

RKL-07B Radar Flowmeter

User Manual



Revision Time	Reviser	Current Version	Remarks
20250604	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.

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
Radar Flowmeter	1	
Cable	1	The length depends on the order
Mounting screw	1	Set
Install the Bracket	1	
Install the Hoop Clamp	2	
USB to RS-485 Converter	1	

1. Product Introduction

The radar flow meter is mainly composed of a radar current meter and a radar water level meter. The current meter is used to collect the surface flow velocity of the fluid, and calculates the average flow velocity of the water cross-section through a model. Combined with the water level measured by the water level meter and the cross-sectional information, it calculates the cross-sectional area of the flow. The discharge is then obtained using the formula: $\text{discharge} = \text{average flow velocity} \times \text{cross-sectional area} \times \text{correction coefficient}$. The correction coefficient is calculated based on standard values derived from the actual measurement environment. This product features high precision, low power consumption, and strong anti-interference capability, making it suitable for water level monitoring in lakes and rivers, mountain flood warning systems, storage tanks, sewage pipe networks, and other scenarios.

2. Product Features

- High precision
- Low power consumption
- Compact size
- Easy installation

3. Specifications

Item	Technical specifications	
	Speed	Distance
Frequency	24~24.250GHz	24GHz
Range	0.1~20 m/s	0.1~40m
Accuracy	±0.01m/s or ±1%FS	Class 1
Resolution	0.001m/s	1mm
Beam Angle	14*32 °	14*10 °
Supply	DC10-16V	
Power consumption	Working current :130mA@12V; Standby current :6mA@12V	
Output	RS485(MODBUS-RTU)	
ESD Protection	Class 3	
Surge Protection	Class 4	
Working temperature	- 30°C~+ 80°C	
Protection grade	IP68	
Product size	200x120x90mm	
Material	Stainless steel	
weight	2.15 Kg	
Cable length	10 m(default), customizable	

4. Electrical Connections

Connector (Cable)	RS485
Red	V+
Black	V-
Yellow	RS485A
White	RS485B

5. Product Dimensions

Unit:mm

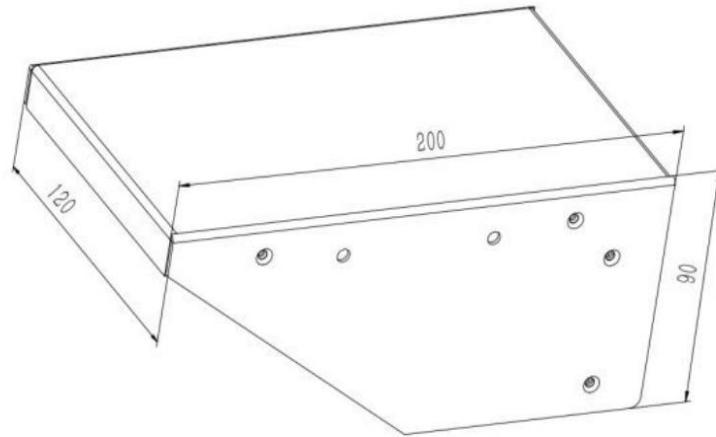


Figure 5.1

Product Dimension Drawing

6. Communication Protocol (MODBUS-RTU)

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

6.1 Read Real-Time Data

Client sends:

01 03 22 00 00 08 4E74

Return:

01 03 10 08 DF 00 00 00 7B 00 00 05 74 00 00 47 B1 00 00 43 89

6.1.1 Description of Return Data Format

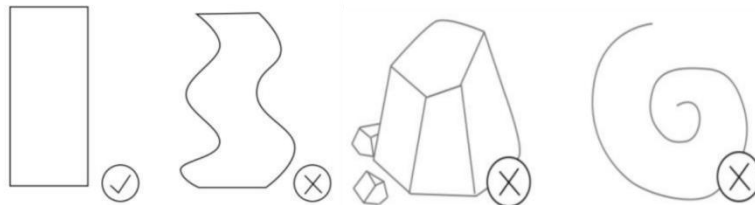
No.	Conception	Byte Number	Description	Remarks
1	Address block	1	Address(0x01)	0x01
2	Function code	1	Only read(0x03)	0x03
3	Number of bytes	1	0X10	16bytes
4	Data block	2	Water depth	0x08DF (2271mm)
		2	Direction of water flow	0x0000 (0:Forward,1:Reverse)
		4	Flow velocity	0x007B0000 (0.123m/s)
		4	Flow rate	0x05740000 (1.396m ³ /s)
		4	Cumulative discharge	0x47B10000 (18353m ³)
5	Check block	2		0x43 0x89

6.2 Modify sensor parameters with examples

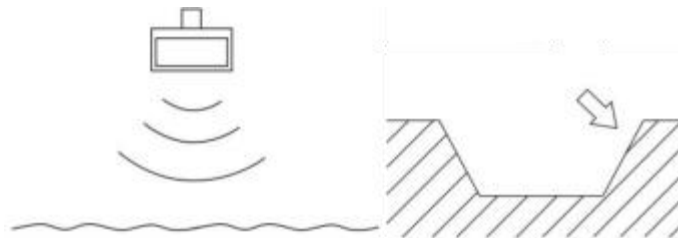
Set parameters	Send / Response	Explanation
Clear cumulative flow	01 10 22 06 00 02 04 <u>00 00 00 00</u> F3 24	
	01 10 22 06 00 02 AB B1	
Change sensor address to 02H	01 10 22 0D 00 01 02 <u>0002</u> 24 8E	Address range: 01 H-FD H
	02 10 22 0D 00 01 9A 41	
Change sensor baud rate to 4800	01 10 22 0E 00 01 02 <u>0002</u> 24 BD	0:1200 1:2400 2:4800 3:9600 4:19800 5:38400 6:57600 7:115200
	01 10 22 0E 00 01 6A 72	
Set channel shape	01 10 22 08 00 01 02 <u>00 01</u> 64 DA	1.Trapezoid 2.Rectangle 3.Circle
	01 10 22 08 00 01 8A 73	
Set channel as a 5m-high, 4m-wide rectangular channel	01 10 22 08 00 03 06 <u>00 02 13 88 0F A0</u> 3F F4	
	01 10 22 08 00 03 0B B2	
Set channel as a trapezoidal channel with height 5m, width 4m, and angle 45°	01 10 22 08 00 04 08 <u>00 01 13 88 0F A0 03 E8</u> DE 73	
	01 10 22 08 00 04 4A 70	
Set installation height to 10m	01 10 22 0C 00 01 02 <u>03 E8</u> A4 20	Unit: cm
	01 10 22 0C 00 01 CB B2	
Broadcast address to read current sensor address	FF 03 03 F4 00 01 D0 62	01 represents the current address
	<u>01</u> 06 00 05 00 01 58 0B	

7. Installation Guidelines

- Select a straight and stable channel section, avoiding slopes, boulders, large eddies, turbulent flows, large floating debris, or sediment accumulation.



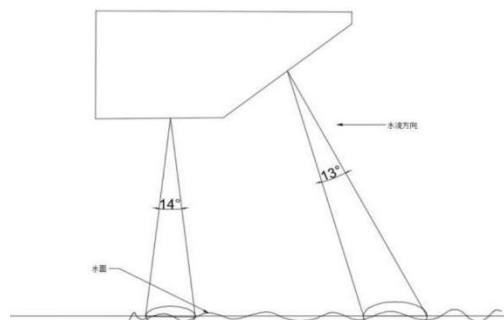
- Ensure no weeds, trees, or obstructions exist between the flowmeter and water surface. Channel hardening is recommended to maintain a smooth cross-section.



- Position the vertical pole based on the purchased crossarm length to ensure it extends to the water surface during low-flow periods (preferably centered in the channel).



- Adjust installation height appropriately: Lower heights are required for low-velocity or narrow channels to prevent radar reflection off banks or signal weakening, ensuring measurement accuracy.



7.1 Installation Method

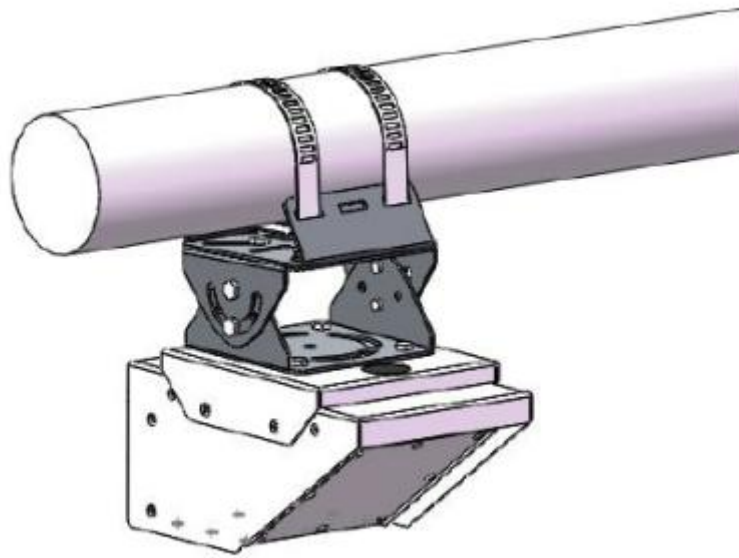


Figure 7.1
Installation Schematic Diagram

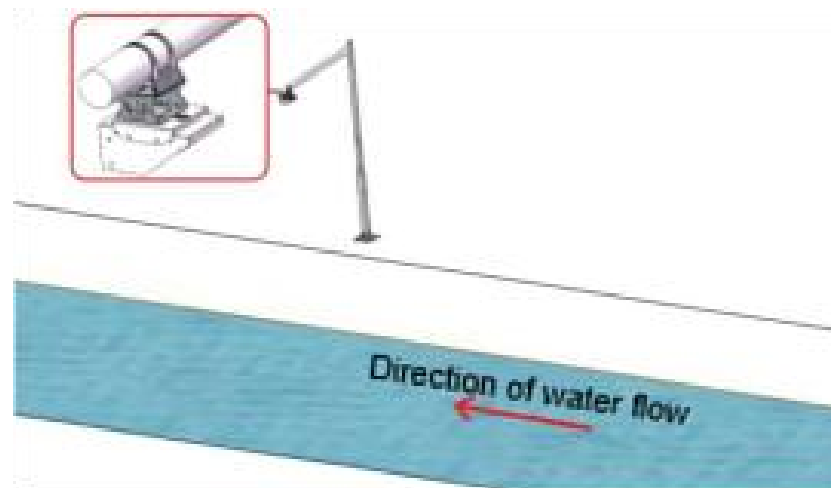


Figure 7.2

Adjust the angle of the flowmeter to ensure the bubble in the spirit level is centered, and the inclined surface of the flowmeter faces the incoming water direction. Tighten the screws after adjustment.

8. Precautions

Package and Model Verification

- Ensure the packaging is intact and verify the sensor model and specifications match your purchased product.

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
- Structural components are strictly prohibited from being compressed under stress

Note: Unauthorized modifications void the warranty.

9. 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.

10. Product Maintenance

Maintenance and Safety

- Regularly clean and inspect the sensor to maintain performance.
- Do not expose the sensor to extreme temperatures, moisture, or corrosive substances unless explicitly specified.
- Unauthorized disassembly, modification, or repairs may void the warranty and lead to malfunctions.

Troubleshooting Protocol

- In case of malfunction, refer to the troubleshooting section of this manual.
- Do not attempt unauthorized disassembly or repairs.
- Contact the manufacturer's after-sales department directly for technical support.

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.

 Complies with applicable CE directives.

Manual subject to change without notice.

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