



This manual contains safety information that if ignored can endanger life or result in serious injury. They are indicated by this icon.



Keep the instrument protected from sun and water.  
Avoid water splashes.



## OPERATING INSTRUCTIONS FOR "LDPHPH" and "LDPHPH T" INSTRUMENT SERIES



DOWNLOAD ERMES COMMUNICATION SOFTWARE  
[www.ermes-server.com](http://www.ermes-server.com)

Read Carefully !



ENGLISH Version

R7-07-19



NORME CE  
EC RULES(STANDARD EC)  
NORMAS DE LA CE

Direttiva Bassa Tensione  
Low Voltage Directive  
Directiva de baja tensión

} 2014/35/UE

Direttiva EMC Compatibilità Elettromagnetica  
EMC electromagnetic compatibility directive  
EMC directiva de compatibilidad electromagnética

} 2014/30/UE



## GENERAL SAFETY GUIDELINES

### Danger!

In emergencies the instrument should be switched off immediately! Disconnect the power cable from the power supply!

When installing always observe local regulations!

Manufacturer is not liable for any unauthorized use or misuse of this product that may cause injury, damage to persons and / or materials.

### Caution!

Instrument must be accessible at all times for both operating and servicing. Access must not be obstructed in any way!

Feeder should be interlocked with a no-flow protection device to automatically shut-off the pumps when there is no flow!

Pumps and accessories must be serviced and repaired by qualified and authorized personnel only!

Always discharge the liquid end before servicing the instrument!

Empty and rinse the liquid end before work on a pump which has been used with hazardous or unknown chemicals!

Always read chemical safety datasheet!

Always wear protective clothing when handling hazardous or unknown chemicals!

Instrument must be operated / serviced by trained technicians only!

All connection operations must be performed while the instrument is not connected to main supply!

# 1. Introduction

LDPPH is a digital microprocessor based double pH controller with temperature reading. Main working modes are: On/Off, PWM proportional and PWM fixed. LDPPH T version controls TEMP RELAY through Setpoint Temperature (see page 38).

Working ranges are: (both) pH: from 0 to 14pH

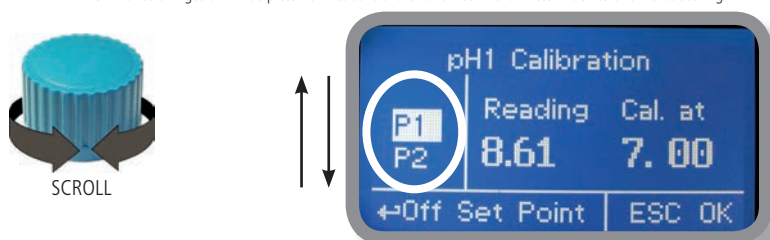
All information are provided through a large backlit LCD display. Using a revolutionary wheel control the instrument can be easily programmed. LDPPH is housed in a IP65 plastic box.

INPUTS:	OUTPUTS
- Stand-by	- 3 proportional outputs (pH1 and pH2)
- Flow	- 2 ON/OFF digital outputs (pH1 and pH2)
- pH1 Level	- Main alarm output
- pH2 Level	- TEMP RELAY output for LDPPHT version
- pH3 Level	
- Double pH Probe	
- Temperature Probe	

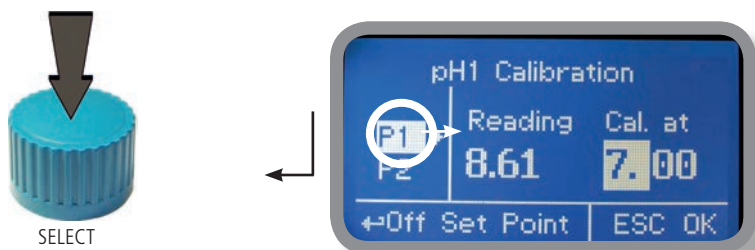
## 2. The wheel

Located in the upper right side of LDPPH there is a wheel that must be used to control the instrument. Wheel can be rotated in both directions to scroll over the menus and / or pressed to confirm highlighted selection / value.

NOTE: Once changes are made press "OK" to save and exit from submenu. Press "ESC" to exit without saving.



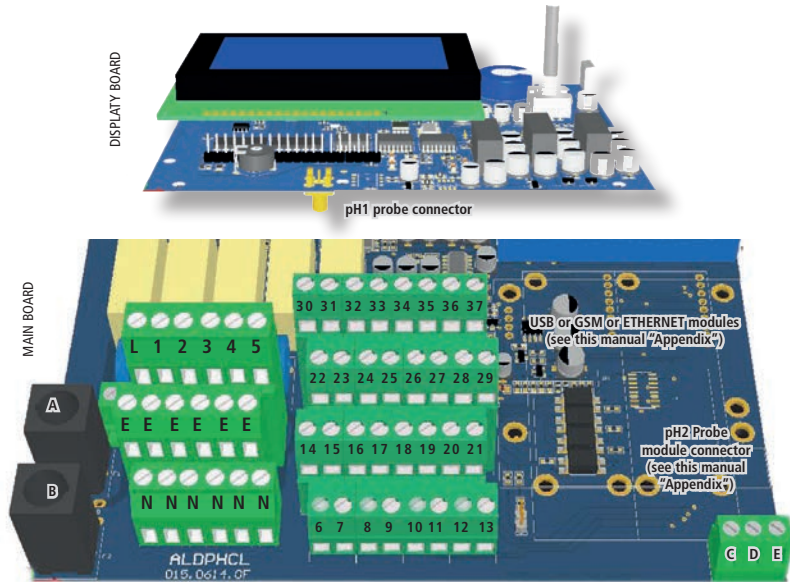
Rotate wheel to scroll through menus or options



Press wheel to select highlighted option

### 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)

L(Live) - E (Earth) - N (Neutral): 85÷264VAC - 50/60 Hz

1(Live) - E(Earth) - N(Neutral): 85÷264VAC - 5A 50/60 Hz Relay 1 Output "CH1 PH RELAY". To use with ON/OFF or PWM device

2(Live) - E(Earth) - N(Neutral): 85÷264VAC - 5A 50/60 Hz Relay 2 Output "CH2 PH RELAY". To use with ON/OFF or PWM device

3(Live) - E(Earth) - N(Neutral) : 85÷264VAC - 5A 50/60 Hz Alarm output

5 (Live) - E (Earth) - N (Neutral): 85÷264VAC - 5A 50/60 Hz Relay 3 Output "TEMP RELAY". To use with ON/OFF or PWM device\*

31(-) - 30(+): Current output mA1 for pH1

31(-) - 32(+): Current output mA2 for pH2

34(-) - 33(+): Current output mA3 (n/a)

34(-) - 35(+): Current output mA4 for temperature

Max resistive load: 500 Ohm

\*LDPPHT model only

36(+) - 37(-): Water Meter Input (max input frequency 500Hz)

22(-) - 23(+): Opto coupled output "CH1 PH PULSE 2". To use with "IS" or "MF" series dosing pumps

24(-) - 25(+): Opto coupled output "CH2 PH PULSE". To use with "IS" or "MF" series dosing pumps

26(-) - 27(+): Opto coupled output "CH1 PH PULSE 1". To use with "IS" or "MF" series dosing pumps

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

14(+ Brown) - 15(Black) - 16/17 (- Blue ; + GND): Proximity sensor mod. "SEPR"

11(-) - 10(+): Standby contact

11(-) - 12(+): LIV1 PH2, Level 1 contact

19(-) - 18(+): LIV2 PH1, Level 2 contact

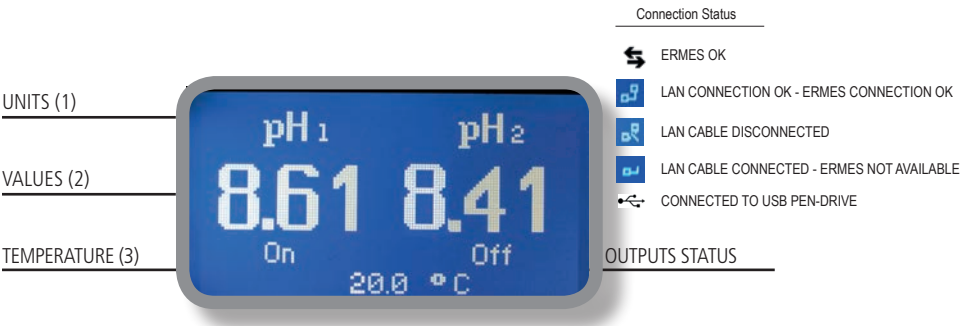
19(-) - 20(+): LIV3 PH1, Level 3 contact

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

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

# 4. Main Screen

When into normal operating mode, LDPPH shows its main screen:



Main screen is divided int 3 zones.

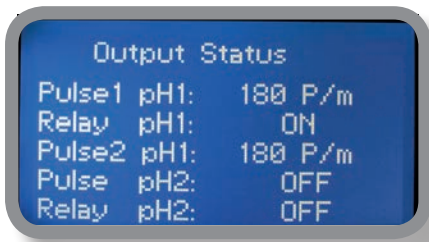
(1) UNITS "pH1" is the measuring unit for pH probe connected to the display side of the board.  
"pH2" is the measuring unit for pH probe connected to the main board.

(2) VALUES These numbers are values read by the probes with activities status for each output.

(3) TEMPERATURE Read temperaure (if installed).

## STATUS

Completely rotate wheel to obtain current status (see next page) and outputs status list.

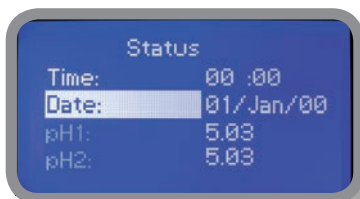


WHEN AN ALARM OCCURS (flow, level, dosage, faulty probe, setpoint) and "ALARM" appears on main screen all outputs are disabled.

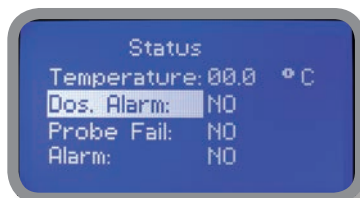
The use of "PUMP" word in this manual means a "DOSING SYSTEM" connected to the instrument outputs!

## 5. Quick status check

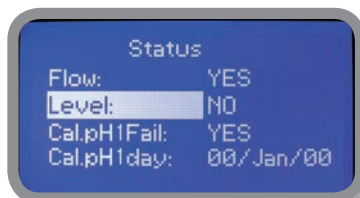
From main screen **completely rotate clockwise** the wheel to review main instrument parameters and current outputs status.



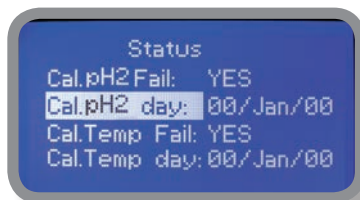
Local Time  
Local Date  
pH1 probe reading  
pH2 probe reading



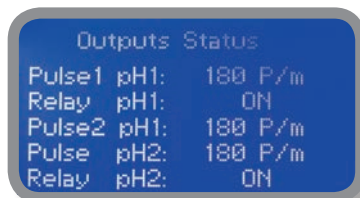
Temperature probe reading  
Dosing alarm condition  
Probe failure status  
Alarm contact status



Flow contact status (SEPR)  
Tank Level 1 status  
Last pH1 calibration result  
Last pH1 calibration date



Last pH2 calibration result  
Last pH2 calibration date  
Last Temp. calibration result  
Last Temp. calibration date



Outputs Status  
See mainboard (page 4) for related connetions.

## 6. Password

To grant access into "Main Menu" press the wheel from main screen and enter the passcode.

If this is the first time here then the passcode is 0000 (factory preset). Press wheel 5 times to enter into "Main Menu".

Otherwise press the wheel 1 time and enter the passcode. Numbers can be selected rotating the wheel.



To set a new passcode choose "PARAMETERS" from "Main Menu", move on "New Pcode", Click on wheel and enter a four numbers code. Click on "EXIT" and choose "YES" to save request. The new passcode is now ready.



---

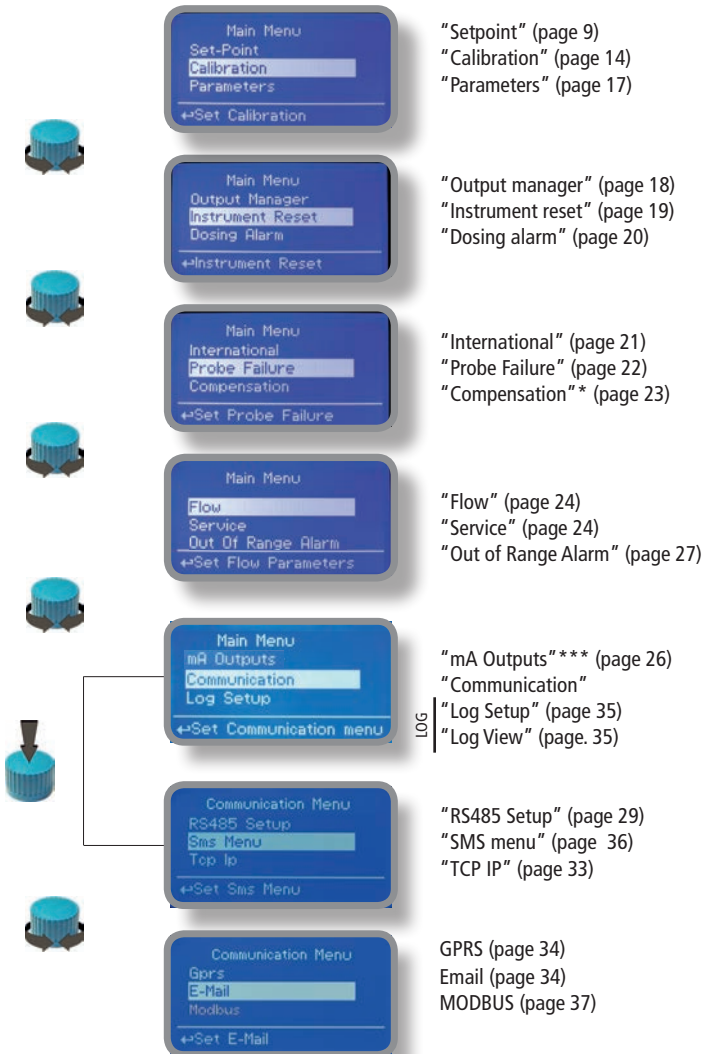
Lost passcode ?

Please don't forget the passcode (if changed). In the unfortunate event, please call your local distributor for unlocking procedure. There is no way for you to recover lost passcode.

---

# 7. "Main Menu" list

To grant access into "Main Menu" enter the passcode (as described in previous chapter). Once into "Main Menu" rotate the wheel to scroll through all the options available. An extra menu "WATER METER" shows and set water meter operation if a pulse sender water meter is connected.

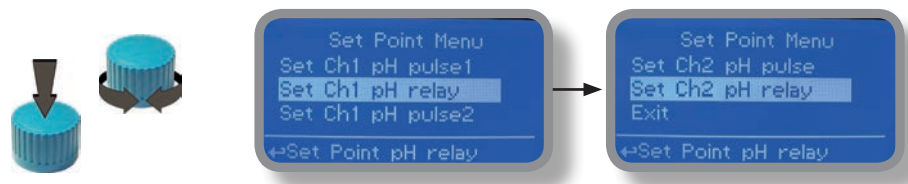


\*\*\*This menu is available on current outputs instrument version only

## 8. "Set-Point", pH (On/Off)

"CH1 pH Pulse1", "CH1 pH Pulse 2", "CH2 pH Pulse" outputs can be set using: On/Off, Proporzionale (%) or OFF setpoint modes.

"CH1 pH Relay", "CH2 pH Relay" output, can be set using: On/Off mode, Proportional PWM, PWM fixed or OFF modes.

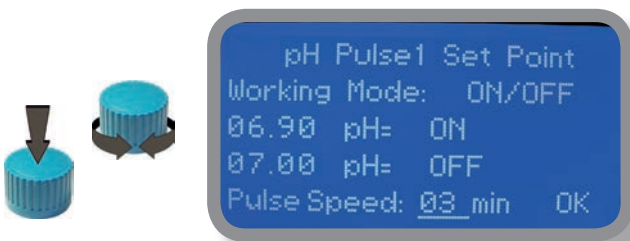


### 8.1 "Set-Point", pH (on/off)

All ph outputs can be set into this mode.

On/Off mode set 2 values that enable or disable pH pump.

Once into "pH1 Pulse Set Point menu" move cursor on "Working Mode" and press it.



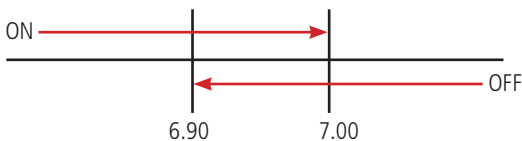
Pulse Speed: this is the frequency that the controller sends to the pump to stroke when it's on

ON/OFF mode dosing ALKALINE

Set pH 7.00 OFF and 6.90 ON.

Instrument will operate pH pump until reading value will be 7.00pH.

At 7.00pH value the pump will be disabled until reading value will go below 6.90pH.



## 8.2 "Set-Point", pH (on/off)

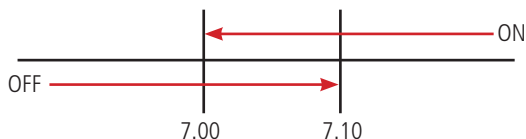
All pH outputs can be set into this mode.

ON/OFF mode dosing ACID

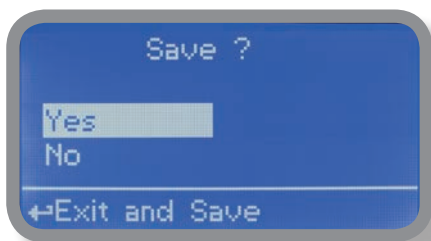
Set pH 7.00 OFF and 7.10 ON.

Instrument will operate pH pump up to reach 7.00pH.

At 7.00pH the pump will be disabled until reading value will raise to 7.10pH.



To end procedure move cursor on "OK" and press wheel. Choose "SAVE" to save setup or "NO" to discard changes.



---

Did you know ?

In chemistry, an alkali is a basic, ionic salt of an alkali metal or alkaline earth metal element. Alkalis are best known for being bases (compounds with pH greater than 7) that dissolve in water. The adjective alkaline is commonly used in English as a synonym for base, especially for soluble bases. This broad use of the term is likely to have come about because alkalis were the first bases known to obey the Arrhenius definition of a base and are still among the more common bases. Since Brønsted-Lowry acid-base theory, the term alkali in chemistry is normally restricted to those salts containing alkali and alkaline earth metal elements.

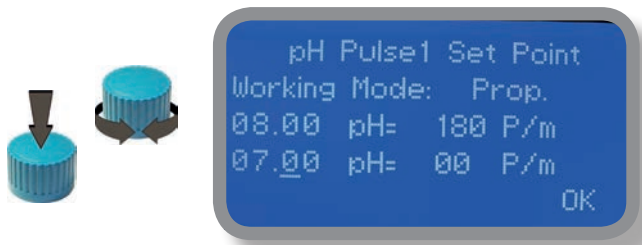
An acid (often represented by the generic formula HA [H+A-]) is traditionally considered any chemical compound that, when dissolved in water, gives a solution with a hydrogen ion activity greater than in pure water, i.e. a pH less than 7.0. That approximates the modern definition of Johannes Nicolaus Brønsted and Martin Lowry, who independently defined an acid as a compound which donates a hydrogen ion (H+) to another compound (called a base). Common examples include acetic acid (in vinegar) and sulfuric acid (used in car batteries). Acid/base systems are different from redox reactions in that there is no change in oxidation state.

### 8.3 "Set-Point", pH (proportional)

"CH1 pH Pulse1", "CH1 pH Pulse 2", "CH2 pH Pulse" outputs can be set into this mode.

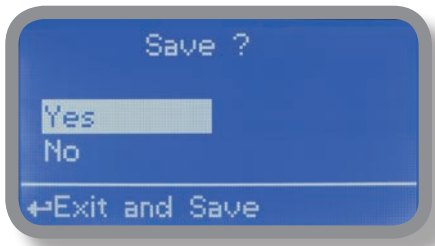


This mode set pulses between two values that enable or disable pH pump.



PROPORTIONAL MODE between 7pH(0 P/m) and 8pH (180 P/m)). [P/m: pulses per minute]  
This mode operates pH pump for values greater than 8pH having maximum dosing capacity (180 P/m) and will stop to dose for values lower than 7 pH. For values within 7.5 pH the pump will be on with 90 P/m dosing capacity based on a 180 P/m scale.

To end procedure move cursor on "OK" and press wheel. Choose "SAVE" to save setup or "NO" to discard changes.



# 8.4 "PWM" Proportional, pH

"CH1 pH Relay", "CH2 pH Relay" outputs can be set into this mode.  
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.  
Time resolution is 5 seconds, 5 steps. 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 are:

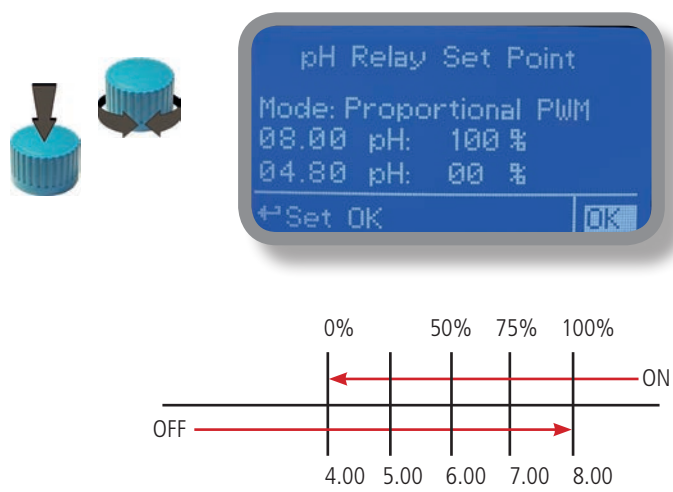
Unit Value + %: (time activity towards set value. 0% means 0 seconds. 100% means 100 seconds.)

pH range: two pH value between PWM operates.

E.g. set first pH value 8.00 = 100% and second pH value 4.0 = 0%.

For reading value  $\geq 8.00$  output will permanently be ON.  
For reading value  $\leq 4.0$  output will permanently be OFF.

For reading value of 7.00 pH the output will be OFF for 25 secs and ON for 75 secs.  
For reading value of 6.00 pH the output will be OFF for 50 secs and ON for 50 secs.



# 8.5 "PWM" Fixed, pH

"CH1 pH Relay", "CH2 pH Relay" outputs can be set into this mode.

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.

Time resolution is 5 seconds, 5 steps. 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 are:

pH range: two pH value between PWM operates.

Ton: "ON" time if output is active.

Toff: "OFF" time if output is active.

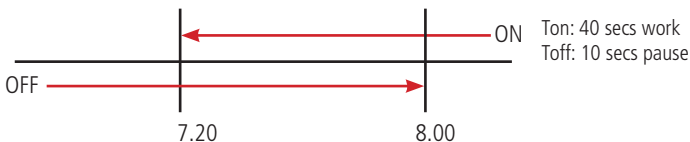
E.g.: set first pH value (OFF) at 7.20 and second pH value (ON) at 8.00.

Set "work-pause" activity with Toff 10 seconds and Ton 40 seconds

For reading values  $\geq$  to 8.00 output will be active (ON) into "WORK-PAUSE" mode based on Ton and Toff.

For reading values  $\leq$  7.20 output will be OFF.

Other reading values involve HYSTERESIS working mode. Reaching 7.20pH will permanently switch OFF the output until reading value will raise to 8.00 pH.



## 9. "Probe Calibration", pH1 and pH2

pH calibration procedure involves two calibration points (FULL CALIBRATION) and it requires two buffer solutions. Default buffer solutions are pH 4.00 and pH 7.00. pH reading value can be also 30°C temperature compensated from "pH compensation" menu. From "Menu Calibration" choose "pH probe".



Fast Calibration procedure involves one point calibration (choose value closest to real field application).

In the following example instrument will calibrate pH using default buffer solutions values.

Note: this procedure assumes that instrument is correctly configured and a working pH probe connected. Otherwise unattended results may occur.



Calib 1st Point.

Once into "pH Calibration" menu move wheel on "P1" then press wheel to enter into first point calibration submenu. Prepare 7.00pH buffer solution and dip probe's sensor on it. Wait until reading value is stable and according to buffer solution value move wheel until it is the same on display ("Cal. at" field). Default value is 7.00pH. To end procedure move cursor on "OK" and press wheel to proceed to next step.

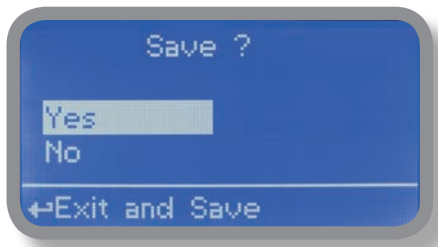
Note: buffer solution value may change if environment temperature it's different than 20°C. Read solution's label for more information. According to this occurrence "pH Default" must be changed.

9. "Probe Calibration", pH1 and pH2



Calib 2nd Point.

Move wheel on "P2" then press wheel to enter into second point calibration submenu. Prepare 4.00pH buffer solution and dip probe's sensor on it. Wait until reading value is stable and according to buffer solution value move wheel until it is the same on display ("Cal. at" field). Default value is 4.00pH.



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.

Note: buffer solution value may change if environment temperature it's different than 20°C. Read solution's label for more information. According to this occurrence "pH Default" must be changed.

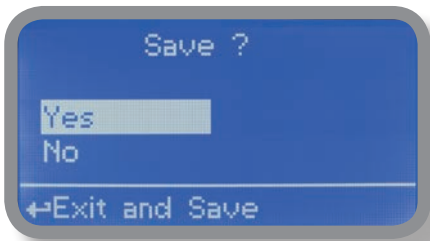
# 9.1 "Probe Calibration", °C - Temperature

A professional thermometer is required to obtain a reliable calibration. From "Menu Calibration" choose "Temp probe".



Note: This procedure assumes that instrument is correctly installed and configured, connected to a working PT100.. Calibrate using plant's temperature otherwise unattended results may occur.

Using an external thermometer read actual temperature and edit related field "Cal. at". Confirm by pressing 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. If an error occurred during calibration procedure then the instrument will show an error message and will ask to proceed to a new calibration, cancel current operation or restore default settings.

## 10. "Parameters"

From "Menu Calibration" choose "Parameters". This menu allows to set a delay (max 60 minutes) before pumps begin to feed. Furthermore use this menu to set pH pump startup priority and to change default passcode.



### Feeding Delay.

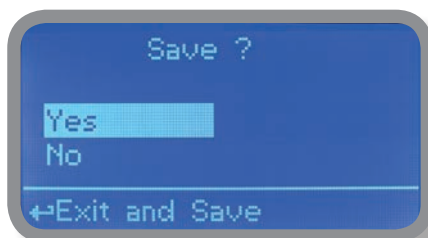
Move on "Feeding Delay" then press wheel. Choose a value between 0 (disabled) and 60 minutes (maximum delay time). This feature can be used to accord a startup delay for the pumps. Delay occurs when instrument is powered.

### Tau.

If probes reading values are changing too fast increase TAU value to stabilize them. Default value is 05. Maximum value is 30.

### New Pcode.

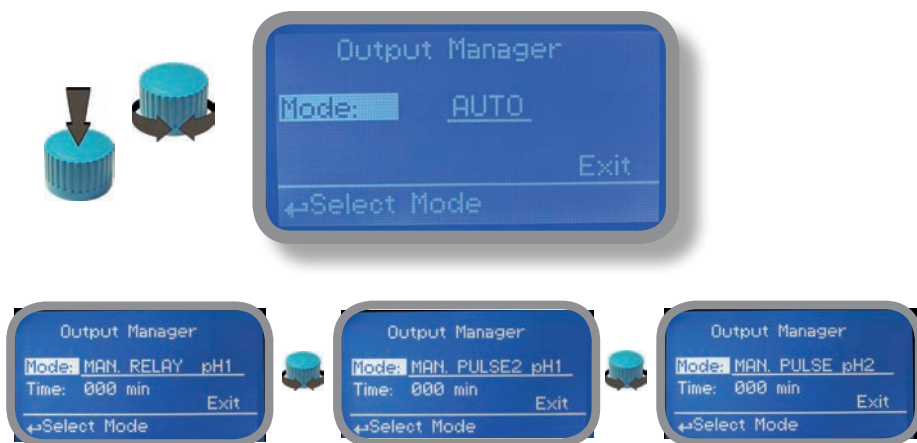
See page 7.



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.

## 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.

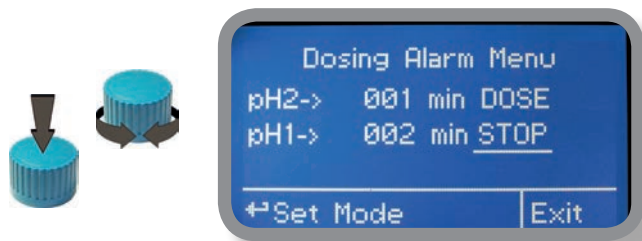
# 12. "Instrument Reset"

To restore instrument to its default values (including password) once into "Instrument Reset" menu, choose parameter to restore and press wheel then change value to "ON", press wheel again, move on "OK" then finally press wheel. Press wheel to return into "Main Menu". Move on "EXIT", then press wheel. The instrument is now restored to factory default. Please repeat all calibration procedures and programming parameters.

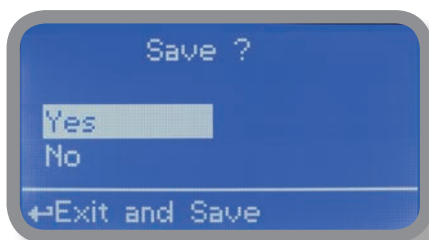


## 13. "Dosing Alarm"

This function allows to set a maximum time for reaching setpoint. At the end of set time it's possible to choose between "DOSE" (the pump will continue to DOSE ignoring probe's readings) or "STOP" (the pump will stop to dose). Function can be set for one or both the pumps and can be disabled setting "OFF" as option.

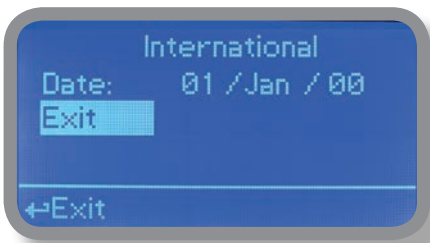
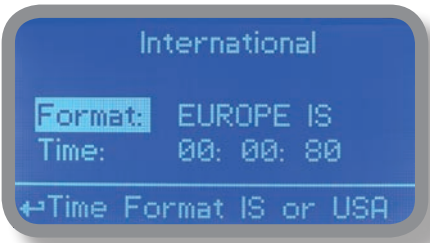


To end procedure move cursor on "OK" and press wheel to proceed to "Save" request screen. Move wheel on "YES" to save or "NO" to discard changes.



# 14. "International"

Use this menu to set international parameters as UNIT FORMAT (Europe IS or USA), Local Time and Date.



Format.

Use this option to use European or USA units format. See table for differences.

EUROPE IS (International Standard)	USA
Date (DD/MMM/YY)	Date (MMM/DD/YY)
Time 24h	Time AM / PM
°C	°F

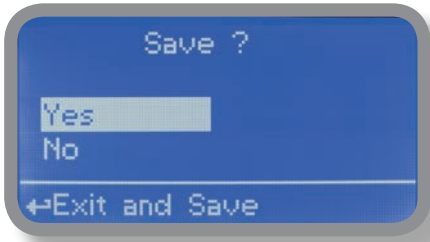
Time.

Use this option to set local time.

Date.

Use this option to set date.

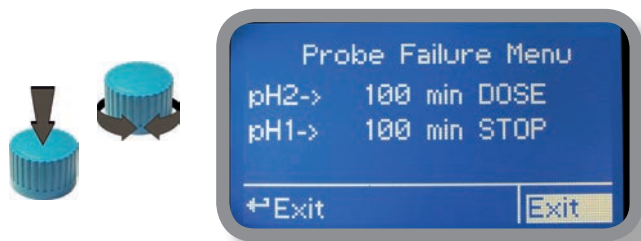
Move on exit to end changes.



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.

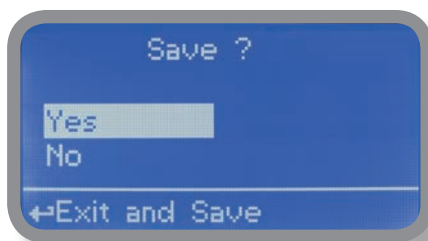
## 15. "Probe Failure"

This function allows to set a maximum time when probe's reading remain fixed (probably) due to malfunctioning. At the end of set time it's possible to choose between "DOSE" (the pump will continue to DOSE ignoring probe's readings) or "STOP" (the pump will stop to dose). Function can be set for one or both the pumps and can be disabled setting "OFF" as option.



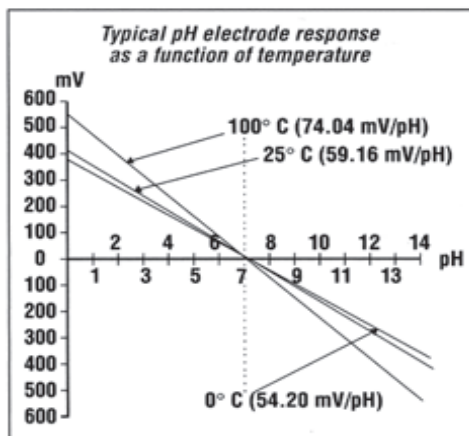
E.g. To set pH1 pump to stop after time ends and probe doesn't change reading values press wheel, choose maximum time, press wheel move on next field and choose "STOP". Time can be disabled (off) or set between 100 and 254 minutes. When satisfied with settings move on exit and press wheel.

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.



## 16. "Temp. Compensation" - Temperature compensation

pH measurements are temperature dependent. The degree to which temperature affects mV readings varies from solution to solution and can be calculated using the following graphic.



Instrument has either fixed or adjustable automatic temperature compensation referenced to a standard temperature of 25°C.

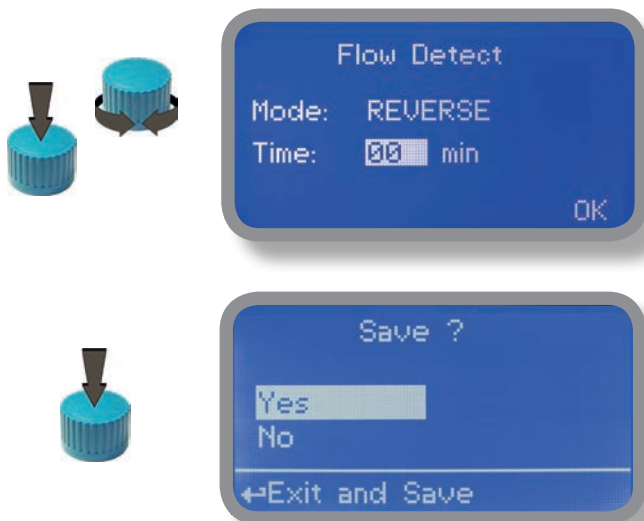


To end procedure move cursor on "OK" and press wheel to proceed to "Save" request screen. Move wheel on "YES" to save or "NO" to discard changes.

## 17. "Flow Contact"

Flow contact (see "SEPR" blocks on page 4) can be enabled to stop a dosing procedure using a N.O. contact mode (normally open) or N.C. contact mode (normally closed) when status on blocks changes. Rotate wheel to choose between: "DISABLE", "REVERSE" (N.O. contact) or "DIRECT" (N.C. contact).

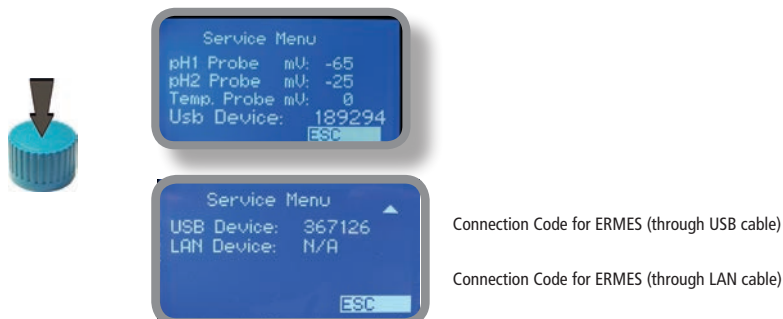
Furthermore "Flow contact" can start after a specified time when contact status changes. To set it move wheel on "Time:00 min", click it and rotate to choose time (from 0 to 99 minutes). Confirm selection by clicking wheel.



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. "Service"

This "view only" menu shows probes reading live and instrument ID for USB LOG connection (if device's connected). Press "ESC" to exit.



# 19. "Log Setup"

Log setup stores instrument activities when an alarm (flow, level, out of range reading, etc.) occurs.



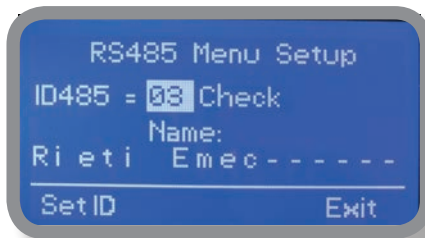
Log activity recording can be started by moving wheel on "Mode: Disable" and changing it to "Mode: Enable". Log activity starting time can be set to begin at specified time by entering "Time". Activities data are collected every specified hour or minutes. Edit this parameter by moving wheel on "Every: 00:00" and changing it to desired time.

ID and Station Name as appears on a received SMS from instrument



# 20. "RS485 Setup"

Prior to use advanced communication functions (e.g.: SMS alarm service or remote communication) the instrument must have a unique ID NUMBER (move wheel on "OK" to check it) and ID NAME (station name). Rotate wheel and edit fields. If ID number has already assigned an error message will follow. In this occurs try using another number.



# 21. "mA Outputs"

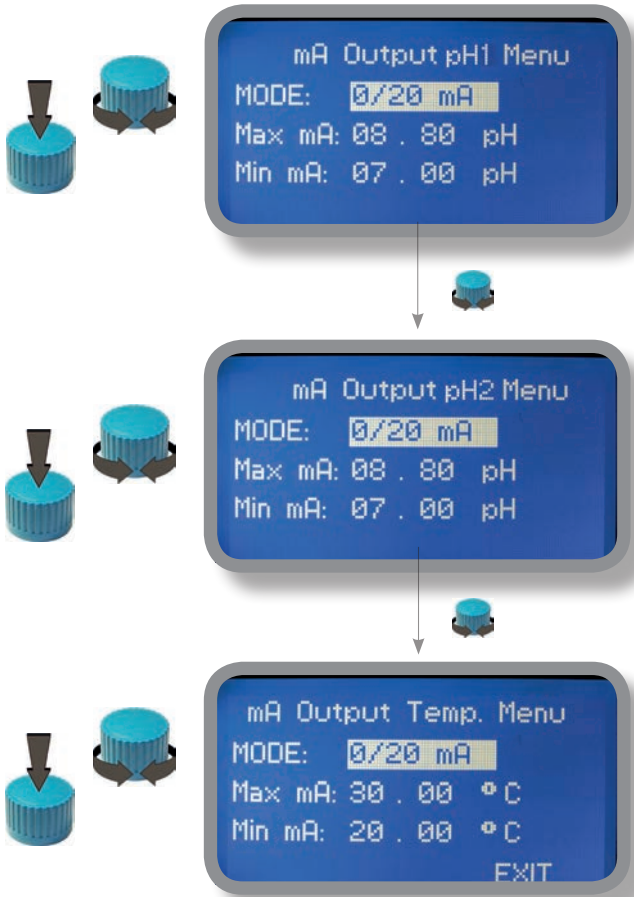
This menu allows to configure mA current outputs for pH (1 and 2) and Temperature channels. Options to set are:

**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

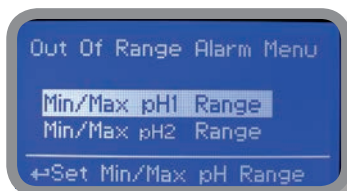
**Disable / Enable on alarm**: enable or disable output on alarm condition (flow, level, probe failure, dosage, out of range)



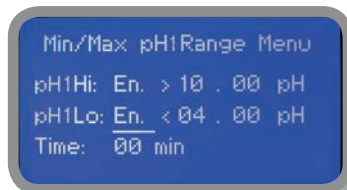
Rotate wheel to move within all 3 channels. Click wheel to select parameter and rotate wheel to change it. Click wheel again and rotate wheel to move cursor on next parameter. To end procedure move cursor on "EXIT" and press wheel to proceed to "Save" request screen. Move wheel on "YES" to save or "NO"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

## 22. "Out of range alarm"

"Out of range alarm" menu defines the minimum and maximum pH1 and pH2 probe read value before to stop dosing activity and to show an alarm message.

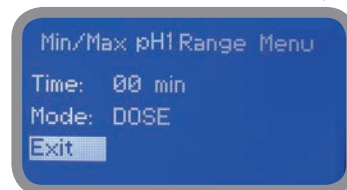


Move wheel on "Min/Max pH Range" to set "out of range" condition for pH probe then click on wheel to enter into "Min/Max Range menu".



Move wheel on "pH 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 "pH 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).

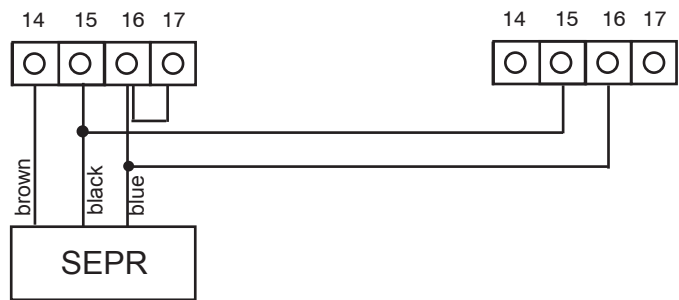
To change alarm mode move wheel on "Mode", press it and choose between "DOSE" (connected pumps will not stop dosing activity when read value is out of range) or "STOP" (connected pumps will stop dosing activity when read value is out of range and an alarm message is displayed).

## 23. Technical Data.

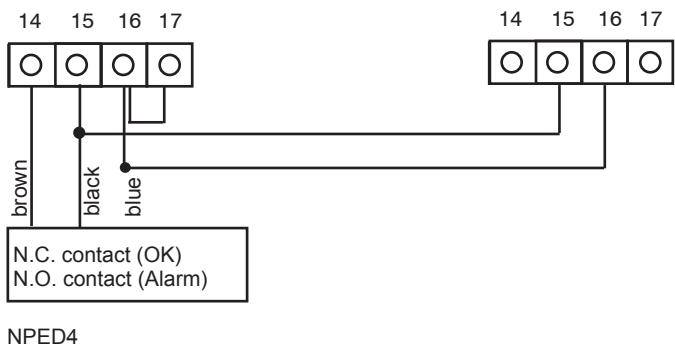
Power Supply: 85÷264 VAC  
Working Range: pH: 0 ÷ 14  
Environmental Temperature: -10 ÷ 45°C (14 ÷ 113°F)  
Chemical Temperature: 0 ÷ 50°C (32 ÷ 122°F)  
Installation Class: II  
Pollution Level: 2  
Transporting and storing temperature : -10 ÷ 50°C (14 ÷ 122°F)  
Sealing Protection: IP 65

# 24. SEPR configuration

## SEPR "Flow Sensor" configuration for two instruments

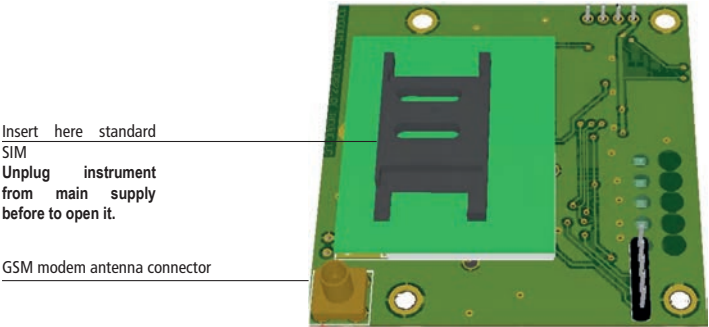


## Configuration of a Flow Switch with a voltage free contact and two instruments



# Appendix Communication HARDWARE - "SMS/GSM" Module

Located under mainboard cover there is a four pins connector that can be used to install USB, ETHERNET or MODEM modules. Modules come pre-installed upon request and may appear different as shown (different configurations).  
**"SMS/GMS module" can be configured to send SMS messages containing critical instrument information.**



**To obtain reliable results with this feature please check the following list:**

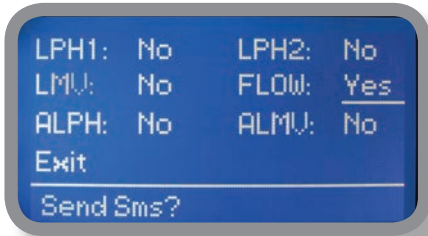
- Make certain the antenna location is not shielded by metal objects or near sources of electrical 'noise'.
- Do not route the cable where it could be pinched in doors, windows etc.
- Secure the antenna cable
- Ensure that SIM into "SMS/GSM module" is properly inserted, activated and within operator range.
- Set instrument ID / NAME from "RS485 Setup" menu and configure "Out of Range Alarm" menu.

Within "Main menu" select "SMS MENU" to enable SMS service and enter SMS receiver phone numbers.



Up to three numbers for sending SMS can be stored into LDPHRH memory. SMS recipient will receive an SMS containing instrument ID, NAME and status. Number formats can be stored using international prefix "+", international prefix "00" or local.

WARNING: THIS FUNCTION COULD NOT BE FREE OF CHARGE. DEPENDING ON YOUR OPERATOR CONTRACT IT COULD GENERATE PAYING SMS TRAFFIC !



To enable warning message for related alarm condition choose "YES", to disable choose "NO". Then move wheel on Exit and SAVE configuration.  
**SMS will be sent when one or more ("YES") fields will change.**

LPH1 or 2 : level alarm for PH1 or PH2 levels

LMV: level alarm for PH2

FLOW: flow alarm

ALPH: out of reading range for pH probe

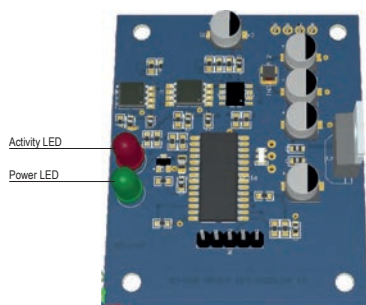
ALMV: out of reading range for PH2 probe

WARNING: TO AVOID UNSOLICITED MESSAGES  
USE CAREFULLY THIS SETUP!

## Appendix Communication HARDWARE - "LOG USB" Module

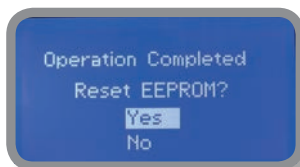
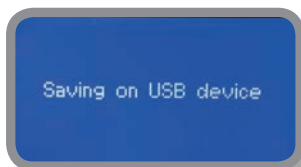
Located under mainboard cover there is a four pins connector that can be used to install "USB data log module" or "SMS module". Modules come pre-installed upon request and may appear different as shown (different configurations).

"USB data log module" records instrument activities. These information can be permanently stored into a standard USB pendrive. Pendrive can be connected to a PC using "ERMES" web [www.ermes-server.com](http://www.ermes-server.com) to review and print instrument's activities. **To obtain reliable results with this feature please set instrument ID and NAME from "RS485 Setup" menu and activate log recording from "LOG SETUP" menu.**



### HOW TO RECORD INSTRUMENT'S ACTIVITIES INTO USB PENDRIVE ?

Insert USB pendrive into USB connector (located on the right side of instrument). Instrument will save data log on USB pendrive. After succeeded in saving data it will ask if delete instrument's log or not (anyway USB pendrive will not be formatted). Move wheel on "YES" to delete log info from instrument and return to main screen or "NO" to leave log info on instrument and return to main screen. **Wait about 30 seconds to safely remove the USB pendrive.**



### HOW TO REVIEW INSTRUMENT'S ACTIVITIES RECORDED INTO USB PENDRIVE ?

It's necessary to connect to web "ERMES" [www.ermes-server.com](http://www.ermes-server.com) to review USB pendrive info on a PC.

## Appendix Communication - Software

### “RS485” menu.

Prior to install the instrument into an RS485 local system a unique ID NUMBER (from 1 to 30) and ID NAME (station name) must be set. Rotate wheel and edit fields. If ID number has already assigned an error message will follow after ID Check (move cursor on CHECK and press wheel). In this event try using another number.



### “SMS” menu.

Instrument may remotely send SMS alarm messages using its own modem (sold as option). It can be configured as follows:

#### SMS1 / SMS2 /SMS3.

Using the wheel enter a mobile phone that will receive alert SMS messages if something wrong occurs. SMS number must be set using local number format. For example : 3391349134 will send an SMS message to mobile phone. Log level (and SMS frequency alert) may be set using options in “ACTIVE MSG” within “GSM menu”.



- TO AVOID UNDESIRED MESSAGES USE CAREFULLY LOG SETUP -

- WARNING: THIS FUNCTION COULD NOT BE FREE OF CHARGE. DEPENDING ON YOUR OPERATOR CONTRACT IT COULD GENERATE PAYING SMS TRAFFIC !

## Appendix Communication - Software

### “TCP/IP” menu.

The instrument may be remotely operated using a standard ethernet connection (sold as option). A static or dynamic IP address and a CAT5 ethernet cable is required. According to your network capacity connection speed is 10/100Mbps. To obtain a valid IP address and subnet mask contact your net administrator. Enter parameters and move cursor on “SAVE” to store parameters then move on “OK” and press wheel to save and activate configuration.

Based on your network configuration choose to obtain network parameters automatically (DYNAMIC) or manually (STATIC).



See “ERMES Communication Software” manual for proper PC software configuration.

---

#### What is a static IP address/dynamic IP address?

A static IP address is a number (in the form of a dotted quad) that is assigned to a computer by an Internet service provider (ISP) to be its permanent address on the Internet. Computers use IP addresses to locate and talk to each other on the Internet, much the same way people use phone numbers to locate and talk to one another on the telephone. When you want to visit whatis.com, your computer asks a domain name system (DNS) server (think telephone information operator) for the correct dotted quad number (think phone number) for whatis.com and your computer uses the answer it receives to connect to the whatis.com server. It would be simple if every computer that connects to the Internet could have its own static IP number, but when the Internet was first conceived, the architects didn't foresee the need for an unlimited number of IP addresses. Consequently, there are not enough IP numbers to go around. To get around that problem, many Internet service providers limit the number of static IP addresses they allocate, and economize on the remaining number of IP addresses they possess by temporarily assigning an IP address to a requesting Dynamic Host Configuration Protocol (DHCP) computer from a pool of IP addresses. The temporary IP address is called a dynamic IP address.

Requesting DHCP computers receive a dynamic IP address (think temporary phone number) for the duration of that Internet session or for some other specified amount of time. Once the user disconnects from the Internet, their dynamic IP address goes back into the IP address pool so it can be assigned to another user. Even if the user reconnects immediately, odds are they will not be assigned the same IP address from the pool. To keep our telephone analogy going, using a dynamic IP address is similar to using a pay phone. Unless there is a reason to receive a call, the user does not care what number he or she is calling from.

There are times, however, when users who connect to the Internet using dynamic IP wish to allow other computers to locate them. Perhaps they want to use CU-SeeMe or use a VoIP application to make long distance phone calls using their IP connection. In that case, they would need a static IP address. The user has two choices; they can contact their ISP and request a static IP address, or they can use a dynamic DNS service. Either choice will probably involve an additional monthly fee.

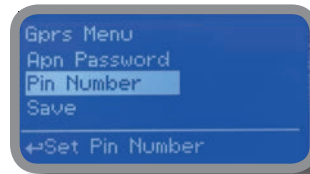
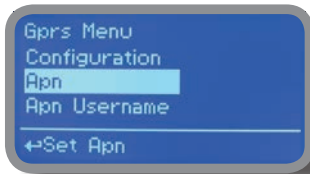
Using a dynamic DNS service works as if there was an old-fashioned telephone message service at your computer's disposal. When a user registers with a DNS service and connects to the Internet with a dynamic IP address, the user's computer contacts the DNS service and lets them know what IP address it has been assigned from the pool; the service works with the DNS server to forward the correct address to the requesting DHCP computer. (Think of calling the message service and saying "Hi. I can be reached at 435.44.32.111 right now. Please tell anyone who tries to reach me to call that number.") Using a dynamic DNS service to arrange for computers to find you even though you are using a dynamic IP address is the next-best thing to having a static IP.

## Appendix Communication - Software

### “GPRS” menu.

Instrument may be remotely operated using an embedded standard GPRS modem (sold as option). In order to activate this service please ensure that the following steps are correctly completed:

- Make certain the antenna location is not shielded by metal objects or near sources of electrical 'noise'.
- Make certain the distance from the antenna to the “Instrument” unit is within cable length.
- Do not route the cable where it could be pinched in doors, windows etc.
- Ensure that SIM into “Instrument” modem is correctly inserted, activated and within operator range.



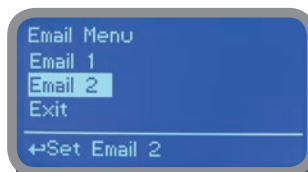
Instrument can be set for ERMES services enabled (Configuration option set to “ERMES YES”) or messages only (Configuration option set to “ERMES NO”) based on your SIM data access parameters. For manual configuration option enter APN (access point name) and SIM phone number. Move wheel on “OK” to save and move on “ESC” to go back to main menu.

**Don't forget to enter SIM CODE into PIN NUMBER menu to unlock SIM.**

**WARNING: THIS FUNCTION COULD NOT BE FREE OF CHARGE. DEPENDING ON YOUR OPERATOR CONTRACT IT COULD GENERATE PAYING DATA TRAFFIC !**

### “Email” menu.

If Ethernet module or GPRS module is installed (sold as option) the instrument can be configured to send email alarm messages up to two recipients. Click on “Email 1” or “Email 2” and enter email address.



Access point name (APN) identifies an IP packet data network (PDN), that a mobile data user wants to communicate with. In addition to identifying a PDN, an APN may also be used to define the type of service, (eg connection to wireless application protocol (WAP) server, multimedia messaging service (MMS)), that is provided by the PDN. APN is used in 3GPP data access networks, eg general packet radio service (GPRS), evolved packet core (EPC).

# Appendix Communication - Software

## “LOG” menu.

This function records instrument activity (date, hour, temperature, uS, totalizer I/O, alarms, outputs). It starts for selected frequency period (every) at requested time (time). SET DATE & TIME BEFORE TO ENABLE LOG. IF NOT POWERED FOR ABOUT 30 DAYS THE INSTRUMENT WILL LOOSE DATE/TIME



Set ACTIVE to “enabled” to activate log recording.

TIME: recording start time (time format 23h e 59min)

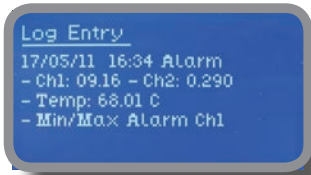
EVERY: recording frequency (time format 23h e 59min)

Note: advanced log control (graph, printing, comparison tables, event filtering, etc) is available through “ERMES Communication Software” for PC.

See “ERMES Communication Software” manual for proper PC software configuration.

## “LOG VIEW” menu.

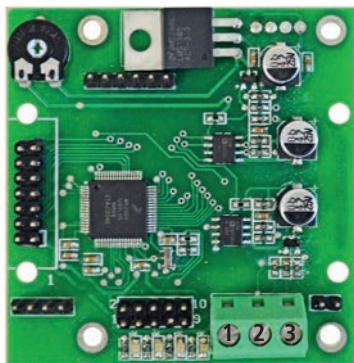
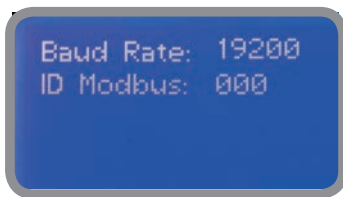
To see alarm log entries as set on log menu choose “log view” on main menu.



## Appendix - MODBUS

Modbus is a serial communications protocol originally published by Modicon (now Schneider Electric) in 1979 for use with its programmable logic controllers (PLCs). Simple and robust, it has since become a de facto standard communication protocol, and it is now a commonly available means of connecting industrial electronic devices.

From main menu select COMMUNICATION then MODBUS to access the options. Set the communication speed according to the PLC system available. Set the ID assigning an UNIQUE address to avoid conflicts.



- 1: GND
- 2: A-RS485 (+)
- 3: B-RS485 (-)

To access the module MODBUS open the instrument only after power is switched off!

Never make connections with the instrument powered!



**WARNING**

# APPENDIX - LDPHPH T “PWM” (proportional), pH & temperature

This mode is valid for “CH1 PH RELAY” and “TEMP RELAY” 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.

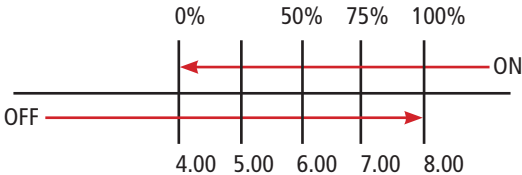
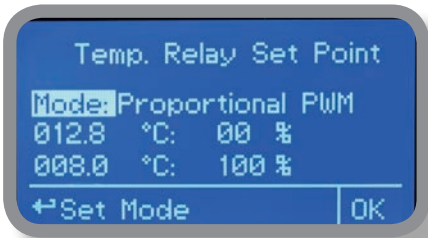
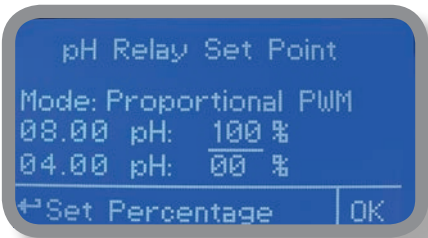
This mode works over a settable (0 to 100 seconds) time to switch on or off selected output. During this time if reading value will move towards a set value (on or off) the PWM will operate the output on timed basis. Reaching the set value the PWM will permanently leave on or off the output.

Parameters to set for this mode are:

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

For example: set first pH value at 8.00 = 100% and second pH value at 4.0 = 0%.  
For reading values  $\geq 8.00$  the output will be permanently ON.  
For reading values  $\leq 4.0$  the output will be permanently OFF.

For reading value of 7.00 the output will be OFF for 25 seconds, ON for 75 seconds.  
For reading value of 6.00 the output will be OFF for 50 seconds, ON for 50 seconds.



# APPENDIX - LDPHPH T “PWM” (fixed), pH & temperature

This mode is valid for “CH1 PH RELAY” and “TEMP RELAY” 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 timed 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:

pH range: two pH values within PWM operates.

Ton: ON period, during output activity.

Toff: OFF period, during output activity.

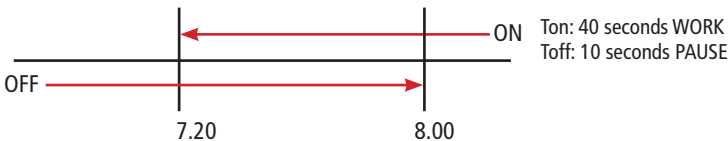
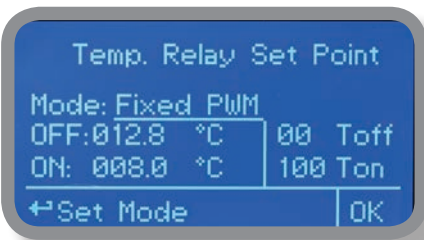
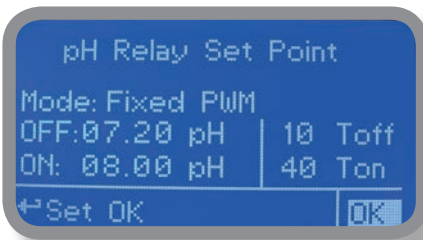
For example: set first pH value (OFF) at 7.20.. Set second pH value (ON) at 8.00.

Set “working-pause” output activity with Toff 0 seconds and Ton 40 seconds.

For reading values  $\geq$  to 8.00 the output will be ON with activity based on Ton and Toff.

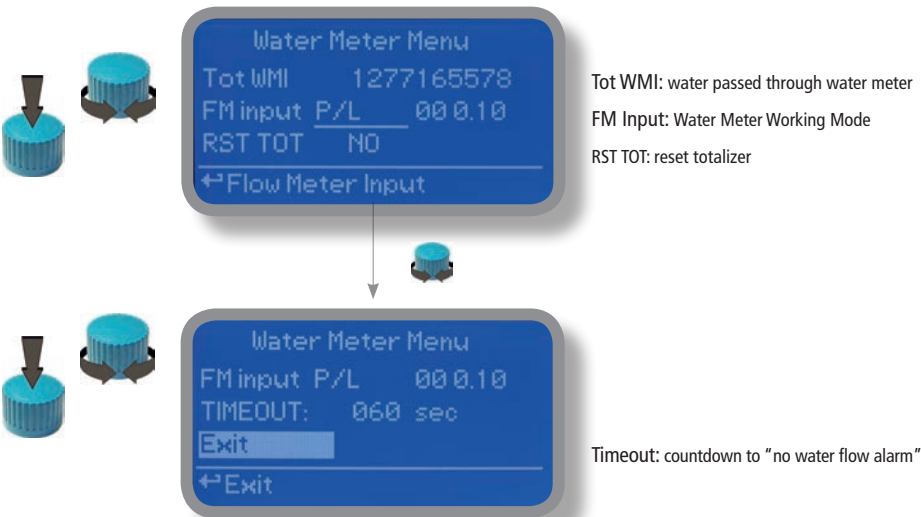
For reading values  $\leq$  7.20 the output will be permanently OFF.

For reading values within working range operating mode is on HYSTERESIS base. Once reading value is 7.20 pH will be permanently off until it will reaches 8.00 pH.



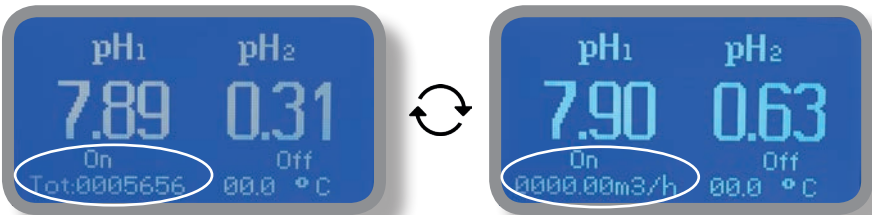
## 24. "Water Meter"

Enter into "Water Meter" menu to setup Flow Meter configuration type, see total amount of liters passed through water meter (blocks n.36 and n.37 on main board), reset totalizer and setup a timeout alarm for no water flow. The alarm will be notified into main screen and water meter status (see page 6).

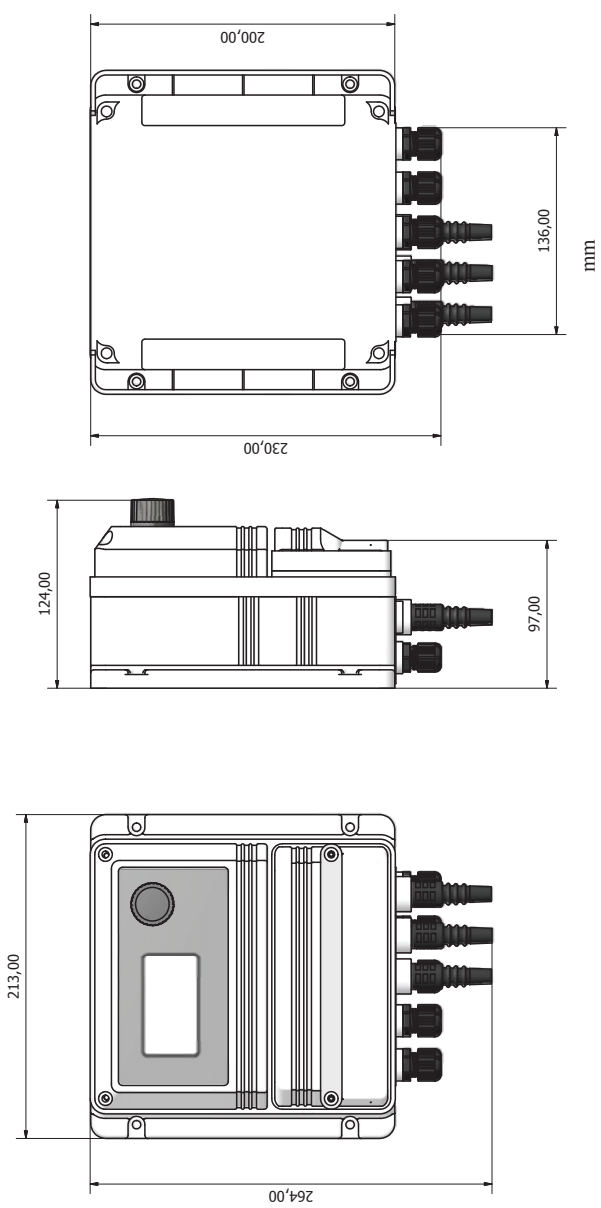


FM Input can be set to operate Water Meter as P/L (pulses per liter) or L/P (liters per pulse).

If the "water meter" feature is enabled the main display will cyclically show the total water passed through the meter and the amount dosed in an hour.



Appendix C - Dimensions







# Index

- 1. Introduction ..... 3
- 2. The wheel..... 3
- 3. Mainboard Connections..... 4
- 4. Main Screen ..... 5
- 5. Quick status check..... 6
- 6. Password ..... 7
- 7. "Main Menu" list ..... 8
- 8. "Set-Point", working modes ..... 9
- 8.4 "PWM" modes..... 12
- 9. "Probe Calibration" ..... 14
- 10. "Parameters" ..... 17
- 11. "Output Manager" ..... 18
- 12. "Instrument Reset" ..... 19
- 13. "Dosing Alarm" ..... 20
- 14. "International" ..... 21
- 15. "Probe Failure" ..... 22
- 16. "Temperature Compensation" ..... 23
- 17. "Flow contact" & "Service" ..... 24
- 19. "Log Setup" & "RS485 Setup" ..... 25
- 21. "mA Outputs" ..... 26
- 22. "Out of range alarm" ..... 27
- 23. Technical information..... 28
- 24. SEPR configuration ..... 29
- Appendix Communication ..... 30
- Appendix MODBUS ..... 36
- Appendix Extra menus / functions for LDPHPH T model ..... 37
- Dimensions ..... 40

Information on this manual may contain technical inaccuracies or typographical errors.  
The information contained may be changed at any time without prior notification or obligation.



#### **Disposal of end-of-life equipment by users**

This symbol warns you not to dispose of the product with normal waste. Respect human health and the environment by giving the discarded equipment to a designated collection center for the recycling of electronic and electrical equipment. For more information visit the online site.



When dismantling a pump please separate material types and send them according to local recycling disposal requirements. We appreciate your efforts in supporting your local Recycle Environmental Program. Working together we'll form an active union to assure the world's invaluable resources are conserved.