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 "LDSCD" & "LDSCDIND" Plus INSTRUMENT SERIES

REMOTE CONTROL AND SETUP
https://www.e-nimbus.com

Read Carefully !

ENGLISH Version
R11-10-14

Codici Identificativi Prodotto
(i simboli "_" completano il codice del prodotto in base alla configurazione delle varianti)

Product Identification Codes
(the "_" symbols complete the product code based on the configuration of the variants)

LDSCD _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
LDSCDA _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
LDSCDB _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
LDSCDHT _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
LDSCDIA _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
LDSCDIN _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
LDSCDIT _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
LDSCDT _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

LDSCDZ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
LDSCL _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
LDSCLA _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
LDSDO _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
LDSFL _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
LDSGAS _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
LDSPH _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
LDSPHA _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

LDSPS _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
LDSPSA _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
LDSRH _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
LDSRHA _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
LDSRHN _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
LDSRHVM _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
LDSTORB _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
LDSTRC _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

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

LDSCD is a microprocessor based digital regulator for **Conductivity** (mS / uS / ppm) and temperature reading (°C or °F). On/Off is main working mode. All information are provided through a large backlit LCD display. Using a revolutionary wheel control the instrument can be easily programmed. LDSCD is housed in a IP65 plastic box.

INPUTS:
- Stand-by
- Flow
- Temperature probe
- Conductivity probe

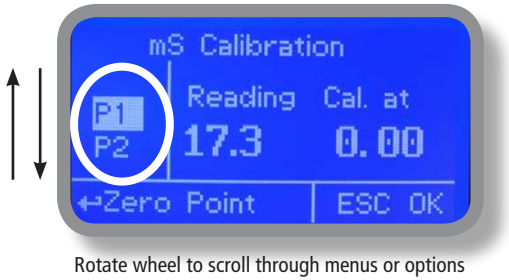
OUTPUTS:
- 2 relay outputs (Conductivity and alarm)
- 2 mA outputs (Conductivity and Temp)
- Main alarm

2. The wheel

Located in the upper right side of LDSCD 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 / alue.

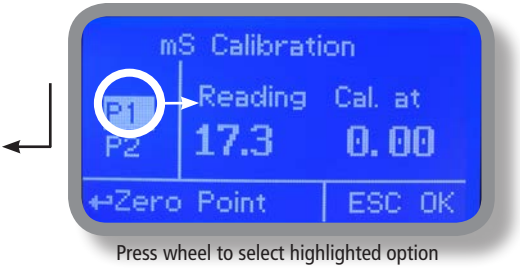
NOTE: Once changes are made press "OK" to save and exit from submenu. Press "ESC" to exit without saving.

SCROLL



Rotate wheel to scroll through menus or options

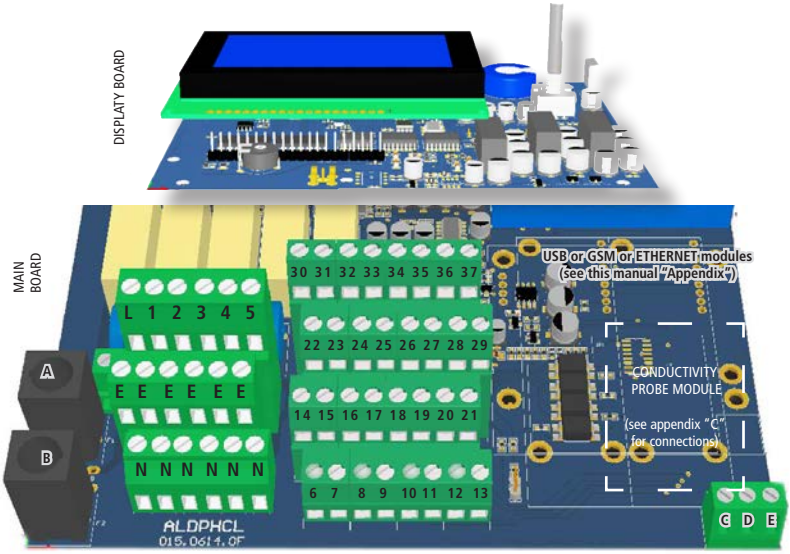
SELECT



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)
C - D - E : Factory reserved +5V

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

31(-) - 32(+): Current output mA2 for CD
34(-) - 35(+): Current output mA4 for temperature
} Max resistive load: 500 Ohm

24(-) - 25(+): Opto coupled output "CD PULSE 1". To use with "IS" or "MF" series dosing pumps
24(-) - 25(+): Opto coupled output "CD PULSE 2". To use with "IS" or "MF" series dosing pumps

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

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

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

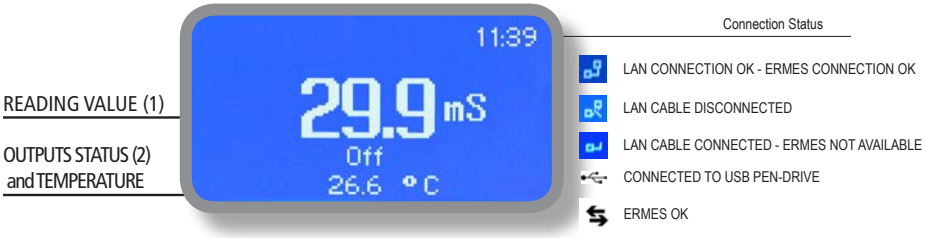
6(verde) - 7(marrone) - 8(bianco) - 9(giallo): Temperature probe mod. PT100*
*remove resistance before to install the probe

Warning: Connections must be perfomed by qualified and trained personnel onl .

Warning: Do not connect the power supply of the dosing pumps in PWM mode.
Warning: Maximum relay output power consumption in PWM mode: 5 W.

4. Main Screen

When into normal operating mode, LDSCD shows the following main screen:



Please note about background color display (RGB Version only): GREEN: normal working mode | WHITE : Standby | RED: Alarm (che info status) | YELLOW: Warning (check controller, ie.: delay time active)

Main screen zones:

(1) READING VALUE

Values read by the probe. "mS" - "uS" - "PPM/TDS"* are the measuring unit for Conductivity probe. To change unit refer to "International" menu.

(2) OUTPUTS STATUS

These fields are related to current outputs status and instrument activit .
For more information rotate the wheel when into main screen. (see next page)

WARNING MESSAGE NOTIFICATION AREA

During critical situations a warning / alarm message may appear. To in-depth explanation **completely rotate clockwise** the wheel to review main instrument parameters and current outputs status.

***PPM / TDS unit is based on 1mS = 640 PPM of TDS (total dissolved solids)**

Note: the word "PUMP" as shown into this manual refers to a "dosing device" connected to the instrument!

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
Conductivity probe reading

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

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

Last Temperature calibration result
Last Temperature calibration date

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.

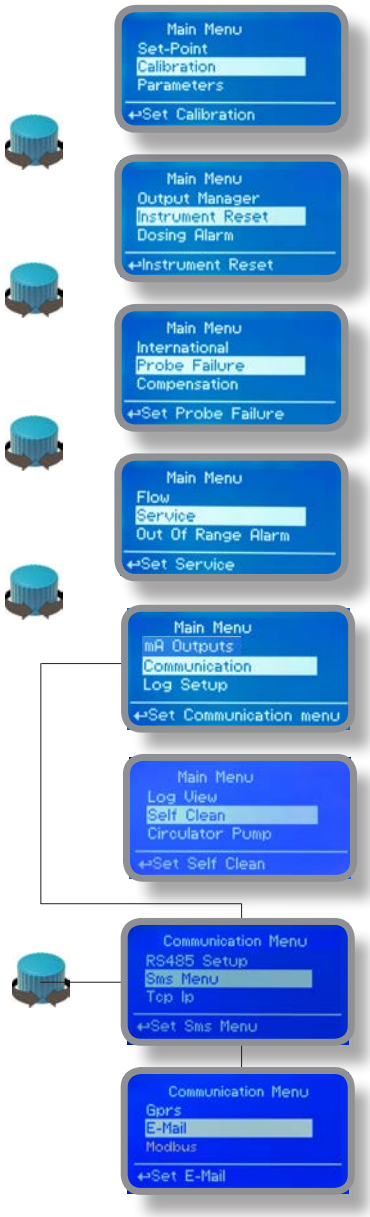
To set a new passcode choose "PARAMETERS" from "Main Menu" , move on "New Pcode", click on wheel and enter a four numbers code. Click on "EXIT" and choose "YES" to save request. The new passcode is now ready.

Lost passcode ?

Please dont' 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.



Setpoint (see page 9)
Calibration (see page 13)
Parameters (see page 16)

Output manager (see page 17)
Instrument reset (see page 18)
Dosing alarm (see page 19)

International (see page 20)
Probe Failure (see page 21)
Compensation (see page 25)

Flow (see page 22)
Service (see page 22)
Out of Range Alarm (see page 25)

mA Outputs*** (see page 23)
Communication (see below)
Log Setup (see page 34)

Log View (see page 34)
Self Clean (see page 37)
Circulator Pump (see page 38)

RS485 Setup (see page 31)
SMS menu (see page 29)
TCP IP (see page 32)

GPRS (see page 29)
Email (see page 33)
Modus (see page 40)

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

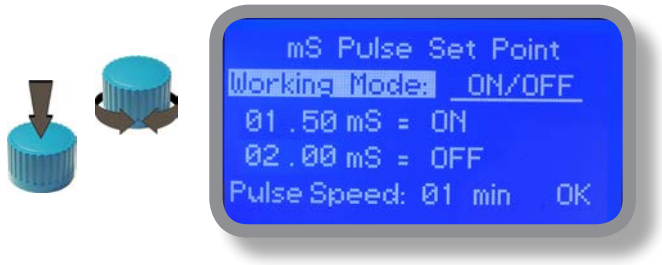
8.1 "Set-Point"

"CD PULSE 1 " and "CD PULSE 2" outputs can be set to operate within:
On/Off, Proportional (%) or disabled (OFF) modes.

"CD RELAY 1" and "CD RELAY 2" outputs can be set to operate within:
On/Off, Proportional PWM, Fixed PWM or disabled (OFF) modes.

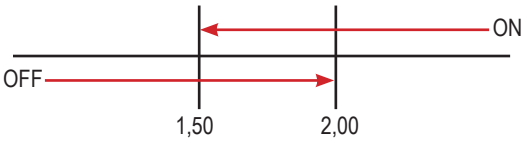
8.2 "Set-Point", Conductivity (on/off)

All Conductivity outputs can be set to operate into this mode.
This mode enables Conductivity pump to operate between two On/Off values. Move wheel over "Working Mode" to select it.



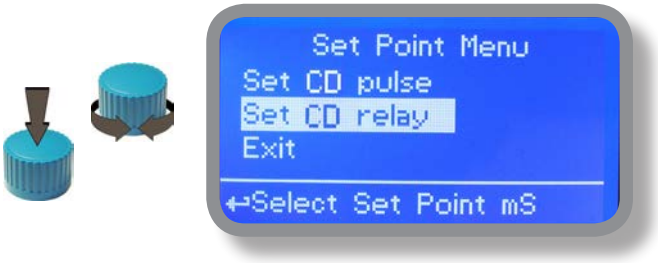
ON/OFF mode
Set Conductivity value at 1,50mS ON and 2,00mS OFF. The difference between the two Conductivity values is called HYSTERESIS.
Instrument will enable the Conductivity pump when reading value will decrease at 1,50mS
At 1,50mS the Conductivity pump will be enabled until reading value will increase at 2,00mS.

Pulse Speed: pulses per minute setting.

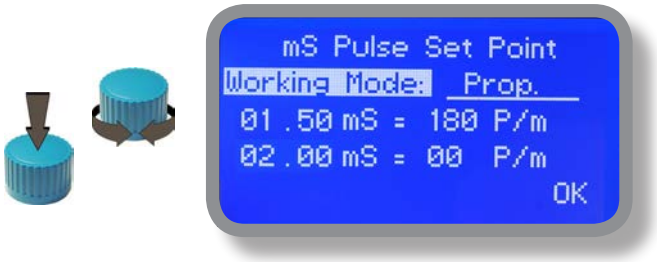


8.3 "Set-Point", Conductivity (proportional)

"CD PULSE 1 " and "CD PULSE 2" outputs can be set into this mode.



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



PROPORTIONAL MODE between 2,00(0 P/m) and 1,50(180 P/m). [P/m: pulses per minute]
This mode operates Conductivity pump for a value lower that 1,50mS with maximum dosing capacity (180strokes) and it will stop Conductivity pump for a reading value higher than 2,00mS.

A 1,75mS reading value will operate Conductivity pump with a 90 strokes capacity calculated on strokes settings (see page 22). Pump will operare with 90 strokes dosing capacity. To end procedure move cursor on "OK" and press wheel. Choose "SAVE" to save setup or "NO" to discard changes.

8.4 "PWM" Proportional, Conductivity

"CD RELAY 1" and "CD RELAY 2" 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.

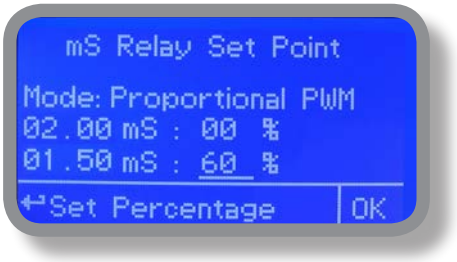
This mode works over a settable (0 to 100 seconds) time to switch on or off selected output.
Time resolution is 5 seconds, 5 steps. During this time if reading value will move towards a set value (on or off) the PWM will operate the output on timered basis. Reaching the set value the PWM will permanently 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.)

mS range: two pH value between PWM operates.

E.g: set first value at 2,00 = 00% and second value at 1,50=60%.
For reading values ≥ 2,00 output will always be OFF.
For reading values ≤ 1,50 output will be ON for 60 seconds and OFF for 40 seconds.
If reading value is 1,75 mS the ouput will be ON with a 30% of total set time. (ON for 30 seconds, OFF for 70 seconds).



8.5 "PWM" (fixed) Conductivity

"CD RELAY 1" and "CD RELAY 2" 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 timered basis. Reaching the set value the PWM will permanently leave on or off the output.

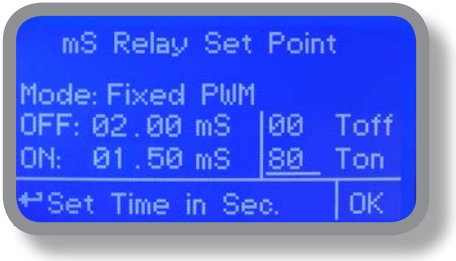
Parameters to set are:

mS range: two mS value between PWM operates.
Ton: "ON" time if output is active.
Toff: "OFF" time if output is active.

E.g.: set first mS value: (OFF) at 2,00 and second mS value: (ON) at 1,50.
Set "WORK-PAUSE" activity with Toff 0 seconds and Ton 80 seconds.

For reading values ≥ 2,00 output will always be OFF.
For reading values ≤ 1,50 output will be ON within "WORK-PAUSE" mode based on Ton and Toff settings.

Within 2,00mS and 1,50mS values output activity will operate on HYSTERESIS basis. Once 2,00mS reading value will be reached the output will always be OFF up to 1,50mS reading value.

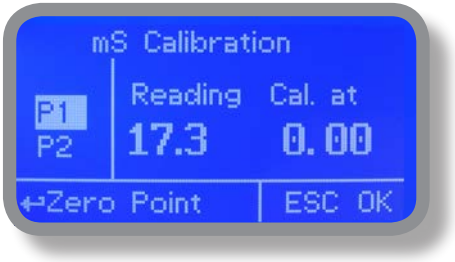


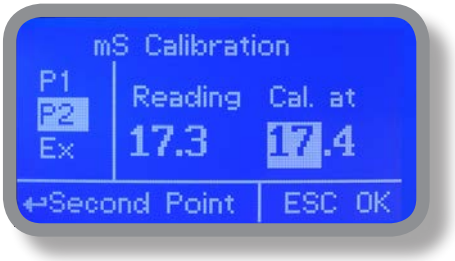
9.1 "Menu Calibration", Probe CD

Conductivity calibration procedure involves a zero calibration (P1) and a 2nd calibration point (P2) that requires a buffer solution with value near working range. Note: This procedure assumes that instrument is correctly installed and configured, connected to a working probe. Calibrate using plant's temperature otherwise unattended results may occur.

P1 & P2

During this procedure probe must be dry and clean and not installed in plant. Move wheel on "P1" then press wheel, move cursor on "OK" and press wheel again. Move wheel on "P2" then press wheel to enter into second point calibration submenu. Prepare 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 ("uS default" field). End procedure moving cursor on "OK".





9.2 "Menu Calibration", Scale Setup

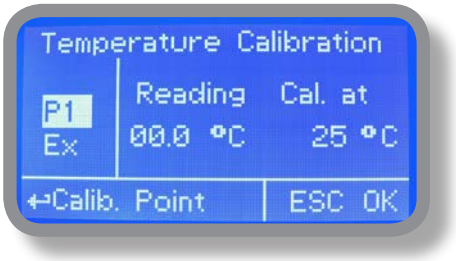
Instrument can operate according to uS, mS or PPM reading values and scale range. Move cursor on "Probe" press and rotate the wheel to change it within 3000uS --> 30.00mS --> 300.0mS or PPM (K1, K 0.1, K10).

Note: these changes must be set according to probe reading capacity. See probe's datasheet to choose correct values.

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.

9.3 "Menu Calibration", Temp Probe

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



Note: This procedure assumes that instrument is correctly configured and properly 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 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.

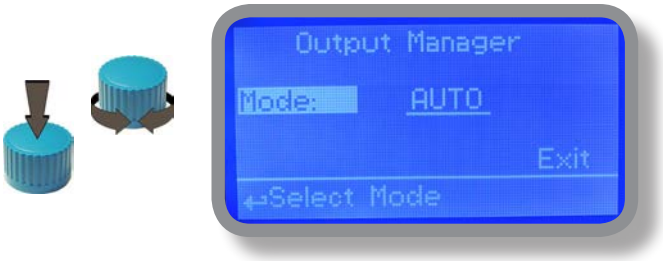
New Pcode.

See page 10.

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, press wheel then change value to "ON", press wheel again, move on "OK" then finally press wheel The instrument display will show "CHECKSUM ERROR". Press whell 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"

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

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

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

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 differencies.

EUROPE IS (Internationl 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.

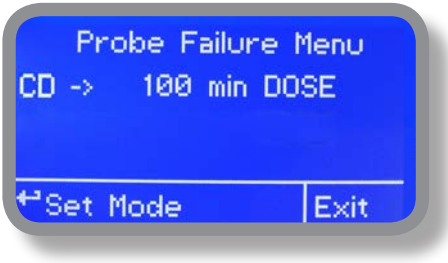
Date.
Use this option to set date.

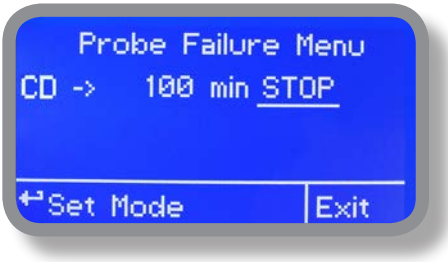
Move on exit to end changes.

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"

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





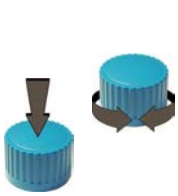
E.g. To set Conductivity pump to stop after time ends and probe doesn't change reading values press wheel, choose maximum time, press wheel move on next field and choose "STOP". Time can be set between 100 and 254 minutes. When satisfied with settings move on exit and press wheel

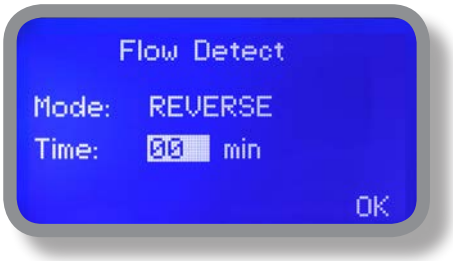
To end procedure move cursor on "OK" and press wheel to proceed to "Save" request screen. Move wheel on "YES" to save or "NO" to discard changes.

16. "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 "SEPR" or "STANDBY" changes. Rotate wheel to choose between: **"DISABLE"**, **"REVERSE"** (N.O. contact) or **"DIRECT"** (N.C. contact).

Furthermore "Flow contact" can starts after a specified time when contact status change . 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

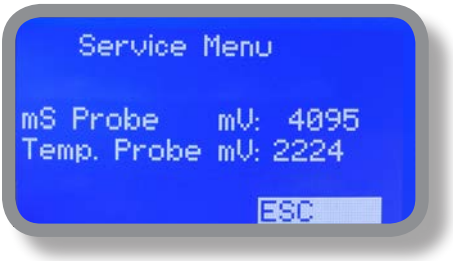




To end procedure move cursor on "OK" and press wheel to proceed to "Save" request screen. Move wheel on "YES" to save or "NO" to discard changes.

17. "Service"

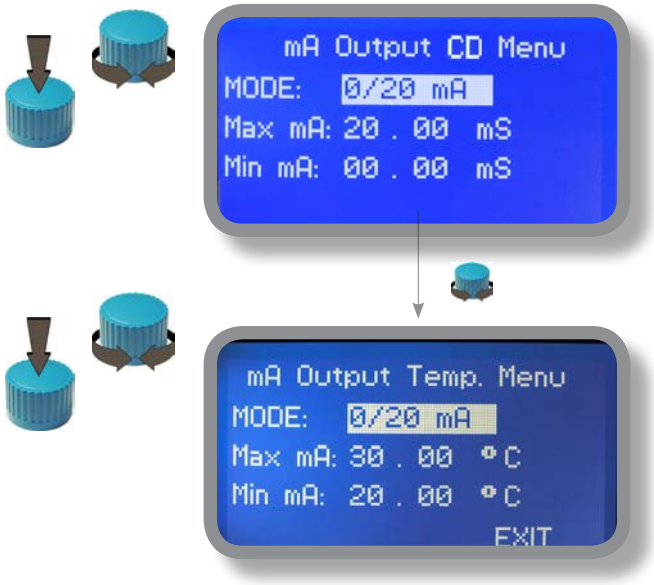
This "view only" menu shows probes reading live and instrument ID for ERMES connection (if device's connected). Press "ESC" to exit.



18. "mA Outputs"

This menu allows to configure mA current otputs for Conductivity 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



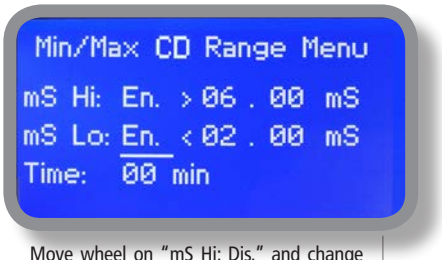
Rotate wheel to move within all channels. Click wheel to selecte parameter and rotate wheel to change it.
Click wheel again and rotate wheel to move cursor on next parameter.
To end procedure move cursor on "EXIT" and press wheel to proceed to "Save" request screen. Move wheel on "YES" to save or "NO"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

This menu is available only for instrument with current outputs option enabled.

19. "Out of range alarm"

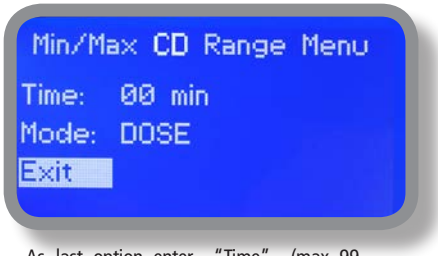
"Out of range alarm" menu defines the minimum and maximum conductivity probe read alue before to stop dosing activity and to show an alarm message.

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



Move wheel on "mS 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 "mS 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).

20. "Temperature compensation"

Conductivity measurements are temperature dependent. The degree to which temperature affects conductivity varies from solution to solution and can be calculated using the following formula:

$$Gt = Gtcal \{1 + a(T-Tcal)\}$$

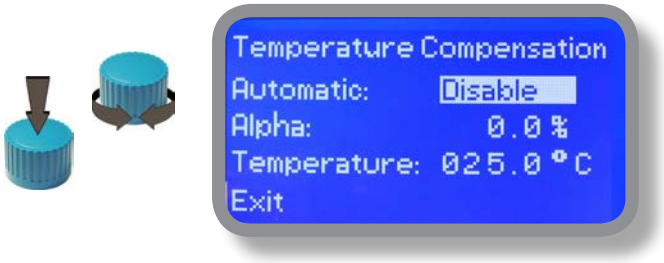
where: Gt = conductivity at any temperature T in °C, Gtcal = conductivity at calibration temperature Tcal in °C, a = temperature coefficient of solution at Tcal in °C.

Substance at 25°C	Concentration	Alpha (a)
HCl	10 wt%	1.56
KCl	10 wt%	1.88
H2SO4	50 wt%	1.93
NaCl	10 wt%	2.14

Common alphas (a) are listed in the table above. To determine that (a) of other solutions, simply measure conductivity at a range of temperatures and graph the change in conductivity versus the change in temperature. Divide the slope of the graph by Gtcal to get a.

Temperature compensation (Alpha) can be changed within 0.0% and 5.0%. It should be set according to measured chemical properties. If a temperature probe is installed choose "Enable" for "Automatic". Otherwise select "Disable" and enter a temperature value in "Temperature" field

Note: "Temperarure" field is not visible if "Automatic" has been set on "Enable".



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.

21. Technical information.

Power supply: 85÷264 VAC
Conductivity range: 0-3000uS ; 0-30.00mS ; 0-300.0mS ; K1 ppm ; K0.1 ppm ; K10 ppm
Environment Temperature: -10 ÷ 45°C (14 ÷ 113°F)
Chemical Temperature: 0 ÷ 50°C (32 ÷ 122°F)
Installation Class: II
Pollution Level: 2
Packaging and Transporting Temperature: -10 ÷ 50°C (14 ÷ 122°F)
Protection degree: IP 65

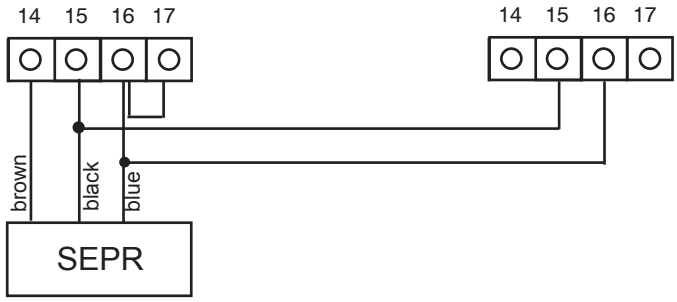
Product	Formula	Ceram.	PVDF	PP	PVC	SS 316	PMMA	Hastel.	PTFE	FPM	EPDM	NBR	PE
Acetic Acid, Max 75%	CH3COOH	2	1	1	1	1	3	1	1	3	1	3	1
Hydrochloric Acid, Concentrate	HCl	1	1	1	1	3	1	1	1	1	3	3	1
Hydrofluoric Acid 40%	H2F2	3	1	3	2	3	3	2	1	1	3	3	1
Phosphoric Acid, 50%	H3PO4	1	1	1	1	2	1	1	1	1	1	3	1
Nitric Acid, 65%	HNO3	1	1	2	3	2	3	1	1	1	3	3	2
Sulphuric Acid, 85%	H2SO4	1	1	1	1	2	3	1	1	1	3	3	1
Sulphuric Acid, 98.5%	H2SO4	1	1	3	3	3	3	1	1	1	3	3	3
Amines	R-NH2	1	2	1	3	1	-	1	1	3	2	3	1
Sodium Bisulphite	NaHSO3	1	1	1	1	2	1	1	1	1	1	1	1
Sodium Carbonate (Soda)	Na2CO3	2	1	1	1	1	1	1	1	2	1	1	1
Ferric Chloride	FeCl3	1	1	1	1	3	1	1	1	1	1	1	1
Calcium Hydroxide (Slaked Lime)	Ca(OH)2	1	1	1	1	1	1	1	1	1	1	1	1
Sodium Hydroxide (Caustic Soda)	NaOH	2	1	1	1	1	1	1	1	2	1	2	1
Calcium Hypochlor.(Chlor.ted Lime)	Ca(OCl)2	1	1	1	1	3	1	1	1	1	1	3	1
Sodium Hypochlorite, 12.5%	NaOCl + NaCl	1	1	2	1	3	1	1	1	1	1	2	2
Potassium Permanganate, 10%	KMnO4	1	1	1	1	1	1	1	1	1	1	3	1
Hydrogen Peroxide, 30% (Perydrol)	H2O2	1	1	1	1	1	3	1	1	1	2	3	1
Aluminium Sulphate	Al2(SO4)3	1	1	1	1	1	1	1	1	1	1	1	1
Copper-II-Sulphate (Roman Vitriol)	CuSO4	1	1	1	1	1	1	1	1	1	1	1	1

Resistance rating: (1: Resistant) ; (2: Fairly resistant) ; (3: Not resistant)

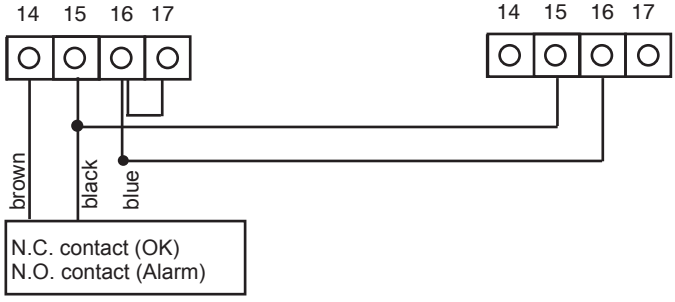
Polyvinyldene fluoride (PVDF) Pump Heads, valves, fitting tubing
Polypropylene (PP) Pump Heads, valves, fitting level floate
PVC Pump Heads
Stainless steel (SS 316) Pump Heads, valves
Polymethyl Metacrilate (Acrylic) PMMA Pump Heads
Hastelloy C-276 Injection valve spring
Polytetrafluoroethylene (PTFE) Diaphragm
Fluorocarbon (Viton® B) Sealings
Ethylene propylene (EPDM) Sealings
Nitrile (NBR) Sealings
Polyethylene (PE) Tubing

22. SEPR configuratio

SEPR "Flow Sensor" configuration for two instruments



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



NPED4

Appendix - Conductivity module MDCD

Setup connections according to probe features. Configure scale according to probe's capacity using menu "SELECT SCALE" (see page 14).

MDCD

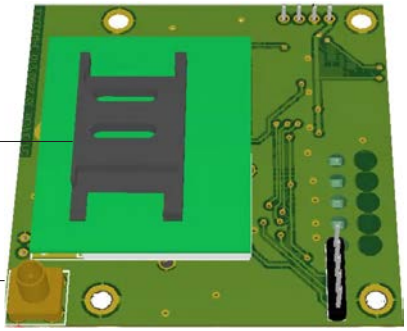
Connect probe as follows:

Block n.1 : Shield
Block n.2 : Black (probe)
Block n.3 : Red (probe)

Instrument scale	PROBE MODEL				JUMPERS SETTING		
	K	PlatinUM	Graphite	Stainless Steel	J3	J4	J5
0 - 300.0 uS	0.1	ECDHL/01	x	ECDI/01	OPEN	CLOSED	CLOSED
0 - 3000 uS	1	ECDHL/1	ECDC/1	ECDI/1	OPEN	CLOSED	OPEN
0 - 30.00 mS	1	ECDHL/1	ECDC/1	x	CLOSED	OPEN	OPEN
0 - 30.00 mS	10	ECDHL/10	ECDC/10	x	OPEN	OPEN	OPEN
0 - 300.0 mS	10	ECDHL/10	ECDC/10	x	CLOSED	OPEN	OPEN

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 modeule" 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 LDSCL 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.**

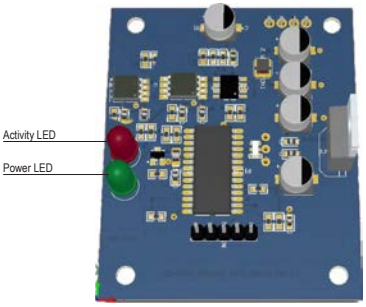
LCD: level alarm for Conductivity
FLOW: flow alar
ALCD: out of reading range for CD probe

WARNING: TO AVOID UNDESIRED 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)

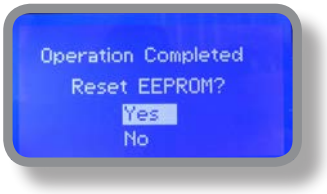
"USB data log module" records instrument activities. These information can be permanently stored into a standard USB pendrive. Pendrive can be connected to a PC using "ERMES" web **www.ermes-server.com** to review and print instrument's activities. **To obtain reliable results with this feature please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



Standard USB pendrive
(not included)

Insert USB pendrive here
(right side of instrument)
After usage put back USB cap

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 succeded 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 safety 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** 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 occurrs. 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 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.

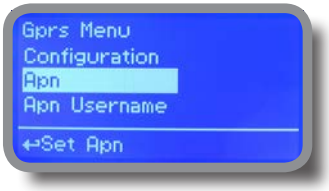
Instrument may be remotely operated using an embedded standard GPRS modem (sold as option). In order to activate this service please ensure that the following steps are correctly completed:

- 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 acitvity (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)

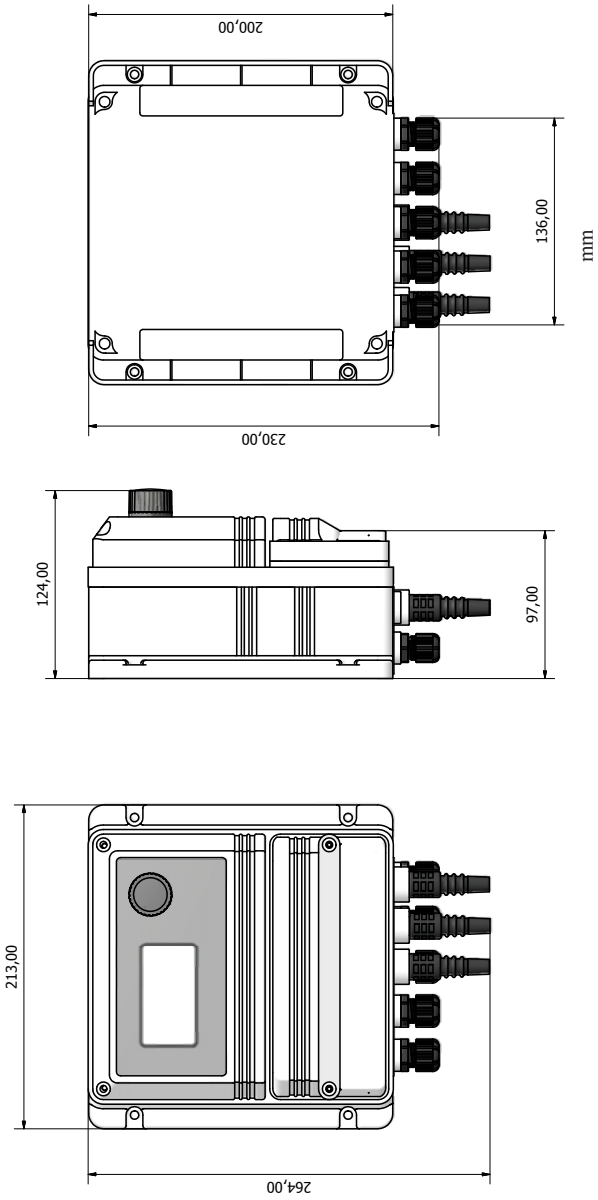
Note: advanced log control (graph, printing, comparison tables, event filtering, etc) is available through “ERMES Communication Software” for PC.

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

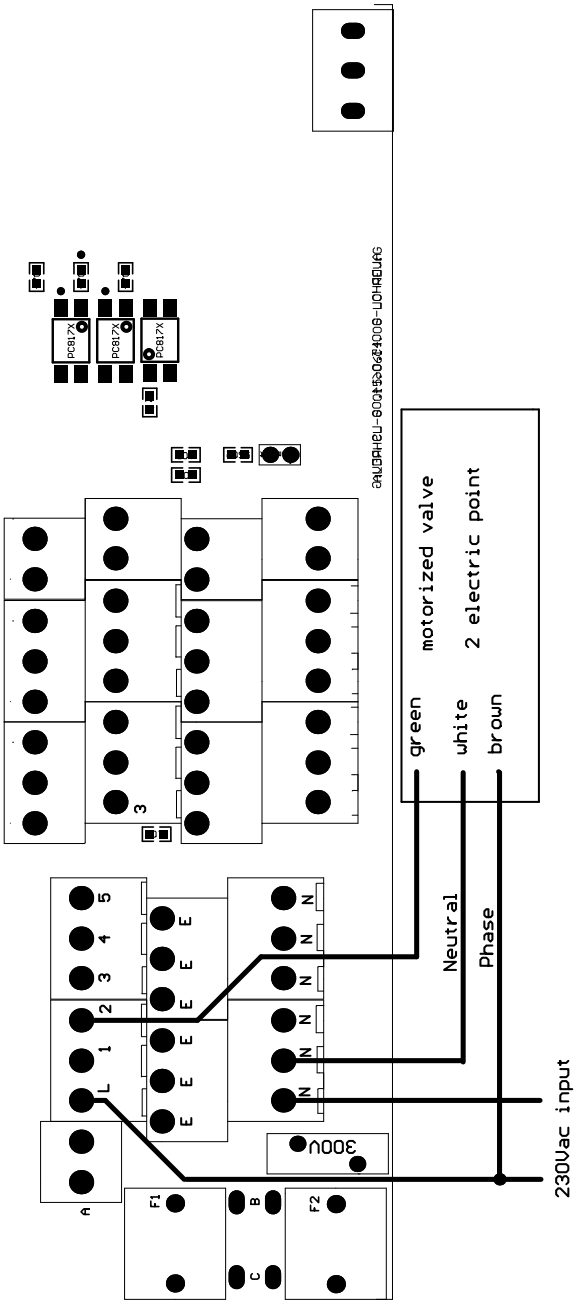
“LOG VIEW” menu.

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

Appendix - Dimensions

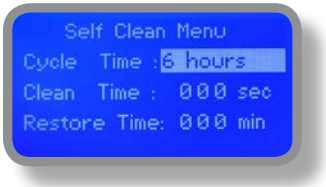


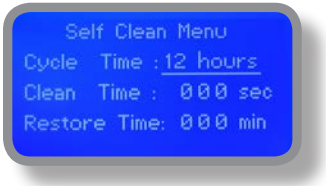
Appendix -Electrovalve connections

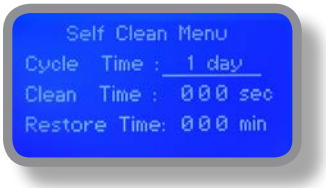


Appendix "Self Clean"

To obtain reliable results from the instrument a cleaning apparatus (eg for cleaning the probe) can be connected to it. This menu enables the functionality to terminals 4-E-N (see mainboard).







Options available are:

Cycle Time: time before next cleaning (adjustable from 6 hours to 10 days)

Clean Time: time required to complete cleaning procedure (can be set from 0 to 999 seconds)

Restore Time: waiting time at the end of cleaning procedure to restore reading functionality (adjustable from 0 to 999 minutes)

Clean on Alarm: cleaning activation when an "out of range alarm" occurs

Appendix "Circulator Pump"

This function allows instrument to power up a pump for water circulation inside the intake pipeline by increasing the pressure.

To manually activate the circulation pump connected to terminals 5-EN (see mainboard) set the instrument to "ENABLED" To disable set the instrument to "DISABLED".

Appendix - Conductivity module MDCD

Setup connections according to probe features.

MDCD

Connect probe as follows:

Block n.1 : Shield
Block n.2 : Black (probe)
Block n.3 : Red (probe)

Instrument scale	PROBE MODEL				JUMPERS SETTING		
	K	PlatinUM	Graphite	Stainless Steel	J3	J4	J5
0 - 300.0 uS	0.1	ECDHL/01	x	ECDI/01	OPEN	CLOSED	CLOSED
0 - 3000 uS	1	ECDHL/1	ECDC/1	ECDI/1	OPEN	CLOSED	OPEN
0 - 30.00 mS	1	ECDHL/1	ECDC/1	x	CLOSED	OPEN	OPEN
0 - 30.00 mS	10	ECDHL/10	ECDC/10	x	OPEN	OPEN	OPEN
0 - 300.0 mS	10	ECDHL/10	ECDC/10	x	CLOSED	OPEN	OPEN

MDIND

8 WIRES CABLE:
4 PROBE WIRES
4 PT100 WIRES

Connect 4 probe wires to MDIND module as follow:

Block n. 1 : blue
Block n. 2 : black
Block n. 3 : grey
Block n .4 : red

Connect 4 PT100 wires to mainboard (ref. p. 4) as follow:

Block n. 6 : green
Block n. 7 : orange or pink
Block n. 8 : white
Block n. 9 : yellow

MDECDSIND

ECDS IND PT PROBE

Connect 4 probe wires to MDIND module as follow:

Block n.1 : blue
Block n.2 : green
Block n.3 : red

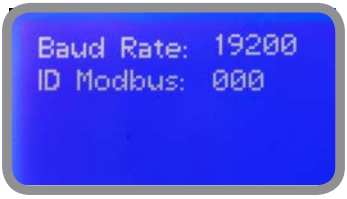
Connect 4 PT100 wires to mainboard (ref. p. 5) as follow:

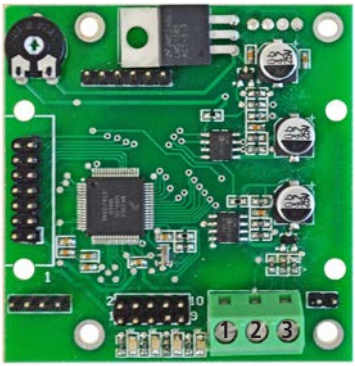
Block n. 6 + 7: white
Block n. 8 + 9 : black

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 conflict .





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

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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.

When dismantling this instrument 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.