



Programmer of ultrasonic levemeters

PRG10

1. APPLICATION

The programmer is designed for control and programming of ultrasonic level sensors ULS10.

2. TECHNICAL DATA

| | |
|-----------------------------|---|
| display | 2-line 16-character alphanumeric LCD, matrix symbols - 5x8 points, 4.84x9.66 mm |
| readings | distance or level measured, sound velocity, ambient temperature, status |
| refreshment time | 1s |
| temperature | 0 + 40 °C |
| atmospheric pressure | 100 ±15 kPa |
| relative humidity | (5 + 95)% |
| cover | IP55 |
| power supply | power adapter ~100-240 V/12VDC 0,5A 50-60 Hz or battery (6F22) 9V |

3. CONTENTS OF DELIVERY

- programmer
- adapter
- dry battery
- cable

4. ELECTRICAL CONNECTION

The programmer is connected to the sensor in two ways:

the sensor has external power supply and on the serial interface of the programmer are connected only wires A and B;


the sensor is powered from the programmer and communicates with it


5. FRONT PANEL AND CONTROLS


The front panel is provided with 2x16 character LCD display and eight (8) push buttons.


By means of the push buttons the user can view the sensor readings or input the setting parameters and select the operating mode.

Push button functions:


 Used in measuring mode. Alternately, it can change the data shown in the upper display line.


 Used in measuring mode. Alternately, it can change the data shown in the lower display line.

 Moves cursor to the left. Adjusts LCD contrast.


 Moves cursor to the right. Selects integrating constant.



 Increases selected digit value.

 Decreases selected digit value.

 Confirms data.


 Exits current menu.

The device has three operating modes:

- Measuring
- Service
- Configuration

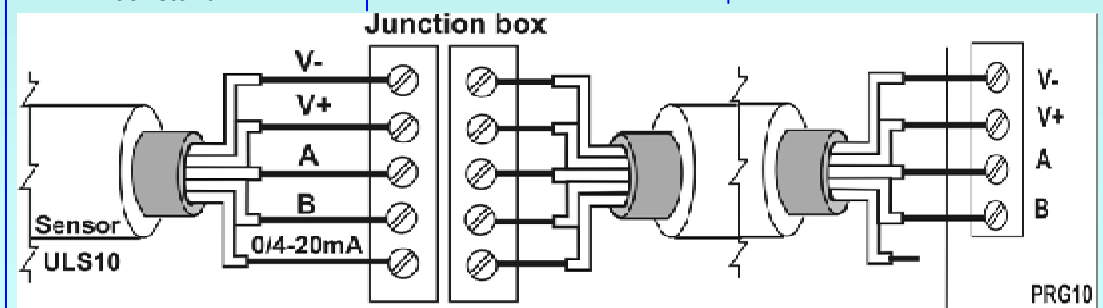
Measuring mode is the main one. It is automatically selected on device switching on.

The remaining two modes can be selected by

 pressing "Enter" and holding for about 1-2 seconds.

6. OPERATING MODES

6.1. Mode Selection



Configuration mode is used by authorized persons or agencies for initial setting and changing of the operating parameters.

6.2. SERVICE MENU

This mode allows entering of measurement related parameters, output configuration and new calibration.

The initial configuration requires entering of operating parameters.

L₀ – distance from the sensor to the point, corresponding to zero (base) level. The value is a 4-digit one in mm.


L_{max} – maximum operating distance. The value is a 4-digit one in mm.

L_{min} – minimum distance between the sensor and the liquid level. The value is a 4-digit one in mm.

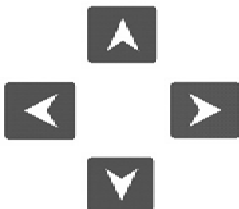
dL – permissible difference between the measured levels during two following measurements (understand 50 mm)

MaxGain – limit amplification of the reflected (echo) signal (understand 90dB)



The data is allocated in the various menus.

To select this mode press "Enter" for  about 1second.

To select and change a parameter, use the following push buttons:



Pressing the  confirms the changes.

To exit the menu press  

<< Analog Out >> Menu

This menu is used for selection of the type and range of the output

0÷ 20 mA, 4÷ 20 mA, 0÷ 24 mA, 0÷ 5 V .

The respective lower and upper range limit values are set on the second line of the display.

The analog output is controlled depending on the operating value.

<< NoEcho >> Menu

This menu is used to set the permissible time (20-99 s) during which the echo is not received. After expiration of the time previously set, the measurements and the outputs are reset.

SENSOR PARAMETER

<< Lmin Lmax >>

On selection of this menu the last entered values are read and shown on the display. Each new value is stored in the sensor's memory.

Attention : *L_{min} should not be less than 300mm . L_{max} should not be greater than the maximum distance from the sensor to the bottom (empty).*

SENSOR PARAMETER

<< L0 >>

On selection of this menu the last entered value of the distance from the sensor to the "zero level" base point is read and shown. Each new value is stored in the sensor's memory.

SENSOR PARAMETER

<< Calibrate >>

On selection of this menu the last reference distance at which the sensor is calibrated is read and shown on the display. If

calibration is required, the new reference distance value from sensor head to liquid level is entered and the process is started. At the end of the process the new calibration values are automatically stored.

Attention: *Calibration affects the accuracy of measurement. In case the entered reference value differs greatly from the actual distance or there is no echo signal reception, calibration is rejected and an ERROR message appears.*


6.3. Measurement


6.3.1 General

On device switching on the sensor parameters are optimized depending on the distance, ambient temperature, reflecting surface etc., hence the information about the measured distance is displayed with up to 30 seconds delay.

6.3.2 Display readings switching

Display data is switched alternately by means of

push button  for Line 1 and

push button  for Line 2.

6.3.3 Level Measurement (Level)

The Level reading is of the XXXX mm type.

6.3.4 Sound velocity

6.3.5 Temperature Measurement (Temp)

The Temperature measurement has + or - sign and 1 °C resolution.

6.3.6 Failure Indication


This is service information that helps localize and eliminate possible failures. The type of failure is shown by means of a letter in the lower left corner of the

display:

- COM** - interrupted communication with the sensor
- ERR** - measurement error
- OVR** - the measured value is greater than a range.

6.3.6 Selection and change of integrating constant.

To minimize the readings fluctuation around the average value in case of frequently and considerably varying level, a program filtration has been provided. The changes are registered with certain delay which allows for their mutual compensation in the mean time.


This option is selected by means of push button 

The symbol κ~ appears in the lower left corner of the display.

The value of the constant can be changed by means of push buttons



6.3.7 Display contrast adjustment.

This function is selected by means of push button 

Contrast adjustment is carried out by means of push buttons

