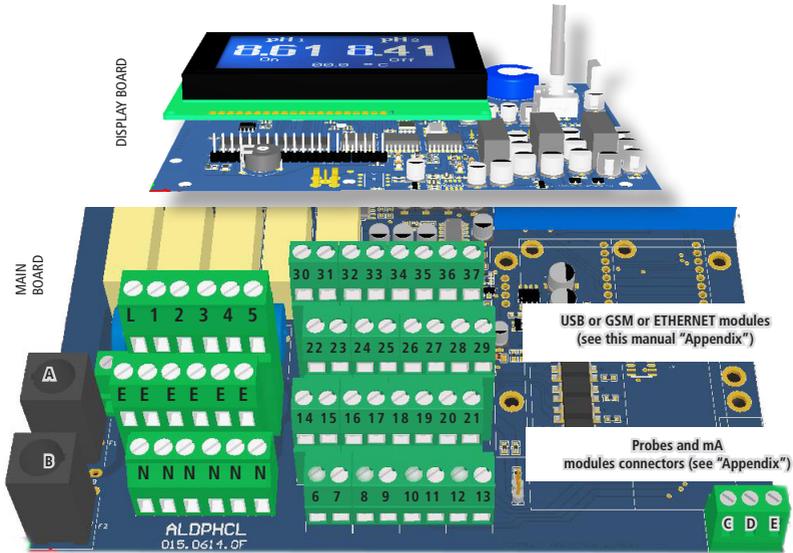


3. Mainboard Connections

Unplug instrument from main power supply then perform connections by following the above picture.



- A: Main Fuse (6A T)
- B: Instrument Fuse (3.15A T)
- C - D - E : Factory reserved +5V

- L(Live) - E(Earth) - N(Neutral): 85±264VAC* or 18±36VAC* 50/60 Hz *see instrument's label
- 1(Live) - E(Earth) - N(Neutral): 85±264VAC - 5A 50/60 Hz Relay Output "CL Relay 2". To use with ON/OFF or PWM device
- 2(Live) - E(Earth) - N(Neutral): 85±264VAC - 5A 50/60 Hz Relay Output "CL Relay". To use with ON/OFF or PWM device
- 3(Live) - E(Earth) - N(Neutral): 85±264VAC alarm output (MAX 5A)
- 4(Live) - E(Earth) - N(Neutral): 85±264VAC "SELF CLEAN" output (MAX 5A)
- 5(Live) - E(Earth) - N(Neutral): 85±264VAC "CIRCULATOR PUMP" output (MAX 5A)

6(Green) - 7(Brown) - 8(White) - 9(Yellow): PT100 temperature probe (remove jumper / resistor prior to install probe)

- 11(-) - 10(+): Standby contact
- 11(-) - 12(+): CL Level 1 contact
- 19(-) - 18(+): CL Level 2 contact

14(+ Brown) - 15(Black) - 16(- Blue) - 17(GND): Proximity sensor mod. "SEPR" (dont' remove jumper between blocks 16 and 17)

21(GND) - 28(+RS485) - 29(-RS485): RS485

- 24(-) - 25(+): Opto coupled output "CL PULSE". To use with "IS", "MF", "PLUS" series dosing pumps
- 26(-) - 27(+): Opto coupled output "CL PULSE 2". To use with "IS", "MF", "PLUS" series dosing pumps

- 31(-) - 32(+): mA Current Output Cl
- 34(-) - 35(+): mA Current Output Temperature
- 31(-) - 30(+): mA Current Output PID

} Max resistive load: 500 Ohm

36(+); 37(-): WM Input (max input frequency 500Hz)

Warning: Connections must be performed by qualified and trained personnel only.

8. "Set-Point", CI working modes

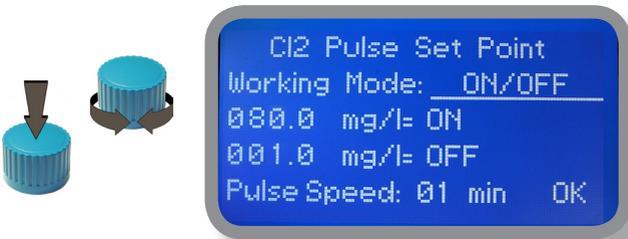
For "CL pulse" and "CI pulse 2" outputs, setpoint can be set using **On/Off mode, Proportional (%) mode or disabled (OFF)**. For "CL relay" and "CI relat 2" outputs, setpoint can be set using **On/Off mode, Proportional PWM mode, Fixed PWM mode or disabled (OFF)**.



8.1 "Set-Point", CI (on/off)

This mode is valid for all CI related outputs.

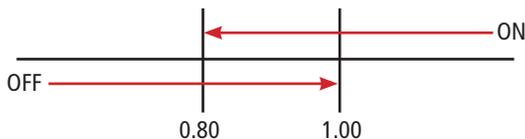
On/Off mode set the instrument to operate using two set values that enable or disable the Chlorine pump. To use this mode move cursor on "Working Mode". Press the wheel and select it.



ON/OFF mode

Set CI value at 0.80 mg/l ON and 1.00 mg/l OFF. The difference between the two CI values is called HYSTERESIS. Instrument will enable the Chlorine pump when reading value will decrease at 0.80mg/l. At 0.80mg/l the Chlorine pump will be enabled until reading value will increase at 1.00mg/l.

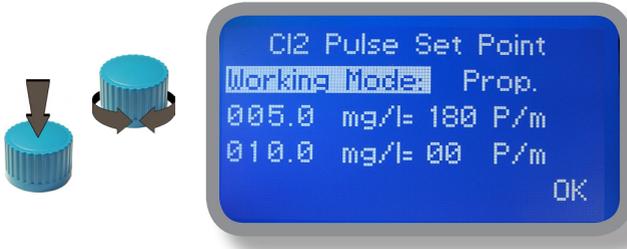
Pulse speed: to let pump operate at pulses per minutes add one or more minute (1pulse every xx minutes).



8.2 "Set-Point", CI proportional & proportional water meter (pulse)

This mode is valid for "CI pulse" and "CI pulse 2" outputs only.

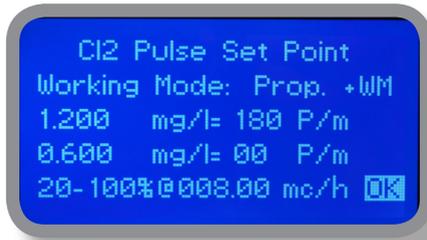
Proportional mode set the instrument to operate using a calculated percentage between two set values that enable or disable the Chlorine pump. To use this mode move cursor on "Working Mode". Press the wheel and select it.



PROPORTIONAL mode between 1.00Cl (0 p/m) and 0.50Cl(180 p/m). p/m is : pulses per minute

In this mode the Cl pump will be "ON" for values lower than 0.50mg/l with set pulses/minute capacity (e.g.: 180) and it'll be "OFF" for values greater than 1mg/l. For values of 0.75mg/l pump will be "ON" with 90 p/m capacity. The calculation is based on 180 pulse / minute. To end procedure move cursor on "OK" and press wheel to proceed to "Save" request screen. Move wheel on "YES" to save or "NO" to discard changes.

Proportional Water Meter



Proportional mode can also be set into PROP+WM mode. This option allows to regulate proportional input based on flow detected by water meter at set percentual values.

e.g.: reading at 0.900 will have an output of 90 P/m (50%). Adding the proportional flow from the water meter with parameters set between 20 % (at 0mc/h) and 100% (at 8mc/h) results will be that (as example):

At 4 mc/h will have a working period of 54 P/m (60% of 90P/m)

60% is the middle value between 20% and 100% for reading of 4mc/h

8.3 "PWM" proportional CI & proportional water meter (relay)

This mode is valid for "CI relay" and "CI relay 2" outputs only. Pulse-width modulation (PWM) of a signal or power source involves the modulation of its duty cycle, to either convey information over a communications channel or control the amount of power sent to a load.

This mode works over a settable (0 to 100 seconds) time to switch on or off selected output. During this time if reading value will move towards a set value (on or off) the PWM will operate the output on timed basis. Reaching the set value the PWM will permanently leave on or off the output.

Parameters to set for this mode are:

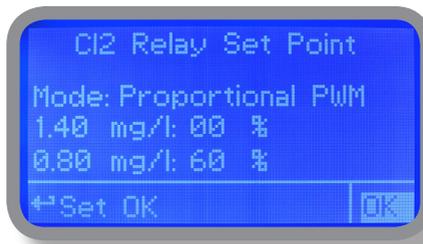
Unit Value + %: (time activity towards set value. 0% means 0 seconds. 100% means 100 seconds.)
CI range: two CI values within PWM operates.

For example: set first CI value at 1.40 = 00% and second CI value at 0.80 = 60%.

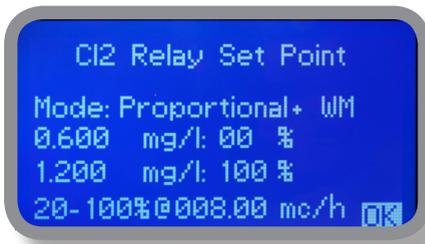
For reading values \geq to 1.40 the output will be permanently OFF.

For reading values \leq 0.80 the output will be ON for 60 seconds and OFF for 40 seconds.

If reading value is 1.1 mg/l then the output will be active at 30% (ON for 30 seconds, OFF for 70 seconds).



Proportional Water Meter



Proportional mode can also be set into PROP+WM mode. This option allows to regulate proportional input based on flow detected by water meter at set percentual values.

e.g.: reading at 0.900 will have an output of 50 seconds on and 50 seconds Off (50% on 100 seconds base). Adding the proportional flow from the water meter with parameters set between 20 % (at 0mc/h) and 100% (at 8mc/h) results will be that (as example):

At 4 mc/h will have a working period of 30 seconds ON and 70 seconds OFF (60% of 90P/m)

60% is the middle value between 20% and 100% for reading of 4mc/h

8.4 "PWM" (fixed), CI

This mode is valid for "CI relay" and "CI relay 2" outputs only. Pulse-width modulation (PWM) of a signal or power source involves the modulation of its duty cycle, to either convey information over a communications channel or control the amount of power sent to a load. Using fixed mode is possible to set operating time to switch on or off selected output.

During this time if reading value will move towards a set value (on or off) the PWM will operate the output on timered basis. Reaching the set value the PWM will permanently leave on (for selected amount of time) or off the output.

Parameters to set for this mode are:

CI range: two CI values within PWM operates.

Ton: ON period, during output activity.

Toff: OFF period, during output activity.

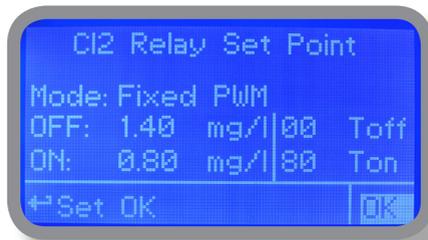
For example: set first CI value (OFF) at 1.40. Set second CI value (ON) at 0.80.

Set "working-pause" output activity with Toff 0 seconds and Ton 80 seconds.

For reading values \geq to 1.40 the output will be permanently OFF.

For reading values \leq 0.80 the output will be ON with activity based on Ton and Toff.

For reading values within working range operating mode is on HYSTERESIS base. Once reading value is 1.40 mg/l will be permanently off until it will reaches 0.80 mg/l.

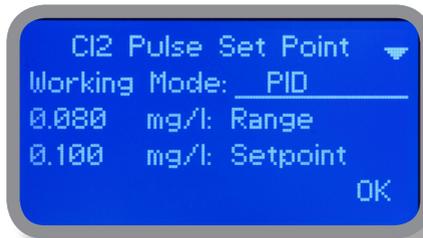


8.5 "PID", CI

A proportional-integral-derivative controller (PID controller) is a control loop feedback mechanism (controller) widely used in industrial control systems. A PID controller calculates an error value as the difference between a measured process variable and a desired setpoint. The controller attempts to minimize the error by adjusting the process through use of a manipulated variable. The PID controller algorithm involves three separate constant parameters, and is accordingly sometimes called three-term control: the proportional, the integral and derivative values, denoted P, I, and D. Simply put, these values can be interpreted in terms of time: P depends on the present error, I on the accumulation of past errors, and D is a prediction of future errors, based on current rate of change.[1] The weighted sum of these three actions is used to adjust the process via a control element such as the position of a control valve, a damper, or the power supplied to a heating element.

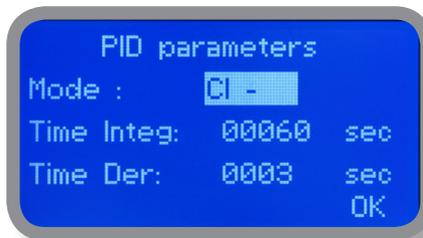
To correctly setup PID as working mode configure the following parameters within two menus "SETPOINT MODE PID" and "PID PARAMETERS"

- 1) Choose related output to work into PID mode using Setpoint menu
- 2) Enter RANGE value. Range is the maximum PID value over or under which (depending on CI + or CI-) the instrument will automatically switch into proportional mode
- 3) Enter SETPOINT which is the optimal value to achieve. Move the cursor to OK and save the data.



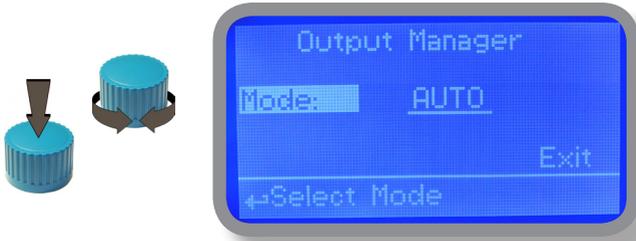
- 4) Select "PID PARAMETERS" within SETPOINT submenu

- Choose working mode (+ or -) based on how setpoint must be reached: starting from lower or higher values.
- Enter INTEGRATIVE value (time needed to the instrument to activate a procedure as answer to a plant's change. E.G.: time needed for pump activation when reached a set value.) Default value: 60 seconds.
- Enter DERIVATIVE value (time needed to the instrument to react to a plant's status change. E.G.: if pH value in water increase, the time integrative is the time needed to notify the change.) Default value: 3 seconds.
- Move cursor on OK then click to save settings.



11. "Output Manager"

From "Menu Calibration" choose "Output Manager". This menu allows to manually operate all outputs for a settable time. Set to "AUTO" for normal operating mode. Set to "OFF" to permanently disable outputs.



Press wheel to move cursor on "TIME" field. Once here, choose a working time between 0 (disabled) or 199 minutes. Move on "EXIT", then press wheel.



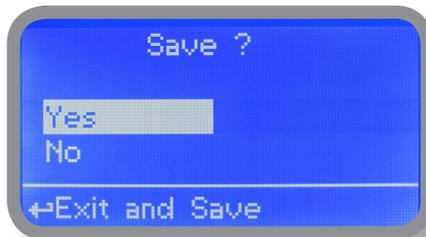
Choose "YES" to save changes. Exit from main menu. Main display will show a countdown for selected output. To stop this countdown go back to "Output Manager" menu and choose "AUTO" as working mode or wait until countdown ends. **This function can be used for priming purposes.**

13. "Dosing Alarm"

Use this menu to assign a maximum time to the pumps for reaching the setpoint. If set time ends and the pumps are still dosing, within this menu is possible to STOP them or just to show an alarm message. Function can be disabled selecting "OFF" instead of a number (minutes). Dosing alarm can be set for both or just one pump.



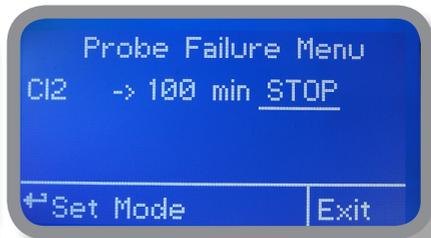
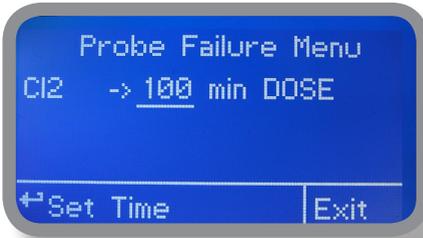
E.g. To set CI pump to stop after time ends and setpoint isn't still reached press wheel, choose maximum time, press wheel move on next field and choose "STOP". Time can be set between 0 and 100 minutes. When satisfied with settings move on exit and press wheel.



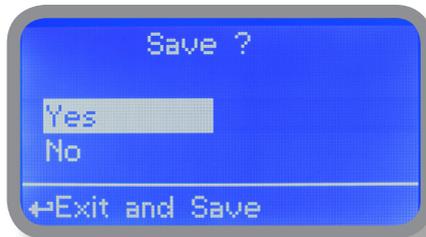
To end procedure move cursor on "OK" and press wheel to proceed to "Save" request screen. Move wheel on "YES" to save or "NO" to discard changes.

15. "Probe Failure"

Use this menu to assign a maximum time for connected probes to stay in "stuck" condition. A stuck probe (it remains on same reading value for some time) means that probably probe itself is damaged. Within this menu is possible to STOP pumps or just to show an alarm message (probe failure) . Function can be disabled selecting "OFF" instead of a number (minutes). This function can be set for both or just one probe.



E.g. To set CI pump to stop after time ends and probe doesn't change reading values press wheel, choose maximum time, press wheel move on next field and choose "STOP". Time can be set between 100 and 254 minutes. When satisfied with settings move on exit and press wheel.



To end procedure move cursor on "OK" and press wheel to proceed to "Save" request screen. Move wheel on "YES" to save or "NO" to discard changes.

18. "mA Outputs"

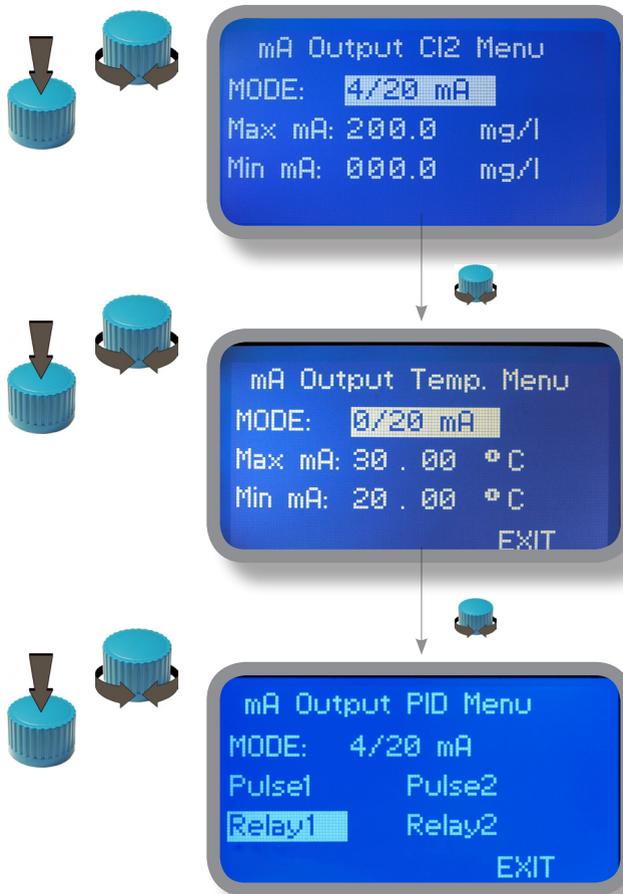
This menu allows to configure mA current outputs for Chlorine and Temperature channels and PID mA mode. Options to set are:

MODE (selectable between 0-20 or 4-20 mA current output)

Max mA: maximum probe's reading value at 20 mA current

Min mA: minimum probe's reading value at 0 or 4 mA current

Disable / Enable on alarm: enable or disable output on alarm condition (flow, level, probe failure, dosage, out of range)



Note: The outputs available for the PID mA are those set in the menu SETPOINT.

PID outputs will be always disabled during an alarm condition

Rotate wheel to move within all 3 channels. Click wheel to select parameter and rotate wheel to change it. Click wheel again and rotate wheel to move cursor on next parameter. To end procedure move cursor on "EXIT" and press wheel to proceed to "Save" request screen. Move wheel on "YES" to save or "NO" to discard changes.

19. "Out of range alarm"

"Out of range alarm" menu defines the minimum and maximum Chlorine probe read value before to stop dosing activity and to show an alarm message.



Move wheel on "Min/Max Cl Range" to set "out of range" condition for Chlorine probe then click on wheel to enter into "Min/Max Range menu".



Move wheel on "Cl Hi: Dis." and change status from "Dis." (option disabled) to "En." (option enabled) by clicking on wheel and rotating it. Press wheel again and move on next field. Press wheel and enter a value for HIGH alarm.

Repeat procedure for "Cl Lo: Dis." and enter a value for LOW alarm.



As last option enter "Time" (max 99 minutes) after which if lower or higher read value condition stays then the alarm occurs (to set into mode field).

To change alarm mode move wheel on "Mode", press it and choose between "DOSE" (connected pumps will not stop dosing activity when read value is out of range) or "STOP" (connected pumps will stop dosing activity when read value is out of range and an alarm message is displayed).