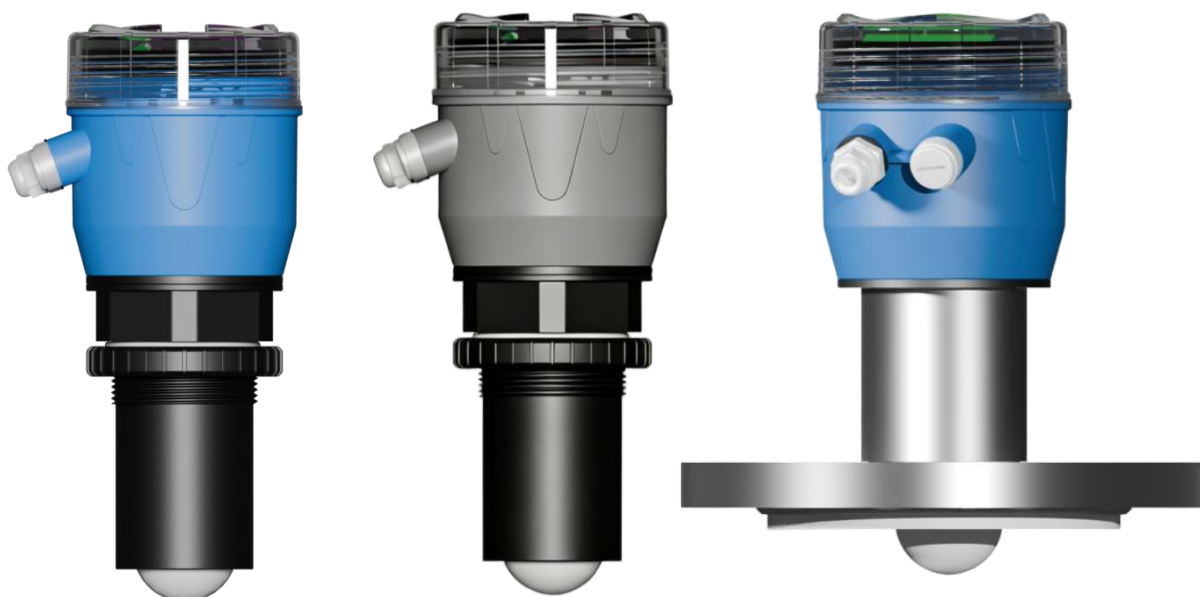


Instruction Manual

Integrated Radar Level Meter

JJY-YLD2SP/JJY-0258DP



1. Product Introduction

1.1 Features

This radar level meter supports RS485 protocol, two-wire 4-20mA with Hart protocol, and 4-20mA three-wire output. The maximum measurement range can reach 40 m, with a blind zone as low as 5 cm in small-range conditions. The device adopts a high-frequency module design with a shorter wavelength, offering excellent adaptability to solid-material detection; relying on radar electromagnetic waves for transmission and reception, it withstands high temperatures up to +70 °C and performs stably in complex conditions such as high dust and harsh temperature fields. The meter uses a threaded mounting structure for simple assembly/disassembly and convenient on-site deployment.

Main advantages are as follows:

- High-frequency radar microwave transceiver module with a compact and simplified circuit architecture and high signal-to-noise ratio, effectively reducing the measurement blind zone.
- High-frequency radar operating mode greatly improves measurement resolution and detection accuracy.
- Excellent sound-field directivity with little influence from external environmental interference, suitable for various on-site installation scenarios.
- Shorter wavelength gives good detection on solid-material surfaces; stable detection is achieved with conventional mounting posture, without the need for an additional universal flange for calibration/alignment.
- Performance complies with the national standard DB50/T 826-2017 General Technical Requirements for Water Level Meters; core components adopt a fully sealed structure with IP67 protection grade, offering excellent water and dust resistance.

1.2 Communication and Debugging

On site, the meter can be debugged via the LCD, or with the optional host computer software on a PC. Communication between 485 and the PC is done as follows:

USB-to-RS485 serial module;

2. Technical Parameters

Communication Mode	Two-wire 4-20mA+Hart	Three-wire 4-20mA+RS485
Supply Range	18-26V	9-26V
Operating Current	38mA inrush current at power-on	12V/15mA
Relay Output	None	Two normally-open relays AC 250V/4A or DC 30V/4A
Sampling Frequency	1500ms / Configurable	500ms / Configurable
Communication Protocol / Version	Hart7	Modbus
Range	0.05m~40m	
Accuracy	±2mm	
Blind Zone	5cm	
Resolution	1mm	
Beam Angle	±2.75 °	
Signal Output	4-20mA/RS485	
Protection Grade	IP67	
Recommended Cable	4–8mm outer-diameter cable	
Screen Display Temperature	-10 ℃~70 ℃	
Device Operating Temperature	-40 ℃~70 ℃	
Housing Material	PC material	
Temperature Detection Range	-70 ℃~150 ℃	
Screen Backlight	Supported	
Flange Pressure Rating	1 MPa	
System Language	Chinese / English	

3. Key Operation Instructions

Key	Main Interface Function	Setting Interface Function
SET	Enter system settings	Return to previous level
▲	Enter system settings	Move up / value increase
▼	Enter system settings	Move down / value decrease
OK	Enter system settings	Enter submenu / confirm / save

4. Structural Dimensions

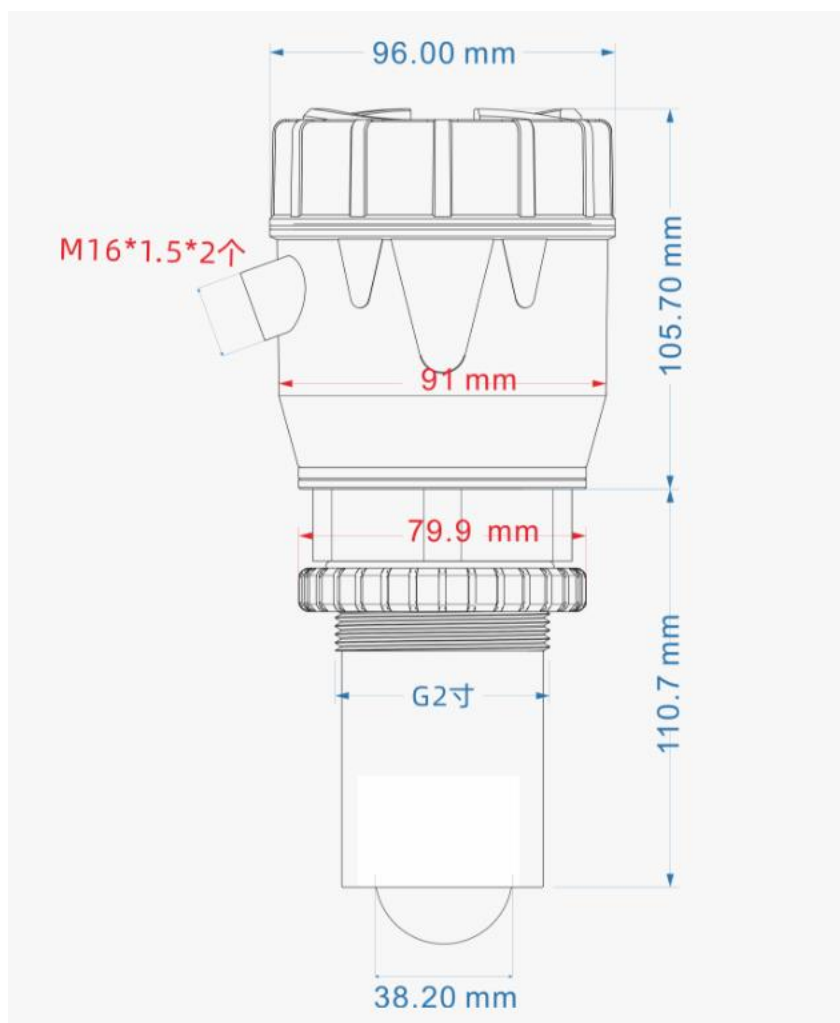


Fig. 4-1 Product Dimension Drawing

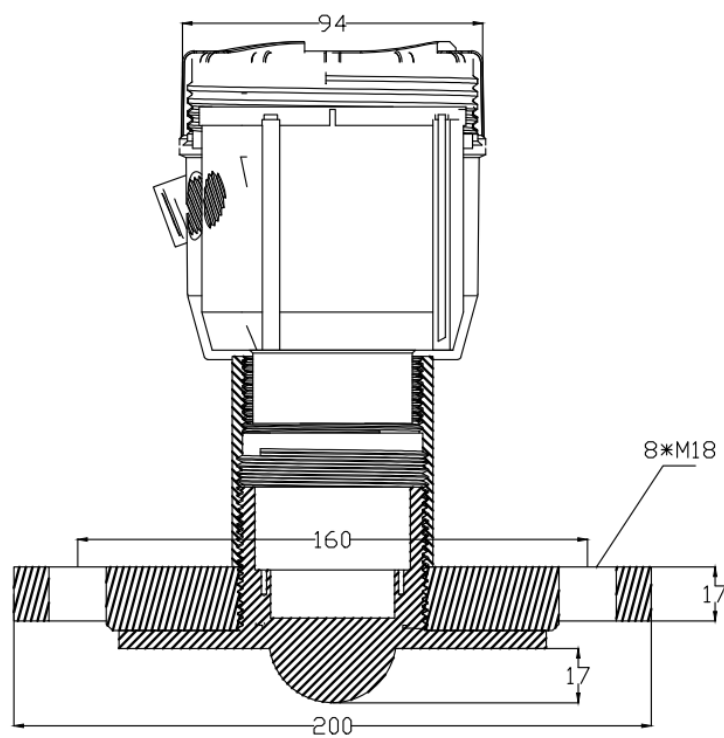
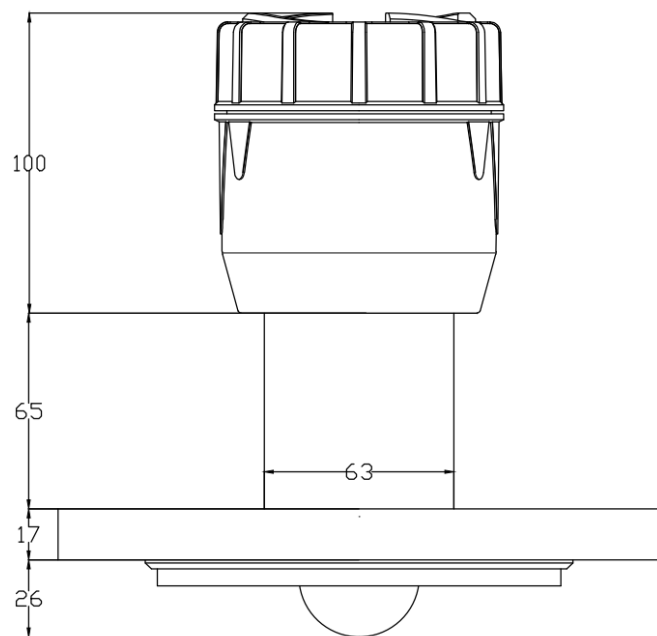


Fig. 4-2 Flange Product Dimension Drawing

5. Product Wiring

5.1 Two-wire 4-20mA+Hart Communication Product Wiring Diagram

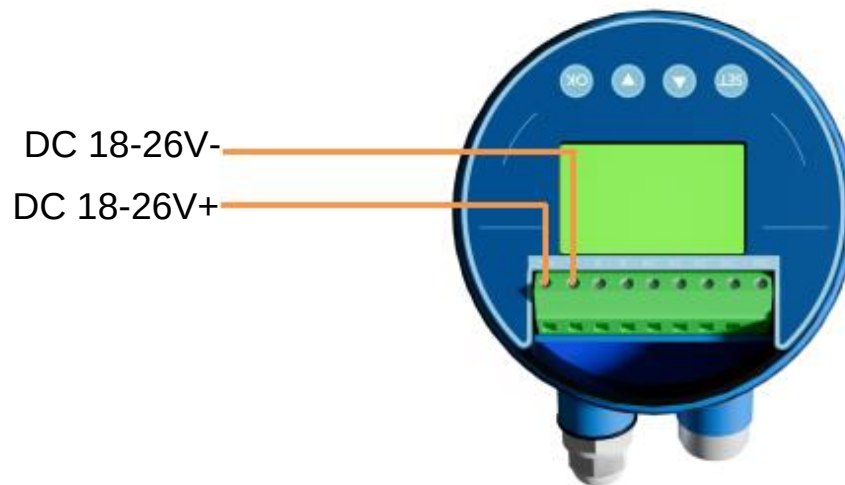


Fig. 5-1 Two-wire Product Wiring Diagram

Power-on gives immediate output: 4mA = low end of range, 20mA = high end of range.

5.2 Three-wire 4-20mA+RS485 Communication Product Wiring Diagram

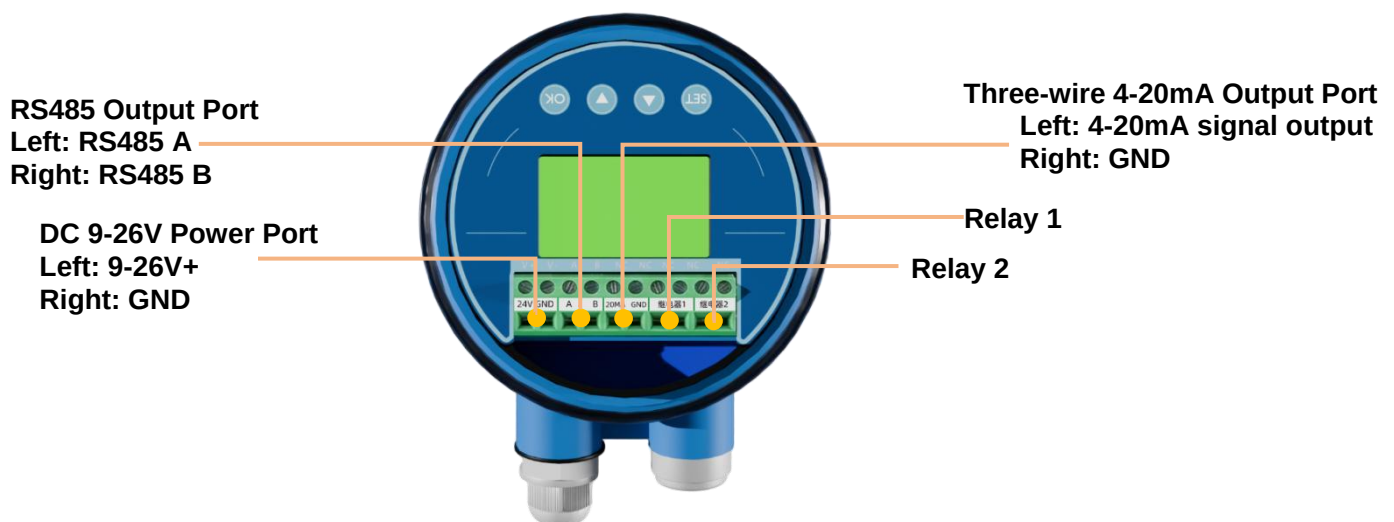


Fig. 5-2 Three-wire Product Wiring Diagram

Default address code 127, baud rate 9600, Modbus protocol.

From left to right:

- (1) Two device power ports: 9-26V, GND
- (2) Two 485 communication output ports: 485 A, 485 B
- (3) Two three-wire 4-20mA output ports: 4-20mA signal line, GND
- (4) Four ports for two relay channels: Relay 1, Relay 2

5.3 Two-wire + Hart Modulator Wiring Diagram

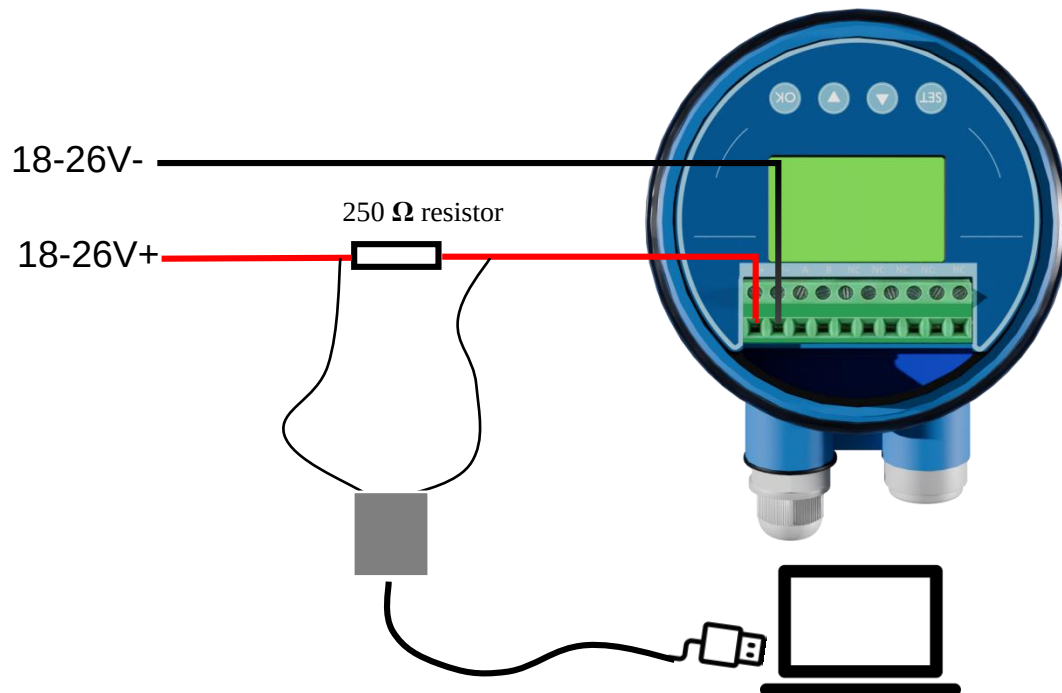


Fig. 5-3 Two-wire + Hart Modulator Wiring Diagram

Device default short address: 0 (conventional single-point mode)

Supported short addresses: 1-15 (multi-point mode)

HART version: Hart7

6. Installation Requirements (Must Be Followed)

Vertical installation: Keep the antenna face as perpendicular as possible to the measured material or water surface to ensure the strongest echo.

Keep away from the feed inlet: The device must not be aimed at the feed inlet to avoid interference from falling material.

No obstacles within the beam: Ensure there are no obstacles such as ladders, steps, or beams within the beam angle ($\pm 2.75^\circ$).

Conical vessel: Try to direct the beam straight to the lowest point of the vessel bottom; avoid oblique incidence that causes inaccurate bottom measurement.

6.1 Installation Example - Sealed Tank Scenario

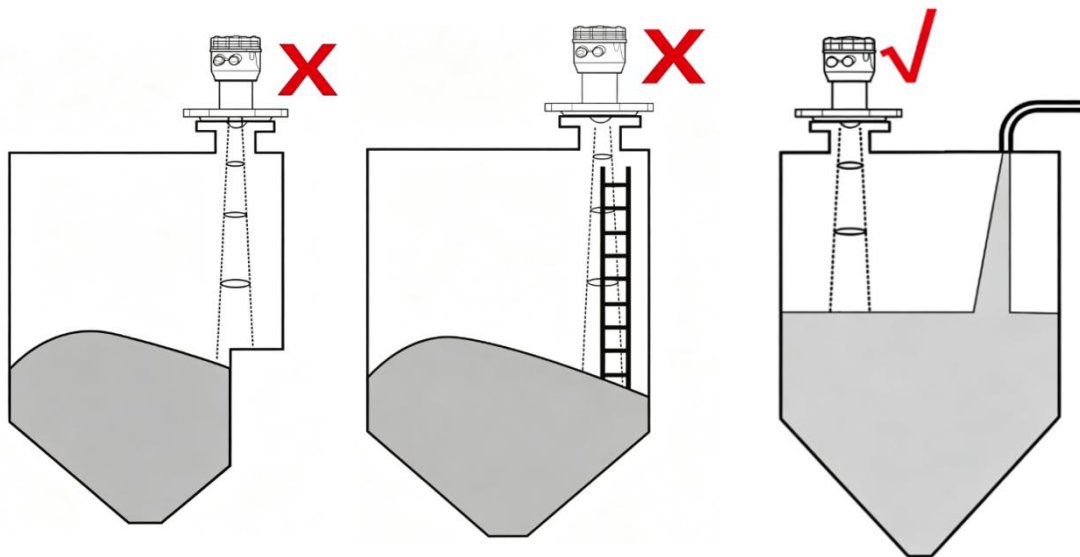


Fig. 6-1 Installation Example for Sealed Scenario

- The radar mounting position must keep the beam completely clear of ladders and steps, away from the feed/drop zone, ensuring no interference below.

10cm away from tank wall

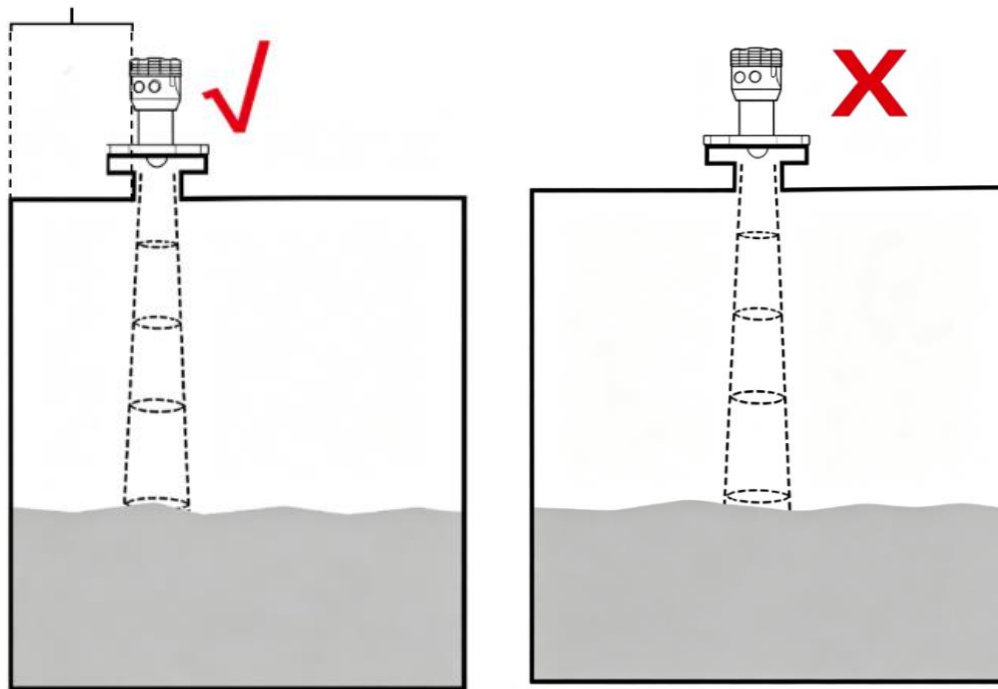


Fig. 6-2 Installation Example for Sealed Scenario

- It is recommended to keep the radar mounting position 10 cm from the tank wall (the wall must be smooth); installing at the tank center tends to cause multiple internal reflections and secondary-echo interference.

6.2 Installation Example - Open Scenario

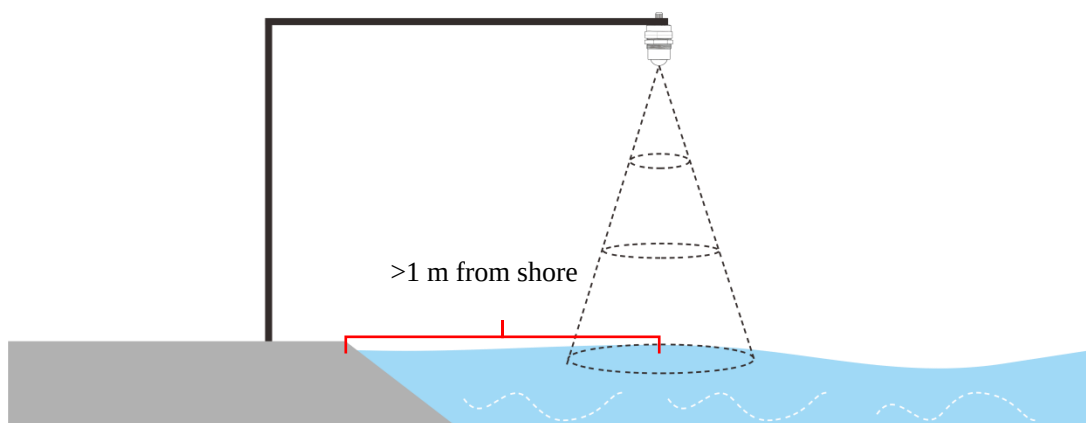


Fig. 6-3 Installation Example for Open Scenario

- The radar mounting position must be at least 1 m from the shore; avoid locations with large waves or heavy swells, as large waves cause echo distortion and increased measurement error.
- Keep away from shore obstacles, foam, and floating objects to avoid false echoes.

7. Terminology Schematic Diagram

Air height: distance from the sensor probe to the liquid surface / measured surface

Liquid level: distance from the bottom of the water / tank to the water surface

Installation height: distance from the sensor probe to the bottom of the water / tank

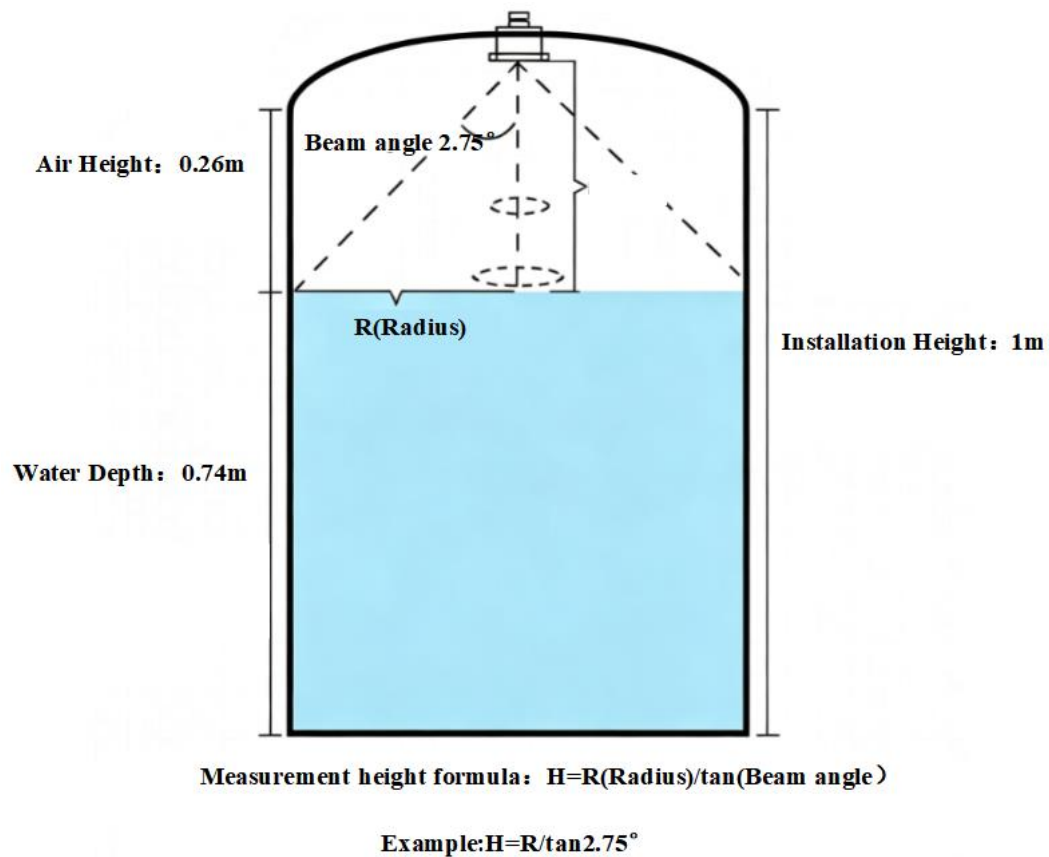


Fig. 7-1 Terminology Schematic Diagram

8. Quick Debugging [3 Steps to Use]

Step	Operation
1	Power-on confirmation: For two-wire 4-20mA devices, connect a DC 18-26V power supply; for three-wire 4-20mA+485 devices, connect DC 9-26V. A lit screen showing the menu interface means power-on is successful. Δ After power-on, if using two-wire mode, use a multimeter to check whether the device supply voltage is between 18V and 26V. If the measured voltage is slightly below 18V, turn off the screen backlight to reduce operating current and avoid inaccurate current output due to undervoltage.
2	Set the installation height or water depth (choose one): Press SET → select "Water Level Config" → press OK → select "Installation Height" or "Water Depth" • Installation height = distance from the sensor probe position to the bottom of the water / tank. (requires manual measurement) • Water depth = distance from the current water surface to the bottom of the water / tank (requires manual measurement); after entering the value, press OK to save.
3	Return to the main interface: Press SET to return level by level; the main interface then displays the real-time liquid / material level value. Debugging is complete.

9. Common Setting Paths

Requirement	Menu Path
Switch Installation Mode	Application Config → Installation Mode → Conventional/Suspended
4-20mA Calibration	Calibration Config → Current Calibration → 4mA / 20mA
4-20mA Range Mapping	Calibration Config → Parameter Config → 4mA mapping / 20mA mapping
485 Parameter Setting	485 Config → Address Code / Baud Rate
Large Data Fluctuation	Data Smoothing → Variation Range + Duration + Sliding-window Filter
Weak Echo Energy	Application Config → Power Adjustment → set to level 2~4
Multiple Echoes in Enclosed Space	Application Config → Application Algorithm → Select Nearest Peak
Language Switch	Device Config → System Language → Chinese/English
Restore Current to Factory Default	Calibration Config → Restore Default → Confirm
Screen Backlight	Device Config → Screen Backlight → On/Off
Blind Zone Setting	Application Config → Installation Mode → Microwave Blind Zone
False Echo Learning	False Echo Learning → Learn → Select Real Target

Suspended installation mode: directly shields the distance of about 20 cm from the probe; suitable for open-environment installation.

Conventional installation mode: for materials/water that may rise up close to, or even touch, the radar probe antenna, such as material bins and tanks.

10. Common Troubleshooting

Symptom	Possible Cause and Handling
Device cannot communicate	(1) If it is a three-wire communication radar, use a multimeter to check whether the voltage is within 9-26V; (2) If it is a two-wire communication radar, use a multimeter to check whether the voltage is within 18-26V; (2) Confirm the wiring: A to A, B to B, with corresponding signal terminals connected one by one; (3) Confirm the baud rate: The device default baud rate is 9600; please confirm the baud rates match; (4) Confirm the serial tool: Short circuit the serial tool's TX and RX, and A and B respectively, to perform a loopback test and verify whether the serial tool's transmit/receive function works properly.
Value occasionally jumps erratically	Enter "Data Smoothing" and appropriately increase the duration (e.g., 45s).
Blind zone displayed	(1) Check whether the installation is vertical; confirm the measured surface is outside the blind zone (5 cm). (2) Enable suspended installation and set the blind zone to 0.3 m. (Recommended for open environments)
Prompt: insufficient echo energy	(1) Confirm whether the installation is vertical; (2) Confirm whether there are interferences around the installation position, such as floating objects, foam, etc.; (3) Confirm the measured surface is flat; severe fluctuation or turbulence causes echo energy attenuation;
Fixed interference exists	Eliminate the fixed interference through false-echo learning.
Air height value often too large	There may be false echoes (tank wall, obstacles); adjust the installation position; Enable the nearest peak.
Air height value often too small	(1) There may be false echoes (tank wall, obstacles); adjust the installation position; (2) Eliminate the fixed interference through false-echo learning.
Device data responds slowly	Find the "Data Smoothing" function option and set both the duration and sliding-window parameters to 0

Notes

- The supply voltage must not exceed the range given in the wiring diagram; the use of AC power is strictly prohibited.
- Always disconnect power before wiring and installation; live plugging/unplugging is prohibited.
- The radar can penetrate clothing, plastic, acrylic, wood, glass, etc.; pay attention to the measured material.
- When measuring liquids, the medium dielectric constant is generally greater than 2.5; too low a dielectric constant easily causes weak echoes, measurement anomalies, or even penetration of the liquid.
- Ensure the probe is mounted perpendicular to the medium surface, avoiding tank walls, nozzles, and internal obstacles.
- Do not disassemble the device yourself; contact the manufacturer's technical support if a fault occurs.