Ultrasonic Liquid Level Sensor

Product manual for Part Numbers: LLUSCS03

Product Description

The Ultrasonic level transmitter is a non-contact, highly reliable level measuring instrument. It is easy to install, maintain and provides continuous level measurement without touching the medium. It is well suited for monitoring fluids of varying viscosity as well as granular solid materials, such as bulk dry goods.

Features

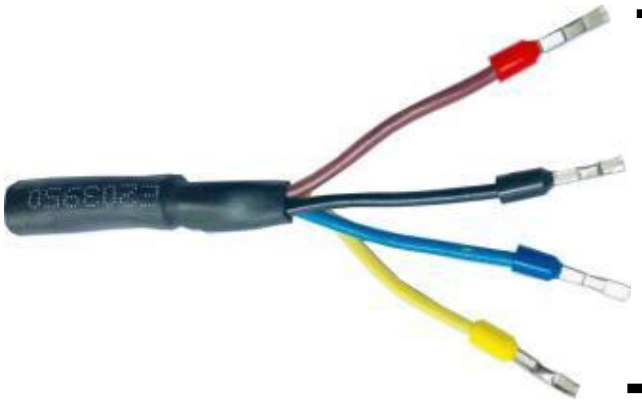
- Fully enclosed probe and one-piece casting provide long service life.
- Echo analysis technology helps eliminate false echo signals and ensure accurate measurements.
- Built-in temperature compensation maintains better measurement accuracy.
- RS-485 output allows stable, long-distance transmission.

Applications

- Sewage level measurement
- Industrial water level measurement
- Liquid level measurement in river wells
- Level measurement of corrosive liquids
- Open channel flow measurement

DESCRIPTION OF INTERFACE BUS

1. Wiring method:
   The wiring method of power supply and 485 data bus is as follows:



Input and output line sequence definition description	
Brown-red wire is connected to the positive pole of the power supply	DC+ 11V - DC+36V
The black wire is connected to the negative pole of the power supply	Power ground
Blue wire RS485 data positive	RS485A (485+)
The yellow-green wire is connected to the negative electrode of RS485 data	RS485B (485-)

2. RS485 bus communication:
   RS485 bus: standard MODBUS protocol.

TECHNICAL PARAMETERS

No	Project	Parameters	Remark
1	Operating Voltage	DC + 11V – DC +36V	
2	Working current	When the power supply is DC12V, the current is ≤ 17mA	
3	Power consumption	When the power supply is DC24V, the current is ≤ 11mA	
4	Communication Interface	<0.3W	
5	Measuring range	RS485 bus interface	Range can be customized
6	Measurement accuracy	20cm-(200cm, 500cm, 600cm, 700cm)	
7	Repeatability	<0.5%	
8	Response time	<0.02%	
9	Blind spot	≤1s	
10	Working temperature	≤20cm	
11	Line length	-20 C-60 C	Can be customized
12	working frequency	2m	
13	Under pressure	64KHZ±5%	
14	Detection angle	≤3kg or 0.3MPa	
15	shell material	(Wave velocity width) half power angle@-3dB: 6°±2	
16	Weight	Sharpness angle: 12°±4	
17	Product Size	Can be used in weak acid and weak base environment (PC)	Calculated according to the largest size, the largest diameter is 76mm, and the height is about 120mm
18	use	460g±5%	

NOTES

1. Apply power within the specified range and follow the wiring diagram to ensure proper operation.
2. Try to keep the instrument away from interference sources.
3. For best results, sensor probe should be perpendicular to the measured surface.
4. Periodic cleaning of the probe may be needed to remove residue that may accumulate over time.

Ultrasonic digital sensor MODBUS protocol and data format

The default sensor address of the factory is 01, the baud rate is 9600, the following host is PC or computer, etc. Digital sensor.

- Data instructions for the host to read the instrument:

1	2	3	4	5	6	7	8
ADR	03H	Start Store high byte	Start Store Low Byte	The number of registers is high byte	The number of registers is low byte	CRC code low byte	CRC code high byte

When the from the machine is received correctly, return from the machine:

1	2	3	4、5	5、6		M-1、M	M+1	M+2
ADR	03H	Total number of bytes	Register data 1	Register data 2	.....	Register data m	CRC code low byte	CRC code high byte

Example: The current sensor address is 01

1. The distance value of the distance from the surface of the sensor to the object to send the sensor surface:
   Host sends: 01 03 00 00 00 01 84 0A
   Answer from the machine: 01 03 02 05 AF FB 68
   The distance from the distance from the machine 05 AF = decimal 1455, which means that the current distance value is 1455mm, unit: MM.

2. The host sends the environment temperature value of the sensor: Host sending: 01 03 00 02 00 01 25 CA
   From machine response: 01 03 02 00 0f F8 40
   The temperature value returned from the machine is 16 -in -made 000F = decimal 15, indicating that the current temperature value is 15 degrees.

3. Read multiple register data.
   Example: Read 3 register data, in order: the distance from the instantaneous high byte, the low byte, simulate the instantaneous high byte, low characters Section (default), high temperature value, low byte.
   Note: The temperature value consists of two bytes, high bytes, and low bytes. If the temperature of the temperature value is 1, the temperature value is zero and 0, and the temperature value is zero. Host sends: 01 03 00 00 00 03 05 CB
   From machine response: 01 03 06 05 D8 00 00 00 0F 41 37

4. The host sends the full volume value of the read sensor. The full volume value ia represented by a 2-byte integer value. The unit MM.
   Host sending: 01 03 00 04 00 01 C5 CB
   From machine response: 01 03 02 27 10 A2 78
   The full volume value returned from the machine 27 10 = decimal 10,000, indicating that the full volume value is 10000mm = 10 meters.
   The full volume value returned from the machine 13 88 = decimal 5000, which means that the full volume value is 5000mm = 5 meters.

- Function code 06h: Write a single register value.
  Send the host:

1	2	3	4	5	6	7	8
ADR	06	High bytes of storage address	Low -bytes of storage address	High byte	Low -byte byte	CRC code low byte	CRC code high byte

When the from the machine is received correctly, return from the machine:

1	2	3	4	5	6	7	8
ADR	06	High byte	Low bytes of register	High byte	Low -byte byte	CRC code low byte	CRC code high byte

Set the sensor address, the factory sensor address is defaults to 01, as follows, the sensor address is set to 02, and the register of the setting address is 0x6B. For details, see the register definition table.

Host sending: 01 06 00 6b 00 02 79 d7

From machine response: 02 06 00 6b 00 02 79 E4

If you don't know the sensor address, the sensor will send the AA address code 01 01 when you call.

The CRC calculation method is:

1. Load a 16 -bit register with a value of 0xffff, this register is a CRC register.
2. The value of the first 8 -bit binary data (that is, the first byte of the communication information frame) is different from the 16 -bit CRC register Or, different or the results are still stored in the CRC register.
3. Move the content of the CRC register to the right, fill the highest bit with 0, and detect whether it is 0 or 1.
4. If the output level is zero, repeat the third step (one digit again); if the output is 1, the CRC register and 0xa001 Do not.
5. Repeat steps 3 and 4 until it moves to the right, so that the entire 8 -bit data is processed.
6. Repeat step 2 and 5 to process the next byte of the communication frame.
7. After all bytes of the communication frame are calculated according to the above steps, the high and low bytes of the 16 -bit CRC register obtained by the 16 -bit CRC register obtained.
8. The contents of the CRC register obtained at the end are: CRC check code

- Register definition table: (Note: The address code of the register is hexadecimal)

Register address	Content description	Read only	Register address	Content description	Read only
0000	Following/physical instantaneous value (2 -byte high)	√	0001	reserve	
0002	Instant temperature (2 bytes high)	√			
0004	Read the full volume value, 2 -byte integer, unit mm	√			
	0005-006A retain		006B	Word Character √ sensor address	