# RPL81

80GHz Radar level transmitter

sgm lektra

# CONTENTS

# 1-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 maintain 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 consequential 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.

# 2-PRODUCT

"1" version          "2" version          "3" version
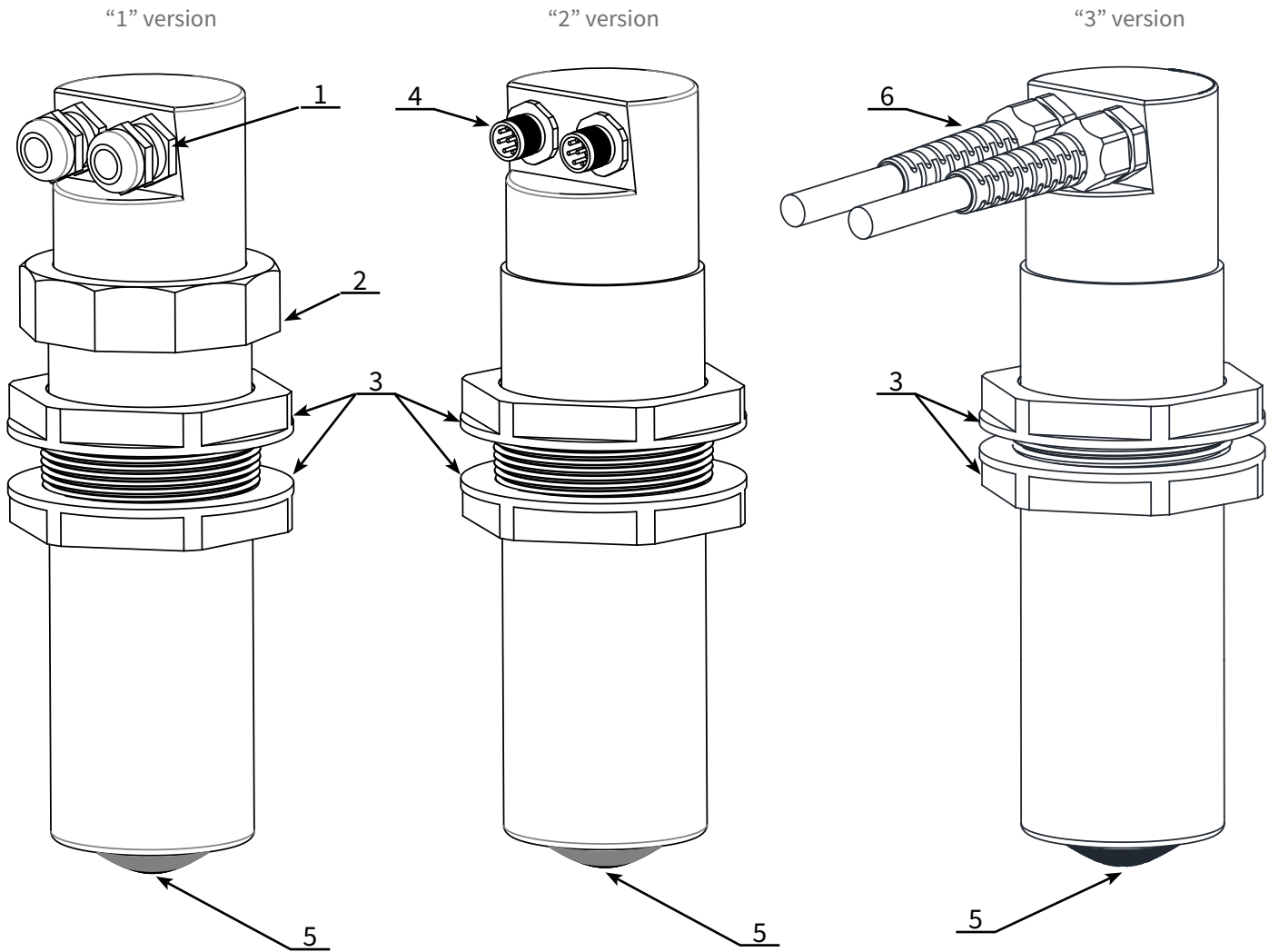
1. Skintop M16
2. Head fixing bolt
3. Fixing bolt
4. Watertight connector M12
5. Sensor
6. 5m integrated cables

## 2.1 - IDENTIFICATION

Each meter has an adhesive identifi cation plate on which are indicated the meter main data.
The following picture describes the information on the identifi cation plate.

1 — Mod. RPL81    CE
2 — P.S. 24Vdc    **SGM** LEKTRA
3 — S.N. MU0081604506
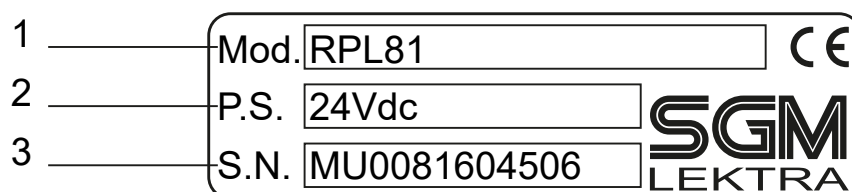
1. Product code        2. Power supply        3. Serial number

# 3-FEATURES

**Housing/sensor material**
  PP
**Mechanical installation**
  2" GAS M (Flange in PP DN80 (opt.)
**Protection degree**
  IP67/IP68 (Sensor) - IP68 (opt.)
**Electrical connection**
  Terminals, connector or 5m integrated cables (IP68)
**Working temperature**
  -20 ÷ +60°C
**Pressure**
  Max. 3 bar
**Power supply**
  20÷30Vdc
**Power consumption**
  5W peak; 2,5W average
**Analog output**
  4...20mA, max 750ohm
**Relays output**
  n°2 3A  230Vac (n.o.) with a resistive load
**Digital communication**
  MODBUS RTU
**Max measure range**
  0.05 ÷ 10mt max for solids
  0.05 ÷ 20mt max for liquids
  In case of non perfectly  reflecting surfaces, the maximum distance value will be reduced
**Blind  distance**
  0,05m
**Accuracy**
  Measurement deviation ±5mm, for distances less than 250mm ±10mm.
**Resolution**
  2mm.
**Calibration**
  Display module - MODBUS - 2 pushing buttons (only for IP67 version) / Bluetooth
**LCD Display**
  VL620 (IP67 vers.) or VL621 (IP68 vers.) display/keyboard 4 buttons matrix LCD
**J-BOX Material**
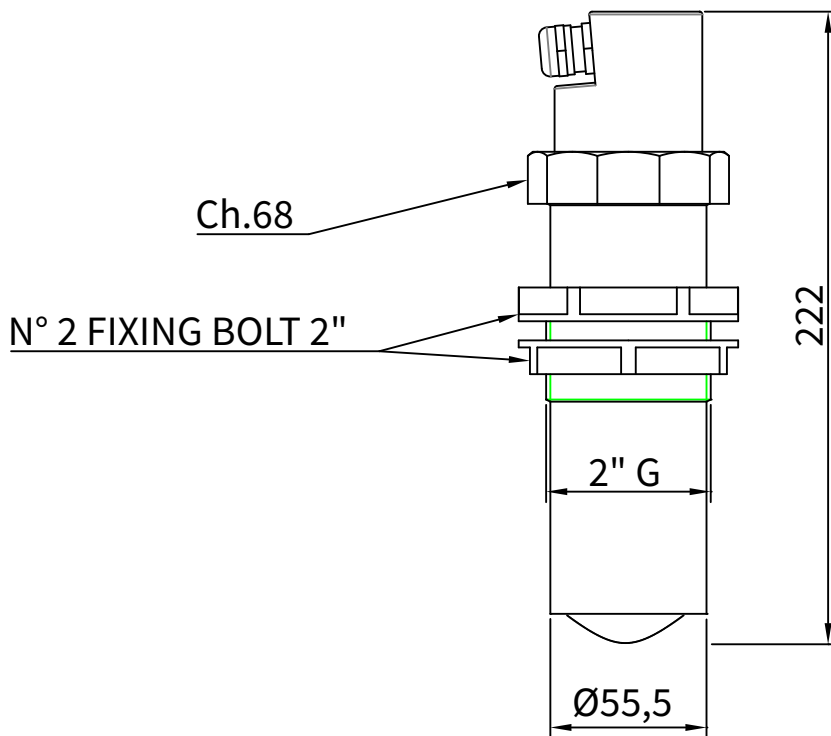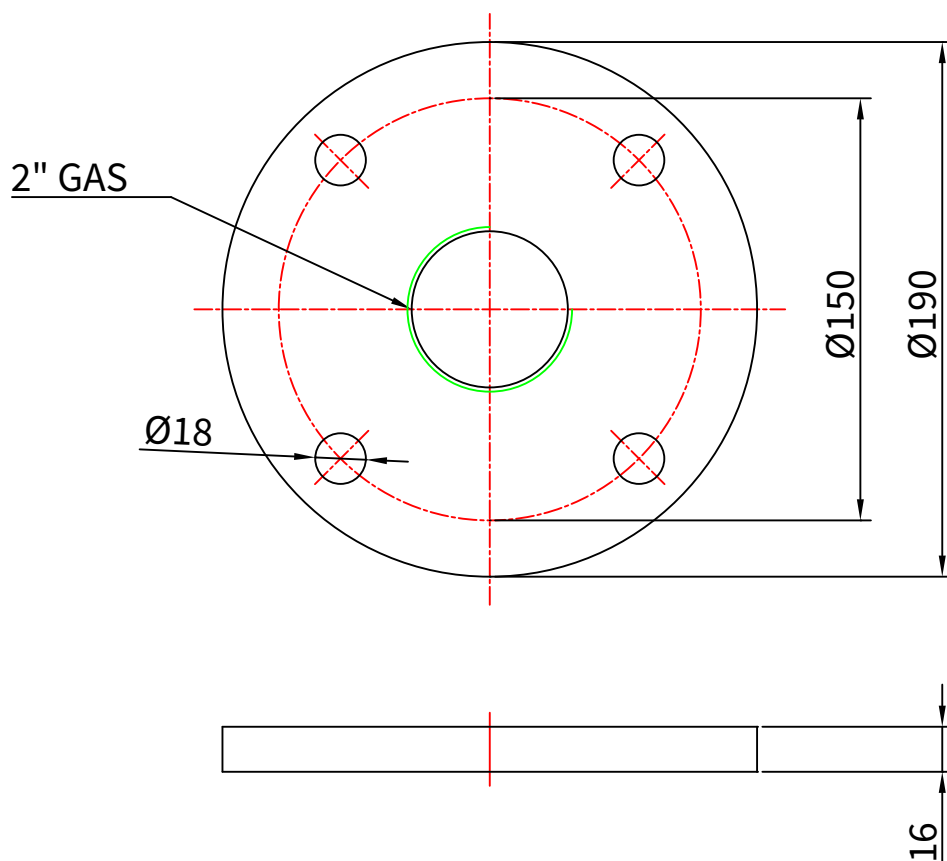  Polycarbonate
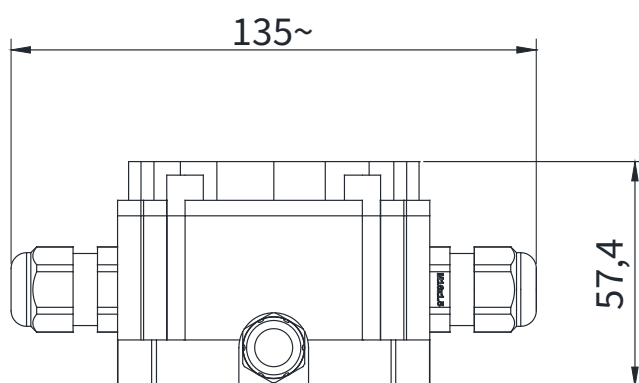**J-BOX protection**
  IP65

# 4-DIMENSIONS

**5.1 - MECHANICAL DIMENSIONS**

Ch.68

N° 2 FIXING BOLT 2"

222

2" G

Ø55,5

## DN80 PN6 UNI 1092-1 flange in PP (Opt.)

2" GAS

Ø150

Ø190

Ø18

16

**4.2 - J-BOX DIMENSIONS**
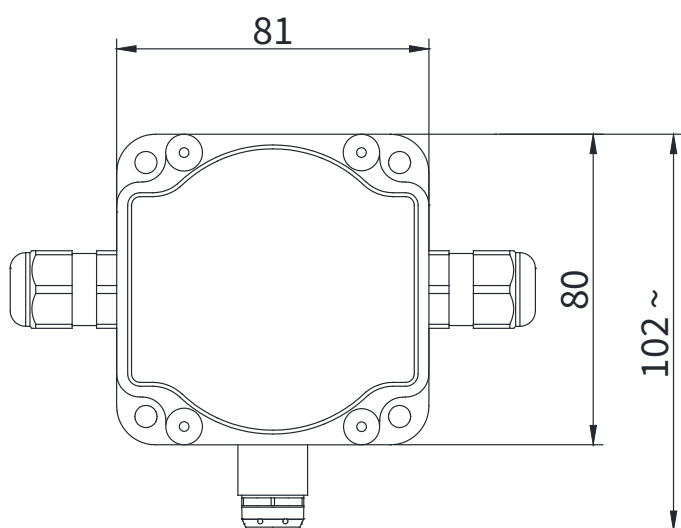
# 5-INSTALLATION

### 5.1 - MOUNTING PRECAUTIONS

#### 5.1.1 - Mounting position
- Leave a 300mm (d) minimum distance between the sensor and the tank smooth wall.
- 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 "α"8°) there are no obstacles (f,e) that can be intercepted as level.
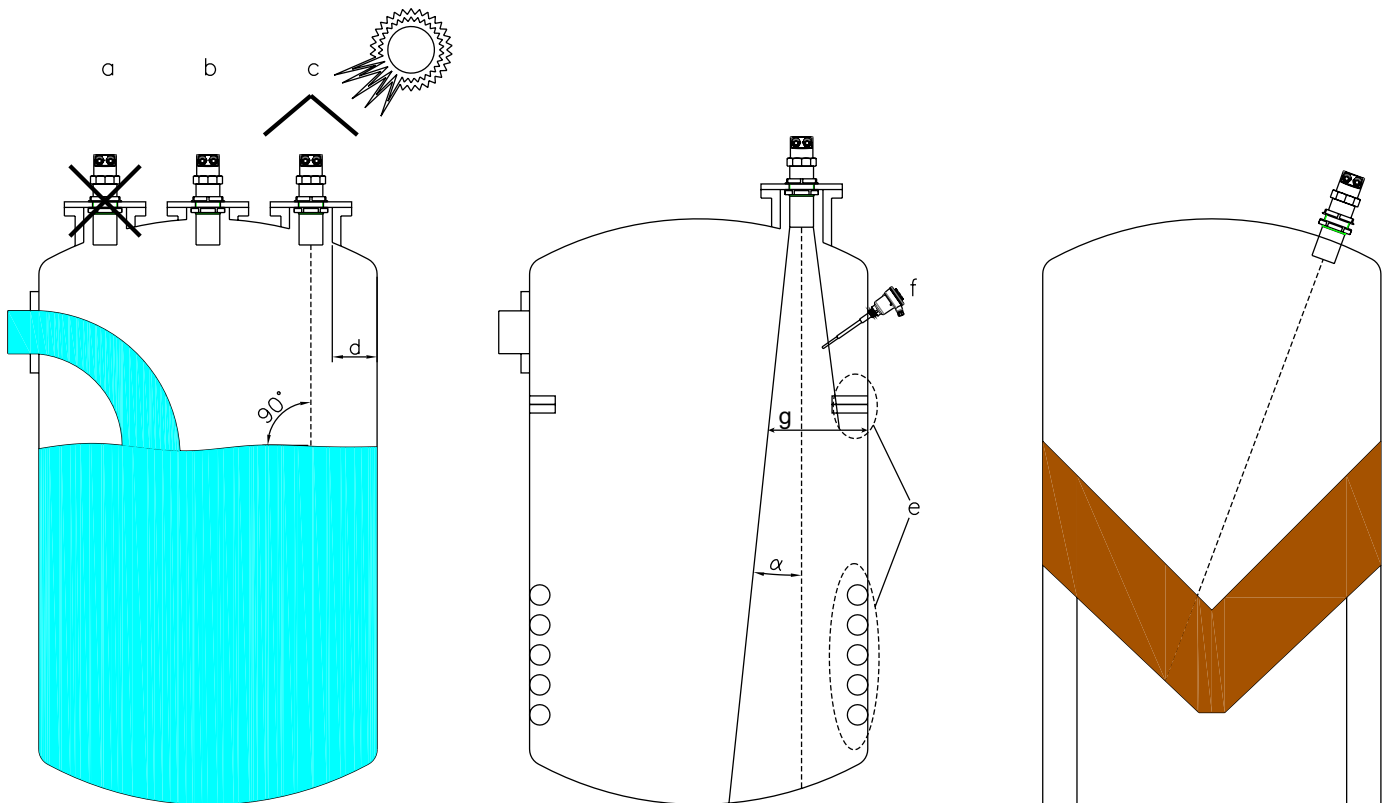


#### 5.1.2 - Special European directive

According to EN 302 729, paragraph 4.6.1.3, a minimum distance of 4 km from radio astronomy sites is required, unless special authorization has been provided by the responsible national regulatory authority.
Also, at the distance between 4 km and 40 km from any radio astronomy site, the height of the LPR antenna should not exceed 15 m above the ground.

#### 5.1.3 - Blind distance

During installation is important to remember that in the sensor proximity there is a blind zone (or BLIND DISTANCE) of 0.05m where the sensor can not measure.



0.05m    Blind Distance
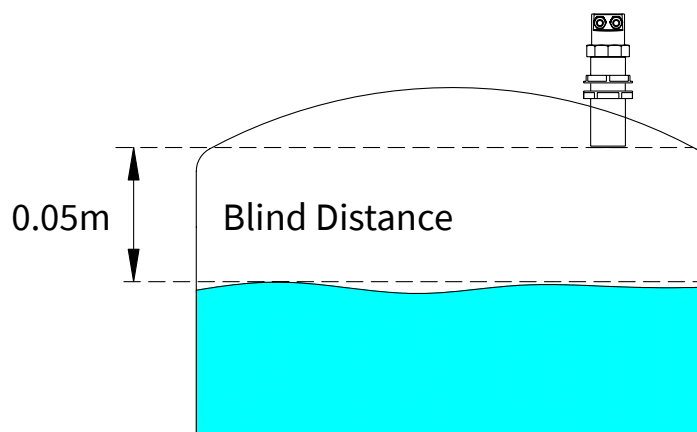
### 5.1.4 - Installation in nozzle

In case of nozzle installation, make sure the sensor bottom protrudes at least 10mm from the bottom of the nozzle.

Max 90mm.

≥10mm.
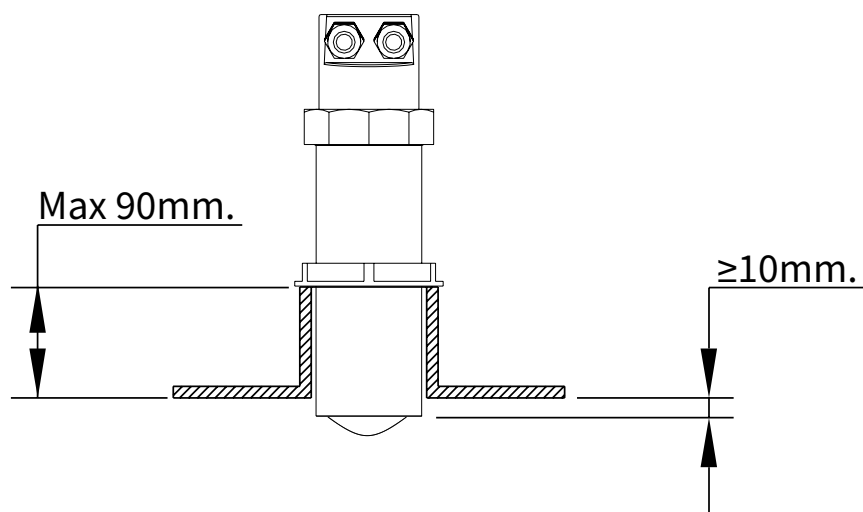
### 5.1.5 - Installation with bracket (mod. 835B026Z)

By installing the RPL81 with the bracket it is possible to orient the emission lobe perpendicular to inclined surfaces.
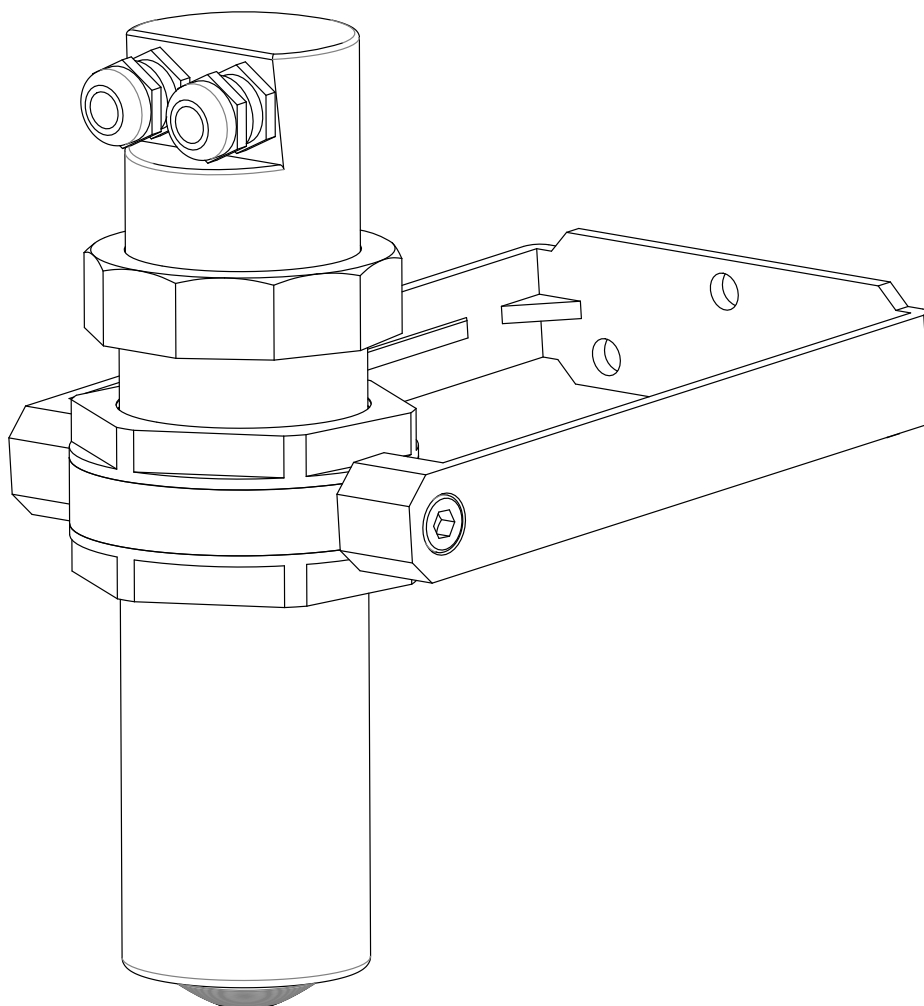
## 5.1.6 - Agitators presence

The level measurement is possible thanks to the  Auto-Tuned statistical filter.
Should rarely need to adjust the filter setting by editing 2 RPL81 sensor programming parameters:
- FILTER; this parameter is present in the Quick Setup menu and in the Advanced Configuration "SETUP" menu;
  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; decreasing the parameter
  programmed value, increases the sensor immunity to false echoes.
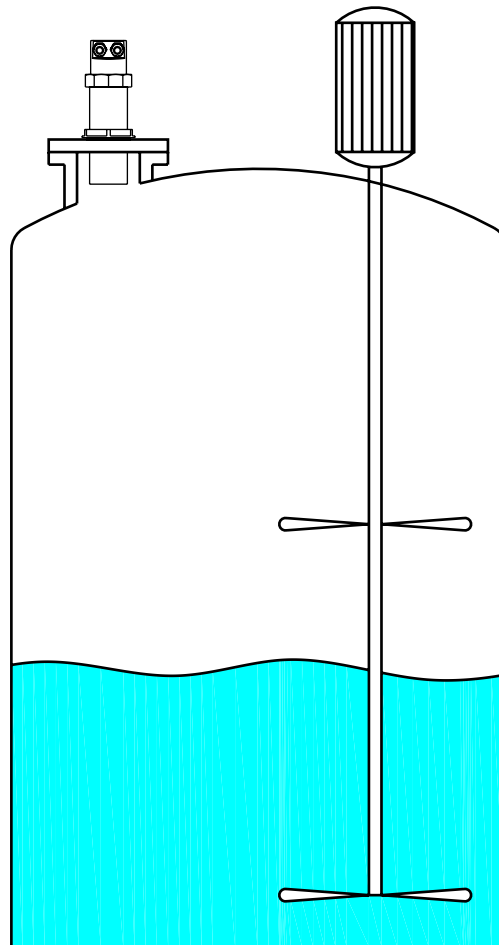
# 6-ELECTRICAL CONNECTIONS

### 6.1 - "1" VERSION CONNECTIONS

1) Separate the engine control cables or power cables from the RPL81 connection cables.
2) Open the cap by unscrewing.
3) Lead the cables into the transmitter through the glands.
4) Close the cap and tighten the cable glands.

4÷20mA      MODBUS

MODE LED
Steady on
Flashes during transmission data
via MODBUS RTU

ECO LED
Flashes during
Signal receiving

RL1 LED
Indicates the relay 1 status:
turned on, relay RL1 energized

RL2 LED
Indicates the relay 2 status:
turner on, relay RL2 energized

Micro USB-B

Power
Supply

+24Vdc
0Vdc

RL1      RL2

### 6.2 - "2" VERSION CONNECTIONS

C1
POWER - RED CABLE

| | | |
|---|---|---|
| N / 0V | (1) | BROWN |
| L / +24V | (2) | RED |
| C RL1 | (3) | YELLOW |
| N.O. RL1 | (4) | WITHE |
| C RL2 | (5) | GREY |
| N.O. RL2 | (6) | PINK |
| N.C. | (7) | GREEN |
| N.C. | (8) | BLUE |

NON INVERTIRE
I COLLEGAMENTI
DO NOT INVERT
THE CONNECTION

C1      C2
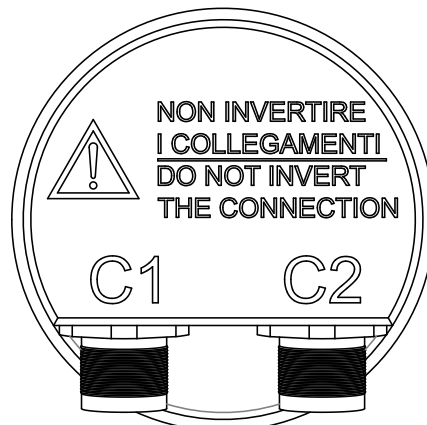
C2
SIGNAL - BLACK CABLE

| | | |
|---|---|---|
| (1) | BROWN | GND DISPLAY |
| (2) | RED | +3,3V DISPLAY |
| (3) | YELLOW | + 4/20mA |
| (4) | WITHE | SCL DISPLAY |
| (5) | GREY | - 4/20mA |
| (6) | PINK | SDA DISPLAY |
| (7) | GREEN | A  RS485 MODBUS |
| (8) | BLUE | B  RS485 MODBUS |

## 6.3 - "3" VERSION CONNECTIONS

C1
POWER - RED CABLE

| | | |
|---|---|---|
| N / 0V | (1) | BROWN |
| L / +24V | (2) | RED |
| C RL1 | (3) | YELLOW |
| N.O. RL1 | (4) | WITHE |
| C RL2 | (5) | GREY |
| N.O. RL2 | (6) | PINK |
| N.C. | (7) | GREEN |
| N.C. | (8) | BLUE |
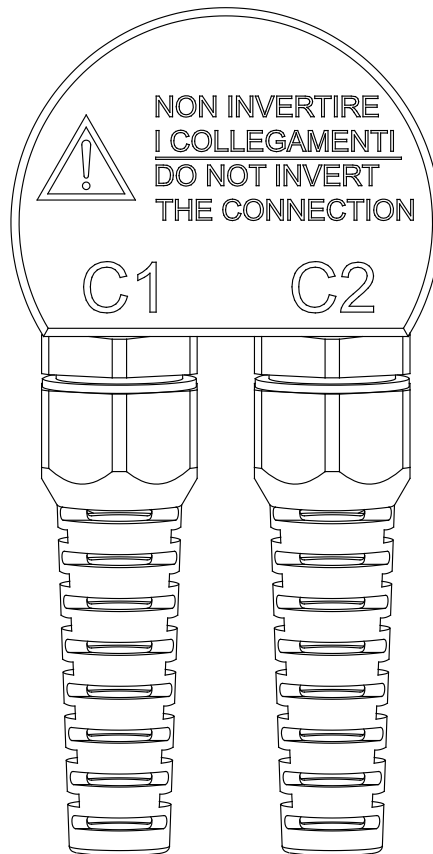
C2
SIGNAL - BLACK CABLE

| | | |
|---|---|---|
| (1) | BROWN | |
| (2) | RED | |
| (3) | YELLOW | + 4/20mA |
| (4) | WITHE | |
| (5) | GREY | - 4/20mA |
| (6) | PINK | |
| (7) | GREEN | A  RS485 MODBUS |
| (8) | BLUE | B  RS485 MODBUS |

NON INVERTIRE
I COLLEGAMENTI
DO NOT INVERT
THE CONNECTION

C1    C2

## 6.4 - HUMIDITY INFILTRATIONS

To avoid the humidity infiltration inside the housing is recommended:
- to use a cable with a 5÷10mm outer diameter and  fully tighten the M16 cable gland for electrical connections
- to fully tighten the cap
- to position the cable so that it forms a downward curve at the M16 output; in this way the condensation and/or the
  rain water will tend to drip from the curve bottom
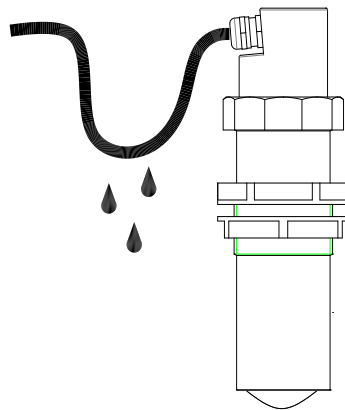
## 6.5 - CONNECTIONS JUNCTION BOX

### 6.5.1 - J-BOX A

C1
POWER - RED CABLE

| BROWN | 0V | 1 |
| RED | +24Vdc | 2 |
| YELLOW | RL1 C. | 3 |
| WITHE | RL1 N.O. | 4 |
| GREY | RL2 C. | 5 |
| PINK | RL2 N.O. | 6 |

### 6.5.2 - J-BOX B

C2
SIGNAL - BLACK CABLE

| YELLOW | +4÷20mA | 1 |
| GREY | -4÷20mA | 2 |
| GREEN | A (RS485) | 3 |
| BLUE | B (RS485) | 4 |
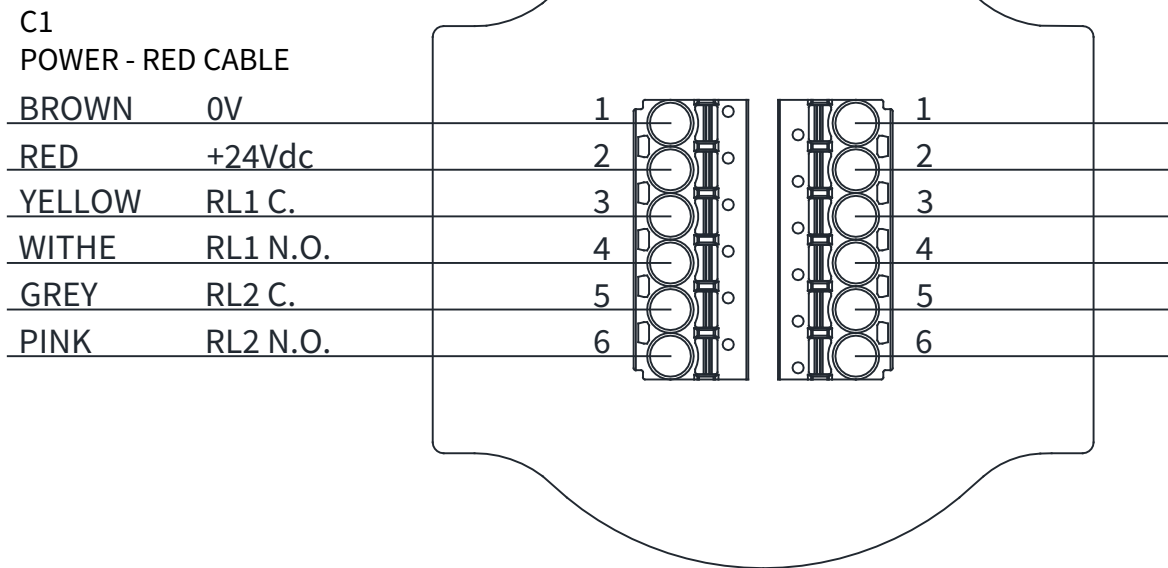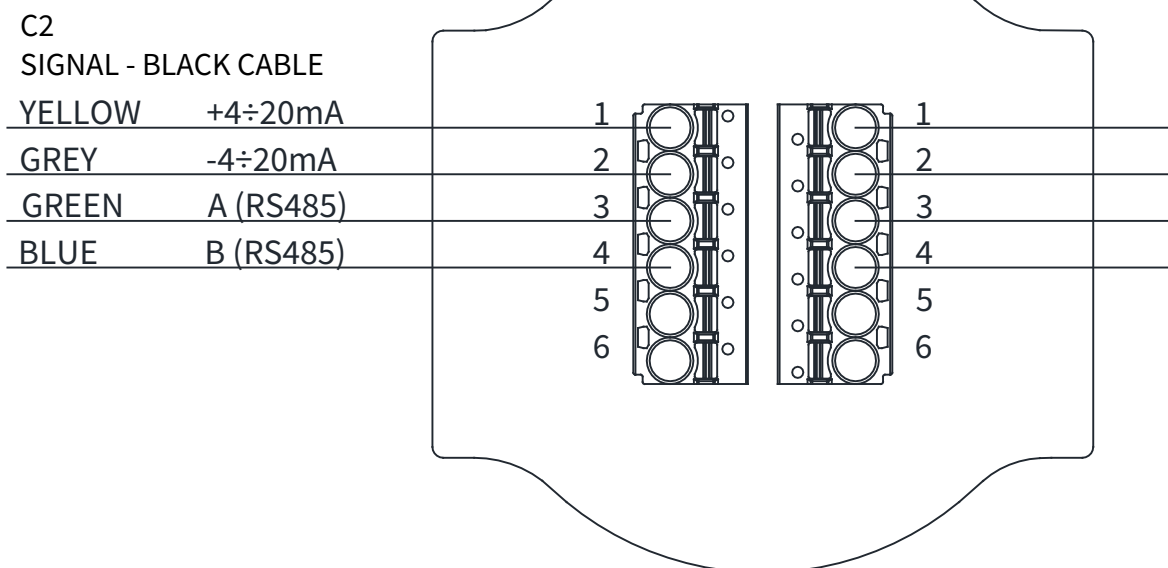
# 7-CONFIGURATION MODES

The RPL81 have 4 configuration/calibration modes:
- via digital communication: via MODBUS RTU, by PC.
- via 2 on board buttons.
- via VL620 or VL621 programming module.
- via Bluetooth with Android App.

## 7.1 - DIGITAL COMMUNICATIONS CONNECTION

### 7.1.1 - RPL81 MODBUS RTU PC connection

1) RPL81 with MODBUS RTU communication protocol.
2) USB/RS485 interface module, cod.694A004A.
3) MODBUS RTU communication S/W, cod.010F105A, for RPL81 transmitter.
With this software is possible:
- to connect the RPL81 transmitters in MODBUS RTU network by selecting the UID address.
- to read on your PC monitor all measures in reading and RPL81 operation data.
- to program all RPL81 configuration parameters.
- to store the measurement readings and the operating status of RPL81.
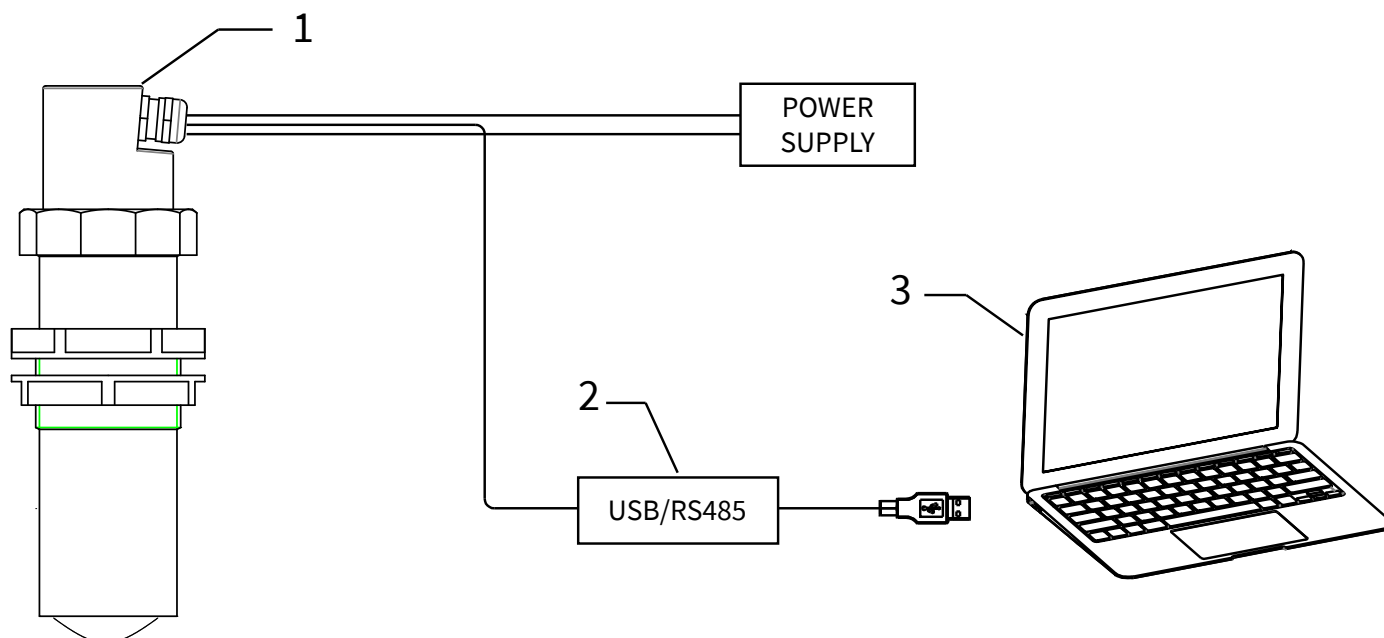
## MODBUS REGISTERS FOR RPL81

| Address (dec) | Address (hex) | (N° of registers) | Type | Description | Measure unit | R | W | Note |
|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 1 | unsigned int | Distance | mm | 03h | | |
| 1 | 1 | 1 | unsigned int | Level | mm | 03h | | |
| 2 | 2 | 2 | float | Level % | % | 03h | | |
| 6 | 6 | 2 | float | Analog output | mA | 03h | | |
| 10 | A | 1 | unsigned int | Distance 4mA | mm | 03h | 06h | |
| 11 | B | 1 | unsigned int | Distance 20mA | mm | 03h | 06h | |
| 14 | E | 1 | unsigned int | Blind distance | mm | 03h | 06h | |
| 22 | 16 | 1 | unsigned int | Filter coefficent | | 03h | 06h | |
| 24 | 18 | 1 | unsigned int | UID | | 03h | 06h | |
| 37 | 25 | 1 | unsigned int | Delay setpoint RL1 | s | 03h | 06h | |
| 39 | 27 | 1 | unsigned int | Delay setpoint RL2 | s | 03h | 06h | |
| 42 | 2A | 1 | unsigned int | Delay pump control RL1 | s | 03h | 06h | |
| 43 | 2B | 1 | | | | | | |
| 44 | 2C | 1 | unsigned int | Alarm mode (MAX/MIN) RL1 | | 03h | 06h | 0:MAX 1:MIN |
| 45 | 2D | 1 | unsigned int | Safety (NO/YES) RL1 | | 03h | 06h | 0:Norm_disexcited 1:Norm_excited |
| 46 | 2E | 1 | unsigned int | Enable RL1 | | 03h | 06h | 0:disabled 1:enabled |
| 47 | 2F | 1 | unsigned int | Alarm mode (MAX/MIN) RL2 | | 03h | 06h | 0:MAX 1:MIN |
| 48 | 30 | 1 | unsigned int | Safety (NO/YES) RL2 | | 03h | 06h | 0:Norm_disexcited 1:Norm_excited |
| 49 | 31 | 1 | unsigned int | Enable RL2 | | 03h | 06h | 0:disabled 1:enabled |
| 50 | 32 | 1 | unsigned int | Pump control mode RL1 | | 03h | 06h | 0:EMPTYING 1:FILLING |
| 51 | 33 | 1 | unsigned int | Enable pump control RL1 | | 03h | 06h | 0:disabled 1:enabled |
| 52 | 34 | 1 | unsigned int | Enable diagnostic alarm RL2 | | 03h | 06h | 0:disabled 1:enabled |
| 53 | 35 | 1 | unsigned int | Measurement return power | | 03h | 06h | 0...32767 |
| 54 | 36 | 1 | | | | | | |

## MODBUS REGISTERS FOR RPL81

| Address (dec) | Address (hex) | (N° of registers) | Type | Description | Measure unit | R | W | Note |
|---|---|---|---|---|---|---|---|---|
| 55 | 37 | 1 | unsigned int | **Echo error** | | 03h | | |
| 56 | 38 | 1 | | | | | | |
| 57 | 39 | 1 | unsigned int | **Distance error** | | 03h | | |
| 58 | 3A | 1 | unsigned int | **Output alarm status for analog output** | | 03h | 06h | 4:21.5mA 6:38.5mA 8:HoldLastValue |
| 59 | 3B | 1 | unsigned int | **Relay RL1 status** | | 03h | | 0: off 1:on |
| 60 | 3C | 1 | unsigned int | **Relay RL2 status** | | 03h | | 0: off 1:on |
| 65 | 41 | 1 | unsigned int | **F_WINDOW value** | | 03h | 06h | 0: filters disabled |
| 69 | 45 | 1 | unsigned int | **Setpoint threshold RL1 (Distance from sensor)** | mm | 03h | 06h | |
| 70 | 46 | 1 | unsigned int | **Setpoint threshold RL2 (Distance from sensor)** | mm | 03h | 06h | |
| 71 | 47 | 1 | unsigned int | **UPPER Setpoint pump RL1 (Distance from sensor)** | mm | 03h | 06h | |
| 72 | 48 | 1 | unsigned int | **LOWER Setpoint pump RL1 (Distance from sensor)** | mm | 03h | 06h | |
| 73 | 49 | 1 | unsigned int | **Modbus RS485 Parity** | | 03h | 06h | 0:NoParity 1:Even 2:Odd |

**7.2 - VIA 2 BUTTONS CALIBRATIONS ("1" VERS. ONLY)**

RPL81 has 2 buttons on board, P1 and P2, with which it is possible:
- to program the level measurement range via the 4mA and 20mA distances self-acquisition.
- to program the RL1 and RL2 thresholds via the switching distances self-acquisition.

Button P1          Button P2
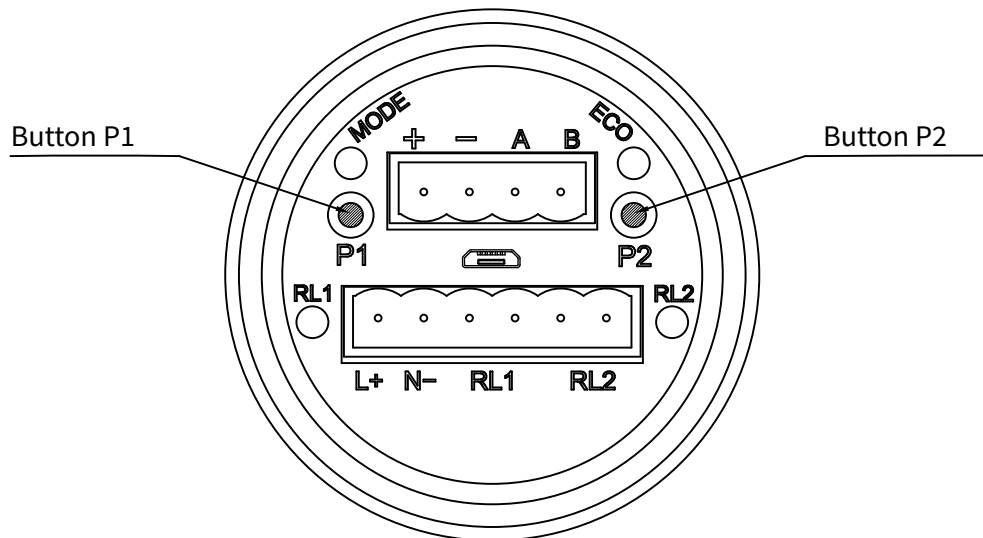
### 7.2.1 - 4mA DISTANCE

To set the 0% level measurement (4mA) it is necessary that the real level is the one corresponding to the "4mA Distance"; alternatively it is possible to place a target orthogonally to the RPL81 transmitter at a distance equivalent to the 0% level.
Wait until the ECO LED flashes for at least 30s, press simultaneously P1 and P2, release them and verify that the ECO LED remains turned on.
Press P1 two times and wait for the ECO LED flashes.
The distance has been saved and automatically associated with the 0% level (4mA).

### 7.2.2 - 20mA DISTANCE

To set the 100% level measurement (4mA) it is necessary that the real level is the one corresponding to the "20mA Distance"; alternatively it is possible to place a target orthogonally to the RPL81 transmitter at a distance equivalent to the 100% level.
Wait until the ECO LED flashes for at least 30s, press simultaneously P1 and P2, release them and verify that the ECO LED remains turned on.
Press P2 two times and wait for the ECO LED flashes.
The distance has been saved and automatically associated with the 100% level (4mA).

### 7.2.3 - RL1 MAX LEVEL THRESHOLD DISTANCE

To set the RL1 maximum level alarm threshold is necessary that the real level is the one corresponding to the "RL1 max. lev. threshold distance"; alternatively it is possible to place a target orthogonally to the RPL81 transmitter at a distance equivalent.
Wait until the ECO LED flashes for at least 30s, press simultaneously P1 and P2, release them and verify that the ECO LED remains turned on.
Press P2 and then P1 and wait for the ECO LED flashes.
The distance has been saved and automatically associated with the RL1 threshold (see default level alarm threshold settings on page 21).

### 7.2.3 - RL2 MIN LEVEL THRESHOLD DISTANCE

To set the RL2 maximum level alarm threshold is necessary that the real level is the one corresponding to the "RL2 min. lev. threshold distance"; alternatively it is possible to place a target orthogonally to the RPL81 transmitter at a distance equivalent.
Wait until the ECO LED flashes for at least 30s, press simultaneously P1 and P2, release them and verify that the ECO LED remains turned on.
Press P1 and then P2 and wait for the ECO LED flashes.
The distance has been saved and automatically associated with the RL2 threshold (see default level alarm threshold settings on page 22).

**7.3 - CALIBRATION / CONFIGURATION VIA VL620/VL621**

The VL620/VL621 programming module can be mounted and removed from the RPL81 without affecting the unit operation.
Unscrewing the cap ("1" vers.), the VL620 module can be connected or disconnected.
For "2" version connect the VL621 module directly to the unit.
The VL620/VL621 module are equipped with matrix LCD.

**N:B: When the VL620/VL621 is connected the communication via MODBUS is inhibited.**

To insert the micro USB connector connector correctly, the following procedure is recommended:

1) disconnect the 2 removable terminals.
2) insert the male micro USB socket of the supplied cableinto the female micro USB socket present between the 2 removable terminals.
3) connect the 2 removable terminals.
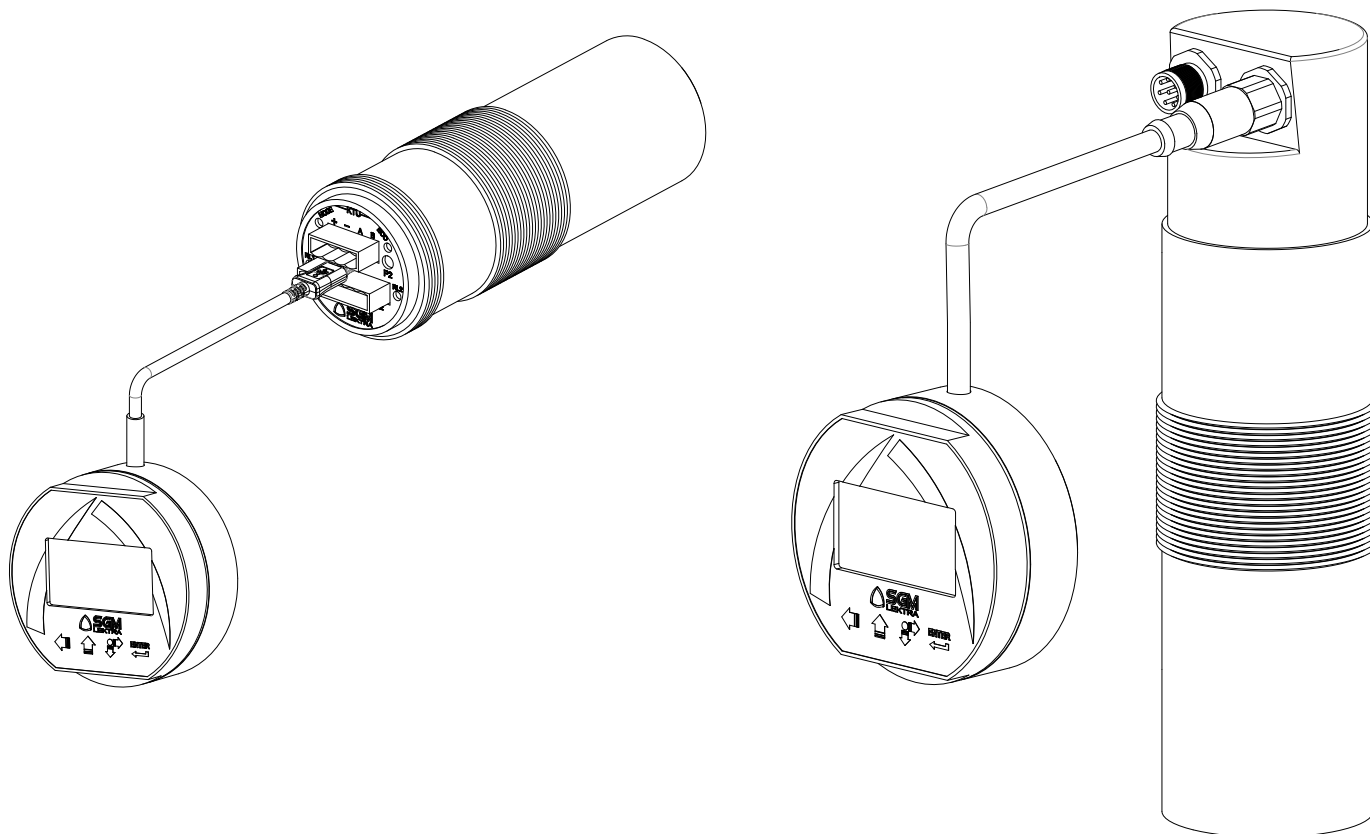
# 8-OPERATOR INTERFACE

### 8.1 - VL620/VL621 FEATURES

The VL620/VL621 program module has 4 buttons which allow to perform all operational, control and programming instrument functions. In the configuration menus, is possible:

1. Submenus and parameters access; press [SCROLL] to select and press [ENTER] to access.

2. Parameter options choice: Press [SCROLL] to select the option and press [ENTER] to store the option.

   Press [LEFT ARROW] to exit without storing.

3. 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 [SCROLL] to select the digit to be modified (the digit is highlighted in inverse ), press [UP ARROW] to change the high

   lighted digits number, press [ENTER] to save the set value and exit automatically.

   Press [LEFT ARROW] to exit without storing.
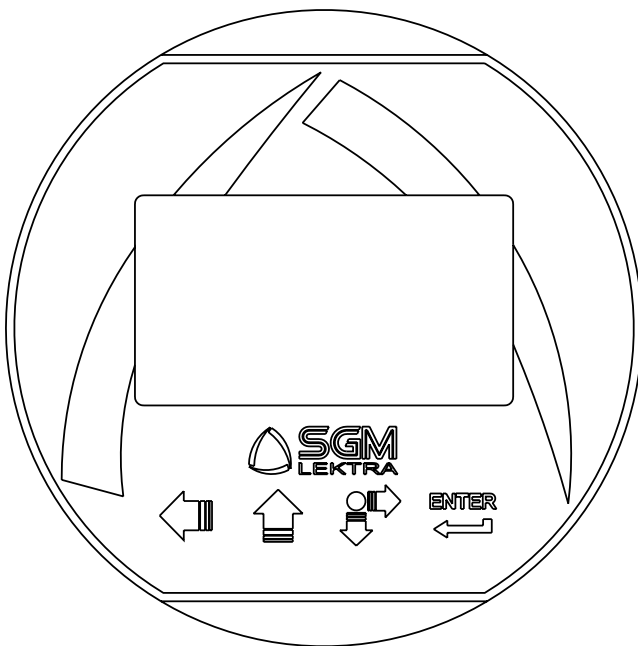
**LEFT ARROW button:**
• **Exit configuration**
• **Back to previous menu**

**UP ARROW button:**
• **Parameter values modification**
• **Parameter scroll**

**SCROLL button:**
• **Cursor movement (to the right)**
• **Parameter scroll**

**ENTER button:**
• **Configuration access**
• **Options confirmation**
• **Parameters values confirmation**
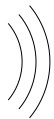
))) Displayed at the bottom indicates the correct echo signal reception

!• Displayed at the top alerts that there is a generic error; press SCROLL to show the message that indicates the present error type.
The RPL81 returns automatically to RUN mode.

**QUICK SETUP** - Menu with easy access for quick basic parameters configuration.
To access: from "RUN" mode press ENTER to the quick setup menu mode access, LEFT ARROW to exit.

**ADVANCED SETUP** - Full menu with access to all parameters, including functional parameters.
It is recommended to carefully read the complete documentation before accessing.
To access: from "RUN" mode, holding down UP ARROW, press ENTER to the advanced configuration mode access, LEFT ARROW to exit.

# 9-QUICK SETUP

## 9.1 - Quick Setup menu structure

| | Parameter Default Values |
|---|---|
| Set Distance 4mA<br>0000 mm | 10000mm |
| Set Distance 20mA<br>0000 mm | 500mm |
| Max Distance<br>00000mm | 00000mm |
| Filter Coefficient<br>000 | 20 |
| Blind Distance<br>0000 mm | 60mm |
| Distance mm<br>Level mm<br>Level %<br>Output mA | Distance mm |
| RL1 Threshold<br>0000 mm | 0mm (Disabled RL1) |
| RL1 Threshold<br>0000 mm | 0mm (Disabled RL2) |

Menu items: Set Distance 4mA → Set Distance 20mA → Max Distance → Filter Coefficient → Blind Distance → Display → RL1 Threshold → RL2 Threshold

## 9.2 - QUICK SETUP MODE

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

$$4321^{D}_{mm}$$

► SET DISTANCE 4mA
  SET DISTANCE 20mA
  MAX DISTANCE
  FILTER COEFFICENT
  BLIND DISTANCE
  DISPLAY
  RL1 THRESHOLD
  RL2 THRESHOLD

Select the parameters by moving the cursor with SCROLL, and confirm with ENTER; press LEFT ARROW to exit.

### 9.2.1 - SET DISTANCE 4mA

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

Use SCROLL and UP ARROW to modify that value; in the example the
4mA distance is 3500mm.
Press ENTER to confirm.

### 9.2.2 - SET DISTANCE 20mA

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

Use SCROLL and UP ARROW to modify that value; in the example the
20mA distance is 500mm.
Press ENTER to confirm.

```
► SET DISTANCE 4mA
  SET DISTANCE 20mA
  MAX DISTANCE
  FILTER COEFFICENT
  BLIND DISTANCE
  DISPLAY
  RL1 THRESHOLD
  RL2 THRESHOLD
```

```
SET DISTANCE 4mA

3500 mm
```

```
  SET DISTANCE 4mA
► SET DISTANCE 20mA
  MAX DISTANCE
  FILTER COEFFICENT
  BLIND DISTANCE
  DISPLAY
  RL1 THRESHOLD
  RL2 THRESHOLD
```

```
SET DISTANCE 20mA

0500 mm
```

RPL81
Reference point

20mA Distance

100%

Lelev measurement

0%
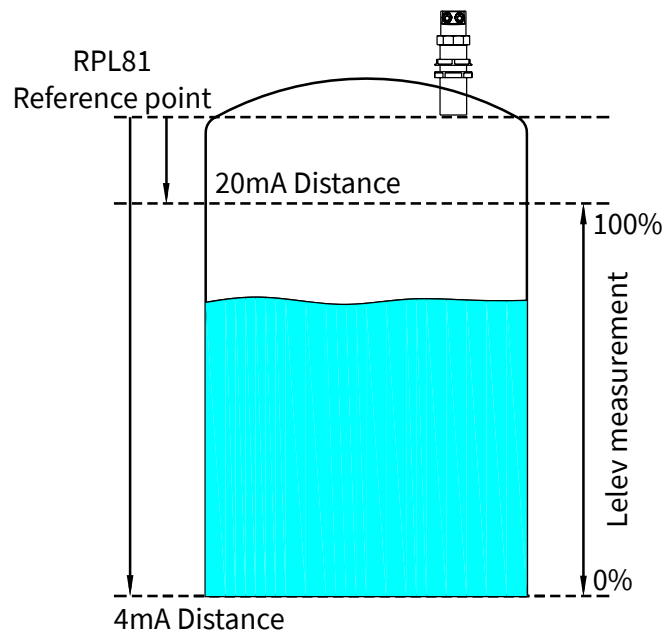
4mA Distance

### 9.2.3 - MAX DISTANCE

Press the ENTER key to display the previously set maximum distance value.
The MAX DISTANCE is used to prevent the sensor from detecting an echo signal at a distance .

Use SCROLL and UP ARROW to modify the value; in the example, the maximum measurement distance is 3600mm.

The function is disabled with the value set to 00000mm.

To confirm press ENTER.

```
  SET DISTANCE 4mA
  SET DISTANCE 20mA
► MAX DISTANCE
  FILTER COEFFICENT
  BLIND DISTANCE
  DISPLAY
  RL1 THRESHOLD
  RL2 THRESHOLD
```

```
      MAX DISTANCE

    00000 mm
```
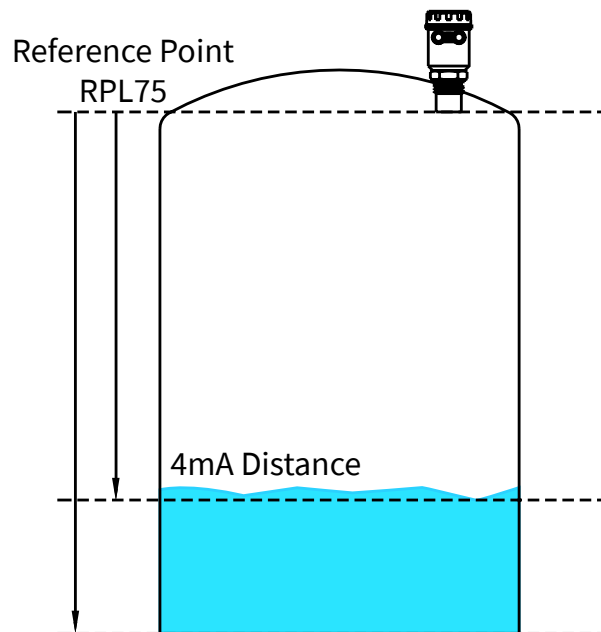
### 9.2.4 - FILTER COEFFICIENT

Press ENTER.
Use SCROLL and UP ARROW to modify the value.
Input a value from 1 to 99.
1 maximum speed, 99 maximum slowness.
The function is deactivated with 0 (immediate response).
Press ENTER to confirm.

SET DISTANCE 4mA
SET DISTANCE 20mA
MAX DISTANCE
► FILTER COEFFICENT
BLIND DISTANCE
DISPLAY
RL1 THRESHOLD
RL2 THRESHOLD

FILTER COEFFICENT

20

**Fast resp. 5÷10**
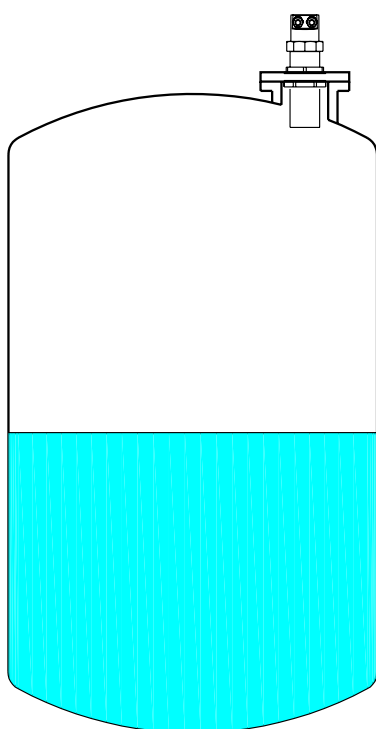
**Normal resp. 20**
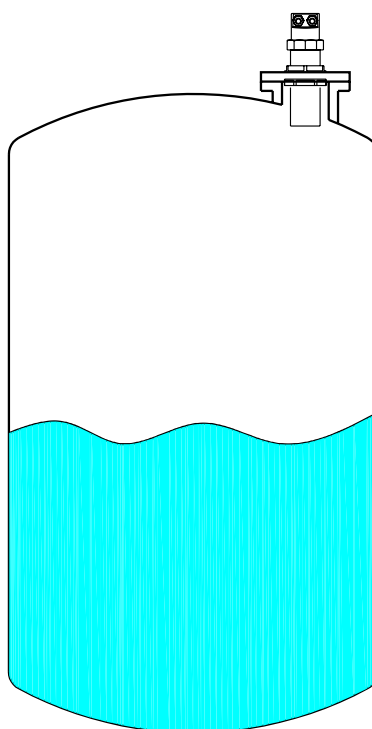
**Slow resp. 40÷100**

## 9.2.5 - BLIND DISTANCE

| SET DISTANCE 4mA |
| SET DISTANCE 20mA |
| MAX DISTANCE |
| FILTER COEFFICENT |
| ► BLIND DISTANCE |
| DISPLAY |
| RL1 THRESHOLD |
| RL2 THRESHOLD |
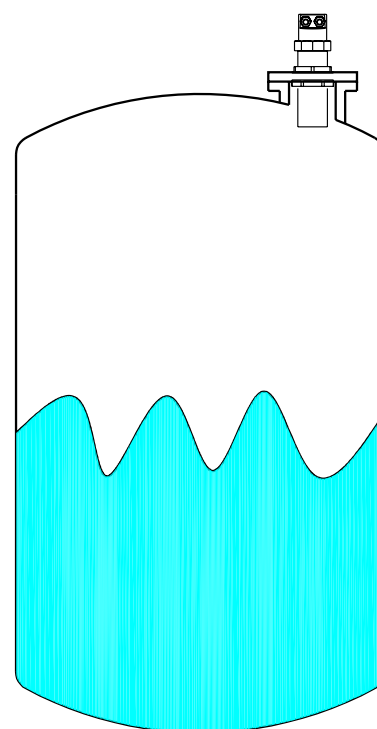
Press ENTER.
The BLIND ZONE is used to avoid undesired measures near the transmitter.

BLIND DISTANCE

0050 mm

Use SCROLL and UP ARROW to modify the value. Press ENTER to confirm.
The minimum value is 0050mm.

RPL81
Reference point

BLIND ZONE

BLIND
DISTANCE

## 9.2.6 - DISPLAY

| SET DISTANCE 4mA |
| SET DISTANCE 20mA |
| MAX DISTANCE |
| FILTER COEFFICENT |
| BLIND DISTANCE |
| ► DISPLAY |
| RL1 THRESHOLD |
| RL2 THRESHOLD |
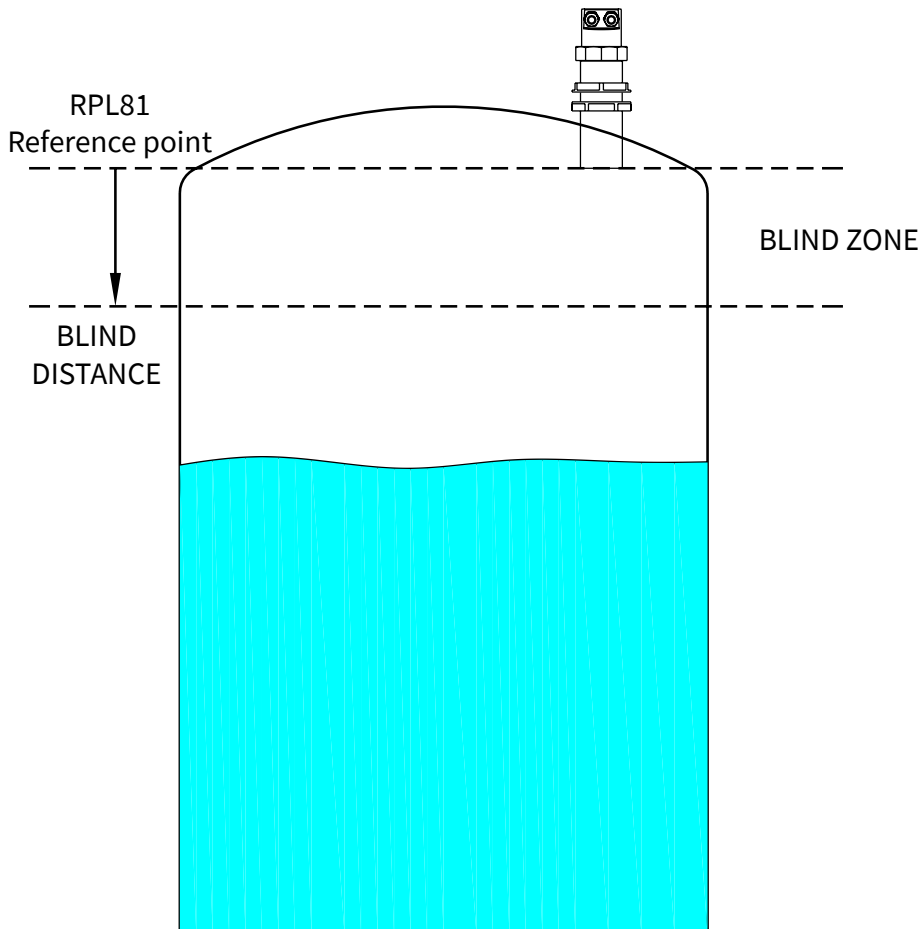
Press ENTER to access the settings change.

| ► DISTANCE mm |
| LEVEL mm |
| LEVEL % |
| OUTPUT mA |

With the SCROLL button is possible to select the data to display.
Press ENTER to confirm.

### 9.2.7 RL1 THRESHOLD

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

Use SCROLL and UP ARROW to modify the value; in the example the
RL1 max. level threshold distance is 700mm.
Press ENTER to confirm.

NB - RL1 inactive with 0000mm

```
SET DISTANCE 4mA
SET DISTANCE 20mA
MAX DISTANCE
FILTER COEFFICENT
BLIND DISTANCE
DISPLAY
► RL1 THRESHOLD
RL2 THRESHOLD
```

```
RL1 THRESHOLD

0700 mm
```

### 9.2.8 - RL2 THRESHOLD

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

Use SCROLL and UP ARROW to modify the value; in the example
the RL2 min. level threshold distance is 3000mm.
Press ENTER to confirm.

NB - RL2 inactive with 0000mm

```
SET DISTANCE 4mA
SET DISTANCE 20mA
MAX DISTANCE
FILTER COEFFICENT
BLIND DISTANCE
DISPLAY
RL1 THRESHOLD
►RL2 THRESHOLD
```

```
RL2 THRESHOLD

3000 mm
```

When confirming with the ENTER button the maximum level threshold value storage, in the example 3000mm,
the RPL81 activates RL2 with the following default settings for level alarm threshold:
1) MIN / MAX = MAX; maximum distance 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.
5) MIN/MAX HYSTERESIS mm = 40mm.

To change these relay settings it is necessary to access the advanced setup menu and any subsequent
changes to the RL2 threshold value will not affect the relay custom settings.
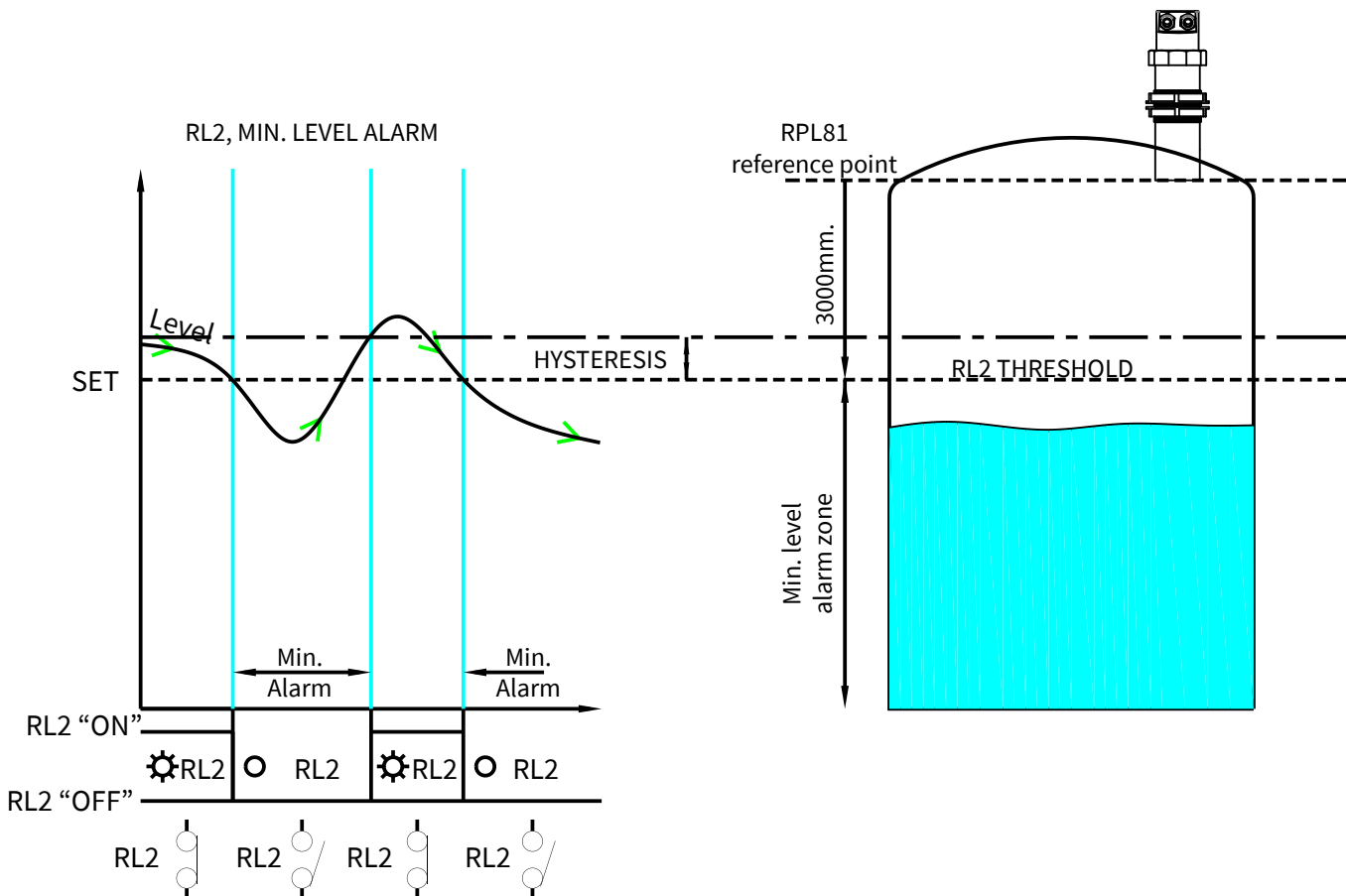
# 10-ADVANCED CONFIGURATION

## 10.1 - "SETUP" MENU

```
SETUP ──────────┬──► SET DISTANCE 4mA ────────► SET DISTANCE 4mA
                │                                 0000mm
                ├──► SET DISTANCE 20mA ──────────► SET DISTANCE 20mA
                │                                 0000mm
                ├──► MAX DISTANCE ───────────────► MAX DISTANCE
                │                                 00000mm
                ├──► FILTER COEFFICIENT ─────────► FILTER COEFFICENT
                │                                 000
                ├──► BLIND DISTANCE ─────────────► BLIND DISTANCE
                │                                 0000mm
                ├──► ACTUAL LEVEL 4mA ───────────► OK to confirm
                ├──► ACTUAL LEVEL 20mA
                └──► RELAY ──────────┬──► RL1 THRESHOLD ──┬──► VALUE ────────► VALUE
                                     ├──► RL2 THRESHOLD   │                    0000mm
                                     │                    ├──► MIN/MAX ──────► >MIN
                                     │                    │                    MAX
                                     │                    ├──► DELAY ────────► DELAY
                                     │                    │                    00 s
                                     │                    ├──► SAFETY ───────► >NO
                                     │                    │                    YES
                                     │                    ├──► ENABLE/DISABLE ► >DISABLE
                                     │                    │                     ENABLE
                                     │                    └──► MIN/MAX HYSTERESIS mm ─► MIN/MAX HYSTERESIS mm
                                     │                                                 040 mm
                                     └──► RL1 PUMP ──┬──► UPPER ──────► VALUE
                                                     │                 0000mm
                                                     ├──► LOWER ──────► VALUE
                                                     │                 0000mm
                                                     ├──► DELAY ──────► DELAY
                                                     │                 00 s
                                                     ├──► FILL./EMPT. ► >EMPTING
                                                     │                  FILLING
                                                     └──► ENABLE/DISABLE ► >DISABLE
                                                                          ENABLE
```

## 10.2 - SETUP

$$4321 \, {}^{D}_{mm}$$

From "RUN" mode, holding down UP ARROW, press ENTER to the advanced setup mode access.

```
► SETUP
  DISPLAY
  DIAGNOSTIC
  SERVICE
  INFO
```

Press SCROLL to select the menu and press ENTER to access.
Press LEFT ARROW to exit.

```
► SET DISTANCE 4mA
  SET DISTANCE 20mA
  MAX DISTANCE
  FILTER COEFFICIENT
  BLIND DISTANCE
  ACTUAL LEV. 4mA
  ACTUAL LEV. 20mA
  RELAYS
```

**10.2.1 - SET DISTANCE 4mA**

Position the cursor on DISTANCE 4mA, press ENTER to access.

```
► SET DISTANCE 4mA
  SET DISTANCE 20mA
  MAX DISTANCE
  FILTER COEFFICIENT
  BLIND DISTANCE
  ACTUAL LEV. 4mA
  ACTUAL LEV. 20mA
  RELAYS
```

Use UP ARROW and SCROLL to modify the value.
Press ENTER to confirm.
LEFT ARROW to exit without changes.

Default value: 10000mm

```
SET DISTANCE 4mA

10000 mm
```

**10.2.2 - SET DISTANCE 20mA**

Position the cursor on DISTANCE 20mA, press ENTER to access.

```
  SET DISTANCE 4mA
► SET DISTANCE 20mA
  MAX DISTANCE
  FILTER COEFFICIENT
  BLIND DISTANCE
  ACTUAL LEV. 4mA
  ACTUAL LEV. 20mA
  RELAYS
```

Use UP ARROW and SCROLL to modify the value.
Press ENTER to confirm.
LEFT ARROW to exit without changes.

Default value: 500mm

```
SET DISTANCE 20mA

500 mm
```

**10.2.3 - MAX DISTANCE**

Press the ENTER key to display the previously sei maximum distance value.
The MAX DISTANCE is used to prevent the sensor from detecting an echo signal
at a distance outside its maximum application distance (eg tank botton).

Use SCROLL and UP ARROW to modify the value;
in the example, the maximum measurement distance is 3600mm.

The function is disabled with the value set to 00000mm.
To confirm press ENTER.
Defaoult value: 00000mm.

```
  SET DISTANCE 4mA
  SET DISTANCE 20mA
► MAX DISTANCE
  FILTER COEFFICIENT
  BLIND DISTANCE
  ACTUAL LEV. 4mA
  ACTUAL LEV. 20mA
  RELAYS
```

```
MAX DISTANCE

00000 mm
```

**10.2.4 - FILTER COEFFICIENT**

Position the cursor on FILTER COEFFICIENT, press ENTER to access.

```
  SET DISTANCE 4mA
  SET DISTANCE 20mA
  MAX DISTANCE
► FILTER COEFFICIENT
  BLIND DISTANCE
  ACTUAL LEV. 4mA
  ACTUAL LEV. 20mA
  RELAYS
```

Enter a value from 1 to 99: 1 maximum speed, 99 maximum slowness.
The function is deactivated with 0 (immediate response)
Use UP ARROW and SCROLL to modify the value.
Press ENTER to confirm.
LEFT ARROW to exit without changes.

Default value: 20

```
FILTER COEFFICENT

20
```

```
SET DISTANCE 4mA
SET DISTANCE 20mA
MAX DISTANCE
FILTER COEFFICIENT
► BLIND DISTANCE
ACTUAL LEV. 4mA
ACTUAL LEV. 20mA
RELAYS
```

### 10.2.5 - BLIND DISTANCE

Position the cursor on DISTANCE 4mA, press ENTER to access.
Represent the "BLIND ZONE".

Input the desired value in order to avoid measures near the surface of
the sensor (if necessary).
The minimum value is 0050mm.
Use UP ARROW and SCROLL to modify the value.
Press ENTER to confirm.
LEFT ARROW to exit without changes.

Default values: 60mm

```
BLIND DISTANCE

60 mm
```

### 10.2.6 - ACTUAL LEV. 4mA

Position the cursor on ACTUAL LEV. 4mA, press ENTER to access.

```
SET DISTANCE 4mA
SET DISTANCE 20mA
MAX DISTANCE
FILTER COEFFICIENT
BLIND DISTANCE
► ACTUAL LEV. 4mA
ACTUAL LEV. 20mA
RELAYS
```

Self distance learning function that is associated with the 4mA
(lower value). Make sure that the level corresponds to 0%,
ENTER to associate the actual measure with 4mA output value;
OK TO CONFIRM .
LEFT ARROW to exit without changes.

### 10.2.7 - ACTUAL LEV. 20mA

Position the cursor on ACTUAL LEV. 20mA, press ENTER to access.

```
SET DISTANCE 4mA
SET DISTANCE 20mA
MAX DISTANCE
FILTER COEFFICIENT
BLIND DISTANCE
ACTUAL LEV. 4mA
► ACTUAL LEV. 20mA
RELAYS
```

Self distance learning function that is associated with the 20mA
(upper value). Make sure that the level corresponds to 100%,
ENTER to associate the actual measure with 20mA output value;
OK TO CONFIRM .
LEFT ARROW to exit without changes.

### 10.2.8 - RELAYS

Position the cursor on RELAYS, press ENTER to access.

```
SET DISTANCE 4mA
SET DISTANCE 20mA
MAX DISTANCE
FILTER COEFFICIENT
BLIND DISTANCE
ACTUAL LEV. 4mA
ACTUAL LEV. 20mA
►RELAYS
```

In this sub-menù it's possible to setup onboard relays
RL1 can be set as threshold relay or pump-control relay;
RL2 can be set as threshold relay or diagnostic relay.
With the SCROLL button you can select the operation mode,
then pressing ENTER to confirm the selection

```
►RL1 THRESHOLD
 RL2 THRESHOLD
 RL1 PUMP
```

### 10.2.8.1 - RL1 THRESHOLD (RL2 THRESHOLD equivalent)

Position the cursor on RL1 THRESHOLD, press ENTER to access.

```
►RL1 THRESHOLD
 RL2 THRESHOLD
 RL1 PUMP
```

In this submenu you can set the set-point and the relay 1 and 2
action type.
With the SCROLL button you can select the parameter to be programmed.
Press ENTER to confirm

```
►VALUE
 MIN/MAX
 DELAY
 SAFETY
 ANABLE/DISABLE
 MIN/MAX HYSTERESIS
```

### 10.2.8.1.1 - VALUE

Position the cursor on VALUE, press ENTER to access.

```
►VALUE
 MIN/MAX
 DELAY
 SAFETY
 ANABLE/DISABLE
 MIN/MAX HYSTERESIS
```

It's possible to input the threshold value that corresponds to the
distance in mm from the sensor.
Use UP ARROW and SCROLL to modify the value.
Press ENTER to confirm.
LEFT ARROW to exit without changes.

Default value: 0000mm
NB-RL1/2 inactive with 0000mm

```
VALUE

1000 mm
```

### 10.2.8.1.2 - MIN/MAX

Position the cursor on VALUE, press ENTER to access.

```
 VALUE
►MIN/MAX
 DELAY
 SAFETY
 ANABLE/DISABLE
 MIN/MAX HYSTERESIS
```

It's possible to select if the relay works as maximum level threshold or
minimum level threshold.
With the SCROLL button you can select the operation mode.
Press ENTER to confirm.
LEFT ARROW to exit without changes.

Default value: MAX for RL1; MIN for RL2

```
 MIN
►MAX
```

### 10.2.8.1.3 - DELAY

Position the cursor on DELAY, press ENTER to access.

```
  VALUE
  MIN/MAX
► DELAY
  SAFETY
  ANABLE/DISABLE
  MIN/MAX HYSTERESIS
```

It's possible to set the activation delay for the selected relay, from 0 to 99 sec.
Use UP ARROW and SCROLL to modify the value.
Press ENTER to confirm.
LEFT ARROW to exit without changes.

Default value: 00s

```
       DELAY

      00 s
```

### 10.2.8.1.4 - SAFETY

Position the cursor on SAFETY, press ENTER to access.

```
  VALUE
  MIN/MAX
  DELAY
► SAFETY
  ANABLE/DISABLE
  MIN/MAX HYSTERESIS
```

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 SCROLL button you can select the alarm mode.
Press ENTER to confirm.
LEFT ARROW to exit without changes.

Default value: YES

```
  NO
► YES
```

### 10.2.8.1.5 - ENABLE/DISABLE

Position the cursor on ENABLE/DISABLE, press ENTER to access.

```
  VALUE
  MIN/MAX
  DELAY
  SAFETY
► ANABLE/DISABLE
  MIN/MAX HYSTERESIS
```

Select ENABLE to activate relay threshold.
Select DISABLE to not activate relay threshold.
With the SCROLL button you can select the operation mode.
Press ENTER to confirm.
LEFT ARROW to exit without changes.

Default value: DISABLE

```
  DISABLE
► ENABLE
```

### 10.2.8.1.6 - MIN/MAX HYSTERESIS mm

Position the cursor on MIN/MAX HYSTERESIS mm, press ENTER to access.

```
  VALUE
  MIN/MAX
  DELAY
  SAFETY
  ANABLE/DISABLE
► MIN/MAX HYSTERESIS
```

It's possible to input the threshold hysteresis.
Use UP ARROW and SCROLL to modify the value.
Press ENTER to confirm.
LEFT ARROW to exit without changes.

Default value: 40mm

```
  MIN/MAX HYSTERESIS mm

      040 mm
```

### 10.2.8.2 - RL1 PUMP (only for RL1)

Position the cursor on RL1 PUMP, press ENTER to access.

```
  RL1 THRESHOLD
  RL2 THRESHOLD
► RL1 PUMP
```

A pump control functioning activation, with hysteresis, is possible two thresholds setting is required:
upper and lower threshold.
With the SCROLL button you can select the parameter to be programmed.
Press ENTER to confirm.

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

### 10.2.8.2.1 - UPPER

Position the cursor on UPPER, press ENTER to access.
The upper threshold is expressed in mm distance from the sensor.
Represents the pump starting point, EMPTY case, or pump stopping point, FILLING case.

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

Use UP ARROW and SCROLL to modify the value.
Press ENTER to confirm.
LEFT ARROW to exit without changes.

Default value: 0

```
        VALUE

      0900 mm
```

### 10.2.8.2.2 - LOWER

Position the cursor on LOWER, press ENTER to access.
The lower threshold is expressed in mm distance from the sensor.
Represents the pump stopping point, EMPTY case, or pump starting point, FILLING case.

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

Use UP ARROW and SCROLL to modify the value.
Press ENTER to confirm.
LEFT ARROW to exit without changes.

Default value: 0
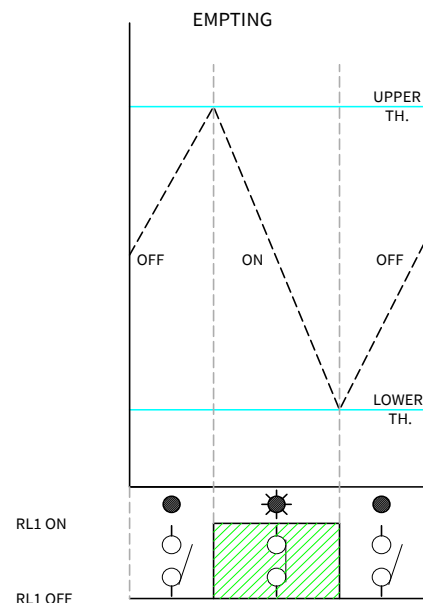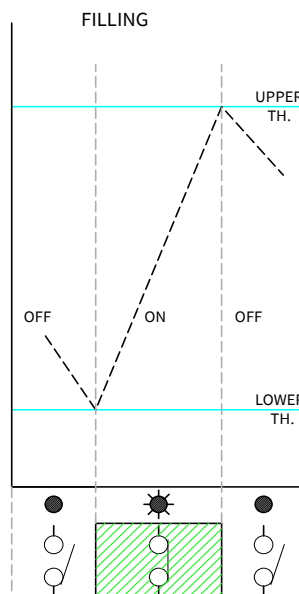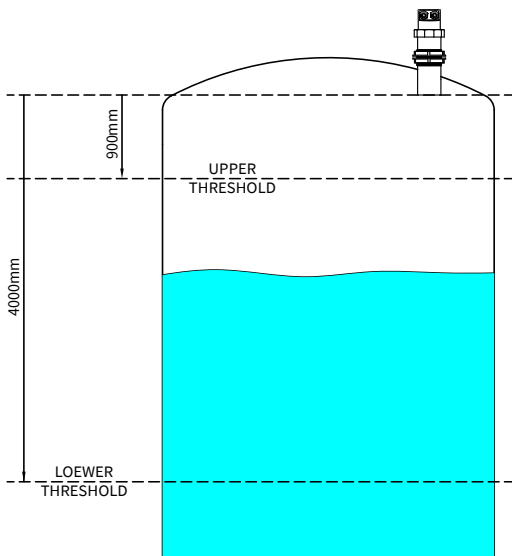
```
        VALUE

      4000 mm
```

**10.2.8.2.3 - DELAY**

Position the cursor on DELAY, press ENTER to access.

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

Set the relay delay activation, from 0 to 99 sec.
Use UP ARROW and SCROLL to modify the value.
Press ENTER to confirm.
LEFT ARROW to exit without changes.

Default value: 0

```
        DELAY

      05 s
```

**10.2.8.2.4 - FILL./EMPT**

Position the cursor on DELAY, press ENTER to access.

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

It's possible to select the mode of pump control (FILLING or EMPTING).
With the SCROLL button you can select the operation mode.
Press ENTER to confirm.
LEFT ARROW to exit without changes.

Default value: EMPTING

```
► EMPTING
  FILLING
```

**10.2.8.2.5 - ENABLE/DISABLE**

Position the cursor on ENABLE/DISABLE, press ENTER to access.

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

Select ENABLE to activate relay threshold.
Select DISABLE to not activate relay threshold.
With the SCROLL button you can select the operation mode.
Press ENTER to confirm.
LEFT ARROW to exit without changes.

Default value: DISABLE

```
► DISABLE
  ENABLE
```

**10.3 - "DISPLAY" menu**

```
DISPLAY ──────────► DISPLAY VALUES ──────►  >1 VALUE      ───►  DISTANCE mm
                                             2 VALUES            LEVEL mm
                                                                 LEVEL %
                                                                 OUTPUT mA

                                             1 VALUE       ──┐
                                            >2 VALUES        │
                                                             ├──►  >PRIMARY VALUE    ──►  DISTANCE mm
                                                             │      SECONDARY VALUE       LIVEL mm
                                                             │                            LIVEL %
                    LCD CONTRAST ──────────►  LCD CONTRAST   │                            OUTPUT mA
                                                 00          │
                                                             └──►  PRIMARY VALUE
                    WELCOME TEXT ──────────►  WELCOME TEXT        >SECONDARY VALUE
                                            SGM-LEKTRA RPL81
```
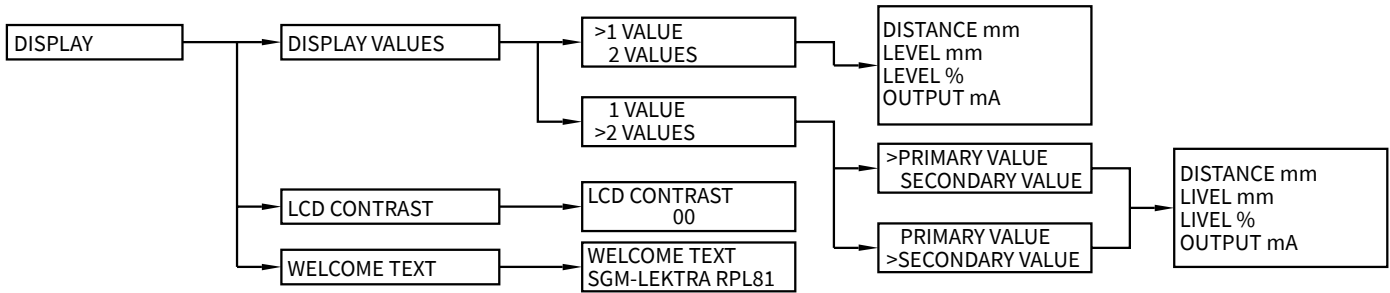
**10.4 - DISPLAY**

From "RUN" mode, holding down UP ARROW, press ENTER to access.
Position the cursor on DISPLAY and press ENTER.
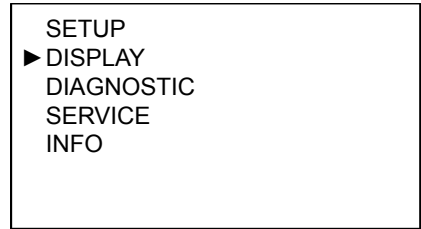
```
   SETUP
 ►DISPLAY
   DIAGNOSTIC
   SERVICE
   INFO
```

Select the parameters by moving the cursor with SCROLL and confirm with ENTER.

```
 ►DISPLAY VALUES
   LCD CONTRAST
   WELCOME TEXT
```

**10.4.1 - DISPLAY VALUES**

Position the cursor on DISPLAY VALUES, press ENTER to access.

```
 ►DISPLAY VALUES
   LCD CONTRAST
   WELCOME TEXT
```
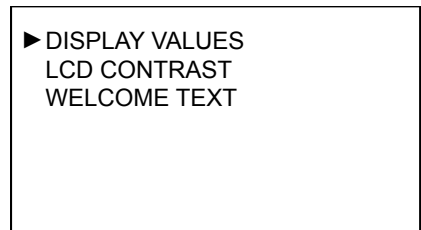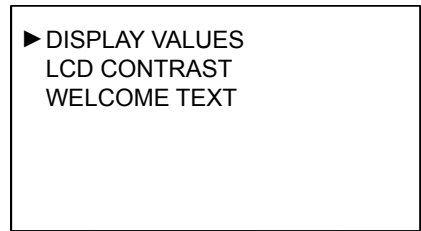
It's possible to select if one value with big digits or two values are shown on the display in "RUN" mode.
Select the parameters by moving the cursor with SCROLL and confirm with ENTER.
LEFT ARROW to exit without changes.

```
 ►1 VALUE
   2 VALUES
```
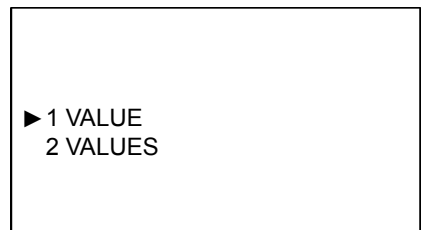
**10.4.1.1 - 1 VALUE**

Position the cursor on 1 VALUE, press ENTER to access.

```
 ►1 VALUE
   2 VALUES
```
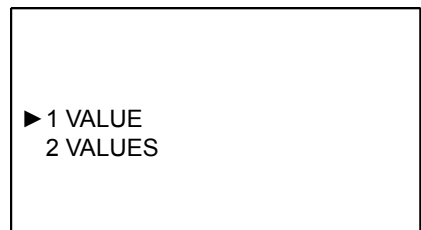
Only one value is displayed; it's possible to choose from 4 parameters.
With the SCROLL button you can select data to display.
Press ENTER to confirm.
LEFT ARROW to exit without changes.

```
 ►DISTANCE mm
   LEVEL mm
   LEVEL %
   OUTPUT mA
```

```
  4321 ᴰ
        mm
```
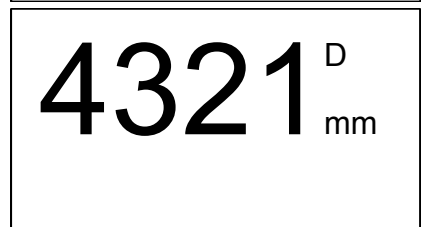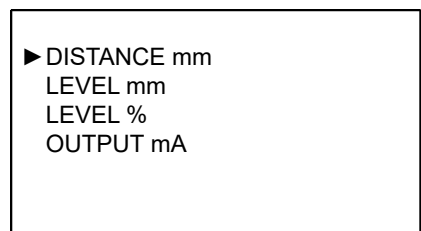
### 10.4.1.2 - 2 VALUE

Position the cursor on 2 VALUE, press ENTER to access.

```
 1 VALUE
►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 4 parameters.
With the SCROLL button you can select data to display.
Press ENTER to confirm.
LEFT ARROW to exit without changes.

```
►PRIMARY VALUE
 SECONDARY VALUE
```

```
►DISTANCE mm
 LEVEL mm
 LEVEL %
 OUTPUT mA
```

```
 PRIMARY VALUE
►SECONDARY VALUE
```

```
 DISTANCE mm
►LEVEL mm
 LEVEL %
 OUTPUT mA
```

### 10.4.2 - LCD CONTRAST

Position the cursor on LCD CONTRAST, press ENTER to access.

```
 DISPLAY VALUES
►LCD CONTRAST
 WELCOME TEXT
```

it's possible to adjust the contrast of LCD, simply increasing or decreasing the value of a parameter from 0 to 63.
Use UP ARROW and SCROLL to modify the value.
Press ENTER to confirm.
LEFT ARROW to exit without changes.

Default value: 22

```
LCD CONTRAST

22
```

### 10.4.3 - WELCOME TEXT

Position the cursor on WELCOME TEXT, press ENTER to access.

```
 DISPLAY VALUES
 LCD CONTRAST
►WELCOME TEXT
```

It's possible to edit or delete the message that is displayed by the RPL81 during the ignition phase.
Use UP ARROW (up scroll) and SCROLL (down scroll) to change the digit; ENTER to move the digit to the right. To confirm press ENTER repeatedly until leave the parameter.
LEFT ARROW to exit without changes.

Default value: SGM-LEKTRA RPL81

```
WELCOME TEXT

SGM-LEKTRA
RPL81
```

**10.5 - "DIAGNOSTIC" menu**

```
DIAGNOSTIC ──────► ALARM CONFIGURATION ──────► NO ECHO FOUND      ──────► DISABLE
                                                ECHO IN BLIND             >ENABLE
                                                DISTANCE >120%

                 ► MEASURE STATUS ──────► 00.00

                 ► PEAK VALUES ──────► >DISPLAY VALUES ──────► PEAK VALUES
                                        RESET VALUES            Max  0000mm
                                                                Min  0000mm

                 ► OUTPUT SIMUL ──────► OUTPUT SIMUL
                                         00.0mA

                 ► LOW DK FILTER ──────► START DIST. ──────► 00000 mm
                                         G. ATTENUATION ──────► 02
```
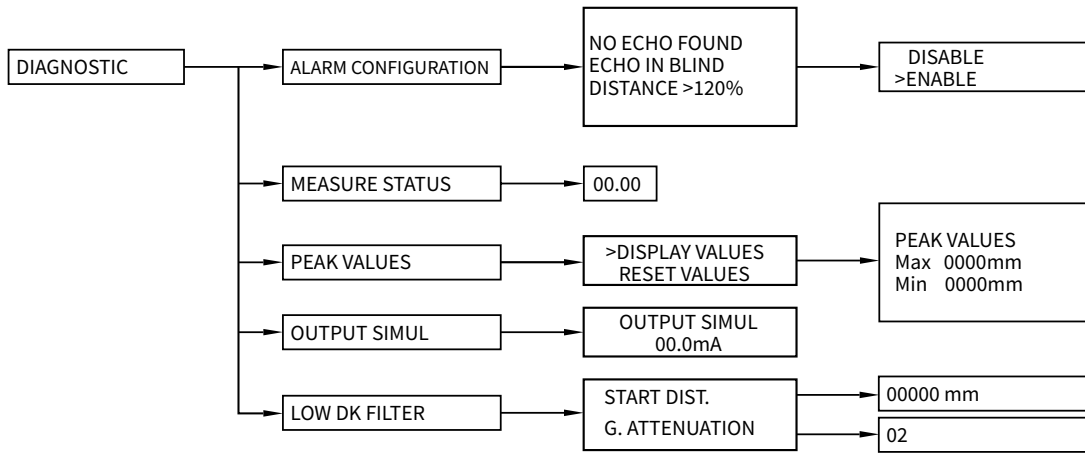
**10.6 - DIAGNOSTIC**

From "RUN" mode, holding down UP ARROW, press ENTER to access.
Position the cursor on DIAGNOSTIC and press ENTER.

```
SETUP
DISPLAY
►DIAGNOSTIC
SERVICE
INFO
```

Select the parameters by moving the cursor with SCROLL and confirm
with ENTER.

```
►ALARM CONFIGURATION
 MEASURE STATUS
 PEAK VALUES
 OUTPUT SIMUL.
 LOW DK FILTER
```

**10.6.1 - ALARM CONFIGURATION**

Position the cursor on ALARM CONFIGURATION, press ENTER to access.

To enable or disable each diagnostic alarms.

- with UP ARROW or SCROLL chose the desired item and press ENTER.

```
►ALARM CONFIGURATION
 MEASURE STATUS
 PEAK VALUES
 OUTPUT SIMUL.
 LOW DK FILTER
```

```
►NO ECHO FOUND
 ECHO IN BLIND
 DISTANCE  >120%
```

- with UP ARROW or SCROLL enable or disable the alarm signal and
  press ENTER to confirm.

```
 DISABLE
►ENABLE
```

## 10.6.2 - MEASURE STATUS

Position the cursor on MEASURE STATUS, press ENTER to access.

```
ALARM CONFIGURATION
► MEASURE STATUS
  PEAK VALUES
  OUTPUT SIMUL.
  LOW DK FILTER
```

It's possible to display a value proportional to the goodness of the installation.
During installation search for the maximum value.
LEFT ARROW to exit

```
MEASURE STATUS

G: 00000
```

## 10.6.3 - PEAK VALUES

Position the cursor on PEAK VALUES, press ENTER to access.

```
ALARM CONFIGURATION
  MEASURE STATUS
► PEAK VALUES
  OUTPUT SIMUL.
  LOW DK FILTER
```

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 SCROLL button you can select the function.
Press ENTER to confirm.

```
► DISPLAY VALUES

  RESET VALUES
```

### 10.6.3.1 - DISPLAY VALUES

Position the cursor on DISPLAY VALUES, press ENTER to access.

```
► DISPLAY VALUES

  RESET VALUES
```

Displays the max. and min. distance measured from power on.
LEFT ARROW to exit.
NB - The peak values stored are erased every time the RPL81 turns-off

```
PEAK VALUES

MAX     0000mm

MIN     0000mm
```

### 10.6.3.2 - RESET VALUES

Position the cursor on RESET VALUES, press ENTER to access.

LEFT ARROW to return to the previous menu.

```
  DISPLAY VALUES

► RESET VALUES
```

## 10.6.4 - OUTPUT SIMULATION

WARNING - 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 LEFT ARROW
button 3 times (RUN mode).

Position the cursor on OUTPUT SIMULATION, press ENTER to access.

It's possible to force the analog output to a desired value, from 3,5 to 21mA.
Use UP ARROW and SCROLL to modify the value.
LEFT ARROW to return to the previous menu.

```
ALARM CONFIGURATION
  MEASURE STATUS
  PEAK VALUES
► OUTPUT SIMUL.
  LOW DK FILTER
```

```
OUTPUT SIMUL.

04.0mA
```
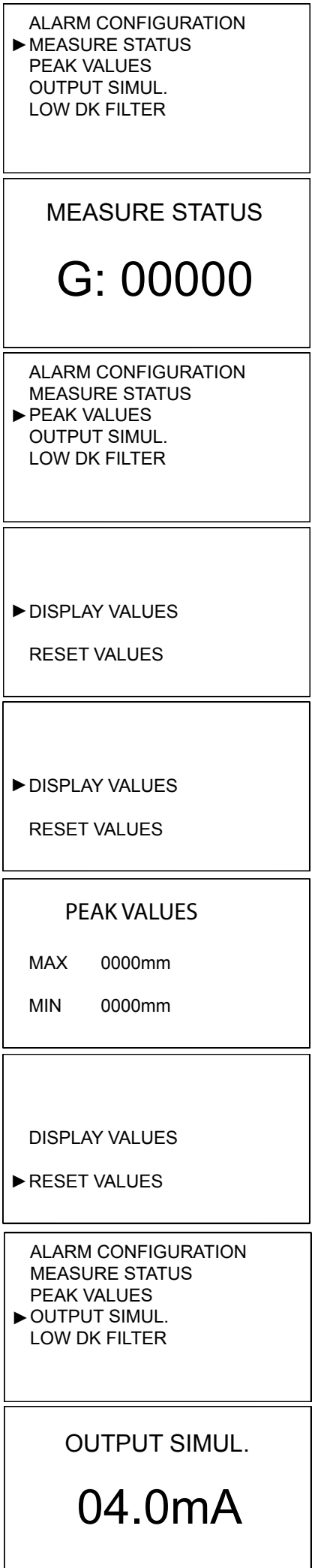
### 10.6.5 - LOW DK FILTER

In level measurement applications with products having a low dielectric constant value (e.g. oils), the radar pulses can pass through the product and reflect on the bottom of the tank.

"LOW DK FILTER" has the function of attenuating any echo signals reflected from the bottom of the tank to prevent them, under certain conditions, from being acquired as an incorrect empty tank level measurement.

You can enable or disable the "LOW DK FILTER" function.
Place the cursor on LOW DK FILTER and press ENTER to enter.

```
ALARM CONFIGURATION
MEASURE STATUS
PEAK VALUES
OUTPUT SIMUL.
►LOW DK FILTER
```

### 10.6.5.1 - START DIST.

Position cursor on START DIST. and press ENTER.
It is possible to set the distance from the RPL sensor beyond which the attenuation of the received echo signals is activated.
By setting 00000mm the LOW DK FILTER function is disabled.
Setting 25000mm START DIST. is in dynamic mode; in this case the activation distance will correspond to the distance of the first echo signal generated by the target and will change dynamically according to the target's movement.

Use UP ARROW and SCROLL to modify the value.
Press ENTER to confirm.
LEFT ARROW to exit without changes.
Default value: 0000mm

```
►START DIST.
 G. ATTENUATION
```

```
START DIST.

00000  mm
```

### 10.6.5.2 - G. ATTENUATION

Place the cursor on G. ATTENUATION and press ENTER.
It is possible to set the efficiency attenuation factor of the echo signals detected at a distance greater than the value set in the START DIST. parameter.

Use UP ARROW and SCROLL to modify the value.
Press ENTER to confirm.
LEFT ARROW to exit without changes.
Default value: 0000mm

```
START DIST.
►G. ATTENUATION
```

```
G. ATTENUATION

02
```

**10.7 - "SERVICE" menu**

```
                                                        ┌──────────────────────┐
                                                        │   21.5 mA            │
                  ┌────────────────┐   ┌──────────────┐ │   3.85 mA            │
                  │ SERVICE        │──▶│ OUTPUT SAFE  │▶│  >HOLD LAST VALUE    │
                  └────────────────┘   │ MODE         │ └──────────────────────┘
                         │             └──────────────┘
                         │             ┌──────────────┐ ┌──────────────────────┐
                         ├────────────▶│ SET UID      │▶│   SET UID            │
                         │             └──────────────┘ │   000                │
                         │                              └──────────────────────┘
                         │             ┌──────────────┐ ┌──────────────────────┐
                         │             │              │ │   ENGLISH            │
                         ├────────────▶│ LANGUAGE     │▶│  >ITALIANO           │
                         │             └──────────────┘ │   FRANCAIS           │
                         │                              └──────────────────────┘
                         │             ┌──────────────┐ ┌──────────────────────┐
                         ├────────────▶│ F_WINDOW     │▶│   F_WINDOW           │
                         │             └──────────────┘ │   00                 │
                         │                              └──────────────────────┘
                         │             ┌──────────────┐ ┌──────────────────────┐
                         ├────────────▶│ RESTORE      │▶│ OK TO CONFIRM        │
                         │             │ SETTINGS     │ └──────────────────────┘
                         │             └──────────────┘
                         │             ┌──────────────┐ ┌──────────────────────┐
                         └────────────▶│ BLUETOOTH    │▶│ CANGE DEVICE PIN     │
                                       └──────────────┘ └──────────────────────┘
                                               │        ┌──────────────────────┐
                                               └───────▶│ RESET MODULE         │
                                                        └──────────────────────┘
```
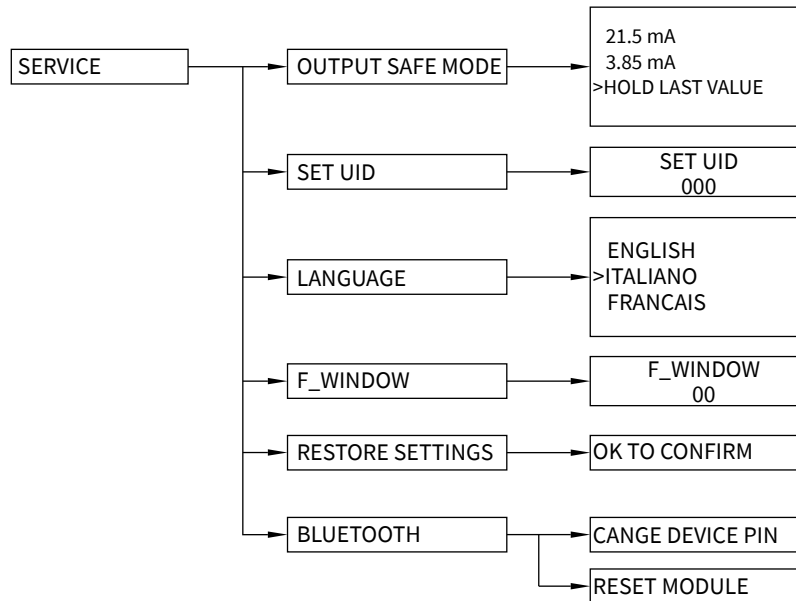
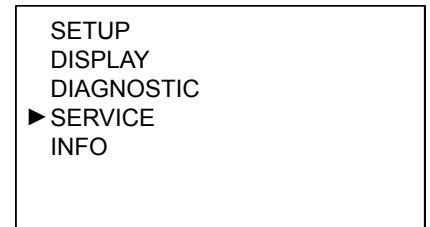**10.8 - SERVICE**

From "RUN" mode, holding down UP ARROW, press ENTER to access. Position the cursor on SERVICE and press ENTER.

```
┌──────────────────────┐
│   SETUP              │
│   DISPLAY            │
│   DIAGNOSTIC         │
│ ► SERVICE            │
│   INFO               │
│                      │
│ ►                    │
└──────────────────────┘
```

Select the parameters by moving the cursor with SCROLL and confirm with ENTER.

```
┌──────────────────────┐
│ ► OUTPUT SAFE MODE   │
│   SET UID            │
│   LANGUAGE           │
│   F_WINDOW           │
│   RESTORE SETTING    │
│   BLUETOOTH          │
│ ►                    │
└──────────────────────┘
```
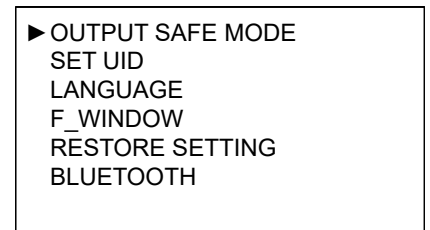
**10.8.1 - OUTPUT SAFE MODE**

Position the cursor on OUTPUT SAFE MODE, press ENTER to access.
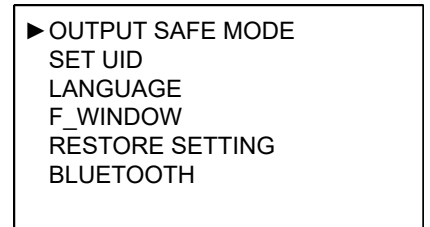
It's possible to choose a analog output value during diagnostic errors.
"21.5 mA" forces the current output to 21,5mA.
"3.85 mA" forces the current output to 3,85mA.
"HOLD LAST VALUE" maintains the output at the last valid value.
With the SCROLL button you can select the operation mode.
Press ENTER to confirm.
LEFT ARROW to exit without changes.
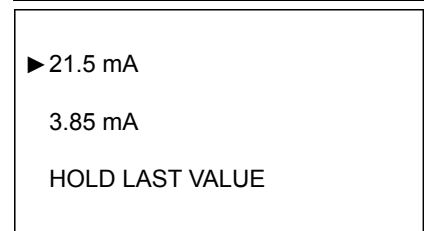
Default value: HOLD LAST VALUE

```
┌──────────────────────┐
│ ► OUTPUT SAFE MODE   │
│   SET UID            │
│   LANGUAGE           │
│   F_WINDOW           │
│   RESTORE SETTING    │
│   BLUETOOTH          │
│                      │
│ ►                    │
│ ► 21.5 mA            │
│                      │
│   3.85 mA            │
│                      │
│   HOLD LAST VALUE    │
│                      │
│ ►                    │
└──────────────────────┘
```

### 10.8.2 - SET UID

Position the cursor on SET UID, press ENTER to access.

Can assign the address UID in this parameter, for a MUDBUS RTU network.

```
► OUTPUT SAFE MODE
► SET UID
  LANGUAGE
  F_WINDOW
  RESTORE SETTING
  BLUETOOTH
```

Use UP ARROW and SCROLL to modify the value.
Press ENTER to confirm.
LEFT ARROW to exit without changes.

Default value 001

```
     SET UID

      001
```

### 10.8.3 - LANGUAGE

Position the cursor on LANGUAGE, press ENTER to access.

Sets the menu language: English, Italian, French.

```
  OUTPUT SAFE MODE
  SET UID
► LANGUAGE
  F_WINDOW
  RESTORE SETTING
  BLUETOOTH
```

Press SCROLL to select the menu language.
Press ENTER to confirm.
LEFT ARROW to exit without changes.

```
  ENGLISH
► ITALIANO
  FRANCAIS
```

### 10.8.4 - F_ WINDOWS

Position the cursor on F_WINDOWS, press ENTER to access.

It is the increaseing value (in cm), step to step, of the window width during the echo signal research phase.
The "F_WINDOWS" is the area where the echo reception is active.
Normally it is positioned around the real echo signal and all echoes detected within the F_WINDOW are deemed valid.
Example: F_WINDOW parameter set to 5.
- The RPL81 detects an echo signal which is 4 meters from the sensor.
- Suddenly, the echo signal disappears and a new echo signal to 3.5 mt away from the sensor is detected.
- Each time the echo signal will be emitted, the RPL81 will enlarge "F_WINDOW" with 5cm step, until covering the new eco detected area.
  Now the F_WINDOW will start to tighten around the new echo signal and the new measurement of 3,5mt distance will be used to calculate the level measurement, alarm thresholds, etc..
F_WINDOW serves to filter false echo signals caused, for example, by the agitator blades.
Range: 05÷20
Use UP ARROW and SCROLL to modify the value.
Press ENTER to confirm.
LEFT ARROW to exit without changes.

Default value:  05

```
  OUTPUT SAFE MODE
  SET UID
  LANGUAGE
► F_WINDOW
  RESTORE SETTING
  BLUETOOTH
```

```
    SET WIDTH

       05
```

### 10.8.5 - RESTORE SETTING

Position the cursor on SET UID, press ENTER to access.

```
┌─────────────────────────────┐
│  OUTPUT SAFE MODE           │
│  SET UID                    │
│  LANGUAGE                   │
│  F_WINDOW                   │
│ ►RESTORE SETTING            │
│  BLUETOOTH                  │
└─────────────────────────────┘
```

Press ENTER to restore the RPL81 default settings.
LEFT ARROW to exit without restored the RPL81 default settings.

```
┌─────────────────────────────┐
│                             │
│                             │
│        OK TO CONFIRM        │
│                             │
│                             │
└─────────────────────────────┘
```

### 10.8.6 - BLUETOOTH (OPTIONAL)

Position the cursor on BLUETHOOT, press ENTER to access.
The BLUETOOTH menu is accessible only when RPL 81 is equipped
with the BLUETOOTH port (opt.).

```
┌─────────────────────────────┐
│  OUTPUT SAFE MODE           │
│  SET UID                    │
│  LANGUAGE                   │
│  F_WINDOW                   │
│  RESTORE SETTING            │
│ ►BLUETOOTH                  │
└─────────────────────────────┘
```

#### 10.8.6.1 – CHANGE DEVICE PIN

Position the cursor on CHANGE DEVICE PIN, press ENTER to enter.
It's possible to change the security PIN for BLUETOOTH connecting.

```
┌─────────────────────────────┐
│ ►CHANGE DEVICE PIN          │
│  RESET MODULE               │
│                             │
│                             │
│                             │
└─────────────────────────────┘
```

Use UP ARROW and SCROLL to modify the value.
Press ENTER to confi rm. LEFT ARROW to exit without changes.
Default value: 1234

```
┌─────────────────────────────┐
│      CHANGE DEVICE PIN      │
│                             │
│          1234               │
│                             │
└─────────────────────────────┘
```

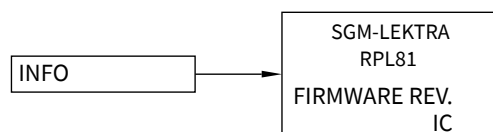#### 10.8.6.2 – BT RESET

Position the cursor on RESET MODULE, press ENTER to enter.
It's possible to restore the BLUETOOTH port settings.

```
┌─────────────────────────────┐
│  CHANGE DEVICE PIN          │
│ ►RESET MODULE               │
│                             │
│                             │
└─────────────────────────────┘
```

```
┌──────────┐        ┌──────────────────┐
│  INFO    │───────▶│   SGM-LEKTRA     │
└──────────┘        │   RPL81          │
                    │                  │
                    │ FIRMWARE REV.    │
                    │            IC    │
                    └──────────────────┘
```

### 10.9.1 - INFO

Position the cursor on INFO, press ENTER to access.

```
┌─────────────────────────────┐
│  SETUP                      │
│  DISPLAY                    │
│  DIAGNOSTIC                 │
│  SERVICE                    │
│ ►INFO                       │
└─────────────────────────────┘
```

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

```
┌─────────────────────────────┐
│       SGM-LEKTRA            │
│         RPL81              │
│                             │
│  FIRMWARE        REV.       │
│                  I.C.       │
└─────────────────────────────┘
```

# 11-FACTORY TEST AND QUALITY CERTIFICATE

CE

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

(Radar level transmitter)

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

Quality Control Manager: ……………………………………….  Production and check date: ……………………………………

sgm lektra