

Programming instructions



Parts of the general documentation

- Part 1 : Installation and starting instructions
- ▶ Part 2 : Programming instructions
- Part 3 : Programming communication instructions

General information:

SYCLOPE Electronique 2016[®] Notice of the 31/10/2017 Rev 2

Professional Analyzers/Controllers for water treatment.

Product line DOUBLEAU[®]

Part 2 : Programming instructions (Ref : DOC0337)

Editor :



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Subject to modification

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I. Use of the document

Please read this entire document before starting to install, adjust or commission your controller device, in order to ensure the safety of swimmers, users and equipment.

The information provided in this document must be strictly observed. SYCLOPE Electronique S.A.S. declines all responsibility in cases where failure to comply with the instructions of this documents is observed.

The following symbols and pictograms will be used to facilitate reading and understanding of these instructions.

- Information
- ▶ Action to be taken
- Item of a list or catalogue

1) Symbols and signs



Identification of a continue voltage or current



Identification of an alternative voltage or current



Protective ground



Functional ground



Risk of injury or accident. Identify a warning concerning a potentially dangerous risk. Documentation must be consulted by the user with each time the symbol is notified. If the instructions are not respected, that presents a risk of death, physical injuries or property damages.



Electric hazard. Identify a warning statement relative to a mortal electric danger. If the instructions are not strictly respected, that implies an inevitable risk of physical injuries or death.



Risk of incorrect operation or damage for the device.



Comment or particular information.



Recyclable element

2) FCC conformity

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference and (2) this device must accept any interference received including interference that may cause undesired operation.

Instructions to Users: This equipment complies with the requirements of FCC (Federal Communication Commission) equipment provided that the following conditions are met.



This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate receiving antenna,
- Increase the separation between the device and receiver,
- Connect the device into an outlet on a circuit different from that to which the receiver is connected,
- Consult the dealer or an experienced radio/TV technician for help.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Remark : In order to maintain compliance with the limits of a Class B digital device, use a recommended shielded cable when connected to this device as describe in the present notice. Using a bad cable or a cable not connected to the ground voids the user's authority, which is granted by the Federal Communications Commission, to operate this equipment.

II. Safety and environmental instructions

Please :

- Read conscientiously the present notice before unpacking, installing and servicing the present controller.
- Take care of all risks and servicing before any use.

No respect of these instructions can cause damages to the users, the technical personal and the integrity of the controller.

1) Use of the controller

The **SYCLOPE DOUBLEAU**® system has been designed to measure and regulate temperature, pH, Redox potential, chlorine (or bromine), Ozone, PHMB, flow, Turbidity and Conductivity by means of sensors and controls of suitable actuators in the context of the possible uses described in this manual.



All other uses are considered to be not conforming and must therefore be forbidden. SYCLOPE Electronique S.A.S. will not be responsible in any case for any damages that result from such uses.



Any use of sensors or interfaces not in conformity to the features defined in this manual must also be proscribed.

2) User obligations

The user undertakes not to allow its employees to work with the **SYCLOPE DOUBLEAU**® equipment described in this manual unless they:

- Are aware of the fundamental instructions relating to work safety and prevention of accidents
- Are trained in the use of the device and its environment
- Have read and understood these instructions, warnings and manipulation rules.

3) Risk prevention



The installation and connection of the **SYCLOPE DOUBLEAU**® equipment should only be performed by personnel specialized and qualified for this task.
The installation must comply with current safety standards and instructions!



Before switching the controller on or manipulating the relay outputs, remember always to cut off the primary power supply!
Never open the controller when it is powered on!
Maintenance operations and repairs should only be performed by trained, specialized personnel!



Take care when choosing the location for installing the equipment according to the environment!
The **SYCLOPE DOUBLEAU**® electronic box should not be installed in a hazardous environment and should be protected against splashing with water or chemical products. It should be installed in a dry, well-ventilated location, isolated



Except for the relay outputs, all connections inputs/outputs must be connected to very low safety voltages. In general, these voltages are provided by the controller and does not exceed 24V continuous.

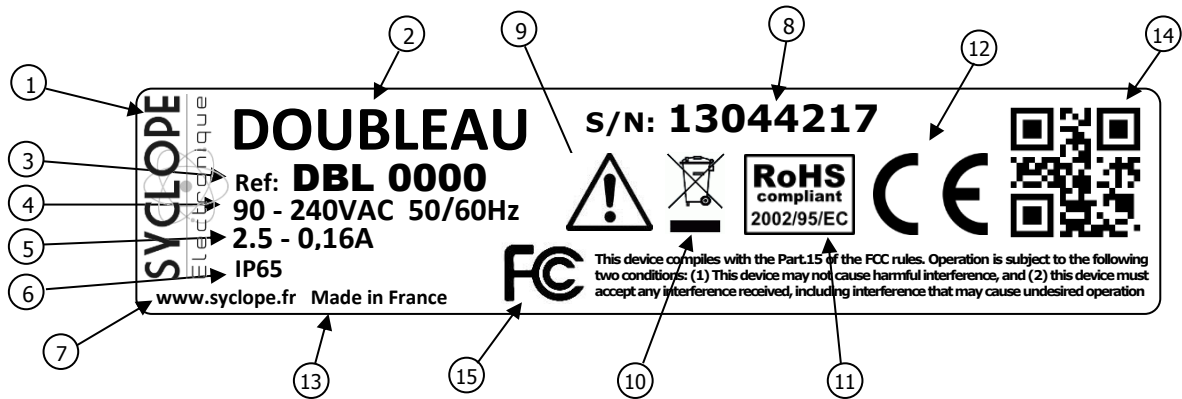


Make sure that the chemical sensors used with this device correspond well to the chemicals used. Refer to the individual technical note of each sensor. Chemistry of water is very complex, in case of doubt, contact immediately our engineering service or your approved installer/reseller.



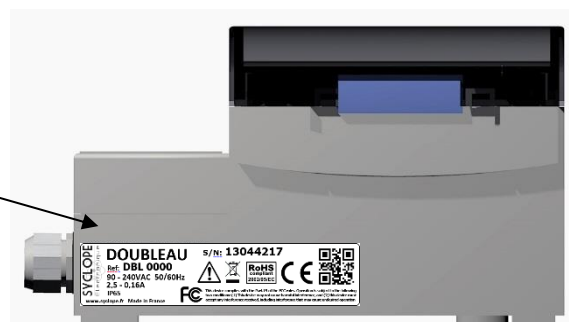
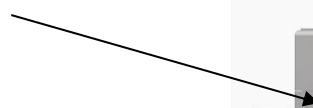
Chemical sensors are sensitive elements using consumable parts. They must be supervised, maintained and calibrated regularly using specific calibrator systems not-provided with this equipment. In the event of defect, a surplus possible hazard of chemical injections can be noted. In the doubt, a service contract must be taken near your reseller/installer or failing this near our engineering services. Contact your approved installer/reseller or our business service for more information.

4) Labelling and localization of the identification plate



① Label of the manufacturer	⑨ Particular risks. Read the notice
② Model of the product	⑩ Product which can be recycled
③ Reference of the product	⑪ Limitation of dangerous substances
④ Range of power supply	⑫ EC compliance
⑤ Values of the maximum current	⑬ Country of the manufacturer
⑥ Class of protection	⑭ Manufacturer square code
⑦ Identification of the manufacturer	⑮ Conformity with the FCC part 15 Class B
⑧ Serial number	

Identification plate



5) Disposal and conformity

The recyclable packaging of the **SYCLOPE DOUBLEAU**® equipment must be disposed of according to current regulations.



Elements such as paper, cardboard, plastic or any other recyclable elements must be taken to a suitable sorting centre



According to European directive 2002/96/EC, this symbol means that as of 12 August 2005 electrical appliances cannot be thrown out together with household or industrial waste. According to current regulations, consumers within the European Union are required, as of this date, to return their used devices to the manufacturer, who will take care of disposing them at no extra expense.



Collecting and recycling of the internal batteries: According to the European directive 2006/66/CE, this symbol indicate that until September, 26th 2006, used batteries, accumulators and waste materials using dangerous heavy metals as lead (pb), cadmium(Cd) or mercury (Hg) must be collected separately by the manufacturer or by an accredited agency.



According to European directive 2002/95/EC, this symbol means that the **SYCLOPE DOUBLEAU**® controller is designed in compliance with the restrictions on hazardous substances



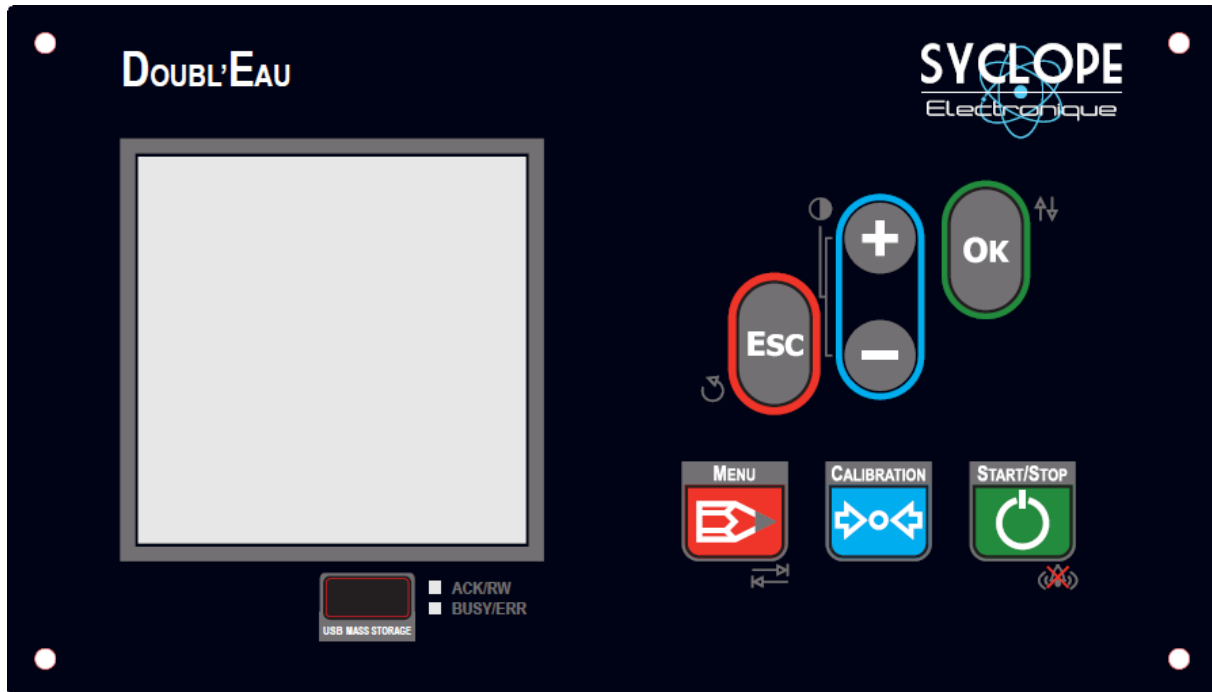
According to low-voltage directive (2006/95/EC) and the electromagnetic compatibility directive (2004/108/EC), this symbol means that the device has been designed in compliance with the previously cited directives



In accordance with part 15 of the FCC regulation (Federal communications commission), this symbol indicates that the device was tested and approved under the respect and the conditions of the limits for a Class B digital.

III. Recall to the human-machine interface of the SYCLOPE DOUBLEAU®

1) Display and control keypad



Key **Menu** :
Access to user menu



Key **Calibration** :
Access to the parameter calibration screen



Key **START/STOP** :
- Start or stop the dosing process.
- Acknowledge pending alarms.



Key **Esc** :
- Long press on main screen to short the polarization delay of all sensors.
- Escape from menu during navigation.



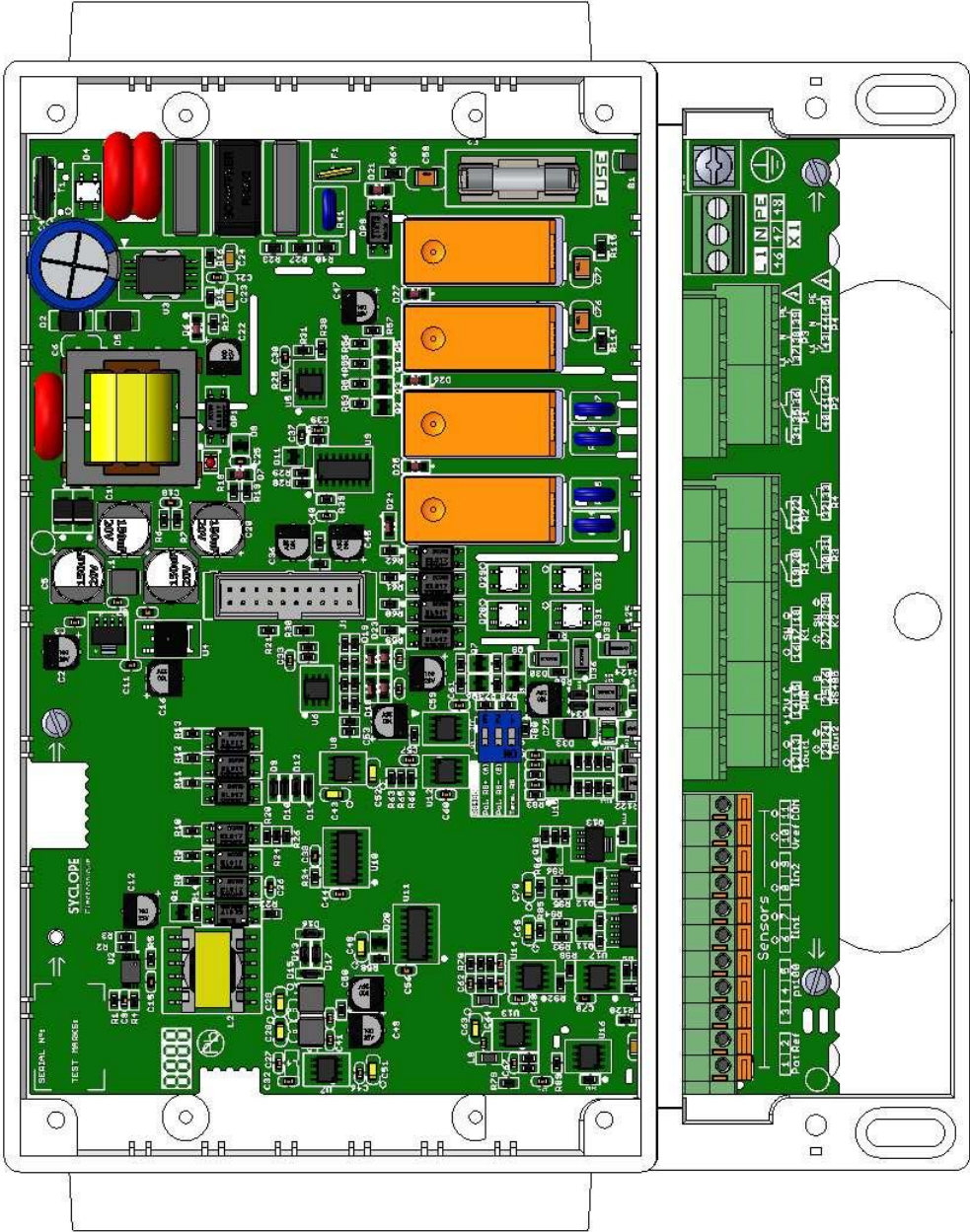
Key **OK** :
- Invert order of parameters channel Ex on main screen.
- Check value and settings.
- Enter to menu during navigation



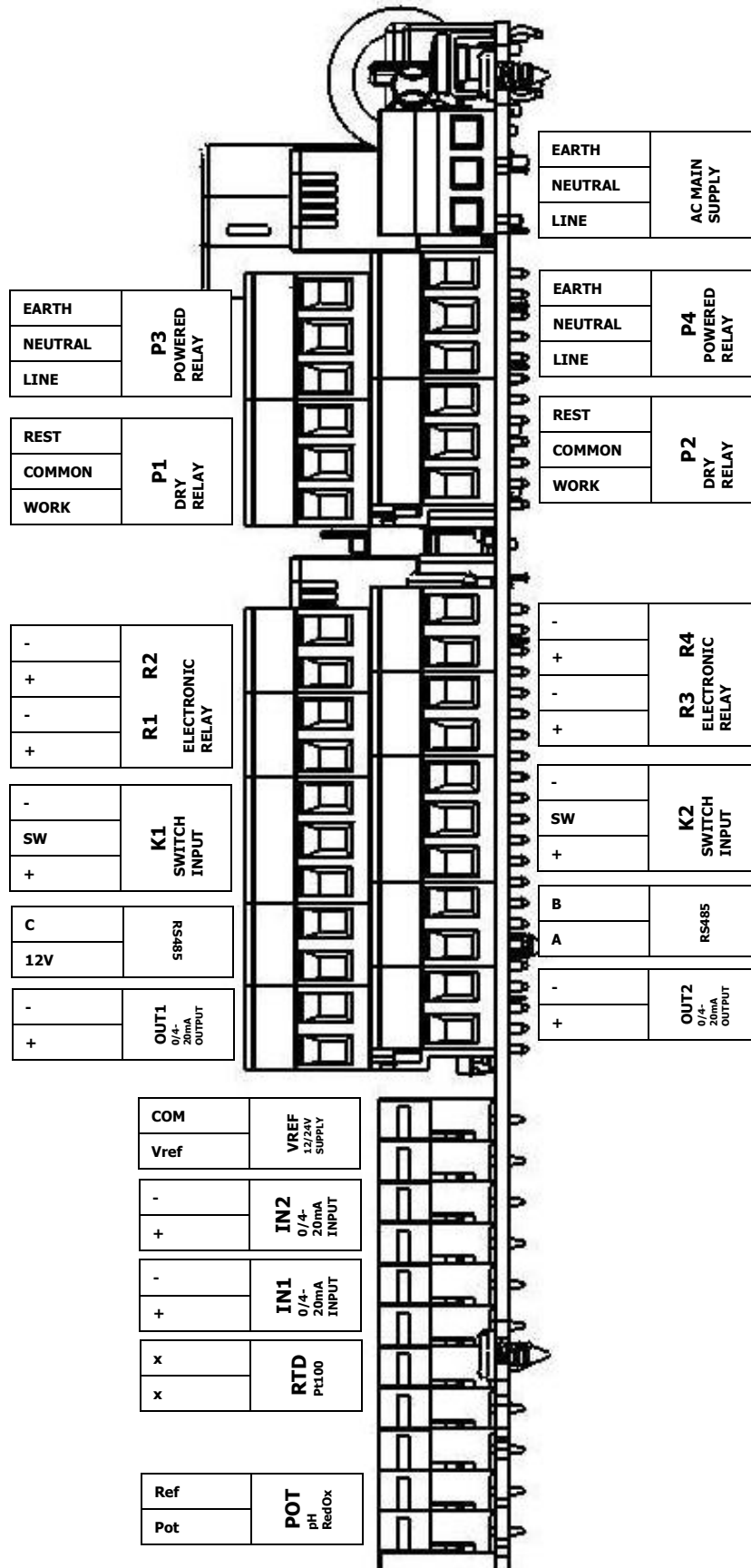
Key **+** :
- Increase value or select upper choice.
- Up/Back to previous menu during navigation.
- Set higher screen contrast on main screen.

Key **-** :
- Decrease value or select lower choice.
- Down/Next to next menu during navigation.
- Set lower screen contrast on main screen.

2) Internal connections



3) Connection terminal boards



IV. Structure and index of the menus

1) Structure of the menus

The **SYCLOPE DOUBLEAU®** controller uses 3 levels of menu with possibilities to protect by an access code each level against modifications. From the very simple level to the high technology level, the controller gives a gradually access to the fundamentals functions with the respect of safety for the chemical treatments and for the users.

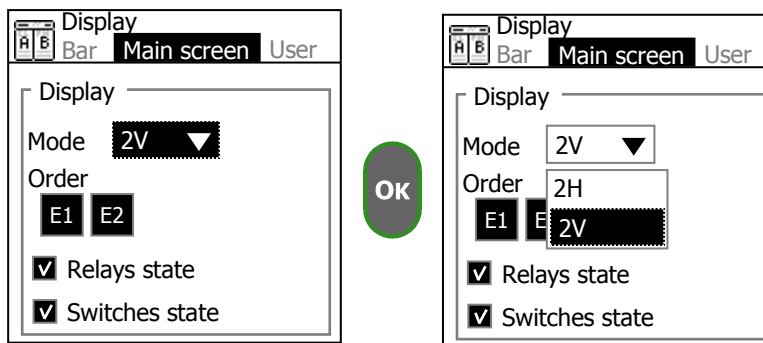
- User Menu : Simple access to calibrations and a standard use.
- Technician Menu : Technical menu for setting points, alarms, ... and technical use.
- Specialist Menu : High level to configure the system and to modify his structure.

2) Tree structure and index of programming

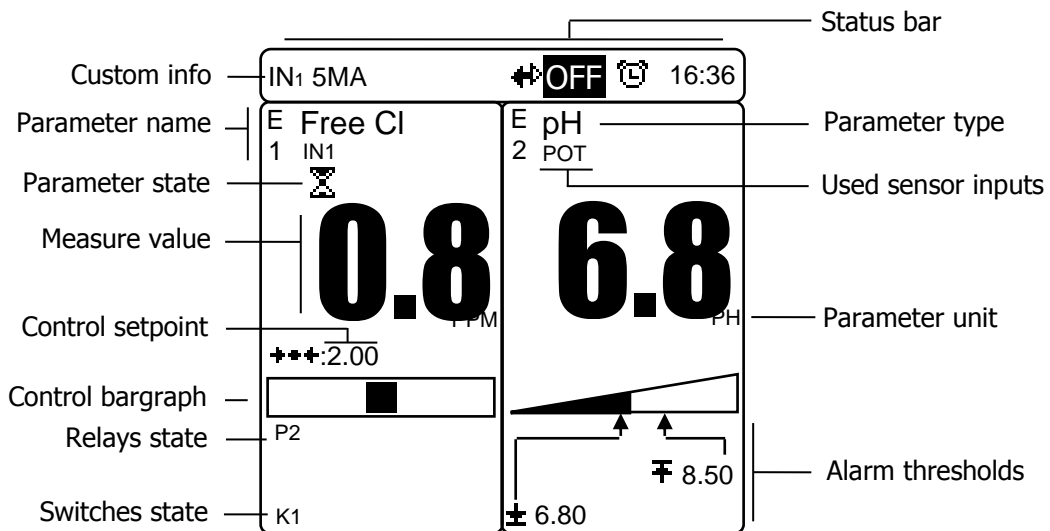
Level	Function	Page
User	Technician menu access	19
	Select language	20
	Setting real time clock	21
	Interface management	22
	About (software version, sensor configuration, ...)	25
	Maintenance (After activation in the specialist menu)	26
Technician	Specialist menu access	30
	Technician code	31
	Working timers	32
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V. Display modes and types

- ▶ Select the main screen display mode



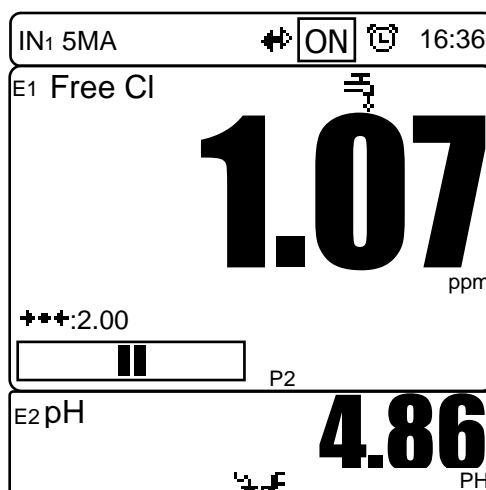
- **Vertical mode 2V**



If you want to invert order of your parameters, press touch


OK

- **Horizontal mode 2H**




1) Symbols and statutes of working➤ **Icons of the statutes bar**

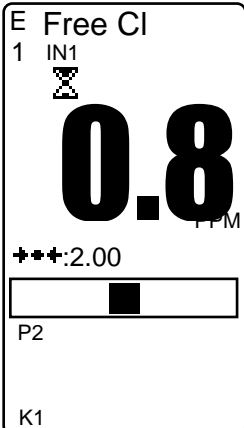
 → RS485 communication is active.





 → A working timer is in progress. Parameters using timers can process controls and alarms.

The number of active timer blink in the center of symbol.











 → The device is ON state, controls and alarms are permitted.

 → The device is OFF state, controls, alarms, relay and analogues outputs are disabled.

➤ **Statutes of parameter channel****Measured value**


 → Measured real value
 → Measured value over the displaying range
 → Measured value under the displaying range
 → Measured value off (Technical alarm)

State of chanel

-  High threshold crossed
-  Low threshold crossed
-  Sensor fault, out of range or disconnected
-  Max dosing time exceeded or empty tank detected
-  Control stopped due to a timer
-  Remote control in progress
-  Water flowing stop
-  Sensor starting up
-  Sensor calibration required
-  Measurement value unstable

Control bargraph

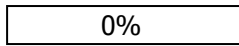
→ Control stopped



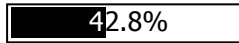
→ Setting point not programmed



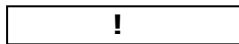
→ Pause control mode for the parameter



→ No treatment needs



→ Active treatment with 42,8% of needs



→ No control. Parameter in alarm!

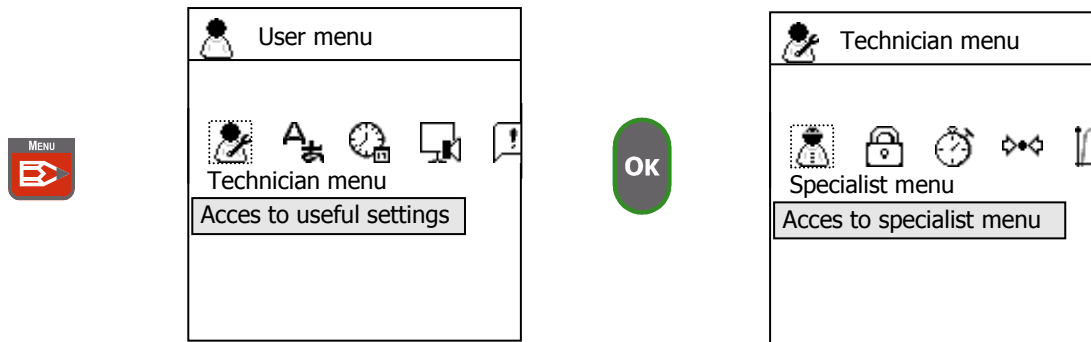
VI. User menu

This menu allows you to change base settings and to show the current configuration.

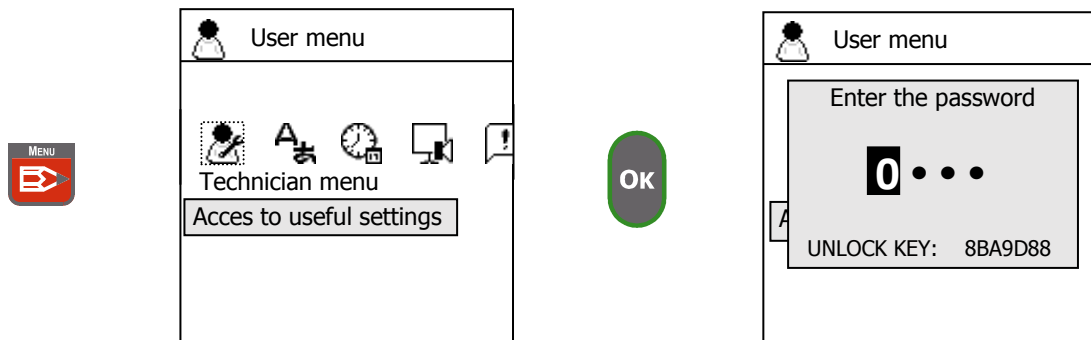
To enter in the user menu, press the  key. Now you have access to the user menu.

1) Technician menu access

This function allows you to access to the technician menu...




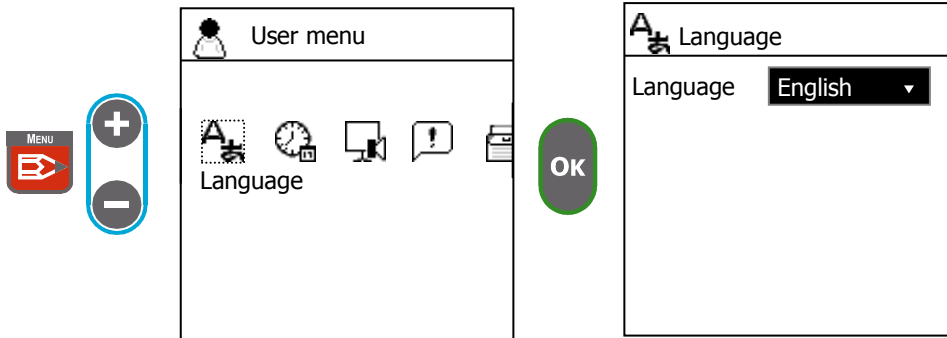
If a technician code was registered:



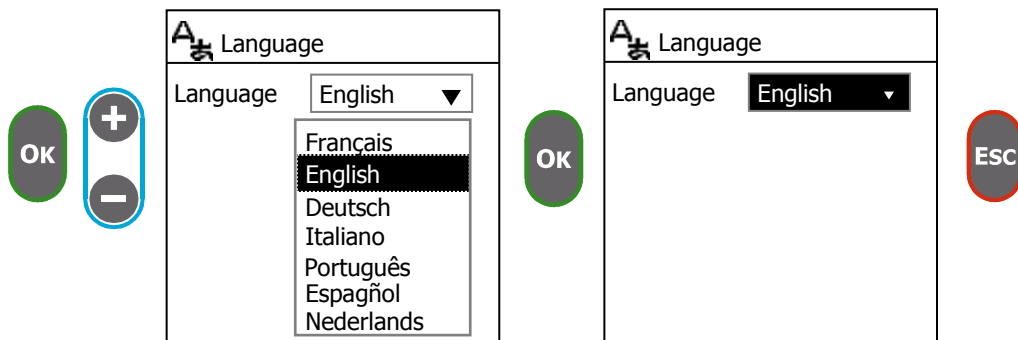
► Enter the correct code using the



keys, and validate by pressing  key when

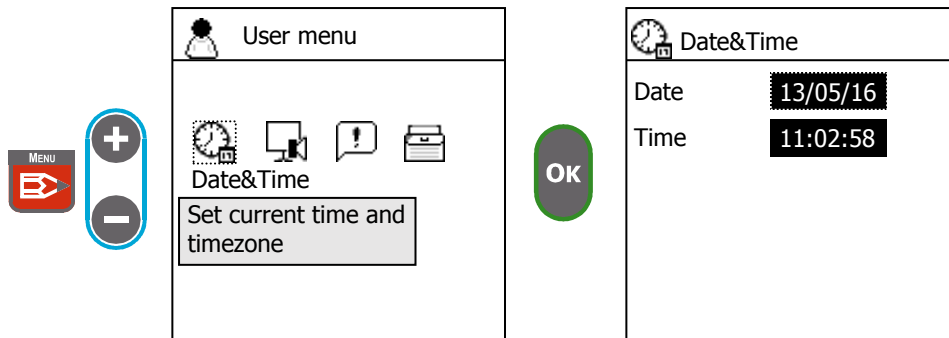
2) Select your language► Go to the "**Language**" screen

► Choose your language

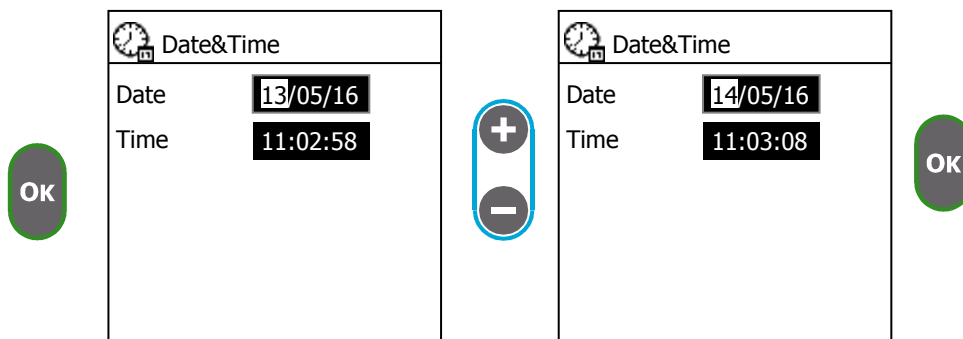


3) Set current date and time

- Go to the **"Date&Time"** screen

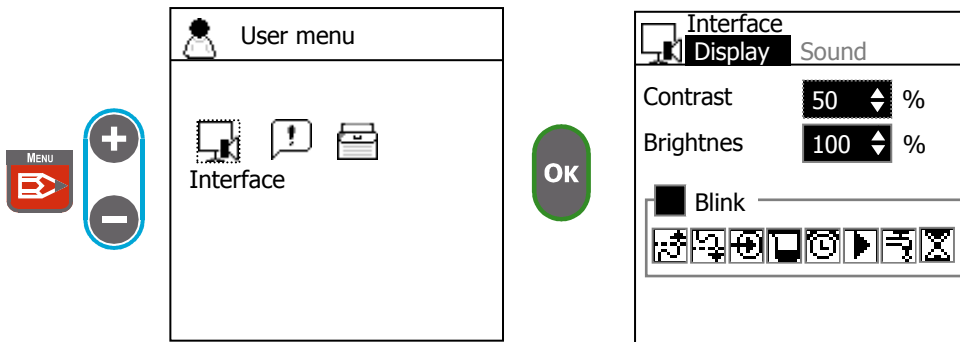


- Edit date and time field according your local timezone

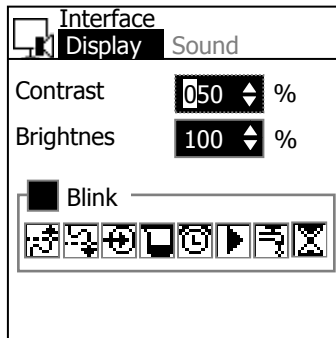



4) Interface management

► Go to the "**Interface**" screen

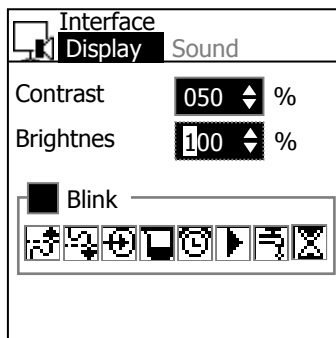


a) Contrast



► Adjust the contrast by using  and  to validate.

b) Brightness



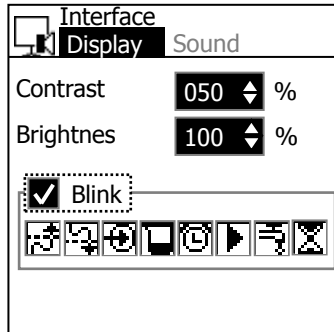
► Adjust the brightness by using  and  to validate.

c) Blink

This function allows you to blink the display when alarm occurs. You can choose which alarm cause blinking.

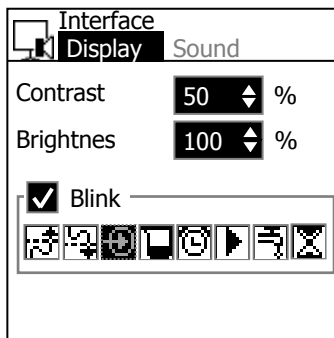
- Check the checkbox to enable the blink function

OK











- Select which alarm cause blinking

OK



In the example the display blink if a sensor fault occurs.

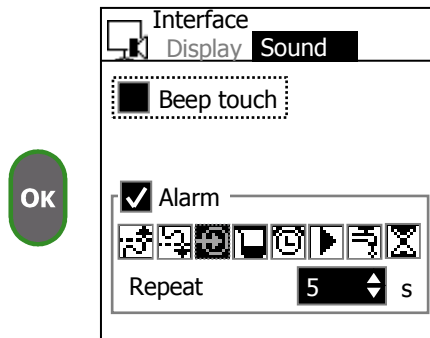
-  High threshold alarm
-  Low threshold alarm
-  Sensor fault, out of range or disconnected
-  Overdose time or empty tank
-  Pause due to a timer
-  Control remote
-  Water not flowing
-  Pause due to a sensor delay



To acknowledge pending alarm press any key on main screen

d) Beep touch

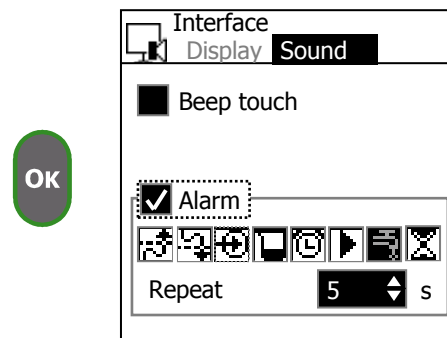
This function allows you to have a beep when pressing the key.



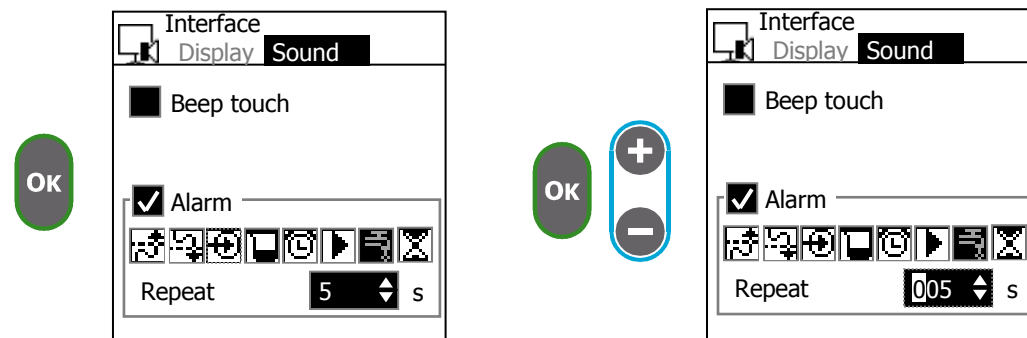
e) Alarm

This function allows you to have an alarm sound when alarm occurs. You can choose which alarm cause sound.

- ▶ Check the checkbox to enable the alarm function



- ▶ Select which alarm cause sound and the repetition interval



In the example the alarm sound occurs every 5 seconds when water no flowing.

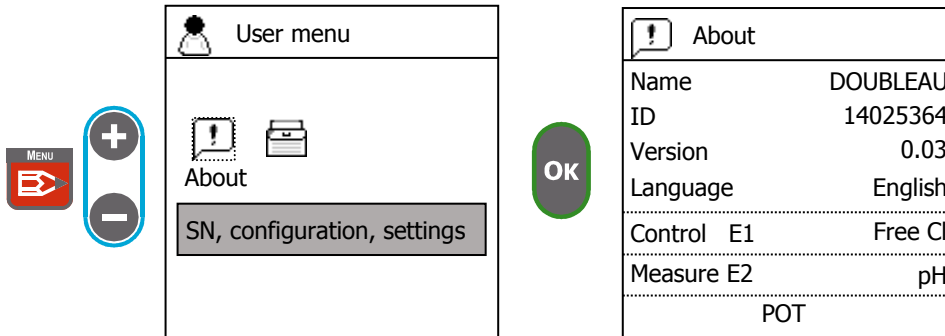
- High threshold alarm
- Low threshold alarm
- Sensor fault, out of range or disconnected
- Overdose time or empty tank
- Pause due to a timer
- Control remote
- Water not flowing
- Pause due to a sensor delay


To acknowledge pending alarm press any key on main screen

6) About

This screen allows you to see a summary of your configuration.

► Go to the **“About”** screen



► Use  to scroll the screen and see all the information.

General information:

Name	Name of the device
ID	Serial number
Version	Software version
Language	Current interface language
Control/measure E1	Kind of parameter selected on E1
Control/measure E2	Kind of parameter selected on E2

Sensors information :

POT/RTD/IN1/IN2/K1/K2	
Kind	Kind of measure
Signal	Signal value of the sensor
Mes	Measure value
Ref	Reference name of your sensor
Slope	Calibration slope
Drift	Drift of the slope, 0% means your sensor is perfect
Offset	Calibration offset
Zero	Isopoint of your sensor

Switches information :

IN1/IN2/K1/K2	
Kind	Switch
State	Open/Closed
Stand	Stand on switch: NO/NC

Common

Vref	IN1, IN2 and Verf terminals voltage: 12V/24V
------	--

7) Maintenance of the controller

This function allows you to control and to test the good working of the controller interfaces. When activated, it is possible to test relays, to generate an analogue signal for example.



It is strongly recommended to use this function when starting the controller to ensure all systems work normally. Do not let this function programmed! Remove it when tests are done.



Be careful! These utilities can drive the relays or analogue outputs. Ensure that no chemical product will be injected during these tests.

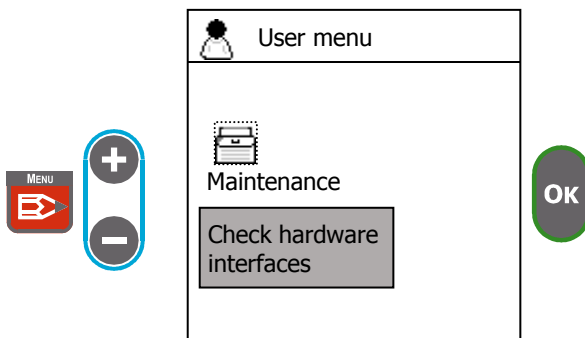


After using maintenance functions, all the manipulations done will be cancelled and reinitiated by the controller.



The maintenance function is displayed and authorized only after his activation in the specialist menu.

► Go to the "**Maintenance**" screen



a) Relay



Activation or inactivation of the relays will start or stop the dosing systems. Take all disposition to prevent any risk of damage.



Impulse signal function cannot be simulated. Only, one impulse could be generated by the selected relay.



"PWR" relay P3 and P4 are self-powered relay, means this relay are connected to the main power supply. Use appropriate measurement instrument to check working.

Maintenance	
Relays	Inputs Output
RCT	
P1	P2
PWR	
P3	P4
ELC	
R1	R2
R3	R4

► Select the relay you want to drive using  and press  to open or close it.

a) Inputs

On this screen you can see the inputs interface measure value, for potentiometric "POT" and thermistance "RTD" inputs the value is also expressed in pH and °C according the perfect sensor slope and offset.

Maintenance	
Relays	Inputs Output
POT	-29mV 7.96pH
RTD	108ohm 22°C
IN1	8.4mA
IN2	0.0mA

a) Analogue outputs



The activation of an analogical output can engage a dosing actuator or can generate an analogical signal to a PLC or to a local recording system. Take all dispositions to prevent risks during testing!



After the test, all analogical outputs will be reset into the initial programmed type. (That means "0mA" for the 0...20mA outputs, "4mA" for the 4...20mA outputs or inhibition current if programmed.)

Maintenance

Relays Inputs **Outputs**

OUT1 0.00 mA

OUT2 0.00 mA

OK

+
-

Maintenance

Relays Inputs **Outputs**

OUT1 5.00 mA

OUT2 0.00 mA

► Adjust an analogical value by using and validate by pressing

► Verify the analogue output with a measuring equipment.

b) Switches

On this screen you can see the state of digitals inputs.

Maintenance

puts Outputs **Switches**

K1

K2

	Switch open
	Switch closed

c) Communication RS485

This screen is useful to control correct configuration of the communication via RS485.

Maintenance	
Output Swiches	COM
NO-COM	0B/s

State message

NO-COM	No activity or wires unplugged
ERR-RS485	Speed or parity error. Inverted wires connection
ERR-MODBUS	Unavailable register or function request, check the register table
COM-OK	Communication ok



If error states, check settings on Specialist menu/Communication.

VII. Technician menu

This menu allows to modify all the basic configurations authorized to a confirmed technician. These configurations don't modify the technical structure of the controller.



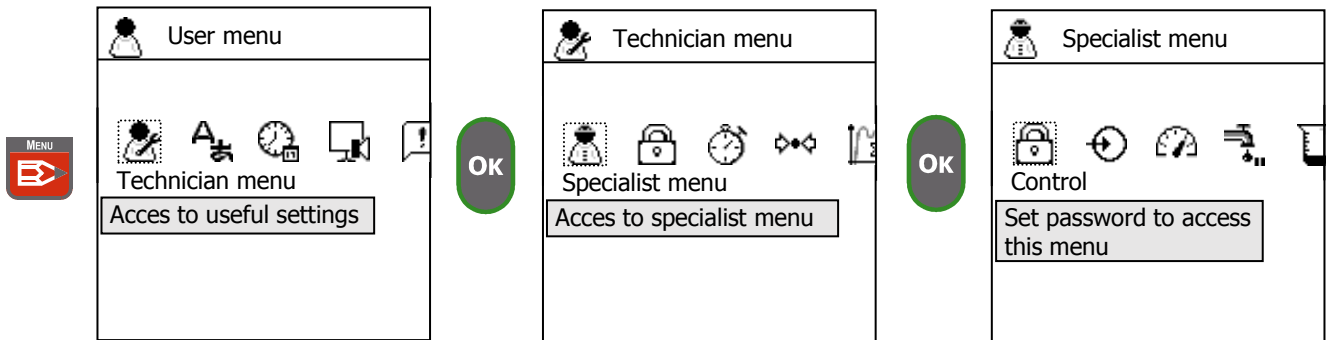
The access to the « Technician Menu » stop the dosing processes!



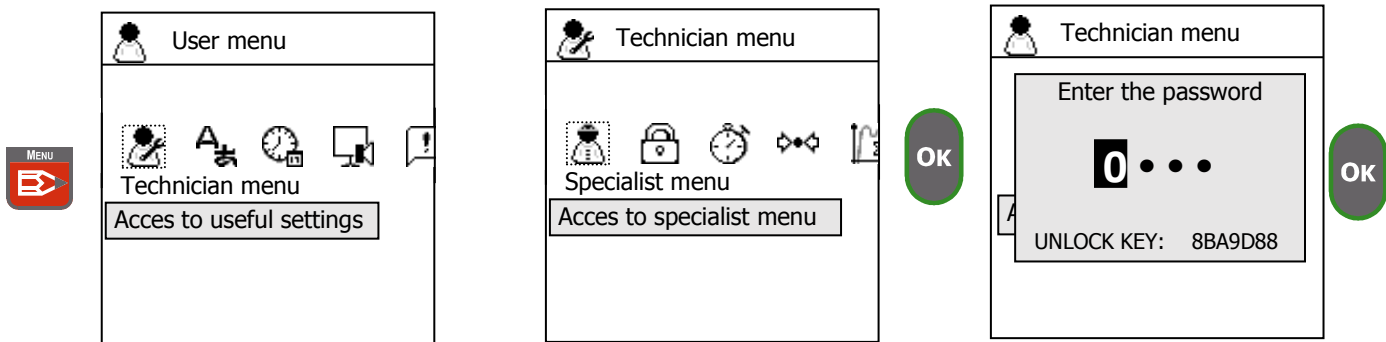
If the access is protected by an unknown code, please call an agreed reseller!

1) Access to the specialist menu

To enter in the user menu, press the  key. Now you have access to the user menu.



If a specialist code was registered:



► Enter the correct code using the



keys, and validate by pressing



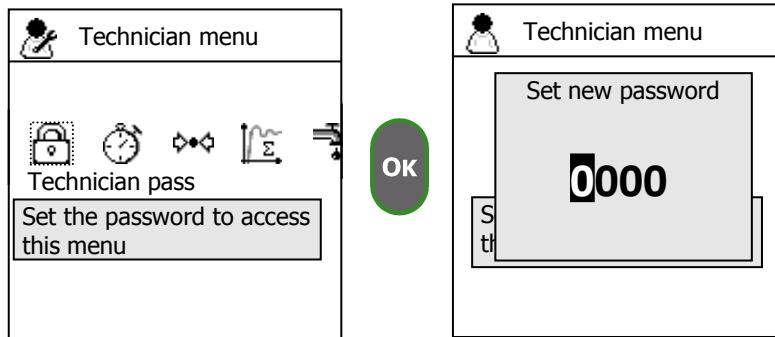
key when



2) Technician code

To modify or to delete the code used to protect this menu level.

a) Modify the access code

This procedure allows you to modify the access code.



- Enter a new code by using  and validate with  key.

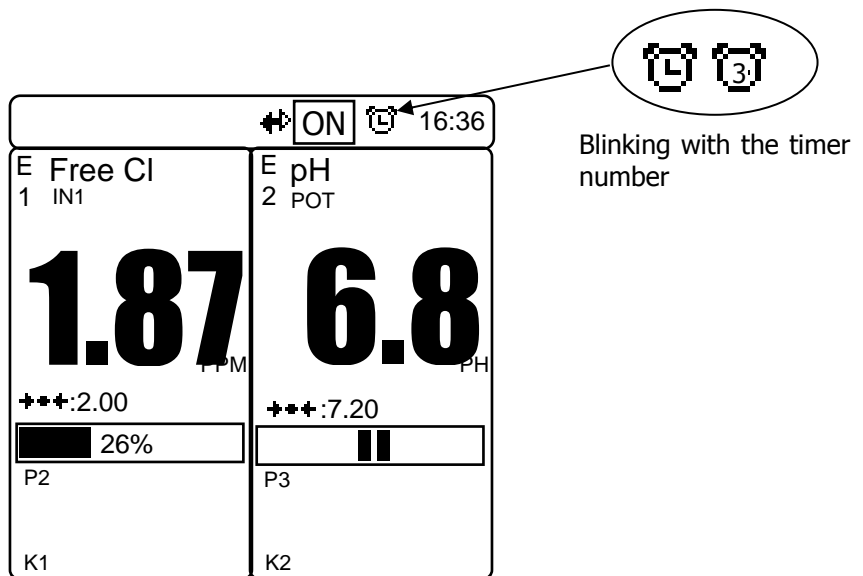
b) Cancellation of the technician code

This procedure allows you to cancel the technician code and to free the access of this menu.

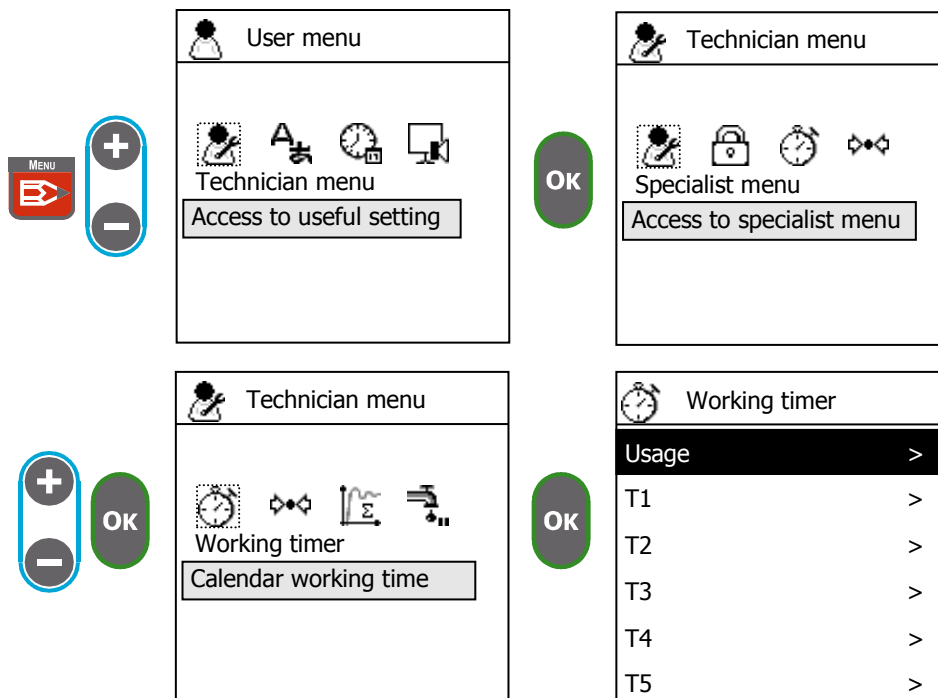
- Enter the value « 0000 » to cancel or to delete the present code.

3) Working timers

This procedure allows you to define the normal working times of your controller. Out of these working times, clock indicator appear in the status bar to inform the user of the state.



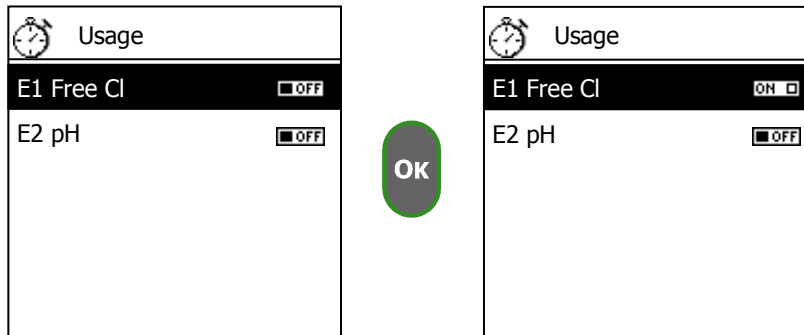
► Go to the "Working timer" screen



a) Timer usage

With this function you can select which parameters use timers to define working time.

If you set usage to **OFF** the parameter process (control and alarm) not depends about the timers, if it's set usage to **ON** it can be done only if at less one timer is active.

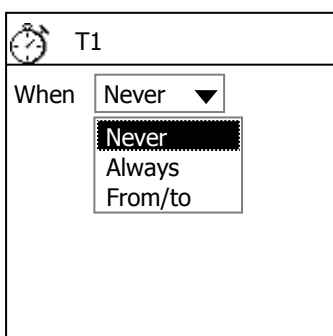


► Select the parameter with  and set the timer usage ON or OFF with 

b) Timer settings

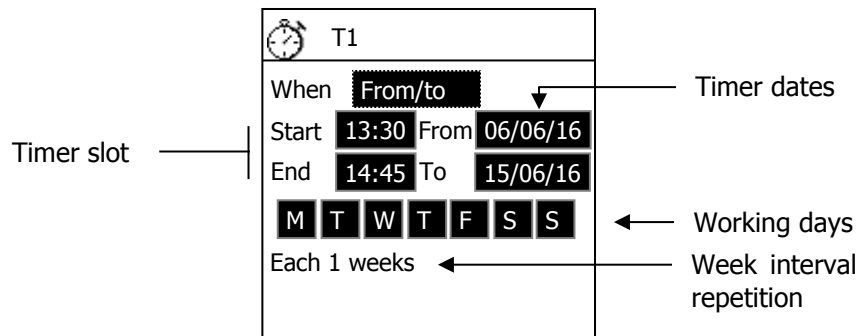


► Choose when the timer will work.



Never	The timer is not used
Always	There is no end date, your timer setting will always be repeated
From/to	You can select the starting and ending date, therefore your timer will work only between these dates

- ▶ Set the timer slot
- ▶ Set the timer date
- ▶ Set the working days
- ▶ Set the repetition interval

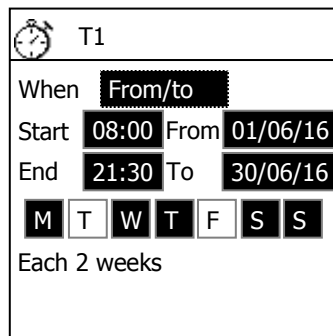


Start and **End** field define the time slot of working. **From** and **To** allows you to define the dates interval where the time slot will be done.

The "MTWTFSS" button represent each days of week, it allows you to choose witch days the timer slot will work.

You can also define the repetition interval of the defined week.

Example of configuration:



According the previous screen settings and the calendar. Timer slot **start** at 8h00 **end** at 21h30, it works **from** 1st june 2016 **to** 30th june 2016, the permeated days are only on Tuesday and on Friday. Week interval is 2 so allowed weeks are:

- 1st - 5th
- 13th - 19th
- 27th - 30th

June						
M	T	W	T	F	S	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

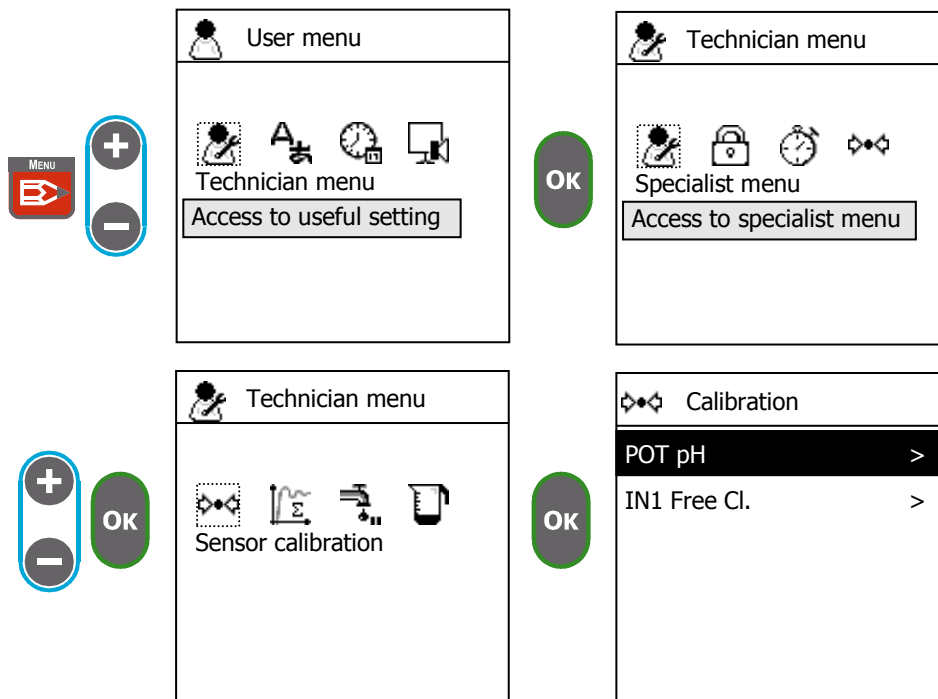
Therefore, timer dates are 3, 14, 17 and 28th june and they start at 8h00 and end at 21h30.

4) Calibration of the sensors

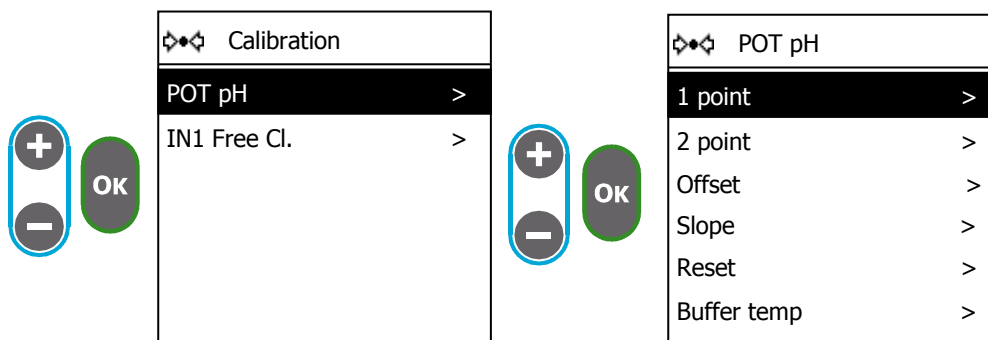
This procedure allows you to calibrate each sensor. It can perform different operations:

- 1 point: To adjust the value online based on sampling measure.
- 2 point: To adjust slope and/or offset using 2 different buffers. (only available with pH and Redox sensors)
- Offset: To adjust the offset of sensor.
- Slope (Gain): To adjust the slope of sensor.
- Reset: To clear the slope and the zero programmed and to return to the factory values.
- Buffer temp: To define the buffer temperature when sensor value is temperature dependent.

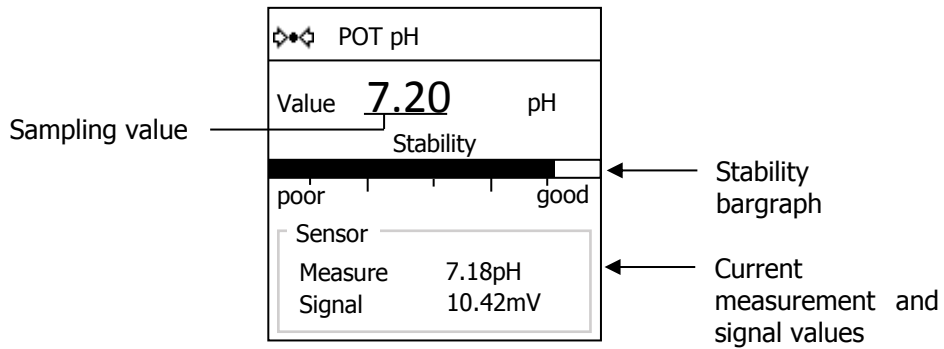
► Go to the “**Sensor calibration**” screen



► Select the sensor and the calibration method.



a) 1 point



► Adjust the sampling value with  and validate with 

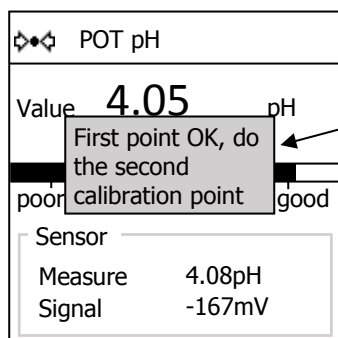
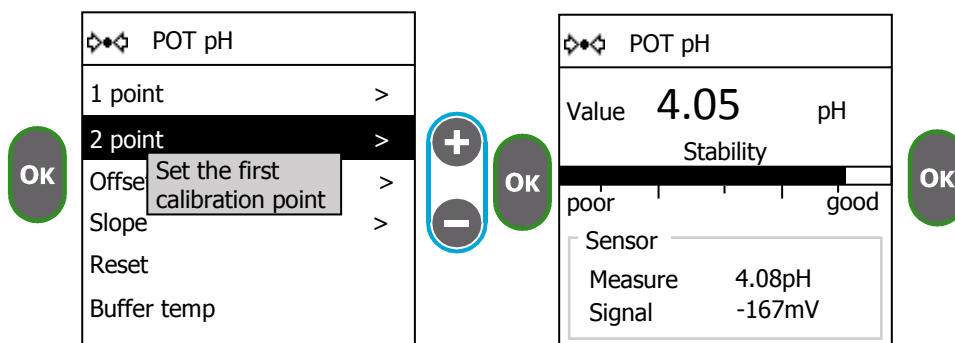


To perform a correct calibration, the measure must be stable. A bar graph helps you to know if stability is stable enough. If stability is no stable enough when you try to calibrate a message box will open to inform you to retry operation.

b) 2 point

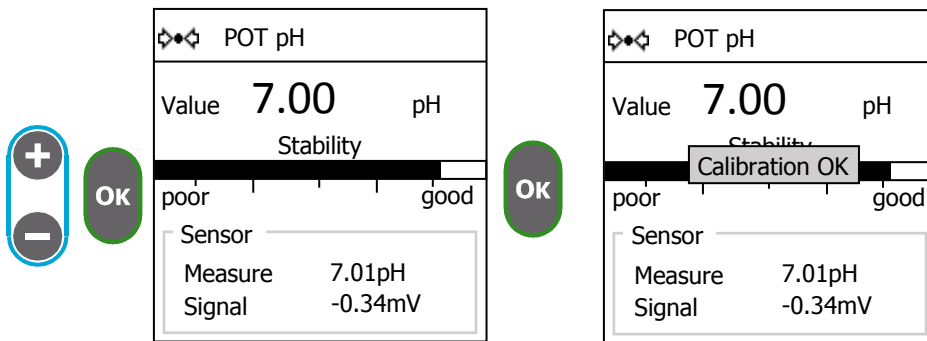
To perform this calibration method, you must use two buffers solutions.

- Remove the sensor from the process.
- Clean it.
- Insert the sensor probe into the first buffer.
- Set the first calibration point.



This message box indicates you if the first calibration point has been correctly performed

- ▶ Clean the probe.
- ▶ Insert the sensor probe into the second buffer.
- ▶ Set the second calibration point.



After calibration done, a results screen will be displayed during few seconds.

POT pH	
Sensor	
Calibred	7.00pH
Raw	7.01pH
Sensor	
Slope	-56.84mV/pH
Offset	-0.342mV
Isopoint	7.006pH
Drift	-0.98%

a) Offset

	<table border="1"> <tr><td colspan="2">POT pH</td></tr> <tr><td>1 point</td><td>></td></tr> <tr><td>2 point</td><td>></td></tr> <tr><td>Offset</td><td>></td></tr> <tr><td>Slope</td><td>></td></tr> <tr><td>Reset</td><td></td></tr> <tr><td>Buffer temp</td><td></td></tr> </table>	POT pH		1 point	>	2 point	>	Offset	>	Slope	>	Reset		Buffer temp																			
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b) Slope


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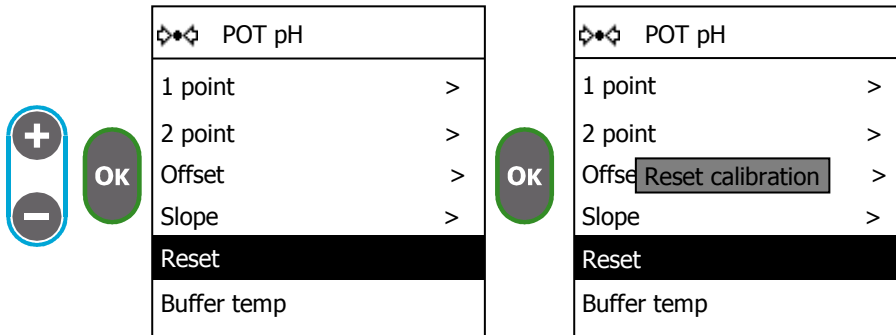


Calibration of the slope must not be performed with a value near zero. Proceed to the slope calibration with a highest possible value.

c) Reset

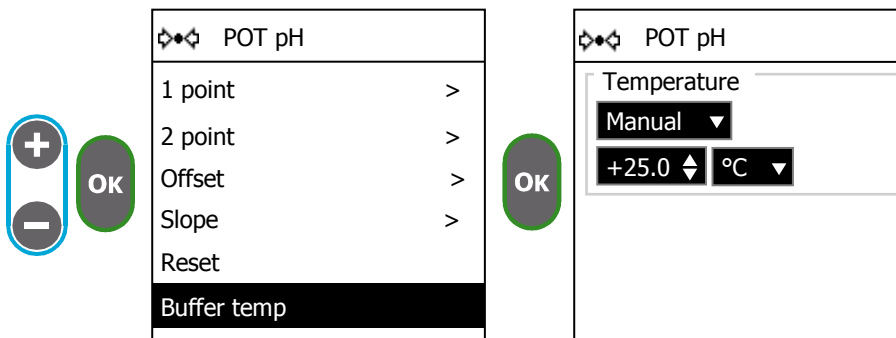
This function allows you to reset the current calibration slope and offset of the sensor with the factory values.

 You must perform this operation if you change your sensor or if you've done a bad calibration.

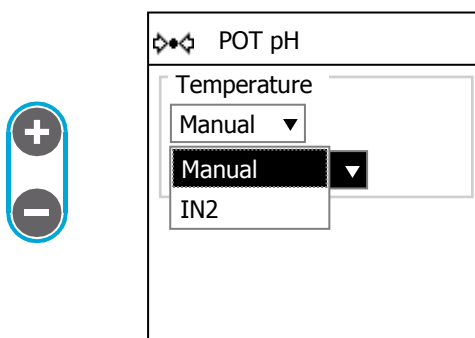


d) Buffer temp

This function allows you to define the temperature of the calibration buffer, this function is available only with temperature dependent sensors. It's recommended to stock the buffer at room temperature.

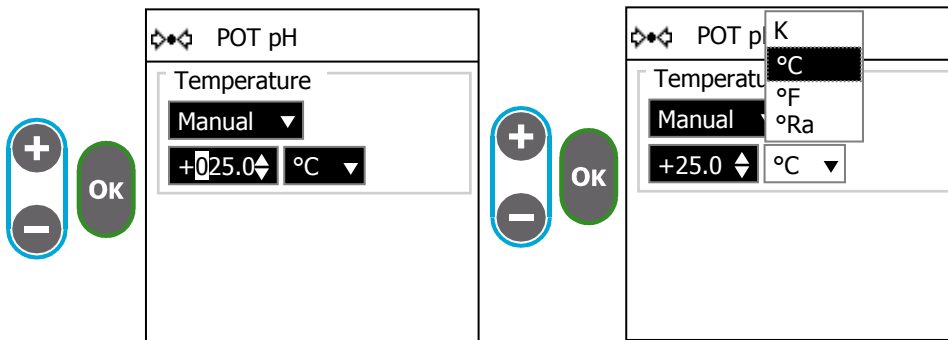


► Select the temperature source.



If you had defined a temperature sensor it is possible to use it, however it is possible to manually set the temperature.

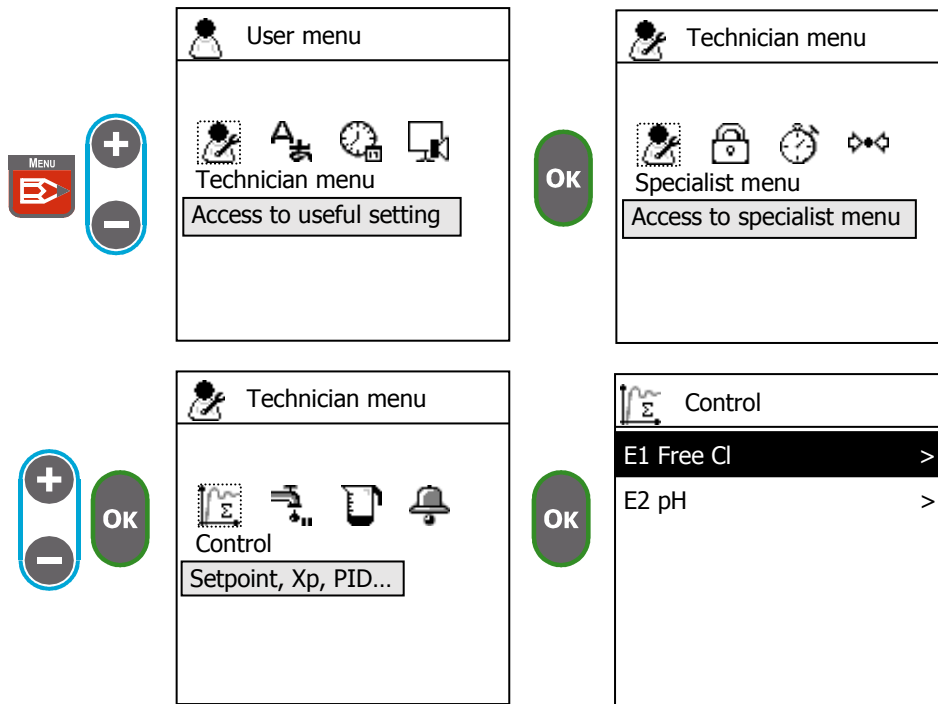
- ▶ Set the temperature.
- ▶ Select the temperature unit.



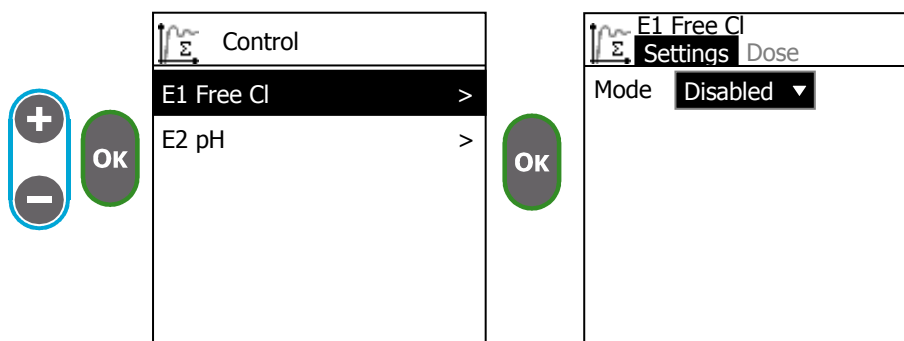
5) Control settings

This procedure allows you to tune all control settings of each parameters.

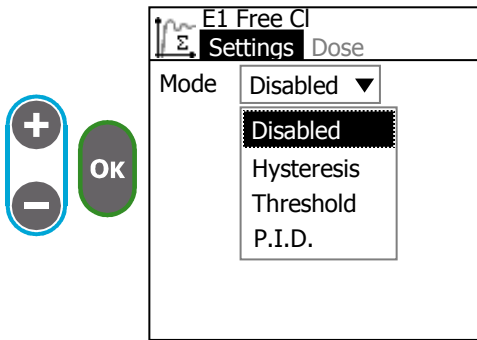
► Go to the “**Control**” screen



► Select the parameter you want to tune.

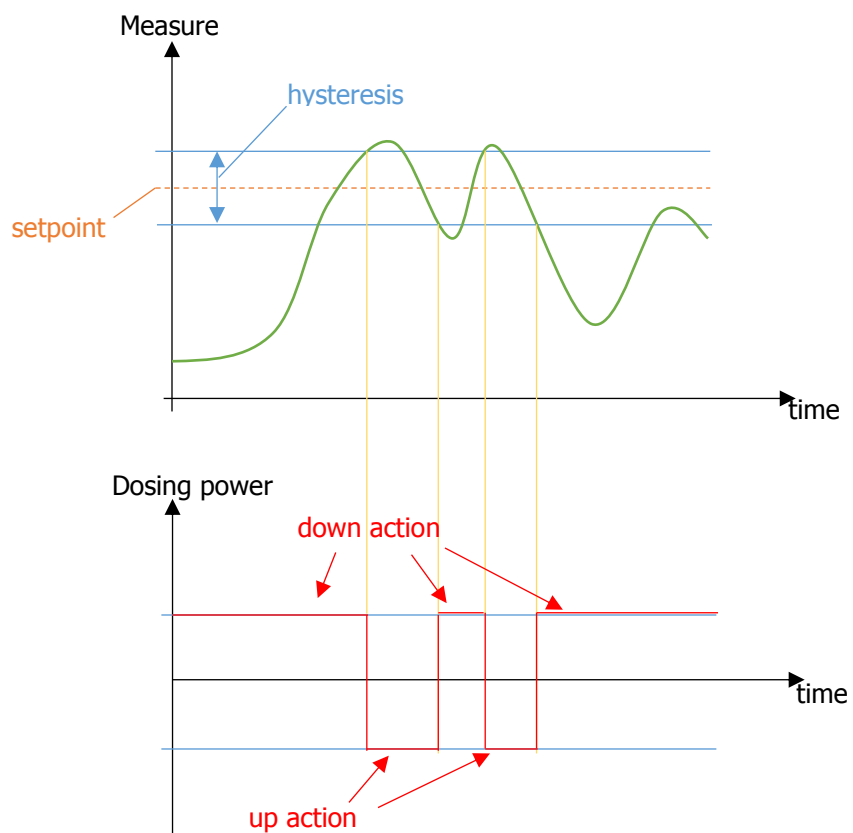


a) Select the computation mode

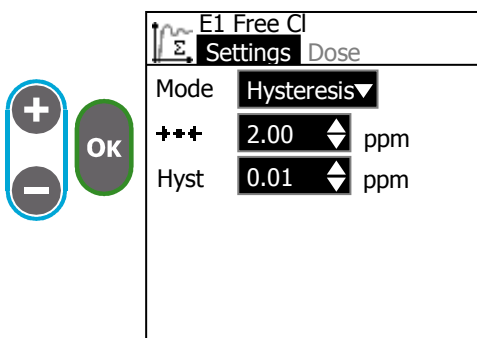


Disabled	The parameter is in measure only mode, no control is done.
Hysteresis	This mode is an on/off control, the hysteresis value is the gap between two points centered around the setpoint, when measure value is upper the highest point the control drives the down actuator, when the measure is lower the lowest point control drives the up actuator
Threshold	This mode allows you to define two thresholds, one to drive down and the other to drive up.
P.I.D.	This mode is linear computation, the drive control is based three components, the Proportional, the Integral and the Derivate.

b) Hysteresis mode

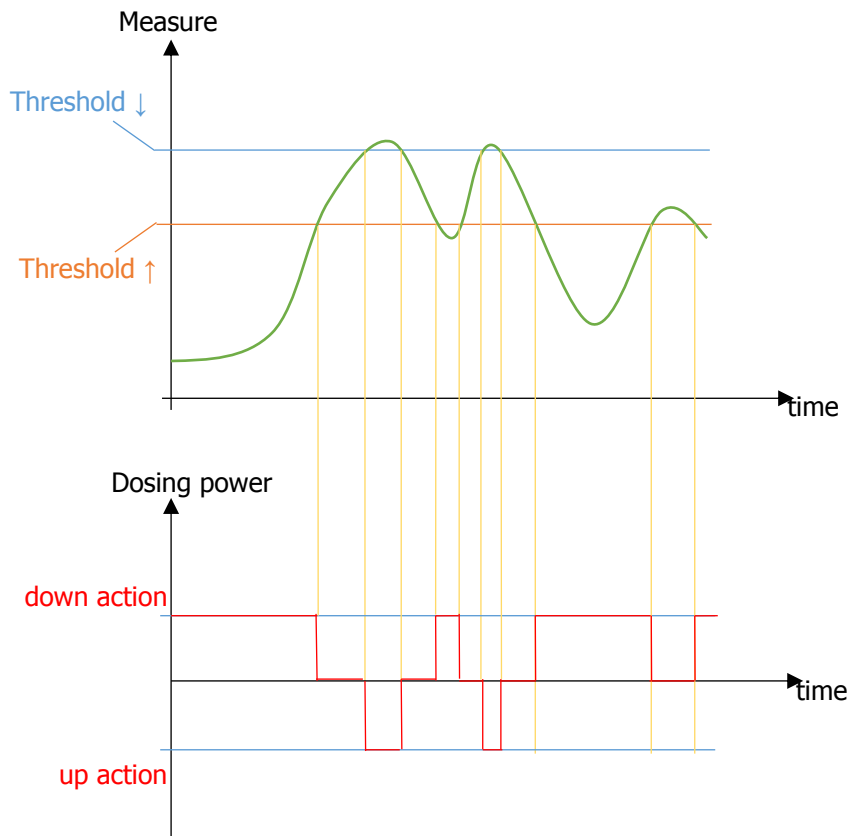


- ▶ Set the setpoint.
- ▶ Set the hysteresis value.

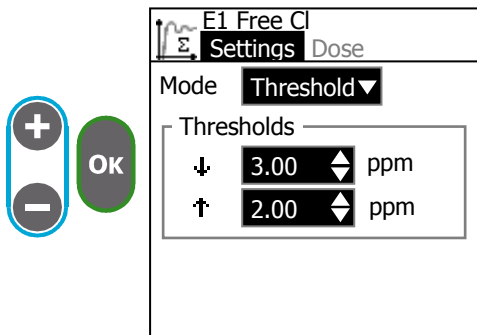


+++	Control setpoint value.
Hyst	Hysteresis value

c) Thresholds mode

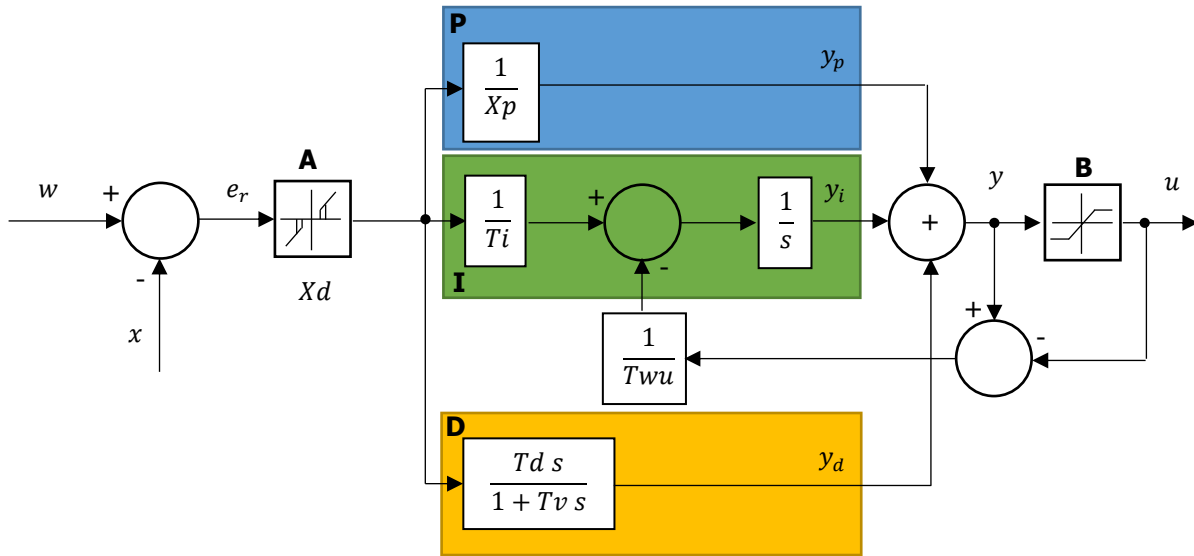


► Set the down and up threshold.



↓	Threshold setpoint who drive the down action.
↑	Threshold setpoint who drive the up action

d) P.I.D. mode

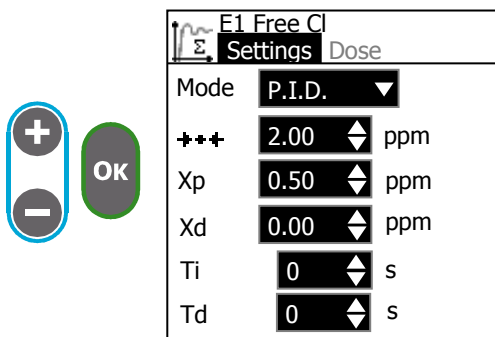


- A Neutral zone
- B Output limiting
- P Proportional compute
- I Integral compute
- D Derivative compute
- Xp Reciprocal proportional value
- Ti Integral action time
- Td Derivative action time
- Xd Neutral zone dead value
- Tv Damping time constant
- Twu Anti-windup time

- w Set point
- x Controlled variable
- e Control deviation
- y Manipulated variable
- u Drive variable

The difference between the set point w and the controller variable (measured value) x results in the control deviation which is filtered by a neutral zone.

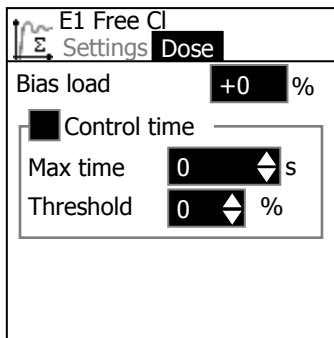
The neutral zone **A** is used to suppress control deviation e that are too small. The control deviation thus filtered is now fed to the actual PID controller which divides into three parts based on the **P** (proportional), **I** (integral) and **D** (derivative) values (top-down). The integral section (green) also comprise an anti-windup mechanism for limiting the integrator. A sum of the 3 components results in the manipulated variable which is limited according to the relays and current outputs settings, **B** (-100% to 0% or 0% to +100% or -100% to +100%).



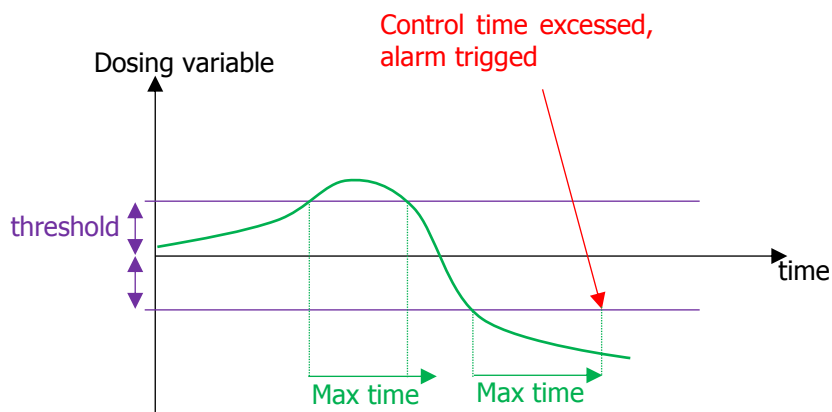
+++	Control setpoint value.
Xp	Reciprocal proportional value. If deviation ($w-x$) is equal to Xp , the drive variable is 100%, decrease Xp will drive harder your pumps for the same deviation. 0.4...700% of the measurement scale
Xd	Neutral zone dead value, if deviation is smaller than this value, no drive is done. 0...20% of the measurement scale
Ti	Integral time, action eliminates offset. If used should be at less equal to the loop feedback time. 0...9999s
Td	Derivative time, reduce the drive overshoot. 0...250s

a) Dosing setting

This screen tab allows you to set a bias load to the computed drive variable. You also can define a maximum dosing time to prevent overdosing due to control feedback problem.



Bias load	This value is added to the drive variable after control computation. The bias load is signed to take care of the drive direction, a positive load adds to the direct action actuator to up the control value. -30...+30%
Control time	If control time is enabled the drive variable is checked before the bias load is added.
Max time	Time limit during the drive variable is higher than the threshold before the overdose alarm is triggered. 0...9999s
Threshold	Drive variable threshold to check the control time. 0...90%




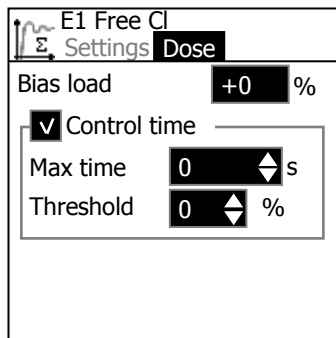
example:
 bias load + 10%
 max time 900s
 threshold 5%

If the setpoint is reached and therefore the need for dosage is 0%, this value is less than the threshold, dosing time is not taken into account.
 After addition of a bias load of 10%, dosing action is $0\% + 10\% = 10\%$

If the need for dosage is 8%, this value is higher than the 5% threshold, the dosing time is counted if the need remains higher than this threshold for more than 900s, an alarm overdose will begin. The dosing action after addition of the bias load is $8\% + 10\% = 18\%$

If the need for dosage is -6% this value is higher than the 5% threshold (absolute value), the dosing time is counted if the need remains higher than this threshold for more than 900s, an alarm overdose will trigger. The dosing action after addition of the bias charge is $-6\% + 10\% = 4\%$


- To enable the control time check the box using 




E1 Free Cl
Σ Settings Dose
Bias load +0 %
 Control time
Max time 0 s
Threshold 0 %

- Set the Max time and threshold using  and 



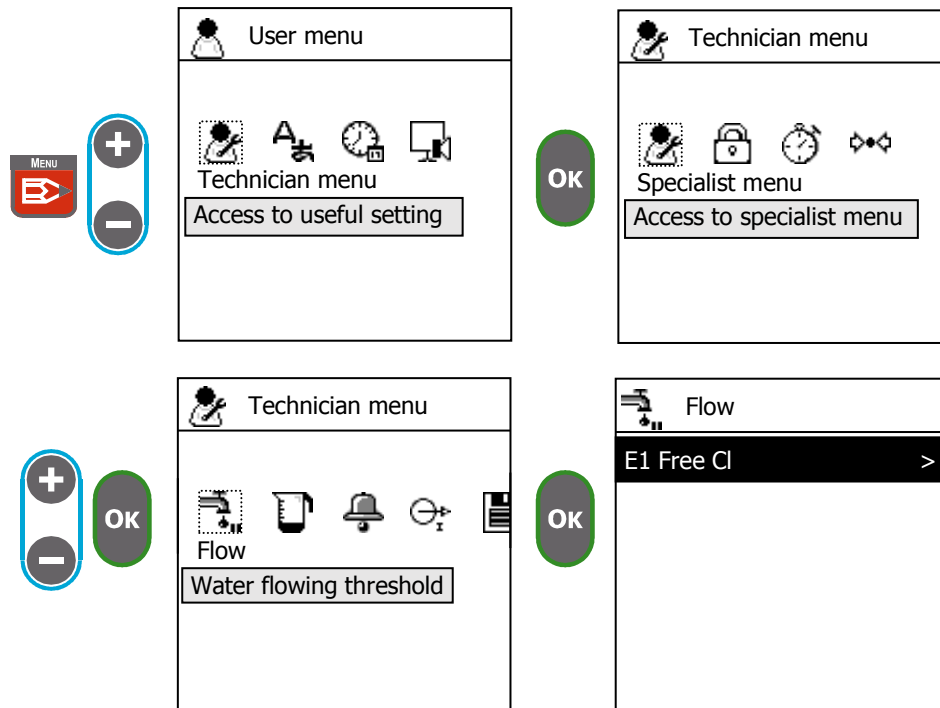
If drive variable is higher than the **threshold** during the **Max time**, overdose alarm  is triggered.

To acknowledge the overdose alarm by pressing hold the  key.

6) Flow settings

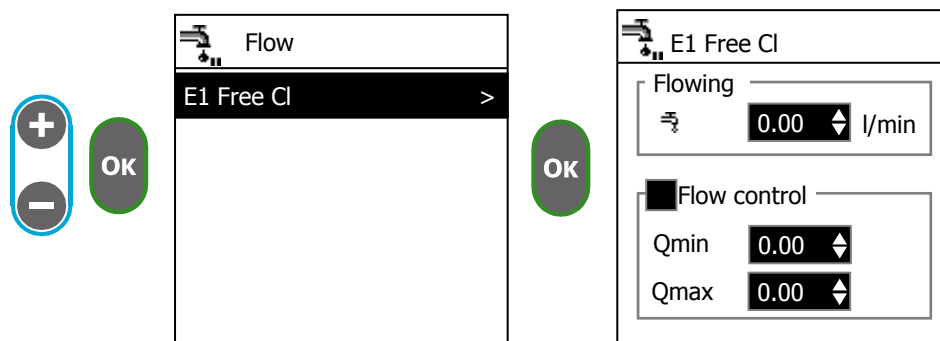
This screen allows you to define a flowing threshold value to prevent water flowing stop or too small who can alter the measure precision.
 You can also define two flowing value to proportionally compensate the drive variable.

► Go to the "Flow" screen



► Select the parameter you want to configure.

i The list only contains parameters with control enabled in the control screen and you can edit settings only if a flow meter has been defined in the inputs screen.



- Set the flowing threshold value.
- Set the two flowing value which correspond to the proportional control drive.

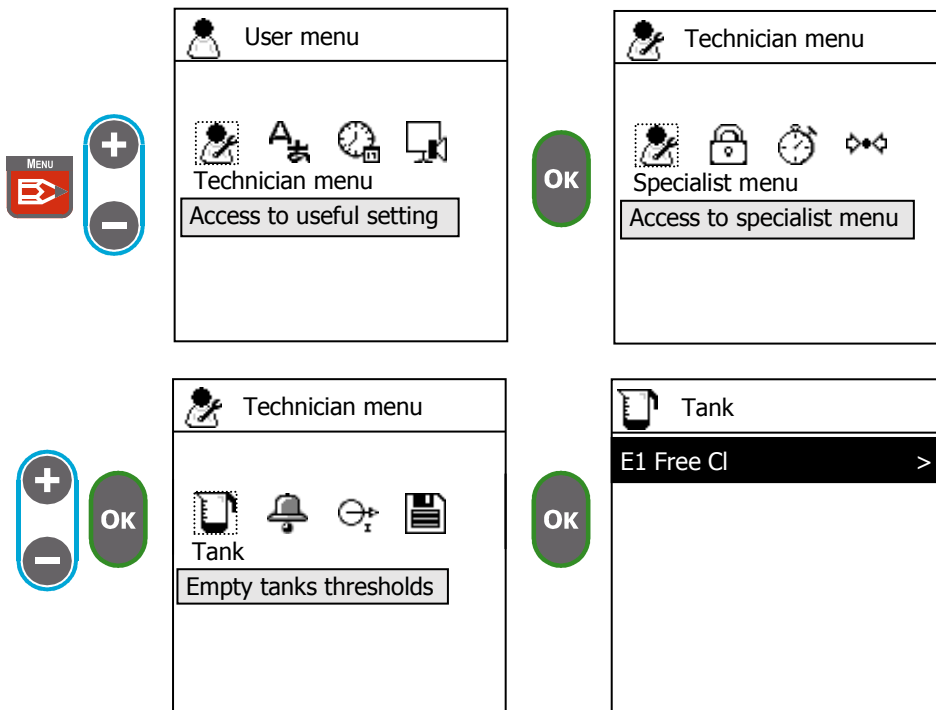
$$A = \frac{Q - Q_{min}}{Q_{max} - Q_{min}} \quad \text{where } Q \in [Q_{min}; Q_{max}] \rightarrow d = u \times A$$

Qmin	Flow corresponding to 0% gain	A	Flow proportional gain
Qmax	Flow corresponding to 100% gain	u	Drive variable
Q	Flow value	d	Actuator variable

7) Tank settings

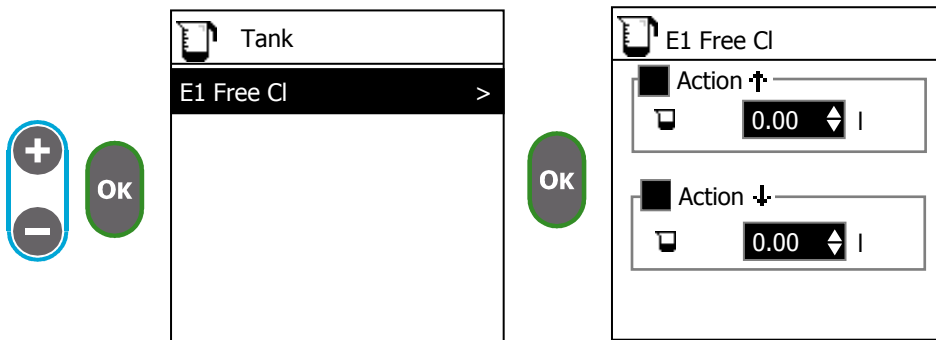
This screen allows you to define level of tanks to indicate one of tanks is empty.

► Go to the “**Tank**” screen



► Select the parameter you want to configure.

i The list only contains parameters with control enabled in the control screen and you can edit settings only if a volume meter has been defined in the inputs screen.



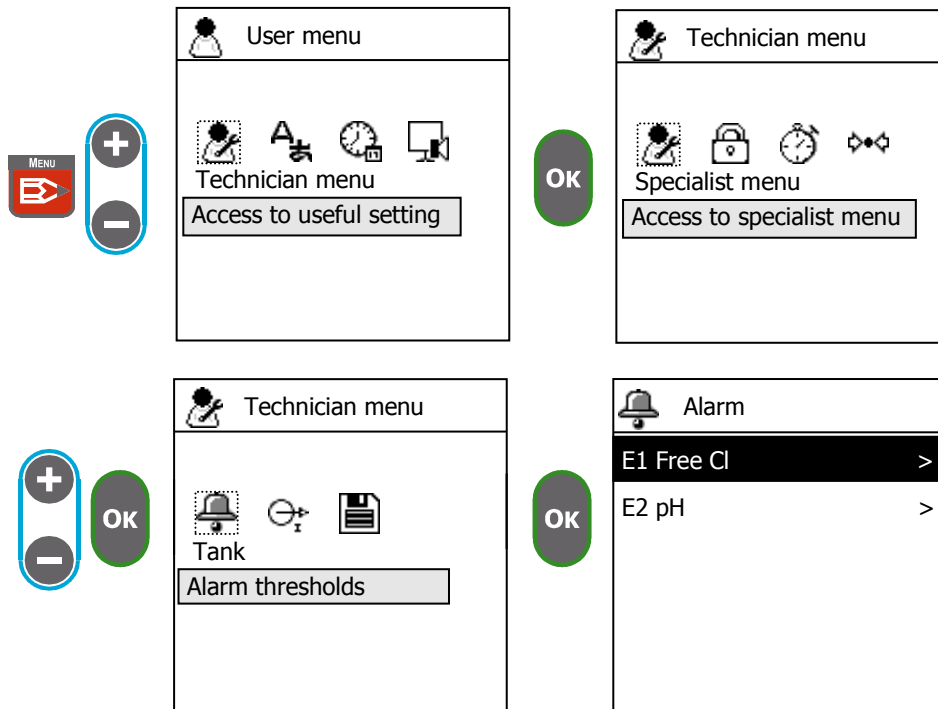
► To enable the empty tanks detection check the corresponding the box using **OK**

► Set the empty tank levels using **+** and validate using **OK**

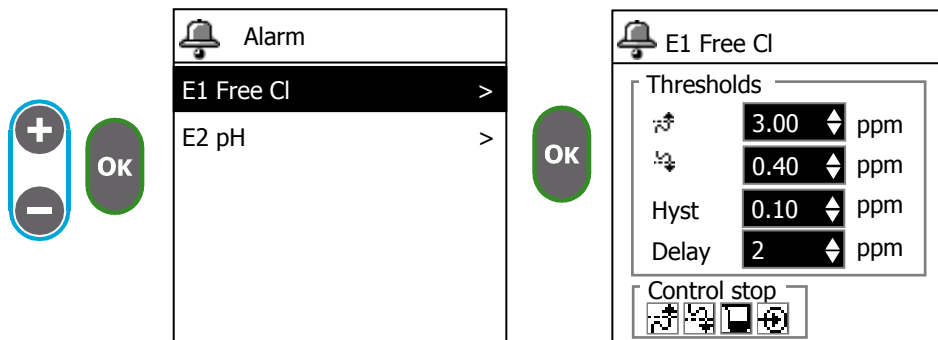
8) Alarms

This screen allows you to define measure alarm thresholds and the alarms conditions who stop the control.


► Go to the “**Alarm**” screen




► Select the parameter you want to configure.




► Adjust the thresholds settings

 E1 Free Cl

Thresholds


 **3.00** ppm



 **0.40** ppm

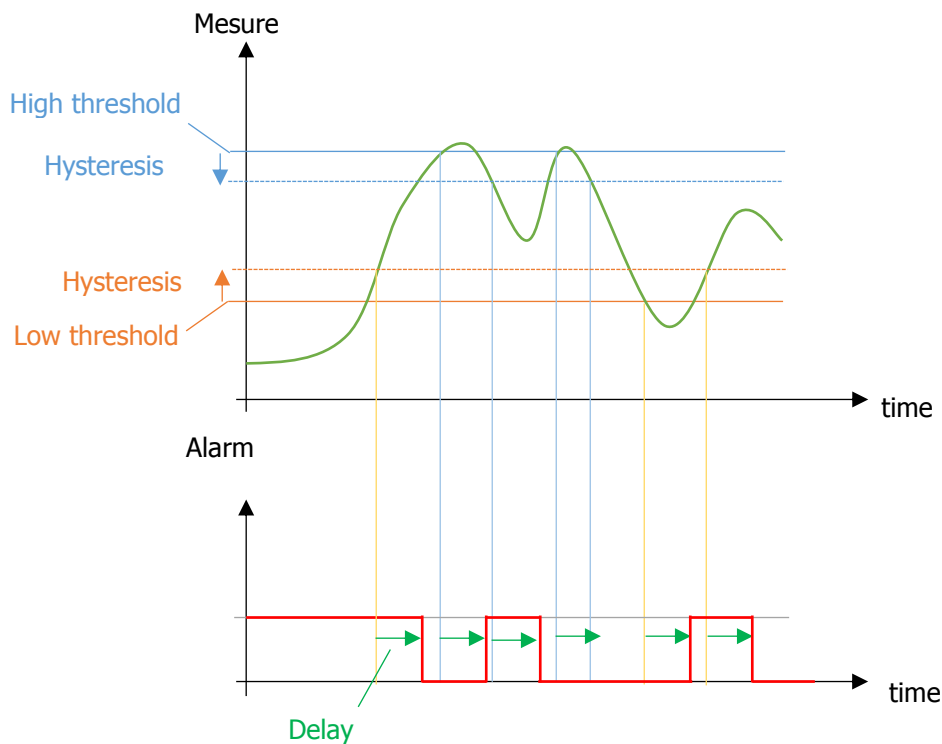
Hyst **0.10** ppm

Delay **2** ppm

Control stop



	Measure high threshold value.
	Measure low threshold value.
Hyst	Hysteresis value for both high and low thresholds alarm release
Delay	Minimum over threshold duration to trigger the alarm.







► Select which alarm can cause stop of control using




and press **OK** to enable or disable is.



-  High threshold alarm
-  Low threshold alarm
-  Sensor fault, out of range or disconnected
-  Overdose time or empty tank

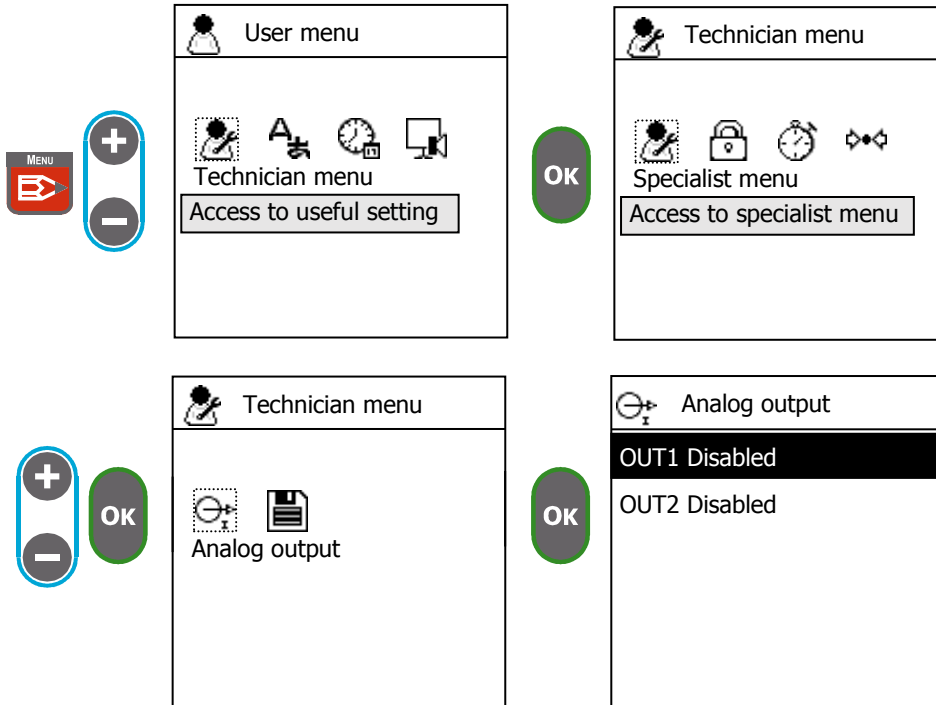


If an alarm stop control, you should fix reasons why its happen and restart control by pressing hold the  key.

9) Analog outputs

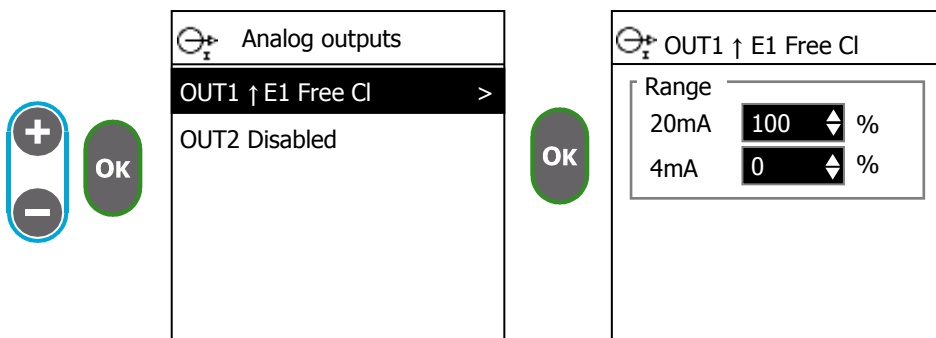
This procedure allows you to define the ranges of the analogue outputs.

► Go to the “**Analog output**” screen



► Select the parameter you want to configure.

i You can only edit the analog output which are set in the “**Specialist menu**”.



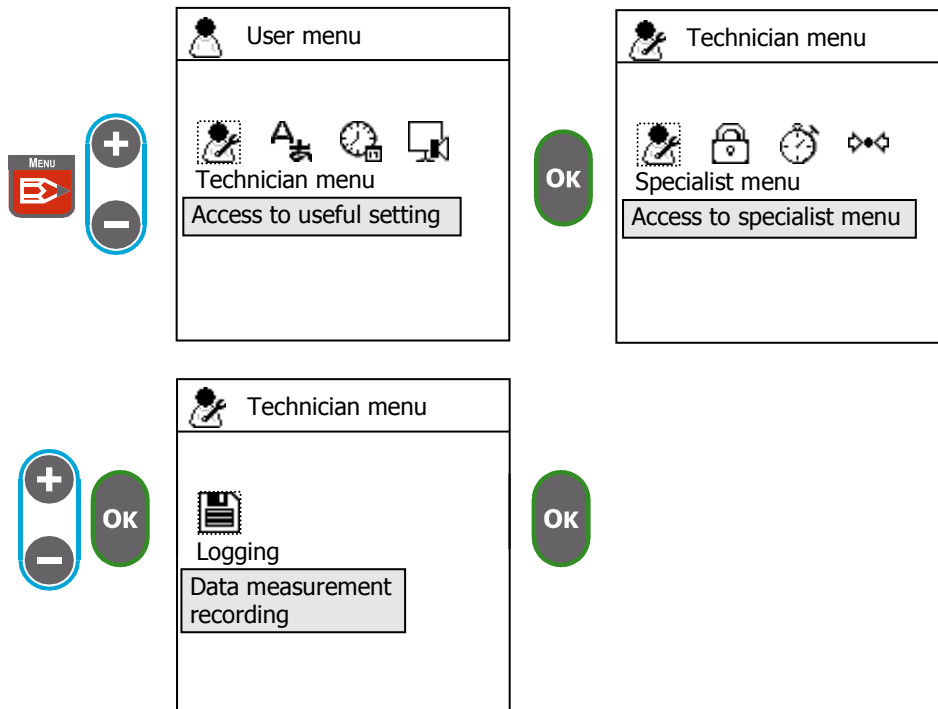
► Edit the high point “20mA” and low point “0/4mA” corresponding to your actuator driving range or your recording range.


i If the analog output mode selected in “Specialist menu” is set to “Control” the range is in percent of drive variable.

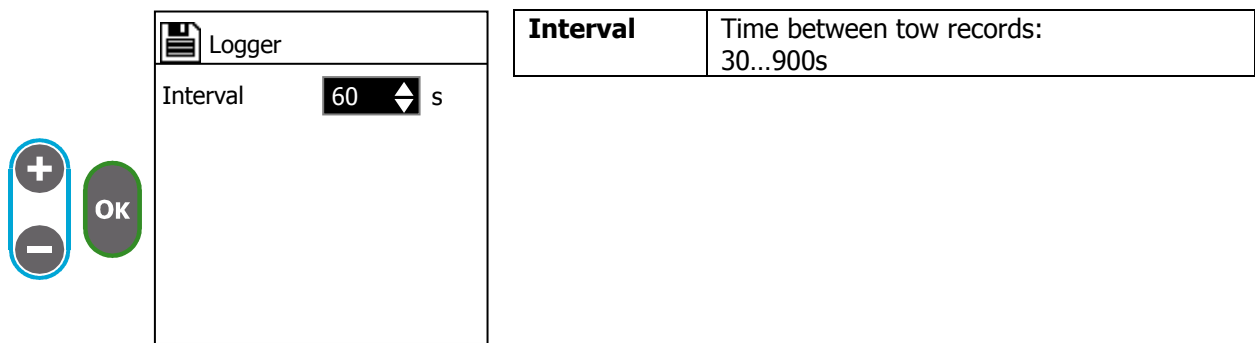
10) Data recording

The **SYCLOPE DOUBLEAU**[®] controller has internal memories used to record measurements, calculated parameters and events. These data are write to a USB stick.

► Go to the “**Logging**” screen



► Set the interval between two records using  key.



The internal memory of the device makes it possible to store data without USB stick connected. When you connect a stick, internal memory containing all the previous records is transferred to the stick. Longer is the interval recording time, longer is the time you have to disconnect the stick, transfer the data into your computer and connect the stick to the device.

To calculate the time you have to transfer data to a computer using this calculation:

$$\text{Time disconnected } X = 15\text{min (range / 30s)}$$

Example: if you select an interval to 30s you have internal memory recording 15min, if you selected 900s you have 7h30min.

VIII. Specialist menu

This menu allows to the specialist to modify the complete configurations as:

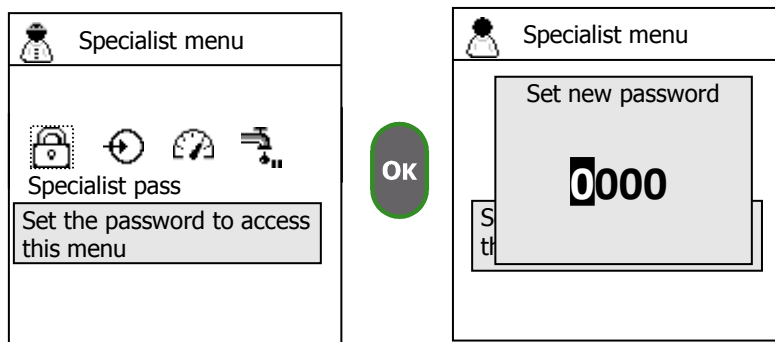
- Define sensors and detector connected to inputs
- Realizing computation between inputs to create parameters
- Definition of the conditional working of the regulations
- Configure the empty tank detection
- Program a control remote
- Using the relays
- Using the analog outputs
- Set the screen display options
- Define communications types and modes
- Initialize the controller configuration

1) Specialist code

To modify or to delete the code used to protect this menu level.

a) Modify the access code

This procedure allows you to modify the access code.



- Enter a new code by using  and validate with  key.

b) Cancellation of the specialist code

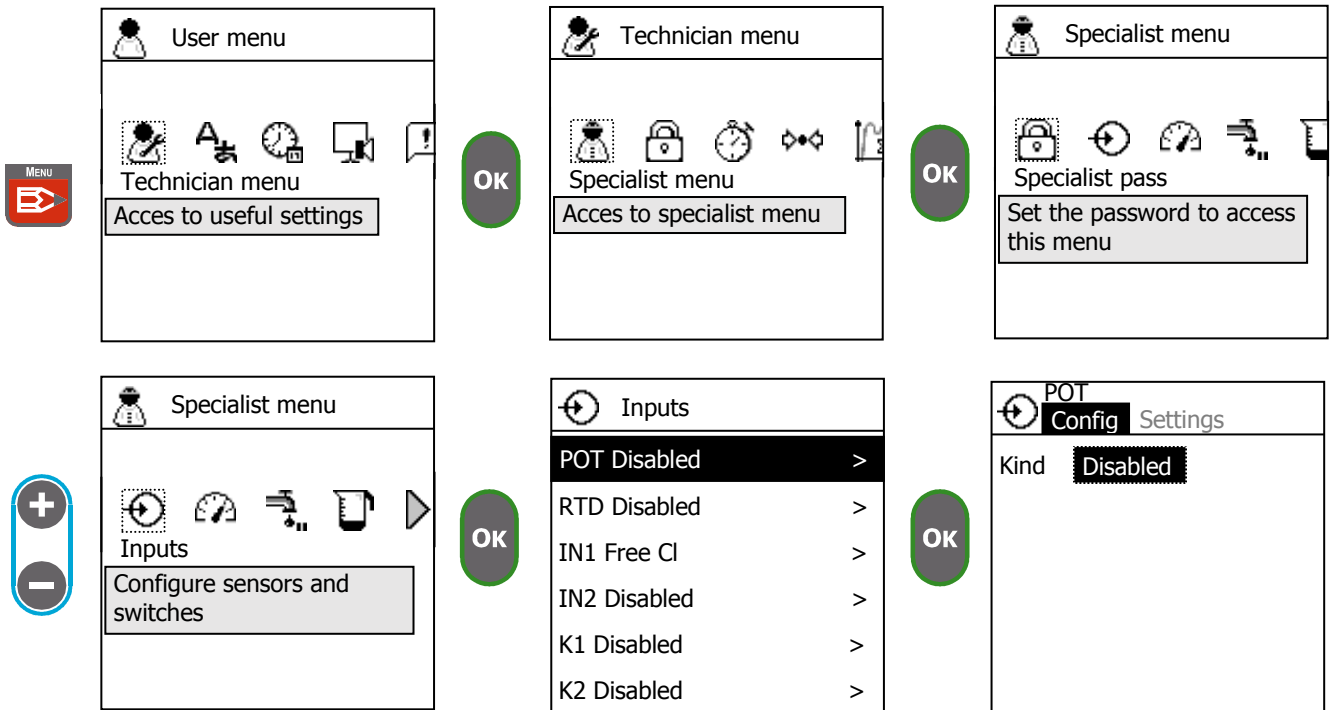
This procedure allows you to cancel the specialist code and to free the access of this menu.

- Enter the value « 0000 » to cancel or to delete the present code.

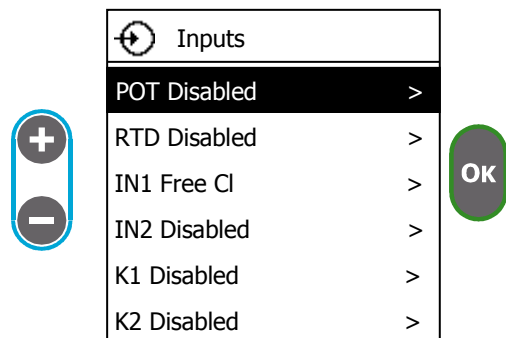
2) Inputs

This menu allows you to define which sensor or detector are connected to the inputs.

► Go to the “**Inputs**” screen



► Select the input corresponding the sensor you want to define

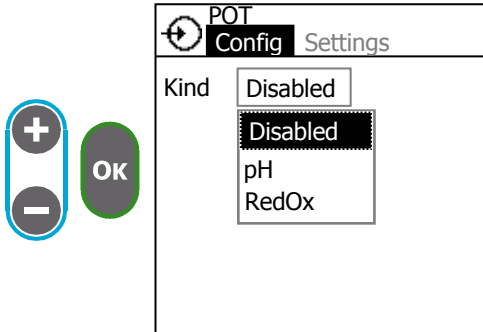


a) Configure POT input



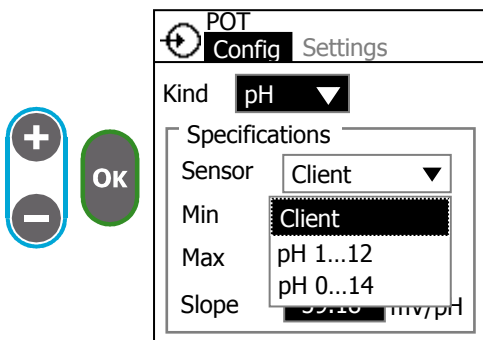
This input is designed to connect potentiometric sensors, be sure your sensor is compatible before using it.

► Select the sensor kind



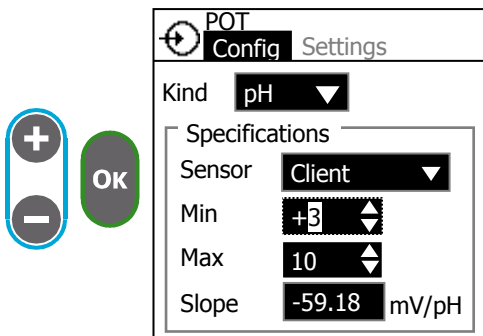
Disabled	The input is disabled.
pH	pH sensor
RedOx	RedOx sensor

► Select the sensor reference

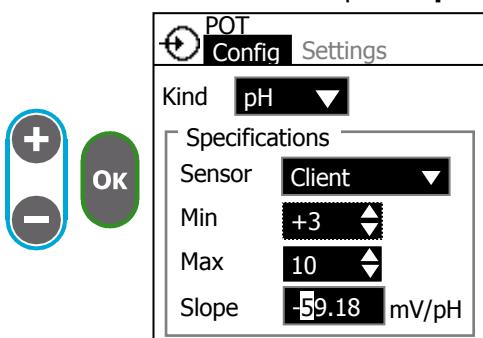


The list of sensors depends the kind you had selected, in case you choose the "Client" sensor you can define the scale of this one.

► Set the sensor measurement range "Min" and "Max".



► Set the sensor slope "Slope" (only available with pH sensors kind).

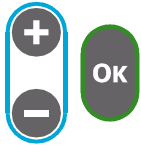


b) Configure RTD input



This input is designed to connect pt100 temperature sensors, be sure your sensor is compatible before using it.

► Select the sensor kind



RTD
Config Settings

Kind Disabled

Disabled

Temp.

Disabled	The input is disabled.
Temp.	pt100 temperature sensor

RTD
Config Settings

Kind Temp. ▼ °C ▼

Specifications

Sensor -20...110°C ▼

Min -20 ▼

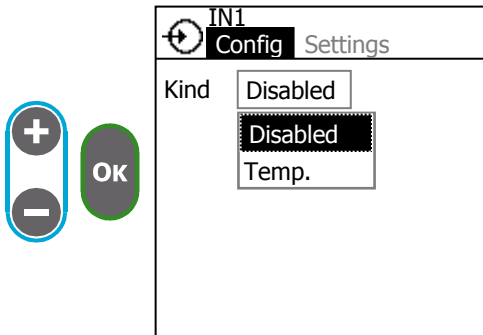
Max 110 ▼

c) Configure IN1 & IN2 input



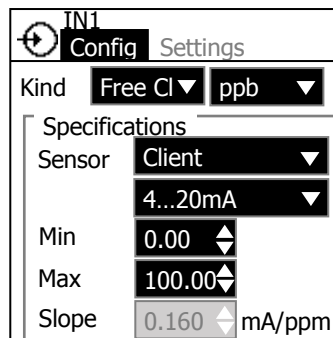
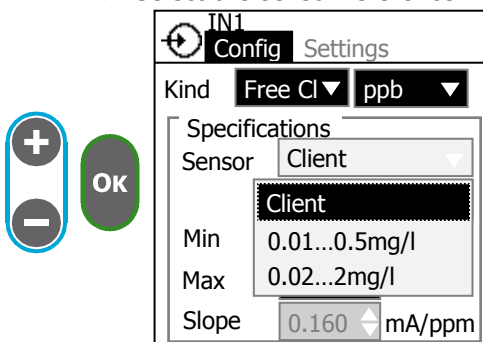
This input is designed to connect different kind of sensors with 0...20mA or 4...20mA transducer, be sure your sensor is compatible before using it.

► Select the sensor kind



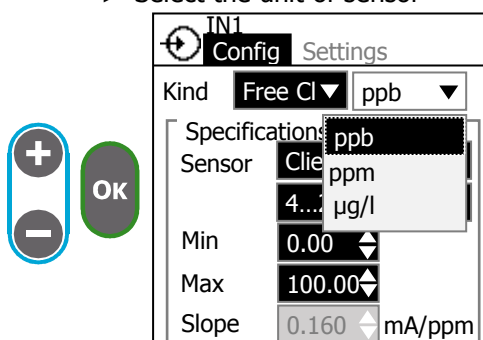
Disabled	The input is disabled.
Switch	<i>Use the input as a digital input</i>
Free Cl	Free chlorine sensor
Active Cl	Active chlorine
Total Cl	Total chlorine
Chlorite	Chlorite
ClO2	Chlorine dioxide
H2O2	Hydrogen peroxide
BCDMH	Bromo chloro dimethylhydantoin
DBDMH	Dibromo dimethylhydantoin
Free Br.	Free bromine
PAA	Peracetic acid
Ozone	Ozone
O2	Dissolved oxygen
PHMB	Polyhexanide
Turbidity	Turbidity
Cond.	Conductivity
Temp.	Temperature
Flow	<i>Flowing detection and control compensation</i>
pH	Potential of hydrogen
RedOx	Reduction oxidation reaction
Volume	<i>Empty tank detection</i>

► Select the sensor reference

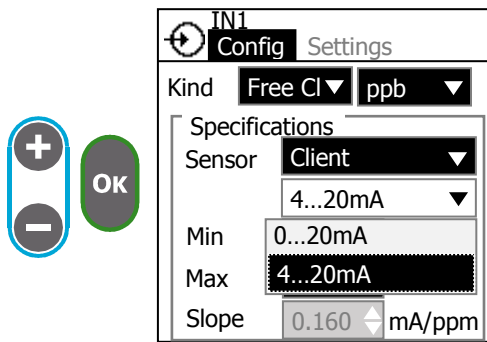


The list of sensors depends the kind you had selected, in case you choose the "Client" sensor you can define the scale of this one.

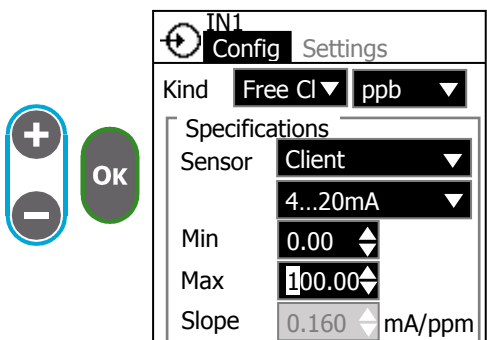
► Select the unit of sensor



► Select the sensor interface



► Set the sensor measurement range "Min" and "Max".



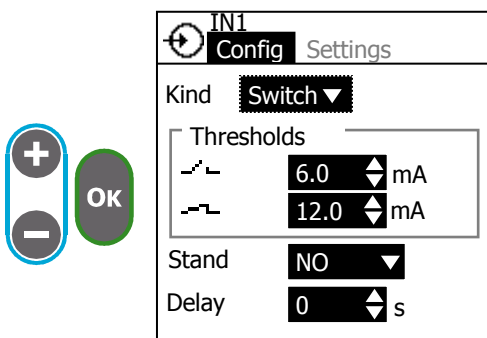
Measurement range depends on your sensor specifications take care to use correct settings



When you select a "Client" sensor, the slope is automatically computed based on measurement range and sensor interface.

Using analog input as a digital input:

► Select "Switch" kind



► Adjust the thresholds currents

	If current is under the threshold the switch is read as open 0...20mA
	If current is over the threshold the switch is read as closed 0...20mA

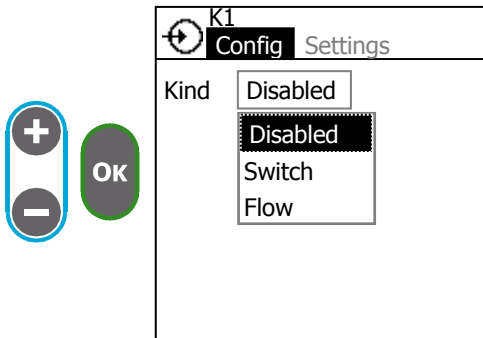
- ▶ Select the switch stand according the application
- ▶ Set the debounce time, this delay is applied on both closing and opening actions

d) Configure K1 & K2 input



This input is designed to connect digitals proximity sensors or dry contact switches, be sure your sensor is compatible before using it.

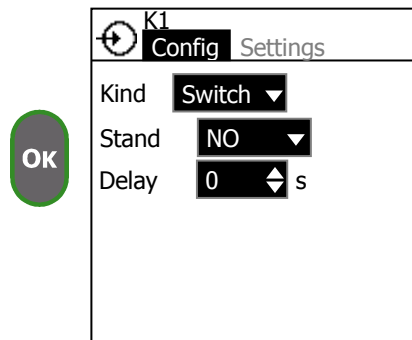
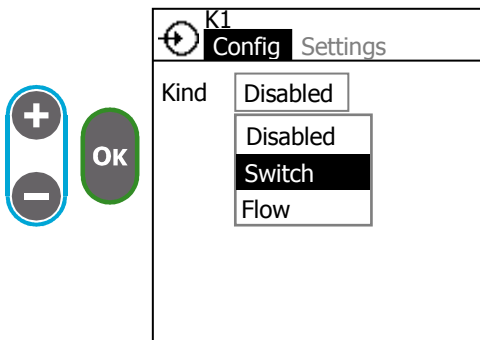
- ▶ Select the sensor kind



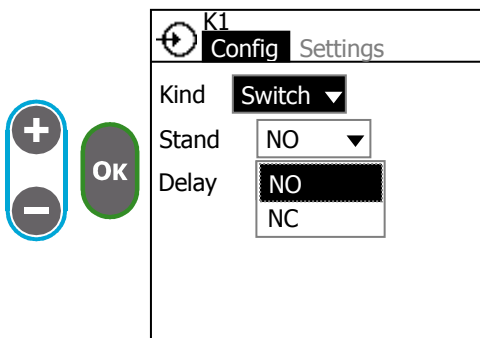
Disabled	The input is disabled.
Switch	State contact
Flow	Pulsed contact used for flow-meter

Using digital input for state:

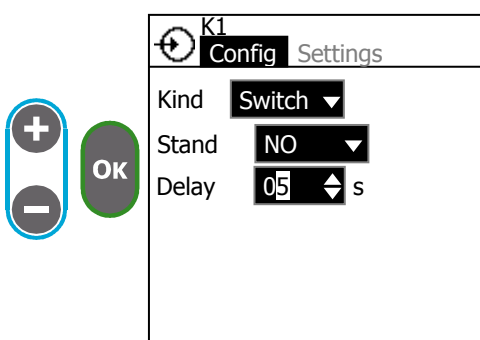
- ▶ Select the **"Switch"** kind



- ▶ Select the stand of the switch



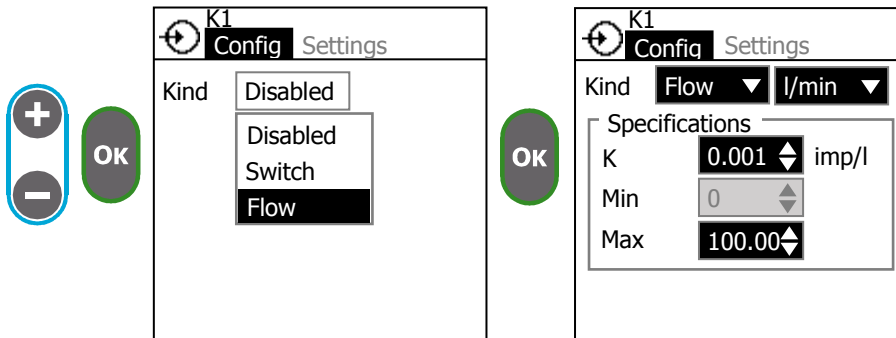
- ▶ Select the debounce



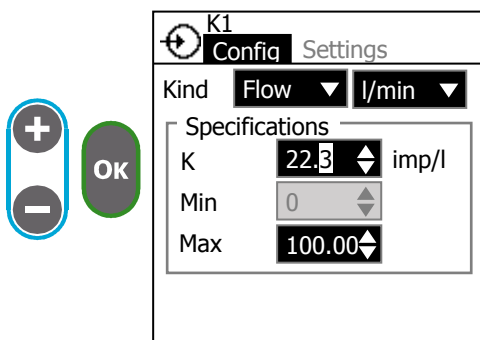
Delay	Debounce delay: 0...240 s
--------------	------------------------------

Using digital input for pulse (flow-meter):

► Select the **“Flow”** kind



► Set the K-factor

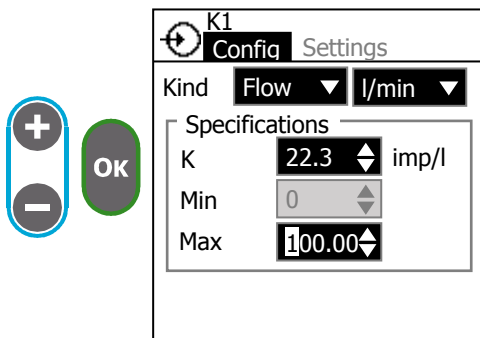


K	Flow rate computation factor: 0.001...2000 imp/l or imp/m3
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To compute the K-factor, use the instructions on your flowmeter manual.

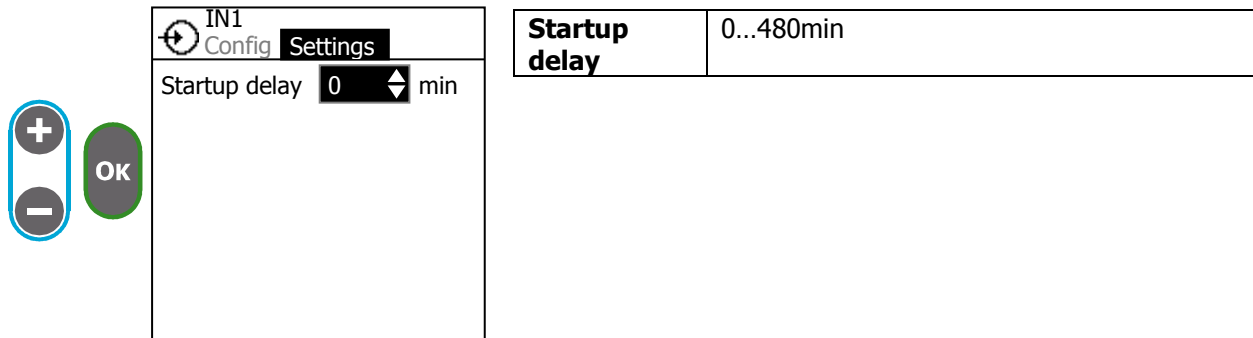
► Set the max flow value



Min	To indicate flowing stop, all the selected switches and flowmeter must be inactive
Max	Max flow rate of the flowmeter: 0.0001...2000 [flow_unit]


e) Set sensor delay

▶ Set the startup delay



Startup delay	0...480min
----------------------	------------



This delay prevents sensor measurement error after device startup or following an analysis water flowing stop. During this phase the symbol  blink on main screen.

f) Configure Vref supply voltage



This function allows you to set the voltage present on Vref terminal and on IN1 & IN2 terminals. Take care to not set a voltage higher the maximum voltage required by your sensors.

► Select the Vref line using the key **OK**

The image shows three sequential screenshots of the 'Inputs' menu, illustrating the steps to select the Vref line. On the left, a blue circular button with a '+' sign is positioned above a blue circular button with a '-' sign. In the first screenshot, the 'POT Disabled' option is highlighted. In the second screenshot, the 'Vref' option is highlighted, and a green oval with the text 'OK' is positioned to its left. In the third screenshot, the 'Vref' option is still highlighted, and a green oval with the text 'OK' is positioned to its right. The 'Vref' option in the second and third screenshots includes a small '12V' icon and a square button icon.

Inputs	
POT Disabled	>
RTD Disabled	>
IN1 Free Cl	>
IN2 Disabled	>
K1 Disabled	>
K2 Disabled	>

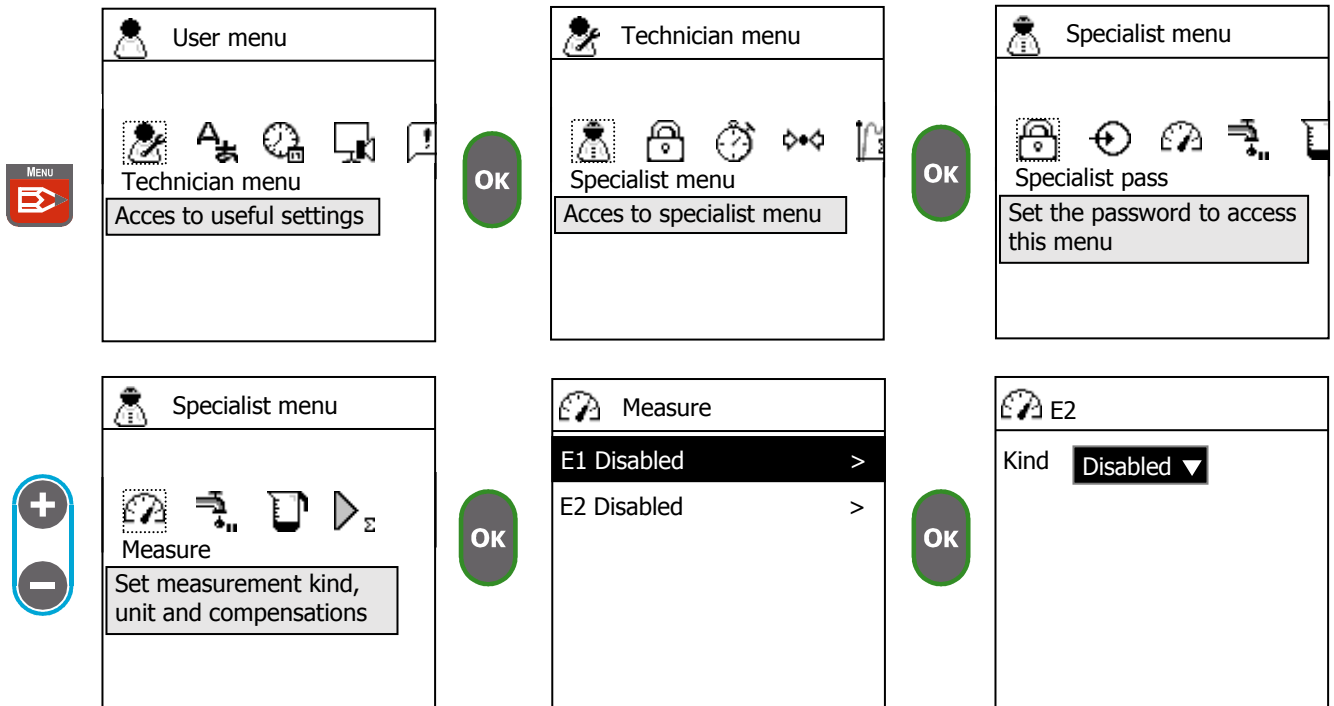
Inputs	
RTD Disabled	>
IN1 Free Cl	>
IN2 pH	>
K1 Flow	>
K2 Switch	>
Vref	12V □

Inputs	
RTD Disabled	>
IN1 Free Cl	>
IN2 pH	>
K1 Flow	>
K2 Switch	>
Vref	12V □

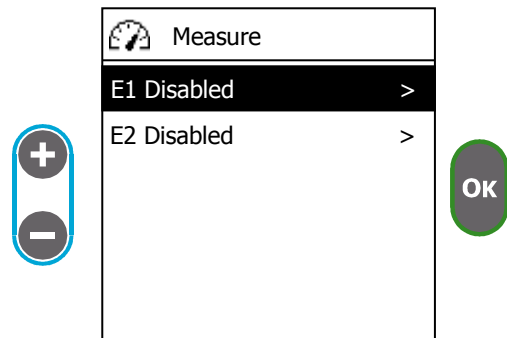
3) Measure

This menu allows you to define the measure parameters, these parameters can be compute based on one or multiple sensors defined on the inputs menu.

► Go to the “**Measure**” screen



► Select the parameter

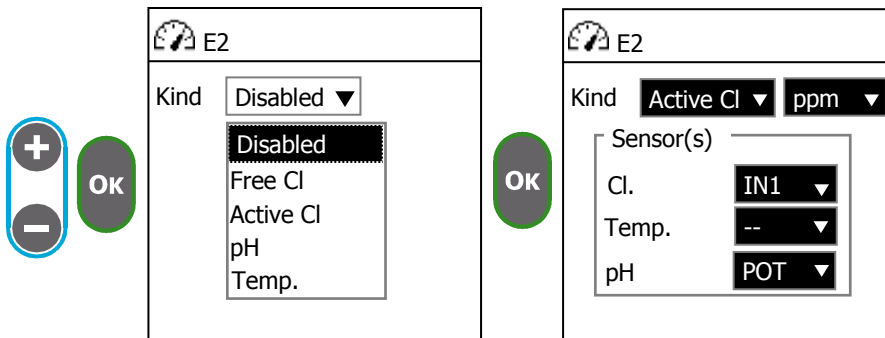


Example: if you had set a pH sensor on POT input, a free chlorine sensor on IN1 input and a temperature sensor on RTD input.



The kind list depends on which sensors you had defined on the input menu.

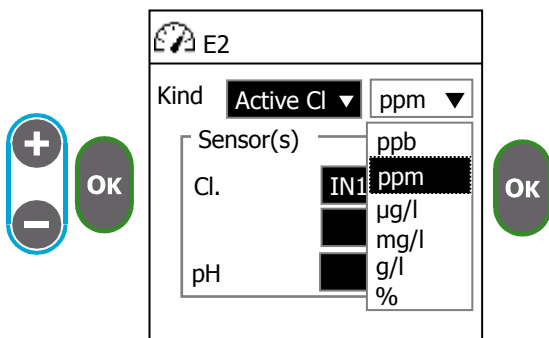
► Select measurement kind



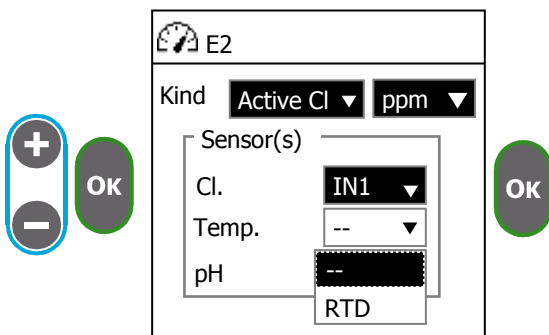
According the sensors defined on the input menu you can choose the same kind of the sensor or computed kind based on several sensors.

Here you can select, free chlorine, pH and temperature form the sensors and active chlorine from computation.

► Select measurement unit



► Choose the sensor input used to compute the parameter measure.

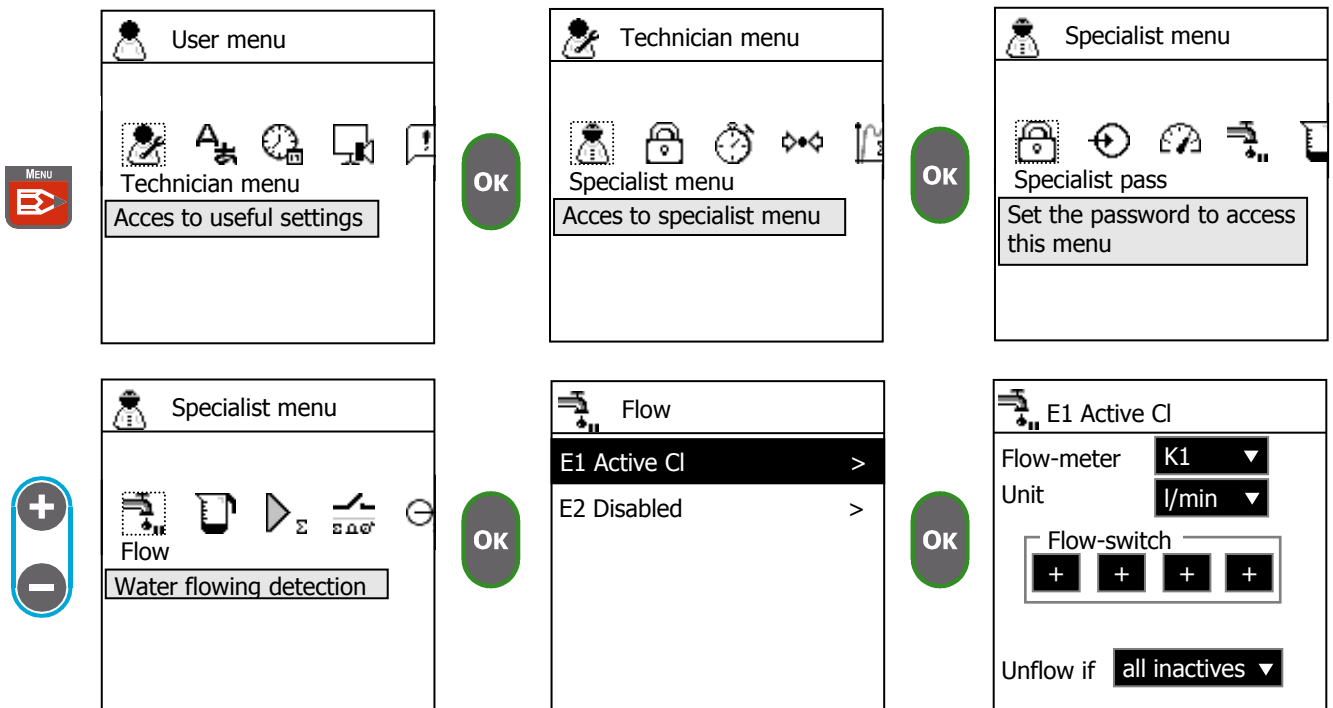


In case you select a parameter kind which can be temperature dependent, you have the choice to use sensor or not, if not the temperature is 25°C.

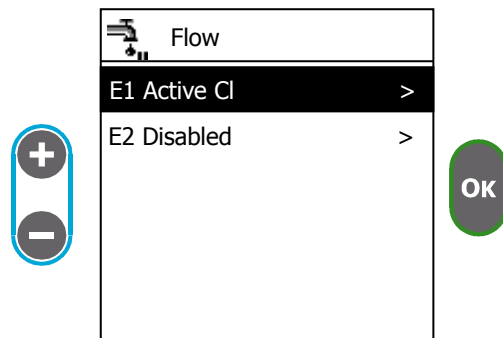
4) Flow configuration

This menu allows you to define the flowing detection and flow metering based on inputs sensors and switches.

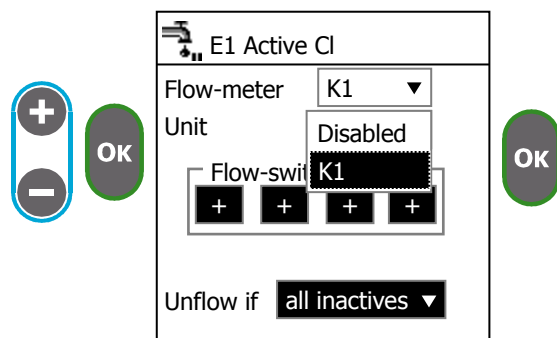
► Go to the "Flow" screen



► Select the parameter which you want to configure the flow detection

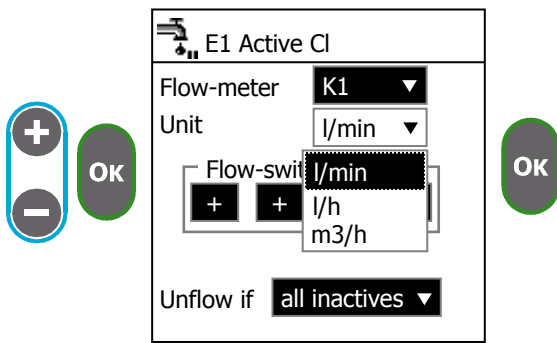


► Select the flowmeter input



Flow-meter selection is only available if you had defined a flow sensor on input screen.

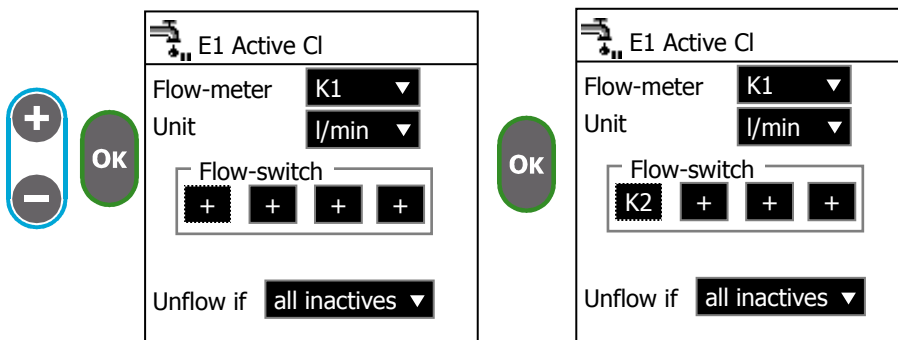
► Select the flowmeter unit



This unit will be used for feature configuration like the flow thresholds.

► You can use 4 switches in same time to detect flowing, to add a switch navigate on one of

the button **+** using **OK** key and press until your switch name appear into the button.

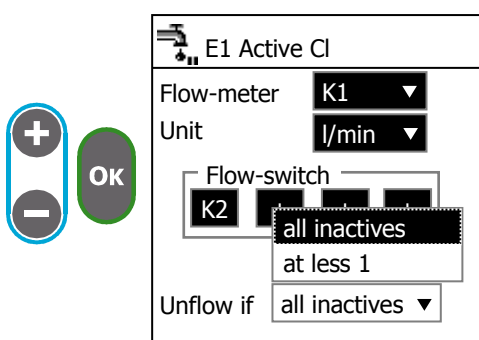


To select a switch or an analog input configured as switch, the corresponding input must be defined as switch on the input screen.



Take care about the switch stand configuration.
If switch stand is NO and switch state is open the corresponding switch is inactive therefore the no flowing indication blinks on the main screen and parameter control is stopped.

► Select the flow detection conditional operation

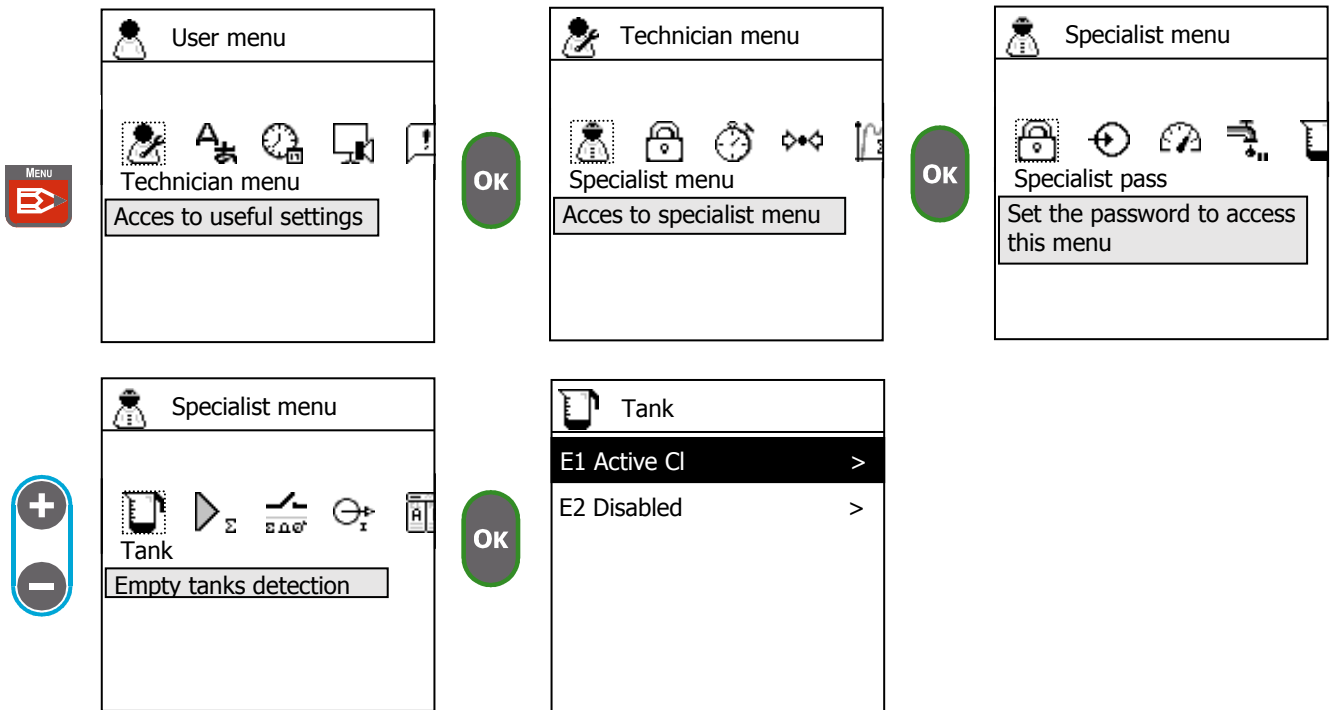


all inactives	To indicate flowing stop, all the selected switches and flowmeter must be inactive
at less 1	If at less one of the switches is inactive or flowmeter is low the flowing stop is detected

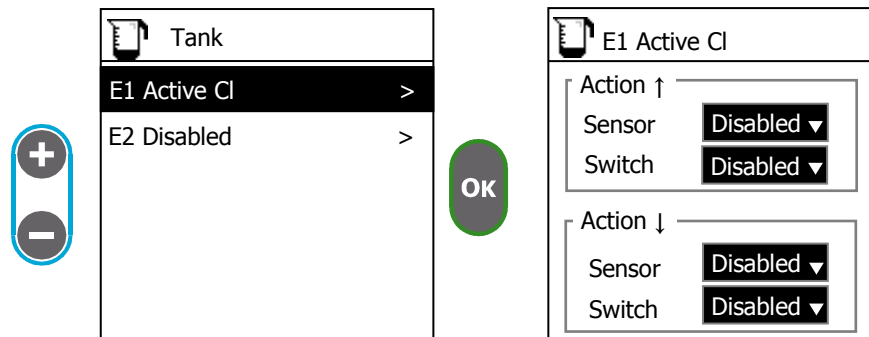
5) Tank configuration

This menu allows you to select which switches and volume meter are used to detect empty tanks.

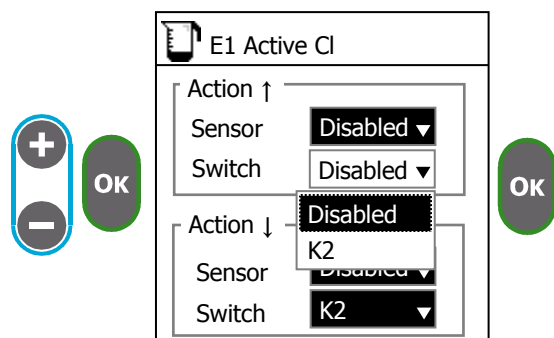
► Go to the "Tank" screen



► Select the parameter



► Select for each tank action the switch and/or the volume sensor used to check the empty tanks.

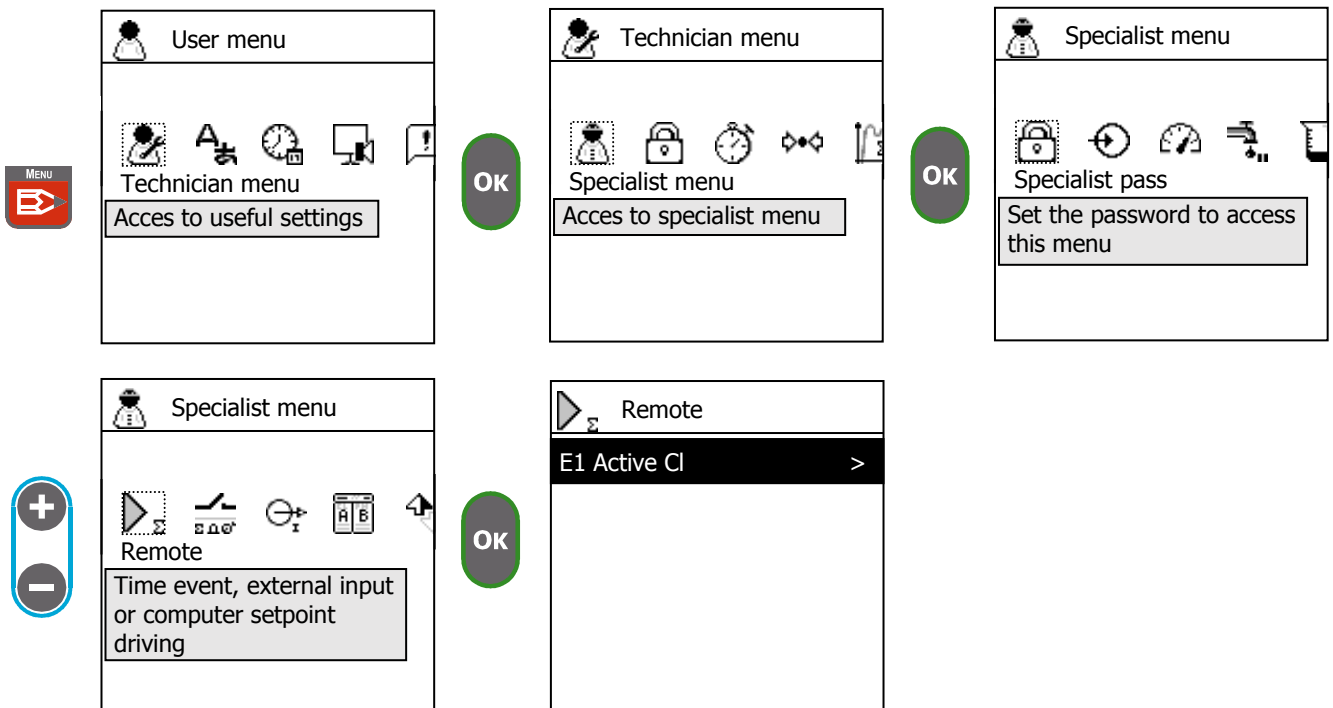


The action ↑ correspond to the chemical product use to increase the measurement value, and action ↓ decrease the measurement value eg. pH+ is action ↑ and pH- is action ↓.

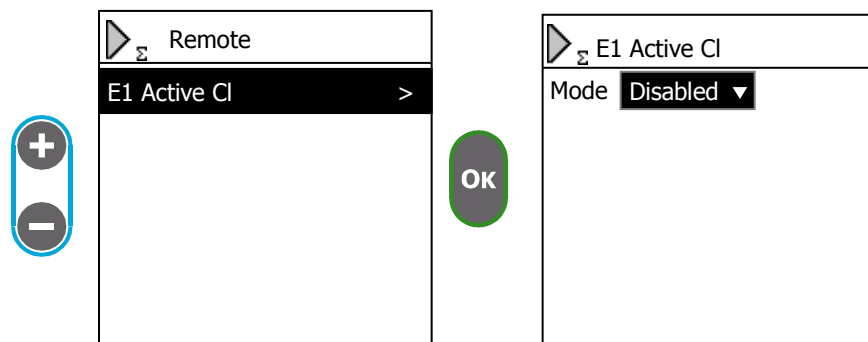
6) Remote

This menu allows you to remote the control of a parameter, you can stop it or drive the set point using a timer or an external input.

► Go to the "Remote" screen

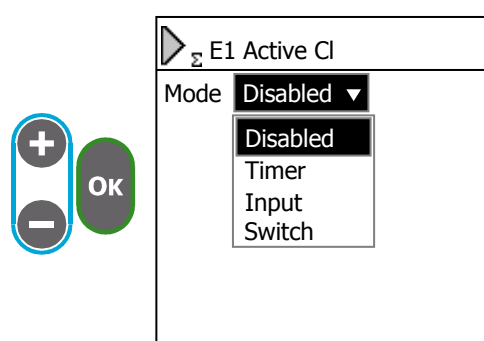


► Select the parameter



A remote can only be assigned to a parameter with control enabled in the control screen.

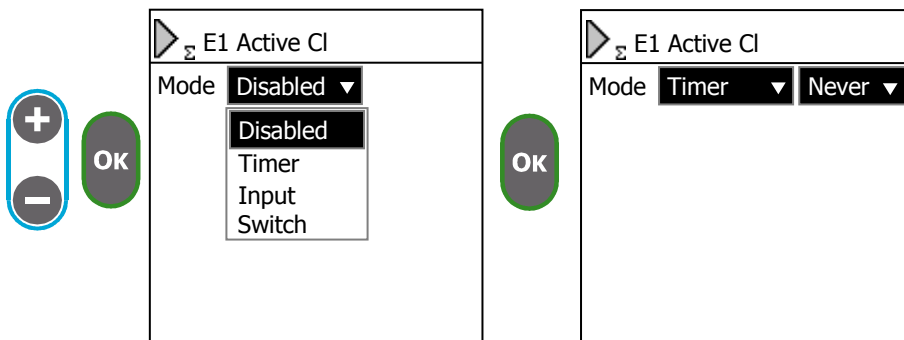
► Select the mode



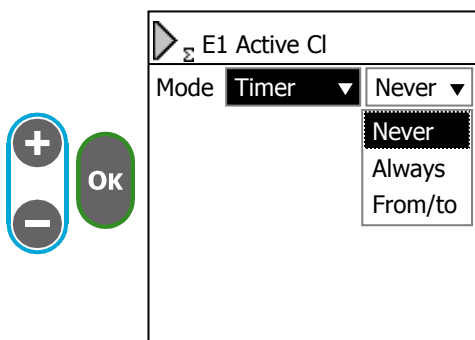
Disabled	No remote is applied to the parameter
Timer	The control can be stopped or setpoint can change during timer slot
Input	The setpoint of a control can follow the value of an input sensor
Switch	A switch contact is used to change control setpoint or stop control

Using "Timer" mode:

- ▶ Select the "Timer" mode

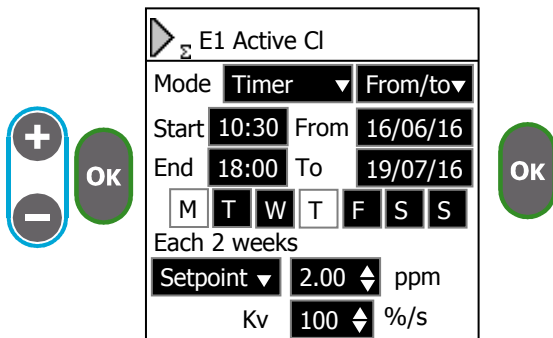


- ▶ Select when the remote control will be done



Never	Remote will never happens
Always	You can only select a starting date
From/to	You can select both starting and ending dates

- ▶ Set the time slot "Start" and "End".
- ▶ Set the beginning and ending dates, "From" and "To".
- ▶ Set the days of week which your time slot will be done.
- ▶ Set the week repetition, means your time slot will be repeated each X weeks.



Start and **End** field define the time slot of working. **From** and **To** allows you to define the dates interval where the time slot will be done.

The "MTWTFSS" button represent each days of week, it allows you to choose witch days the timer slot will work.

You can also define the repetition interval of the defined week.

Example of configuration:

According the previous screen settings and the calendar. Timer slot **start** at 10h30 **end** at 18h00, it works **from** 16th june 2016 **to** 19th july 2016, the permeated days are only on Monday and Thursday.

Week interval is 2 so allowed weeks are:

13th june- 19th june

27th june – 3rd july

11th july- 17th july

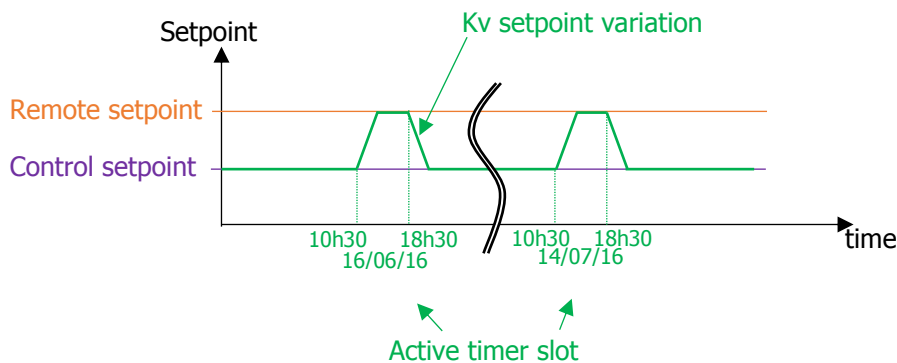
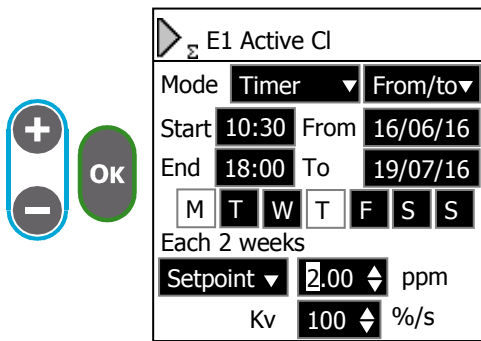
June						
M	T	W	T	F	S	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			
July						
M	T	W	T	F	S	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

Therefore, timer dates are 16, 27, 30th june and 11, 14th july, starting at 10h30 and ending at 18h00.

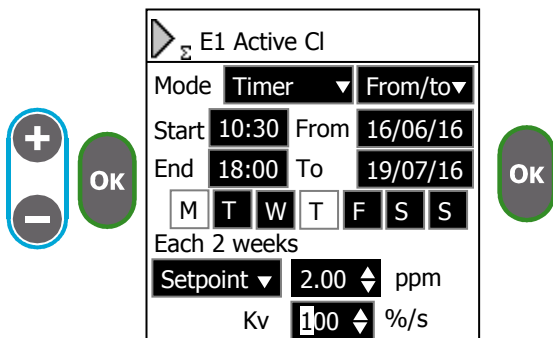
► Select the remote action

Stop	When timer is active, the control is stopped
Setpoint	When timer is active, the control setpoint is substituted by the remote setpoint.

► Set the remote setpoint



► Set the variation speed between control setpoint and remote setpoint.



Kv is the speed variation between the control setpoint and the remote setpoint.

Eg.

control setpoint = 1ppm

remote setpoint = 2ppm

Kv = 10%


At the beginning of timer slot, setpoint is 1ppm, it will increase by $(2\text{ppm}-1\text{ppm}) \times 10\% = 0.1\text{ppm}$ each seconds.

Therefore, the remote setpoint will be reached 10 s after the start of slot.



If Kv is set to 0% or 100% the remote setpoint is immediately reached.



When a remote control is active the symbol  is displayed on main screen.

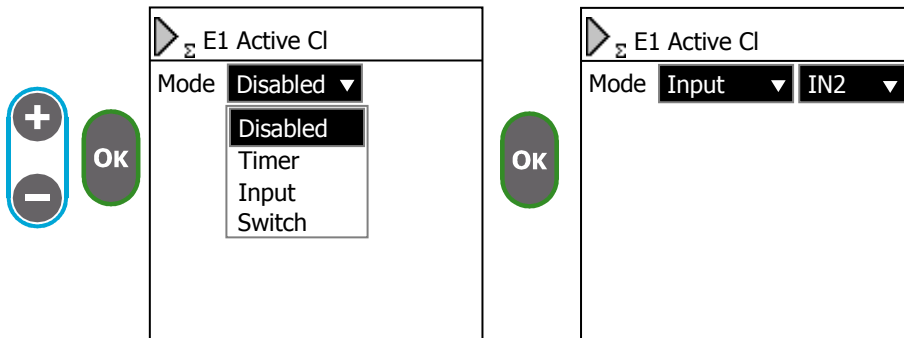
Using "Input" mode:

This mode allows you to remote the control of a parameter using an input. To do that you must define the remote input with the same kind as you defined the parameter kind.



If you want to remote E1 active chlorine setpoint using the IN2 input, you must define IN2 as active chlorine with the appropriate scale.

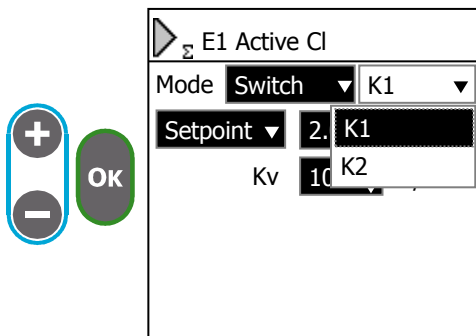
- ▶ Select the "Input" mode



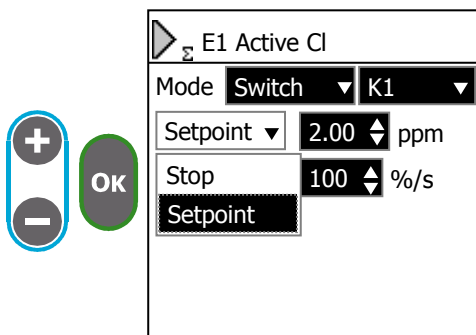
Using "Switch" mode:

This mode allows you to remote the control of a parameter using a switch. You can stop the control or change the setpoint.

- ▶ Select the switch



- ▶ Select the remote action

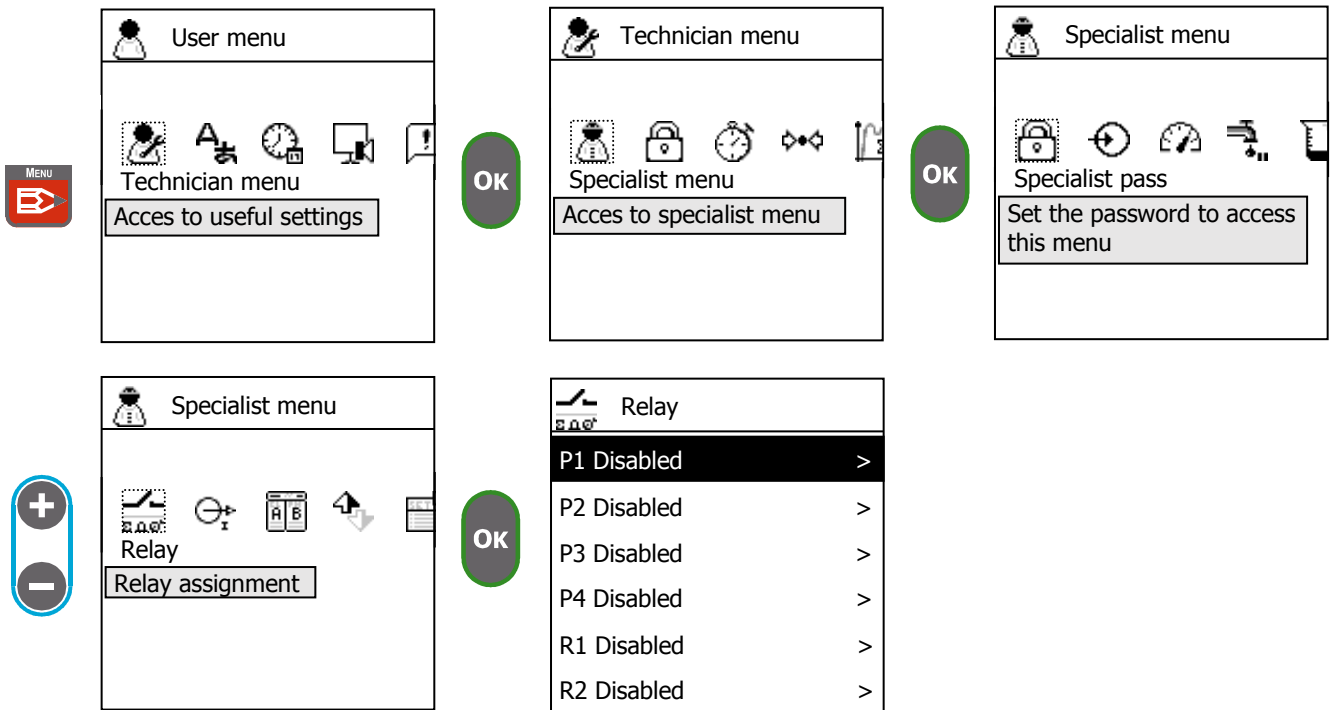


Stop	When switch is active, the control is stopped
Setpoint	When switch is active, the control setpoint is substituted by the remote setpoint.

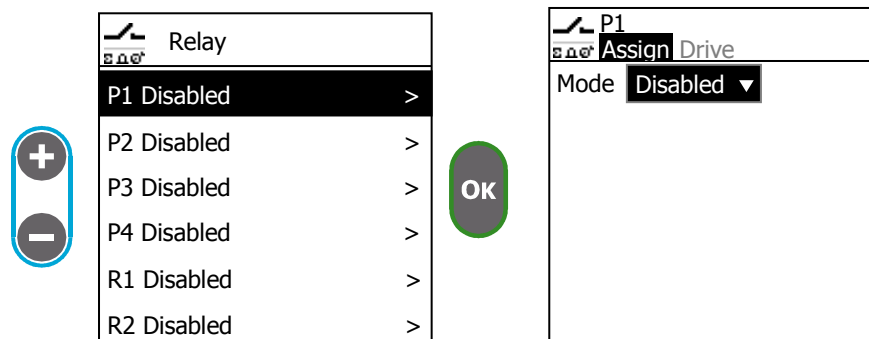
7) Relay

This menu allows you to define which action is realized by your relays.

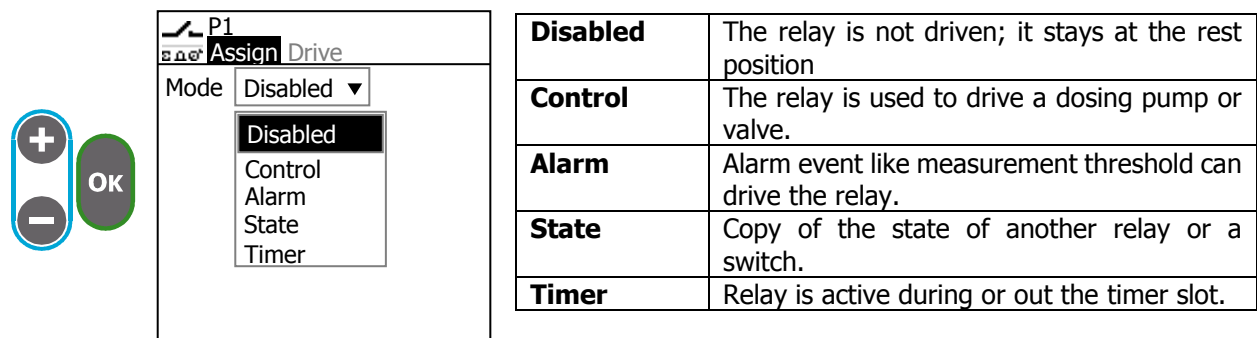
► Go to the “Relay” screen



► Select the relay to edit it



► Select the mode

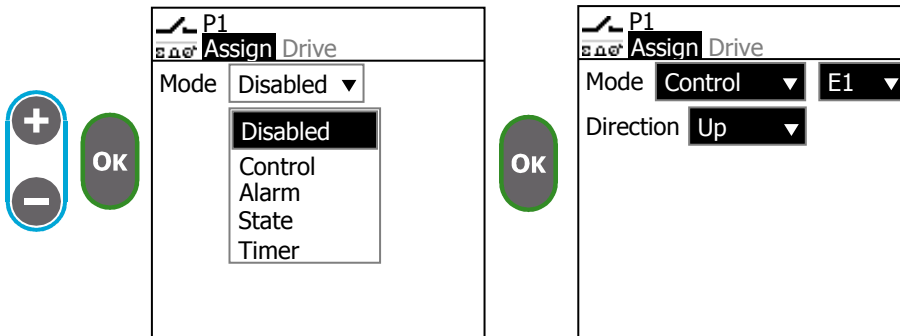


Disabled	The relay is not driven; it stays at the rest position
Control	The relay is used to drive a dosing pump or valve.
Alarm	Alarm event like measurement threshold can drive the relay.
State	Copy of the state of another relay or a switch.
Timer	Relay is active during or out the timer slot.

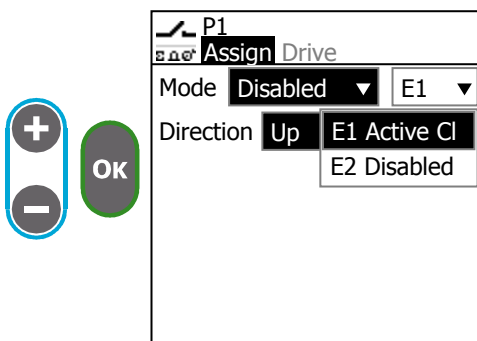
Using "Control" mode:

This mode allows you to drive an actuator to perform control action.

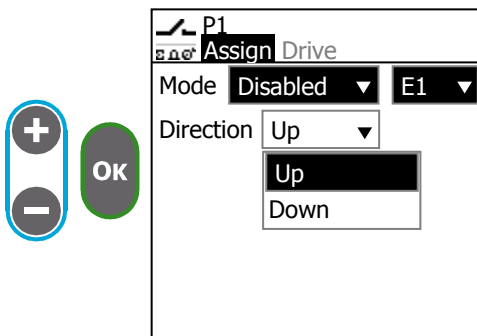
- ▶ Select the **"Control"** mode



- ▶ Choose which parameter is assigned to this relay



- ▶ Select the control direction of the actuator connected to this relay



Up	Relay action will increase the assigned parameter value
Down	Relay action will decrease the assigned parameter value

Eg. In case you want to drive a dosing pump of chlorine to increase the value of your process you must select **"Up"** direction.

► Select relay rest stand

P1
Assign Drive

Stand NO

Drive NO

Control NC

Min 0 Max 100 %

Period 10 s

Tmin 0 s

NO	Normally Open
NC	Normally Closed

► Select the drive method

P1
Assign Drive

Stand NO

Drive PWM

Control ON/OFF

Min 0 Max 100 %

Period 10 s

Tmin 0 s

ON/OFF	If drive is needed the relay is active, if not is inactive
PWM	Pulse Width Modulation. Relay do pulses with active state duration proportional to the drive variable.
PFM	Pulse Frequency Modulation. Relay do pulses with frequency proportional to the drive variable.

- ▶ Set the cycle duration "**Period**" (PWM only)
- ▶ Set the minimum latch time "**Tmin**" (PWM only)

+

-

OK

P1

Assign Drive

Stand **NO** ▼

Drive **PWM** ▼

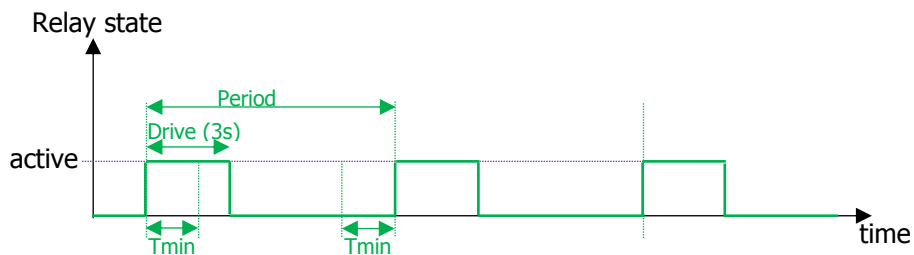
Control range

Min **0** ▼ Max **100** ▼ %

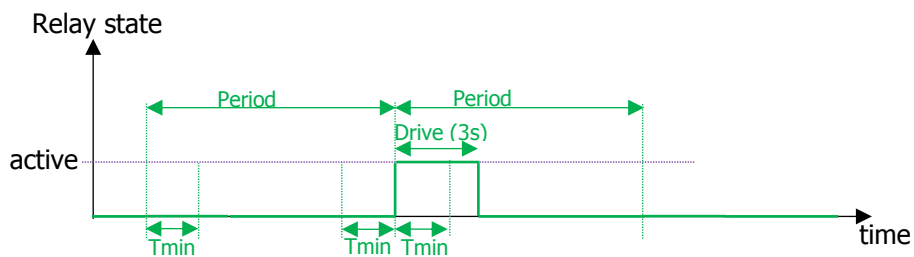
Period **0010** ▼ s

Tmin **2** ▼ s

Period	Cycle duration: 10...1800s
Tmin	Latch time: 0...5s



Example: Period=10s; Tmin=2s; Drive variable=30%
 Drive action = 30% X 10s = 3s



Example: Period=10s; Tmin=4s; Drive variable=15%
 Drive action = 15% X 10s = 1.5s

During the first period, drive action is smaller than "Tmin" so relay is not active, during the second period drive action is the sum of current needed drive and the previous undone action (1.5s +1.5s) = 3s

- ▶ Set the maximal stroke frequency "**Freq**" (PFM only)

+

-

OK

P1

Assign Drive

Stand **NO** ▼

Drive **PFM** ▼

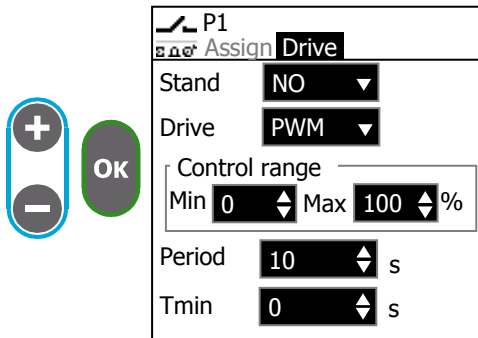
Control range

Min **0** ▼ Max **100** ▼ %

Freq **180** ▼ str/min

Freq	Stroke frequency: 1...500str/min
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► Set the control range "Min" and "Max".



Min	Drive variable value corresponding to the minimal action of the relay (stop of dosing): 0...100%
Max	Drive variable value corresponding to the maximal action of the relay (max dosing): 0...100%

This function allows you to do drive different actuator depends on the drive variable.

Example of configuration:

	P1	P2	P3	R1	R2
Direction	Up	Up	Down	Down	Down
Control range	20...100%	0...20%	0...10%	10...70%	70...100%
Max pump flow	15l/h	1l/h	1l/h	2l/h	5l/h

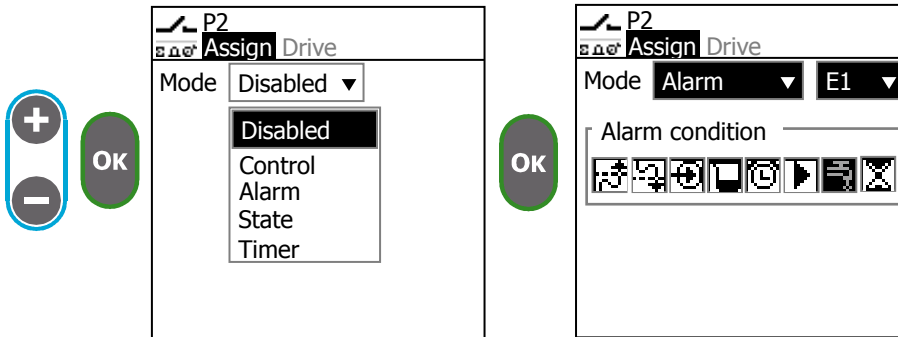
Relays action/pump flow vs Drive variable

Drive variable	P1	P2	P3	R1	R2
100%	100% 15l/h	100% 1l/h	0 0	0 0	0 0
30%	12.5% 1.88l/h	100% 1l/h	0 0	0 0	0 0
10%	0% 0l/h	50% 0.5l/h	0 0	0 0	0 0
5%	0% 0l/h	25% 0.25l/h	0 0	0 0	0 0
0%	0 0	0 0	0 0	0 0	0 0
-5%	0 0	0 0	50% 0.5l/h	0% 0l/h	0% 0l/h
-10%	0 0	0 0	100% 1l/h	0% 0l/h	0% 0l/h
-30%	0 0	0 0	100% 1l/h	16.7% 0.33l/h	0% 0l/h
-80%	0 0	0 0	100% 1l/h	100% 2l/h	33% 1.67l/h
-100%	0 0	0 0	100% 1l/h	100% 2l/h	100% 5l/h

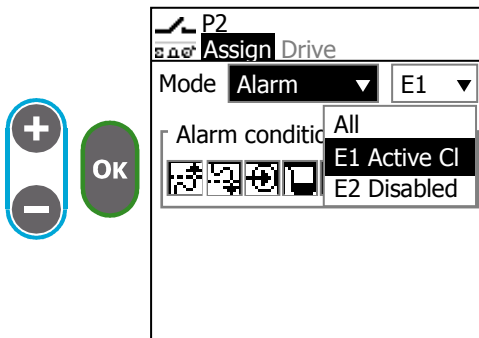
Using "Alarm" mode:

This mode allows you to drive a relay in case of alarm.

- ▶ Select the "Alarm" mode

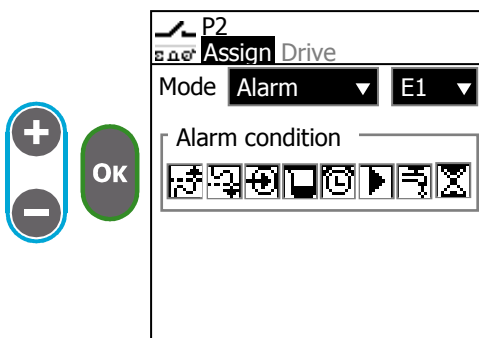


- ▶ Choose which parameter is checked



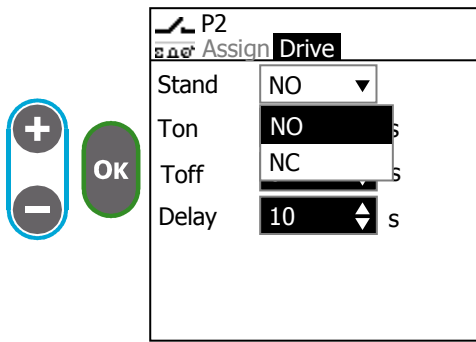
If you select "All", both E1 and E2 alarms events will cause an alarm that can drive the relay.

- ▶ Choose which alarms can drive the relay



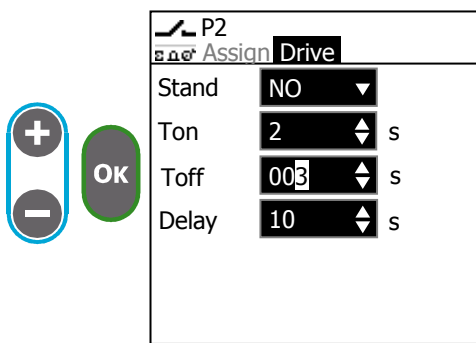
	High threshold alarm
	Low threshold alarm
	Sensor fault, out of range or disconnected
	Overdose time or empty tank
	Pause due to a timer
	Control remote
	Water not flowing
	Pause due to a sensor delay

► Select the rest stand



NO	Normally Open
NC	Normally Closed

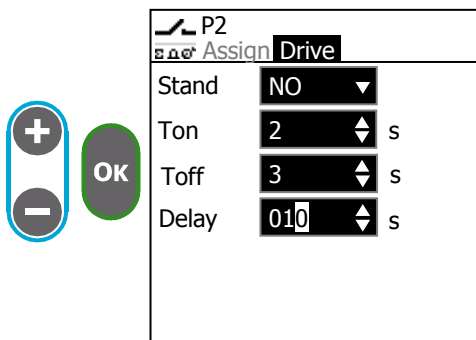
► Set "Ton" and "Toff" tilt duration



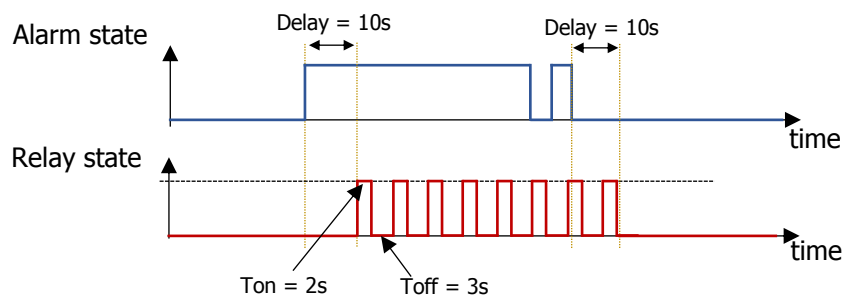
Ton	Active time: 0...240s
Toff	Inactive time: 0...240s

Here you can define the active time "Ton" and the inactive time "Toff", to drive the relay when an alarm pending.

► Set "Delay" the lag time before and after the alarm to drive the relay



Delay	Lag time: 0...240s
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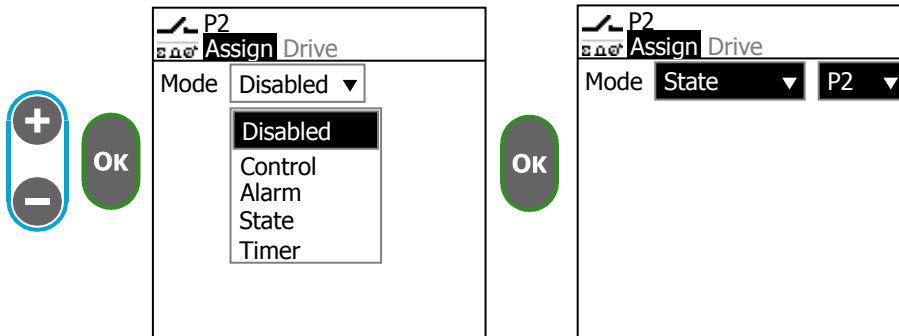


Relay action according previous settings, Ton = 2s, Toff = 3s, Delay = 10s

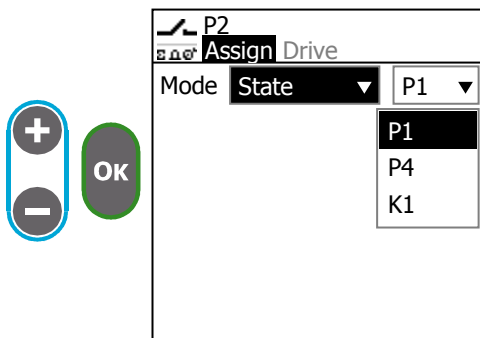
Using "State" mode:

This mode allows you to copy the state of another relay or a switch

- ▶ Select the **"State"** mode



- ▶ Select which relay or switch is copied

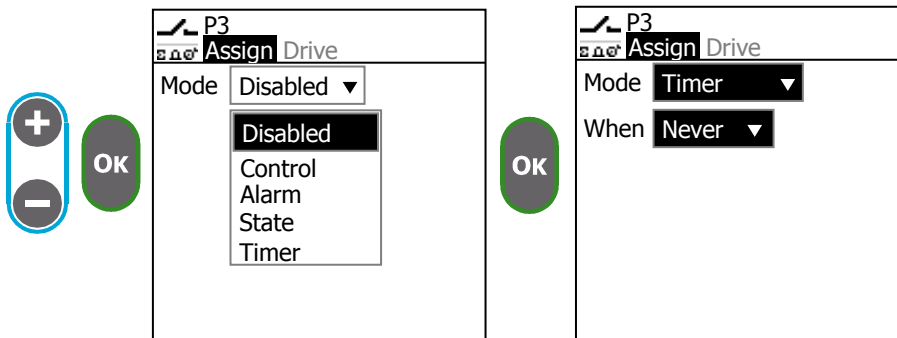


This list contains all the relay and switches who are not disabled.

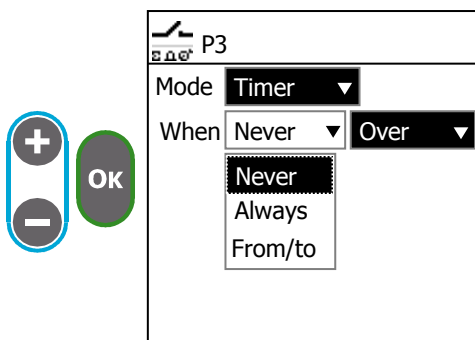
Using "Timer" mode:

This mode allows you to drive a relay according a timer slot

- ▶ Select the "Timer" mode



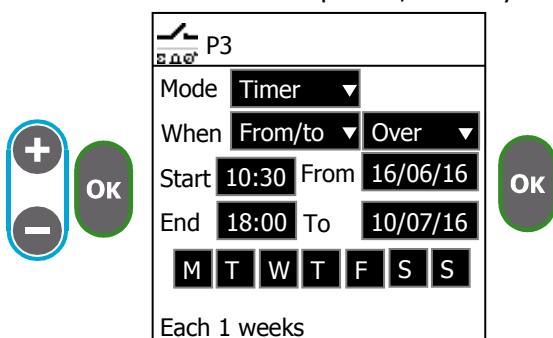
- ▶ Select when the relay is active



Never	Timer is disabled
Always	You can only select a starting date
From/to	You can select both starting and ending dates

Over	Relay is active during the timer slot
Out	Relay is inactive during the timer slot

- ▶ Set the time slot "Start" and "End".
- ▶ Set the beginning and ending dates, "From" and "To".
- ▶ Set the days of week which your time slot will be done.
- ▶ Set the week repetition, means your time slot will be repeated each X weeks.



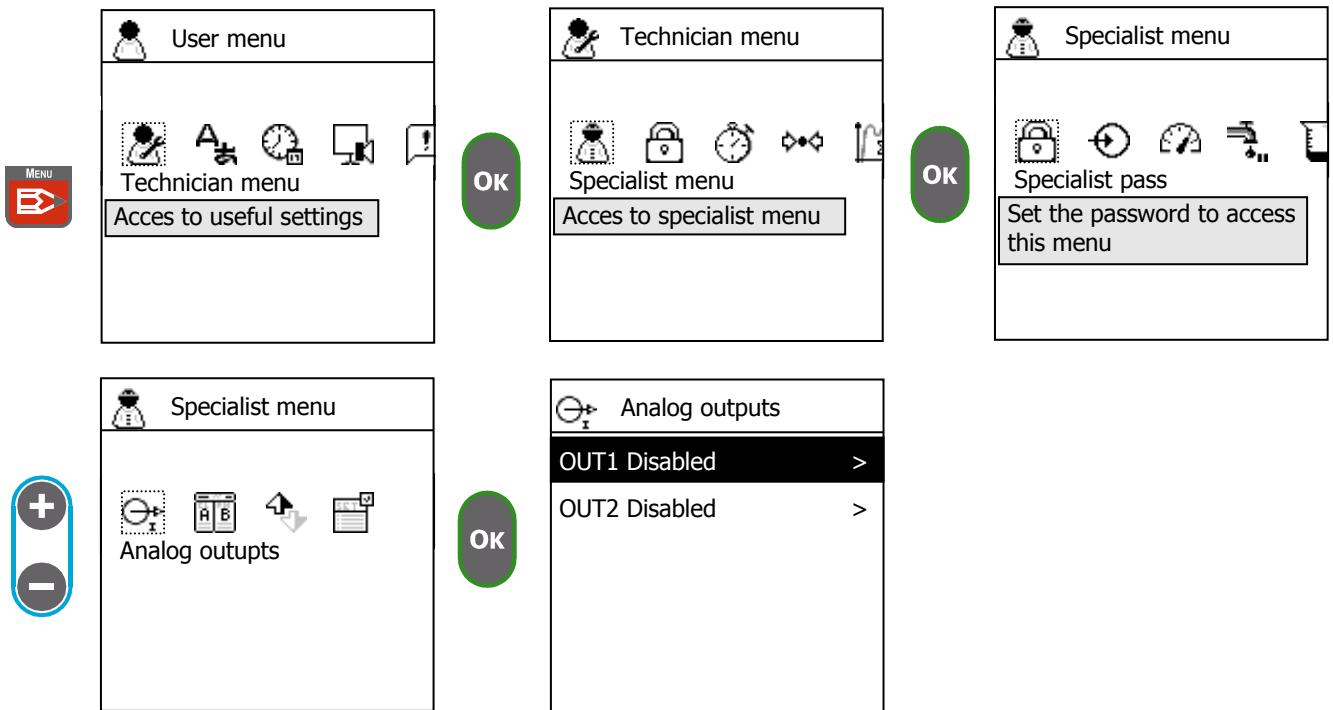
Start and **End** field define the time slot of working. **From** and **To** allows you to define the dates interval where the time slot will be done.

The "MTWTFSS" button represent each days of week, it allows you to choose witch days the timer slot will work.

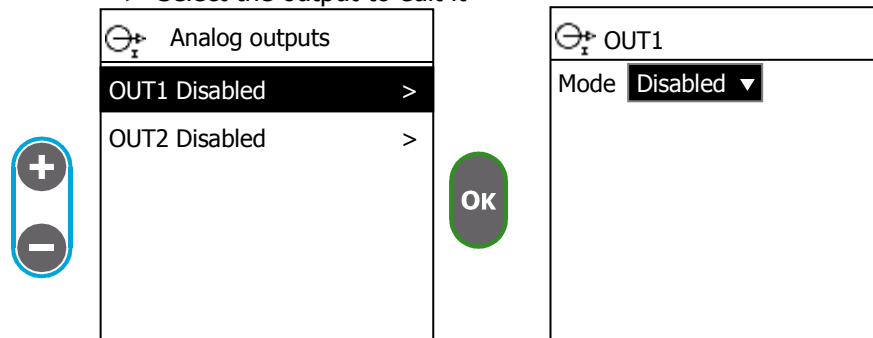
You can also define the repetition interval of the defined week.

8) Analog outputs

► Go to the “**Analog outputs**” screen



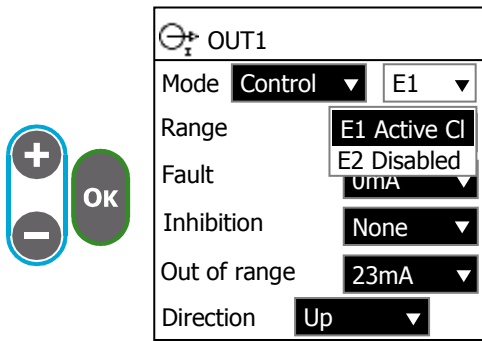
► Select the output to edit it



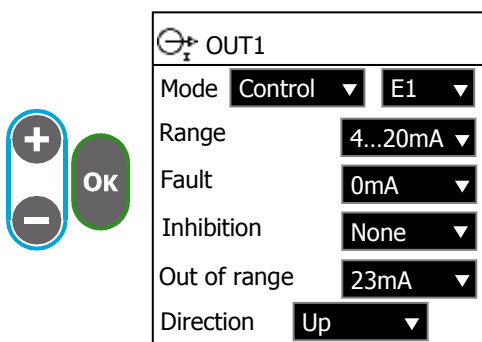
► Select the mode

Disabled	The output is disabled.
Control	The output is used to drive a dosing pump or valve.
Measure	A parameter measure is transferred to the output
Sensor	A sensor measure is transferred to the output.

► Select the output assignment

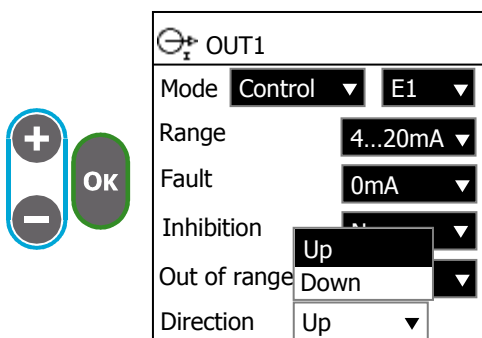


► Select the current range
 ► Select the specifics states currents



Range	Output current range: 0...20mA 4...20mA
Fault	Current when fault occurs on measure or configuration (sensor disconnected, short circuit, bad settings): 0mA 0/4mA (0 or 4 depending the range) 2.6mA
Inhibition	Current during temporary pause (water flowing pause, menu editing): None 0mA 0/4mA (0 or 4 depending the range) 3.4mA
Out of range	Current when measure is out of range: 23mA 20mA 20.8mA

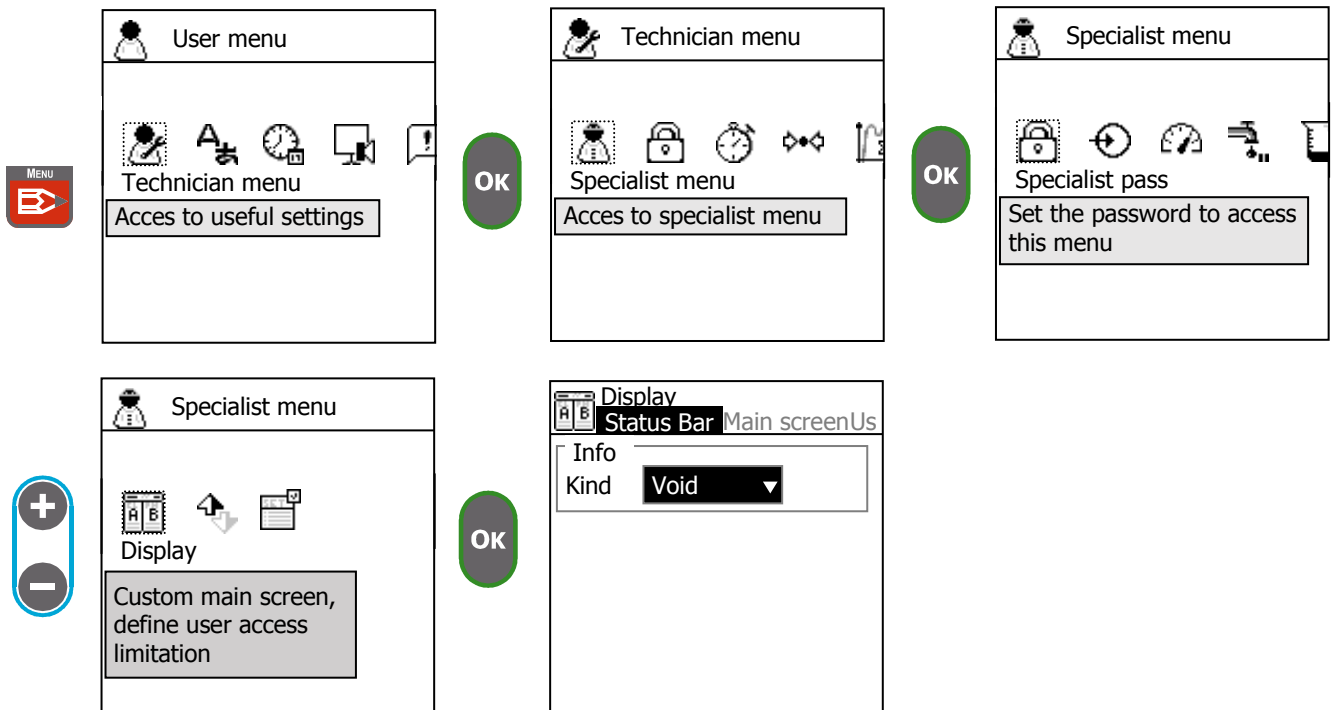
► Select the dosing direction (control only)



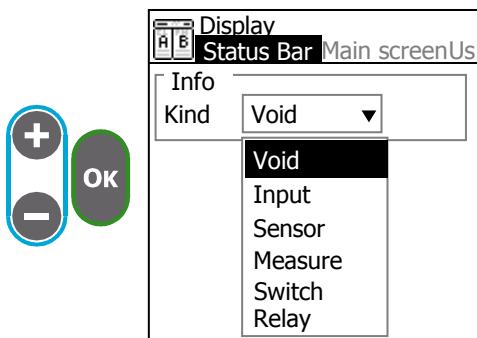
Up	The actuator action can increase the measurement value.
Down	The actuator action can decrease the measurement value.

9) Display

► Go to the “**Display**” screen

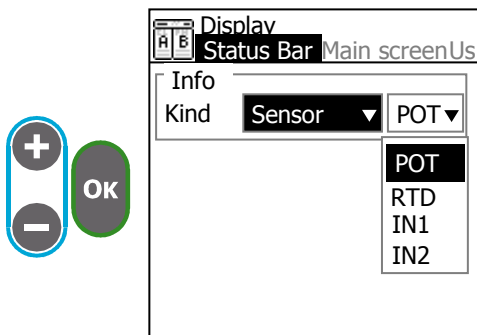


► Select the information kind you want to display in the status bar

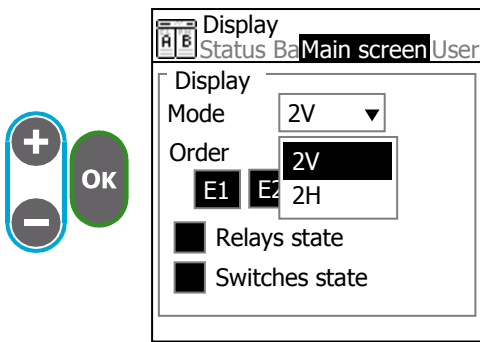


Void	The information zone of the status bar is void
Input	Input value: (mV, Ohm, mA, Hz)
Sensor	Sensor value: POT, RTD, IN1, IN2
Measure	Measurement value of a parameter: E1, E2
Switch	State of a switch
Relay	State of a relay

► Select the information

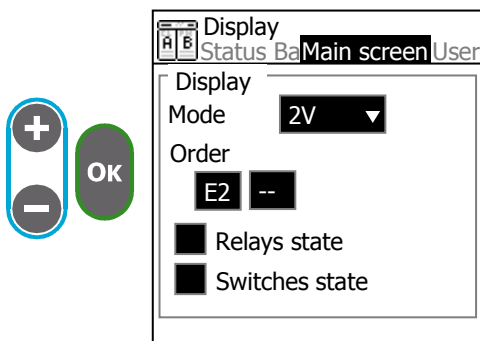


- ▶ Select the display mode



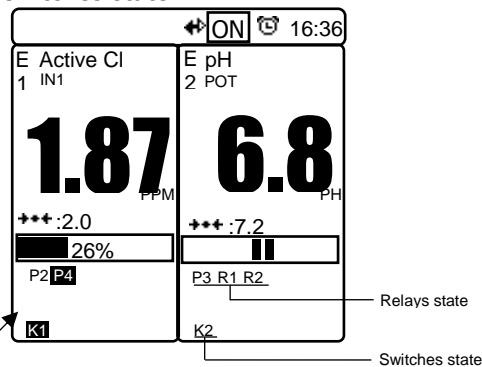
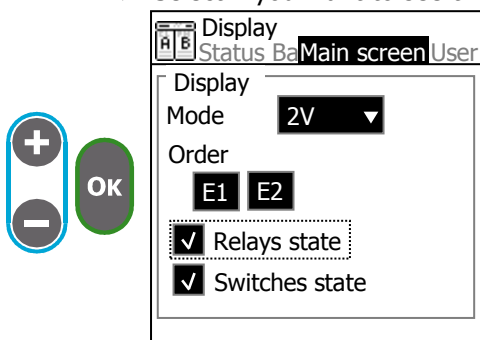
Mode	Main screen display mode: 2V (2 parameters vertical) 2H (2 parameters horizontal)
------	---

- ▶ Define the parameters order, **--** means the parameter is no displayed on the main screen



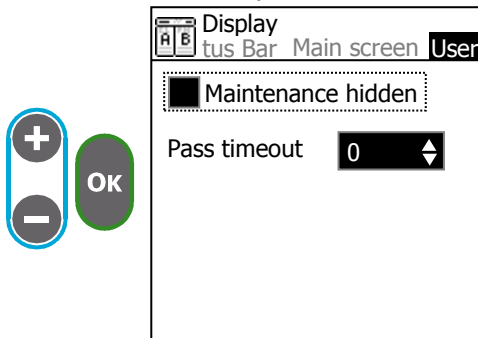
i Pressing **OK** key on the main screen invert the current parameters order.

- ▶ Select if you want to see the used relays state
- ▶ Select if you want to see the used switches state

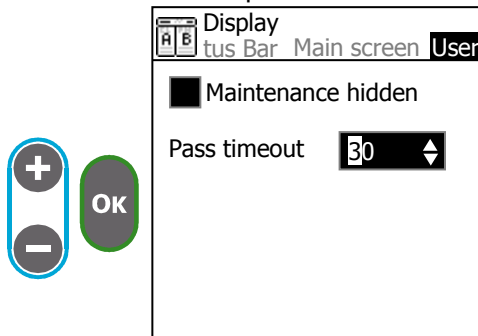


P2 open
P4 closed
K1 closed

- Select if you want to hide the maintenance icon on the user menu



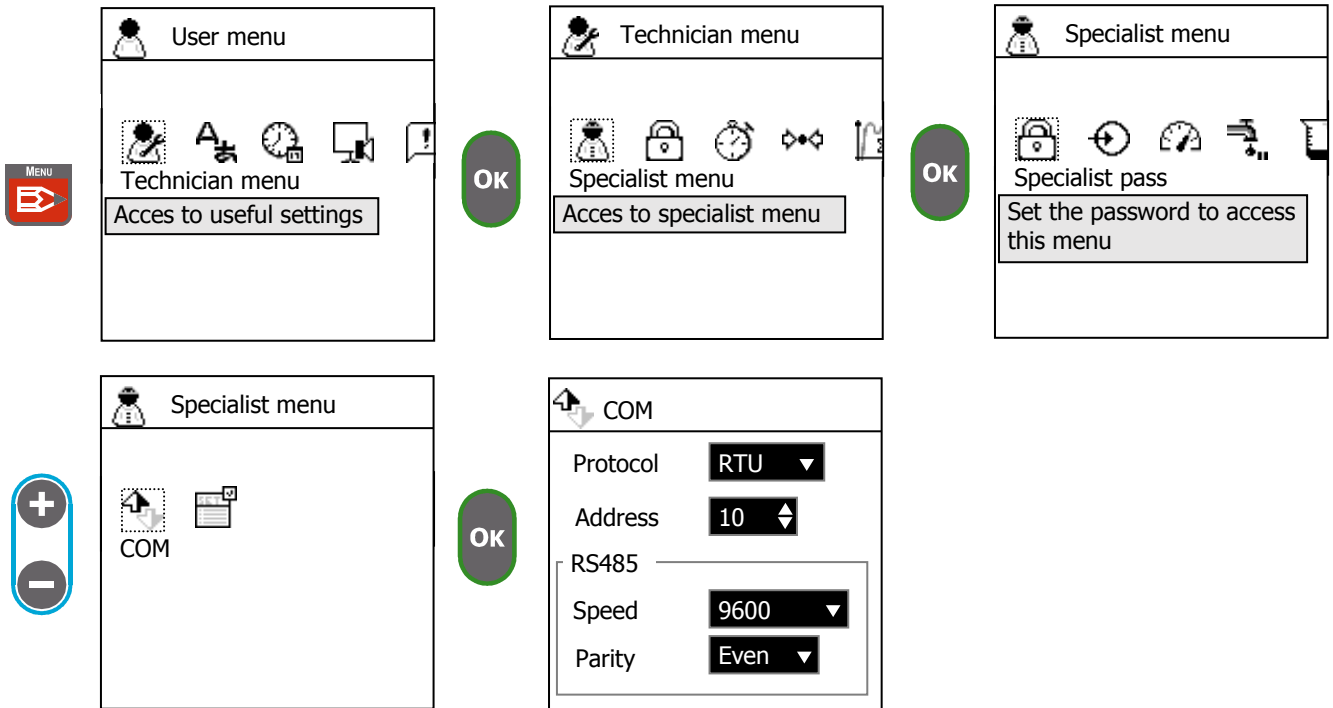
- Set the password timeout



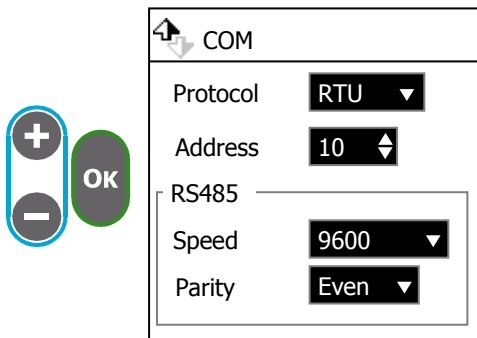
Password timeout	Inactivity time until you don't have to enter the password each times you try to enter locked menu: 0...3600s
-------------------------	--

10) Communication

► Go to the "COM" screen



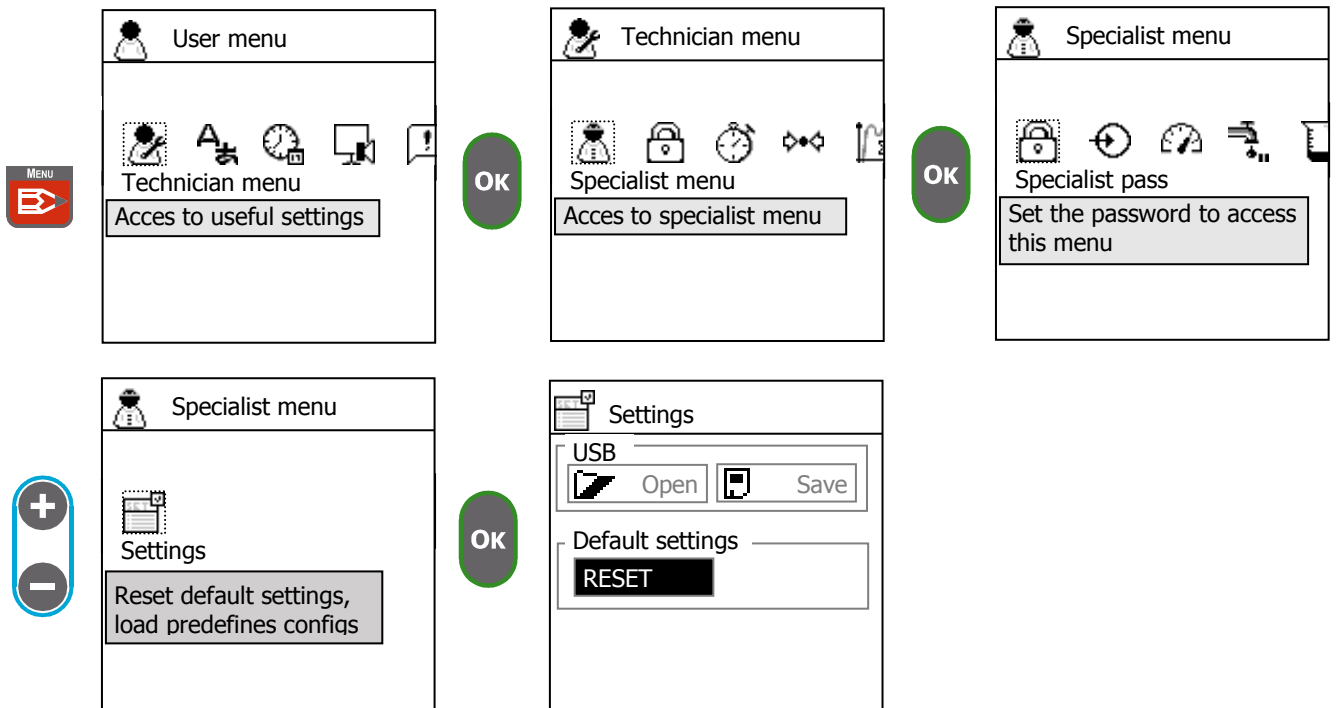
- Select the Modbus protocol
- Select the Modbus address (device slave id)
- Select the serial communication speed
- Select the serial communication parity



Protocol	Modbus specific protocol according your local network protocol: RTU, ASCII
Address	Slave ID 1...247
Speed	Baudrate: 300 1200 2400 4800 9600 19200 38400 57600 115200
Parity	Serial parity None, Odd, Even

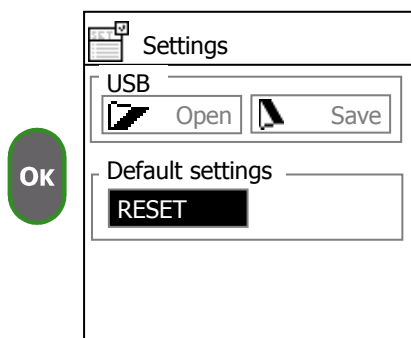
11) Settings

► Go to the "**Settings**" screen



This screen allows you to do a factory reset.

► Press key **OK** on the RESET button to do the reset.



After reset the device will automatically restart.
All the settings and calibrations are cleared, you must do the configuration of the device and calibrate your sensors.

IX. USB

Your device has a USB connection for connecting a USB stick. This allows you to :

- Save the measurement data and your device dosage
- Save and load a configuration file
- Update device firmware

1) Data recording

Data recording allows you to trace operating of your device. The recording is performed at constant interval, you can set this time in the technician menu> Save.

Without USB device is able to retain the last 15 minutes fo recording. Once the stick is connected to the device data is automatically recorded each time intervals.

The data is recorded in a CSV file. You can read it with a text editor or using your spreadsheet. The file name is the date of the recordings.

Contenu du fichier :

Row	Description
Time	Recording time
POT.value	Measure value
POT.fault	Input fault (unconnected or out of range)
POT.delayed	Sensor delayed
RTD.value	Measure value
RTD.fault	Input fault (unconnected or out of range)
RTD.delayed	Sensor delayed
IIN1.value	Measure value
IIN1.fault	Input fault (unconnected or out of range)
IIN1.delayed	Sensor delayed
IIN2.value	Measure value
IIN2.fault	Input fault (unconnected or out of range)
IIN2.delayed	Sensor delayed
K1.value	Measure value
K1.fault	Input fault (unconnected or out of range)
K1.delayed	Sensor delayed
K2.value	Measure value
K2.fault	Input fault (unconnected or out of range)
K2.delayed	Sensor delayed
K1.closed	Switch physical state (open or closed)
K1.active	Switch active state (depending the stand NO/NC)
K2.closed	Switch physical state (open or closed)
K2.active	Switch active state (depending the stand NO/NC)
E1.enabled	Control and alarm enabled
E1.delayed	Pause due to a sensor startup
E1.flow	Analysis water flowing
E1.threshold_high	High threshold crossed
E1.threshold_low	Low threshold crossed
E1.overdose	Max dosing time or empty tank
E1.timer	Pause due to a timer
E1.remote	Remote control in progress
E1.value	Measure value
E1.y	Control value
E1.u	Dosing value
E2.enabled	Control and alarm enabled
E2.delayed	Pause due to a sensor startup
E2.flow	Analysis water flowing

E2.threshold_high	High threshold crossed
E2.threshold_low	Low threshold crossed
E2.overdose	Max dosing time or empty tank
E2.timer	Pause due to a timer
E2.remote	Remote control in progress
E2.value	Measure value
E2.y	Control value
E2.u	Dosing value
D1.enabled	Device state (control and alarm)
D1.halted	Device halted due to a configuration
D1.timer	Working timer enabled

2) Save and load a configuration file

This feature allows you to save the configuration of a device and load it on other devices.

To save current configuration:

1. Connect to USB stick to your device
2. Restart your device
3. Press OK button, you have only 3 seconds to do that
4. Wait few seconds
5. Device start

At the end of this procedure you will show 3 files into your stick:

<EEExxxY.bak> configuration file

<EXTxxxY.bak> data file

<FWxxxxY.bak> firmware file

xxxY is the software version.

To load the configuration on another device:

1. Rename <EEExxxY.bak> file to <EEExxxY.bin>
2. Connect the stick to your device
3. When device asking you if you want to load the configuration press OK button
4. Device automatically restart with the new configuration

3) Firmware update

This function allows you to update your device with the latest available version.

To update your device:

1. Save the firmware file into your USB stick <FWxxxY.bin>
2. When device asking you if you want to update press OK button
3. Device automatically restart and performed the update



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