Wireless Ultrasonic Level/Distance Sensor

I. Introduction

Wireless ultrasonic level gauge/level gauge is a low-power and high-performance product with integrated IP68 protection level of ultrasonic sensor, wireless NBiot or LoraWan remote transmission, and large-capacity battery. It is widely used in municipal, water, and smart cities. , automation, etc.

II. System

The wireless ultrasonic distance/level system consists of: application objects, long-life wireless ultrasonic range finder, cloud management software, the key product is "low-power wireless ultrasonic sensor", cloud management software is a software customized product.



Low power consumption ultrasonic sensor



NBiot ultrasonic sensors

System diagram

III. Product review:

1. Ultrasonic ranging products provide reliable continuous level or distance measurement for water, liquid, glue or solid materials. These sensors are ideal for applications ranging from 3cm to 400cm.

2. The ultrasonic range finder can be easily connected to the control system electronically and mechanically, combined with the most advanced ultrasonic technology and processing algorithms, the design is reasonable and the complete system is integrated.

3. Ultrasonic sensor conforming to IP68 standard, the product conforms to RoHS.

4. Ultrasonic distance/level meters can also provide accurate non-contact measurements for applications such as factory automation, process control or tank level monitoring.
5. Ultrasonic rangefinders are powered by 3.6~5.5V DC battery , they use asynchronous UART TTL signal to communicate with customer's control system. Their power-on time is very short (less than 300ms), which allows system integrators to develop very low-power operation, where 3.6~5.5V DC is briefly applied to the sensor to obtain a distance measurement and then removed. This capability is especially important in battery powered installations. The sensor is protected against overvoltage and reverse polarity in both DC power and UART communication. Perform continuous temperature compensation for precise measurement accuracy.

6. Provides wireless communication with LoraWan or NBiot sensors (5 years battery life if data is transmitted every 2-3 hours).

7. Sensors stand out from others because of their user-friendly setup, versatile control options, field-proven reliability, and affordable cost.



Measurements

IV. Characteristic

- 1. 3.6~5.5V power supply
- 2. Communication via Tx/Rx UART or Bluetooth, LoraWan, NBiot, Wifi
- 3. Fast power-on response with level measurement, suitable for low-power systems
- 4. Plug and Play Setup
- 5. Temperature Compensation
- 6. Small blind spot
- 7. Tamper-proof and durable
- 8. IP68 enclosure protection class
- 9. Preservation of Accuracy in Harsh Environmental Conditions

V. Application

- 1. Measurement of water level, level/material level and distance
- 2. Smart city applications such as garbage bins, water wells, underground pipe networks,

etc.

- 3. Bulk material management
- 4. Location detection



VI. Parameters

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Measureing range	304000mm	
Resolution	5mm	
Accuracy	FS±2%	
Sensitivity	Adjustable by user	
Beam Angle	12-15°Cone	
Power warm-up	<200ms	
Temperature	Internal temperature compensation	
compensation		
Mechanical Parameters		
Housing material	PVC or PVDF	
Transducer surface	PPA or PVDF	
Connection interface	4 wires (4pin) or wireless LoraWan, NBiot, Bluetooth	
Ambient		
Working temperature	-40°C ~ 70°C	
Storage temperature	-40°C ~ 85°C	
Humidity	0~95%, no freeze	
Electric Parameters		
Battery	9000mAh (5 years if data transmit interval is 2-3 hours)	
Working voltage	3.65.5V DC	
Currency	15mA (Typical value)	

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UART TTL	3.3V
Measurement	10hz (Default)
frequency	

VII. Installation

Install it on the top cover (drill holes) or install it on the reverse side of the top cover with screws, try to install it in the middle of the tank to avoid sound waves hitting obstacles.



VIII: Communication

Frame	Data definition
Frame header	Fixed as 0xFF
H_Data	High 8 bytes of Distance
L_Data	Low 8 bytes of Distance
Sum	Data checksum

The distance calculation method is as follows (unit: mm):

Convert distance=OX (H_DATA) (L_DATA) to decimal.

For example:

Return data FF 07 A1 A7

The checksum SUM=A7=(0x07+0xA1+0Xff)&0x00ff

0x07 is the high-byte data of distance

0xA1 is the low-byte data of distance

The distance value is 0x07A1; Convert to decimal 1953; Unit: millimeters

command to change the data transmitting interval: A1 XX, XX is hex, unit is Minute. For example, if you want to change the interval to 10 minutes, you can send the command A1 0A. If you want to change the interval to 2 hours, it's 120 minutes, then send the command: A1 78

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