# METER

Ultrasonic level transmitter

825B105C

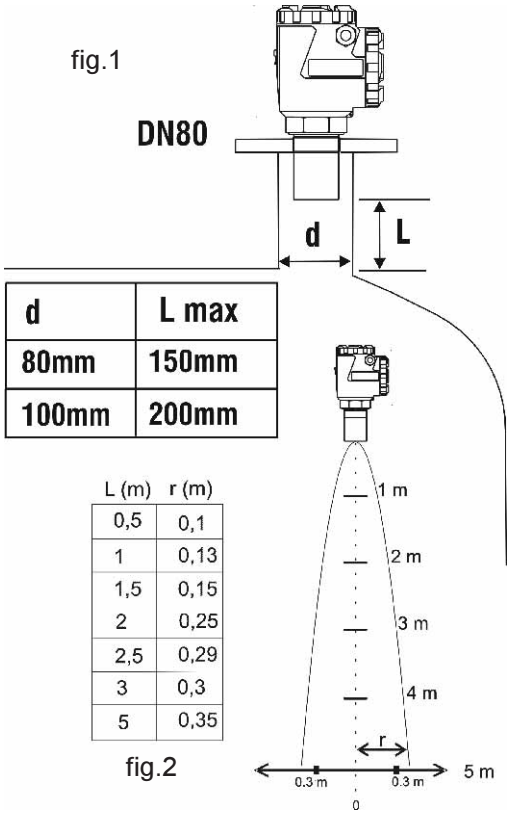
## Technical Data

| | |
|---|---|
| Housing material: | **PBT/PP wetted part** |
| Mechanical installation: | **2"GAS M on request PP flange DN50 or DN80** |
| Protection degree: | **IP65** |
| Electrical connection: | **Internal push actuators connectors** |
| Working temperature: | **-30 ÷ +70°C; +80°C non-continuous** |
| Pressure: | **from 0,5 to 1,5 bar (absolute)** |
| Power supply.: | **2-wire: 20÷30 Vdc / 4-wire: 24Vdc** |
| Power consumption: | **2-wire max 0,6W / 4-wire max 1,5W** |
| Relays output: | **(4-wire only) -n°2 3A 230Vac** |
| Digital communication: | **4-wire: RS485 / HART (optional)** |
| Max measure range : | **standard max 0.25÷5m (In case of non perfectly reflecting surfaces, the maximu distance value will be reduced)** |
| Blind distance: | **0.25m** |
| Temperature compensation: | **digital from -30 to 80°C** |
| Accuracy: | **±0,15 % (of the measured distance) not better than ±3mm** |
| Resolution: | **1mm** |
| Calibration: | **4 buttons or by HART/RS485** |
| Warm-up: | **1 minutes typical** |
| LCD Display : | **Plug-in display/keyboard 4 buttons matrix LCD** |

**METER**

Ultrasonic level transmitter

fig.1




| d | L max |
|---|---|
| 80mm | 150mm |
| 100mm | 200mm |

| L (m) | r (m) |
|---|---|
| 0,5 | 0,1 |
| 1 | 0,13 |
| 1,5 | 0,15 |
| 2 | 0,25 |
| 2,5 | 0,29 |
| 3 | 0,3 |
| 5 | 0,35 |




fig.2

## METER Mechanical Installation

Important!!! close to the sensor there is a "blind zone" of 0.25m where the instrument can't measure (see fig.3). To reach a good and safe measurement, avoiding spurious echoes (not reflected by the surface), take care of the positioning of the METER sensor and check that no obstacles are interferring with the ultrasonic waves emission lobe (see fig.2).

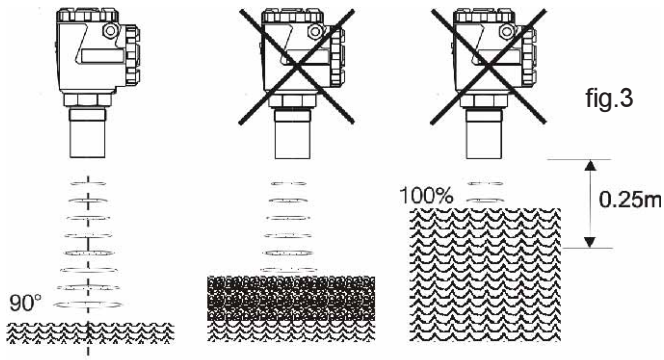



fig.3

Install perpendicularly to the surface

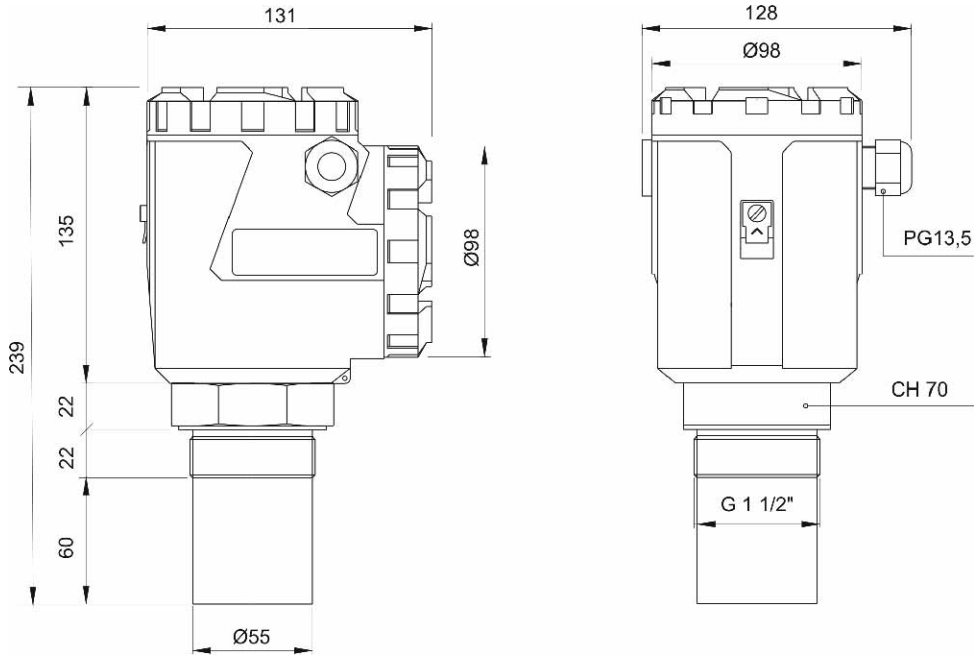
Do not use with foaming products

Avoid to install in case of product level distance < -0,25m from the sensor

LEKTRA

*applied solution for the application*

## **LOW** Outline dimensions




## **METER** Electrical connections

Unscrew and remove the cover to reach the the plug-in display/keyboard module. By pressing the drawing-spring as shown in Fig.6 -part.1 extract the module and gain the electrical (plug-in) connectors.
See Fig.7 for 2-wire versions: METER-1;METER-2 (HART); METER-3 (ATEX)
See Fig.8 for 2 relays version: METER-4

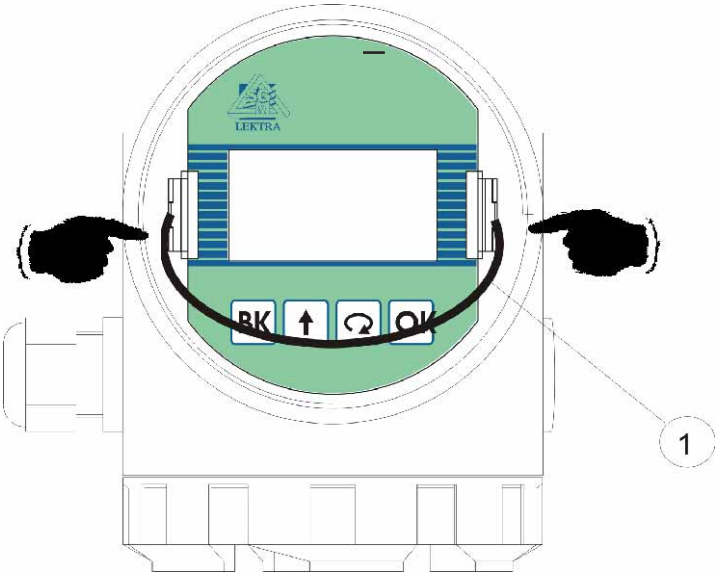



Fig.6

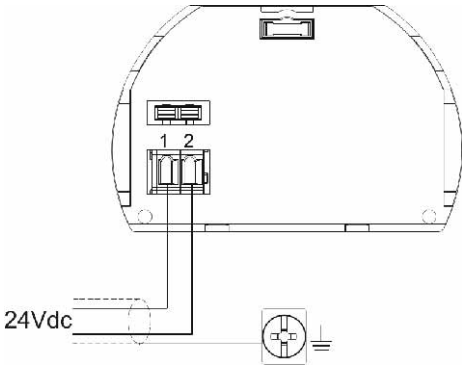



Fig.7

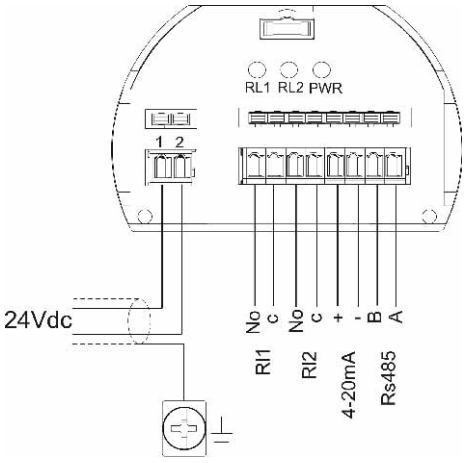



Fig.8

**Calibration**

The METER configuration and calibration can be done in two different ways: by HART (Hand-Held or PC Modem) if avalaible

- by HART Hand-Held (if available for the selected version)
- by the plug-in / keyboard module

**HART Hand Held connection (fig.9)**

1) Hand Held
2) METER with HART communication protocol
3) 250ohm resistance

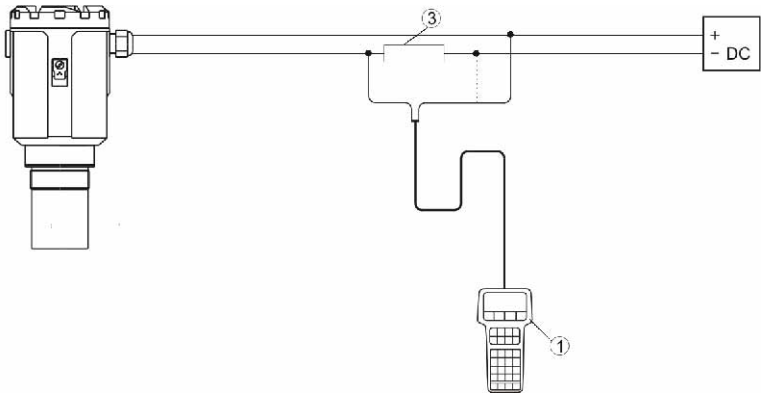



Fig.9

**PC/MODEM HART connection (Fig.10)**

1) RS232 connector
2) METER with HART communication protocol
3) 250ohm resistence
4) HART MODEM

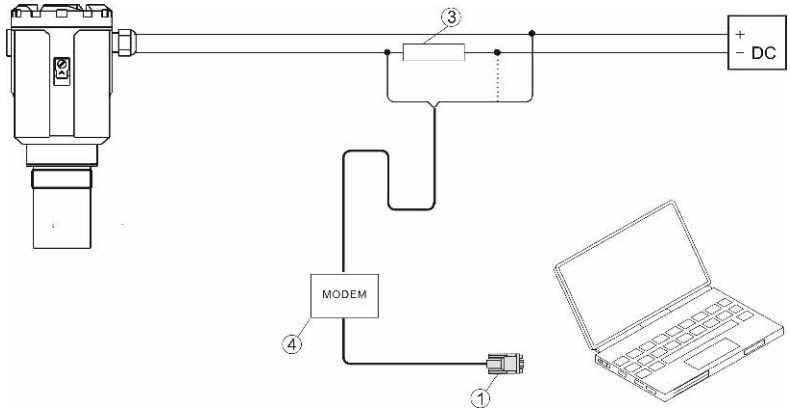
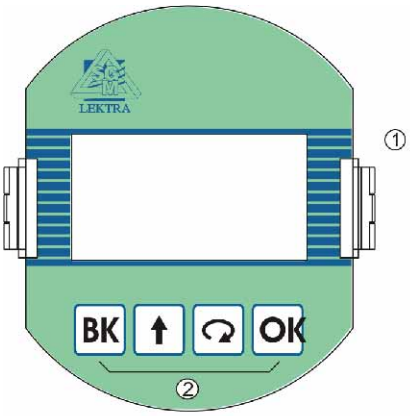



Fig.10

### Programming display

The programming display (fig.11) has a large matrix LCD. The operating manual allows an easy and fast start up through the keyboard (fig.11)




1) Display LCD
2) Tasti di programmazione

Fig.11

OK Il tasto "**OK**" consente di confermare la selezione del cursore e dei valori numerici inseriti

Il tasto " ↻ " consente di muovere dall'alto verso il basso il cursore di selezione alla cifra adiacente verso DX nei campi di inserimento numerico

Il tasto " ↑ " consente di variare le cifre nei campi di inserimento numerico

BK Il tasto "**BK**" consente di ritornare alla finestra da cui si proviene

The menù structure is shown on pages 17/18.

From “RUN” mode, press OK to enter “PROGRAM” mode. Press BK to quit

Press ↻ to move the cursor on the parameter you want to use and confirm with OK

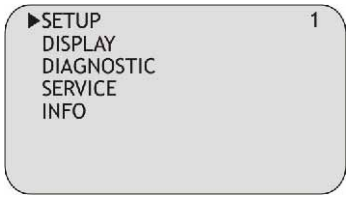
To edit numbers, press ↑ to modify the digit shown in negative, press ↻ to edit the next digit, press OK to confirm and store the number. Press BK to quit

**Programming menù**

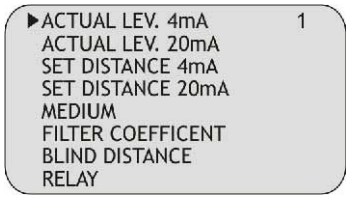
1. SETUP – in this menù it’s possible to set the basic adjustment of the sensor
2. DISPLAY – in this menù it’s possible to setup the sensor display mode an adjust the B/W contrast of LCD
3. DIAGNOSTIC - in this menù it’s possible to test and check the sensor, display peak values and measure status.
4. SERVICE - in this menù it’s possible to set com mode, output mode, language, input password to enable parameters
5. INFO - this menù show firmware revision, serial number and manufacturer information

## SETUP (1)

From “RUN” mode press OK then move the cursor on “SETUP” and confirm with




Select the parameters by moving the cursor with ↻, and confirm with OK




**ACTUAL LEV. 4mA :**

press OK to associate the actual measure with 4mA output value;the following message will be displayed:
**OK TO CONFIRM** press ↻ to confirm

**ACTUAL LEV. 20mA:**

press ↑ to associate the actual measure with 20mA output value;the following message will be displayed:
**OK TO CONFIRM** press OK to confirm

**SET DISTANCE 4mA:**

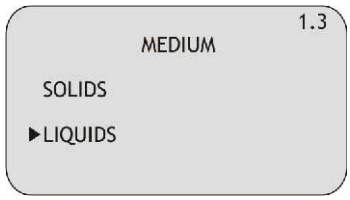
press OK to display the value of distance associated with 4mA output; use ↑ and ↻ to modify that value. Confirm with OK


**SET DISTANCE 20mA:**

press OK to display the value of distance associated with 20mA output; use ↑ and ↻ to modify that value. Confirm with OK


**MEDIUM:**

select LIQUIDS if the sensor is measuring a liquid level, else select SOLIDS




**FILTER COEFFICENT:**

input a value from 1 to 100 (10 default) to smooth the response of the sensor: the biggest is the value, the smoothest is the response

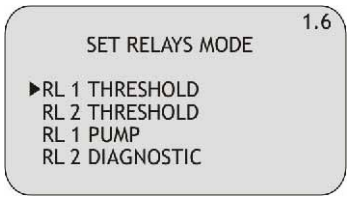
**BLIND DISTANCE:**

represent the “BLIND ZONE” of the sensor. Input the desired value in order to avoid measures near the surface of the sensor (if necessary). The minimum value is 250mm


**RELAY**:

**in this sub-menù it’s possible to setup onboard relays (only LOW-4 model).**

RL1 can be set as **threshold** relay or **pump-control** relay; RL2 can be set as **threshold** relay or **diagnostic** relay




**RL1 THRESHOLD/RL2 THRESHOLD:**

select the parameter by moving the cursor with  and confirm with 

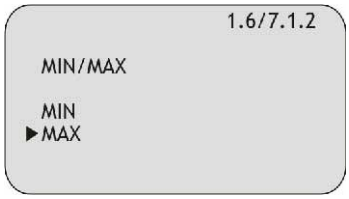


**VALUE:**

it’s possible to input the threshold value, **<u>in terms of pencentage of level</u>**


**MIN/MAX:**

itís possible to select if the relay works as maximum level threshold or minimum level threshold

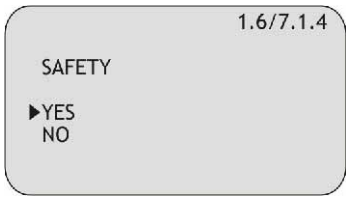


**DELAY:**

it's possible to select the delay of activation for the selected relay, from 0 to 99 sec. (0s default)


**SAFETY:**

it's possible to selct if the coil of relay is normally EXCITED (YES) or normally DISEXCITED (NO)

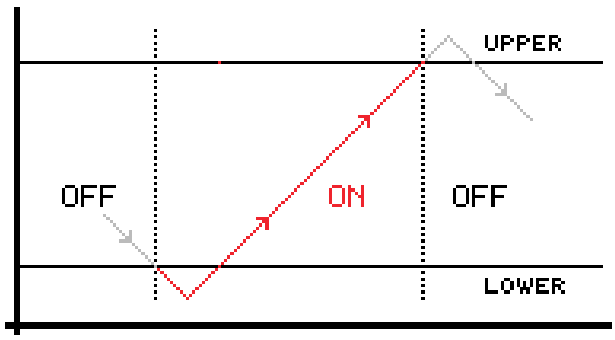



**ENABLE/DISABLE:**

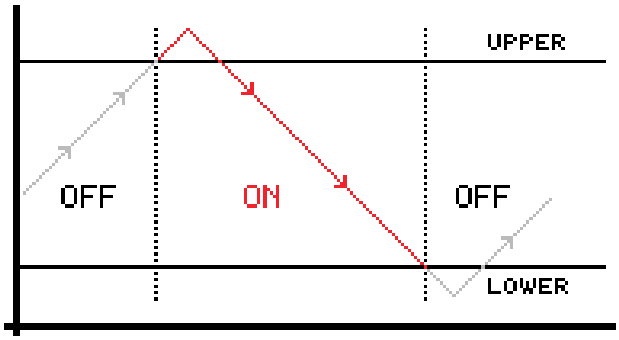
select ENABLE to allow the relay to work in the selected mode (Threshold/Pump or Threshold/Diagnostic)


**RL1 PUMP:**

it's possible to allow **pump control** with RL1, also in **FILLING** mode or **EMPTYING** mode.

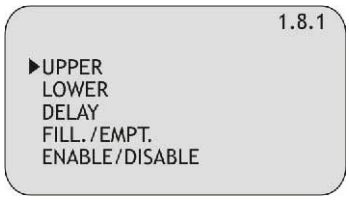



FILLING MODE




EMPTYING MODE

Select the parameter by moving the cursor with and confirm with OK

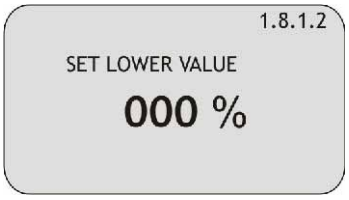



**UPPER:**

it's possible to input the upper level value, to enable start emptying or stop filling.


**LOWER:**

it's possible to input the lower level value, to enable stop emptying or start filling.

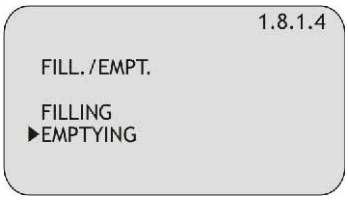



**DELAY:**

it's possible to select the delay of activation for the selected relay, from 0 to 99 sec. (0s default)

**FILL./EMPT.:**

it's possible to select the mode of pump control (filling or emptying)



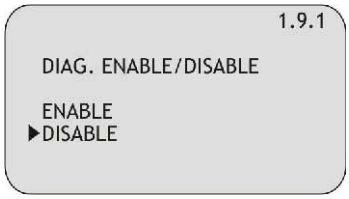

**ENABLE/DISABLE:**

select ENABLE to allow the relay to work in the selected mode


**RL2 DIAGNOSTIC:**

it's possible to enable RL2 to activate its contact in case of error as:

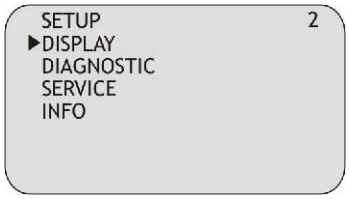
- TEMP.: temperatutre out of range
- ECHO: no echo is detected
- GAIN: the sensor's gain exceed the value setted in Max Gain TH (3.4)
- DIST.: the measured distance exceed the 120% of the maximum distance in setup




NOTE: when an error occours, a "**!**" is flashing on the display: press  to show a message that indicate what kind of error is present

## DISPLAY (2)

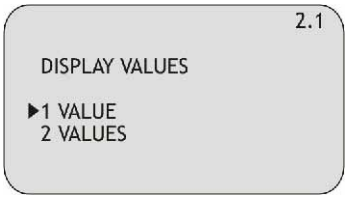
From “RUN” mode press OK, then move the cursor on “DISPLAY” and confirm with OK




Select the parameters by moving the cursor with , and confirm with

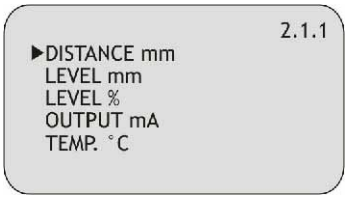

**DISPLAY VALUES:**

It’s possible to select if one value with big digits or two values are shown on the display in “RUN” mode



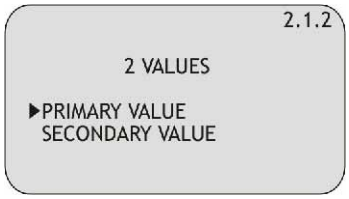

**1 VALUE:**

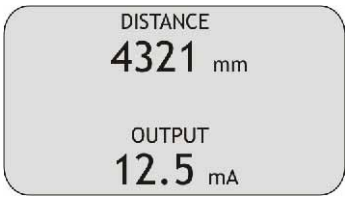
only one value is displayed; it’s possible to choose from 5 parameters:




**2 VALUES:**

two values are displayed; it's possible to choose which one is the primary and which is the secondary, each with a choice of 5 parameters




**ECHO MAP:**

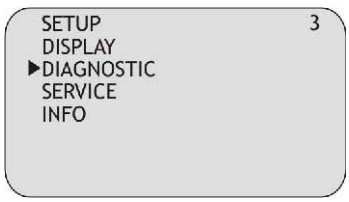
NOT YET AVAILABLE

**CONTRAST:**

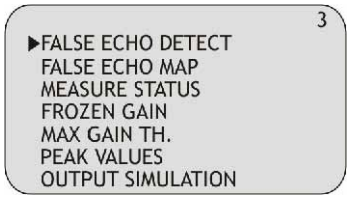
it's possible to adjust the contrast of LCD, simply increasing or decreasing the value of a parameter from 0 to 63 (16 default)


## DIAGNOSTIC (3)

From "RUN" mode press OK, then move the cursor on "DIAGNOSTIC" and confirm with OK



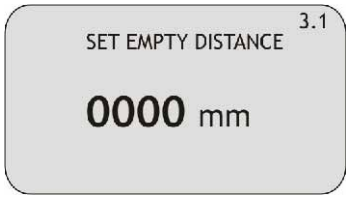
Select the parameters by moving the cursor with , and confirm with OK




**FALSE ECHO DETECT:**

It's possible to scan the empty tank in order to avoid obstacles like agitators' blades,limit switces,mechanical struts

It's necessary to imput the empty distance (distance from the instrument to the bottom of the tank) and confirm with OK




The system will automatically scan and store all echoes separating false echoes from the real one that match the empty distance. After this,the following message is displayed: **FALSE ECHO DETECT DONE**

If something's not corretct (e.g wrong empty distance value, obstacles that hides the bottom) the following message is displayed **FALSE ECHO DETECT ERROR**

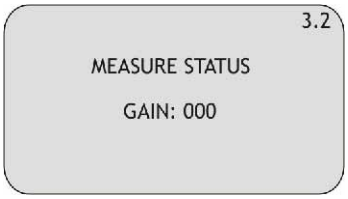
**Note: False echo detect procedure is not recommended for pipe and stand-pipe applications**

**FALSE ECHO MAP:**

NOT YET AVAILABLE

**MEASURE STATUS:**

it's possible to display the gain of the system, with values from 0 to 255. While displayed, the automatic gain control is not active




**FROZEN GAIN:**

it's possible to fix a value of gain (from 1 to 255) and consequently disable the automatic gain control. Once the value is 000 the automatic gain control restarts

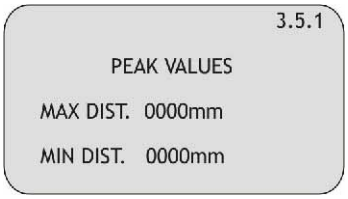
**MAX GAIN TH:**

it's possible to input a value of gain that it should be not reached. If the gain is above this value, an error occours


**PEAK VALUES:**

the system store the maximum distance and the minimum distance measured since the power is turned ON. It's possible to see those values or reset the

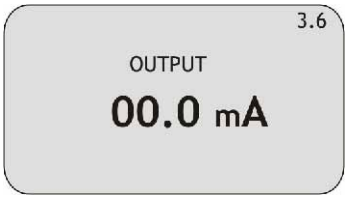

Select DISPLAY VALUES and confirm with OK




Select RESET VALUES an confirm with OK in order to cancel the stored values

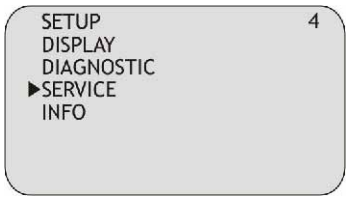

**OUTPUT SIMULATION:**

it'possible to force the analog output to a desired value, simply by using ↑ and ↻ to modify that value. Confirm with OK. The output returns to its normal function in only in "RUN" mode.

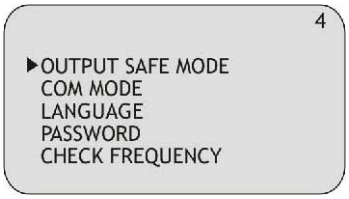


## SERVICE (4)

From “RUN” mode press OK, then move the cursor on “SERVICE” and confirm with OK

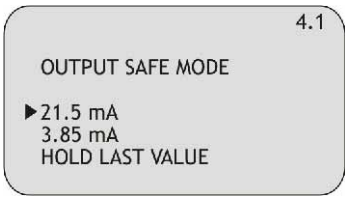



Select the parameters by moving the cursor with , and confirm with OK




**OUTPUT SAFE MODE:**

it’s possible to choose a value of analog output durin condition of system’s internal errors.
Hold last value keep the output at the level corresponding at last valid measure.



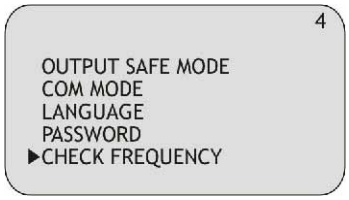

**COM MODE:**
NOT YET ACTIVE

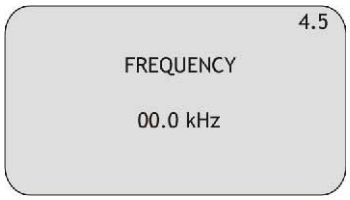
**LANGUAGE:**
NOT YET ACTIVE

**PASSWORD:**
NOT YET ACTICE

**CHECK FREQUENCY:**

it's possible to check the computed emission frequency of the sensor.

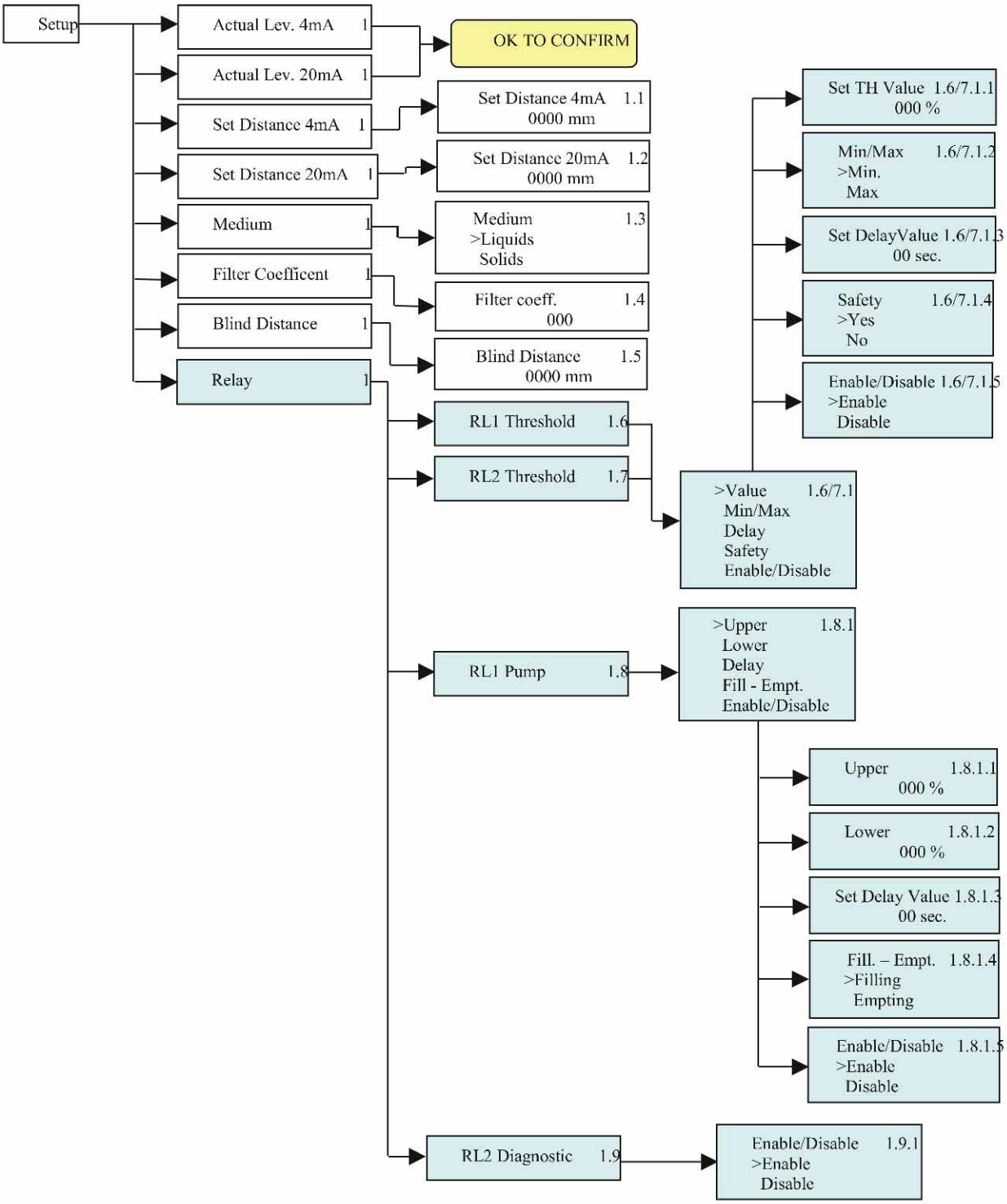


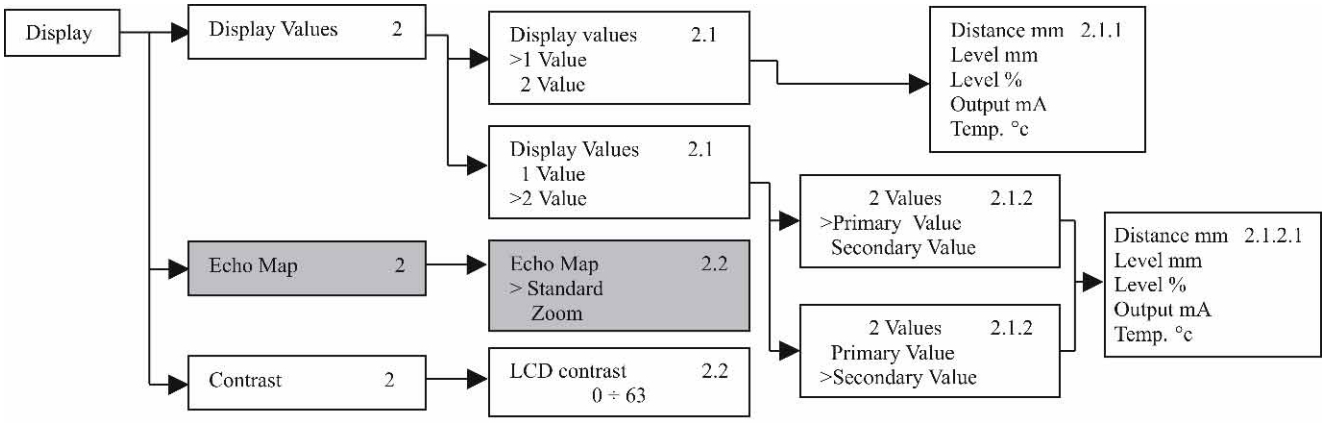



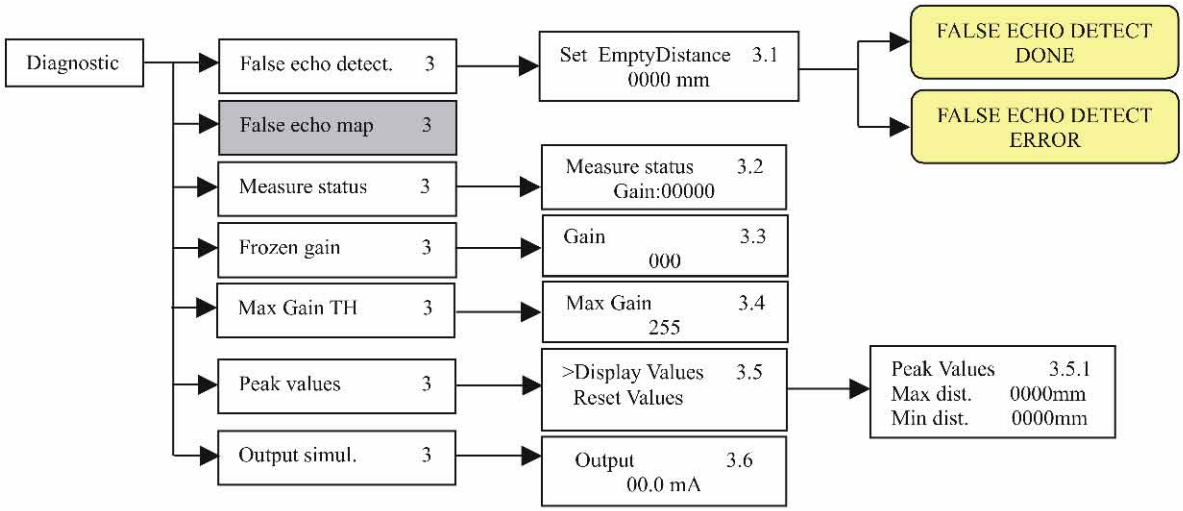

## INFO (5)

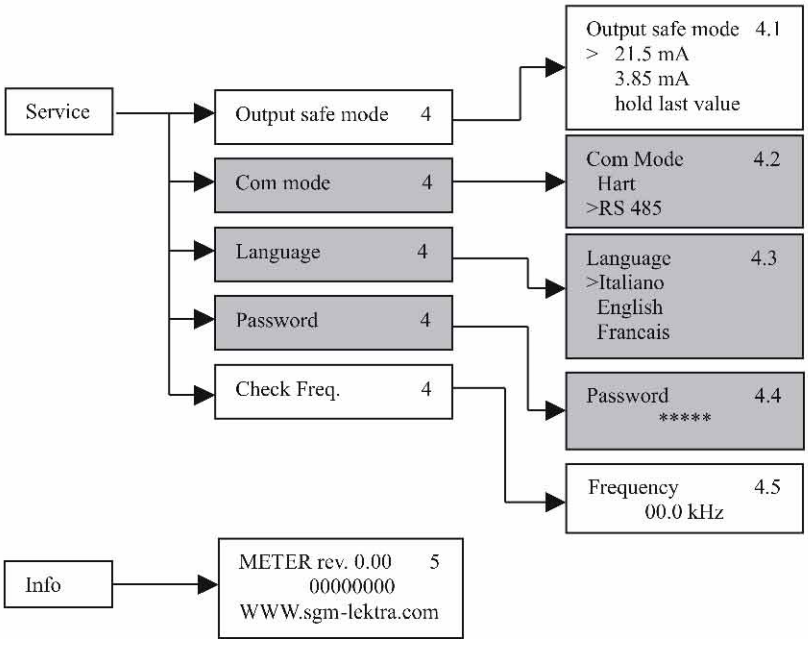
From "RUN" mode press OK, then move the cursor on "INFO" and confirm with OK

Informations about manufacturer, firmware version and serial number are displayed


Setup
Actual Lev. 4mA 1
Actual Lev. 20mA 1
Set Distance 4mA 1
Set Distance 20mA 1
Medium 1
Filter Coefficent 1
Blind Distance 1
Relay 1
OK TO CONFIRM
Set Distance 4mA 1.1
0000 mm
Set Distance 20mA 1.2
0000 mm
Medium 1.3
>Liquids
Solids
Filter coeff. 1.4
000
Blind Distance 1.5
0000 mm
RL1 Threshold 1.6
RL2 Threshold 1.7
>Value 1.6/7.1
Min/Max
Delay
Safety
Enable/Disable
Set TH Value 1.6/7.1.1
000 %
Min/Max 1.6/7.1.2
>Min.
Max
Set DelayValue 1.6/7.1.3
00 sec.
Safety 1.6/7.1.4
>Yes
No
Enable/Disable 1.6/7.1.5
>Enable
Disable
RL1 Pump 1.8
>Upper 1.8.1
Lower
Delay
Fill - Empt.
Enable/Disable
Upper 1.8.1.1
000 %
Lower 1.8.1.2
000 %
Set Delay Value 1.8.1.3
00 sec.
Fill. – Empt. 1.8.1.4
>Filling
Empting
Enable/Disable 1.8.1.5
>Enable
Disable
RL2 Diagnostic 1.9
Enable/Disable 1.9.1
>Enable
Disable


Display
Display Values 2
Display values 2.1
>1 Value
2 Value
Distance mm 2.1.1
Level mm
Level %
Output mA
Temp. °c
Display Values 2.1
1 Value
>2 Value
2 Values 2.1.2
>Primary Value
Secondary Value
Distance mm 2.1.2.1
Level mm
Level %
Output mA
Temp. °c
2 Values 2.1.2
Primary Value
>Secondary Value
Echo Map 2
Echo Map 2.2
> Standard
Zoom
Contrast 2
LCD contrast 2.2
0 ÷ 63


Diagnostic
False echo detect. 3
Set EmptyDistance 3.1
0000 mm
FALSE ECHO DETECT
DONE
FALSE ECHO DETECT
ERROR
False echo map 3
Measure status 3
Measure status 3.2
Gain:00000
Frozen gain 3
Gain 3.3
000
Max Gain TH 3
Max Gain 3.4
255
Peak values 3
>Display Values 3.5
Reset Values
Peak Values 3.5.1
Max dist. 0000mm
Min dist. 0000mm
Output simul. 3
Output 3.6
00.0 mA


Service
Output safe mode 4
Output safe mode 4.1
> 21.5 mA
3.85 mA
hold last value
Com mode 4
Com Mode 4.2
Hart
>RS 485
Language 4
Language 4.3
>Italiano
English
Francais
Password 4
Check Freq. 4
Password 4.4
*****
Frequency 4.5
00.0 kHz


Info
METER rev. 0.00 5
00000000
WWW.sgm-lektra.com

# METER Ordering code

## Ordering code

**METER**

**Version**

| | |
|---|---|
| **1** | 2-wirei 4÷20mA |
| **2** | 2-wire HART (PENDING) |
| **3** | 2-wire ATEX (PENDING) |
| **4** | 24 Vdc+ 4÷20mA + 2 relays |
| **9** | Special |

**Housing/Sensor material**

| | |
|---|---|
| **D** | PBT / PP |
| **Z** | Special |

**Power supply**

| | |
|---|---|
| **4** | 24Vdc (20 ÷ 30Vdc) |
| **5** | 12Vdc max 3m (only for version 1) |
| **9** | Special |

**Accessories**

| | |
|---|---|
| **A** | None |
| **C** | DN80 PN6 PP flange UNI 6091-71 |
| **D** | Keyboard/programming display module |
| **H** | Fixing 2" BSS PP bolt |
| **Z** | Special |

**METER 1 D 4 A**

**( Ordering code example )**

# METER Warranty

Products supplied by SGM LEKTRA are guaranteed for a period of 12 (twelve) months from delivery date according to the conditions specified in our sale conditions document.
SGM LEKTRA can choose to repair or replace the Product.
If the Product is repaired it will mantein the original term of guarantee, whereas if the Product is replaced it will have 12 (twelve) months of guarantee.
The warranty will be null if the Client modifies, repair or uses the Products for other purposes than the normal conditions foreseen by instructions or Contract.
In no circumstances shall SGM LEKTRA be liable for direct, indirect or consequiential or other loss or damage whether caused by negligence on the part of the company or its employees or otherwise howsoever arising out of defective goods

# **METER** Factory Test Certificate

In conformity to the company and check procedures I certify that the equipment:

METER ..... Serial n. .....

is conform to the technical requirements on Technical Data and it is made in conformity to the SGM-LEKTRA procedure

Quality Control Manager .....

Production and check date .....

**SGM LEKTRA s.r.l.**
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CERT. N. 2032308