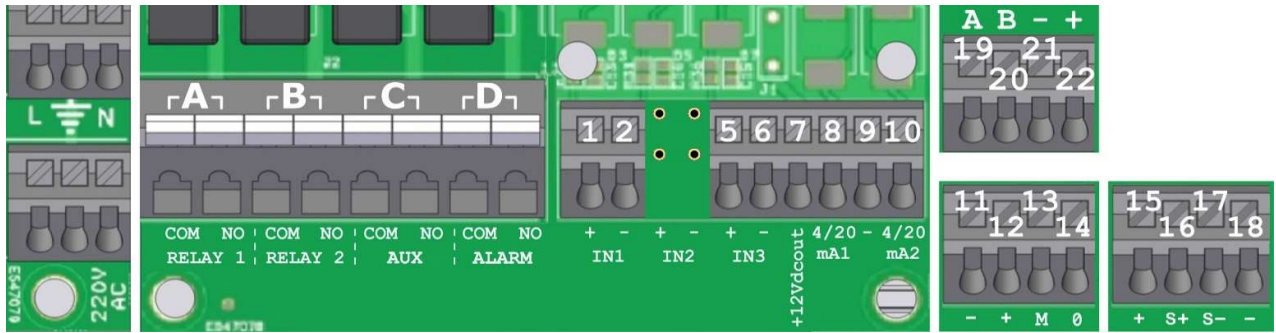
WHEN OPENING THE LID FOR SERVICING THE UNIT, ALWAYS DISCONNECT POWER SUPPLY !!!

- Unscrew the front panel and carefully open the lid.
- CTRL+ series is provided with 2 m cable already wired onto the terminal board; in case user wishes to replace the cable with a longer one, connect the mains to neutral, earth, phase, unit switches **ON**, initially display **quickly** shows latest software review.

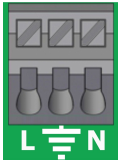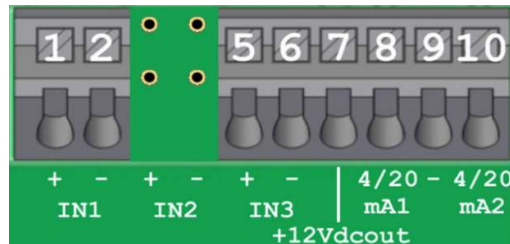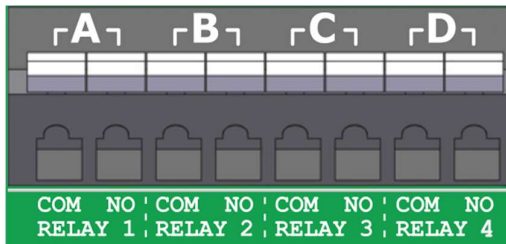 • **MAINS** connect power supply wires to following pins: **L** (line), **N** (neutral).

*The terminal board is built with special pin for top safety: ensure to twist well the wire ends, use a small screwdriver to press the safety on top of the slot where insert the wire ends and, according International electrical rules, **we advice not to connect more then one equipment on each pin**.*

Out A Pin COM / N.O. RELAY1	Set-point 1 CL CHLORINE ON-OFF / output relay PWM timed pulses
Out B Pin COM / N.O. RELAY2	Set-point 2 CL CHLORINE ON-OFF / output relay PWM timed pulses
Out C Pin COM / N.O. RELAY 3	AUX auxiliary output ON-OFF controlling remote equipment via timer programming
Out D Pin COM / N.O. RELAY 4	ALARM output ON-OFF for external device
Pin 1 + / Pin 2 **IN 1**	Digital Input Level switch for chemical tank
Pin 5 + / Pin 6 **IN3 PROX**	Proximity Switch input wires BLACK **+** / BLUE **–**
Pin 7 + 12Vdc **PROX**	Proximity Switch output 12Vdc BROWN wire
Pin 8 / Pin 9 **4/20mA1**	CHLORINE 4-20mA1 output for dosing pump or another device suitable to mA current
Pin 9 / Pin 10 **4/20mA2**	CHLORINE 4-20mA2 output for dosing pump or another device suitable to mA current
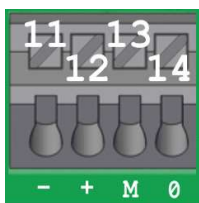
	Chlorine sensor or PPM sensor **Membrane type CLS** series	**CLS series**
		Pin 11 **(–)** = **–** 12Vdc **WHITE**
		Pin 12 **(+)** = **+**12Vdc **BROWN**
		Pin 13 **(M)** = Sensor Measurement **IN GREEN**
		Pin 14 **(0)** = GROUND **YELLOW**
	Chlorine sensor Amperometric **Open Cell** type **CLC** series	Pin 11 = NO CONNECTION
		Pin 12 = NO CONNECTION
		Pin 13 = **BLUE** wire
		Pin 14 = **BROWN** wire
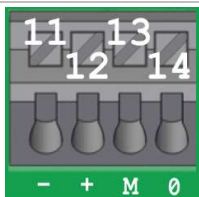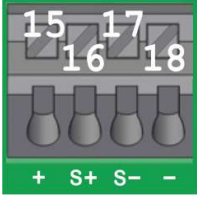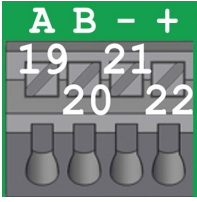
	Temperature probe PT100 DO NOT CONNECT BRAIDED WIRE	Pin 15 = + RED
		Pin 16 = S+ BLUE
		Pin 17 = S– GREEN
		Pin 18 = – YELLOW
	RS485 / ETHERNET connection to external module For software **FWT SMARTAPP** and installation ask for information	Pin 19 = A
		Pin 20 = B
		Pin 21 = 0
		Pin 22 = +

CAUTION

KEEP IN MIND: *unit with universal voltage 100÷250Vac (±10%) or 9÷24Vdc. If the actual voltage is constantly at the limit (lower or higher), or when spikes are much higher than mentioned range, the unit pcb is electronically protected against Voltage fluctuations; outside the above-mentioned ranges, controller will not work and circuit boards must be replaced. We **RECOMMEND** using voltage protections, checking system ground and, when connecting in parallel other units, using remote contact switch. A plant not built according to correct electrical rules, without a ground system, with frequent ON/OFF operations, could directly affect the circuit boards. It is also suggested installing a UPS (Uninterruptible Power Supply) to ensure power continuity. A discontinuous voltage along with many On/Off operations, could affect the pcb's integrity and Data loss.*

5.0   OPERATING MODES GLOSSARY

ON-OFF mode

- Unit is provided with ON-OFF mode which will activate (or deactivate in case of reverse mode ON) output relays Constant / ON-OFF dosing pumps, peristaltic dispensers or other ON-OFF equipment.

BENEFITS: it will work with most of ON-OFF equipment, which are also cost effective.

DISAVANTAGES: due to dosing equipment high output performance rate, this will result to slightly different values between actual measurement in the system and what controller shows on display (keep in mind that other factors may influence the actual measurement such as; chemical concentration, distance from injection point and systems and other factors).

ACID / ALKALINE - DIRECT / REVERSE DIRECTION MODE

- Set-points relays Direction mode are set as default as follow:

Set-point 1 CL_PPM: *DIRECT mode, output is active when measured value is lower than selected set-point, the connected dosing unit will dose chlorine.*

Set-point 2 CL_PPM: *REVERSE mode, output is active when measured value is higher than selected set-point, the connected dosing unit will dose chlorine reducing chemical.*

ALARM HIGH / LOW FUNCTION

- **Alarm** function allows selecting two points high and low passed which controller will go into alarm.

BENEFITS: increase safety measurements ensuring warning in case parameters are out of control.

HYSTERESIS

- **Hysteresis** is useful during ON-OFF mode set-point adjustment operations and is used to activate or deactivate output relays when selected hysteresis is reached. Hysteresis is useful when there are too many quick changes around set point, which could damage connected equipment. Increasing Hysteresis will allow moving away from set point according to required value.

  Example with CL chlorine with range 2 ppm: *if selected set point is 1 ppm and Hysteresis set at 0,050 Cl ppm, the two actives points are 0,95 ppm and 1,05 ppm: within this range, set point is OFF and outputs are blocked, outside this range set point is ON (always in accordance with Direct or Reverse mode).*

BENEFITS: ensuring good control the systems without stressing connected equipment.

DISAVANTAGES: user must remember that programmed hysteresis is slightly different from required set point.

DELAY

- **Delay time** blocks relay outputs (max 999 sec. programmable) to ensure that the outputs are active only when the sensors measurements are stable thus allowing the best results in terms of chemical balance.

PWM MODE: PULSES WIDTH MODULATION TIMED PULSES

- **Timed Pulses** also known as **PWM** "pulses with modulation" time/pause allows proportional mode on each ON-OFF set-point activating corresponding pulses with Start/Stop time cycle variation according to measured value in respect to set-point.

  Window Width: *pulses are timed ON and OFF according to the distance from selected set-point, programmable, e.g.: working with a chlorine range 0-2 Cl ppm and window width 0,050; if selected set point is 0,500 Cl ppm and measured value is 0,400 ppm **PWM** mode starts after reaching 0,450 Cl ppm (0,050 Cl ppm) with Time/Pause pulses according to selected time Cycle in seconds.*

  Cycle Time: *PWM mode cycle 60 seconds (programmable): e.g. setpoint 0,500 Cl ppm, window width 0,050; at measured value 0,450 Cl ppm = active time 60 sec / pause time = 0 sec.; at value 0,475 Cl ppm active time= 30 sec / pause time 30 sec .... and decreasing active time accordingly while reaching setpoint value. Cycle time depends on many variables such as: distance from*

injection point to the system to treat, reaction time required, chemical concentration, etc....

Active Time MIN programmable: it sets the minimum time in which PWM is active; it overrules selected settings. Times Pulses Function follows the following formula:

Active Time MIN = [(measured value – set point) / window width] * cycle time.

If the result of the formula is < the selected Active Time Min, the latter with overrule the first. However, we suggest keeping the default active time shown when programming, that is 5 seconds.

BENEFITS: a proportional function more accurate than ON-OFF mode using simple equipment such as Constant mode dosing pumps and peristaltic dispensers.

DISAVANTAGES: user must be a professional to select the most accurate settings for excellent results.

ANALOG CURRENT OUTPUTS 4÷20 mA

Controller features 2 analog current signal mA outputs. The signal 4-20mA1 and 4-20mA2 follow the Chlorine selected settings. Output mA provides two working mode to select according to the system operating requirements:

- **AUX** is a programmable function combined to the unit chlorine measurements in real time thus driving remote equipment such as data logger, PLC or Chart recorders or other equipment suitable to process a remote mA signal.
  At 4 mA corresponds minimum Chlorine value (0 Cl ppm), at 20 mA corresponds max measured Chlorine value (according to the selected Chlorine_PPM sensor range): 2 Cl_ppm, 20 Cl_ppm, 200 Cl_ppm, 10 CL; connected equipment will work accordingly.
- **DOSING SETPOINT**: mA output drives dosing pumps or equipment suitable to manage a mA incoming signal.
  At 4 mA corresponds the minimum Chlorine value (0 Cl ppm) thus connected dosing pump will work at minimum capacity.
  At 20 mA corresponds the max measured Chlorine value Chlorine value (according to the selected Chlorine_PPM sensor range): 2 Cl_ppm, 20 Cl_ppm, 200 Cl_ppm, 10 CL; connected dosing pump will work at max capacity (according to dosing pump settings).

BENEFITS: best results because pulses are extremely accurate in relation to measured levels.

DISAVANTAGES: user needs a specific dosing pump or other equipment suitable to process a remote mA signal.

OVERDOSING TIME

- **Overdosing time-out** alarm allows to select a period in which set point must be reached. If during this time set point is not reached, controller will block outputs operations including mA outputs (dosing pump), Alarm is ON shown on display and will activate a signalling device connected to alarm relay.

BENEFITS: to prevent excess of chemical addition.

MAX DOSING

- **Max Dosing** is an extra safety function ensuring that dosing operations are carried out within the time selected by the operator. Relays connected to dosing pumps will open accordingly. This function allows no time limit dosing continuously always in accordance to selected set points or, in case the operator wants to change settings, can select a number of minutes (up to 999) within the selected hours.

BENEFITS: to prevent excess of chemical addition not only according the set point but also overruling any kind of the controller set point programming.

REAL TIME CLOCK / START-STOP TIME

- **Real time clock** allows driving via timer programming Auxiliary outputs, sensors cleaning (open chlorine cell) or any remote equipment for the period selected in the program. Operator can also program the working days and exact time of the unit operations via Start/Stop programming.

AUX OUTPUT

- **Auxiliary output** control various functions related to remote equipment and dosing pump. Each output can drive remote equipment or devices according to a very accurate programming of minutes/hours/days/weeks.

BENEFITS: this function make this controller a very versatile management unit not only to measure chemical-physical parameters but also for other functions related to the systems where is installed.

START-UP DELAY

- **Start-up Delay time** stops the relay outputs when switching ON the unit thus allowing sensors to polarize ensuring correct measurements (programmable).

FLOW SENSOR "PROXIMITY SWITCH" FUNCTION

- **Flow Sensor:** in case, no water is running through the sensor cell holder (and eventually into the systems), flow sensor (proximity switch) will deactivate all outputs ensuring that no extra chemical is added.

TEMPERATURE

- Manual temperature compensation. 0÷100°C. Selecting **PT100** (latter with temperature sensor) **automatically compensates** temperature / sensor measurements, always giving the exact value against the current temperature. In Manual mode, if user does not select any temperature value, controller will set 25°C value as default, which can be changed.
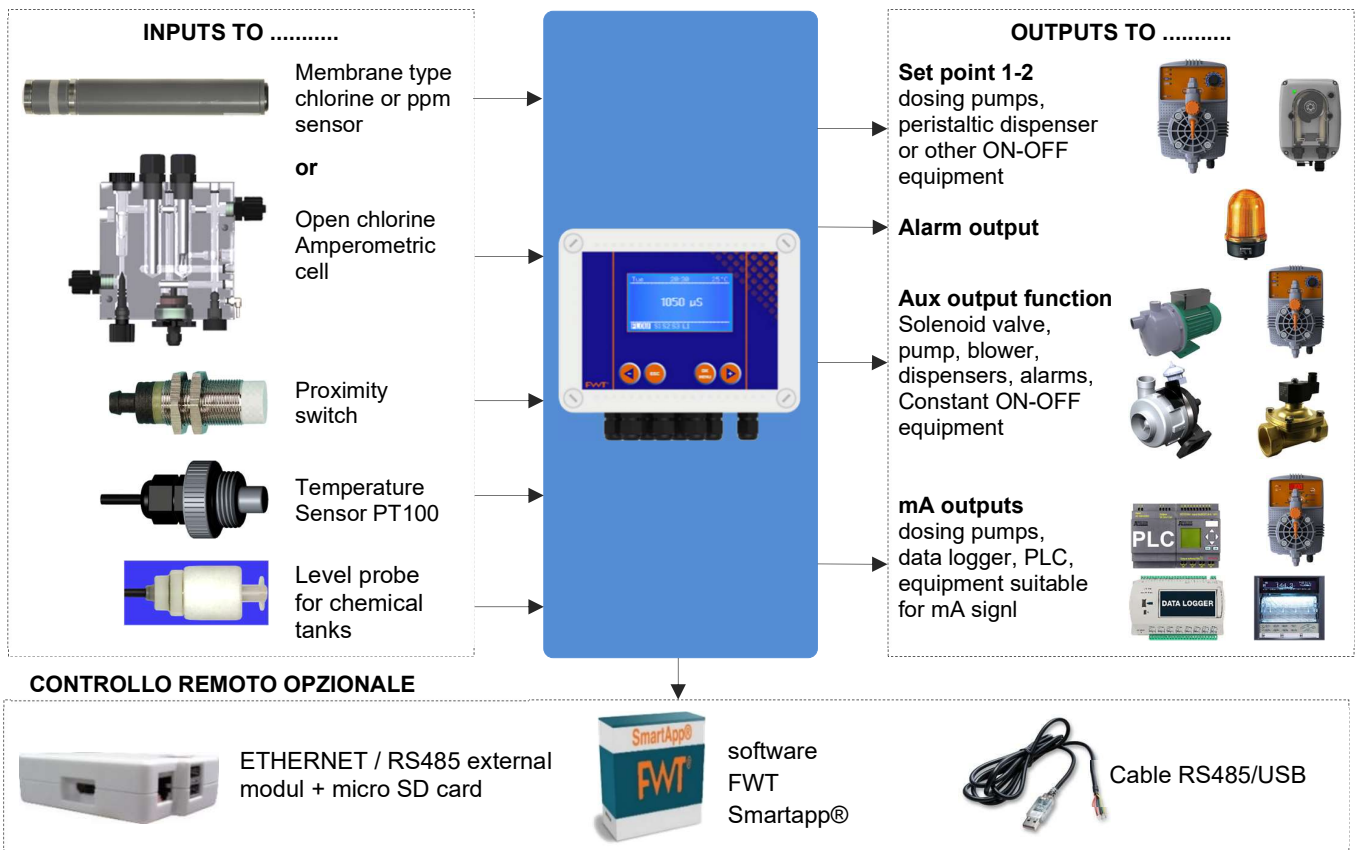
ETHERNET / RS485 communication control unit with external module

- The CTRL+ series is suitable for remote control via an RS485 expansion card with Modbus protocol using FWT SmartApp® software. The control unit connection via RS485/ETHERNET **external module**, allows the operator to connect to the unit via PC, smartphone, or tablet, and change the programming and visualise settings using FWT SmartApp® software. The unit will send an email once reached the alarm level, overdose settings, or finished the maximum dosing time of the metering pump.
- FWT features, upon request, a useful service which will allow the customers to monitor and control from anywhere in the world the controllers installed in any place in the world: FWT "CLOUD" SYSTEM.

6.0 PROGRAMMING FUNCTIONS

Set-Points	Output Relays 1 - 2	2 set-point ON-OFF	*Independent setting to activate Constant / ON-OFF mode dosing pumps, peristaltic or ON-OFF equipment.*
		Set point	*adjusts set-point value (ON-OFF mode).*
		Hysteresis	*It selects a measuring range around set-point value, blocking output relays (ON-OFF mode)*
		Direct - Reverse	*It selects output dosing relay dosing direction.*
		PWM Proportional mode with modular pulses	*Proportional time/pause pulses output will activate a Constant / ON-OFF mode dosing pumps, peristaltic or others ON-OFF equipment.*
		Delay on set point	*It selects a delay time (999 seconds adjustable) before activating relay output.*
	Relay 3 output AUX		*Real-Time clock drives remote equipment or devices according to a very accurate programming of minutes/hours/days/weeks*
	Relay 4 Alarm	Alarm min / Alarm Max	*Alarm function selects alarm Lowest and Highest level passed which alarm relay will be ON or OFF.*
4÷20 mA1-2	**AUX mA device**		*driving data logger, PLC, data recorder or equipment suitable to work with mA signal*
	Dosing setpoint		*driving mA dosing pumps or equipment suitable to work with mA signal*
Calibration	*Calibration menu for ion selective membrane sensor or Open chlorine cell.*		
System Settings	**Flow sensor**		*It activates (ON) or deactivates (OFF) flow sensor (proximity switch) input.*
	Manual temperature		*It selects manual temperature compensation. 0÷100°C (Auto-Temp=OFF).*
	Auto-temperature Compensation		*It compensates the temperature/electrode sensor thus always measuring the exact value against the current temperature, function available only with PT100 sensor.*
	RS485 / Ethernet		*Remote connection RS485 / ETHERNET via external module, Modbus protocol, Software FWT SmartApp@: operator is connected via pc, smartphone or tablet.*

7.0 INPUTS / OUTPUTS DIAGRAM FUNCTIONS

INPUTS TO ....

Membrane type chlorine or ppm sensor

or

Open chlorine Amperometric cell

Proximity switch

Temperature Sensor PT100

Level probe for chemical tanks

OUTPUTS TO ....

Set point 1-2 dosing pumps, peristaltic dispenser or other ON-OFF equipment

Alarm output

Aux output function Solenoid valve, pump, blower, dispensers, alarms, Constant ON-OFF equipment

mA outputs dosing pumps, data logger, PLC, equipment suitable for mA signl

CONTROLLO REMOTO OPZIONALE

ETHERNET / RS485 external modul + micro SD card

software FWT Smartapp®

Cable RS485/USB

8.0   INITIAL DISPLAY

NOTES FOR PROGRAMMER: try not to press the keys continuously. First, read the manual before programming or have the booklet handy so to be sure to perform a correct selection.

IMPORTANT: if keys are not pressed for 60 seconds, controller will display current measurements.
For rapid advancement, **keep** pressed firmly either one of ◄► keys

FWT
MODEL CTRL+
`Rev. X.X`
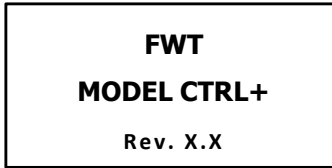
When the controller is turned ON there will be displayed at the bottom the latest software upgrades.
Software is subject to revision without notice.

Controller will get set for measurements and ready to work.

at this point, there could be some here are displayed some other messages status such as:
S1 S2 L1 DATE/TIME AUX ALARM OVERDOSING MAX DOSING FLOW *BASIC MENU* *EXPERT MENU*
which could be ON due to actual measurements, just go ahead with programming.

Display shows Chlorine Cl_PPM measurements according to chlorine range selected in following paragraph **8.2**. If controller has been already programmed, display shows previously selected set points.

INITIAL DISPLAY shows measurements, which are random since no calibrations have yet been effectuated. If the controller has been already programmed, display will show previously selected programs.

CONTINUOS MEASUREMENT DISPLAY shows when parameter measurements, function status and alarm indications.

When the controller is turned **ON** for **the first time**, there will be displayed a list of all the programming function keys which will not appear in the next switching ON operations.

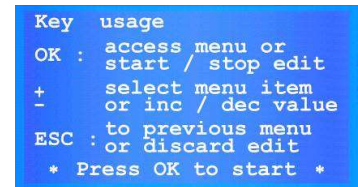CAREFULLY READ KEY USAGE THEN PRESS ☞ **.OK.** to start
KEYS CONFIGURATION
 OK: menu access, start/stop, selection and modifications
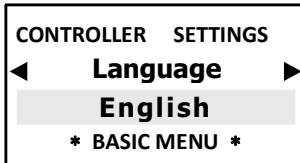 **±   program step selection or selected value increase / decrease**
 ESC: back to previous step (does not save any modifications
 * Press OK to start*
*For rapid advancement **keep** pressed firmly either one of the ◄► keys*

8.1 - SELECTING PROGRAMMING MENU LANGUAGE

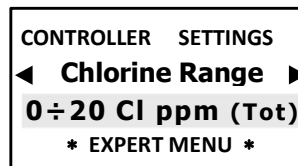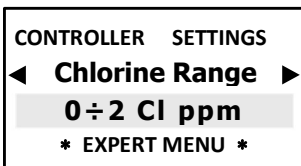| CONTROLLER   SETTINGS |
|---|
| ◄   **Language**   ► |
| **English** |
| ✴ **BASIC MENU** ✴ |

It allows to select programming menu language.

8.2 - SELECTING CHLORINE MEASURING RANGE

CTRL+ CL series chlorine controller is set as for 4 ranges of chlorine or ppm measurements sensors:
- **CLS** membrane type ion selective: **Chlorine** range 0÷2 Cl ppm; 0÷20 Cl ppm; 0÷20 Cl ppm (Total chlorine); 0÷5 Cl ppm
- **CLS** membrane type for **PPM** measurements such as: Chlorine Dioxide, Bromine, Ozone, Peracetic Acid and others:
     range 0÷2 ppm; range 0÷20 ppm; range 0÷20 ppm; range 0÷200 ppm; range 0÷2000 ppm;
- **CLC** open type chorine cell: range CLC 0÷10 Cl ppm;
After making the selection, consequently, display and measurement resolutions will change accordingly.

CONTROLLER SETTINGS	CONTROLLER SETTINGS	CONTROLLER SETTINGS	CONTROLLER SETTINGS
◄ **Chlorine Range** ►	◄ **Chlorine Range** ►	◄ **Chlorine Range** ►	◄ **Chlorine Range** ►
0÷2 Cl ppm	**0÷20 Cl ppm**	**0÷20 Cl ppm (Tot)**	**CLC 0÷10 Cl ppm**
✴ **EXPERT MENU** ✴	✴ **EXPERT MENU** ✴	✴ **EXPERT MENU** ✴	✴ **EXPERT MENU** ✴

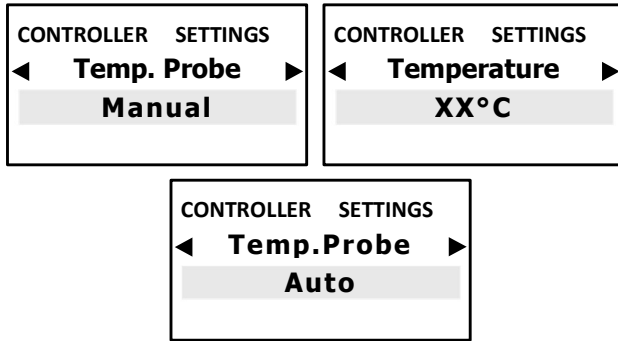**IMPORTANT:** once selected **Chlorine_PPM range**, **ENSURE**, to connect the **proper** sensor or Chlorine cell.
In case, user wished to change **Chlorine_PPM range**, even during operations:

☞ **BASIC** menu, move to > .SETTINGS. > .EXPERT. > SELECT MENU. > SET POINT1 > .Chlorine range.
☞ **EXPERT** menu, move to > SELECT MENU. > SET POINT1 > .Chlorine range.
☞ Press ESC to return to SELECT MENU.

8.3 - TEMPERATURE SETTINGS

```
CONTROLLER   SETTINGS
◄    Temp. Probe    ►
        Manual
```

```
CONTROLLER   SETTINGS
◄    Temperature    ►
        XX°C
```

Manual temperature compensation 0÷100°C.
☞ Press ◄► to show the environmental temperature.
Selecting Manual mode, if user does not select any temperature value, controller will set 25°C value as default, programmable.

```
CONTROLLER   SETTINGS
◄    Temp.Probe     ►
         Auto
```

Selecting AUTO compensation temperature/electrode measurements, always giving the exact value against the current temperature.
AUTO mode works only if using temperature sensor PT100

Press ◄► to show the temperature to calibrate sensor.

8.4 - DATE AND TIME – REAL TIME CLOCK

```
◄        Date        ►◄
     2014 May 14
```

```
         Time         ►
        12:02
```
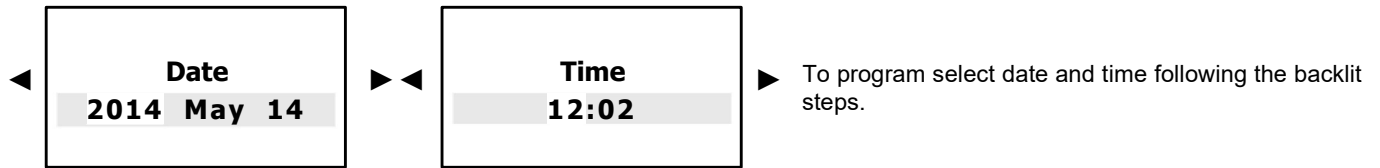
To program select date and time following the backlit steps.

8.5 - PROGRAMMING MENU

CTRL+ series allows choosing between:

   BASIC programming: simplified mode for not professional operators.
   EXPERT programming: complete programming including functions for a more refined control and results.
Once selected the programming menu, Menu and submenus will change accordingly.
To help operator to choose the correct menu here following the main difference between the two menus:
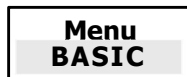
```
   Menu
   BASIC
```
Setpoint 1-2 *Setpoint Value - Dosing Mode - Mode ON/OFF or Timed Pulses - Alarm MIN/MAX (only Setpoint1)* **> Calibrate > Settings**
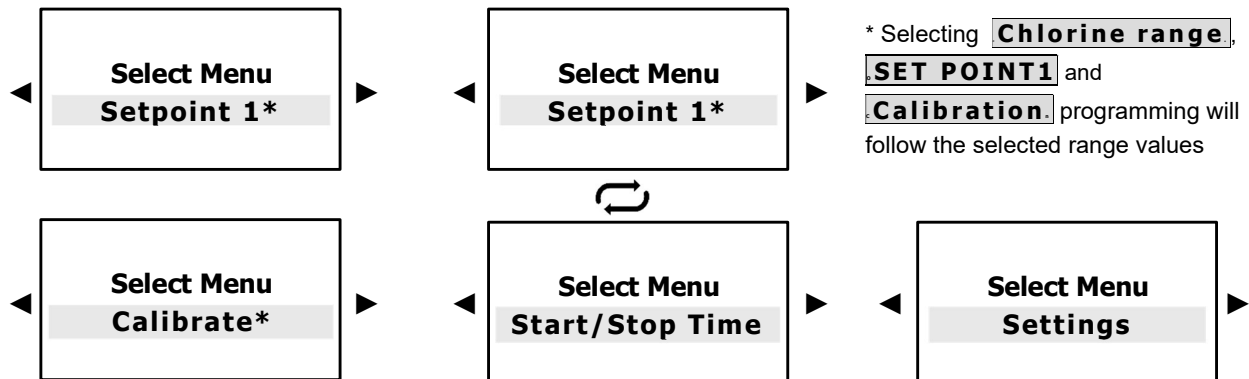
```
   Menu
  EXPERT
```
Setpoint 1-2 *Setpoint Value - Dosing Mode - Mode ON/OFF or Timed Pulses - Hysteresis - Delay - Measure Param. or Range - Alarm MIN/MAX (only Setpoint1) - Overdosing - Max dosing - Startup Delay* **> 4-20mA1 > 4-20mA2 > Calibrate > Start/Stop > Aux output > Settings >**

☞ Press OK/MENU display shows ∗ **BASIC** ∗ mode (default)

9.0   SELECT MENU > BASIC programming menu

These are all the steps included in the SELECT MENU loop visualization with BASIC menu programming:

```
◄   Select Menu    ►
      Setpoint 1*
```
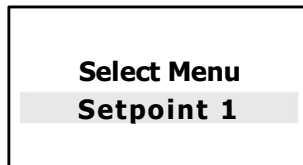
```
◄   Select Menu    ►
      Setpoint 1*
```

* Selecting Chlorine range, SET POINT1 and Calibration programming will follow the selected range values

```
◄   Select Menu    ►
      Calibrate*
```

```
◄   Select Menu    ►
     Start/Stop Time
```

```
◄   Select Menu    ►
       Settings
```

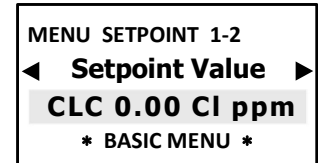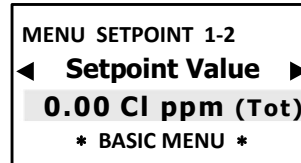☞   Press OK/MENU to confirm selection and to approach next submenu.
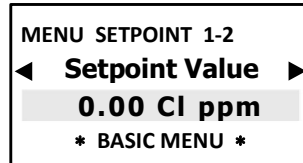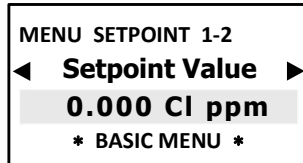☞   Press ESC to return to continuous MEASUREMENT DISPLAY

10.0   SETPOINT 1 CL (or PPM) and SETPOINT 2 CL (or PPM) > BASIC MENU

10.1 - SETPOINT1 CL

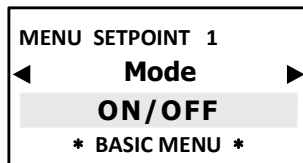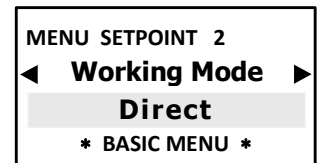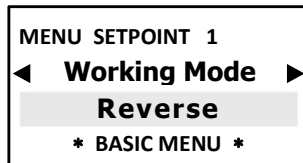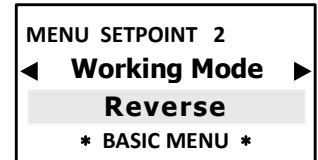### 10.2 - SETPOINT2 CL

```
Select Menu
Setpoint 1
```

CTRL+ CL series chlorine controller is set as default for a sensor range 0÷2 Cl ppm. Select the chlorine range required, consequently display and measurement resolutions will change accordingly.
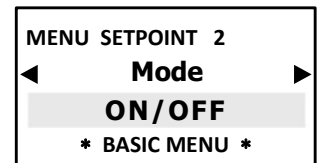
```
Select Menu
Setpoint 2
```

```
MENU SETPOINT 1-2
◄  Setpoint Value  ►
0.000 Cl ppm
* BASIC MENU *
```

```
MENU SETPOINT 1-2
◄  Setpoint Value  ►
0.00 Cl ppm
* BASIC MENU *
```

```
MENU SETPOINT 1-2
◄  Setpoint Value  ►
0.00 Cl ppm (Tot)
* BASIC MENU *
```

```
MENU SETPOINT 1-2
◄  Setpoint Value  ►
CLC 0.00 Cl ppm
* BASIC MENU *
```

```
MENU SETPOINT 1
◄  Working Mode  ►
Direct
* BASIC MENU *
```

Direct mode operation: output is active when measured value is **lower** than selected set-point, dosing pump injects **chlorine**.
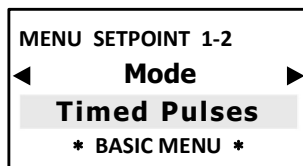
Set point 2 is set for **Reverse** mode operation: output is active when measured value is **higher** than selected set-point, dosing pump injects **chlorine reducer**.

```
MENU SETPOINT 2
◄  Working Mode  ►
Reverse
* BASIC MENU *
```

```
MENU SETPOINT 1
◄  Working Mode  ►
Reverse
* BASIC MENU *
```

```
MENU SETPOINT 2
◄  Working Mode  ►
Direct
* BASIC MENU *
```

```
MENU SETPOINT 1
◄  Mode  ►
ON/OFF
* BASIC MENU *
```

Unit is provided with **ON-OFF mode** which will activate or deactivate in case of reverse mode ON) output relays such as Constant / ON-OFF mode dosing pumps or other ON-OFF mode equipment.

```
MENU SETPOINT 2
◄  Mode  ►
ON/OFF
* BASIC MENU *
```

↳ *SELECTING MODE* **"ON-OFF"** *NEXT PROGRAMMING STEP* ➔ **"ALARM MIN"** **(FUNCTION ONLY SET POINT1)**

```
MENU SETPOINT 1-2
◄  Mode  ►
Timed Pulses
* BASIC MENU *
```
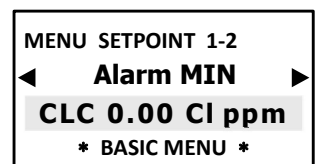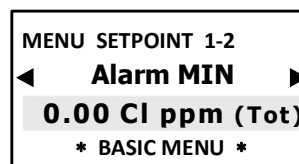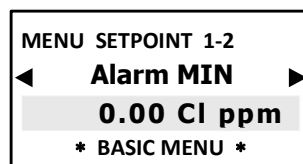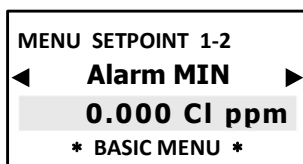
*Timed Pulses also known as PWM "pulses with modulation" time/pause allows proportional mode on each ON-OFF set point activating corresponding pulses on output relay according to measured value and always relating to the previous selected settings. **Default activating point at 0,050 Cl ppm or ppm** (range 2 Cl ppm or ppm); 0,5 (range 10-20 Cl ppm); 0,5 ppm (range 200 ppm); 5 ppm (range 2000 ppm).
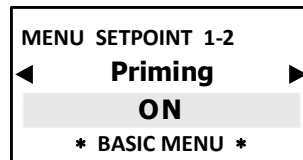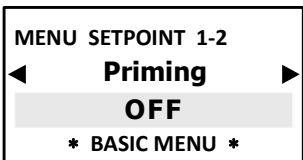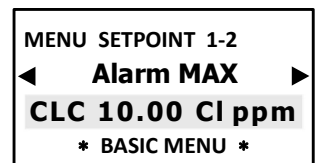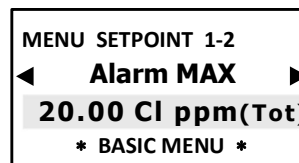
For more accurate **"Timed Pulses"** *PWM settings, select* **"Expert"** *menu from initial settings*

↳ *BACK TO SETPOINT PROGRAMMING STEPS FROM EITHER* **"ON-OFF"** *OR* **"TIMED PULSES"** *MODE*

Alarm MIN, **ONLY SET POINT 1**, selects **LOWEST** alarm level: below this point **alarm relay** will be ON.

```
MENU SETPOINT 1-2
◄  Alarm MIN  ►
0.000 Cl ppm
* BASIC MENU *
```

```
MENU SETPOINT 1-2
◄  Alarm MIN  ►
0.00 Cl ppm
* BASIC MENU *
```

```
MENU SETPOINT 1-2
◄  Alarm MIN  ►
0.00 Cl ppm (Tot)
* BASIC MENU *
```

```
MENU SETPOINT 1-2
◄  Alarm MIN  ►
CLC 0.00 Cl ppm
* BASIC MENU *
```

Alarm MAX, **ONLY SET POINT 1**, selects **HIGHEST** alarm: higher this point alarm relay will be ON.
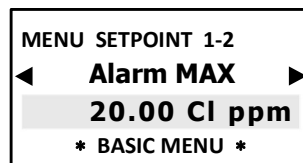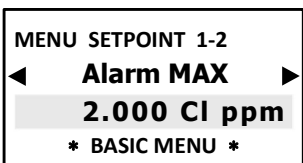
```
MENU SETPOINT 1-2
◄  Alarm MAX  ►
2.000 Cl ppm
* BASIC MENU *
```

```
MENU SETPOINT 1-2
◄  Alarm MAX  ►
20.00 Cl ppm
* BASIC MENU *
```

```
MENU SETPOINT 1-2
◄  Alarm MAX  ►
20.00 Cl ppm(Tot)
* BASIC MENU *
```

```
MENU SETPOINT 1-2
◄  Alarm MAX  ►
CLC 10.00 Cl ppm
* BASIC MENU *
```

```
MENU SETPOINT 1-2
◄  Priming  ►
OFF
* BASIC MENU *
```

```
MENU SETPOINT 1-2
◄  Priming  ►
ON
* BASIC MENU *
```

ONLY WHEN USING DOSING PUMPS
Priming function "blocks" the set point value to allow the dosing pumps to be primed, outputs will not be active.
☞ Select **ON**, do not press OK or ESC until dosing pump is primed, then confirm **OK**, display will show **OFF**

☞ Press ESC returns to SELECT MENU or Press ESC ESC to continuous MEASUREMENT DISPLAY

11.0   SENSOR CALIBRATION > BASIC MENU

```
◄   Select Menu
     Calibration   ►
```

☞ Press OK/MENU to confirm selection and to approach next submenu

*For rapid advancement **keep** pressed firmly either one of the ◄ ► keys*

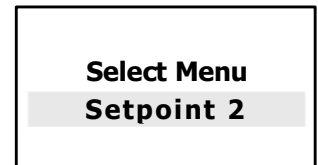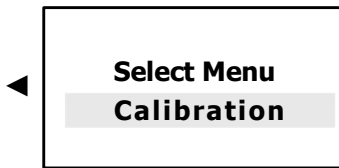*During Calibration, it may appear the sign – (minus) which either disappears or is removed by correct values settings! The mV value at the bottom of the display shows the mV sensor signal thus indicating the sensor efficiency. We recommend a constant control and recalibration of the sensor by means of DPD1 and DPD3 or, when using OPEN chlorine cells (CLC series) to clean **cell electrodes** (refer to page 26÷28)*

CTRL CL features various ranges of **Membrane** type **Chlorine** or **PPM** membrane sensor and 1 range for open type chlorine cell.
IMPORTANT: membrane sensors type, **CLS** series <u>**DO NOT NEED**</u> ZERO calibration.
However, if sensor conditions are **not ideal,** we RECOMMEND ZERO calibration.
For **OPEN** type amperometric cell (FWT **CLC** model)
<div align="center"><u>**ZERO Calibration is required !**</u> **Therefore, use Expert menu.**</div>

IMPORTANT: BASIC programming menu **DOES NOT** include **ZERO Calibration** step; to carry out this function, operator must enter **EXPERT** programming menu: considering that we are into Calibration BASIC menu:
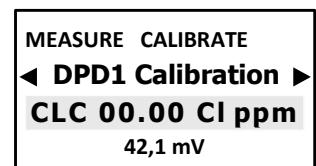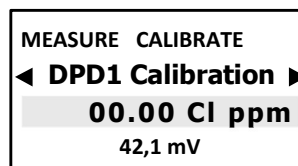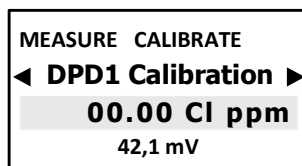CALIBRATE menu (BASIC) > ESC > SELECT MENU > SETTINGS > PROGRAMMING MENU > EXPERT > **OK** > ESC
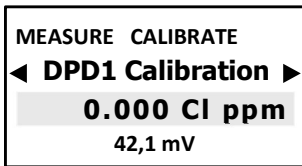**You are now in EXPERT** menu SETTING < CALIBRATE > OK
At this point, CALIBRATE menu (EXPERT) include also ZERO calibration function: carefully follow the steps as shown on page 23÷24 of the present booklet. Once CALIBRATE programming is over, operator can choose to continue programming in EXPERT menu, knowing that all the settings previously selected will remain as such,

If operator wishes to return to BASIC menu programming, knowing that CALIBRATE settings will remain intact:
CALIBRATE menu (EXPERT) > ESC > SELECT MENU > SETTINGS > PROGRAMMING MENU > BASIC > **OK** > ESC

PROCEDE TO CALIBRATION POINT / IMPORTANT: CHECK SENSOR-CONTROLLER INPUT mV SIGNAL (page 31)

```
MEASURE  CALIBRATE       MEASURE  CALIBRATE       MEASURE  CALIBRATE       MEASURE  CALIBRATE
◄ DPD1 Calibration ►     ◄ DPD1 Calibration ►     ◄ DPD1 Calibration ►     ◄ DPD1 Calibration ►
    0.000 Cl ppm             00.00 Cl ppm             00.00 Cl ppm           CLC 00.00 Cl ppm
      42,1 mV                  42,1 mV                  42,1 mV                  42,1 mV
```

Select required sample solution value and verify with test kit **DPD1** for free chlorine or **DPD3** for Total chlorine, or by means of portable controller, measure the concentration of free (or total) chlorine ppm in water.

☞ Press OK/MENU to confirm selection   ☞ Press ESC to SELECT MENU

☞ Press ESC ESC to continuous MEASUREMENT DISPLAY

***NOTE: keep in mind that it takes a few hours** (minimum **2/3**) before the value reading stabilizes: the best reference is to visualize the Cl ppm value shown on the display and the mV value at the bottom to check sensor efficiency.*

12.0   START / STOP TIME > BASIC MENU
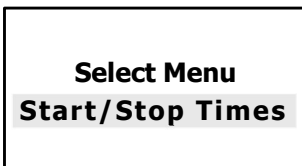
```
   Select Menu
 Start/Stop Times
```

Real time clock programs the working days and exact time of the unit operations.

```
START/STOP TIME          START/STOP TIME
◄    Monday     ►         ◄    Tuesday    ►
 00:00 ◄–► 24:00          00:00 ◄–► 24:00
  * BASIC MENU *           * MENU BASE *
```

Select date and time following the backlit steps.

☞ Press ESC returns to SELECT MENU or Press ESC ESC to continuous MEASUREMENT DISPLAY

13.0   SETTINGS > BASIC MENU
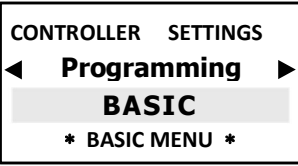
```
Select Menu
  Settings
```

```
CONTROLLER   SETTINGS
◄    Programming    ►
       BASIC
   * BASIC MENU *
```

```
CONTROLLER   SETTINGS
◄    Programming    ►
       EXPERT
   * BASIC MENU *
```

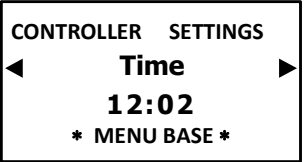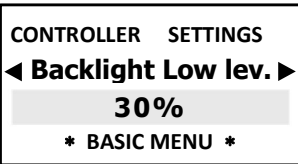**BASIC** programming: simplified mode for not professional operators

**EXPERT** programming: complete programming including functions for a more refined control and results.

(i) *After selecting, e.g. choosing EXPERT, at first display will still show Basic but as soon as moving to other steps it will change to Expert, and vice versa.*

```
CONTROLLER   SETTINGS
◄       Date       ►
    2017 May 14
   * MENU BASE *
```

```
CONTROLLER   SETTINGS
◄       Time       ►
       12:02
   * MENU BASE *
```

Programmare la data e l'ora selezionando i passi retroilluminati.

```
CONTROLLER   SETTINGS
◄ Backlight Low lev. ►
        30%
   * BASIC MENU *
```

It adjusts the display save energy mode backlight level; touching any button will restore full 100% display operative brightness.

```
CONTROLLER   SETTINGS
◄      Language     ►
       English
   * BASIC MENU *
```
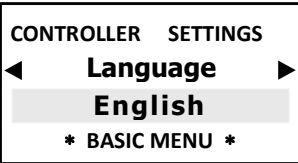
It allows to select the programming menu language. Once the Language is selected, the programming menu adjusts accordingly.
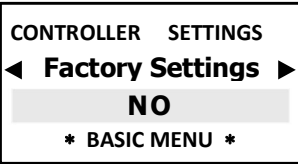
```
CONTROLLER   SETTINGS
◄   Factory Settings ►
         NO
   * BASIC MENU *
```

FACTORY SETTINGS: it restores factory default settings. To be used ONLY when parameters or measurements are not responding correctly or when user wants to ensure to re-program from zero. Not to abuse, continuous restoring can affect controller efficiency.

```
CONTROLLER   SETTINGS
◄   Factory Settings ►
        YES
   * BASIC MENU *
```
◄
```
CONTROLLER   SETTINGS
       CONFIRM ?
         NO
   * BASIC MENU *
```
► ◄
```
CONTROLLER   SETTINGS
       CONFIRM ?
        YES
   * BASIC MENU *
```
►
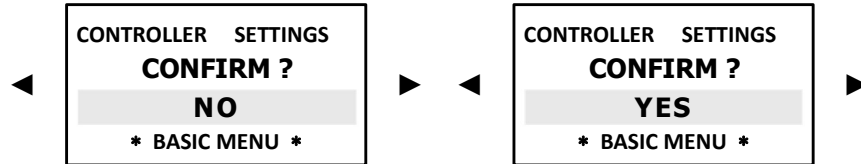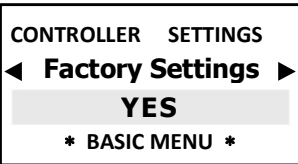
Once confirmed **YES**, display will be OFF for 1 second than will return to continuous ▨MEASUREMENT DISPLAY▨

14.0   SELECT MENU > EXPERT programming menu

These are all the steps included in the **SELECT MENU** loop visualization with **BASIC** menu programming:

◄ **Select Menu** / **Setpoint 1*** ►   ◄ **Select Menu** / **Setpoint 2*** ►   ◄ **Select Menu** / **4-20mA 1** ►

↻

◄ **Select Menu** / **4-20mA 2** ►   ◄ **Select Menu** / **Calibrate*** ►   ◄ **Select Menu** / **Start/Stop Time** ►

↻

◄ **Select Menu** / **Aux Output** ►   ◄ **Select Menu** / **Settings** ►

* Selecting `Chlorine range`, `SET POINT1` and `Calibration` programming will follow the selected range values
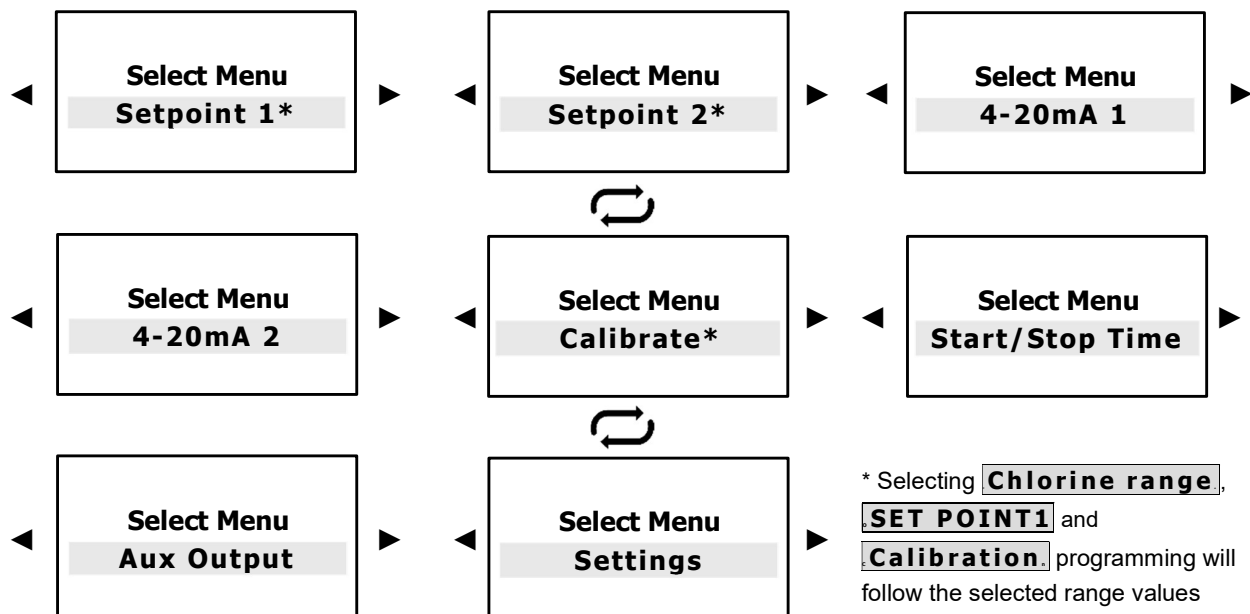
☞ Press `OK/MENU` to confirm selection and to approach next submenu.

☞ Press `ESC` to return to continuous `MEASUREMENT DISPLAY`

15.0   SETPOINT 1 CL (or PPM) and SETPOINT 2 CL (or PPM) > EXPERT MENU

15.1 - SETPOINT1 CL

Select Menu
Setpoint 1

CTRL+ CL series chlorine controller is set as default for a sensor range 0÷2 Cl ppm. Select the chlorine range required, consequently display and measurement resolutions will change accordingly.
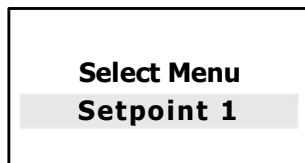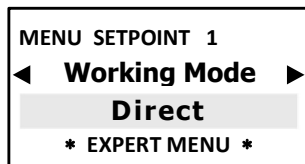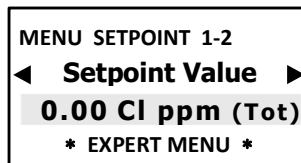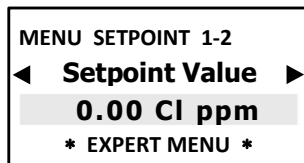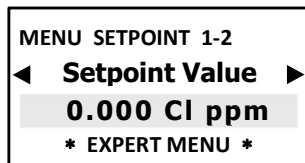
15.2 - SETPOINT2 CL

Select Menu
Setpoint 2

MENU SETPOINT 1-2
◄ **Setpoint Value** ►
0.000 Cl ppm
* EXPERT MENU *

MENU SETPOINT 1-2
◄ **Setpoint Value** ►
0.00 Cl ppm
* EXPERT MENU *

MENU SETPOINT 1-2
◄ **Setpoint Value** ►
0.00 Cl ppm (Tot)
* EXPERT MENU *

MENU SETPOINT 1-2
◄ **Setpoint Value** ►
CLC 0.00 Cl ppm
* EXPERT MENU *

MENU SETPOINT 1
◄ **Working Mode** ►
Direct
* EXPERT MENU *

Direct mode operation: output is active when measured value is **lower** than selected set-point, dosing pump injects **chlorine**.

Set point 2 is set for **Reverse** mode operation: output is active when measured value is **higher** than selected set-point, dosing pump injects **chlorine reducer**.

MENU SETPOINT 2
◄ **Working Mode** ►
Reverse
* EXPERT MENU *

MENU SETPOINT 1
◄ **Working Mode** ►
Reverse
* EXPERT MENU *

MENU SETPOINT 2
◄ **Working Mode** ►
Direct
* EXPERT MENU *

MENU SETPOINT 1
◄ **Mode** ►
ON/OFF
* EXPERT MENU *

Unit is provided with **ON-OFF mode** which will activate or deactivate in case of reverse mode ON) output relays such as Constant / ON-OFF mode dosing pumps or other ON-OFF mode equipment.

MENU SETPOINT 2
◄ **Mode** ►
ON/OFF
* EXPERT MENU *

↳ *SELECTING MODE* **"ON-OFF"** *NEXT PROGRAMMING STEP* ➔ **"ALARM MIN"** (FUNCTION ONLY SET POINT1)

```
┌─────────────────────────┐
│ MENU SETPOINT 1-2       │
│ ◄     Mode          ►   │
│     Timed Pulses        │
│   * EXPERT MENU *       │
└─────────────────────────┘
```

*Timed Pulses also known as PWM "pulses with modulation" time/pause allows proportional mode on each ON-OFF set point activating corresponding pulses on output relay according to measured value and always relating to the previous selected settings. **Default activating point at 0,050 Cl ppm or ppm** (range 2 Cl ppm or ppm); 0,5 (range 10-20 Cl ppm); 0,5 ppm (range 200 ppm); 5 ppm (range 2000 ppm).

↳ *SELECTING MODE* **"ON-OFF"** *NEXT PROGRAMMING STEP* ➔ **"HYSTERESIS"**

↳ *SELECTING MODE* **"TIMED PULSES"** *WILL REQUIRE NEXT PARAMETERS SETTINGS*

CI CHLORINE TIMED PULSES PROGRAMMING

Window Width: *pulses are timed ON and OFF according to the distance from selected set-point, programmable, e.g.: working with a chlorine range 0-2 Cl ppm and window width 0,050; if selected set point is 0,500 Cl ppm and measured value is 0,400 ppm **PWM** mode starts after reaching 0,450 Cl ppm (0,050 Cl ppm) with Time/Pause pulses according to selected time Cycle in seconds.*

```
┌──────────────────────┐  ┌──────────────────────┐  ┌──────────────────────┐  ┌──────────────────────┐
│ MENU SETPOINT 1-2    │  │ MENU SETPOINT 1-2    │  │ MENU SETPOINT 1-2    │  │ MENU SETPOINT 1-2    │
│ ◄  Window Width  ►   │  │ ◄  Window Width  ►   │  │ ◄  Window Width  ►   │  │ ◄  Window Width  ►   │
│    0.050 Cl ppm      │  │    0.50 Cl ppm       │  │   0.50 Cl ppm (Tot)  │  │   CLC 0.50 Cl ppm    │
│   * EXPERT MENU *    │  │   * EXPERT MENU *    │  │   * EXPERT MENU *    │  │   * EXPERT MENU *    │
└──────────────────────┘  └──────────────────────┘  └──────────────────────┘  └──────────────────────┘
```
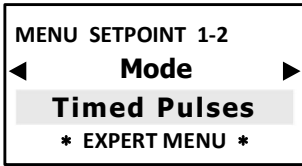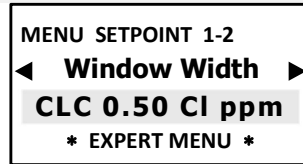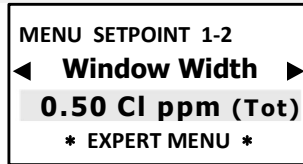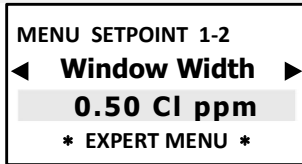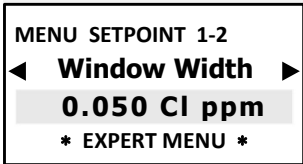
```
┌──────────────────────┐
│ MENU SETPOINT 1-2    │
│ ◄   Cycle Time   ►   │
│      60 sec          │
│   * EXPERT MENU *    │
└──────────────────────┘
```
Cycle Time: *PWM mode cycle 60 seconds (programmable): e.g. setpoint 0,500 Cl ppm, window width 0,050; at measured value 0,450 Cl ppm = active time 60 sec / pause time = 0 sec.; at value 0,475 Cl ppm active time= 30 sec / pause time 30 sec .... and decreasing active time accordingly while reaching setpoint value. Cycle time depends on many variables such as: distance from injection point to the system to treat, reaction time required, chemical concentration, etc....*
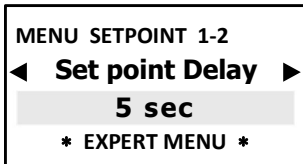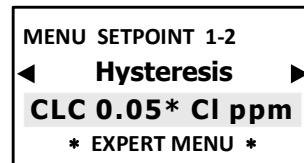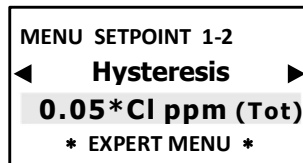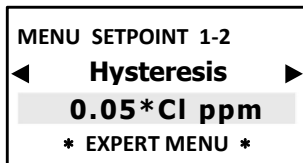
```
┌──────────────────────┐
│ MENU SETPOINT 1-2    │
│ ◄ Active Time MIN ►  │
│      5 sec           │
│   * EXPERT MENU *    │
└──────────────────────┘
```
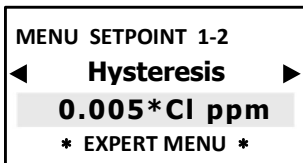**Active Time MIN** *programmable: it sets the minimum time in which PWM is active; it overrules selected settings. Times Pulses Function follows the following formula:*
Active Time MIN = [(measured value – set point) / window width] * cycle time.
*If the result of the formula is < the selected Active Time Min, **the latter with overrule the first**. However, we suggest keeping the default active time shown when programming, that is 5 seconds.*

↳ *SELECTING MODE* **"ON-OFF"** *NEXT PROGRAMMING STEPS ARE AS FOLLOW ......*

HYSTERESIS FUNCTION IS NOT AVAILABLE WITH TIMED PULSES MODE

Hysteresis is used to activate or deactivate output relays when selected value is reached. It is useful when there are too many and/or quick changes, which could damage connected equipment. Increasing Hysteresis will allow to move away from set point value. ***Value shown according to selected Chlorine range.***

```
┌──────────────────────┐  ┌──────────────────────┐  ┌──────────────────────┐  ┌──────────────────────┐
│ MENU SETPOINT 1-2    │  │ MENU SETPOINT 1-2    │  │ MENU SETPOINT 1-2    │  │ MENU SETPOINT 1-2    │
│ ◄   Hysteresis   ►   │  │ ◄   Hysteresis   ►   │  │ ◄   Hysteresis   ►   │  │ ◄   Hysteresis   ►   │
│    0.005*Cl ppm      │  │    0.05*Cl ppm       │  │   0.05*Cl ppm (Tot)  │  │   CLC 0.05* Cl ppm   │
│   * EXPERT MENU *    │  │   * EXPERT MENU *    │  │   * EXPERT MENU *    │  │   * EXPERT MENU *    │
└──────────────────────┘  └──────────────────────┘  └──────────────────────┘  └──────────────────────┘
```

```
┌──────────────────────┐
│ MENU SETPOINT 1-2    │
│ ◄  Set point Delay ► │
│      5 sec           │
│   * EXPERT MENU *    │
└──────────────────────┘
```
NOT AVAILABLE WITH TIMED PULSES MODE (VALID FOR BOTH SETPOINT)
Delay time blocks relay outputs to ensure that the outputs are active only when the sensors measurements are stable thus allowing the best results in terms of chemical balance.

↳ * *BACK TO SETPOINT PROGRAMMING STEPS FROM EITHER* **"ON-OFF"** *OR* **"TIMED PULSES"** *MODE*

VALID ONLY SET POINT 1 to change CTRL+ chlorine controller, range from previously selected:
CLS membrane type ion selective: **Chlorine** range 0÷2 Cl ppm; 0÷20 Cl ppm; 0÷20 Cl ppm (Total chlorine); 0÷5 Cl ppm
CLS membrane type ion selective for **PPM** measurements: range 0÷2 ppm; 0÷20 ppm; 0÷200 ppm; 0÷2000 ppm;
CLC amperometric open chorine cell: range Free Chlorine range CLC 0÷10 Cl ppm (CLC is FWT Systems chlorine open cell);

Once making e selection consequently display and measurement resolutions will change accordingly.

```
┌──────────────────────┐  ┌──────────────────────┐  ┌──────────────────────┐  ┌──────────────────────┐
│ MENU SETPOINT 1      │  │ MENU SETPOINT 1-2    │  │ MENU SETPOINT 1-2    │  │ MENU SETPOINT 1-2    │
│ ◄  Chlorine Range ►  │  │ ◄  Chlorine Range ►  │  │ ◄  Chlorine Range ►  │  │ ◄  Chlorine Range ►  │
│    0÷2 Cl ppm        │  │    0÷20 Cl ppm       │  │   0÷20 Cl ppm (Tot)  │  │   CLC 0÷10 Cl ppm    │
│   * EXPERT MENU *    │  │   * EXPERT MENU *    │  │   * EXPERT MENU *    │  │   * EXPERT MENU *    │
└──────────────────────┘  └──────────────────────┘  └──────────────────────┘  └──────────────────────┘
```
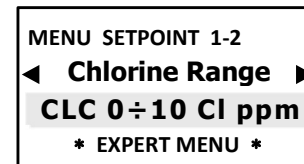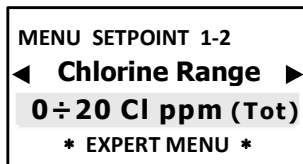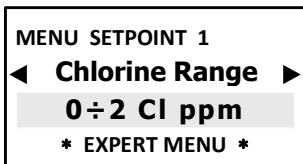
Alarm MIN, **VALID ONLY SET POINT 1**, selects **LOWEST** alarm level: below this point **alarm relay** will be ON.

MENU SETPOINT 1	MENU SETPOINT 1	MENU SETPOINT 1	MENU SETPOINT 1
◄ **Alarm MIN** ►	◄ **Alarm MIN** ►	◄ **Alarm MIN** ►	◄ **Alarm MIN** ►
0.000 Cl ppm	**0.00 Cl ppm**	**0.00 Cl ppm (Tot)**	**CLC 0.00 Cl ppm**
* EXPERT MENU *	* EXPERT MENU *	* EXPERT MENU *	* EXPERT MENU *
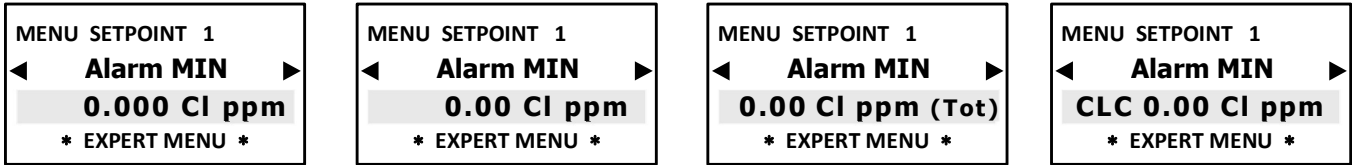
Alarm MAX, **VALID ONLY SET POINT 1**, selects **HIGHEST** alarm: higher this point **alarm relay** will be ON.
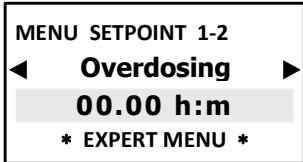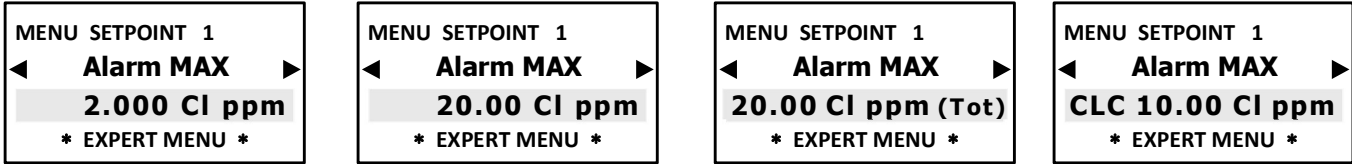
MENU SETPOINT 1	MENU SETPOINT 1	MENU SETPOINT 1	MENU SETPOINT 1
◄ **Alarm MAX** ►	◄ **Alarm MAX** ►	◄ **Alarm MAX** ►	◄ **Alarm MAX** ►
2.000 Cl ppm	**20.00 Cl ppm**	**20.00 Cl ppm (Tot)**	**CLC 10.00 Cl ppm**
* EXPERT MENU *	* EXPERT MENU *	* EXPERT MENU *	* EXPERT MENU *

MENU SETPOINT 1-2
◄ **Overdosing** ►
00.00 h:m
* EXPERT MENU *

Overdosing time-out alarm selects a period for reaching set-point. If set point is not reached within time, controller will block outputs operations including mA outputs. Alarm is ON shown on display and will activate Alarm relay activating an alarm device.

MENU SETPOINT 1-2	MENU SETPOINT 1-2
◄ **Max Dosing** ►	◄ **Max Dosing** ►
000 (no limite)	**000 m / 00 h**
* EXPERT MENU *	* EXPERT MENU *

Max Dosing extra safety function ensuring dosing is carried out within selected time. Relays dosing pumps will open accordingly. This function allows no time limit (dosing continuously in accordance to selected set points) or selects minutes (up to 999) and hours, for example dosing 999 min. within 24 hours.

MENU SETPOINT 1-2
◄ **Startup Delay** ►
00.00 h:m
* EXPERT MENU *

FUNCTIONS ONLY SETPOINT 1 EXPERT MENU

Start-up Delay time "blocks" the relay outputs when switching ON the unit thus allowing sensors to polarize ensuring correct measurements.

MENU SETPOINT 1-2	MENU SETPOINT 1-2
◄ **Priming** ►	◄ **Priming** ►
OFF	**ON**
* EXPERT MENU *	* EXPERT MENU *
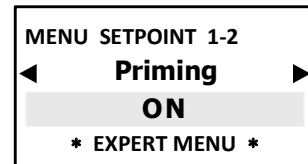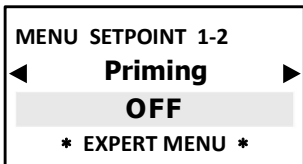
ONLY WHEN USING DOSING PUMPS
Priming function "blocks" the set point value to allow the dosing pumps to be primed, outputs will not be active.
☞ Select **ON**, do not press OK or ESC until dosing pump is primed, then confirm **OK**, display will show **OFF**

☞ Press ESC returns to SELECT MENU or Press ESC ESC to continuous MEASUREMENT DISPLAY

16.0   4-20mA ANALOG CURRENT OUTPUTS FUNCTION SELECTION > EXPERT MENU

Select Menu	Select Menu
◄ **4-20mA1** ►	◄ **4-20mA2** ►

☞ Press OK/MENU to enter mA mode CTRL+ series mA allows choosing between two functions:

4-20mA SETTINGS	4-20mA SETTINGS
◄ **mA Output Mode** ►	◄ **mA Output Mode** ►
mA device	**Dosing Setpoint**
* EXPERT MENU *	* EXPERT MENU *
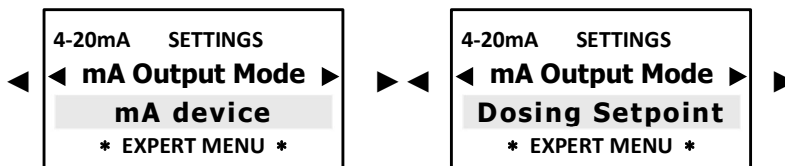
- **AUX** driving data logger or data recorder or other equipment suitable to work with mA signal.
- **DOSING SETPOINT**: driving dosing pumps suitable to work with mA signal.

16.1 - 4-20mA1 / 4-20mA2 OUTPUTS > AUX FUNCTION REMOTE mA DEVICE

CTRL+ analog outputs 4-20mA1 and mA2 follow the option selected for **CHLORINE_PPM RANGE** measuring settings.

```
    Select Menu
     4-20mA
```

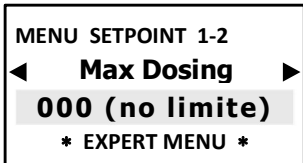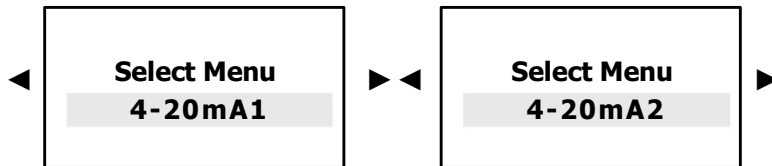*CTRL+ CL series chlorine controller is set as default for a sensor range 0÷2 Cl ppm. Select the chlorine range required, consequently display and measurement resolutions will change accordingly.*

```
4-20mA   SETTINGS
◀ mA Output Mode ▶
    mA device
  * EXPERT MENU *
```

Proportional analog 4-20mA outputs are combined to the unit measurements in real time of any of the chlorine range thus driving remote equipment such as data logger, PLC, Chart recorders or other equipment suitable to process remote mA signal.
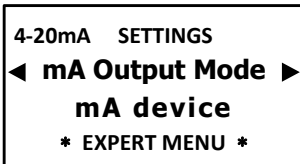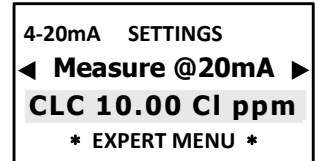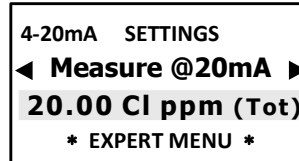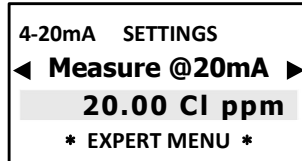
Programming valid for both **mA1** and **mA2**: select the value corresponding to **4** and **20 mA** according to **Setpoint 1**

```
4-20mA   SETTINGS          4-20mA   SETTINGS          4-20mA   SETTINGS          4-20mA   SETTINGS
◀ Measure @4mA ▶          ◀ Measure @4mA ▶          ◀ Measure @4mA ▶          ◀ Measure @4mA ▶
   0.000 Cl ppm              0.00 Cl ppm              0.00 Cl ppm (Tot)         CLC 0.00 Cl ppm
  * EXPERT MENU *           * EXPERT MENU *           * EXPERT MENU *           * EXPERT MENU *
```

```
4-20mA   SETTINGS          4-20mA   SETTINGS          4-20mA   SETTINGS          4-20mA   SETTINGS
◀ Measure @20mA ▶         ◀ Measure @20mA ▶         ◀ Measure @20mA ▶         ◀ Measure @20mA ▶
   2.000 Cl ppm             20.00 Cl ppm             20.00 Cl ppm (Tot)        CLC 10.00 Cl ppm
  * EXPERT MENU *           * EXPERT MENU *           * EXPERT MENU *           * EXPERT MENU *
```

☞ Press `ESC` returns to `SELECT MENU` or Press `ESC` `ESC` to continuous `MEASUREMENT DISPLAY`

16.2 - 4-20mA1 / 4-20mA2 OUTPUTS > DOSING SETPOINT

CTRL+ analog outputs 4-20mA1 and mA2 follow the option selected for **CHLORINE_PPM RANGE** measuring settings.
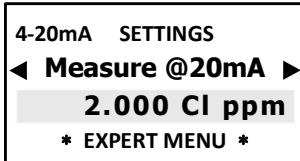
```
    Scelta Menu
     4-20mA1
```
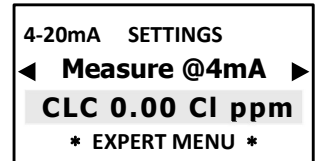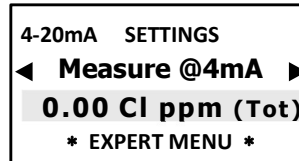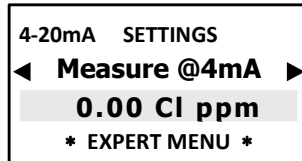
CTRL+ CL series chlorine controller is set as default for a sensor range 0÷2 Cl ppm. Select the chlorine range required, consequently display and measurement resolutions will change accordingly.

```
4-20mA   SETTINGS
◀ mA Output Mode ▶
  Dosing Setpoint
  * EXPERT MENU *
```

Proportional analog 4-20mA outputs are combined to the unit measurements in real time of any of the chlorine range thus driving remote equipment such as data logger, PLC, Chart recorders or other equipment suitable to process remote mA signal.
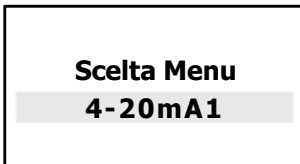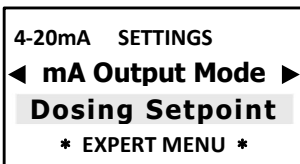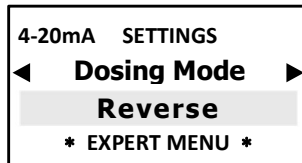
Programming valid for both **mA1** and **mA2**

```
4-20mA   SETTINGS          4-20mA   SETTINGS          4-20mA   SETTINGS          4-20mA   SETTINGS
◀ Setpoint Value ▶        ◀ Setpoint Value ▶        ◀ Setpoint Value ▶        ◀ Setpoint Value ▶
   0.000 Cl ppm             0.00 Cl ppm              0.00 Cl ppm*(Tot)          0.00 Cl ppm
  * EXPERT MENU *           * MENU ESPERTO *          * EXPERT MENU *           * EXPERT MENU *
```

```
4-20mA   SETTINGS          4-20mA   SETTINGS
◀ Dosing Mode ▶          ◀ Dosing Mode ▶
     Direct                   Reverse
  * EXPERT MENU *           * EXPERT MENU *
```
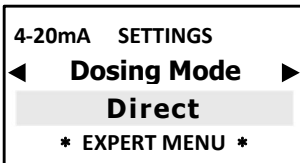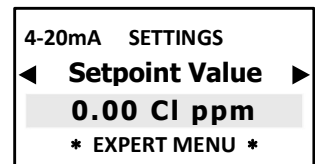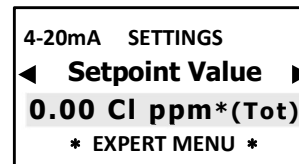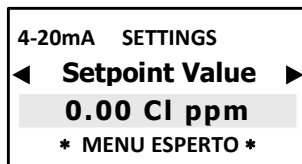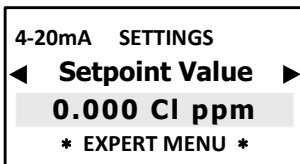
Direct mode operation, meaning that output is active whe measured value is lower than selected set-point, connected dosin pump will be dosing chlorine and vice versa with Reverse Mode

Window Width: sets the distance from set point at which point 4-20mA mode will start: 4 mA = 0 dosing pump pulse, 20 mA = max dosing pump pulses frequency. Window width depends on many variables: distance injection point, reaction time, chemical concentration %, etc....
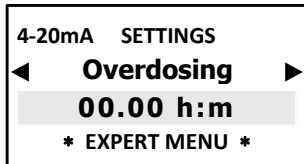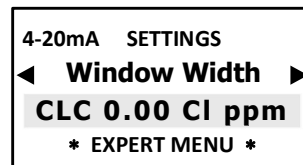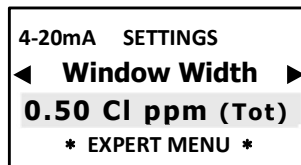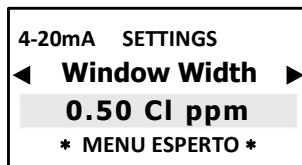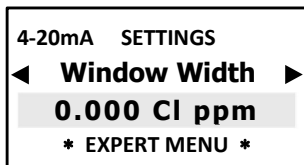
4-20mA SETTINGS	4-20mA SETTINGS	4-20mA SETTINGS	4-20mA SETTINGS
◄ Window Width ►	◄ Window Width ►	◄ Window Width ►	◄ Window Width ►
0.000 Cl ppm	0.50 Cl ppm	0.50 Cl ppm (Tot)	CLC 0.00 Cl ppm
* EXPERT MENU *	* MENU ESPERTO *	* EXPERT MENU *	* EXPERT MENU *

```
4-20mA    SETTINGS
◄     Overdosing     ►
      00.00 h:m
    * EXPERT MENU *
```

Overdosing time-out alarm selects a period for reaching set-point. If set point is not reached within time, controller will block outputs operations including mA outputs. Alarm is ON shown on display and will activate relay4 activating an alarm device.
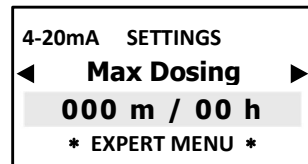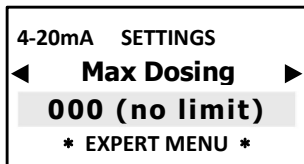
```
4-20mA    SETTINGS
◄     Max Dosing     ►
    000 (no limit)
    * EXPERT MENU *
```

```
4-20mA    SETTINGS
◄     Max Dosing     ►
   000 m / 00 h
    * EXPERT MENU *
```

Max Dosing extra safety function ensuring dosing is carried out within selected time. Relays dosing pumps will open accordingly. This function allows no time limit (dosing continuously in accordance to selected set points) or selects minutes (up to 999) and hours, for example dosing 999 min. within 24 hours.

☛ Press ESC returns to SELECT MENU or Press ESC ESC to continuous MEASUREMENT DISPLAY

17.0 SENSOR CALIBRATION > EXPERT MENU

```
◄    Select Menu
      Calibration      ►
```

☛ Press OK/MENU to confirm selection and to approach next submenu

CTRL+ CL features various ranges of **Membrane** type **Chlorine** or **PPM** membrane sensor and 1 range for open type chlorine cell.
IMPORTANT: membrane sensors type, **CLS** series **DO NOT NEED** ZERO calibration.
However, if sensor conditions are **not ideal,** we RECOMMEND ZERO calibration.
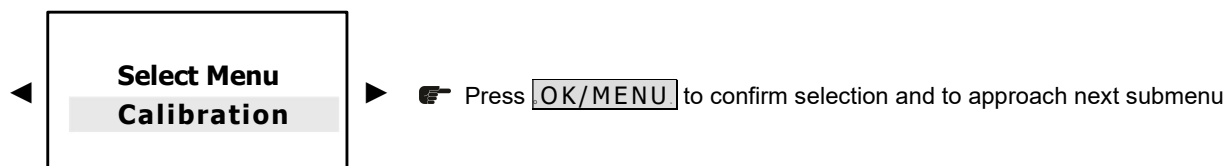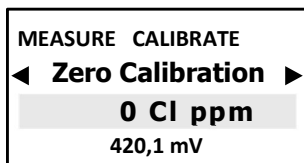For **OPEN** type amperometric cell (FWT **CLC** model)
ZERO Calibration is required !

*During Calibration, it may appear the sign – (minus) which either disappears or is removed by correct values settings ! The mV value at the bottom of the display shows the mV sensor signal thus indicating the sensor efficiency. We recommend a constant control and recalibration of the sensor by means of DPD1 and DPD3 or, when using OPEN chlorine cells (CLS series) to clean **cell electrodes** (refer to page 26÷28)*

```
MEASURE   CALIBRATE
◄  Zero Calibration  ►
      0 Cl ppm
       420,1 mV
```

☛ press ► ensuring **NOT** to press OK, wait 5/10 minutes

.ZERO. adjustment must be made under realistic operating conditions with chlorine-free water !

NOTE: keep in mind that it takes a few hours (minimum 2/3) before the value reading stabilizes, however, the best reference is to visualize the Cl ppm value shown on the display.
A. a **simple method** for calibrating ZERO is to carry out the controller **electronic Zero** as follow: short circuit pins M-0 (13-14) of the internal terminal board. **Operator must be an expert.**
 For this step **ENSURE to DISCONNET THE SENSOR !!!!** Press ▲▼ until showing **0.00** and then confirm **OK.**
NOTE: this mode guarantees the instrument electronic ZERO, this may not be equivalent to the real value of chlorine-free water, which is the chemical physical ZERO chlorine into water.
B. Closed water flow circuit chlorine-free value:
- FOR OPEN CHLORINE CELL: introduce a chlorine-free water stream into the Cell, about 40÷50 l/h.
- FOR MEMBRANE ION-SELECTIVE SENSORS: deep the sensor into a chlorine-free water container and gently shake the it (without touching any surface or ensuring no air bubbles) and wait for the measurement to stabilize.
 1st INSTALLATION wait that values stabilise (about 2 hours)
  Press ▲▼ until showing **0.00** then confirm .OK/MENU
 2nd RICALIBRATION wait that values stabilise (minimum 1 hour or longer)
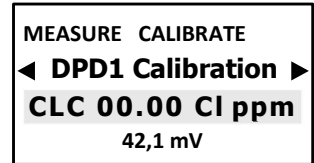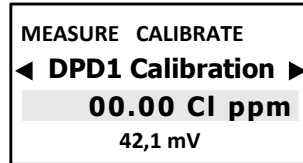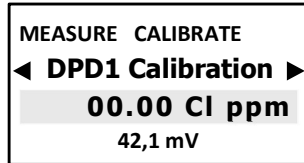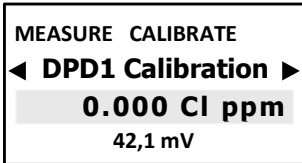 Press ▲▼ until showing **0.00** then confirm OK/MENU
B. Activated carbons, only for OPEN TYPE AMPLOMETRIC CELL (FWT CLC model).
- Install a by-pass system ahead of the sensor holder and let the water run through an Activated Carbon cartridge: press ▲▼ until showing .**0.00**. and then confirm .OK/MENU

NOTE: activated carbons tend to reduce the pH value thus making the calibration redundant and they must be changed after each calibration and do not guarantee the effective Zero value. This mode is the least recommended due to its complexity

PROCEDE TO CALIBRATION POINT / IMPORTANT: CHECK SENSOR-CONTROLLER INPUT mV SIGNAL (page 31)

MEASURE CALIBRATE	MEASURE CALIBRATE	MEASURE CALIBRATE	MEASURE CALIBRATE
◄ **DPD1 Calibration** ►	◄ **DPD1 Calibration** ►	◄ **DPD1 Calibration** ►	◄ **DPD1 Calibration** ►
0.000 Cl ppm	**00.00 Cl ppm**	**00.00 Cl ppm**	**CLC 00.00 Cl ppm**
42,1 mV	**42,1 mV**	**42,1 mV**	**42,1 mV**

Select required sample solution value and verify with test kit **DPD1** for free chlorine or **DPD3** for Total chlorine, or by means of portable controller, measure the concentration of free (or total) chlorine ppm in water.

☞ Press OK/MENU to confirm selection

☞ Press ESC to SELECT MENU.

☞ Press ESC ESC to continuous MEASUREMENT DISPLAY.

NOTE: ideally it takes a few hours before the value reading stabilizes, however, the best reference is to visualize the Cl ppm value shown on the display.

18.0   START/STOP TIMES > EXPERT MENU

Select Menu
Start/Stop Times

Real time clock programs the working days and exact time of the unit operations.

START/STOP TIME
◄   **Monday**   ►
00:00◄–►24:00
✱ **EXPERT MENU** ✱

START/STOP TIME
◄   **Tuesday**   ►
00:00◄–►24:00
✱ **EXPERT MENU** ✱

Select date and time following the backlit steps.

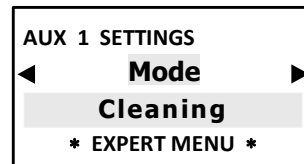☞ Press ESC returns to SELECT MENU or Press ESC ESC to continuous MEASUREMENT DISPLAY

19.0   AUX OUTPUT > EXPERT MENU

◄ Select Menu
Aux Output #1 ►
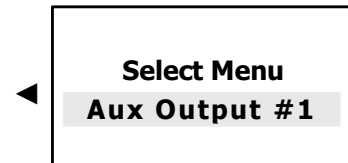
Auxiliary output can control various functions related to remote equipment which can be programmed according to the different selected settings.
BENEFITS: this function make this controller a very versatile management unit not only to measure chemical-physical parameters but also for other functions related to the systems where is installed such as flocculants dosing pumps, open solenoid valves, irrigation systems, other devises connected to the main system.

☞ Press **OK/MENU** to confirm selection and to approach next submenu.

If operator in paragraph "**8.2 - SELECTING CHLORINE MEASURING RANGE**" has selected **ClC 0-10 ppm** (Open Chlorine Cell sensor, FWT series CLC) **AUX1** output can be set to control a remote equipment for a **Cleaning** program of Open Chlorine cell (CLC); AUX2 and AUX3 only have control of remote equipment. Selecting **Remote Equipment** controller can control and/or drive external device and dosing pump according to a selected program:

AUX 1 SETTINGS
◄   **Mode**   ►
Remote equipment
✱ **EXPERT MENU** ✱

AUX 1 SETTINGS
◄   **Mode**   ►
Cleaning
✱ **EXPERT MENU** ✱
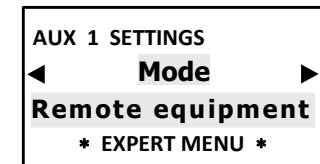
To program select functioning AUX mode.

AUX1 can be used for Open chlorine cell (CLC) automatic maintenance cleaning.

☞ Press ESC returns to SELECT MENU or Press ESC ESC to continuous MEASUREMENT DISPLAY

Digit in highlighted steps ☞ select required settings, confirm **OK** move to next step, here following programming steps to select:

Aux 1	Program 01
Active time (h:m)	**00 : 00**
Start time (h:m)	– – : – –
Days Enabled	Mon : –
Tue: – Wed : –	Thu : –
Fri : – Sat : –	Sun : –
Weeks 1 : – 2 : – 3 : – 4 : –	
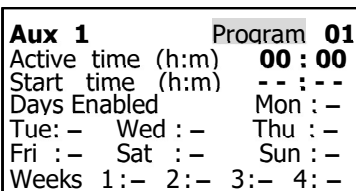
Program settings features many steps, which can be programmed to have the most accurate operation with absolute precision (up to 99 programs for each AUX output).

Operator must enter in each highlight step ☞ and select required parameters then confirm with **OK** and move to next step, here is the programming approach:

AUX 1 **Program** **01**	Press ◄► it selects program number (up to 99 programs for each biocide), Confirm with **OK**, automatically it moves to next step
Active time (m:s) **01:00**	Select the time cycle of the connected On-Off equipment Press ◄► it selects minutes, confirm **OK** moves to seconds digits, press ◄► Select seconds, confirm with **OK** automatically it moves to next step
Start time (h:m) **10:30**	Select the start active time of the connected On-Off equipment will Press ◄► it selects hours, confirm with **OK** moves to next highlighted digits, Press ◄► it selects minutes, confirm **OK** automatically it moves to next step
Days Enabled Mon : N ... Y	Select the days when connected On-Off equipment will operate Press ◄► to select the day when active and ◄► **Y** yes or **N** not Confirm **OK** automatically it moves to next step
Weeks 1:Y 2:N 3:N 4:N	Select the week of the month when connected On-Off equipment will operate Press ◄► to select the day when active and ◄► **Y** yes or **N** not Confirm OK automatically it moves to next step

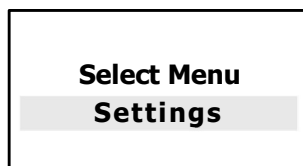☞ Press ESC returns to SELECT MENU or Press ESC ESC to continuous MEASUREMENT DISPLAY

20.0 SETTINGS > EXPERT MENU

```
  Select Menu
   Settings
```

ⓘ

```
CONTROLLER  SETTINGS
◄  Programming  ►
     BASIC
 * EXPERT MENU *
```
```
CONTROLLER  SETTINGS
◄  Programming  ►
     EXPERT
 * EXPERT MENU *
```

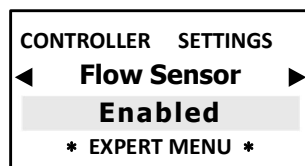**BASIC** programming: simplified mode for not professional operators
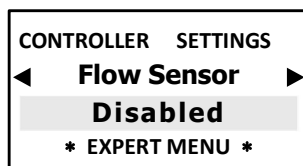
EXPERT programming: complete programming including functions for a more refined control and results.

ⓘ *After selecting, e.g. choosing EXPERT, at first display will still show Basic but as soon as moving to other steps it will change to Expert, and vice versa.*

```
CONTROLLER  SETTINGS
◄    Date    ►
  2017 May 14
 * EXPERT MENU *
```
```
CONTROLLER  SETTINGS
◄    Time    ►
    12:02
 * EXPERT MENU *
```

Select date and time following the backlit item to program.

```
CONTROLLER  SETTINGS
◄  Flow Sensor  ►
    Disabled
 * EXPERT MENU *
```
```
CONTROLLER  SETTINGS
◄  Flow Sensor  ►
    Enabled
 * EXPERT MENU *
```

Enabling Flow sensor, in case no water flows into sensor cell holder, the controller will deactivate all outputs thus ensuring that no extra chemical is added.

```
CONTROLLER  SETTINGS
◄  Temp.Probe  ►
    Manual
 * EXPERT MENU *
```
```
CONTROLLER  SETTINGS
◄  Temperature  ►
     XX°C
 * EXPERT MENU *
```
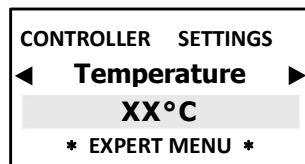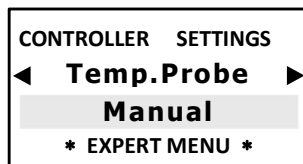
Manual temperature compensation 0÷100°C.
☞ Press ◄► select the existing water temperature into the plant to treat.
Selecting Manual mode, if user does not select any temperature value, controller will set 25°C value as default, programmable.

```
CONTROLLER  SETTINGS
◄  Temp.Probe  ►
     Auto
 * EXPERT MENU *
```
```
CONTROLLER  SETTINGS
◄ Probe Calibration ►
     XX°C
 * EXPERT MENU *
```
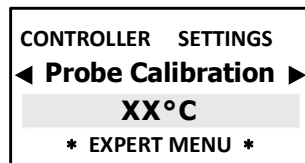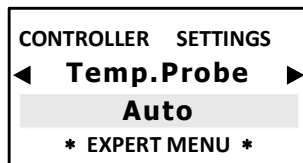
Selecting **Auto** automatic compensation of temperature/electrode measurements, the controller will always show the exact PH value against the current temperature.

Press ◄► to show the temperature into the water to calibrate temperature sensor PT100

```
CONTROLLER  SETTINGS
◄ Modbus Address ►
     240
 * EXPERT MENU *
```
```
CONTROLLER  SETTINGS
◄ Baudrate Modbus ►
     38400
 * EXPERT MENU *
```
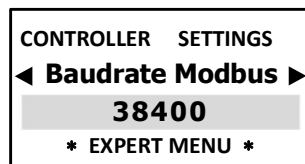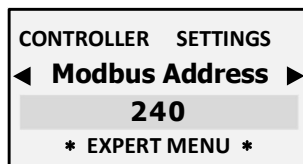
ONLY IF YOU CONNET CONTROLLER TO EXTERNAL MODULE RS485 / ETHERNET
Modbus Address: from 0 to 254
Baudrate Modbus: transmission speed.
When you open the software via PC, smartphone or tablet, user **must set up a referral email** to receive messages and information
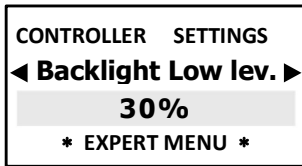
CONTROLLER SETTINGS ◄ **Backlight Low lev.** ► **30%** ∗ EXPERT MENU ∗	It adjusts the display save energy mode backlight level; touching any button will restore full 100% display operative brightness.
CONTROLLER SETTINGS ◄ **Language** ► **English** ∗ EXPERT MENU ∗	It selects the programming menu language.
CONTROLLER SETTINGS ◄ **Factory Settings** ► **NO** ∗ EXPERT MENU ∗	FACTORY SETTINGS: it restores factory default settings. To be used ONLY when parameters or measurements are not responding correctly or when user wants to ensure to re-program from zero. Not to abuse, continuous restoring can affect controller efficiency.

CONTROLLER   SETTINGS
◄ **Factory Settings** ►
YES
∗ EXPERT MENU ∗

◄

CONTROLLER   SETTINGS
CONFIRM ?
NO
∗ EXPERT MENU ∗

► ◄

CONTROLLER   SETTINGS
CONFIRM ?
YES
∗ EXPERT MENU ∗

►

Once confirmed **YES**, display will be OFF for 1 second than will return to continuous MEASUREMENT DISPLAY

21.0   SENSORS CLEANING AND MAINTENANCE

21.1 - MEMBRANE TYPE CHLORINE_PPM SENSOR INSTALLATION, MAINTENANCE AND WIRING

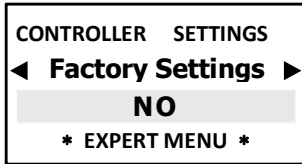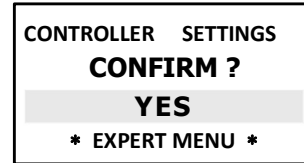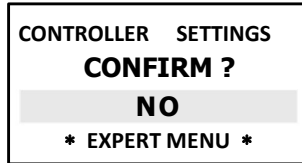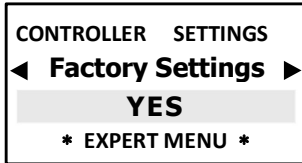**Installation:** push the cap with the PG7 screw-connection over the measuring cable. Then fasten the wires in the terminal. Screw in the cap by hand until the o-ring seals. Now tighten the PG screw-connection and fix the cable. For the disconnection untighten the PG screw-connection so that the cable is released. Recommended cable: diameter approx. 4 mm, 2 x 0,25 mm².

PLEASE NOTE: CTRL CL offers various chlorine ranges by adapting the controller to the different type of sensors characteristic. The most used probes are:

CLS membrane type ion selective: **Chlorine** range 0÷2 Cl ppm; 0÷20 Cl ppm; 0÷20 Cl ppm (Total chlorine); 0÷5 Cl ppm

CLS membrane type ion selective for **PPM** measurements: range 0÷2 ppm; 0÷20 ppm; 0÷200 ppm; 0÷2000 ppm;

CLC amperometric open chorine cell: range Free Chlorine range CLC 0÷10 Cl ppm (CLC is FWT Systems chlorine open cell);

NOTE: the user must be careful of the sensor in his possession when he must wire the probe to the terminal board as shown in paragraph 4 on page 10.
Place chlorine sensor into off-line holder and connect to Terminal board and check sensor wires configuration before connecting to mains.

CHLORINE SENSOR CABLE WIRINGS

Sensor connector 4 or 16 poles	**CLS** series wirings
Cable	**Brown** **White** **Yellow** **Green**
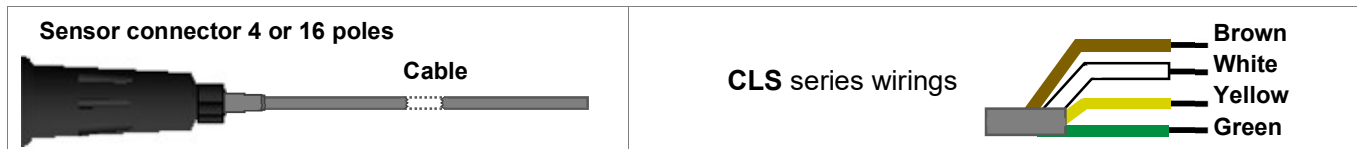
CLS series

- Pin **8** (**–**) = **–** 12Vdc **white** wire
- Pin **9** (**+**) = **+**12Vdc **brown** wire
- Pin **10** (**M**) = Measurement **IN green** wire
- Pin **11** (**0**) = GROUND **yellow** wire

⚠ CAUTION ⓘ **VERY IMPORTANT NOTE:** *when using sensors for other PPM measurements, wiring parameters may change, therefore, please contact and advice FWT SYSTEMS customer service.*
If the ion-selective membrane sensors are incorrectly connected and / or have a wrong configuration, they can easily be damaged irreparably

Counter electrode   Reference electrode   Working electrode   O-Ring   Membrane / Electrolyte cap

Vent   Membrane disc holder   Membrane disc
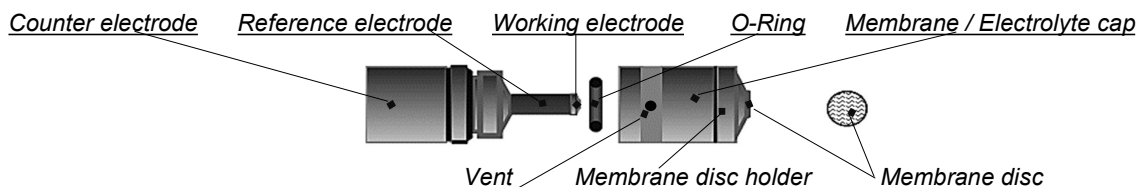
Electrical specifications: power supply: min. voltage 12 VDC (load resistor max. 50 Ohm) max. voltage 30 VDC (load resistor 50 until 900 Ohm). The connection is protected against wrong polarity of the power supply.
Maximum current by overloading is approx. 30 mA.

Technical data, general description and information: the chlorine sensor is a membrane covered potentiostatic 3-electrode system, with a specially placed counter electrode. The measuring electrode is membrane covered and is in the electrolyte area together with the reference electrode. This area contains a special electrolyte and is separated from the measuring water. In this measuring method, chlorine diffuses out of the measuring water, through the membrane and causes in compound with the electrolyte an electrical signal at the measuring electrode. This method is patented. The electrical signal at the measuring electrode is proportional to the chlorine concentration and is amplified by the electronics of the sensor. The measuring signal is independent from the temperature of the measuring water due integrated temperature compensation. The exterior housing of the probe consists of stainless steel, PVC and silicon rubber. The probe diameter is 25mm, length 175mm; when they have a plug adapter and 4÷20mA model length is 220mm. Each probe has been tested and the results are documented.

- Zero-point calibration is normally not necessary.
- Provided pressure remains constant, the probe can be used up to approx. 1 bar. But air bubbles are not allowed to be in the water. In front of the membrane, they prevent the disinfectant passing through resulting in a false reading of the probe.
- Response time T_{90} is about 1 min.
- Recommended flow is 30 L/h. A minimum flow rate is necessary. The flow rate must be constant.
- Recommended temperature range is 5÷45°C. The measuring signal is independent of temperature.
- Dependence from pH-value is highly reduced regarding to the previous systems for chlorine measurement. The measuring signal decreases with approx. 10% per increasing pH-step
- The lifetime of the membrane disc is normally one year but can vary considerably depending on the water quality. Heavy contamination of the membrane should be avoided.
- Controller and probe must operate continuously. The probe must not be allowed to stand dry.
- To store the probe the membrane cap is unscrewed. Membrane cap and electrode finger are rinsed in clean water and dried in a place free of dust. The dry membrane cap is then loosely screwed onto the electrode shaft. The membrane must not rest against the measuring electrode.
- When putting the probe back into use after storage, the electrode tip must be cleaned with the special abrasive paper and a new membrane cap must be used.
- When there is lime on the membrane, it can be inserted in thinned acid for a few hours. Then cleanse the membrane cap carefully with clean water and put it into operation.

VERY IMPORTANT NOTE: *when using sensors for other PPM measurements, wiring parameters may change, therefore, please contact and advice FWT SYSTEMS customer service.*
If the ion-selective membrane sensors are incorrectly connected and / or have a wrong configuration, they can easily be damaged irreparably

21.2 - OPEN CHLORINE CELL INSTALLATION, MAINTENANCE AND WIRING

CHLORINE Open Cell

PIN 13 = BLUE WIRE

PIN 14 = BROWN WIRE

Blue wire   **Brown wire**
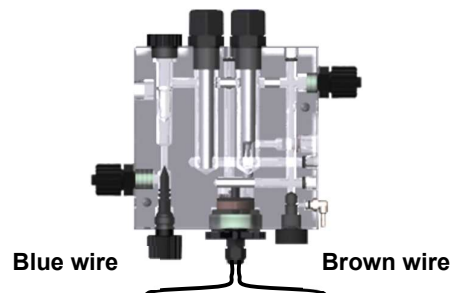
CLC open type chorine cell: range CLC 0÷10 Cl ppm;

INSTALLATION

- Mount the cell on the wall or onto a panel as shown in Fig.1 and connect hydraulic parts.
- To ensure the most efficient operation it is strongly recommended to install ahead of the cell a water filter of 50 - 80 microns.
- Connect the cell wires to the controller connection clamp following strictly wires polarity according to their colors BROWN/Platinum (PT) and BLUE/Copper (CU).
- The cell CLC is set to host a proximity switch (provided with CLC), 2 electrodes (pH and Rx) and a Temperature probe (only FWT model STEMP2). For electrical connection, refer to controller manual.
- **VERY IMPORTANT:** Once water is flowing internally, by means of a valve, adjust the water flow ensuring it stabilised by checking the movement and rotation of the balls between the two electrodes, thus getting the most efficient results. As soon as the ball rotation is steady, ensure that water flow remains constant during operations.
- Connect the cell wires to the controller connection clamp following strictly wires polarities according to their colours BROWN/Platinum (PT) and
- Power ON the controller and proceed to calibration according to controller instructions.

MAINTENANCE

After a period of operation of the cell, it is possible that calibration results difficult to obtain, in this case it is necessary to clean the electrodes proceeding as follows:
- Stop the water flow and remove the cell from the wall.

- Relapse electrode clamp as much as possible (otherwise, it may cut internal wires), remove Copper-Platinum electrodes unscrewing the cap, ensuring to collect all the glass balls.
- Clean the electrodes with detergent for grease, ensuring not to damage electrodes, especially the platinum one. For the latter, use a delicate brush whilst for the copper electrode is needed Hydrochloric acid solution and abrasive paper to remove the oxidized part (remove the basket from the copper).
- Reassemble the cell and allow water to flow adjusting the flow as described in above installation procedure. Let it stabilize for about 12 hours, then next day repeat calibration procedure.
- Calibrate the chlorine cell. PLEASE NOTE: (2/3 h) the CLC cell will need the first time few hours after calibration until the measurement is stabilized.

FOR BEST RESULTS: It is very important to have a steady and stable water flow and almost a daily cleaning to avoid any measuring drifts.

MORE ABOUT CLC MAINTANANCE

CTRL+ features AUX output can drive the external peristaltic comprised in FWT **CLEANING KIT CLC** to dose appropriate chemical to maintain copper electrode according to a selected program

1. ensure that a water filter is always mounted in front

2. ensure that the water flow is constant (without any hammer stroke, sudden increase of pressure)

3. frequently clean with some acid (commercial HCL 10%) or detergent the cell platinum and copper electrodes (better is using our cleaning kit as in price list **CLEANING KIT CLC**

4. After the first calibration, the time to stabilise the electrodes after the cleaning if about 2/3 hours max.

5. if the cell has been working continuously, make a visual check of the internal electrodes, and if they are not in good shape (distorted or dark colour which is not cleaned with previous cleaning kit), just change the electrodes and glass balls.
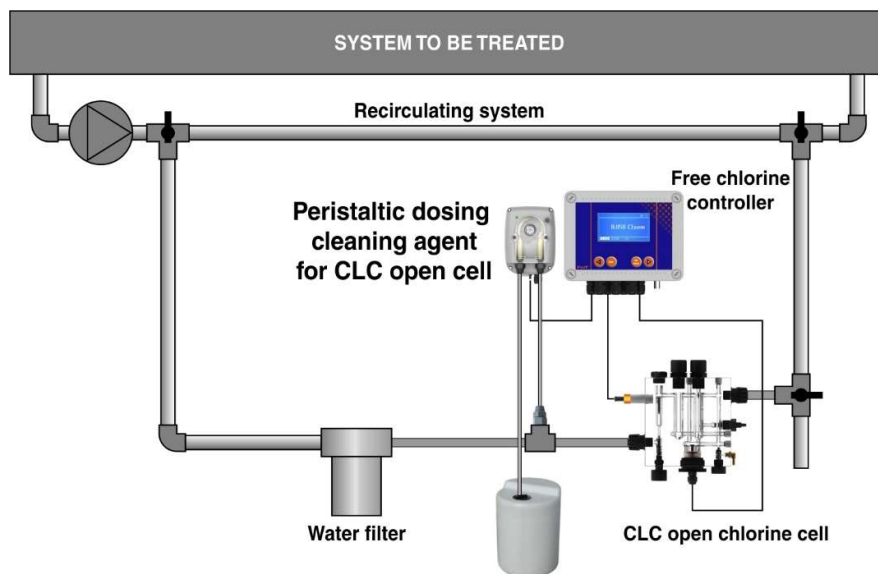
22.0   CTRL+ CL (PPM) TYPICAL INSTALLATIONS

Herefollowing installation diagrams are just examples of typical installation. However, each system to be treated differs from one another, therefore ensure that installation responds to commissioning requirements following the instructions in the present booklet.

22.1 - CLS1/P HOLDER FOR MEMBRANE TYPE CHLORINE SENSOR

1. Inlet fitting and nipple for incoming water flow
2. Proximity switch
3. Temperature probe PT100
4. Membrane Ion selective Chlorine sensor
5. Outlet fitting and nipple

22.2 - CLC CHLORINE OPEN CELL (CLC SERIES) ELECTRODE HOLDER
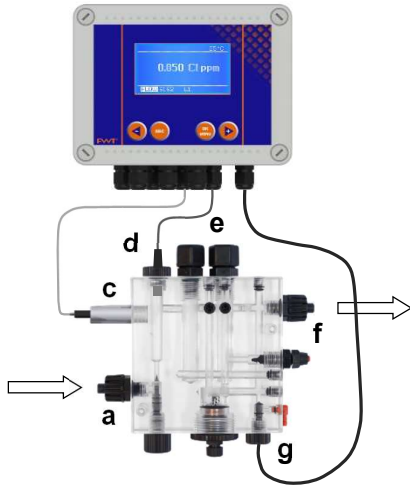
a. Inlet fitting and nipple for incoming water flow
b. Open amperometric chlorine cell
c. Proximity switch
d. Housing for Temperature probe PT100
e. Housing for pH and RX electrodes
f. Outlet fitting and nipple
g. Cell copper/platinum electrodes connection wires

22.3 - LEVEL CONTROL PROBES AND DOSING TANKS INSTALLATION

Dosing Tank

Level
Floating
Switch
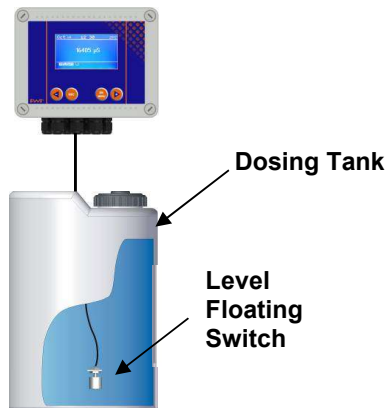
23.0   OVERALL DIMENSIONS / ENCLOSURE CHARACTERISTICS
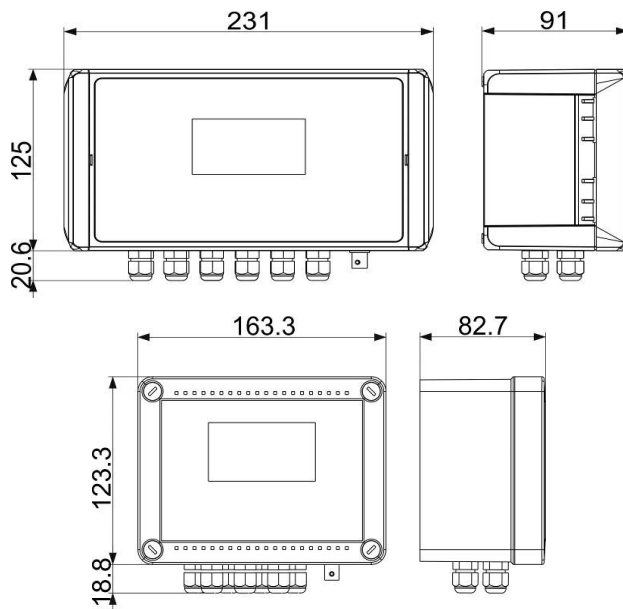
CTRL
Dimension mm
Net weight: 1230 gr
Gross weight: 1530 gr

CTRL B
Dimension mm
Net weight: 700 gr
Gross weight: 1000 gr

Enclosure:	Material - Protection **CTRL**	Plastic ABS-V0 self-extinguish IP66, hinged front panel with safe lock
	Material - Protection **CTRL B**	Plastic ABS-HB self-extinguish IP56, lid with captive screws
	Front controls	Polycarbonate adhesive
	Working temperature	0÷50 °C

29

24.0   TROUBLESHOOTING CONTROLLER

⚠️ **WARNING:** *ignoring safety information can endanger life or result in serious injury !*

⚠️ **BEWARE:** *in presence of chlorine gas or an environment saturated with it, ensure to disconnect the power supply of the chlorine gas dosing equipment; ensure also to secure the power supply to other equipment being part of the plant.*

⚡ ***Before working on the unit, disconnect it from mains network***

MALFUNCTION	POSSIBLE CAUSE	*SOLUTION*
1. Display is OFF	No power supply	*a. Check electrical connections*
		b. Check if mains correspond to power supply printed instrument label.
	Burning smell	*Check pcb and replace it under FWT authorization*
2. Error **NO LINK WITH METER**	Wrong alignment of the pins between circuit boards	*Check the electrical flat cable or the two circuit boards connecting pins alignment or the measuring board two side selectors position. If problem persists, contact FWT Systems customer service.*
4. Display measurements do not move (there are no changes)	Chlorine levels are **NOT** stable	*Double check levels by means of portable instrument or colorimetric kit, for Chlorine reference measure.*
	Signal from sensor doesn't change	*Repeat sensor calibration and if the problem remains change the probe*
5. Display measurements change continuously (measuring jumps)	Electrical disturbs from electrical local network	*Check the electrical local network. Check system ground connection.*
	Micro-Electrical disturbs into the measuring liquid	*Check controller calibration, if controller measures correctly eliminate electrical disturbs and refer to below point A.*
6. It is not possible to complete sensor calibration procedure	Buffer solution kit old or contaminated	*Change buffer solution and use portable Kit*
	Sensor is defective	*Check sensor lifetime: for electrodes, if it's over 1 year old change it.*

***IMPORTANT TESTS** in the above cases 2, 3, 4, always test the unit functioning making the following steps:*
A. *Dismount the unit from the system and mount it into another room or you own lab without connection to other equipment but directly to local network mains.*
B. *Recreate into a bucket with fresh water the physical-chemical conditions as in the plant, for chlorine levels.*
C. *Program the unit and calibrate the sensor.*
  a. *If results are a correct unit functioning, it means there are problems with the systems*
  b. *If problems persist, change sensor with brand new ones: if problem persist, the unit is defective, contact the Manufacturer or Dealer*

5. Set-point relay doesn't close the contact	Set-point value is incorrect	*Change set-point value*
	Set-point "direction" mode is incorrect	*Change set-point function mode, direct or reverse, from the menu functions*

ℹ️ *Ensure that the system EARTH, in which the controller operates, is properly carried out, including pipes, other equipment installed, relays, etc.*

⚠️ **CAUTION** **KEEP IN MIND:** *unit with universal voltage 100÷250Vac (±10%) or 9÷24Vdc. If the actual voltage is constantly at the limit (lower or higher), or when spikes are much higher than mentioned range, the unit pcb is electronically protected against Voltage fluctuations; outside the above-mentioned ranges, controller will not work and circuit boards must be replaced. We **RECOMMEND** using voltage protections, checking system ground and, when connecting in parallel other units, using remote contact switch. A plant not built according to correct electrical rules, without a ground system, with frequent ON/OFF operations, could directly affect the circuit boards. It is also suggested installing a UPS (Uninterruptible Power Supply) to ensure power continuity. A discontinuous voltage along with many On/Off operations, could affect the pcb's integrity and Data loss.*

25.0   CONTROLLER TECHNICAL CHARACTERISTICS

Measuring range Chlorine range ppm (free or total) or PPM, **Membrane type** sensor: *PWM = Pulse Width Modulation*	**Dynamic measuring range input ± 2500 mV** (it reaches ± 2995 mV)		
	▪ 0÷2 ppm=Resolution 0.001	Hysteresis=0.005	PWM point=0.050 ppm
	▪ 0÷20/10 ppm=Resolution 0.01	Hysteresis= 0.05	PWM point=0.50 ppm
	▪ 0÷200 ppm=Resolution 0.1 ppm	Hysteresis= 0.5	PWM point=0.5 ppm
	▪ 0÷2000 ppm=Resolution 1 ppm	Hysteresis= 5	PWM point=5 ppm

Measuring range Chlorine range ppm (free), **Amperometric Open Cell** type:	▪ 0÷10 ppm (Open type sensor or cell) / Resolution 0.01 Cl ppm
	▪ range 0÷10 Cl ppm / Hysteresis = 0.05 Cl ppm / PWM point = 0.50 Cl ppm

Temperature setting:	Manual or automatic compensation (latter combined temperature probe PT100)
	▪ Resolution 0.1% °C ▪ Accuracy: ± 0.5% °C
Temperature probe range:	– 20 ....100°C
	▪ Resolution 0.1% °C ▪ Accuracy: ± 0.5% °C

Power supply:	Universal power supply 100÷250Vac / 5W at 240Vac
	Upon request power supply 9÷36 Vdc / 9÷24 Vac
Microprocessor technology:	SMD components mounting, digital controls keypad 6 key
Linearity, Stability Reproducibility:	± 0.5 % under standard conditions
Display:	back-lit display 126x64; Display visible area 70x37 mm
Delay on Set-point:	Delay time relay activation, programmable for each set-point (999 sec.)
Start-up Delay:	Delay time relay when switching ON the unit, programmable
Power consumption = Nominal current:	230Vac 3W 13mA ▪ 24Vac-dc 3W 125mA ▪ 12Vdc 3W 250mA
Internal electrical protection:	power supplier guarantees electrical protection (instead of fuse)
Level / Remote relay control	Chemical additive level (level switch not included) output voltage +5Vdc

Outputs:	Output RELAY A (set-point 1):	CHLORINE_PPM ON-OFF / PWM mode voltage free contact, relay 5Amax 230Vac
	Output RELAY B (set-point 2):	CHLORINE_PPM ON-OFF / PWM mode voltage free contact, relay 5Amax 230Vac
	Output RELAY C (AUX):	AUXILIARY ON-OFF remote equipment free contact 5Amax 230Vac
	Output RELAY D (ALARM):	ALARM contact voltage free 5Amax 230Vac
	FLUX sensor (proximity switch):	It blocks output operations in case of no flow into the sensor cell
	0/4...20 mA1 output:	Adjustable (500 Ω max input impedance), with galvanic separation. Related to Chlorine_PPM measuring settings.
	0/4...20 mA2 output:	Adjustable (500 Ω max input impedance), with galvanic separation. Related to Chlorine_PPM measuring settings.
	Signal for chlorine sensor	1w a 12V = 80mA, available for sensor running approx. 50mA
	Unit load:	Resistive load 5A at 230Vac / Inductive load 0.5A at 230Vac
	Insulation voltage relay output:	> 3000Vac
	Relay contact lifespan:	≥ 5x10^4 switching operations (5A at 230Vac)
	Noise Level:	Irrelevant

Unit Working temperature:	Ideal working temperature 5°C÷40°C, withstand 0°C÷45°C
Environmental Conditions:	Possibly dry environment, altitude up to 2000m, Relative humidity 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40°C. Pollution degree 2.
Transport and storage conditions:	– 5÷60°C possibly dry environment

UPON REQUEST Optional included with remote control via Ethernet/RS485:	FWT Smartapp® software for connecting the unit via "**Intranet**" (local network)
	ETHERNET / RS485 connection EXTERNAL module + micro SD memory card 16 GB
	RS485/USB cable (to connect unit to a pc via RS485 protocol) also capable to connect to PLC by a RS485/USB adaptor (upon request FWT provides registers protocol to use with third party software)
	Data Logger via FWT software "SmartApp®"
	RS485/USB cable (to connect CTRL+ unit to a pc via RS485 protocol)
	Ready for Wifi connection for remote control (WiFi / Usb adapter not included)
	FWT Smartapp "**CLOUD**" for remote control via the "**Internet**" through FWT server

FWT "CLOUD" SYSTEM

FWT features a useful service which will allow the customers to monitor and control from anywhere in the world the controllers installed in any place in the world: FWT "CLOUD" SYSTEM. This platform, installed in FWT own server, will enable the user in charge with servicing the plant, to remote control and monitor FWT instrument operations: the user, in possess of the controller authentication certificate, will create a free internet account in FWT server: user will access its own personal area. The platform will show a geographical map (which can be zoomed at like) pointing out all the registered controllers the user has installed in the area; once identified the controller to monitor, the user will log in the controller software (FWT SmartApp®) allowing the visualization of the current measurements and have the possibility to modify all the main parameters.

FWT "CLOUD" SYSTEM is available for those controller that feature RS485 Modbus protocol, Ethernet connection, FWT SmartApp® software

---

WASTE OF ELECTRICAL AND ELECTRONIC EQUIPMENT DIRECTIVE (WEEE, RAEE in Italy) UP TO LAST EDITION

The marking shown below indicates that the product cannot be disposed of as part of normal household waste. Electrical and Electronic Equipment (EEE) can contain materials harmful to health and the environment, and therefore is subject to separate waste collection: it must be disposed of at appropriate waste collection points or returned to the distributor against purchase of new equipment of similar type or having the same functions. The directive mentioned above, to which refer for further details, provides for punitive actions in case of illegal disposal of such waste.

FWT SYSTEMS S.r.l.
Via Cancelliera 16,
Ariccia (RM) 00072, ITALIA
Tel.+39 06 9311940 / 06 9316 0328
Fax +39 06 99334972
info@fwtsystems.it

www.fwtsystems.it

CTRL+ CL (PPM)   *Rev. 01_0920*