User manual of Ultrasonic level Transmitter

MODEL NO. MS0410

It has following features:

- **Analogue output 4-20mA**
- **Digital output for relay operation (On/OFF)**
- **Rs485 standard Modbus Communication.**
- **Auxiliary Power supply 24vDC 600mA**
- **Small display .96" OLED type**

Introduction:

This is microprocessor based Ultrasonic level transmitter. It has Multifunction Instruments It is capable of monitoring Virtually Any Short or Medium Range of Non-Contact Ultrasonic Level Measurements of Liquids, Solids or Slurries. In this Instrument User can take measurements of Roller Lift of mills, water level and select the range in the range parameter and set action in Action parameter. It has One Analog Output 4-20mA (Isolated) and two digital control output (we can also define these two digital control output as relay1and Relay2).

Modbus communication protocol:

1. Baud Rate: 9600 B/S
2. Data Bits :8
3. Party: None
4. Stop Bit: One
5. Communication Mode: RTU 8 Bit

The instrument has standard Modbus communication via RS-485

The user can read parameter value and display levels value etc.

Note: Modbus data 35000 received when over range message

is received on the display

Note: User can change Modbus Id (0-255) in Modbus id

parameter as per requirement.

Master Query: [id] [Function Code] [High Addr. Byte] [Low addr. Byte] [No of Points High] [No. of point low] [CRCL][CRCH]
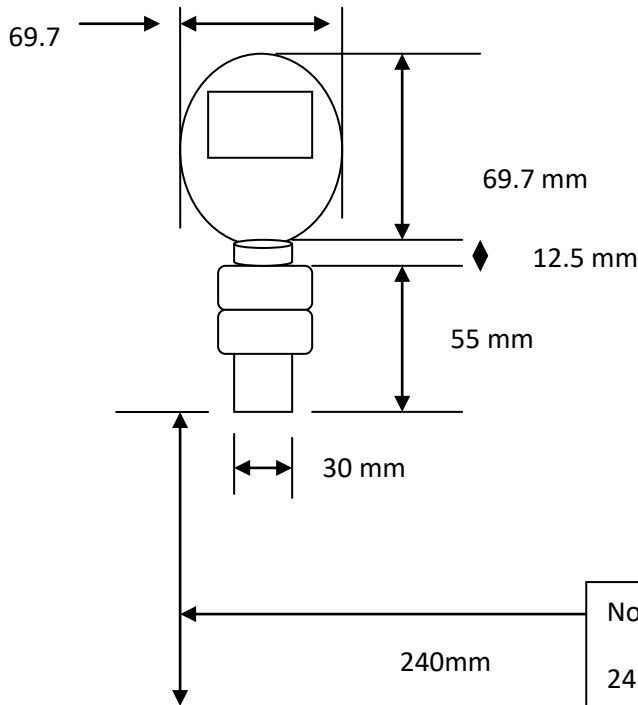
Slave Response: [id]][Function Code][Byte Count.][Data High][Data Low] [CRCL][CRCH]

[id]] Function Code] [High Addr. Byte][Low addr. Byte] [No of Points High] [No. of point low][CRCL][CRCH]

Address: Decimal value

<u>**4000/4001 : Tank_Level/ Distance_value**</u>

<u>**Note:**</u> **Model No. MS0410, Sensing Range: 0-6meter (Adjustable)**

Noted: 24**/25 cm is dead zone of Sensor**

24 cm is the dead zone of the sensor, in this zone the sensor will not work. If using it to check tank level, make sure it fits 24 cm above the top of the tank.

<u>How can Tank Level Measurement:</u>

<u>**Action parameter:**</u> **If the tank level is to be measured, the action parameter has to be set value of 1. If the distance is to be measured then the value has to be kept 0.**

<u>**RANGE PARAMETER**</u> **– in range parameter we have to define that value(0-6000mm) which gives the output of 420mA.**

WORKING OF TRANSMITTER- (REVERSEACTION) if we mention the value of action parameter as 1 , suppose the object is placed 1 m (value of range parameter) from the transmitter then this value will be considered zero and as the object will move closer to it ,it will begin to sense the distance and will give the output as soon as when the object will be at 24cm(Dead Zone) it will display maximum range i.e 4-20 mA.

FORWARD ACTION – if we mention the value of action parameter as 0 and the object is placed closer to the transmitter ie24cm from it or less than

that, it will consider it as zero and show dead zone and at this time the range will be 3.8 mA .when the object will move farther from 24cm it will sense the value and display the output.
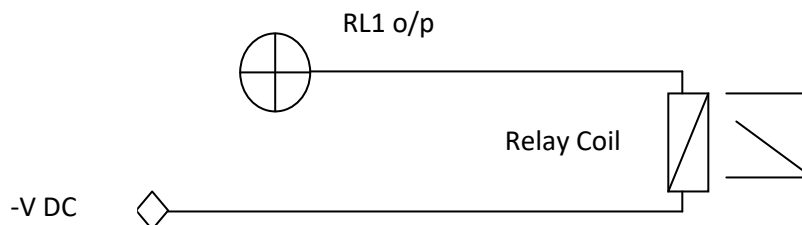

Ultrasonic Transmitter

Cable of sensor

240mm Dead zone

TANK
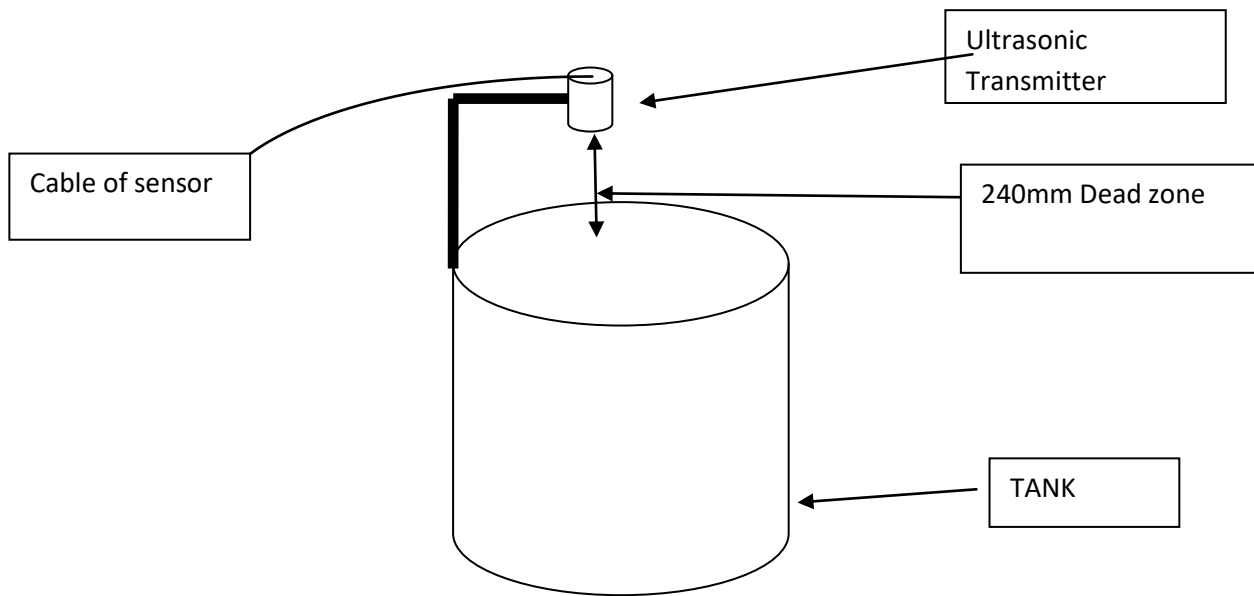
DIFGITAL OUTPUT:

⊕ **+V Common wire(pin 7 of 'D' type connector**
   +24vDC apply at this terminal

⊕ RL1 o/p   (+24v o/p to relay coil)

⊕ RL2 o/p   (+24v o/p to relay coil)

RL1 o/p

Relay Coil

-V DC

Noted: By programming, relay1 will go into the parameter and set the value of relay1 to turn on. If relay2 is also to be used, the value of relay2 has to be set in the relay2 parameter. After this, the value of relay closure has to be set in His1 and His2 parameter.

PARAMETER DETAILS:

Action parameter: - if we mention the value of action parameter as 1 then it will work in reverse order and if value is mentioned as 0 it will work in forward order.

■ **Range Parameter:** 0 – 6000mm (set higher range of 20mA)
■ **RL 1& RL2**   :Set value of Relay(Digital O/p). If actual value lowers than Set value Relay & His

will be OFF and if actual Values cross the Set value. Relay goes to change its control (ON).

- **CORRE.FACTOR** : <u>This parameter is selectable for multiplier and divider factor for display</u>

  Actual value x Corre. Factor value =result (corrected value)

  Example1: 1800(actual) x .834=1501 value (result)

  Example 2.   if actual value 3000mm but you want display 1535 mm then

  Actual value/ required value= result (it is multiplier value or it is Corre.Factor parameter value)

  Noted : if Actual value 1500 but if you Want display 6000 mm

  Then   Corre.Factor parameter= 6000/1500 Or If Actual value are 6000 but you Want display 1500 value Then Corre.Factor parameter = 1500/6000 .

  Noted: If you are not using correction factor then must be set the zero value in correction factor parameter , Press Hold PROG key up to 1 second & after press enter key now release both keys.

  Now modified value has been stored.

  <u>**Zero Parameter:**</u> **In this parameter user can adjust Zero , Suppose after installation indicator showing 5mm at the zero position of machine then select zero parameter and set 5 mm by use up/dn key press & hold PRG key & after 1 second press E Key & now release both keys.**

- # <u>Configuration:</u> **Press PRG key for 5 seconds ,display Action Parameter if want change in existing value then use up/Dn key and again press PRG key now modified value store and display Range parameter in this parameter user can set value for 20mA(Higher Range) again press PRG key now modified value store same process apply for all parameters. If user not touch any for some time then system automatically exit from configuration mode.**

- # <u>Noted Correc.Factor Parameter :</u>

In this parameter user can selectable for multiplier and divider correction factor for display actual value by use Up/Dn key.

For storing modified value , Press Hold PROG key up to 1 second & Then press enter now release both keys now modified value has been stored.

For not store muddied value then Press Enter key only. Now you have been exit From configuration mode.

<u>SPESIFICATION</u>

Measuring Range   : 0-6 Meters(0-6000MM)

Main (auxiliary supply)   **: 24V DC**
O/P (Analogue)   **: 4-20mA(Isolated)**
Digital o/p (RL1& RL2)   **: +24v common**
Display OLED   **: 16 x7**
Display value   **: In CM(Centimetre) And MM(Millimetre)**
Reveres Action   **: User can be take 4-20mA in reveres action**
R1:OF/ON   **: Display status of Relay 1(On/OFF)**
R2:OF/ON   **: Display status of Relay 2(On/OFF)**

<u>Sensor</u> CONNECTION DETAILS: 9Pins 'D' Type Connector provide at the back side.

Discretion	Pins Numbers	Pins Details
Power	1	+24V DC
	2	-24V DC
O/P 4-20mA	3	+mA
	4	-mA
Digital O/P	7	+V Common
	6	RL1 O/P
	8	Rs485 D-
Modbus Communication	9	Rs485 D+

Programming flow chart

Press PRG key for 4 seconds

Display Action: 0001

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If change value then use Up/Dn key

Press E key

↓

Display Range : 0500MM , If change then use up/dn key & press E key

↓

Display RL1:0050MM ,relay on value, If change then use up/dn key & press E key

↓

Display RL2:0050MM, relay on value, If change then use up/dn key & press E key

↓

Display His1:0040MM, relay oFF value, If change then use up/dn key & press E key

↓

Display His2:0040MM, relay oFF value, If change then use up/dn key & press E key

↓

Display Scale factor value, If change then use up/dn key & press Prgkey + E key Press for store otherwise press Ekey only

↓

Display Modbusid:0001, If change then use up/dn key & press E key