RKL-12 Radar Liquid Level Transmitter User Manual

Revision Time	Reviser	Current Version	Remarks
20250821	SUN	V5.0	

User Notice

Please read this manual carefully before use to ensure safe and optimal operation. Retain this manual for future reference.

Pre-Use Instructions

- Carefully review this manual and follow all operational and safety guidelines to prevent malfunctions and hazards.
- Check that the packaging is intact and verify the product model matches the selected specifications.

Unpacking Inspection

- Upon receipt, carefully inspect the sensor device and accessories for any shipping damage.
- If damage is detected:
- Immediately notify the manufacturer and distributor.
- Retain all packaging materials for return or replacement processing.

Parts List

Item	Quantity	Remarks
Sensor	1	
Cable	1	The length depends on the order
Install screw	1	Set
Install bracket	1	
Install hoop	1	Set

1. Product Introduction

The radar water level transmitters series consists of 76-81GHz Frequency Modulated Continuous Wave (FMCW) radar devices, featuring a maximum measuring range of 65m and a blind zone of ≤10cm. With its high operating frequency (76-81GHz), wide signal bandwidth, and superior measurement accuracy (±3mm typical), this product delivers enhanced performance. The included pre-configured mounting bracket eliminates the need for field wiring, ensuring quick and simple installation.

2. Product Features

- FMCW (Frequency Modulated Continuous Wave) technology
- 5GHz working bandwidth, high precision, fine resolution
- Non-contact measurement with minimal maintenance, unaffected by sediment or other factors;
- Continuous 24/7 operation, unaffected by temperature variations with strong anti-interference capability
- Energy-saving design combining measurement operation and sleep mode Multiple interface modes are provided for easy access to platform systems
- Easy installation

3. APPLICATIONS

- River water level measurement
- Lake water level measurement
- Shallow water level measurement
- Hydrographic surveying
- Environmental protection

4. Specification

Item	Technical specifications
Range	100~65000mm
Output	RS485(Modbus-RTU)
Supply Voltage	10-33VDC
Working frequency	76-81GHz
Accuracy	≤±3mm
Resolution	1mm
Ingress Protection	IP68
Antenna Type	Lens Antenna,6°*6°
Operating Temperature	-40℃~ +85℃
Housing material	Aluminum alloy
Installation Method	Bracket
Cable length	10m default, customizable

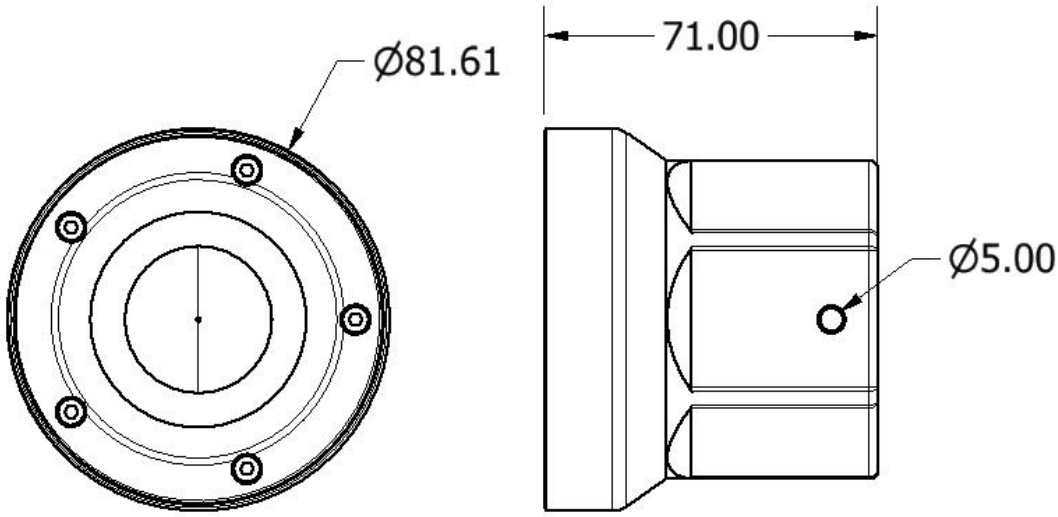
5. Electrical Connections

Cable	RS485
Red	V+
Black	V-
Yellow	RS485A
Blue	RS485B

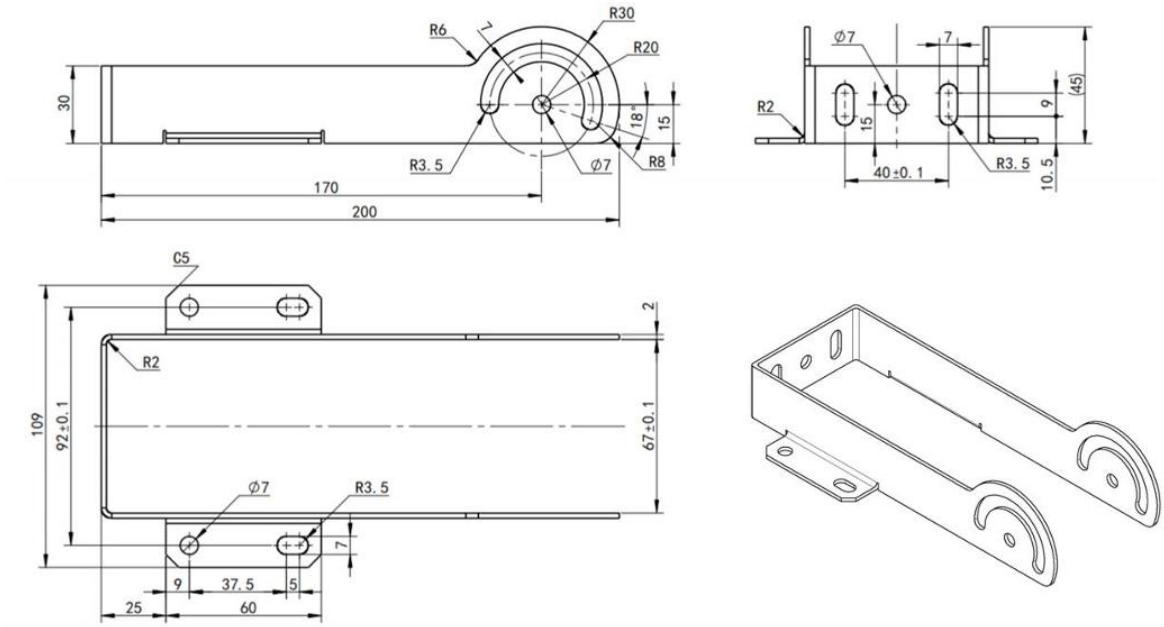
6. Product Dimensions

Unit:mm

Sensor:



Bracket:



7. Communication Protocol（MODBUS-RTU）

Parameter	Value
Data Bits	8 bits
Check Bit	None
Stop Bit	1 bit
Baud Rate	9600 bps
Slave Address	0x01 (Factory Default)

7.1 Read Real-Time Data

Client sends:

01 03 00 01 00 04 15C9

Return:

01 03 08 03 E8 00 64 13 88 01 F4 48BD

7.2 Description of Return Data Format

No.	Conception	Byte Number	Description	Remarks
1	Address block	1	Address(0x01)	0x01
2	Function code	1	Only read(0x03)	0x03
3	Number of bytes	1	0X08	2bytes
4	Data block	2	Clear height (mm)	0x03E8(1000mm)
5	Data block	2	Clear height (cm)	0x0064(100cm)
6	Data block	2	water level (mm)	0x1388(5000mm)
7	Data block	2	water level (cm)	0x01F4(500cm)
8	Check block	2		0x48 0xBD

7.3 Modify Slave Address(address setting range:01H-FDH)

Client sends:(Change the slave address from 01H to 02H.)

Response:

Slave id	Function code	Address_H	Address_L	New id_H	New id_L	CRC_L	CRC_H
0x01	0x06	0x00	0x06	0x00	0x02	0xE8	0x0A

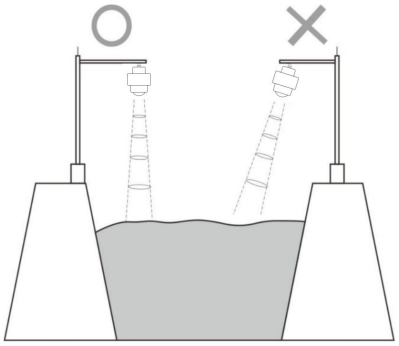
Response:

Slave id	Function code	Address_H	Address_L	New id_H	New id_L	CRC_L	CRC_H
0x02	0x06	0x00	0x06	0x00	0x02	0xE8	0x39

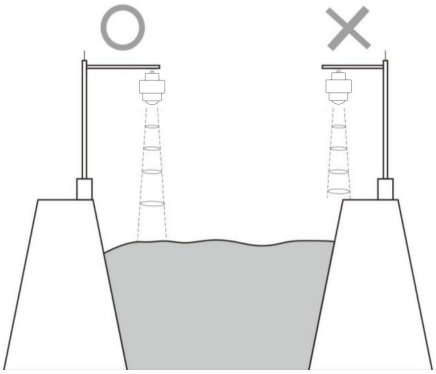
8. Installation Guidelines

- **Ensure that the instrument is perpendicular to the water surface;**
- **Prevent the transmitting beam from illuminating interfering objects and generating false echoes.See the following points for typical working conditions：**

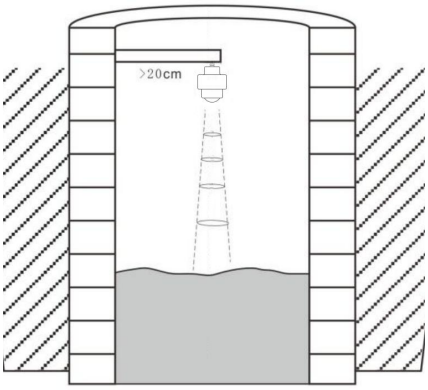
- Ensure that the water level gauge is installed perpendicular to the water surface. Inclination will weaken the amplitude of the received signal and affect the normal ranging.



- Ensure that there are no interfering objects within the beam range, such as the riverbank.



- The instrument shall be installed at least 20cm away from the side wall, and the underground pipe network shall be installed as close to the center of the well as possible, otherwise the well wall is prone to generate interference signals, affecting the measurement and judgment.



9. Precautions

Powered Wiring Prohibition

- Do not connect wires while powered. Only energize the sensor after confirming correct wiring.

Component Modification Restriction

- Do not alter factory-soldered components or pre-connected wires.

Precision Handling Requirement

The sensor is a precision device. Avoid:

- Unauthorized disassembly
- Do not touch internal components to prevent product damage

Note: Unauthorized modifications void the warranty.

10. Troubleshooting

Incorrect Output Signals (Analog/RS232/RS485):

- Verify wiring correctness and secure connections.
- Check if the serial port is occupied or malfunctioning.
- Confirm serial port settings (baud rate, data/stop bits) match device requirements.

Persistent Issues:

- Contact the manufacturer if the above steps fail to resolve the problem.

11. Warranty Terms

This product comes with a one-year warranty, starting from the date of delivery. Within twelve months, the Company shall be responsible for free repair or replacement of any failure caused by sensor quality issues (non-human damage). Fees will be charged for repairs or replacements after the warranty period expires.

CE Complies with applicable CE directives.

Manual subject to change without notice.

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