METER

Ultrasonic level transmitter

Technical Data

Housing material: PC or Al / PP wetted part

(PVDF for ATEX certified vers.)

Mechanical installation: 2"GAS M (PP flange DN80 opt.)
Protection degree: IP67 / IP68 (sensor)
Electrical connection: Internal push connectors

Working temperature: -30 ÷ +70°C; +80°C non-continuous

-20 ° to +60 ° C for ATEX certified vers.

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
Analog output: 4÷20mA, max 750ohm (4-wire)

Relays output: (4-wire only) n°2 3A 230Vac (n.o.)

Digital communication: MUDBUS RTU for 4-wire vers.

(opt.) HART for 2-wire vers.

Max measure range: max 0.25÷5m; max 0.4÷8m

[In case of non perfectly reflecting surfaces, the maximu

distance value will be reduced]

Blind distance: 0,25m (5m vers.) / 0,40m (8m vers.) Temperature compensation: digital from -30 to 80°C

Accuracy: ±0,5% (of the measured distance)
not better than ±3mm

Resolution: 1mm

Calibration: 4 buttons or by HART/MODBUS RTU Warm-up: 5 minutes typical

LCD Display: Plug-in display/keyboard4buttons matrix LCD

Ex-proff: ATEX II 1/2G Ex ia II C T6







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

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

METER	Production and check date:		
Serial n			
is conform to the technical requirements	on Technical Data and it is mad	de in conformity to the SGM-LEKTRA	procedure
Quality Control Manager			



METER - Safety / Mechanical installation

The non intrusive system application is now preferred in the level measurements field. For this reason the **SGM-LEKTRA** developed the **METER** unity to best meet the "GENERAL-PURPOSE" application requests. The **METER** unit offers, together with its compact size, a complete versions range that makes the **METER** very versatile for the most varied applications, including areas with explosion hazard and chemically aggressive environments. **METER** is an ultrasonic level transmitter, temperature-compensated and suitable for connection with **MODBUS RTU** (only 4 wires vers.) or **HART** (option only for 2-wire vers.) acquisition systems. **METER** is a compact unit which in addition to an analog output includes two freely addressable relay (only 4 wires vers.).

	Non-contact level measurements	HART or MODBUS RTU com. protoco
	Suitable for liquids and granulates level mea-	24Vdc power supply
surement Integrated digital temperature s to compensate the measure		☐ Mechanical protection: IP67 / IP68 (senso
	ggg	Output: 1 4÷20mA analog output 2 relays output (4-wires vers
		ATEX II 1/2G Ex ia II C T6

1. SAFETY

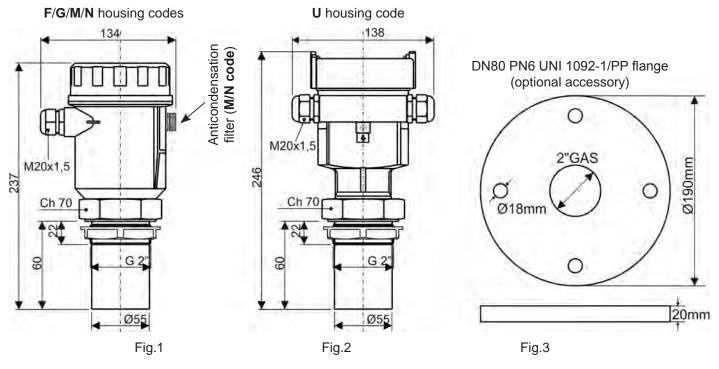
1.1 Installation precaution

- a) Installation shall only be performed by qualified personnel and in accordance with local governing regulations.
- **b)** Make sure that the working temperature is between -30 and +70 ° C, +80 ° C non-continuous (**ATEX** versions: -20÷+60°C).
- c) Install the transmitter in a its physical characteristics and housing/sensor construction materials compatible environment.
- d) The transmitter must be used safety warnings observance.
- e) Improper transmitter use would cause serious damage to people, to the product and connected equipment.

2. INSTALLATION

2.1 MECHANICAL DIMENSIONS

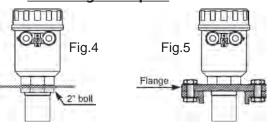
The METER transmitter has the 2 "GAS M threaded, equipped with 2" BSP/PP fixing bolt. DN80 PN6 UNI 1092-1/PP flange is available (optional accessory).

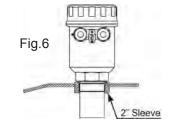


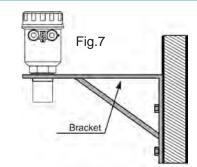


METER - Mechanical installation

2.2 Mounting examples



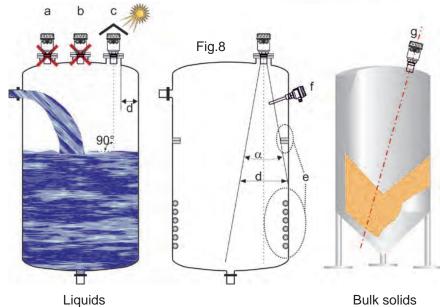




2.3 Mounting precautions

2.3.1 Mounting position (Fig.8)

- With cambered roof, Do not install the sensor in the tank center (b). Leave a 300mm minimum distance between the sensor and the tank smooth wall (d).
- Use a protective cover to protect the sensor from weather and direct sunlight (c).
- Do not install the sensor near the load zone (a).
- Make sure that in the sensor emission beam (lobe "Q") there are no obstacles (f,s) that can be intercepted as level.
- Make sure that there is not foam presence on the product surface to be measured



Bulk solids

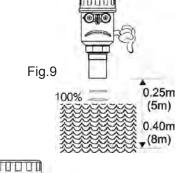
≥10mm

	Lobo "Œ"	L	d
METER 5m	10°	5m	1m (5m)
METER 8m	10°	8m	1.6m (8m)

Tab.1

2.3.1 Blind distance

During installation is important to remember that in the sensor vicinity there is a blind zone (or BLIND DISTANCE) of 0.25m (for 5m max METER range) or 0.4m (for 8m max **METER** range) where the sensor can not measure.

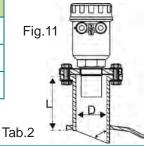


2.3.2 Installation in nozzle

Installing the METER sensor in a nozzle (see fig.10), make sure the sensor bottom protrudes at least 10 mm from the bottom nozzle Fig.10

METER can be installed in an extension pipe (see Figure 11) to turn away the sensor from the maximum level point. The extension pipe must be flat and without joints (welds, etc..), also, the pipe terminal part must be cut at 45° and with the borders without burr.

METER 5m		METER 8m		
D (mm)	Lmax(mm)	D (mm)	Lmax(mm)	
57	80	80	240	
80	240	100	300	
100	300			





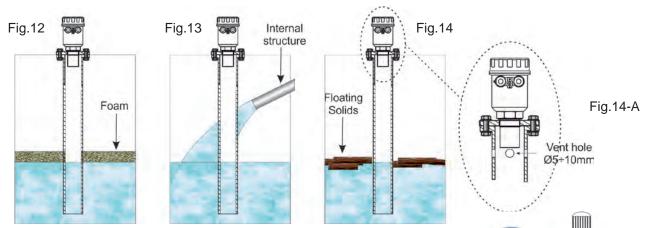
METER - Mechanical installation

2.3.4 Reference pipe installation

Disturbing factors that may influence the level measurement in liquids, as for example:

- foam presence on the product surface (Fig.12)
- internal structures presence in the tank (Fig.13)
- presence on the liquid surface of floating bodies (Fig.14) can be avoided with the use of level measurement inside of pipes (by-pass pipe or calm pipe with <u>57mm min. diameter</u>)
 - The pipe must have a length greater or equal than the empty distance, also, must have some of vent holes (Fig. 14-A) to allow the pipe regular filling and emptying.

In the programming menu, to the "PRODUCT" parameter, must select the "LIQUID PIPE" option (see page 9 or 15)



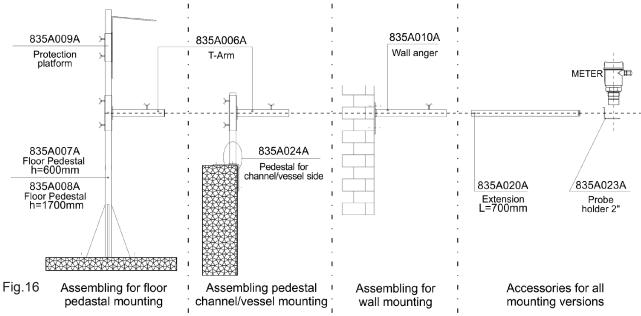
2.3.5 Agitators presence

The level measurement is possible thanks to the **Auto-Tuned** statistical filter. Should rarely need to adjust the filter setting by editing 2 **METER** sensor programming parameters:

- **FILTER**; this parameter is present in the **Quick Setup** menu (page 9) and in the Advanced Configuration "**SETUP**" menu (page 16); increasing the parameter value, decreases the sensor sensitivity to the level measurement sudden variations.
- **F-WINDOW**; this parameter is present in the Advanced Configuration "**SERVICE**" menu (page 26); decreasing the parameter programmed value, increases the sensor immunity to false echoes.



2.3.6 Mechanical installation accessories



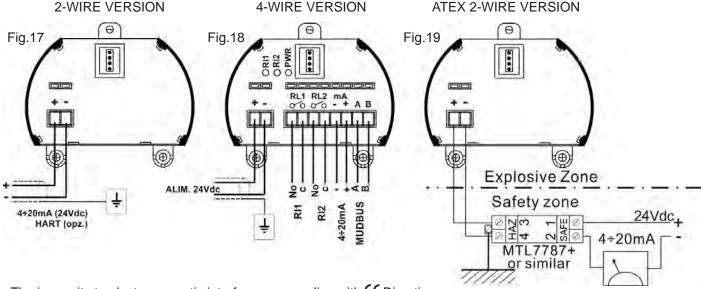


METER - Connections and Configuration

3. CONNECTIONS

3.1 Wiring

- 1) Separate the engine control cables or power cables from the METER connection cables...
- 2) Open the cap by unscrewing.
- 3) Lead the cables into the transmitter through the glands.
- 4) Do not use sleeves terminals, because they might interfere with the VL601 module insertion
- 5) Close the cap and tighten the cable glands.



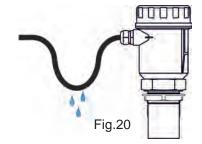
The immunity to electromagnetic interference complies with (Directives

3.2 **Humidity infiltrations**

To avoid the humidity infiltration inside the housing is recommended:

- for electrical connections, use a cable with a 6÷12mm outer diameter and fully tighten the M20 cable gland
- fully tighten the cap
- position the cable so that it forms a downward curve at the M20 output (Fig. 20); in this way the condensation and/or rain water will tend to drip from the curve bottom

For installations with a strong humidity/vapor presence the version with the optional anti-condensation filter (cod.M/N) is available



4. CONFIGURATION MODES

The **METER** have 2 configuration/calibration modes:

- via digital communication:
 - via MODBUS RTU, by PC, for 4-wires versions
 - via HART, by Hand-Held or PC, for 2-wires versions (optional)
- via VL601 programming module

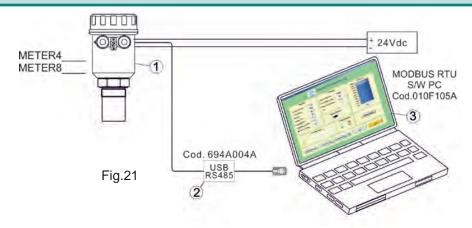
4.1 Via MODBUS RTU

4.1.1 4-wires METER; MODBUS RTU PC connection (fig.21)

- 1) METER4____ or METER8____ (1) with MODBUS RTU communication protocol
- 2) USB/RS485 interface module, cod.694A004A
- 3) MODBUS RTU communication S/W, cod.010F105A (3), for METER transmitter With this software is possible:
 - connect, by selecting the UID address, the METER transmitters in MODBUS RTU network
 - read on your PC monitor all measures in reading and METER operation data
 - programming all METER configuration parameters
 - storing on files, data logger function; METERmeasures in reading and operating states



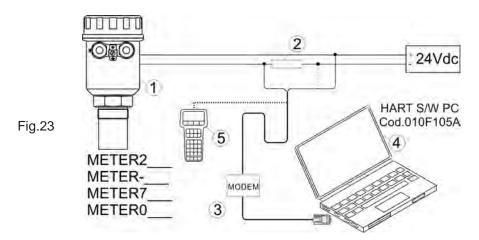
METER - Configuration



4.2 Via HART

4.2.1 2-wires METER; HART Hand Held connection or HART PC/MODEM (fig.23)

- 1) METER-___, METER0___, METER2___, METER7___, with HART communication protocol
- 2) 250ohm resistence
- 3) HART MODEM
- 4) HART communication S/W, cod.010E105A (for PC HART MODEM only)
- 5) HART HAND-HELD



4.3 via VL601 configuration

The **VL601** programming module can be mounted and removed from the **METER** without affecting the unit operation. Unscrewing the cap, the **VL601** module can be mounted (by clockwise rotation until it clicks) or dismounted (by rotation counterclockwise) as shown in Fig.21. The **VL601** module is equipped with matrix LCD.

))) displayed at the bottom indicates the correct echo signal reception

displayed at the top alerts that there is a generic error; press to show the message that indicates the present error type.

The METER returns automatically to RUN mode.



Fig.21



METER - Configuration

The **VL601** program module has 4 buttons (fig. 24) which allow to perform all operational, control and programming instrument functions.

In the configuration menus, is possible:

- a) Submenus and parameters access; press 😭 to select and press 🖭 to access.
- **b)** Parameter options choice: Press to select the option and press to store the option. Press to exit without storing
- c) Configure the parameter values; in some parameters the configuration is done by setting a value (eg., in the SET DISTANCE 4mA parameter is possible to change the the corresponding distance value, in mm): press to select the digit to be modified (the digit is highlighted in inverse), press to change the highlighted digits number, press to save the set value and exit automatically. Press to exit without storing.

In the display top right, during the settings, there is always a number, eg. "1.2". This number is the menu or parameter index that's displayed. The menu structure is represented on page 8 and on pages 13÷14.



With the VL601 module is possible to access two configuration modes for the METER setting:

- QUICK START Menu with easy access for quick basic parameters configuration.

 To access: from "RUN" mode press to the quick setup menu mode access, to exit
- ADVANCED CONFIGURATION Full menu with access to all parameters, including functional parameters.

 It is recommended to carefully read the complete documentation before accessing.

 To access from "PLIN" mode, holding down a process to the advanced configuration mode access.

To access: from "RUN" mode, holding down a, press to the advanced configuration mode access, to exit

WARNING! - The documentation provided with the METER contain the most frequently used indications. If it's necessary refer to the full manual, it can be downloaded from our website www.sqm-lektra.com, in the products section.



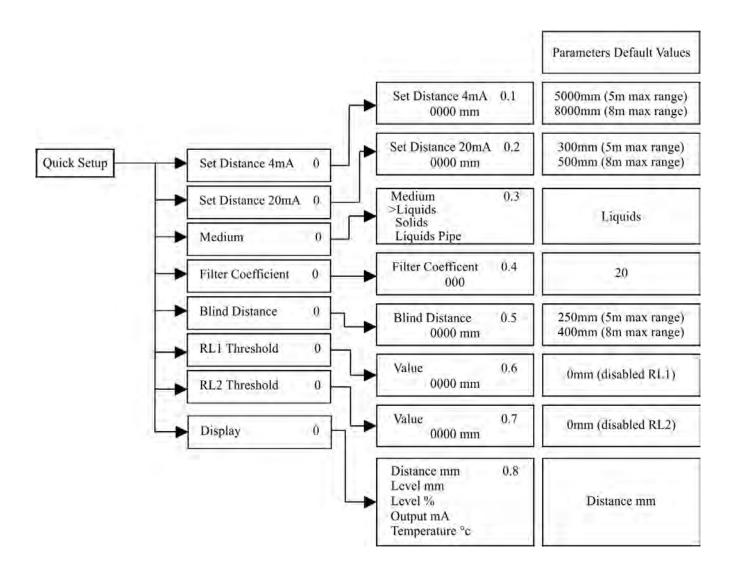
5. QUICK START MODE

From "RUN" mode press to access the Quick Setup menu

and confirm with ==; press **to exit**



5.1 Quick Setup menu structure





0

5.2.1 SET DISTANCE 4mA

Press **to** display the distance value associated with 4mA output.

Use 🕶 and 🔳 to modify that value; in the Fig.25 example, the 4mA distance is 3500mm. Press **to** confirm.

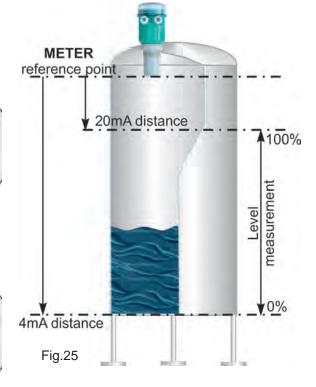
SET DISTANCE 4mA SET DISTANCE 20mA MEDIUM FILTER COEFFICIENT BLIND DISTANCE **RL1 THRESHOLD** RL2 THRESHOLD DISPLAY SET DISTANCE 4mA

0.1 3500 mm

SET DISTANCE 20mA

0500 mm





5.2.2 SET DISTANCE 20mA

Press to display the distance value associated with 20mA output.

Use 🚏 and 👔 to modify that value; in the Fig.25 example, the 20mA distance is 500mm. Press **to** confirm.

5.2.3 MEDIUM

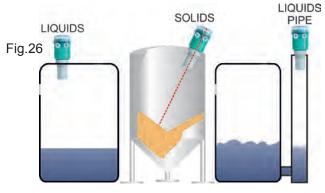
Press to display the previous setting

Press property to select the medium type.

Press to confirm. In fig. 26 product selection example.



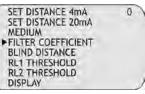
0.3 MEDIUM SOLIDS **▶LIQUIDS** LIQUIDS PIPE



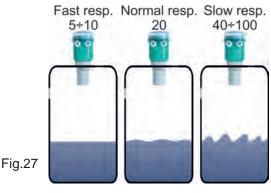
5.2.4 FILTER COEFFICIENT

Press . Increasing the value slows down the sensor response speed.

Use 👺 and 👚 to modify the value. Input a value from 1 to 99. Press to confirm. In fig.27 value choice example.



0.4 FILTER COEFFICENT 20



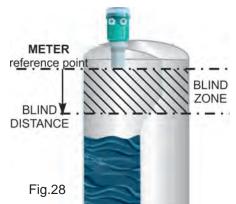
5.2.5 BLIND DISTANCE

Press . The BLIND ZONE is used to avoid undesired measures near to the transmitter

Use 👺 and 🚹 to modify the value. Press E to confirm. The minimum value is 250mm (5m max vers.) or 400mm (8m max vers.).









5.2.6 RL1 THRESHOLD

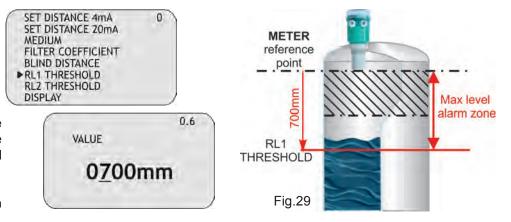
Press to display the previous setting. Set the distance from the sensor

Use and to modify the value; in the Fig.29 example the RL1 max. level threshold distance is 700mm.

Press to confirm.

NB-RL1 inactive with

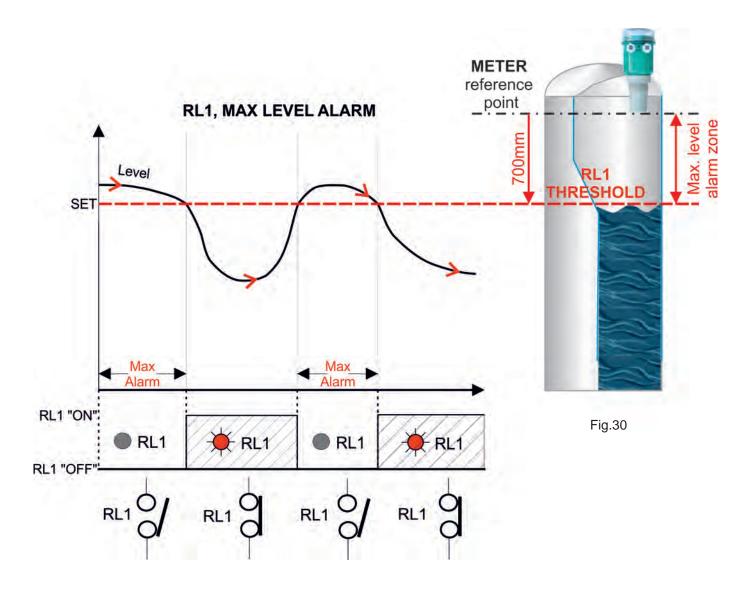
0000mm



When confirming with the button the maximum level threshold value storage, in the example 700m (figures 29 and 30), the **METER** activates RL1 with the following default settings for level alarm threshold:

- 1) MIN / MAX = MAX; maximum level alarm
- 2) DELAY = 0 sec.; no switching delay
- 3) SECURITY = YES; relay de-energized, and contact open, during the maximum level alarm
- 4) ENABLE / DISABLE = ENABLE; alarm threshold function enabled

To change these relay settings is necessary to access the advanced setup menu (pag.16) and any subsequent changes to the RL1 threshold value not affect the relay custom settings.



5.2.7 RL2 THRESHOLD

Press to display the previous setting. Set the distance from the sensor

Use and to modify the value; in the Fig.31 example the RL2 min. level threshold distance is 3000mm.

Press to confirm.

NB-RL2 inactive with

0000mm



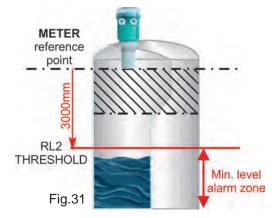
SET DISTANCE 4mA SET DISTANCE 20mA

FILTER COEFFICIENT

BLIND DISTANCE

RL1 THRESHOLD

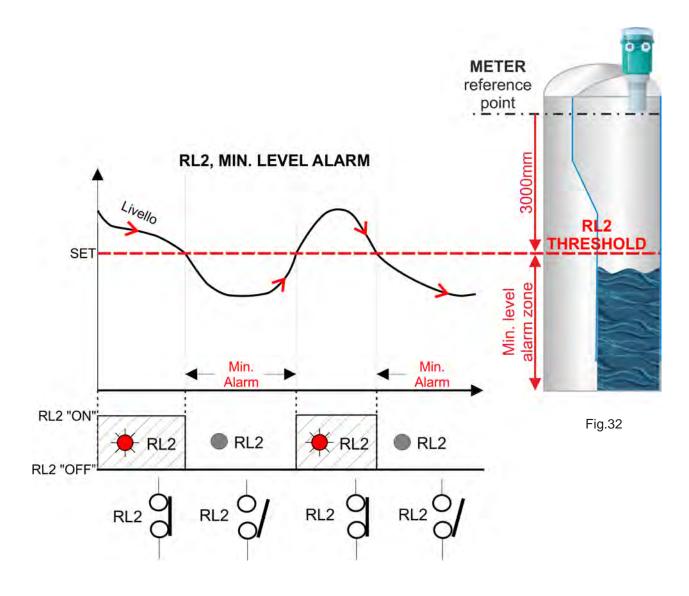
MEDIUM



When confirming with the button the maximum level threshold value storage, in the example 3000mm (figures 31 and 32), the **METER** activates RL2 with the following default settings for level alarm threshold:

- 1) MIN / MAX = MIN; minimum level alarm
- 2) DELAY = 0 sec.; no switching delay
- 3) SECURITY = YES; relay de-energized, and contact open, during the maximum level alarm
- 4) ENABLE / DISABLE = ENABLE; alarm threshold function enabled

To change these relay settings is necessary to access the advanced setup menu (pag.16) and any subsequent changes to the RL2 threshold value not affect the relay custom settings.





5.2.8 DISPLAY

Press to access the settings change.

SET DISTANCE 4mA 0
SET DISTANCE 20mA
MEDIUM
FILTER COEFFICIENT
BLIND DISTANCE
RL1 THRESHOLD
RL2 THRESHOLD
DISPLAY

With the button is possible to select the data to display_

Press to confirm.

D.8

DISTANCE mm
LEVEL mm
LEVEL %
OUTPUT mA
TEMP. *C

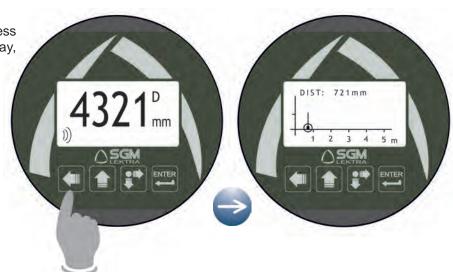


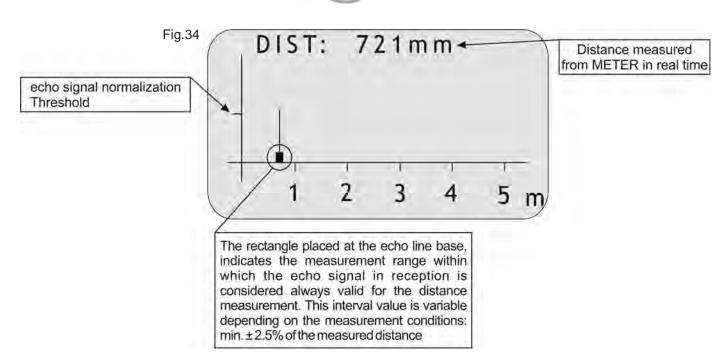
5.2 ECHO MAP

Pressing the **BK**, from RUN mode, to access directly to the echoes digital map display, which are in METER receiving (Fig.34).

This function is useful for:

- properly orient the transducer pointing.
- verify the echoes in acquisition correctness.
- identify any false echo signals that may cause measurement errors.

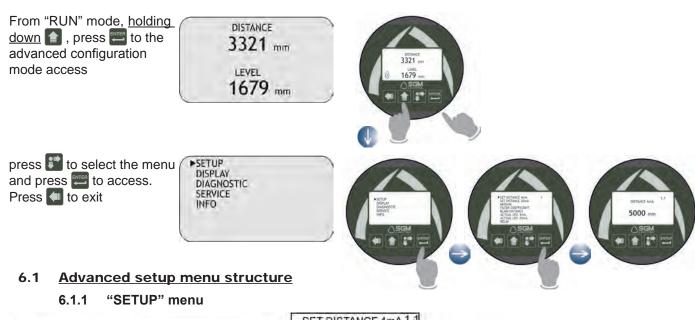




SGM-LEKTRA S.r.I. Via Papa Giovanni XXIII, 49 - 20090 Rodano (MI) - ITALYtel: ++39 0295328257 fax: ++39 0295328321 web: www.sgm-lektra.com e-mail: info@sgm-lektra.com

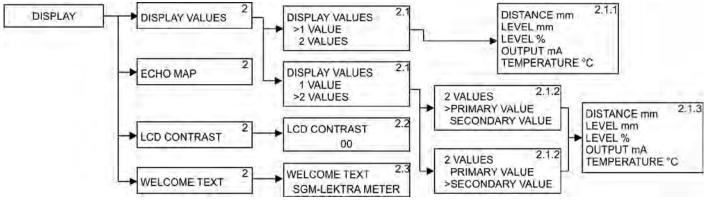
Documentation subject to technical change with no prior warning

6. ADVANCED CONFIGURATION MODE

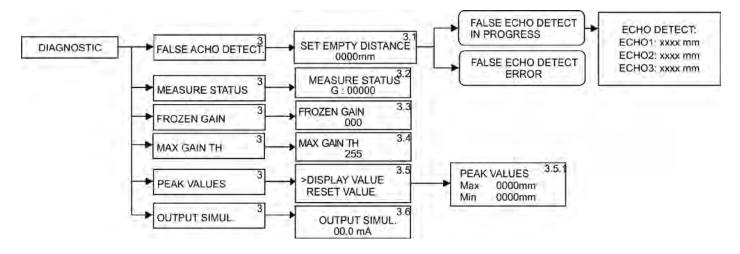


SET DISTANCE 4mA 1.1 0000 mm SET DISTANCE 4mA SETUP SET DISTANCE 20mA1.2 SET DISTANCE 20mA 0000mm LIQUIDS MEDIUM SOLIDS LIQUIDS PIPE FILTER COEFFICIENT FILTER COEFFICIENT 1.4 000 1.6.1. **BLIND DISTANCE** VALUE **BLIND DISTANCE 1.5** 0000mm 1.6.1 0000mm 1.6.1.2 **ACTUAL LEV 4mA** VALUE MIN/MAX >MIN OK TO confirm 1.6. ACTUAL LEV 20mA MAX MIN/MAX 1.6.1.3 1,6 1.6. DELAY RELAY **RL1 THRESHOLD** DELAY 1.6. 1.6 1.6.1.4 SAFETY RL2 THRESHOLD SAFETY >YES 1.6. ENABLE/DISABLE NO ENABLE/DISABLE >ENABLE DISABLE 1.6.2.1 UPPER 1.6.2 0000mm UPPER 1.6.2.2 LOWER 1.6.2 0000mm LOWER 1.6.2.3 1.6.2 1,6 DELAY RL1 PUMP DELAY 00 s 1.6.2 1.6.2.4 FILL/EMPT. FILL./EMPT. >FILLING ENABLE/DISABLE 1.6.2 **EMPTING** ENABLE/DISABLE >ENABLE DISABLE ENABLE/DISABLE RL2 DIAGNOSTIC >ENABLE DISABLE

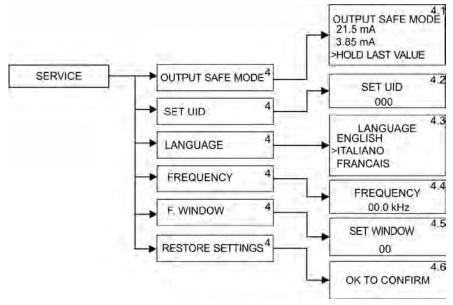
6.1.2 "DISPLAY" menu



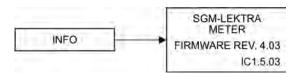
6.1.3 "DIAGNOSTIC" menu



6.1.4 "SERVIce" menu



6.1.4 "INFO" menu





7. ADVANCED CONFIGURATION DETAIL

7.1 SETUP

From "RUN" mode, holding down

, press to access



Select the parameters by moving the cursor with and confirm with

SET DISTANCE 4mA 1
SET DISTANCE 20mA
MEDIUM
FILTER COEFFICIENT
BLIND DISTANCE
ACTUAL LEV. 4mA
ACTUAL LEV. 20mA
RELAY

7.1.1 SET DISTANCE 4mA

Position the cursor on DISTANCE 4mA, press to enter

Use and to modify the value.

Press to confirm. to exit without changes

Default value: 5000mm (range 5m) or 8000mm (range 8m)

SET DISTANCE 4MA 1
SET DISTANCE 20MA
MEDIUM
FILTER COEFFICIENT
BLIND DISTANCE
ACTUAL LEV. 4MA
ACTUAL LEV. 20MA
RELAY

Default value: 5000mm (range 5m) or 8000mm (range 8m)

7.1.2 SET DISTANCE 20mA

5000 mm

Position the cursor on SET DISTANCE 20mA, press em to enter

Use and to modify the value.

Press to confirm. to exit without changes

Default value: 300mm (range 5m) or 500mm (range 8m)

SET DISTANCE 4mA 1
SET DISTANCE 20mA
MEDIUM
FILTER COEFFICIENT
BLIND DISTANCE
ACTUAL LEV. 4mA
ACTUAL LEV. 20mA
RELAY

SET DISTANCE 20mA 1.2

7.1.3 MEDIUM

Position the cursor on MEDIUM, press to enter Sono possibili 3 configurazioni:
SOLIDS - granular solids measurement
LIQUIDS - liquids measurement
LIQUIDS PIPE - liquids measurement in pipe reference
Press to select the product type.
Press to confirm. to exit without changes
Default value: LIQUIDS

SET DISTANCE 4mA
SET DISTANCE 20mA

MEDIUM
FILTER COEFFICIENT
BLIND DISTANCE
ACTUAL LEV. 4mA
ACTUAL LEV. 20mA
RELAY

MEDIUM

SOLIDS

LIQUIDS

LIQUIDS PIPE



7.1.4 FILTER COEFFICIENT

Position the cursor on FILTER COEFFICIENT, press to enter

SET DISTANCE 4mA 1 SET DISTANCE 20mA MEDIUM FILTER COEFFICIENT **BLIND DISTANCE** ACTUAL LEV. 4mA ACTUAL LEV. 20mA RELAY

Enter a value from 1 to 99: 1 = maximum speed, 99 = maximum slowness. The function is deactivated with 0 (immediate response)

Use and to modify the value.

Press em to confirm. to exit without changes

Default value: 20

1.4 FILTER COEFF. 20

7.1.5 BLIND DISTANCE

Position the cursor on BLIND DISTANCE, press to enter

SET DISTANCE 4mA 1 SET DISTANCE 20mA MEDIUM FILTER COEFFICIENT ► BLIND DISTANCE ACTUAL LEV. 4mA ACTUAL LEV. 20mA

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 (5m vers.) or 400mm (8m vers.) Use and to modify the value.

Press to confirm. OK TO CONFIRM

Default values: 250mm (range 5m) or 400mm (range 8m)

1.4 BLIND DISTANCE 0290 mm

7.1.6 ACTUAL LEV. 4mA

Position the cursor on ACTUAL LEV. 4mA, press to enter Self distance learning function that is associated with the 4mA (lower value). Make sure that the level corresponds to 0%.

to associate the actual measure with 4mA output value;

OK TO CONFIRM . **(** to exit without changes

SET DISTANCE 4mA SET DISTANCE 20mA MEDIUM FILTER COEFFICIENT **BLIND DISTANCE** ACTUAL LEV. 4mA ACTUAL LEV. 20mA RELAY

7.1.7 ACTUAL LEV. 20mA

Place the cursor on ACTUAL LEV. 20mA, press to enter Self distance learning function that is associated with the 20mA (lower value). Make sure that the level corresponds to 100%,

to associate the actual measure with 20mA output value;

SET DISTANCE 4mA SET DISTANCE 20mA MEDIUM FILTER COEFFICIENT BLIND DISTANCE ACTUAL LEV. 4mA ACTUAL LEV. 20mA RELAY

7.1.8 **RELAY**

Position the cursor on RELAY, press to enter

SET DISTANCE 4mA SET DISTANCE 20mA MEDIUM FILTER COEFFICIENT **BLIND DISTANCE** ACTUAL LEV. 4mA ACTUAL LEV. 20mA ▶ RELAY

In this sub-menù it's possible to setup onboard relays (only 4-wires versions) RL1 can be set as threshold relay or pump-control relay; RL2 can be set as threshold relay or diagnostic relay.

With the button you can select the operation mode, then pressing to confirm the selection

1.6 SET RELAYS MODE ▶RL 1 THRESHOLD RL 2 THRESHOLD RL 1 PUMP **RL 2 DIAGNOSTIC**



7.1.8.1 RL1 THRESHOLD (RL2 THRESHOLD equivalent)

Position the cursor on RL1 THRESHOLD, press to enter

SET RELAYS MODE

PRL 1 THRESHOLD
RL 2 THRESHOLD
RL 1 PUMP
RL 2 DIAGNOSTIC

In this submenu you can set the set-point and the relay 1 and 2 action type (only 4-wires versions).

With the button you can select the parameter to be programmed. Press to confirm.

VALUE
MIN/MAX
DELAY
SAFETY
ENABLE/DISABLE

7.1.8.1.1 VALUE

Position the cursor on VALUE, press to enter

1.6.1

VALUE
MIN/MAX
DELAY
SAFETY
ENABLE/DISABLE

It's possible to input the threshold value that corresponds to the distance in mm from the sensor. Use and to modify the value.

Press to confirm. to exit without changes

Default value: 0000mm

NB-RL1 inactive with 0000mm

1.6.1.1 1000mm

7.1.8.1.2 MIN/MAX

Position the cursor on MIN/MAX, press to enter

VALUE
►MIN/MAX
DELAY
SAFETY
ENABLE/DISABLE

It's possible to select if the relay works as maximum level threshold or minimum level threshold.

With the button you can select the operation mode.

Press to confirm. to exit without changes

Default value: MAX for RL1; MIN for RL2

MIN/MAX
MIN
►MAX

7.1.8.1.3 DELAY

Position the cursor on DELAY, press to enter

VALUE
MIN/MAX
▶ DELAY
SAFETY
ENABLE/DISABLE

It's possible to select the activation delay for the selected relay, from 0 to 99 sec.

Use and to modify the value.

Press to confirm. to exit without changes

Default value: 00s

1.6,1.3 SET DELAY VALUE 00 S



7.1.8.1.4 SAFETY

Position the cursor on SAFETY, press to enter A "safety alarm" provides a "closed" contact with relay energized

in normal condition (no alarm), the contact switches to "open":

- Alarm condition (eg overcoming MAX);

- In power failure case.

With the putton you can select the alarm mode.,

Press to confirm. to exit without changes

Default value: YES

1.6.1 VALUE MIN/MAX DELAY **▶** SAFETY ENABLE/DISABLE

> 1.6.1.4 SAFETY **▶YES** NO

7.1.8.1.5 ENEBEL/DISABLE

Position the cursor on ENABLE/DISABLE, press to enter

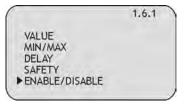
Select ENABLE to activate relay threshold.

Select DISABLE to not activate relay threshold.

With the **!** button you can select the operation mode.

Press to confirm. to exit without changes

Default value: ENABLE



1.6.1.5

1.6.2

ENABLE/DISABLE

▶ENABLE DISABLE

7.1.8.2 RL1 PUMP (solo per RL1)

Position the cursor on PUMP, press to enter

1.6 SET RELAYS MODE RL 1 THRESHOLD RL 2 THRESHOLD ▶RL 1 PUMP RL 2 DIAGNOSTIC

A pump control functioning activation, with hysteresis, is possible Two thresholds setting is required:

upper and lower threshold.

With the parameter to be programmed, Press to confirm.

▶UPPER LOWER DELAY FILL./EMPT. ENABLE/DISABLE

7.1.8.2.1 UPPER

Position the cursor on UPPER, press to enter The upper threshold (see fig.35) is expressed in mm distance from the sensor. Represents the pump starting point, EMPTY case, or pump stopping point, FILLING case.

Use and to modify the value.

Press to confirm. to exit without changes

Default value: 0000mm

1.6.2 **▶UPPER** LOWER DELAY FILL./EMPT. ENABLE/DISABLE

> 1.6.2.1 SET UPPER VALUE 0900mm



7.1.8.2.2 LOWER

Position the cursor on LOWER, press to enter The lower threshold (see fig.35) is expressed in mm distance from the sensor. Represents the pump stopping point, EMPTY case, or pump starting point, FILLING case.

Use and to modify the value.

Press to confirm. to exit without changes

Default value: 0000mm

UPPER
▶LOWER
DELAY
FILL./EMPT.
ENABLE/DISABLE

set Lower value
4000mm

7.1.8.2.3 DELAY

Position the cursor on DELAY, press to enter

Set the relay delay activation, from 0 to 99 sec.

Use and to modify the value.

Press to confirm. to exit without changes

Default value: 00

UPPER LOWER DELAY FILL./EMPT. ENABLE/DISABLE

1.6.2.3 SET DELAY VALUE

7.1.8.2.4 FILL./EMPT.

Position the cursor on FILL./EMPT., press to enter

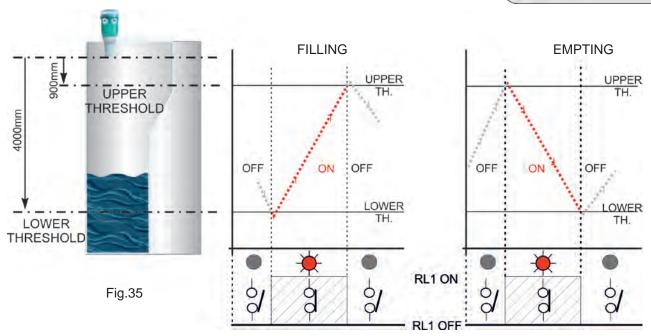
it's possible to select the mode of pump control (FILLING or EMPTING). With the button you can select the operation mode.

Press to confirm. to exit without changes

Default value: EMPTING

UPPER
LOWER
DELAY
FILL./EMPT.
ENABLE/DISABLE

1.6.2.4 FILL./EMPT. FILLING ►EMPTING





7.1.8.2.5 ENABLE/DISABLE

Position the cursor on ENABLE/DISABLE, press to enter

Select ENABLE to activate relay threshold. Select DISABLE to not activate relay threshold.

With the button you can select the operation mode.

Press to confirm. to exit without changes

Default value: DISABLE

UPPER LOWER DELAY FILL./EMPT. ►ENABLE/DISABLE 1.6.2.5 ENABLE/DISABLE

ENABLE ▶DISABLE

7.1.8.3 RL2 DIAGNOSTIC

Position the cursor on RL2 DIAGNOSTIC, press to enter If it becomes necessary the METER functional control, it's possible to enable the RL2 alarm output function. In this case, enabling the function, RL2 is energized in normal operation (RL2 LED on) and is de-energized (LED RL2 off, safety alarm) when at least one of the four conditions mentioned below, shall be verified:

- TEMP. : temperatutre out of range

- ECHO: no echo is detected

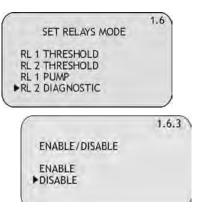
- GAIN : the sensor's gain exceed the value setted in Max Gain TH (3.4)

- DIST. : the measured distance exceed the 120% of the maximum distance in setup

With the button you can select the operation mode.

Press ro confirm. to exit without changes

Default value: DISABLE



NOTE: when an error occours, a "\bigselow" is flashing on the display: press to show a message that indicate what kind of error is present. The METER automatically returns to RUN mode.

7.2 DISPLAY

From "RUN" mode, holding down , press to

Position the cursor on DISPLAY, press to enter

Select the parameters by moving the cursor with and confirm with

SETUP
DISPLAY
DIAGNOSTIC
SERVICE
INFO

DISPLAY VALUES
ECHO MAP
LCD CONTRAST
WELCOME TEXT

7.2.1 DISPLAY VALUES

Position the cursor on DISPLAY VALUES, press to enter

DISPLAY VALUES
ECHO MAP
LCD CONTRAST
WELCOME TEXT

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

With the button you can select the parameter to be programmed.

Press to confirm. to exit without changes

DISPLAY VALUES

1 VALUE
2 VALUES



7.2.1.1 1 VALUE

Position the cursor on 1 VALUE, press to enter

Only one value is displayed; it's possible to choose from 5 parameters. With the button you can select data to display.

Press to confirm. to exit without changes

Z.1

DISPLAY VALUES

1 VALUE
2 VALUES

DISTANCE mm
LEVEL mm
LEVEL %
OUTPUT mA
TEMP. *C

2013mm

7.2.1.2 2 VALUES

Position the cursor on 2 VALUES, press to enter

DISPLAY VALUES

1 VALUE

> 2.1

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

With the button you can select data to display

With the button you can select data to display Press to confirm. to exit without changes

2.1.2

2 VALUES

PRIMARY VALUE
SECONDARY VALUE

2.1.3



2.1.2 2 VALUES PRIMARY VALUE • SECONDARY VALUE

DISTANCE mm

LEVEL mm

LEVEL %

OUTPUT mA

TEMP. °C













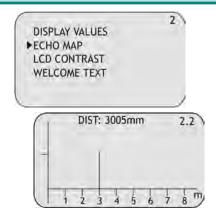




7.2.2 ECHO MAP

Position the cursor on ECHO MAP, press at to enter

Detailed function description on page 13, figure 34 to exit and return to the menu 2



7.2.3 LCD CONTRAST

Position the cursor on LCD CONTRAST, press to enter

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

Use and to modify the value.

Press to confirm. to exit without changes

Default value: 32



LCD CONTRAST

32

2

7.2.4 WELCOME TEXT

Position the cursor on WELCOME TEXT, press to enter

It's possible to edit or delete the message that is displayed by the METER during the ignition phase.

Use (up scroll) and (down scroll) to change the digit; to move the digit to the right. To confirm press repeatedly until leave the parameter.

to exit without changes

Default value: SGM-LEKTRA METER



DISPLAY VALUES

ECHO MAP LCD CONTRAST •WELCOME TEXT

7.3 DIAGNOSTIC

From "RUN" mode, holding down , press to access

Position the cursor on DIAGNOSTIC, press to ent

Select the parameters by moving the cursor with and confirm with



FALSE ECHO DETECT
MEASURE STATUS
FROZEN GAIN
MAX GAIN TH.
PEAK VALUES
OUTPUT SIMUL.

7.3.1 FALSE ECHO DETECT

Position the cursor on FALSE ECHO DETECT, press to enter

NB - To use this parameter the tank must strictly be empty

►FALSE ECHO DETECT

MEASURE STATUS

FROZEN GAIN

MAX GAIN TH.

PEAK VALUES

OUTPUT SIMUL



It's necessary to imput the empty distance (distance from the tank bottom)
Use and to modify the value.

Press to confirm. to exit without changes

"METER" automatically stores all echoes detected and implemented an echo true and any eventual spurious echoes automatic selection. After this, the following message is displayed: **FALSE ECHO DETECT PROGRESS**

After procedure completion, the detected false echoes distances are displayed and automatically stored (up to 3 false echoes).

Press to return to the "DIAGNOSTIC" menu

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: <u>False echo detect procedure is not recommended for pipe and stand-pipe applications</u>
<u>To delete this function, need to restore the default parameters (see par. 7.4.5)</u>

SET EMPTY DISTANCE 3.1 OOOO mm ECHO DETECTED:

ECHO DETECTED:
ECHO1: xxxx mm
ECHO2: xxxx mm
ECHO3: xxxx mm

7.3.3 MEASURE STATUS

Position the cursor on MEASURE STATUS, press to enter

FALSE ECHO DETECT 3

MEASURE STATUS
FROZEN GAIN
MAX GAIN TH.
PEAK VALUES
OUTPUT SIMUL.

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 to exit

MEASURE STATUS

G: 00000

7.3.4 FROZEN GAIN

Position the cursor on FROZEN GAIN, press to enter

FALSE ECHO DETECT
MEASURE STATUS
FROZEN GAIN
MAX GAIN TH.
PEAK VALUES
OUTPUT SIMUL

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 \underline{co} ntrol restarts

Use and to modify the value.

Press to confirm. to exit without changes

Default value: 000



7.3.5 MAX GAIN TH

Position the cursor on MAX GAIN TH, press to enter

FALSE ECHO DETECT
MEASURE STATUS
FROZEN GAIN
MAX GAIN TH.
PEAK VALUES
OUTPUT SIMUL.

It's possible to input a value of gain that it should be not reached in normal operation. If the gain exceeds this value, the "GAIN" error code is activated.

Use and to modify the value.

Press to confirm. to exit without changes

Default value: 255 (Max gain)

3.4 MAX GAIN TH 255



7.3.6 PEAK VALUES

Position the cursor on PEAK VALUES, press enter

FALSE ECHO DETECT
MEASURE STATUS
FROZEN GAIN
MAX GAIN TH.
PEAK VALUES
OUTPUT SIMUL

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 values With the button you can select the function.

Press **to** confirm.

DISPLAY VALUES
RESET VALUES

7.3.6.1 DISPLAY VALUES

Position the cursor on DISPLAY VALUES, press to enter

DISPLAY VALUES
RESET VALUES

Displays the max. and min. distance measured from power on. to exit.

NB - The peak values stored are erased every time the METER turns-off



7.3.6.2 RESET VALUES

Position the cursor on RESET VALUES, press to reset to return to the previous menu.



7.3.7 OUTPUT SIMULATION

WARNING - <u>entering in the SIMULATION function, the current output is not in function of the level measurement. To restore the current as a measured level function, press the <u>button 3 times (RUN mode)</u></u>

Position the cursor on OUTPUT SIMULATION, press to enter .

It'possible to force the analog output to a desired value.

Use and to modify the value.

Press to return to the previous menu.

FALSE ECHO DETECT
MEASURE STATUS
FROZEN GAIN
MAX GAIN TH.
PEAK VALUES
DOUTPUT SIMUL

OUTPUT SIMUL.



7.4 SERVICE

From "RUN" mode, holding down , press to access

Position the cursor on SERVICE, press to enter

Select the parameters by moving the cursor with and confirm with

SETUP
DISPLAY
DIAGNOSTIC
SERVICE
INFO

POUTPUT SAFE MODE SET UID LANGUAGE FREQUENCY F. WINDOW RESTORE SETTINGS

7.4.1 OUTPUT SAFE MODE

Position the cursor on OUTPUT SAFE MODE, press to enter

►OUTPUT SAFE MODE
SET UID
LANGUAGE
FREQUENCY
F. WINDOW
RESTORE SETTINGS

It's possible to choose a analog output value durin diagnostic errors.

"21.5 mA" forces the current output to 21,5mA

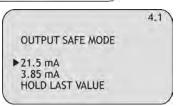
"3.85 mA" forces the current output to 3,85mA

"HOLD LAST VALUE" maintains the output at the last valid value.

With the button you can select the operation mode.

Press em to confirm. to exit without changes

Default value: HOLD LAST VALUE



4

7.4.2 SET UID

Position the cursor on SET UID, press to enter Can assign the address UID in this parameter, for a MUDBUS RTU network

Use and to modify the value.

Press to confirm. to exit without changes

Default value: 001





7.4.3 LANGUAGE

Position the cursor on LANGUAGE, press to enter

Sets the menu language: English, Italian, French Press properties to select the menu language.

Press 🎏 to confirm. 🗖 to exit without changes



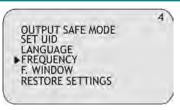




7.4.5 CHECK FREQUENCY

Position the cursor on CHECK FREQUENCY, press to enter

It's possible to check the computed sensor emission frequency to exit



FREQUENCY 00.0 kHz

7.4.6 F. WINDOWS

Position the cursor on F. WINDOWS, press to enter Refer to figure 34 on page 13 .The F.WINDOW is the sensitive area width around the true echo. All echoes detected inside the F.WINDOW are valid. F.WINDOW automatically centers itself in the most probable echo neighborhood and automatically adjusts its width (step). The step value of the window, expressed in cm, is represented by SET WIDTH; for example: parameter set to 5; the sensor is hooked to a 4m distant signal echo; suddenly the echo signal disappears and a echo signal is detected to 1m; METER will start to open the search range with steps of 5cm at each echo signal emission, so to cover the 3 meters that separate the 4m distant signal echo by the new 1m distant echo, METER will take 60 emissions to reach the new 1m distance eco. This parameter serves to filter false echo signals products, for example, by the agitator blades. Range: 00÷20



SET WIDTH 4.6

4

7.4.5 RESTORE SETTING

Default value: 05

Position the cursor on RESTORE SETTING, press to enter

enter

Press to restore the METER default settings to exit whitout restored the METER default settings.

Press to confirm. to exit without changes



7.5 INFO

Position the cursor on INFO, press to enter

SETUP
DISPLAY
DIAGNOSTIC
SERVICE
INFO

OUTPUT SAFE MODE SET UID

LANGUAGE FREQUENCY

In addition to information about the manufacturer, are displayed the firmware revision and the configuration index.

to exit.

SGM-LEKTRA 5
METER
FIRMWARE REV. 4.04
I.C 1.5.03



METER - Notes

Notes:

