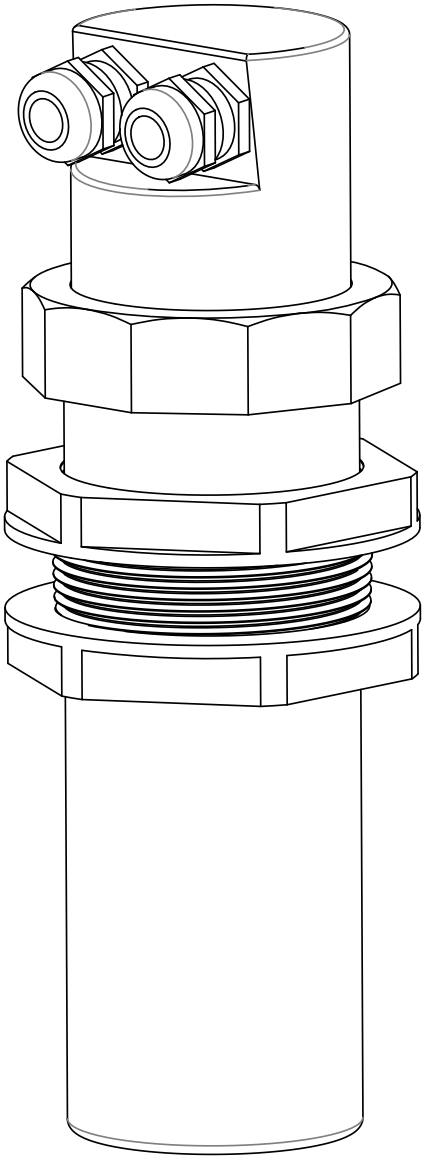
KTU5

ultrasonic level transmitter



technical documentation EN Rev. of 02/04/2024

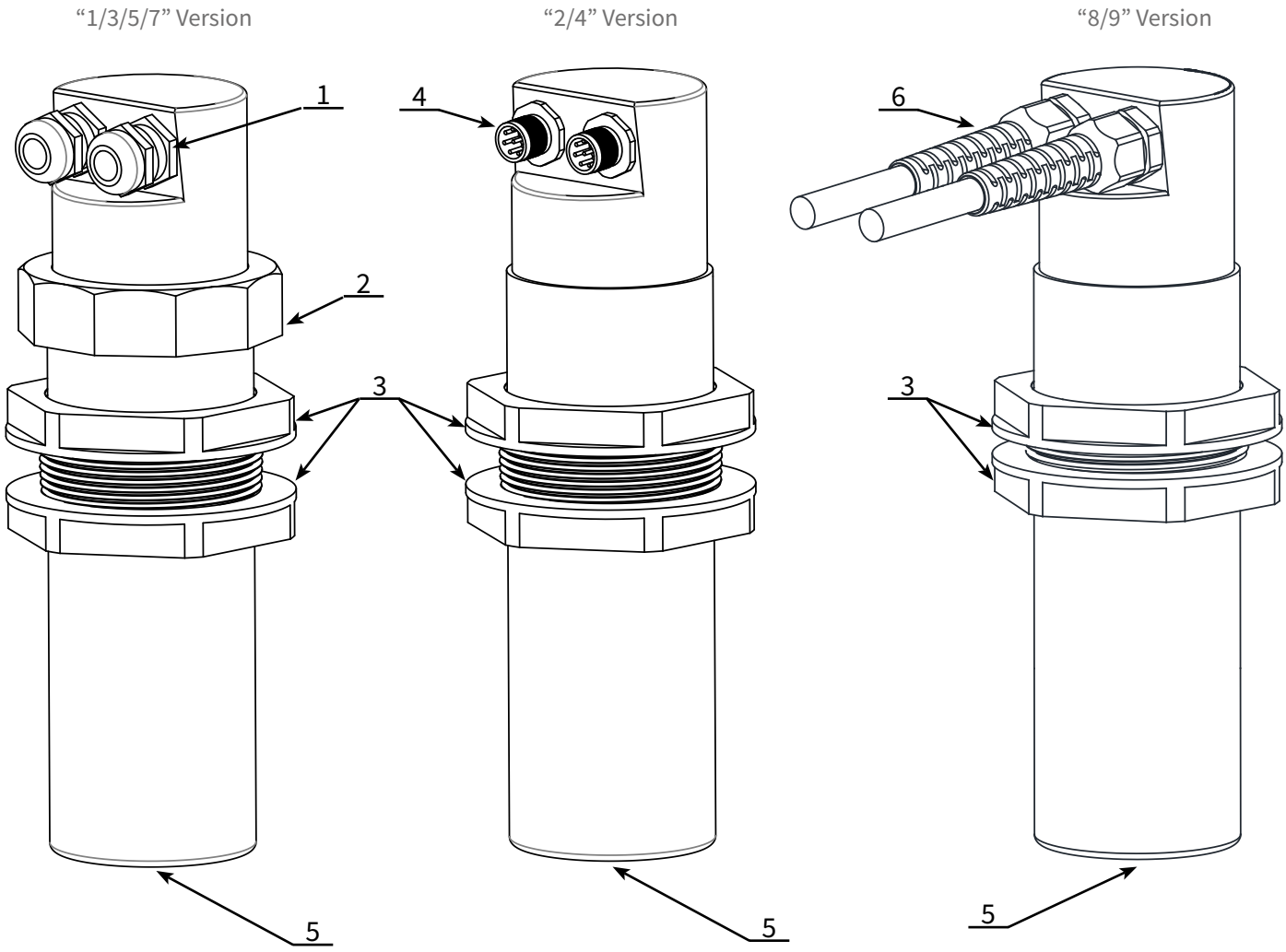
sgm lektra

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.

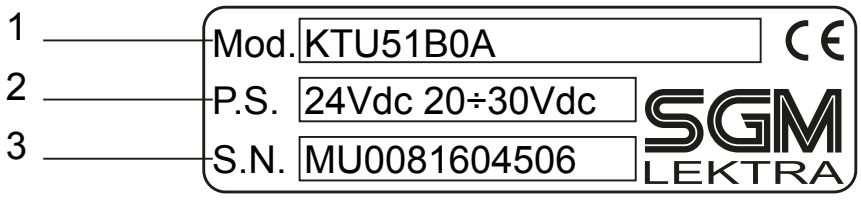
2-PRODUCT



1. 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.



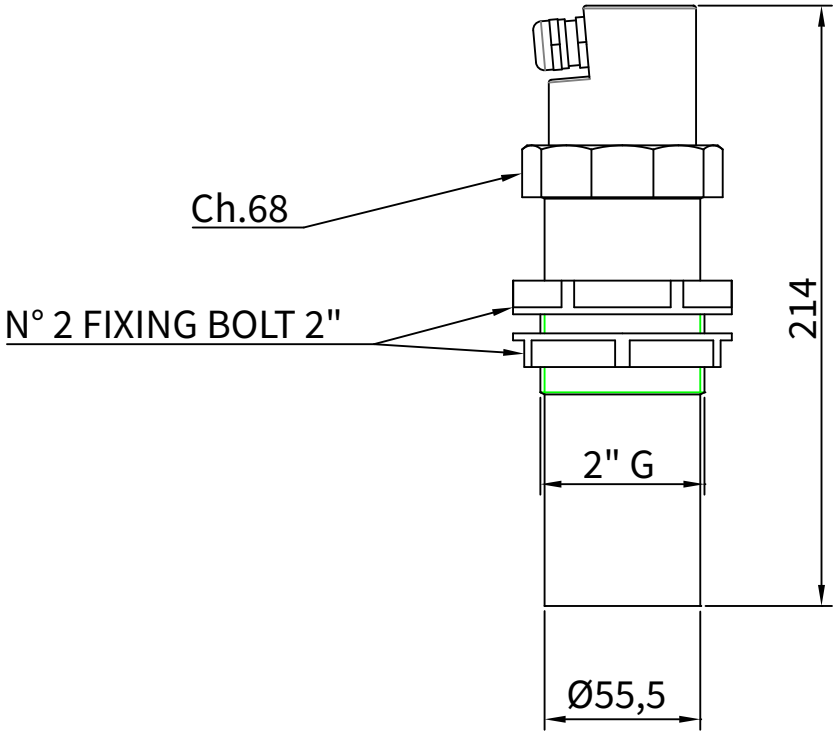
1. Product code
2. Power supply
3. Serial number

3-FEATURES

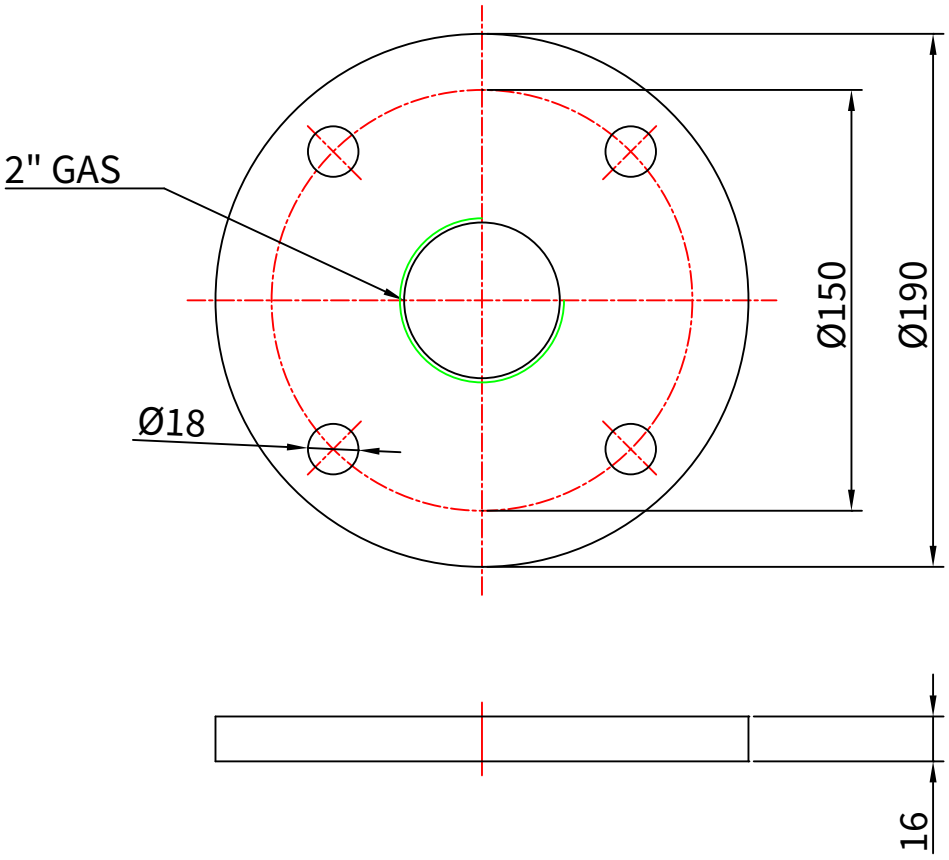
Housing/sensor material
PP
Mechanical installation
2” GAS M (Flange in PP DN80 (opt.)
Protection degree
IP67/IP68 (Sensor) - IP68 (opt.)
Electrical connection
Terminals, connector or 5m integrated cables
Working temperature
-20°C ÷ +60°C
Pressure
from 0,5 to 1,5 bar (absolute)
Power supply
12Vdc - 20÷30Vdc - 24Vac - 115Vac - 230Vac
Power consumption
0,6W - 1,5W
Analog output
4...20mA, max 750ohm
Relays output
n°2 3A 230Vac (n.o.)
Digital communication
MODBUS RTU
Max measure range
max 0.25 ÷ 6mt
max 0.40 ÷ 10mt
In case of non perfectly reflecting surfaces, the maximum distance value will be reduced
Blind distance
0,25m (6mt versions) / 0,40m (10mt versions)
Temperature compensation
digital from -30 to 80°C
Accuracy
±0,2% (of the measured distance) not better than ±3mm.
Resolution
1mm.
Calibration
VL620/VL621 (Opt.) - MODBUS - 2 pushing buttons (only for IP67 version)
Warm-up
5 minutes typical
LCD Display
Plug-in display/keyboard 4 buttons matrix LCD
J-BOX Material
Polycarbonate
J-BOX protection
IP65

4-DIMENSIONS

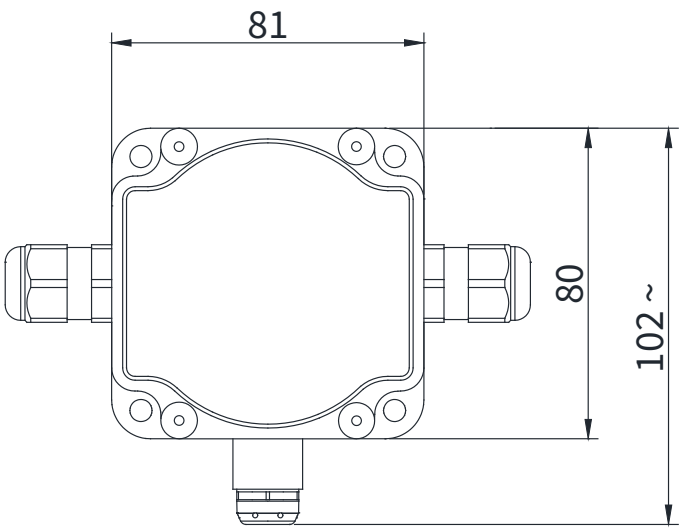
4.1 - MECHANICAL DIMENSIONS

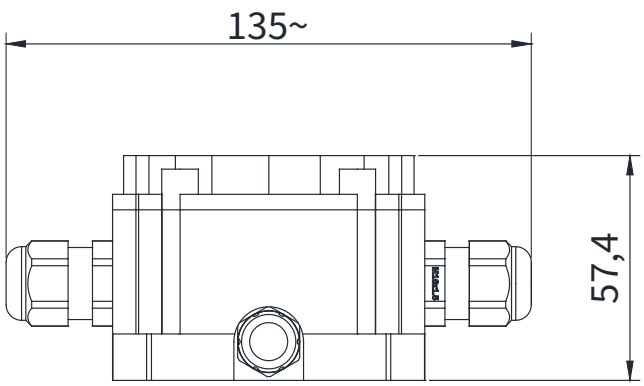


DN80 PN6 UNI 1092-1 flange in PP (Opt.)



4.2 - J-BOX DIMENSIONS



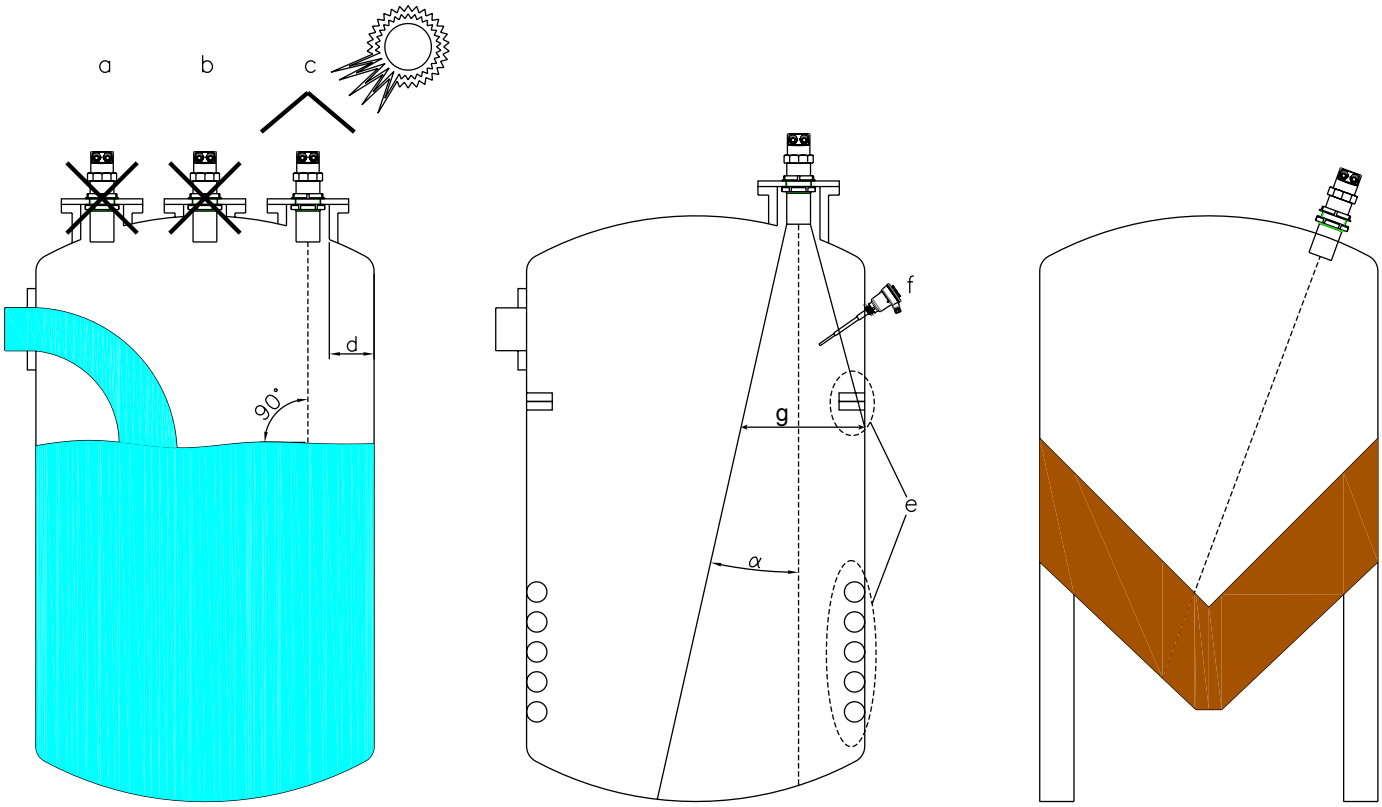


5-INSTALLATION

5.1 - MOUNTING PRECAUTIONS

5.1.1 - Mounting position

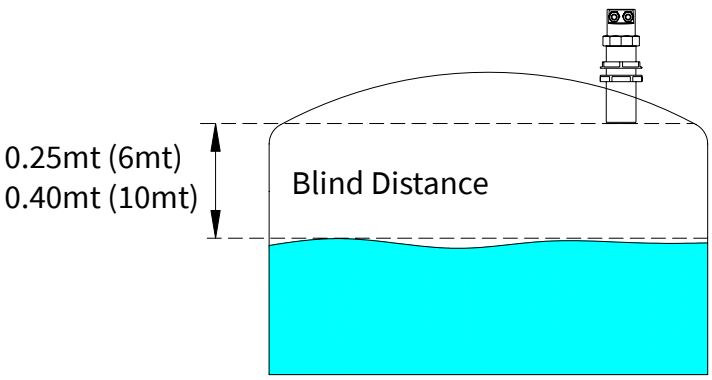
- With cambered roof, do not install the sensor in the tank center (b). Leave a 300mm (d) minimum distance between the sensor and the tank smooth wall.
- Use a protective cover to protect the sensor from weather and direct sunlight (c).
- Do not install the sensor near the load zone (a).
- Make sure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



	Lobo “α“	g
KTU5 6mt	5°	1.0m
KTU5 10mt	5°	1.6m

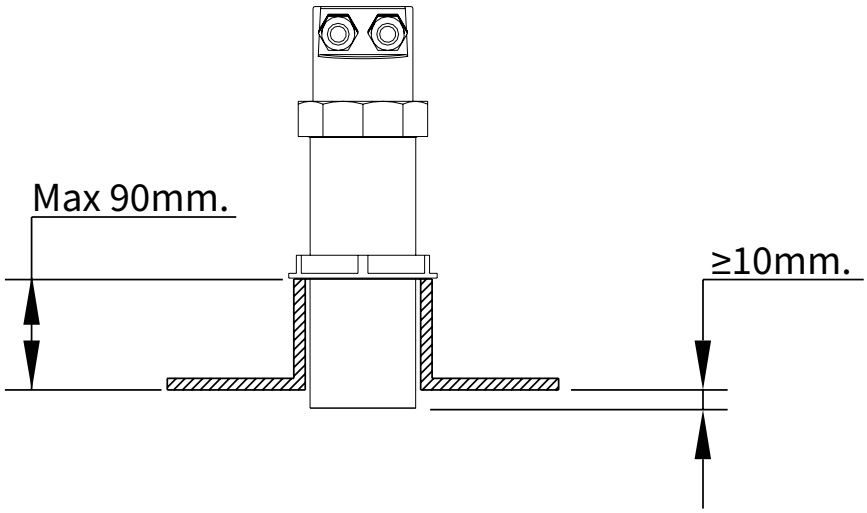
5.1.2 - Blind distance

During installation is important to remember that in the sensor proximity there is a blind zone (or BLIND DISTANCE) of 0.25m (for 6mt max KTU5 range) or 0.4m (for 10mt max KTU5 range) where the sensor can not measure.

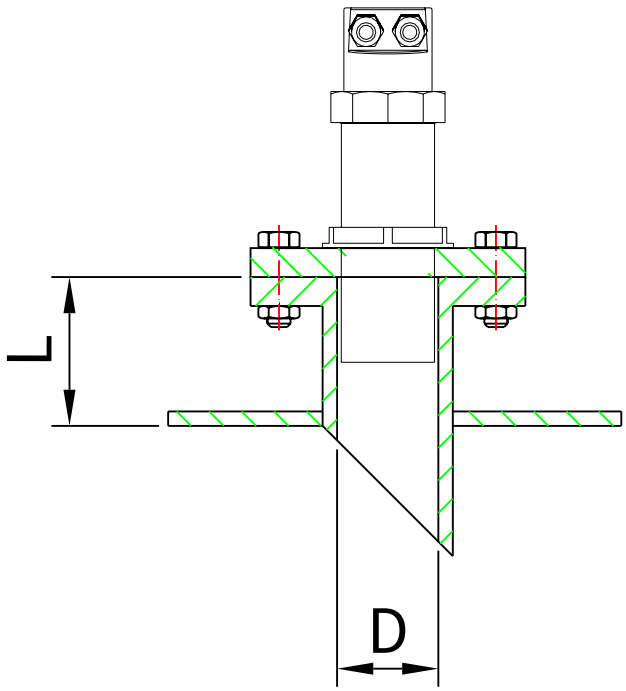


5.1.3 - Installation in nozzle

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



KTU5 can be installed in an extension pipe to turn away the sensor from the maximum level point.
The extension pipe must be flat and without joints (welds, etc..), and the pipe terminal part must be cut at 45° without burr.



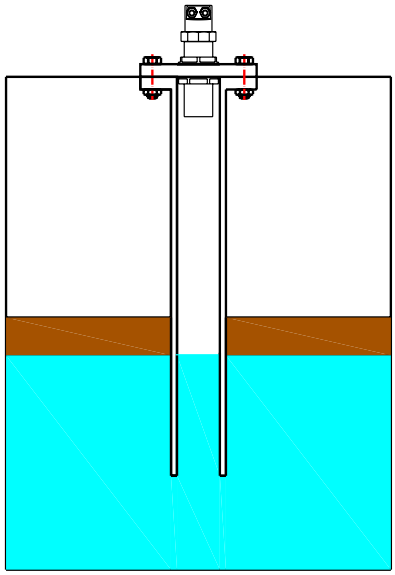
KTU5 6mt		KTU5 10mt	
D (mm)	Lmax(mm)	D (mm)	Lmax(mm)
57	180	80	240
80	240	100	300
100	300		

5.1.4 - Reference pipe installation

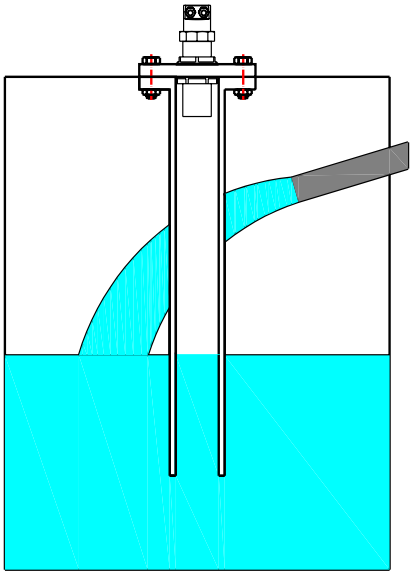
Disturbing factors that may influence the level measurement in liquids, as for example:
- foam presence on the liquid surface
- internal structures presence in the tank
- presence of floating bodies on the liquid surface

can be avoided with the use of level measure inside of pipes (by-pass pipe or still-pipe with 57mm min. diameter).
The pipe must have a length greater or equal than the empty distance and some vent holes to allow the pipe regular filling and emptying. In the programming menu select the “LIQUID PIPE” option in product parameter.

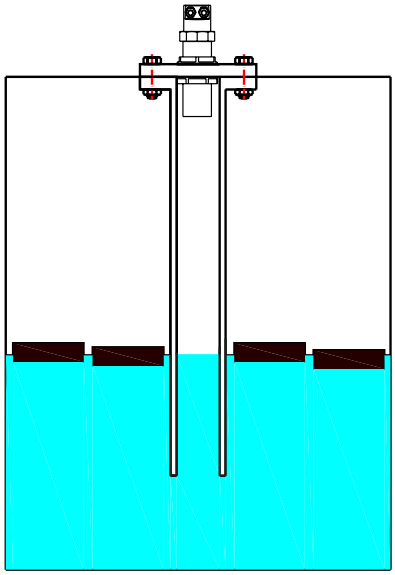
Foam

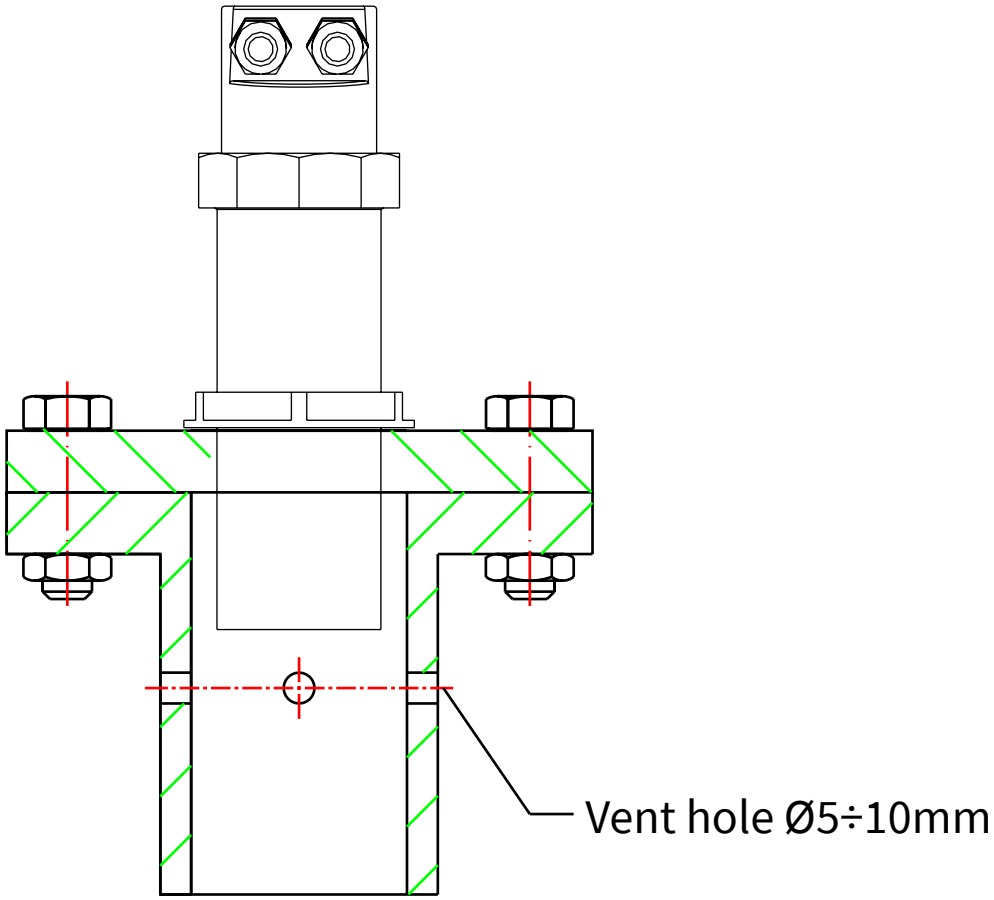


Internal structures



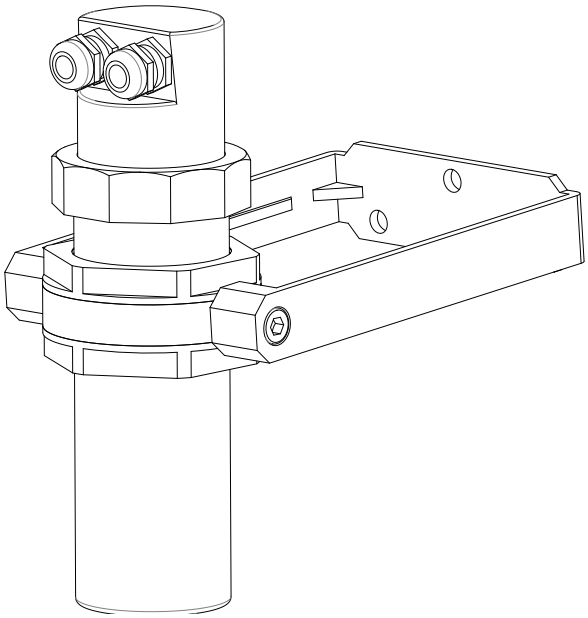
Floating bodies





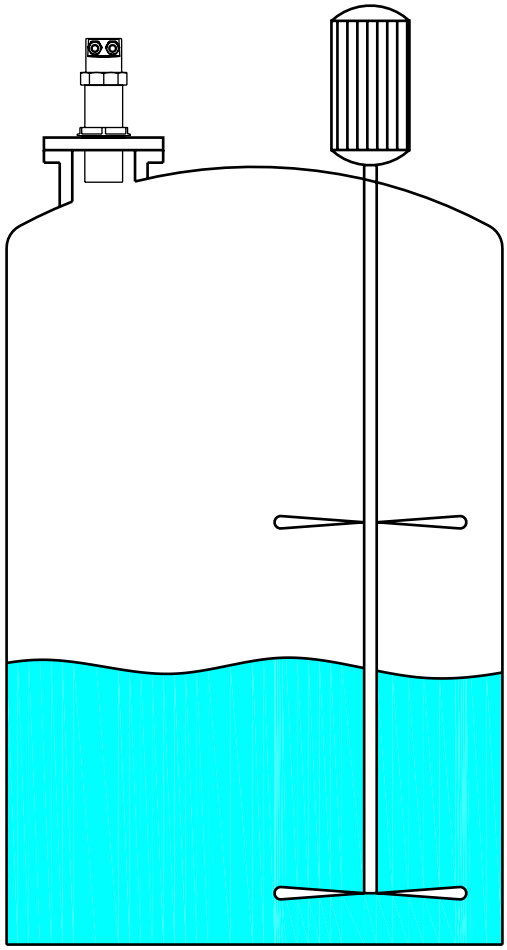
5.1.5 - Installation with bracket (mod. 835B026Z)

By installing the KTU5 with the bracket it is possible to orient the emission lobe perpendicular to inclined surfaces.



5.1.6 - Agitators presence

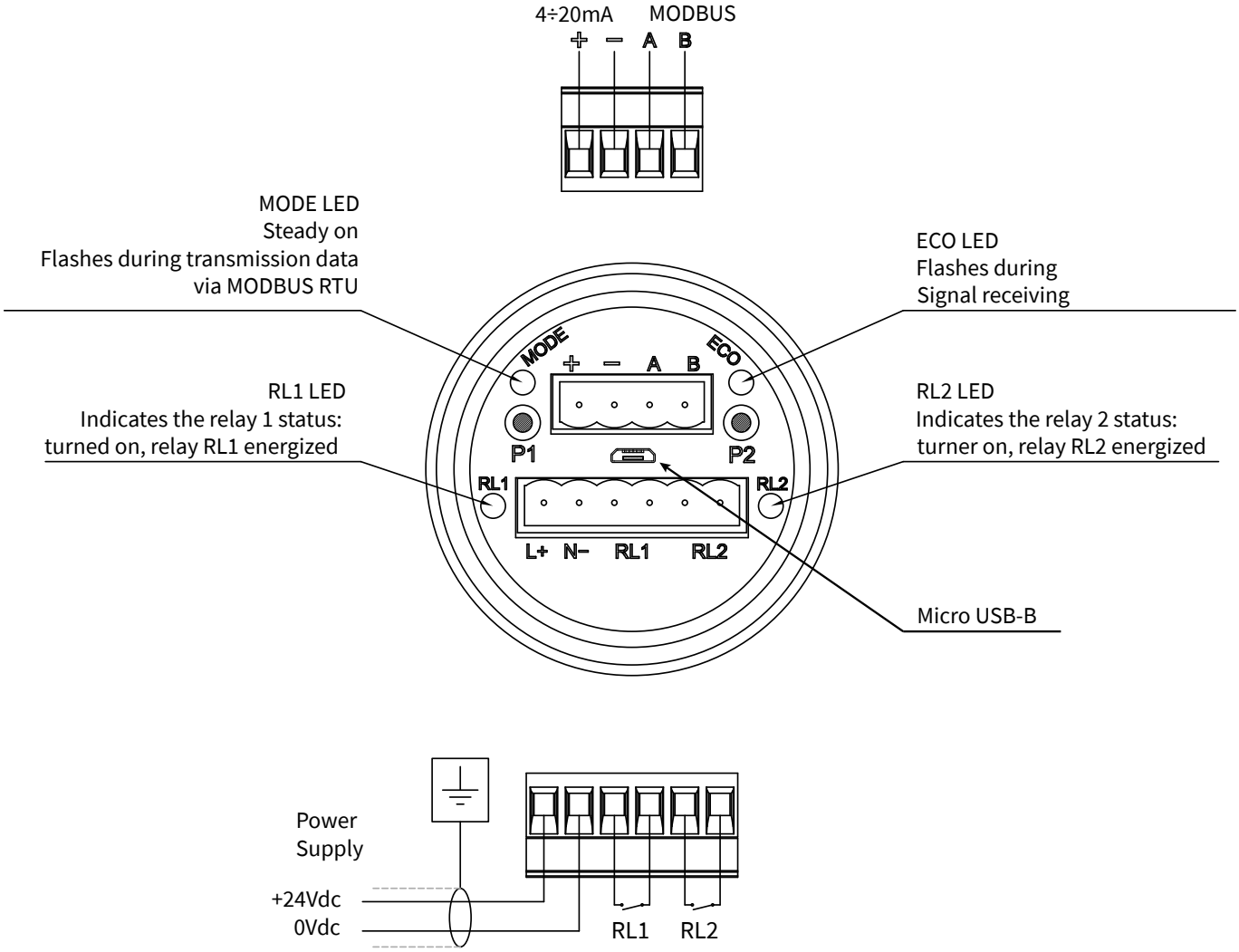
The level measurement is possible thanks to the Auto-Tuned statistical filter.
Should rarely need to adjust the filter setting by editing 2 KTU5 sensor programming parameters:
- FILTER; this parameter is present in the Quick Setup menu and in the Advanced Configuration “SETUP” menu; increasing the parameter 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 - 1/3/5/7 VERSION CONNECTIONS

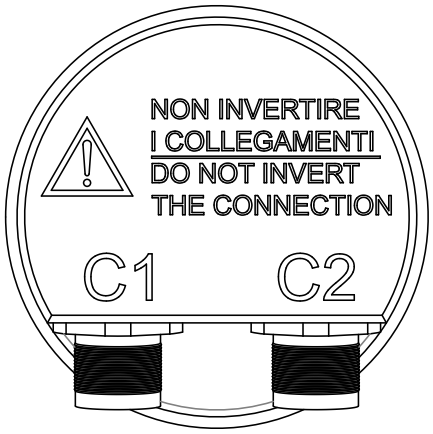
1) Separate the engine control cables or power cables from the KTU5 connection cables.
2) Open the cap by unscrewing.
3) Lead the cables into the transmitter through the glands.
4) Close the cap and tighten the cable glands.



6.2 - 2/4 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	



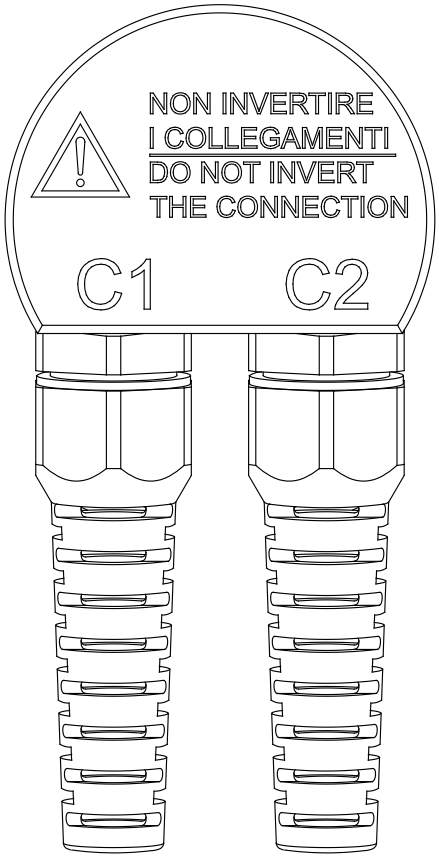
C2
SIGNAL - BLACK CABLE

(1) BROWN		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 - 8/9 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

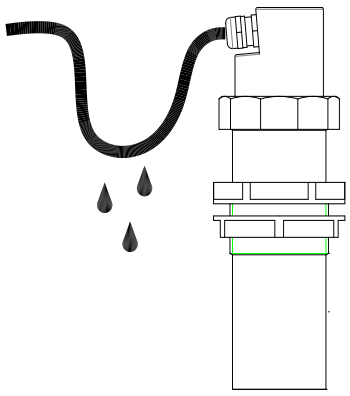


C2
SIGNAL - BLACK CABLE

(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

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.

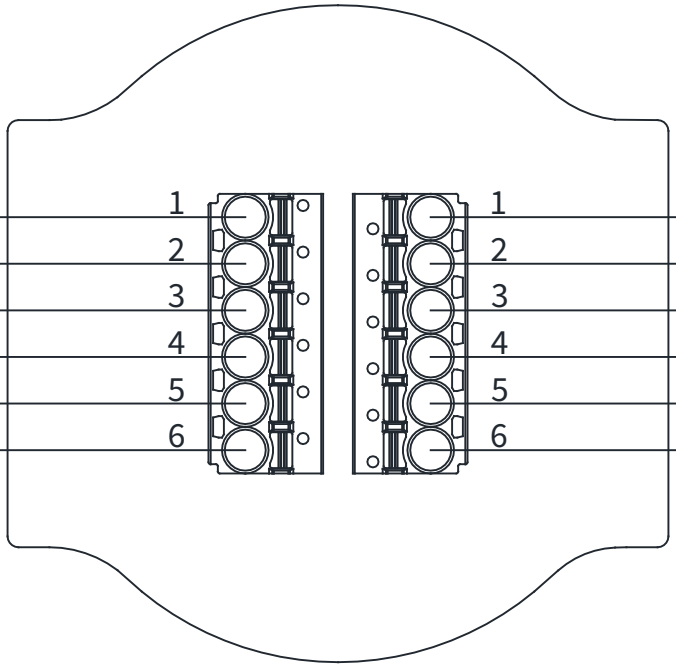


6.5 - CONNECTIONS JUNCTION BOX

6.5.1 - J-BOX A

C1
POWER - RED CABLE

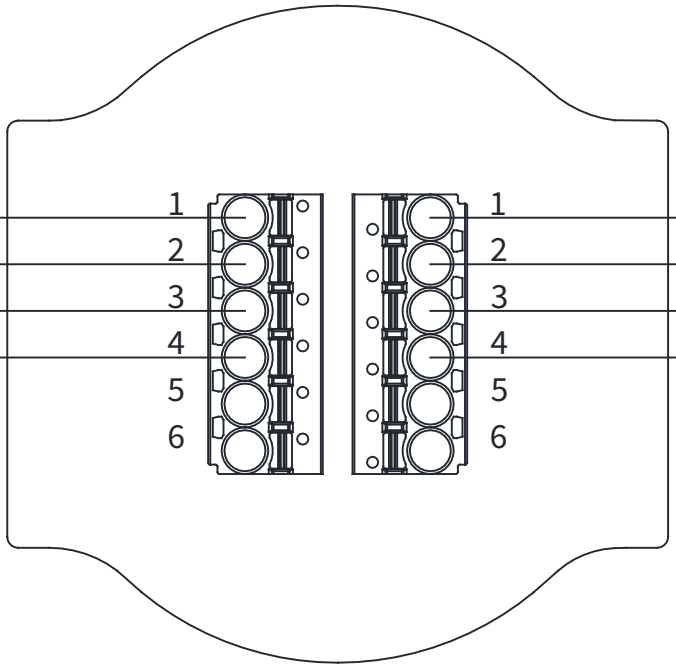
BROWN	0V	1	1
RED	+24Vdc	2	2
YELLOW	RL1 C.	3	3
WITHE	RL1 N.O.	4	4
GREY	RL2 C.	5	5
PINK	RL2 N.O.	6	6



6.5.2 - J-BOX B

C2
SIGNAL - BLACK CABLE

YELLOW	+4÷20mA	1	1
GREY	-4÷20mA	2	2
GREEN	A (RS485)	3	3
BLUE	B (RS485)	4	4
		5	5
		6	6



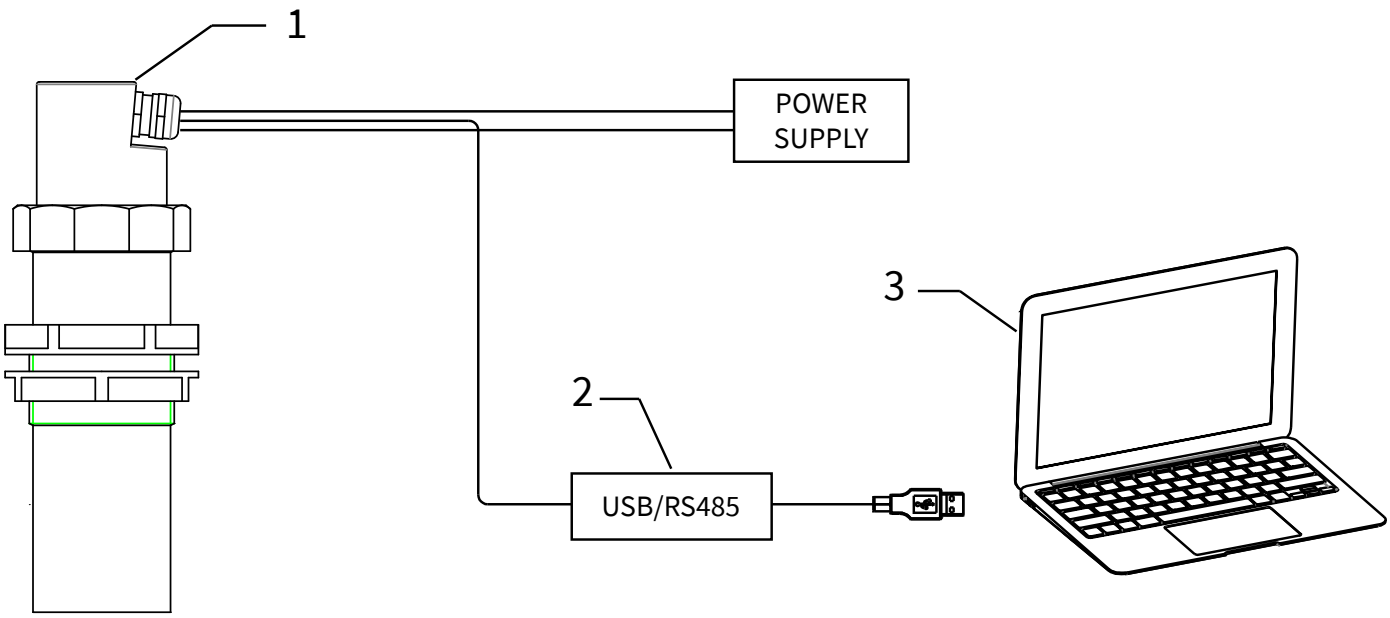
7-CONFIGURATION MODES

The KTU5 have 3 configuration/calibration modes:
- via digital communication: via MODBUS RTU, by PC
- via 2 on board buttons
- via VL611 programming module

7.1 - DIGITAL COMMUNICATIONS CONNECTION

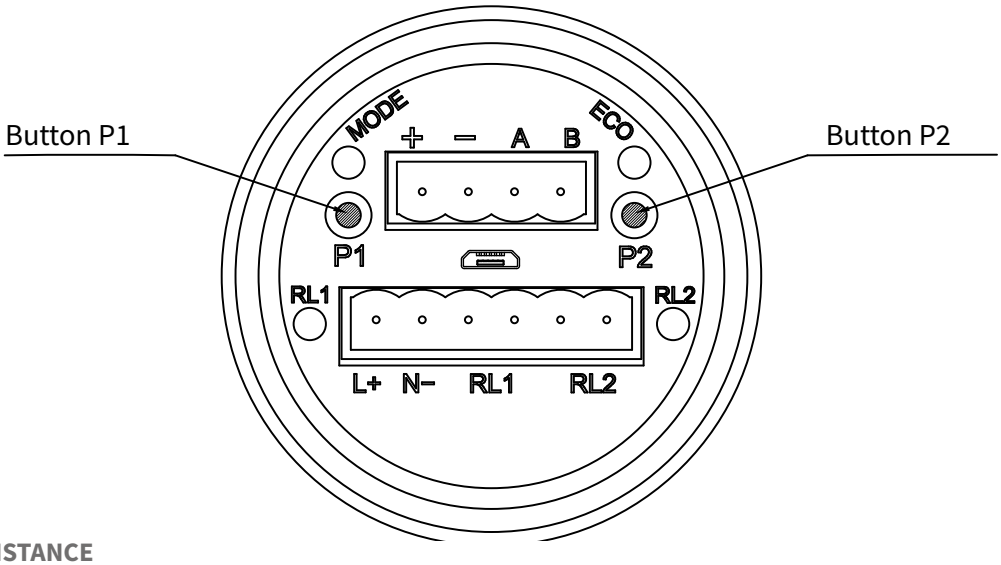
7.1.1 - KTU5 MODBUS RTU PC connection

1) KTU5 with MODBUS RTU communication protocol.
2) USB/RS485 interface module, cod.694A004A.
3) MODBUS RTU communication S/W, cod.010F105A, for KTU5 transmitter.
With this software is possible:
- to connect the KTU5 transmitters in MODBUS RTU network by selecting the UID address..
- to read on your PC monitor all measures in reading and KTU5 operation data.
- to program all KTU5 configuration parameters.
- to store the measurement readings and the operating status of KTU5.



7.2 - VIA 2 BUTTONS CALIBRATIONS

KTU5 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.



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 Dist.”; alternatively it is possible to place a target orthogonally to the KTU5 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 Dist.”; alternatively it is possible to place a target orthogonally to the KTU5 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 dist.”; alternatively it is possible to place a target orthogonally to the KTU5 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 22)

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 dist.”; alternatively it is possible to place a target orthogonally to the KTU5 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 23)

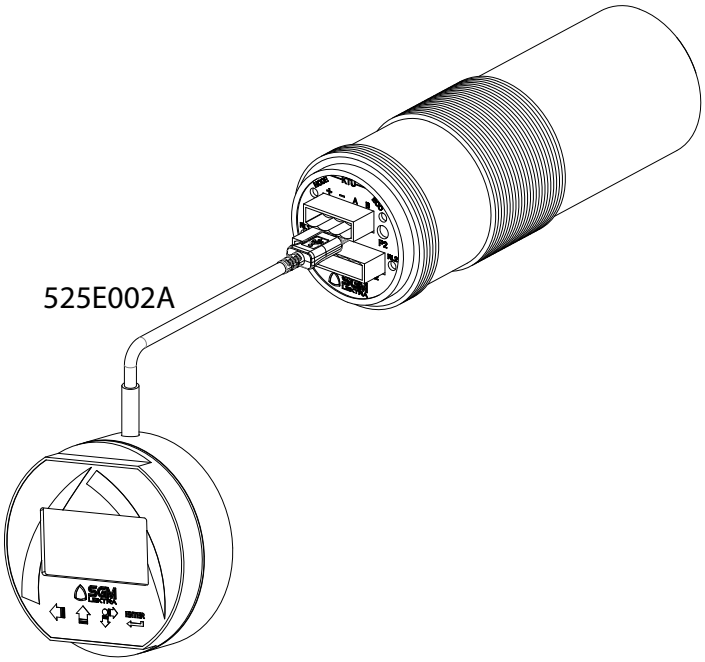
7.3 - CALIBRATION / CONFIGURATION VIA VL620/VL621

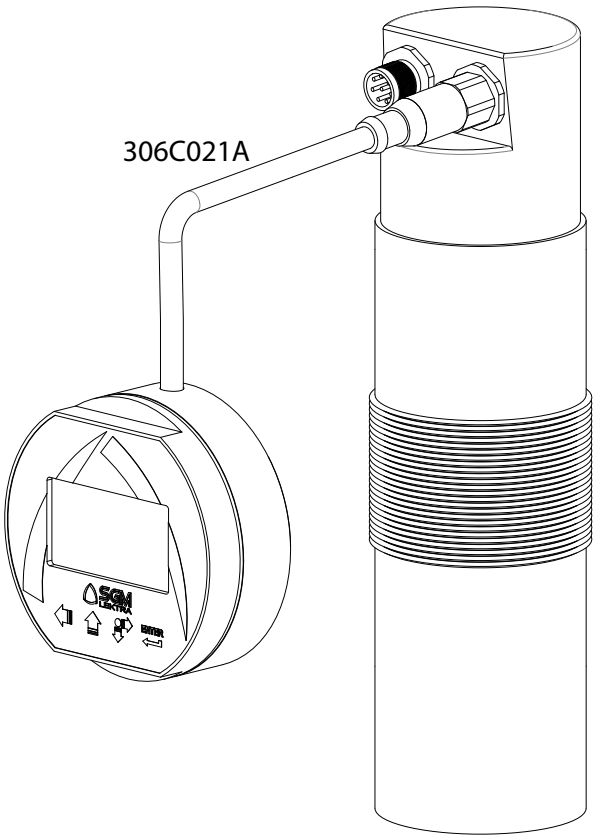
The VL620/VL621 programming module can be mounted and removed from the KTU5 without affecting the unit operation.
Unscrewing the cap (1/3/5/7), the VL620 module can be connected or disconnected.
For 2/4 version connect the VL621 module directly to the unit.
The VL620/VL621 module are equipped with matrix 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 to select and press to access.
2. Parameter options choice: Press to select the option and press to store the option.
   Press 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 to select the digit to be modified (the digit is highlighted in inverse), press to change the high lighted digits number, press to save the set value and exit automatically.
   Press to exit without storing.

LEFT ARROW button:
- **Exit configuration**
- **Back to previous menu**
- **Echo map (from RUN mode)**

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

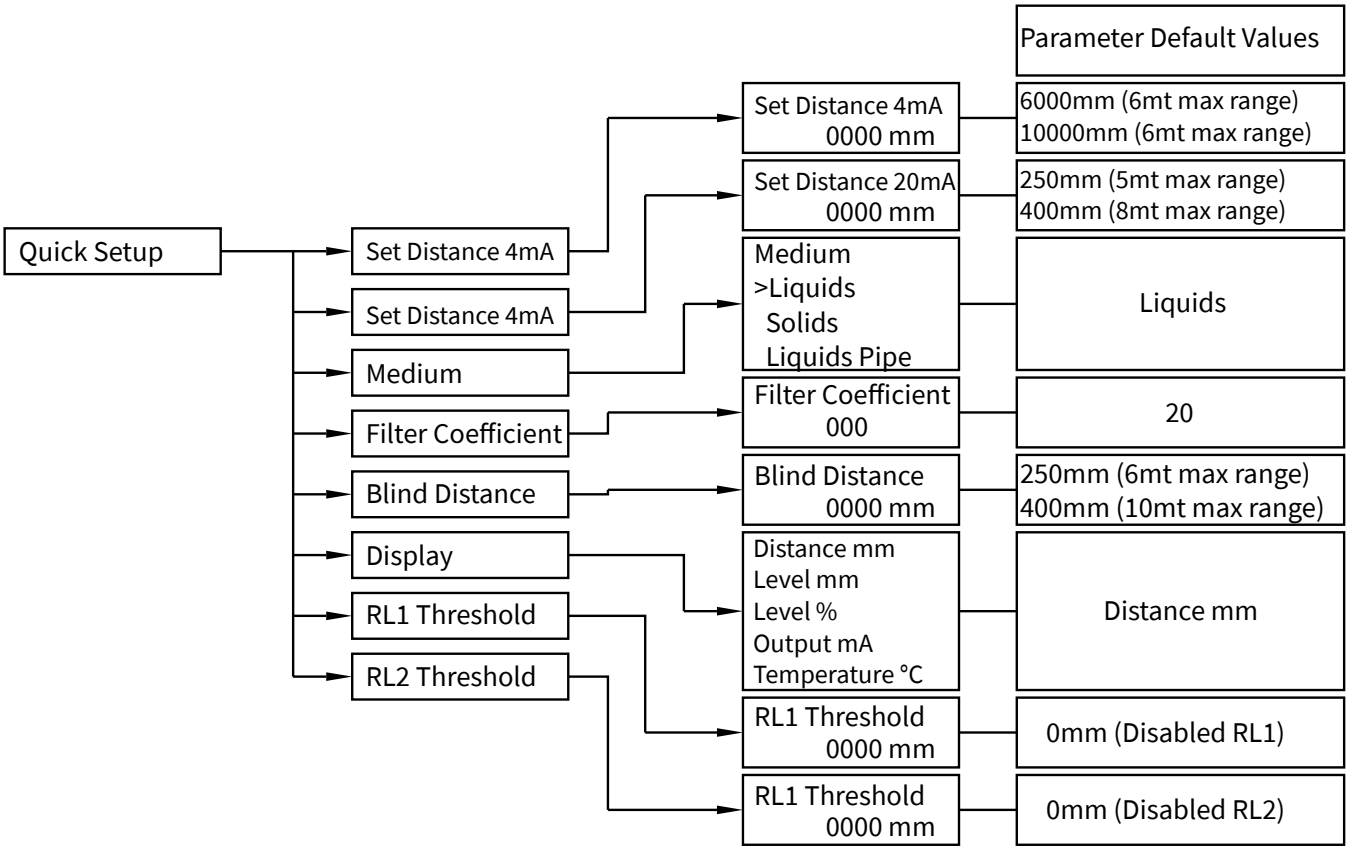
Displayed at the top alerts that there is a generic error; press SCROLL to show the message that indicates the present error type.
The KTU5 returns automatically to RUN mode.

QUICK START - 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 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 “RUN” mode, holding down UP ARROW, press ENTER to the advanced configuration mode access, LEFT ARROW to exit

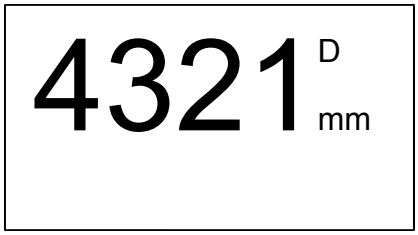
9-QUICK SETUP

9.1 - Quick Setup menu structure

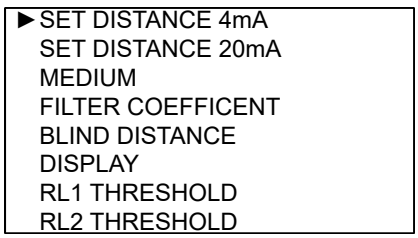


9.2 - QUICK SETUP MODE

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



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.

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

```
SET DISTANCE 4mA

3500 mm
```

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

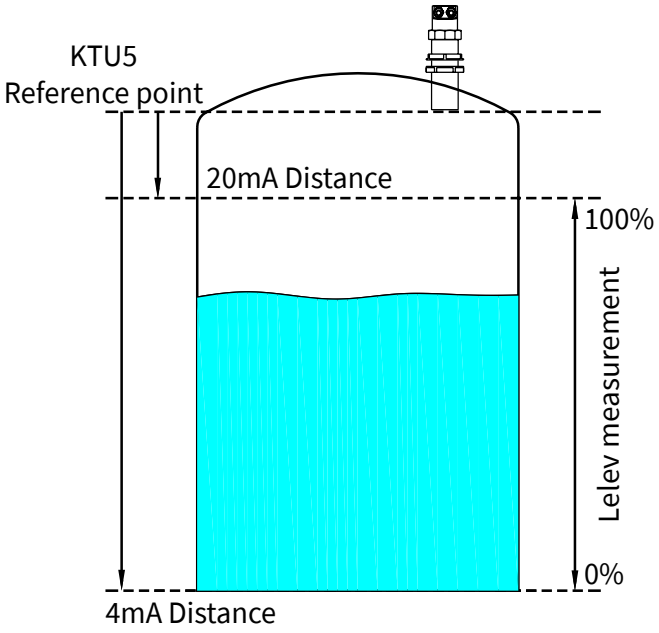
9.2.2 - SET DISTANCE 20mA

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

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

```
SET DISTANCE 20mA

0500 mm
```

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



9.2.3 - MEDIUM

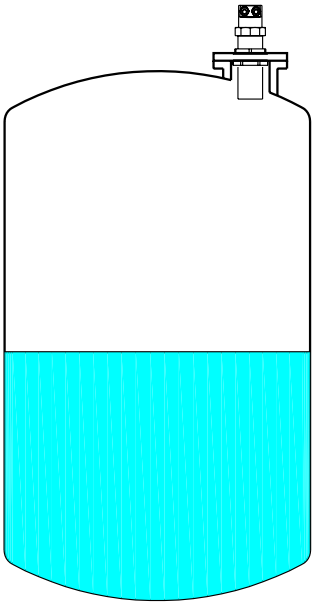
Press ENTER to display the previous setting.

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

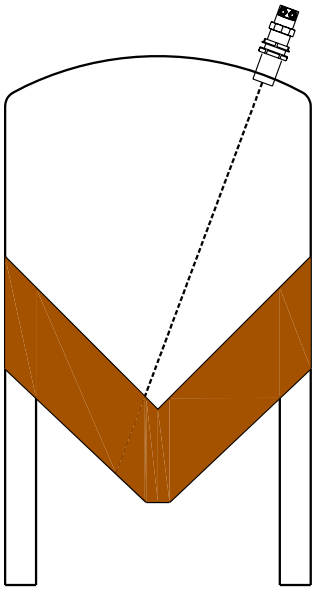
Press SCROLL to select the medium type.
Press ENTER to confirm.

```
        MEDIUM
► LIQUIDS

  SOLIDS

  LIQUIDS PIPE
```

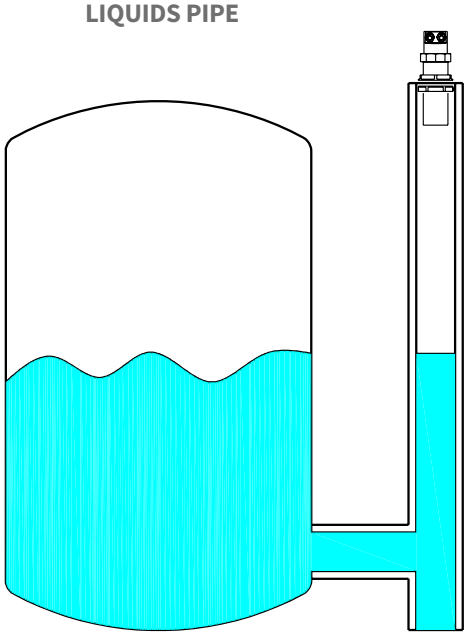
LIQUIDS



SOLIDS



LIQUIDS PIPE



9.2.4 - FILTER COEFFICIENT

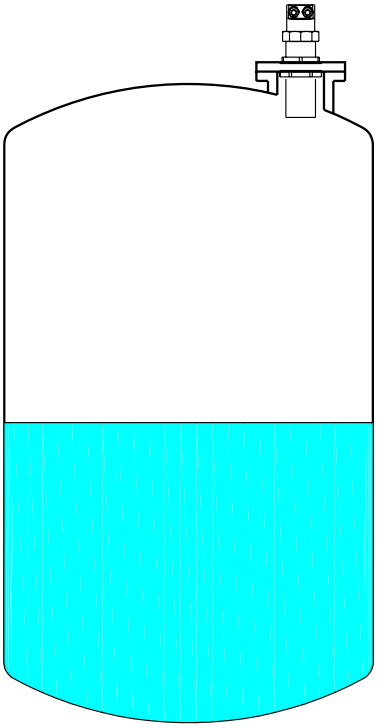
Press ENTER.
Use SCROLL and UP ARROW to modify the value.
Input a value from 1 to 99.
1 maximum speed, 99 maximum slowness.
The function is deactivated with 0 (immediate response).
Press ENTER to confirm

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

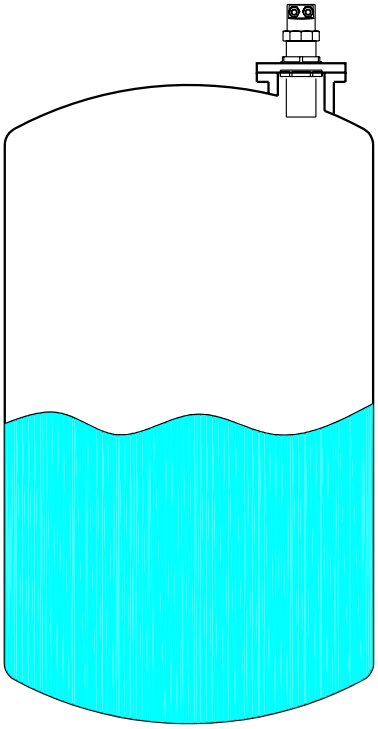
FILTER COEFFICENT

20

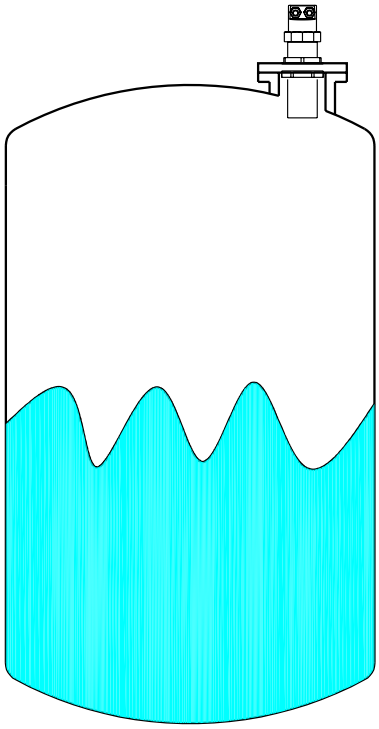
Fast resp. 5÷10



Normal resp. 20



Slow resp. 40÷100



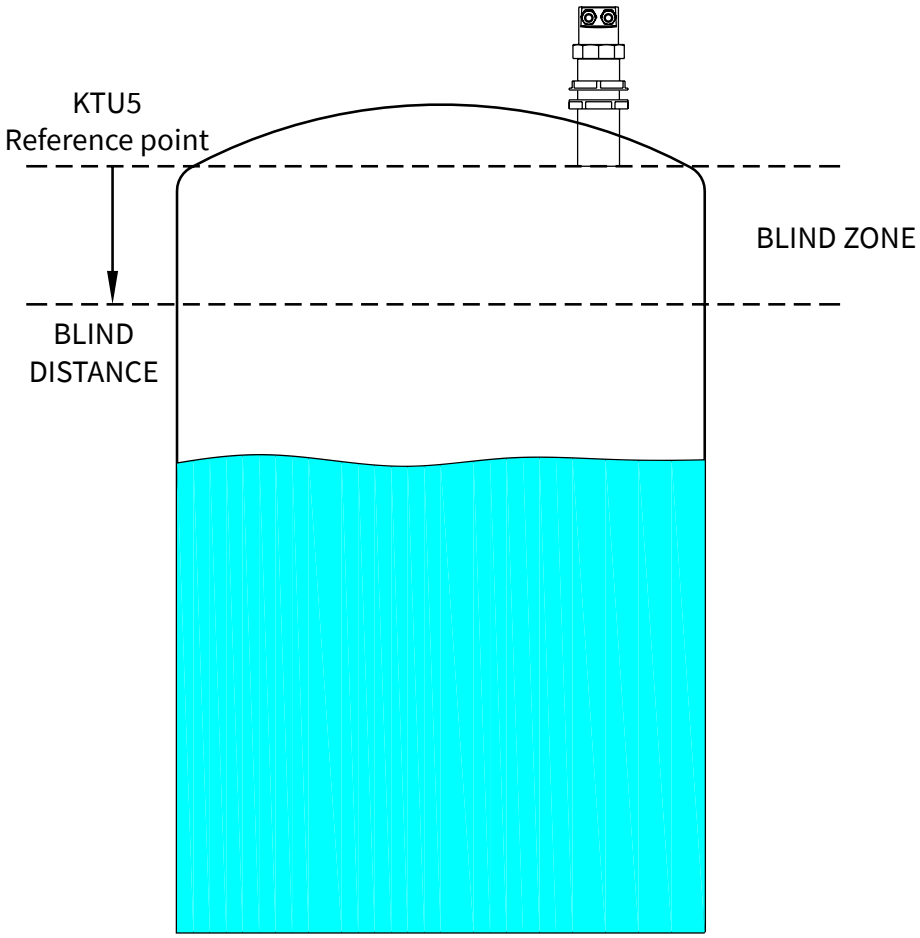
9.2.5 - BLIND DISTANCE

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

```
  SET DISTANCE 4mA
  SET DISTANCE 20mA
  MEDIUM
  FILTER COEFFICENT
▶ BLIND DISTANCE
  DISPLAY
  RL1 THRESHOLD
  RL2 THRESHOLD
```

Use SCROLL and UP ARROW to modify the value. Press ENTER to confirm.
The minimum value is 250mm (5mt max vers.) or 400mm (8mt max vers.).

```
BLIND DISTANCE

0250 mm
```



9.2.6 - DISPLAY

Press ENTER to access the settings change.

```
  SET DISTANCE 4mA
  SET DISTANCE 20mA
  MEDIUM
  FILTER COEFFICENT
  BLIND DISTANCE
▶ DISPLAY
  RL1 THRESHOLD
  RL2 THRESHOLD
```

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

```
▶ DISTANCE mm
  LEVEL mm
  LEVEL %
  OUTPUT mA
```

9.2.7 - RL1 THRESHOLD

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

SET DISTANCE 4mA
SET DISTANCE 20mA
MEDIUM
FILTER COEFFICENT
BLIND DISTANCE
DISPLAY
▶ RL1 THRESHOLD
RL2 THRESHOLD

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

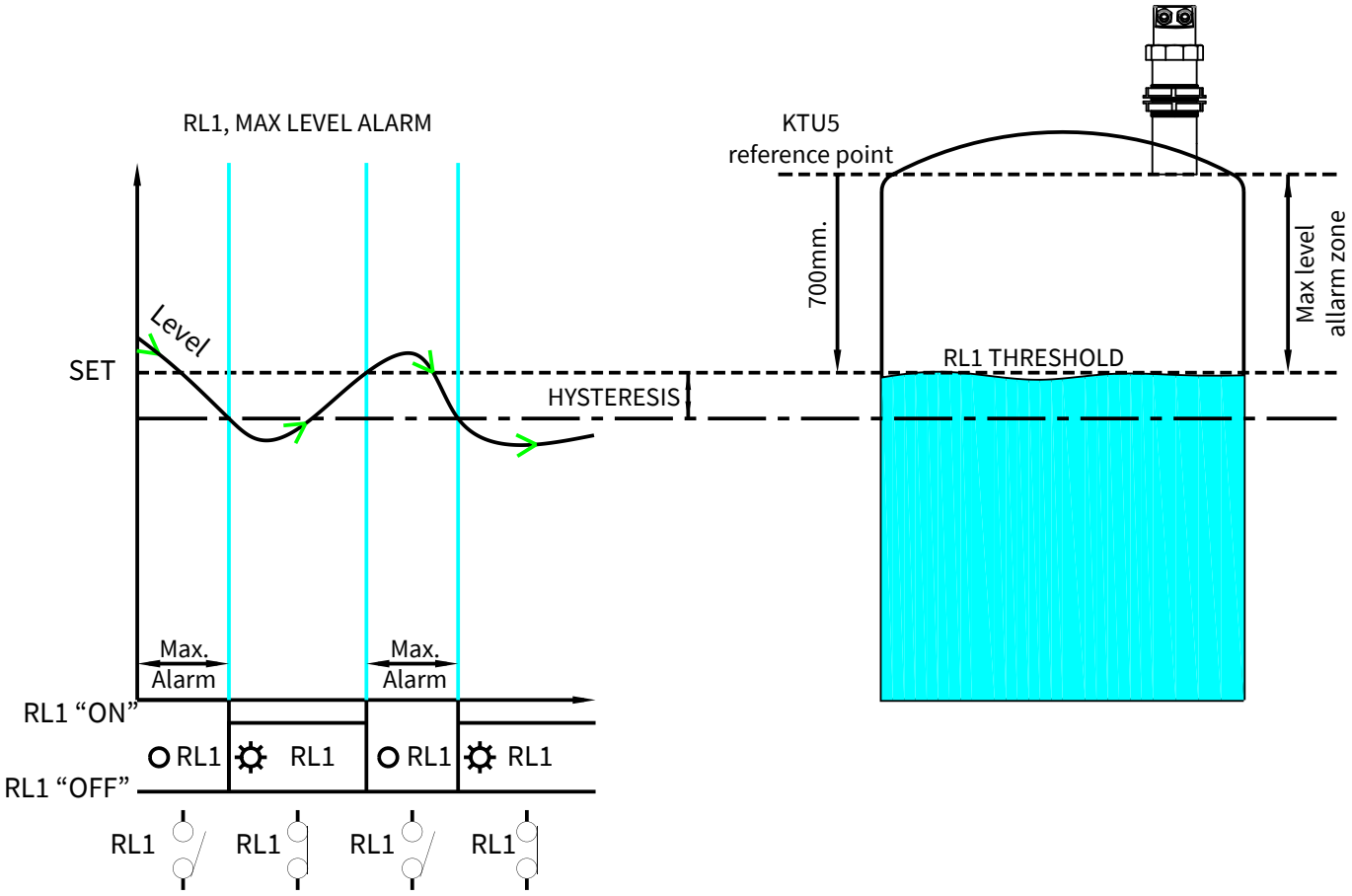
RL1 THRESHOLD

0700 mm

When confirming with the ENTER button the maximum level threshold value storage, in the example 3000mm the KTU5 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.
5) MIN/MAX HYSTERESIS mm = 40mm.

To change these relay setting 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.



9.2.8 - RL2 THRESHOLD

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

SET DISTANCE 4mA
SET DISTANCE 20mA
MEDIUM
FILTER COEFFICENT
BLIND DISTANCE
DISPLAY
RL1 THRESHOLD
▶RL2 THRESHOLD

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

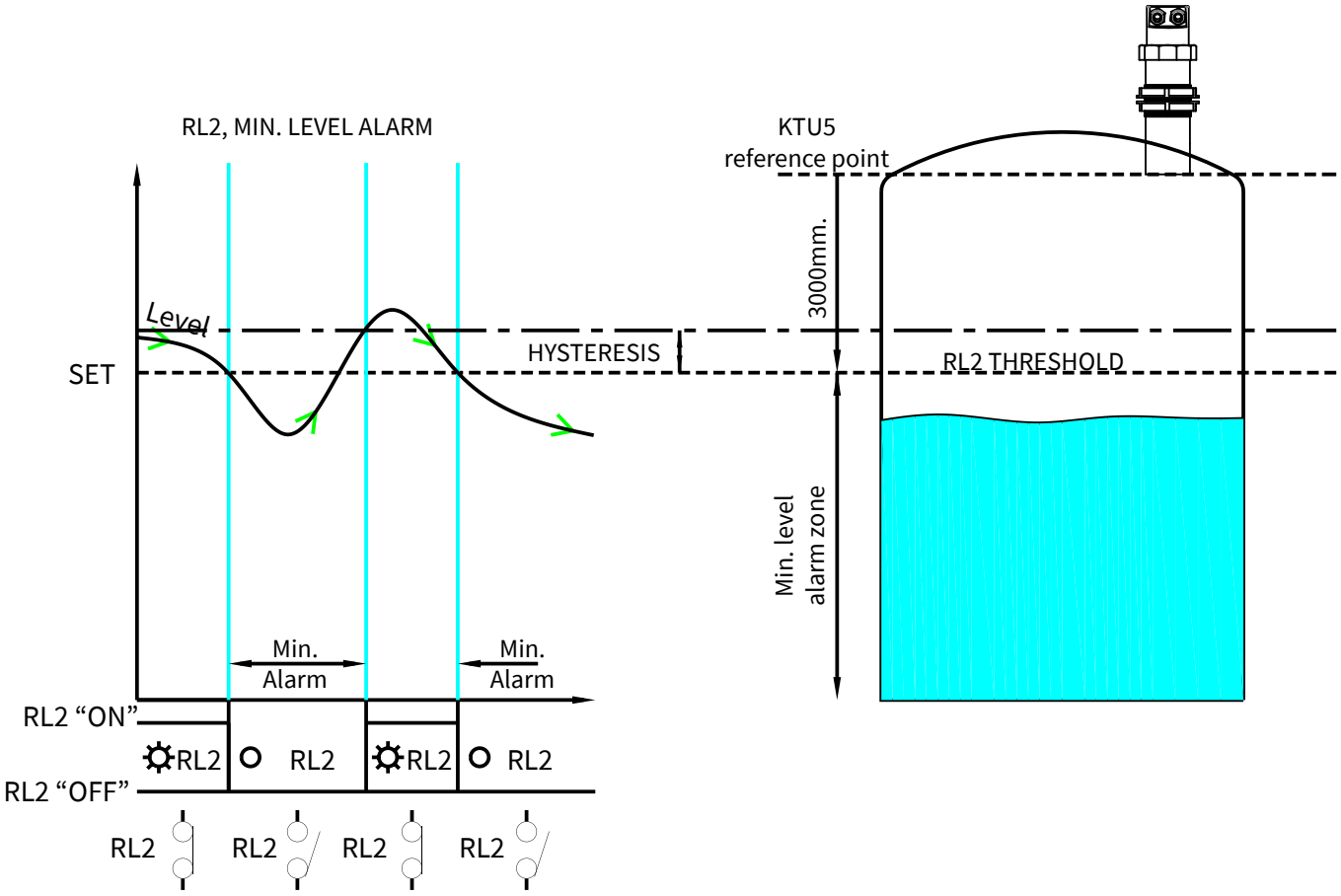
RL2 THRESHOLD

3000 mm

When confirming with the ENTER button the maximum level threshold value storage, in the example 3000mm, the KTU5 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.
5) MIN/MAX HYSTERESIS mm = 40mm.

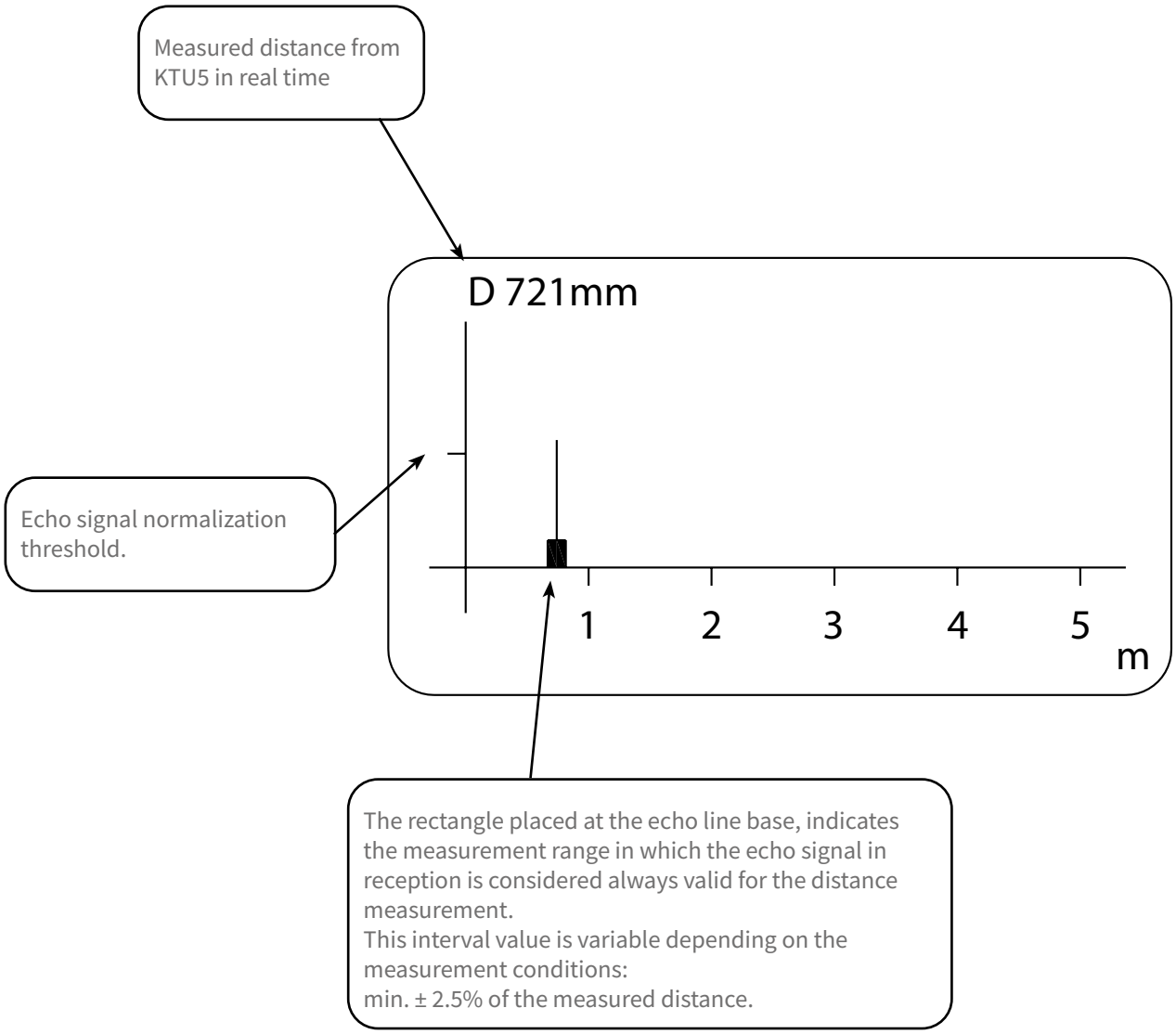
To change these relay settings it is necessary to access the advanced setup menu and any subsequent changes to the RL2 threshold value will not affect the relay custom settings.



9.3 - ECHO MAP

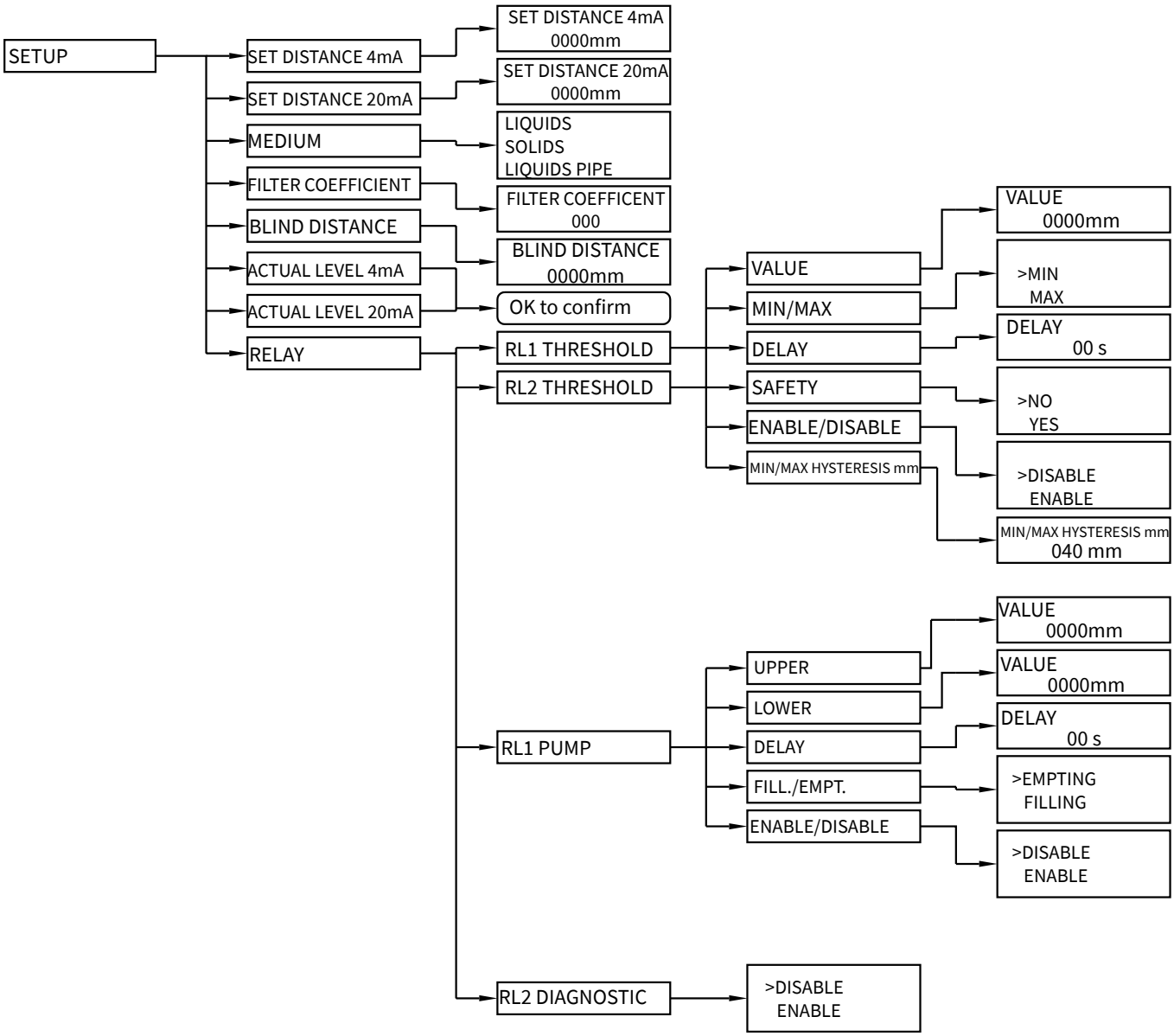
From RUN mode press LEFT ARROW to access directly the digital map of the KTU5 incoming echoes.
This function is useful for:

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

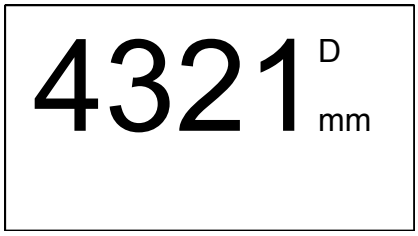


10-ADVANCED CONFIGURATION

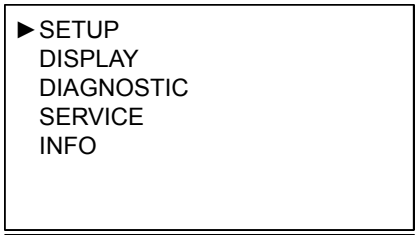
10.1 - "SETUP" MENU



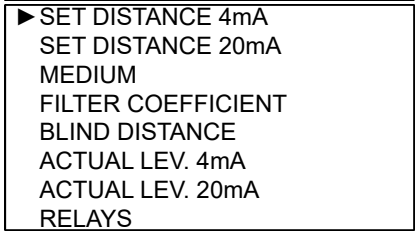
10.2 - SETUP



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

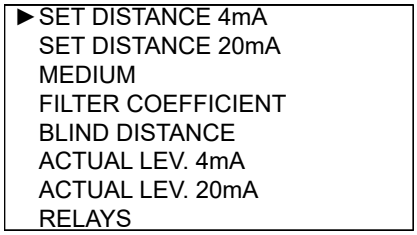


Press SCROLL to select the menu and press ENTER to access.
Press LEFT ARROW to exit.



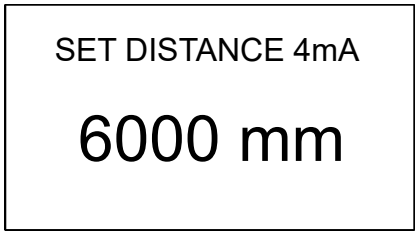
10.2.1 - SET DISTANCE 4mA

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



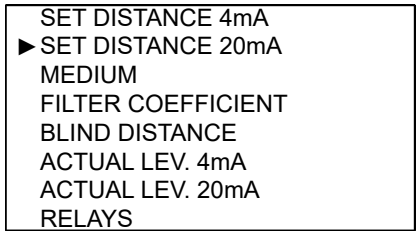
Use UP ARROW and SCROLL to modify the value.
Press ENTER to confirm.
LEFT ARROW to exit without changes.

Default value: 6000mm (range 6mt) or 10000mm (range 10mt)



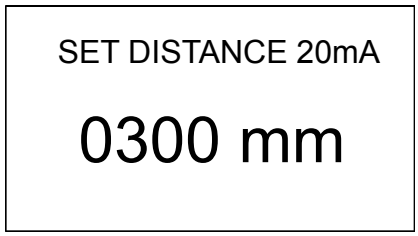
10.2.2 - SET DISTANCE 20mA

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



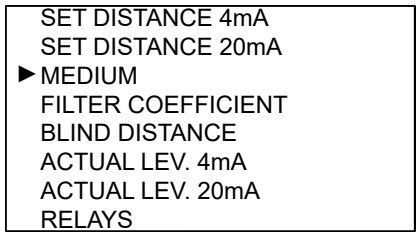
Use UP ARROW and SCROLL to modify the value.
Press ENTER to confirm.
LEFT ARROW to exit without changes.

Default value: 300mm (range 6mt) or 500mm (range 10mt)



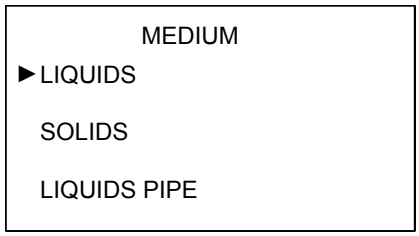
10.2.3 - MEDIUM

Position the cursor on MEDIUM, press ENTER to access.



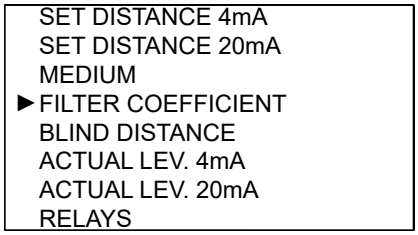
3 configurations are possible:
LIQUIDS - liquids measurement.
SOLIDS - granular solids measurement.
LIQUIDS PIPE - liquids measurement in pipe reference.
Press SCROLL to select the product type.
Press ENTER to confirm.
LEFT ARROW to exit without changes.

Default value: LIQUIDS



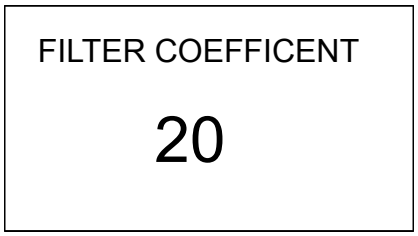
10.2.4 - FILTER COEFFICIENT

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

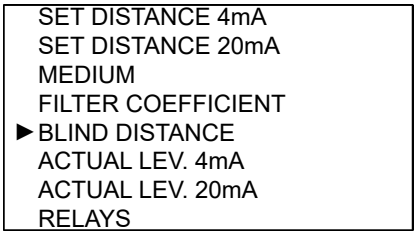


Enter a value from 1 to 99: 1 maximum speed, 99 maximum slowness.
The function is deactivated with 0 (immediate response).
Use UP ARROW and SCROLL to modify the value.
Press ENTER to confirm.
LEFT ARROW to exit without changes.

Default value: 20

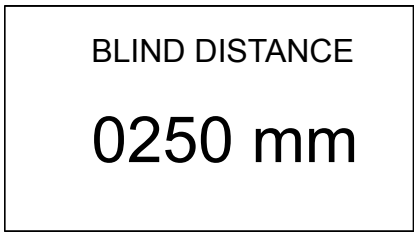


10.2.5 - BLIND DISTANCE



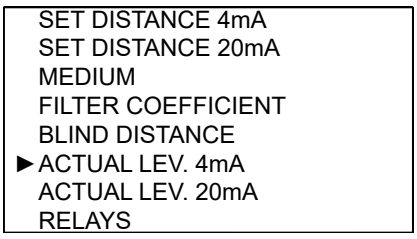
Position the cursor on DISTANCE 4mA, press ENTER to access.
Represent the “BLIND ZONE”

Input the desired value in order to avoid measures near the surface of the sensor (if necessary).
The minimum value is 250mm (6mt vers.) or 400mm (10mt vers.).
Use UP ARROW and SCROLL to modify the value.
Press ENTER to confirm.
LEFT ARROW to exit without changes.



Default values: 250mm (range 6mt) or 400mm (range 10mt)

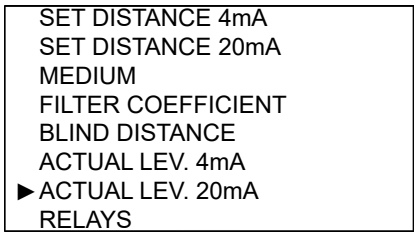
10.2.6 - ACTUAL LEV. 4mA



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

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

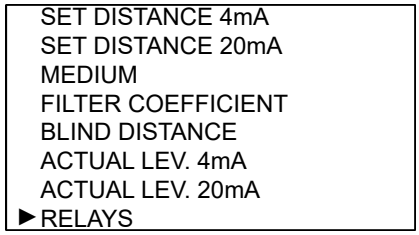


Position the cursor on ACTUAL LEV. 20mA, press ENTER to access.

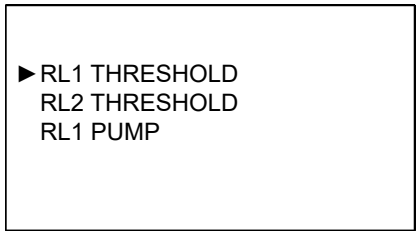
Self distance learning function that is associated with the 20mA (upper value).
Make sure that the level corresponds to 100%, ENTER to associate the actual measure with 20mA output value;
OK TO CONFIRM .
LEFT ARROW to exit without changes.

10.2.8 - RELAYS

Position the cursor on RELAYS, press ENTER to access.

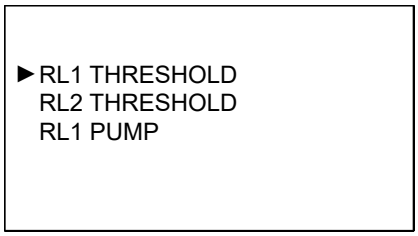


In this sub-menù it's possible to setup onboard relays
RL1 can be set as threshold relay or pump-control relay;
RL2 can be set as threshold relay or diagnostic relay.
With the SCROLL button you can select the operation mode,
then pressing ENTER to confirm the selection.

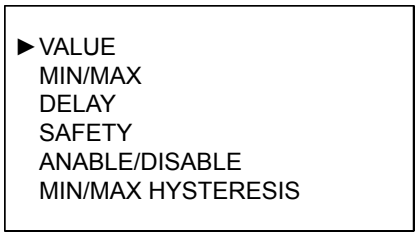


10.2.8.1 - RL1 THRESHOLD (RL2 THRESHOLD equivalent)

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

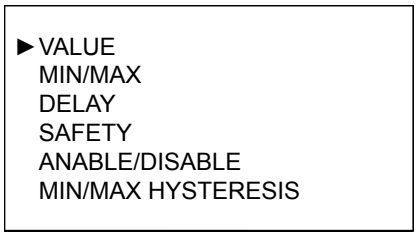


In this submenu you can set the set-point and the relay 1 and 2 action type.
With the SCROLL button you can select the parameter to be programmed.
Press ENTER to confirm



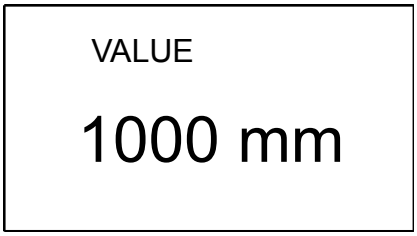
10.2.8.1.1 - VALUE

Position the cursor on VALUE, press ENTER to access.



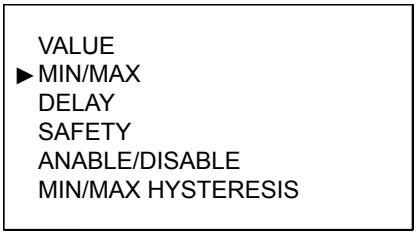
It's possible to input the threshold value that corresponds to the distance in mm from the sensor.
Use UP ARROW and SCROLL to modify the value.
Press ENTER to confirm.
LEFT ARROW to exit without changes.

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



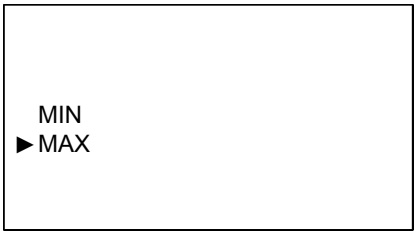
10.2.8.1.2 - MIN/MAX

Position the cursor on VALUE, press ENTER to access.



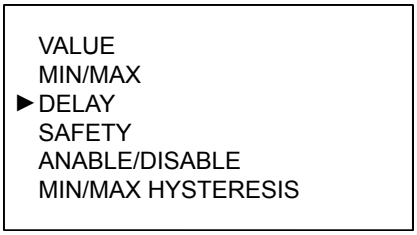
It's possible to select if the relay works as maximum level threshold or minimum level threshold.
With the SCROLL button you can select the operation mode.
Press ENTER to confirm.
LEFT ARROW to exit without changes.

Default value: MAX for RL1; MIN for RL2



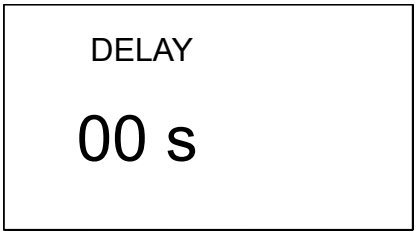
10.2.8.1.3 - DELAY

Position the cursor on DELAY, press ENTER to access.



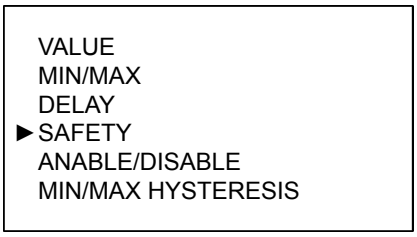
It's possible to set the activation delay for the selected relay, from 0 to 99 sec.
Use UP ARROW and SCROLL to modify the value.
Press ENTER to confirm.
LEFT ARROW to exit without changes

Default value: 00s



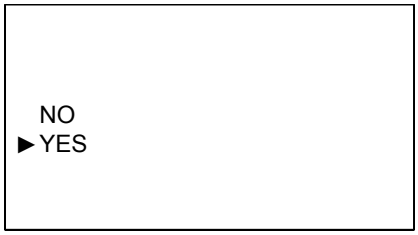
10.2.8.1.4 - SAFETY

Position the cursor on SAFETY, press ENTER to access.



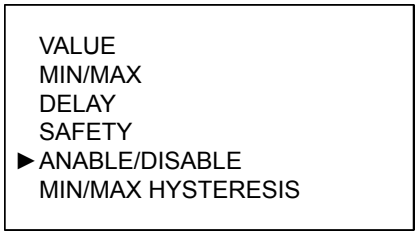
A "safety alarm" provides a "closed" contact with relay energized in normal condition (no alarm), the contact switches to "open":
- Alarm condition (eg overcoming MAX);
- In power failure case.
With the SCROLL button you can select the alarm mode.
Press ENTER to confirm.
LEFT ARROW to exit without changes.

Default value: YES



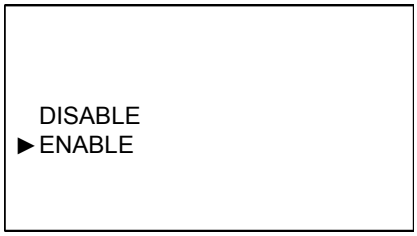
10.2.8.1.5 - ENABLE/DISABLE

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



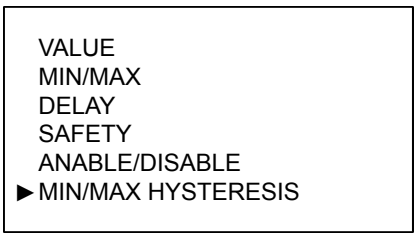
Select ENABLE to activate relay threshold.
Select DISABLE to not activate relay threshold.
With the SCROLL button you can select the operation mode.
Press ENTER to confirm.
LEFT ARROW to exit without changes.

Default value: DISABLE



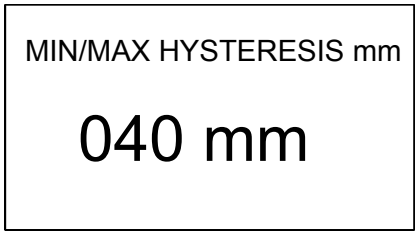
10.2.8.1.6 - MIN/MAX HYSTERESIS mm

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



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



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

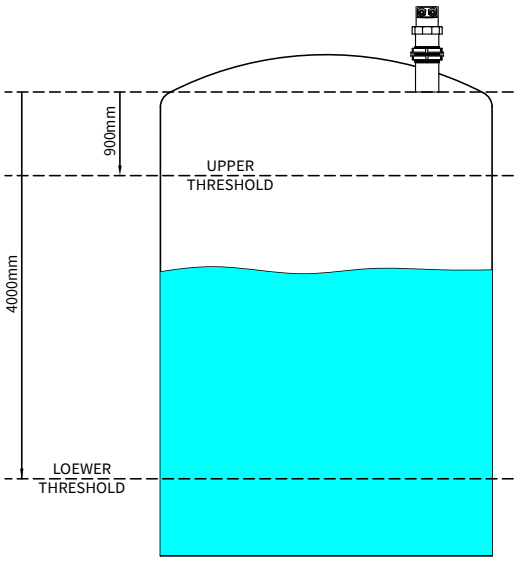
Position the cursor on LOWER, press ENTER to access.
The lower threshold is expressed in mm distance from the sensor.
Represents the pump stopping point, EMPTY case, or pump starting point, FILLING case.

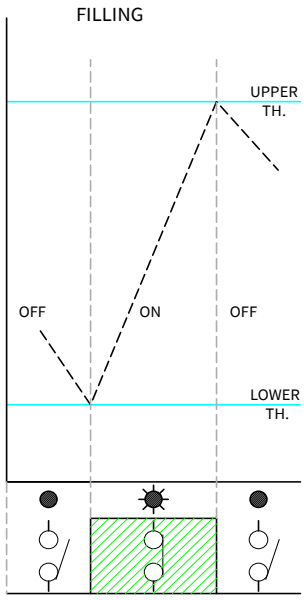
```
  UPPER
► LOWER
  DELAY
  FILL./EMPT.
  ENABLE/DISABLE
```

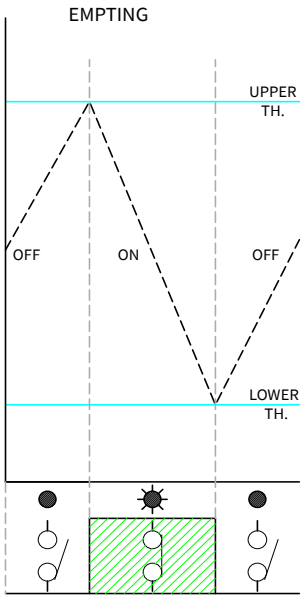
Use UP ARROW and SCROLL to modify the value.
Press ENTER to confirm.
LEFT ARROW to exit without changes.

Default value: 0

```
VALUE

4000 mm
```

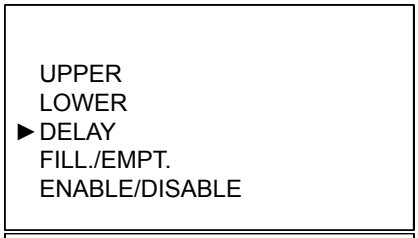






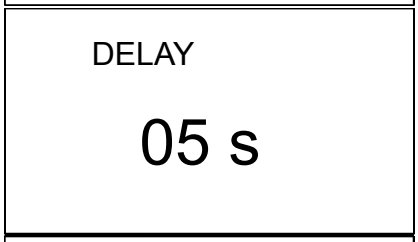
10.2.8.2.3 - DELAY

Position the cursor on DELAY, press ENTER to access.



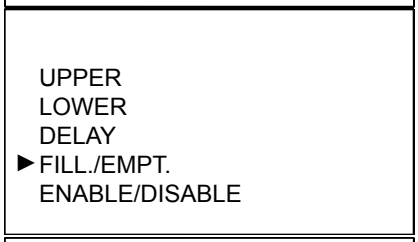
Set the relay delay activation, from 0 to 99 sec.
Use UP ARROW and SCROLL to modify the value.
Press ENTER to confirm.
LEFT ARROW to exit without changes.

Default value: 0



10.2.8.2.4 - FILL./EMPT

Position the cursor on DELAY, press ENTER to access.

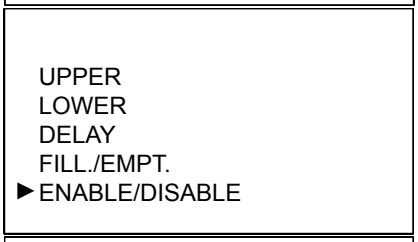


it's possible to select the mode of pump control (FILLING or EMPTING).
With the SCROLL button you can select the operation mode.
Press ENTER to confirm.
LEFT ARROW to exit without changes.

Default value: EMPTING

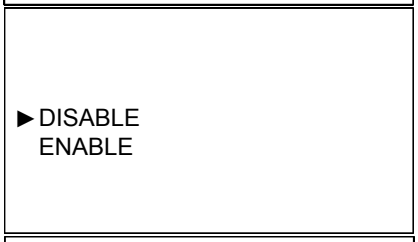
10.2.8.2.5 - ENABLE/DISABLE

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



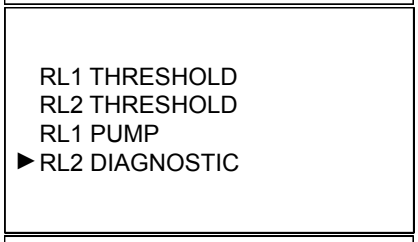
Select ENABLE to activate relay threshold.
Select DISABLE to not activate relay threshold.
With the SCROLL button you can select the operation mode.
Press ENTER to confirm.
LEFT ARROW to exit without changes.

Default value: DISABLE



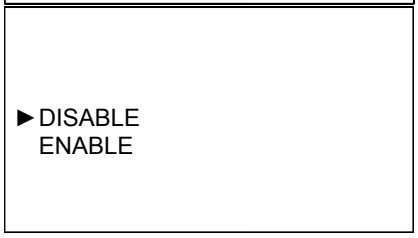
10.2.8.3 - RL2 DIAGNOSTIC

Position the cursor on RL2 DIAGNOSTIC, press ENTER to access.

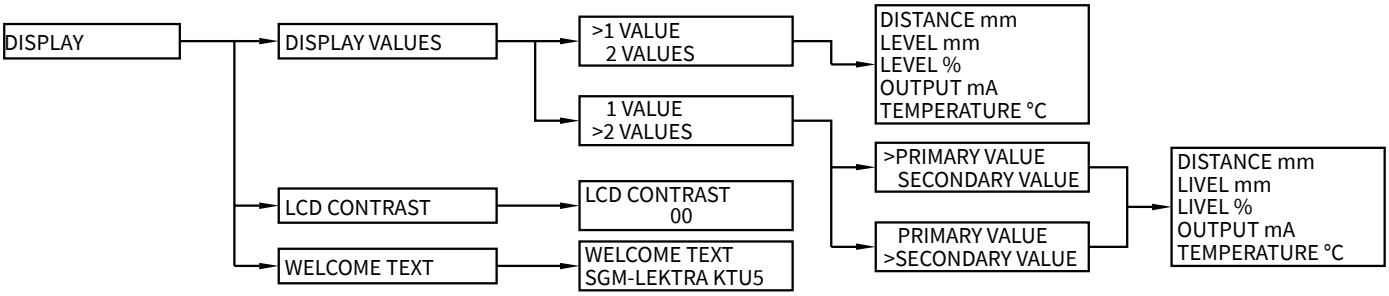


If it becomes necessary the KTU5 functional control, it's possible to enable the RL2 alarm output function.
In this case, enabling the function, RL2 is energized in normal operation (RL2 LED on) and is de-energized (LED RL2 off, safety alarm) when at least one of the four conditions mentioned below, shall be verified:
- TEMP. : temperature out of range
- ECHO : no echo is detected
- GAIN : the sensor's gain exceed the value setted in Max Gain TH (7.3.5)
- DIST. : the measured distance exceed the 120% of the maximum distance in setup

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
when an error occurs, a "!" is flashing on the display:
press SCROLL to show a message that indicate what kind of error is present.
The KTU5 automatically returns to RUN mode.



10.3 - "DISPLAY" menu



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
```

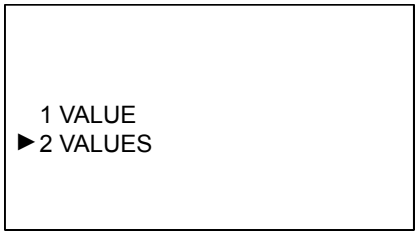
Only one value is displayed; it's possible to choose from 5 parameters.
With the SCROLL button you can select data to display.
Press ENTER to confirm.
LEFT ARROW to exit without changes.

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

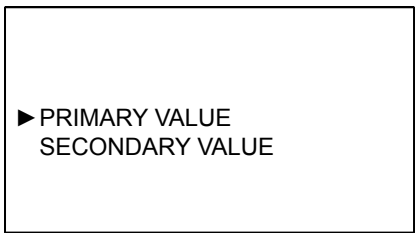
```
4321 D
     mm
```

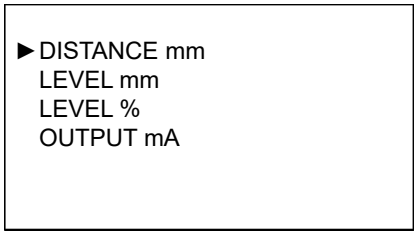
10.4.1.2 - 2 VALUE

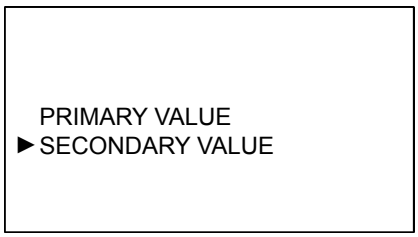
Position the cursor on 2 VALUE, press ENTER to access.

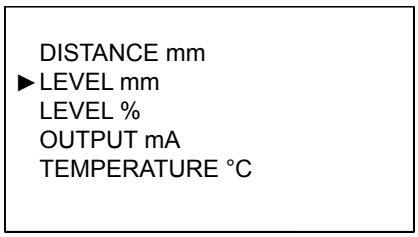


Two values are displayed; it's possible to choose which one is the primary and which is the secondary, each with a choice of 5 parameters.
With the SCROLL button you can select data to display.
Press ENTER to confirm.
LEFT ARROW to exit without changes.



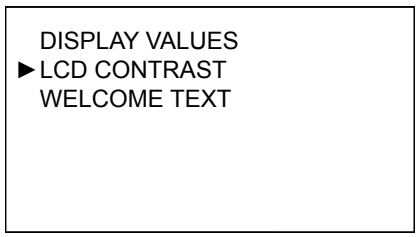






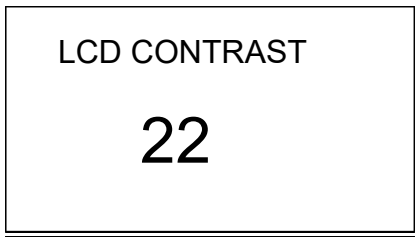
10.4.2 - LCD CONTRAST

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



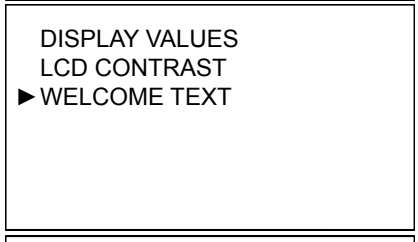
it's possible to adjust the contrast of LCD, simply increasing or decreasing the value of a parameter from 0 to 63.
Use UP ARROW and SCROLL to modify the value.
Press ENTER to confirm.
LEFT ARROW to exit without changes.

Default value: 32



10.4.3 - WELCOME TEXT

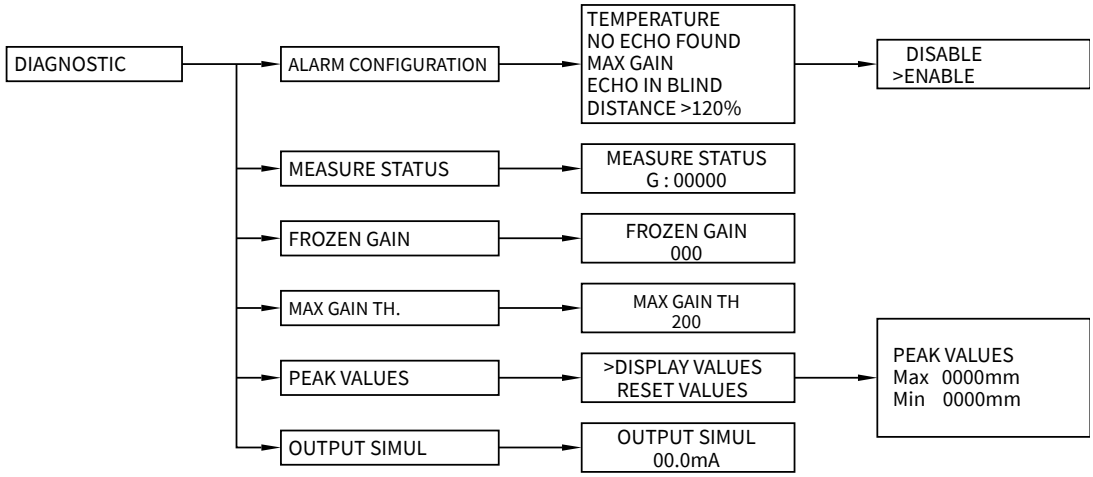
Position the cursor on WELCOME TEXT, press ENTER to access.



It's possible to edit or delete the message that is displayed by the KTU5 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 KTU5

10.5 - "DIAGNOSTIC" menu



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
  FROZEN GAIN
  MAX GAIN TH.
  PEAK VALUES
  OUTPUT SIMUL.
```

10.6.1 - ALARM CONFIGURATION

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

```
► ALARM CONFIGURATION
  MEASURE STATUS
  FROZEN GAIN
  MAX GAIN TH.
  PEAK VALUES
  OUTPUT SIMUL.
```

To enable or disable each diagnostic alarms.

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

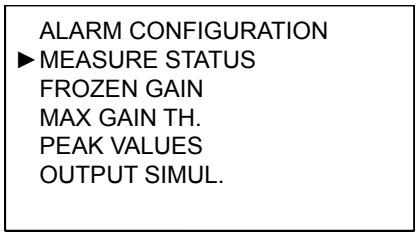
```
► TEMPERATURE
  NO ECHO FOUND
  MAX GAIN
  ECHO IN BLIND
  DISTANCE  >120%
```

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

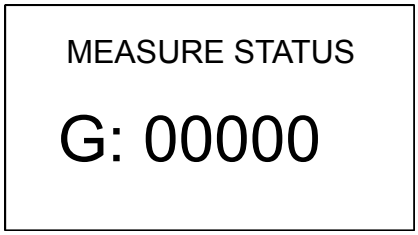
```
  DISABLE
► ENABLE
```

10.6.2 - MEASURE STATUS

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

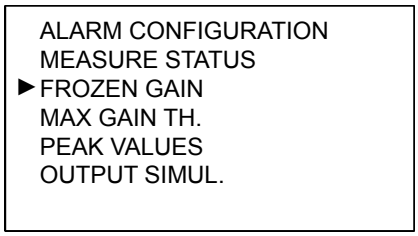


It's possible to display the gain of the system, with values from 0 to 255.
LEFT ARROW to exit.



10.6.3 - FROZEN GAIN

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

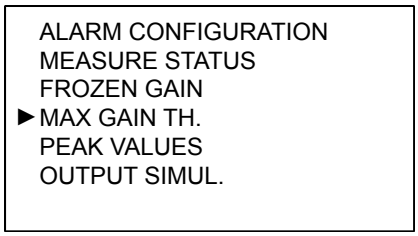


It's possible to fix a value of gain (from 1 to 255) and consequently disable the automatic gain control.
Once the value is 000 the automatic gain control restarts.
Use UP ARROW and SCROLL to modify the value.
Press ENTER to confirm.
LEFT ARROW to exit without changes.

Default value: 000

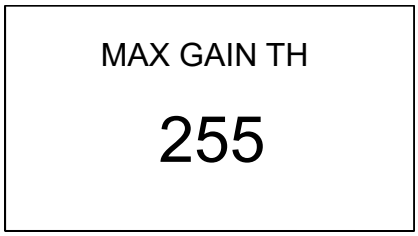
10.6.4 - MAX GAIN TH

Position the cursor on MAX GAIN TH, press ENTER to access.



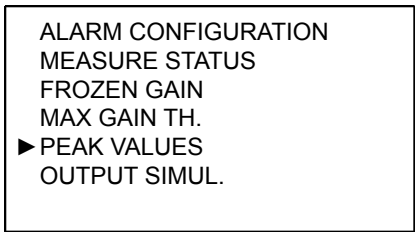
It's possible to change the max value of gain.
If the gain reaches this value, the "GAIN" error code is activated.
Use UP ARROW and SCROLL to modify the value.
Press ENTER to confirm.
LEFT ARROW to exit without changes.

Default value: 200

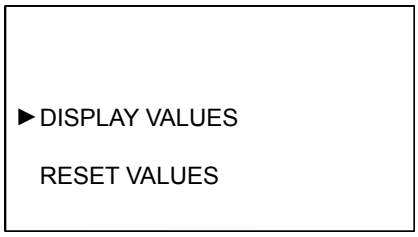


10.6.5 - PEAK VALUES

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

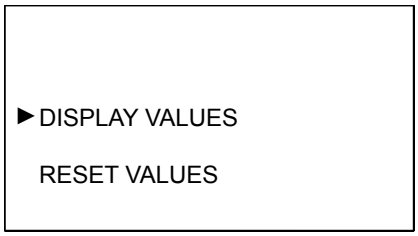


The system store the maximum distance and the minimum distance measured since the power is turned ON.
It's possible to see those values or reset the values.
With the SCROLL button you can select the function.
Press ENTER to confirm.

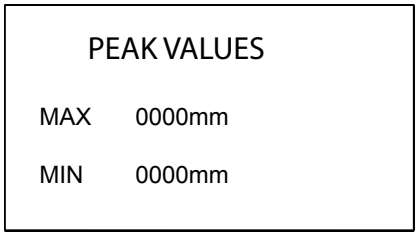


10.6.5.1 - DISPLAY VALUES

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

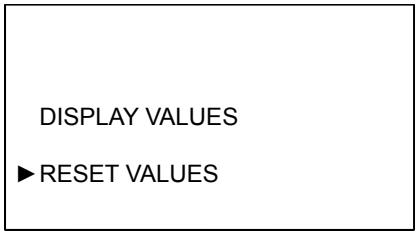


Displays the max. and min. distance measured from power on.
LEFT ARROW to exit.
NB - The peak values stored are erased every time the KTU5 turns-off



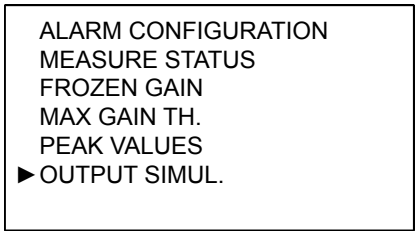
10.6.5.2 - RESET VALUES

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



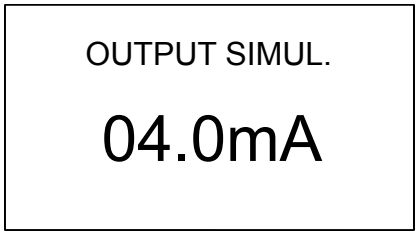
LEFT ARROW to return to the previous menu.

10.6.6 - OUTPUT SIMULATION



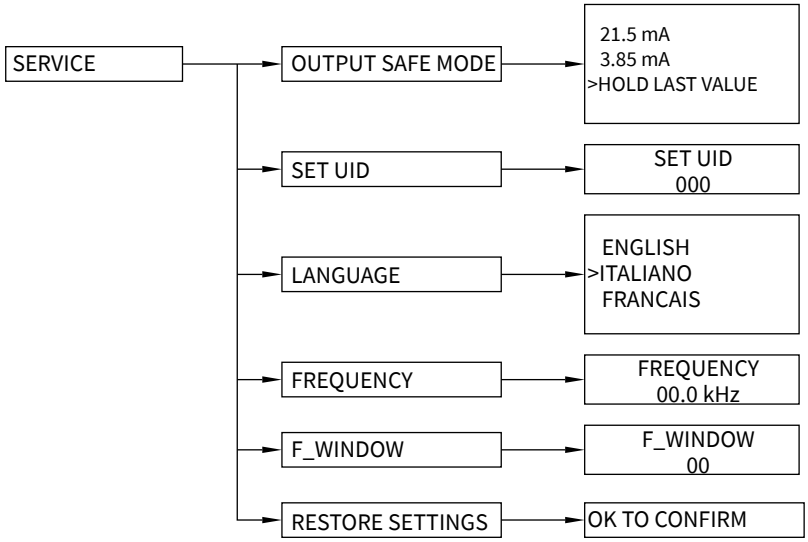
WARNING - entering in the SIMULATION function, the current output is not in function of the level measurement.
To restore the current as a measured level function, press the LEFT ARROW button 3 times (RUN mode).

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



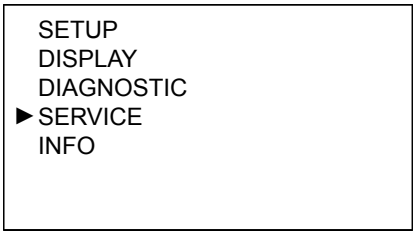
It's possible to force the analog output to a desired value, from 3,5 to 21mA.
Use UP ARROW and SCROLL to modify the value.
LEFT ARROW to return to the previous menu.

10.7 - "SERVICE" menu

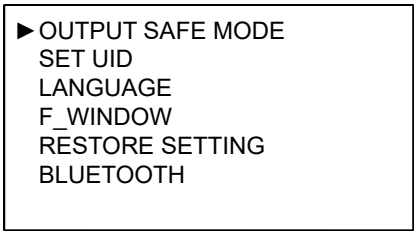


10.8 - SERVICE

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

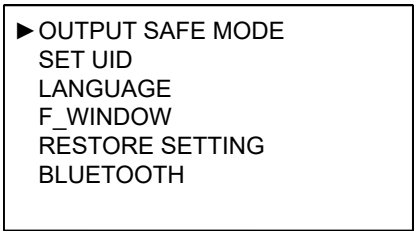


Select the parameters by moving the cursor with SCROLL and confirm with ENTER.



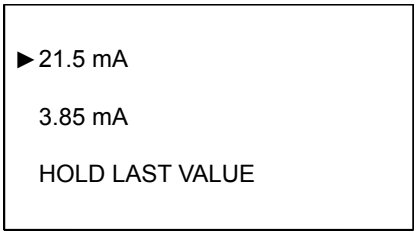
10.8.1 - OUTPUT SAFE MODE

Position the cursor on OUTPUT SAFE MODE, press ENTER to access.



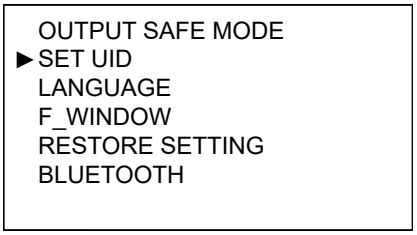
It's possible to choose a analog output value during diagnostic errors.
"21.5 mA" forces the current output to 21,5mA
"3.85 mA" forces the current output to 3,85mA
"HOLD LAST VALUE" maintains the output at the last valid value.
With the SCROLL button you can select the operation mode.
Press ENTER to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

Default value: HOLD LAST VALUE



10.8.2 - SET UID

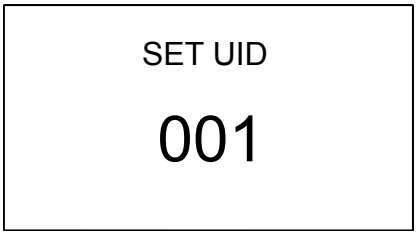
Position the cursor on SET UID, press ENTER to access.



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

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

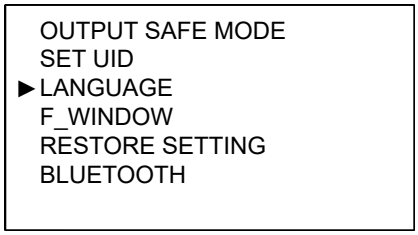
Default value 001



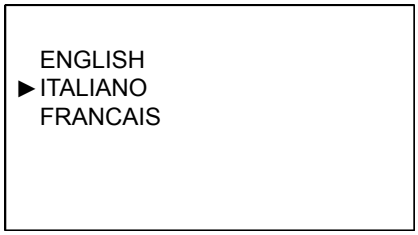
10.8.3 - LANGUAGE

Position the cursor on LANGUAGE, press ENTER to access.

Sets the menu language: English, Italian, French.



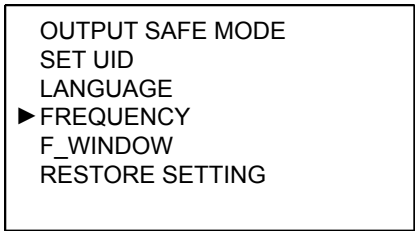
Press SCROLL to select the menu language.
Press ENTER to confirm.
LEFT ARROW to exit without changes.



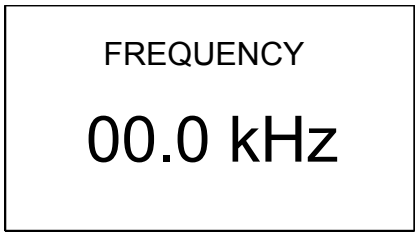
10.8.4 - FREQUENCY

Position the cursor on FREQUENCY, press ENTER to access.

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

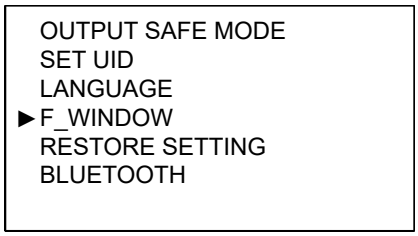


LEFT ARROW to exit without changes.



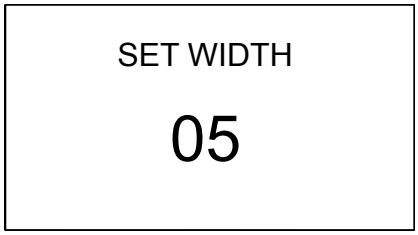
10.8.5 - F_ WINDOWS

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 KTU5 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 KTU5 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..

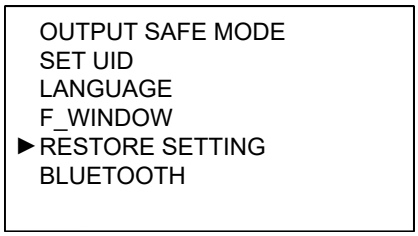
F_WINDOW serves to filter false echo signals caused, for example, by the agitator blades
Range: 05÷20
Use UP ARROW and SCROLL to modify the value.
Press ENTER to confirm.
LEFT ARROW to exit without changes



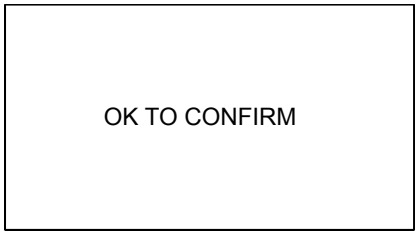
Default value: 05

10.8.6 - RESTORE SETTING

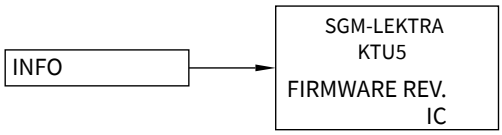
Position the cursor on SET UID, press ENTER to access.



Press ENTER to restore the KTU5 default settings.
LEFT ARROW to exit without restored the KTU5 default settings.

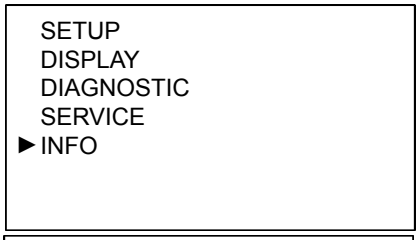


10.8.7 - “INFO” menu

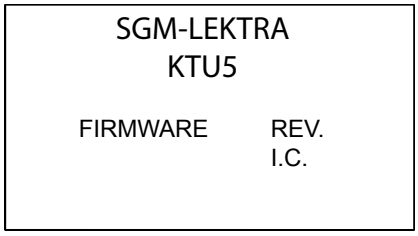


10.8.7 - INFO

Position the cursor on INFO, press ENTER to access.



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



11-FACTORY TEST AND QUALITY CERTIFICATE

CE

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

(Ultrasonic sensor)

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 S.r.l.
Via Papa Giovanni XXIII, 49
20090 Rodano (MI) - ITALY
tel: ++39 02 95328257
fax: ++39 02 95328321
e-mail: info@sgm-lektra.com
web: sgm-lektra.com

sgm lektra