



80G Radar Level Sensor User Manual

Version:202604
RDSM25080648

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Due to the continuous updating and upgrading process of the product, we cannot guarantee that the content covered in this manual is the latest version. However, even if this situation exists, the information provided in the manual can still meet your usage needs and will not have a substantial impact on your reference and use of the manual.

1. Product Introduction

The 80G frequency-modulated continuous-wave (FMCW) radar level meter is an efficient solution for industrial level measurement. Based on 80 GHz FMCW technology, it measures material level accurately and reliably.

Operating in a high-frequency band, the instrument provides high resolution and a measurement accuracy of up to $\pm 2\text{mm}$. With a narrow beam angle of only 3° to 8° , it effectively reduces measurement deviation and false echoes.

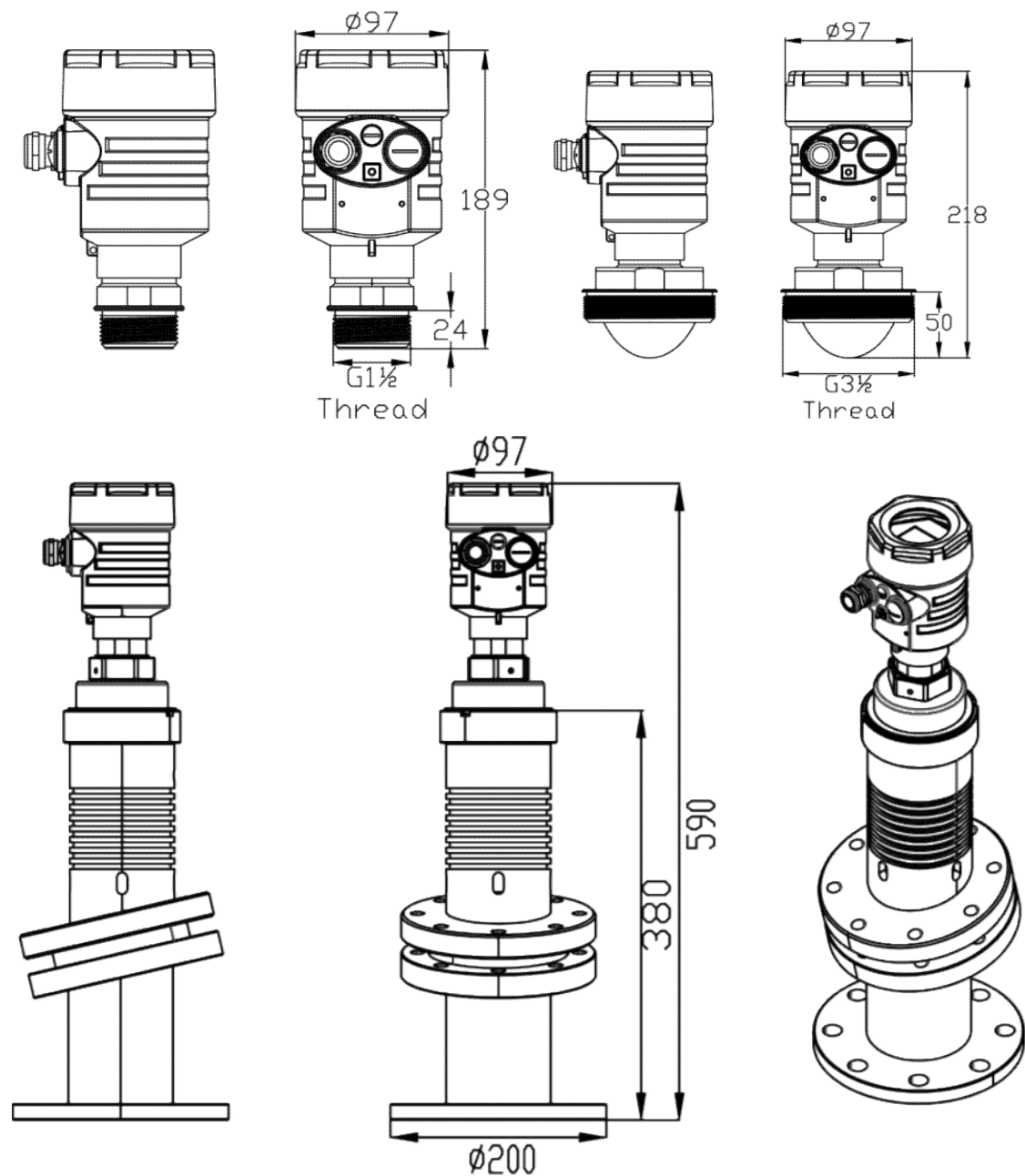
The device offers strong anti-interference capability and stable output even under harsh process conditions. It is easy to install and maintain and is suitable for a wide range of applications, making it a high-quality choice for improving production efficiency.

2. Technical Specifications

Working power supply	(12~36) VDC
Working temperature	-40°C ~ 70°C
Cable entry	M20 * 1.5
Shell material	Die cast aluminum
Protection class	IP68
Installation method	Thread/flange
Onsite operation	LCD display with 4 buttons
Communication method	RS485/ HART 7 / Bluetooth 5.0
Output method	4-20mA
Maximum range	120m
Measurement accuracy	Up to $\pm 2\text{mm}$ (depending on range)

3. Dimensions

The dimensional drawings shall follow the corresponding product structure drawing for the delivered model. Confirm antenna type, process connection, insertion length, and housing orientation before installation.



4. Installation Instructions

4.1 Installation

Power supply: DC24V is recommended. The minimum supported supply voltage is DC16V.



Installation precautions:

1. During installation, the radar should be mounted horizontally at a position at least 200 mm away from the container wall to minimize signal interference.
2. When installing on a container with a conical bottom, it is recommended to install the device at the center of the container to ensure proper measurement of the conical bottom.
3. During installation, keep the device as perpendicular as possible to the measured medium to reduce errors caused by angle deviation.
4. Do not install the device at the inlet (feeding port). The installation position should maintain a certain distance from the inlet (at least 20 cm).

- ***Ensure that there are no obstructions within the beam range, such as ladders or steps.***

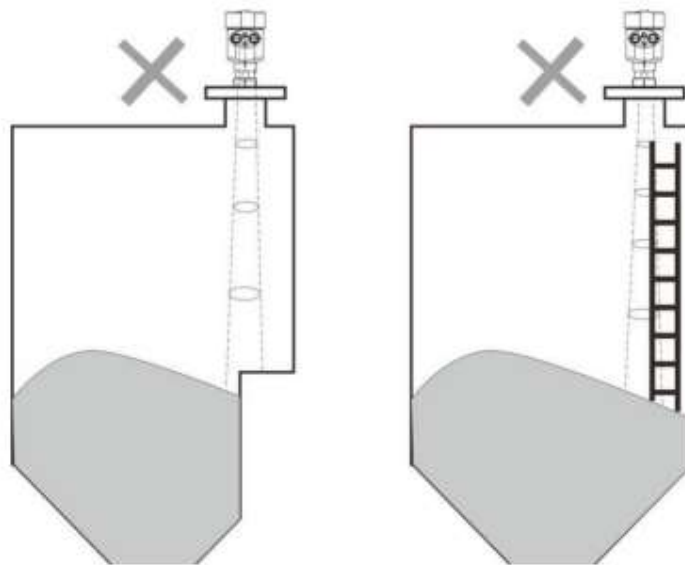


Figure 4-1 Incorrect Installation Example

- ***The instrument should be installed so that the antenna beam avoids the inlet, as shown in Figure 4-2.***

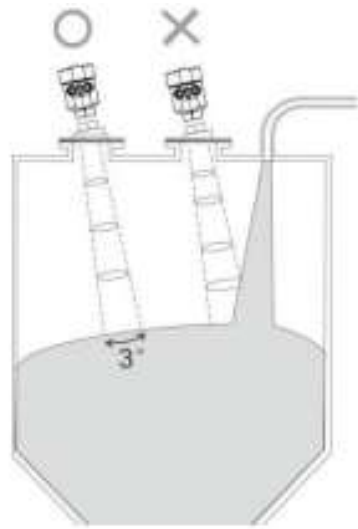


Figure 4-2 Keep Beam Away from Filling Inlet

- *The instrument should be installed at least 20 cm away from the container wall; otherwise, incorrect readings may occur, as shown in Figure 4-3.*

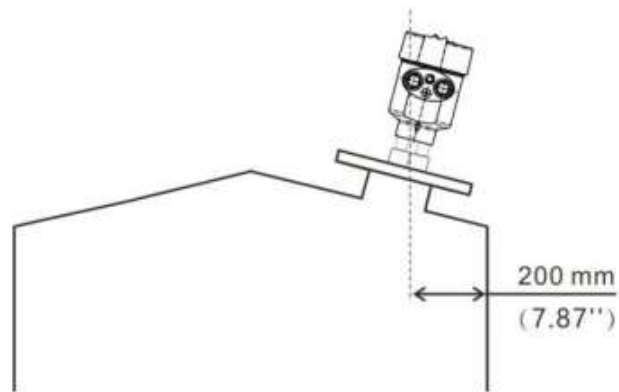


Figure 4-3 Keep at Least 200 mm from Vessel Wall

- ***For conical containers, ensure that the beam is directed straight toward the bottom of the tank; otherwise, the measurement at the bottom may be inaccurate, as shown in Figure 4-4.***

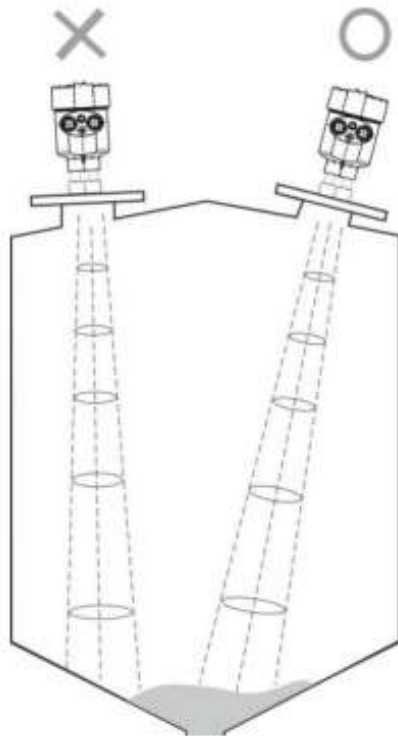


Figure 4-4 Aim Beam at the Bottom of a Conical Vessel

- ***For instruments installed outdoors, in humid environments, or on cooling/heating tanks, moisture protection measures should be taken: tighten the cable gland to prevent moisture ingress, and ensure the cable is bent downward at the entry point.***

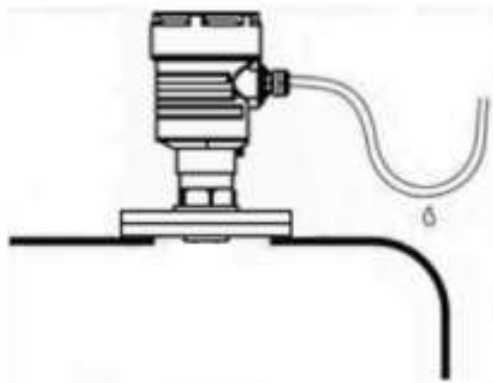


Figure 4-5. Moisture protection for outdoor or damp installations

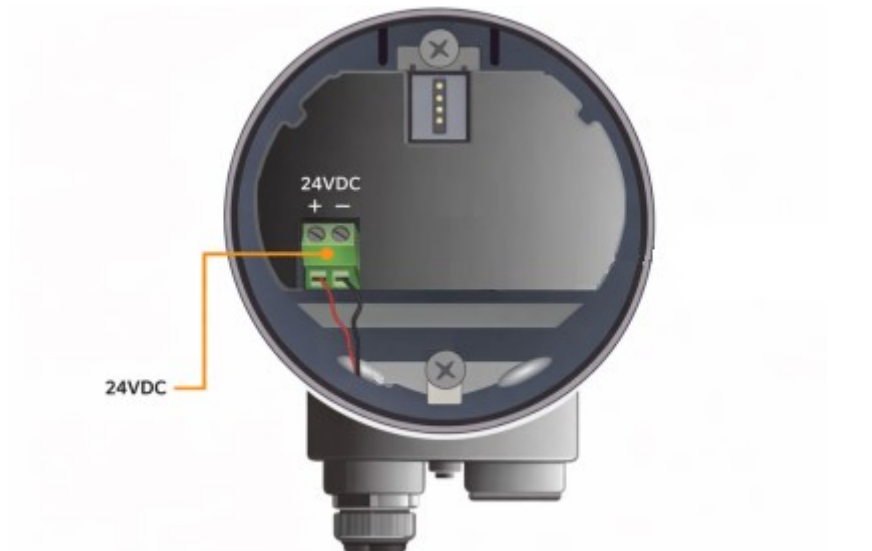
4.2 Wiring

A single multi-core cable with an outer diameter of 6-10 mm is recommended for cable entry. The single-core conductor size should be 24-14 AWG, up to 2.5 mm². Use a 2-3 mm flat-head screwdriver, and tighten screws with a torque of 5.0 kgf.cm.

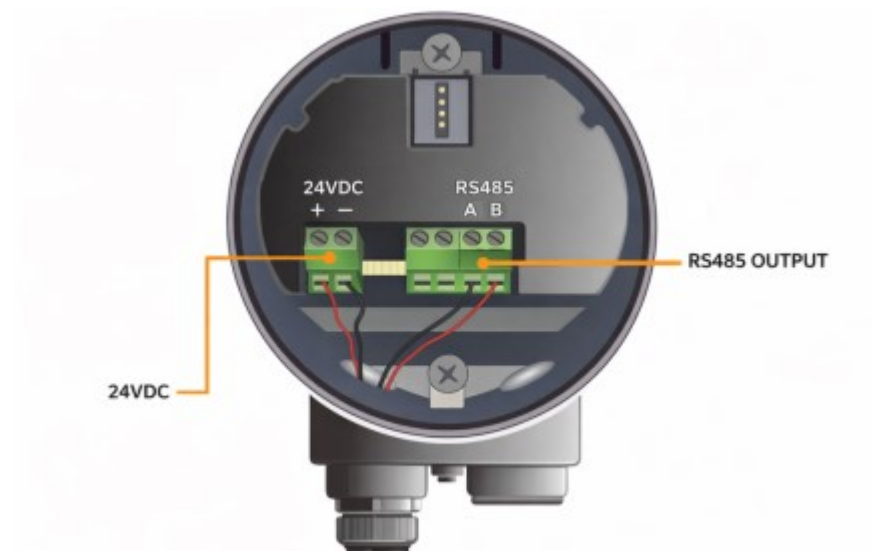


Attention: Refer to the control drawing located at the end of this manual for installation and wiring.

4.2.1 Two-wire current output and wiring



4.2.2 RS485 output wiring



4.3 Commissioning

The 80G radar performs level measurement according to the configured parameters. These settings can be modified through the local display module. The display module consists of four keys and a 128 x 64 dot-matrix LCD.

Key Operation:

Key	Function
ESC	Switch screen / return to the previous menu
+	Increase value / select previous option
►	Move cursor / select next option
OK	Enter setting interface / save parameter

- Set the Max Adjustment and Low Level Adjustment according to the actual application. See Sections 5.2.1 and 5.2.2.
- Set the Blind Zone to support stable and reliable measurement. See Section 5.2.3.
- Set the Change Rate parameter according to the actual process variation speed. See Section 5.2.5.
- After the above settings, the instrument should be able to operate normally. For additional adjustments, refer to Chapter 5.



Attention: After commissioning is completed, tighten the instrument cover and cable gland. Route the cable downward. When using conduit, provide a drain opening at the lowest point and ensure proper waterproofing.

5. Menu Parameter Description

5.1 Menu Parameter List

Menu Item	Parameter Range	Description
Basic Settings		
Min adjustment	0.1–120m	The farthest distance to be measured; one range value for current output.

Max adjustment	0–120m	The nearest distance to be measured; the other range value for current output.
Blind Zone	0.1–120m	Area where measurement is not performed.
Range Setting	0.5–120m	Maximum detection distance.
Damping	1–100S	Longer Damping results in slower response speed.
Change Rate	Slow, Medium, Fast, Ultra-Fast	Select the changing speed of the measured material.
Fluctuation / Angle	None, Small, Medium, Large	—
Foam / Dust	None, Small, Medium, Large	—
Volume Meas	Container Type, Volume Unit, Mass Meas	Built-in various tank shapes for volume and mass calculation.
Sensor Tag	SENSOR	—
Display		
Language	Chinese / English / Spanish / Russian / Korean/Polish	LCD display language selection.
LCD Contrast	40–100	—
Temperature Unit	°C / °F / K	Temperature display unit selection.
Distance Unit	ft / m / in / cm / mm	Distance display unit selection.
Display Content	Distance / Space / Level / Volume / Current / Percentage	LCD display content selection.
Diagnostics		
Echo Quality Peak	Echo Quality Max, Echo Quality Min	Historical extreme value of measured echo quality.
Echo Intensity Peak	Echo Intensity Max, Echo Intensity	Historical extreme value of measured echo strength.

	Min	
Distance Peak	Distance Max, Distance Min	Historical extreme value of measured distance.
Temp. Peak	Temp. Max, Temp. Min	Historical extreme value of measured temperature.
Service		
In/Out Rate	0-600m/min	Restrict large sudden changes.
False Echo Learn	—	—
False Echo New	—	Suppress the influence of interference signals on normal measurements.
Edit False Echo	—	Manually edit and suppress interference signals.
Del. False Echo	—	Delete all modified false echoes.
mA Output Mode	4–20mA / 20–4mA	Select current output from low to high or high to low.
mA Simulate	—	Arbitrary current output.
mA Calibration	4mA Calibration / 20mA Calibration	Eliminate deviation of current output.
Fault Current	3.8mA / 4mA / 20mA / 20.2mA / Keep	
Backup & Restore	—	Restore and restart, backup data.
Factory Reset	Restore restart	—
Data Backup	Confirm Backup	
Data Restore	Restore and restart	
Low DK Value	No, Yes	—
HART Address	0–15	HART short address.
Distance Offset	-0.229~1m	Reference offset.
TVT Amplitude	0–15	—

False Echo Offset	0–15	—
Near Detection	Close, Open	—
Information		
Serial Number	XXXXXXXXX	9-digit code, unique per device.
Software Version	Vx.x.xx	Software identification.
Hardware Version	xx.xx.xx	Hardware version.
Sensor Model	XXXXXXX	Fixed value, cannot be modified.
Production Date	YYYY-MM-DD	Instrument production date.
Factory Settings	Password	
Serial Port Configuration (485 only)		
RS485 Address	1–247	Slave address for RS485 communication.
Baud Rate	1200–921600	RS485 communication speed.
Parity	None / Odd / Even	RS485 parity selection.
Stop Bits	1 / 1.5 / 2	RS485 stop bit selection.

5.2 Basic Parameters

5.2.1 Min. Adjustment

Example: Set Min. Adjustment (0%) to 30 m.

Settings	Basic Settings	Min adjustment
Basic Settings	Min adjustment	
Display	Max adjustment	30.000 m
Diagnostics	Blind Zone	

Parameter Description:

Min adjustment corresponds to the empty tank level, i.e., the 0% position as shown in the figure.

Max adjustment and Min adjustment define the effective measurement range of the

radar level transmitter.

The current output is mapped proportionally to the configured high and low level settings.

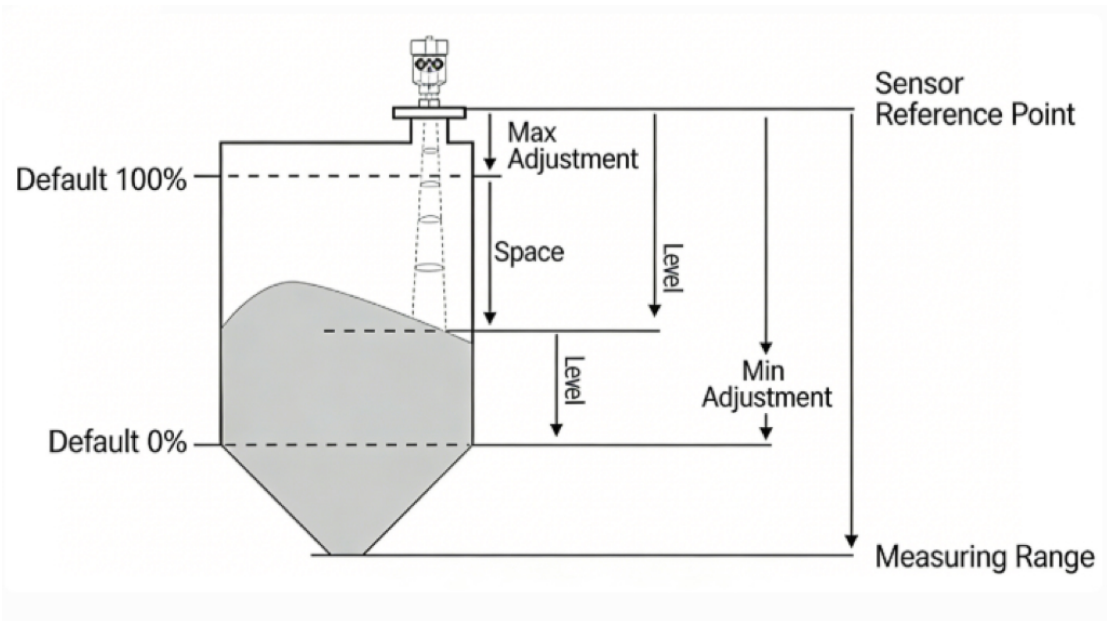
5.2.2 Max Adjustment

Example: Set Max Adjustment (100%) to 0 m.

Settings	Basic Settings	Max adjustment
Basic Settings	Min adjustment	
Display	Max adjustment	0.000 m
Diagnostics	Blind Zone	

Parameter Description:

Max adjustment corresponds to the full level of the tank, i.e., the 100% position as shown in the figure.



5.2.3 Blind Zone

Example: Set Blind Zone to 0.2 m.

Settings	Basic Settings	Blind Zone
Basic Settings	Min adjustment	
Display	Max adjustment	0.200 m
Diagnostics	Blind Zone	

Parameter Description:

Blind Zone is used to exclude echo signals within the defined blind zone from algorithm processing, thereby avoiding interference from near-field signals.

5.2.4 Range Settings

Example: Set Range Settings to 32 m.

Settings	Basic Settings	Range Settings
Basic Settings	Max adjustment	32.000 m
Display	Blind Zone	
Diagnostics	Range Settings	

Parameter Description:

Range limits the maximum values of related parameters. Echo signals beyond the configured range will not be selected for processing.

This setting does not represent the maximum measurable distance of the instrument.

5.2.5 Damping

Example: Set Damping to 5 s.

Settings	Basic Settings	Damping
Basic Settings	Blind Zone	005 s
Display	Range Settings	
Diagnostics	Damping	

Parameter Description:

Damping is used to smooth sudden changes in the measurement results, providing a more accurate representation of the average material level.

Damping Formula:

$$V_{out} = \frac{V_{new} - V_{old}}{Damp} + V_{old}$$

5.2.6 Change Rate

Example: Set Change Rate to Medium.

Settings	Basic Settings	Change Rate
Basic Settings	Range Settings	Slow
Display	Damping	Medium
Diagnostics	Change Rate	Fast

Parameter Description:

This parameter adjusts the measurement speed and Damping of the radar transmitter to match the rate of material level changes.

It is particularly important when the liquid in the tank is under agitation or when material during the filling process interferes with the radar beam.

Change Rate	Feed Rate	Discharge Rate	Damping	Description
Slow	0.5 m/min	0.5 m/min	10 s	Suitable for slow material in/out applications where measurement stability is required.
Medium	1 m/min	1 m/min	5 s	Suitable for most general applications.
Fast	2 m/min	2 m/min	2 s	Suitable for applications requiring fast response.
Ultra Fast	10 m/min	10 m/min	1 s	Suitable for applications requiring ultra-fast response, such as hoppers and anti-collision scenarios.

5.2.7 Fluctuation / Angle

Example: Set Fluctuation / Angle to None.

Settings	Basic Settings	Fluctuation / Angle
Basic Settings	Damping	None
Display	Change Rate	Small
Diagnostics	Fluctuation / Angle	Medium

Parameter Description:

For liquid media: If the surface of the liquid in the tank fluctuates significantly (e.g., boiling liquid, vortex or turbulent conditions), this parameter should be enabled.

For solid media: When the solid material in the tank forms a large inclination, such as a heap angle or concave surface, during filling or emptying, this parameter should be enabled.

This is especially recommended for applications involving high-viscosity solids, granular materials, or stone-like materials.

5.2.8 Foam / Dust

Example: Set Foam / Dust to None.

Settings	Basic Settings	Foam / Dust
Basic Settings	Change Rate	None
Display	Fluctuation / Angle	Small
Diagnostics	Foam / Dust	Medium

Parameter Description:

Foam:If a light foam layer is present on the surface of the liquid in the tank, this parameter should be enabled.

The thickness of the foam layer can significantly affect the accuracy and stability of radar measurement.

Dust:If there is a large amount of dust, airborne dust, or vapor in the solid material inside the tank, this parameter should be enabled.

5.2.9 Volume Meas

Example: Calculate volume by configuring Container Type and unit.

Settings	Basic Settings	Volume Meas
Basic Settings	Fluctuation / Angle	Container Type
Display	Foam / Dust	Volume Unite
Diagnostics	Volume Meas	Mass Meas

Parameter Description:

Container Type:Includes rectangular, cylindrical, conical, horizontal tank, etc.

Volume Unit: m³, L.

Mass Meas:When mass measurement is enabled, the mass will be calculated based on volume and density.

5.2.10 Sensor Tag

Default sensor tag: SENSOR.

Settings	Basic Settings	Sensor Tag
Basic Settings	Foam / Dust	SENSOR
Display	Volume Meas	
Diagnostics	Sensor Tag	

Parameter Description:

This parameter is used to identify the product model or to distinguish between multiple instruments.

5.3 Display Parameters

5.3.1 Language

Example: Set language to Chinese.

Settings	Display	Language
Basic Settings	Language	中文
Display	LCD Contrast	English

Parameter Description:

Set the menu language shown on the LCD.

5.3.2 LCD Contrast

Example: Set LCD contrast to 70.

Settings	Display	LCD Contrast
Basic Settings	Language	
Display	LCD Contrast	070
Diagnostics	Temperature Unit	

Parameter Description:

Used to set the brightness and darkness of the LCD liquid crystal background.

5.3.3 Temp. Unit

Example: Set the unit for displaying temperature on the main interface to °C.

Settings	Display	Temp. Unit
Basic Settings	Language	°C
Display	LCD Contrast	°F
Diagnostics	Temp. Unit	K

Parameter Description:

Set the temperature unit displayed on the main screen.

5.3.4 Distance Unit

Example:Set the display distance unit in the menu to feet.

Settings	Display	Distance Unit
Basic Settings	LCD Contrast	ft
Display	Temperature Unit	m
Diagnostics	Distance Unit	in

Parameter Description:

Sets the display unit for the main screen and all distance-related menus.

5.3.5 Display Content

Example:Set the display content to distance.

Settings	Display	Display Content
Basic Settings	Temperature Unit	Distance
Display	Distance Unit	Space
Diagnostics	Display Content	Level

Parameter Description:

Configures the main display content. Available options: Distance / Space / Level / Volume / Current / Percentage.

5.4 Diagnostics

5.4.1 Echo Quality Peak

Records the highest and lowest echo quality values since power-up.

5.4.2 Echo Intensity Peak

Records the highest and lowest echo strength values since power-up.

5.4.3 Distance Peak

Records the highest and lowest measured distance values since power-up.

5.4.4 Temp. Peak

Records the highest and lowest internal temperature measured by the core temperature sensor since power-up.

5.5 Service

5.5.1 In / Out Speed

Used to adjust the response speed of the instrument to the actual level variation. When the filling or emptying speed setting changes, the response speed changes automatically. This parameter corresponds to [Change Rate] under Basic Settings.

5.5.2 False Echo Learn

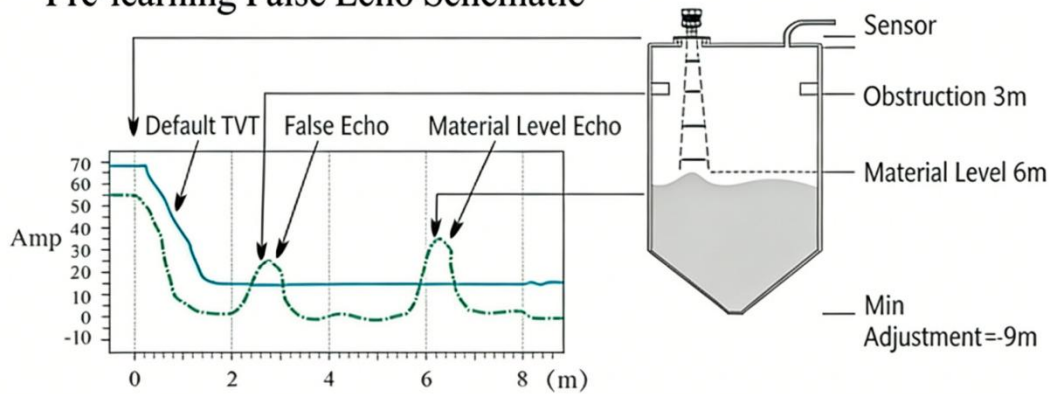
In practical applications, internal tank structures may generate reflected echoes, called false echoes, that interfere with recognition of the real level echo. To ensure normal measurement, these false echoes should be masked and suppressed by defining their shape and position on the echo curve.

[False Echo Learn] defines a suppression interval from distance A to distance B and is suitable for applications with significant clutter. After setting the starting and ending distance values, the radar will based on the current statistical background noise of the echo signals in this area, establish the shielding zone.

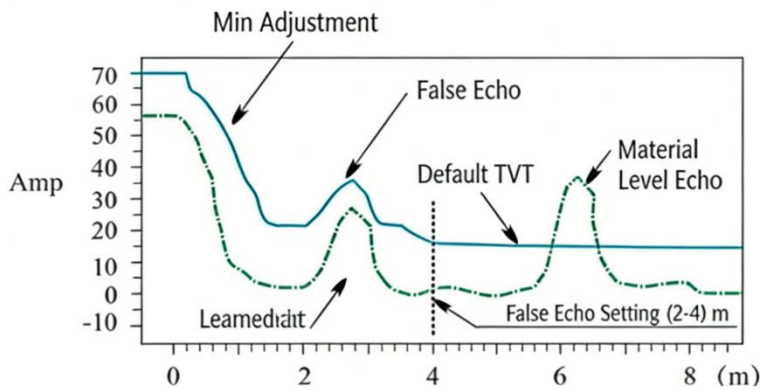


When a real target is present, the learning area must not cover the real target. There is a default value for the signal strength, and 0 dB is generally sufficient under normal circumstances.

Pre-learning False Echo Schematic



Post-learning False Echo Schematic



5.5.3 Edit False Echo

Edits an existing false echo interval that has already been created.

5.5.4 Delete False Echo

Deletes all existing false echo parameter settings.

5.5.5 mA Output Mode

Determines whether the bus outputs 4-20 mA or 20-4 mA. With 4-20 mA selected, an empty tank outputs 4 mA and a full tank outputs 20 mA. With 20-4 mA selected, an empty tank outputs 20 mA and a full tank outputs 4 mA.

5.5.6 mA Simulation

This function can make the instrument output arbitrary current values within the range of 4–20mA (or 20–4mA). It is used to check whether the current output loop of the instrument is accurate and normal. After exiting this menu, the system will resume normal analog output operation.

5.5.7 mA Calibration

Corrects output current deviation. Calibration is completed at the factory.

5.5.8 Data Backup and Restore

Restores all instrument parameters to default settings. Recovery takes approximately 10 seconds. If the instrument cannot measure normally due to improper operation, this option is recommended first. The backup function copies common parameters to the display so that other radar instruments can be configured quickly using the same parameters.

5.5.9 Data Backup

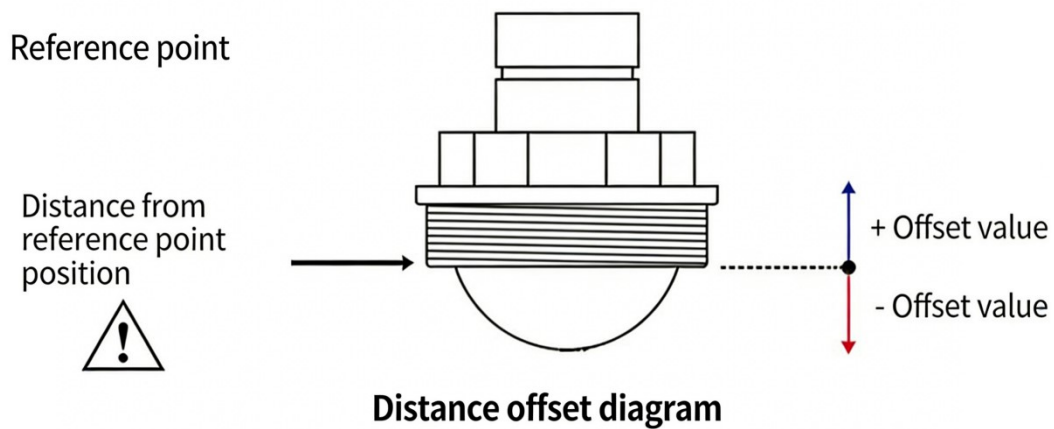
Backs up parameters to the display module, allowing the display to configure other instruments conveniently in identical applications.

5.5.10 HART Address

Sets the HART short address for networking. When the HART short address is not 0, the current output is fixed at 4 mA.

5.5.11 Offset

Used to correct the deviation between the measured value and the actual value. The instrument is factory-calibrated by default, with the reference point set at the end face of the thread. Suitable for small fine-tuning adjustments.



5.5.12 TVT Amplitude

Threshold range: 0-15. Default value: 6 dB. Used to suppress field interference. This parameter should be set by qualified personnel.

5.5.13 False Echo Offset

Threshold range: 0-15. Default value: 6 dB. Used to suppress field interference. This parameter should be set by qualified personnel.

5.6 Information

This menu allows viewing of basic device information such as serial number, software version, hardware version, sensor model and production date.

5.7 Serial Port Settings (not available on two-wire instruments)

5.7.1 RS485 Address

Sets the RS485 slave address for field networking. Factory default is 1.

5.7.2 Baud Rate

Adjusts the RS485 communication speed. Available settings: 1200, 2400, 4800, 9600, 14400, 19200, 38400, 56000, 115200, 256000, 460800, 500000, 512000, 600000, 750000, 921600 bps. Factory default is 9600.

5.7.3 Parity

Sets the UART data parity method. Available options: None, Odd, Even. Default: None.

5.7.4 Stop Bits

Indicates the end of data transmission in UART communication. Available options: 1, 1.5, 2. Default: 1.

6. Register List

6.1 Read Variable Values

Address	Function Code	Register Address	Quantity	CRC	Description
01	03	0000	0001	840A	Space (unit: cm)
01	03	0001	0001	D5CA	Space (unit: mm)
01	03	0002	0001	25CA	Level (unit: cm)
01	03	0003	0001	740A	Level (unit: mm)
01	04	9001	0001	4D0A	Temperature (INT16), C/100
01	04	900A	0001	3CC8	Current (INT16), uA
01	04	9015	0002	4D0F	Distance (Float32), m
01	04	9022	0002	FCC1	Space (Float32), m
01	04	9026	0002	BD00	Level (Float32), m

6.2 Common Parameter Registers

Parameter	Register	Function Code	Data Type	Description
Change Rate Speed	0x9305	0x03, 0x10	uint16	0-3: Slow, Medium, Fast, Ultra-Fast
Damping	0x930B	0x03, 0x10	uint16	s
Blind Zone Setting	0x9344	0x03, 0x10	Float32	m (CDAB)
Range Setting	0x9346	0x03, 0x10	Float32	m (CDAB)
Low Level Setting	0x9348	0x03, 0x10	Float32	m (CDAB)
High Level Setting	0x934A	0x03, 0x10	Float32	m (CDAB)

Parameter	Register	Function Code	Data Type	Description
Distance Offset	0x934E	0x03, 0x10	Float32	m (CDAB)
Baud Rate	0x924E	0x03, 0x10	Uint32	1200-921600 (CDAB)
Slave Address	0x9301	0x03, 0x10	uint16	Lower 8 bits, 1-247

7. Common Faults and Troubleshooting

Abnormal Symptom	Possible Cause	Recommended Action
Display screen is off	1. Abnormal power supply 2. Poor contact of display probe	1. Check the power supply and measure the loop current. 2. Replace the upper cover of the core housing.
PLC (DCS) level display differs from radar display	Instrument range settings do not match PLC range settings	Modify the instrument High Level and Low Level Adjustment values so they match the PLC range.
Measured value jumps toward 100% during filling	Condensation or buildup on the antenna	Perform interference suppression and carry out false echo learning after condensation or buildup occurs. If measurement is not affected, appropriately increase the blind zone.
Measured value jumps toward 0% during filling	Obstacles in the measuring path prevent the instrument from distinguishing interference echoes from the true level echo	Fine-tune the radar installation angle to weaken the interference signal, or select a more favorable mounting position.
Measured value fluctuates by 10% to 20%	1. Liquid surface fluctuation 2. Uneven medium surface, such as in a conical silo	1. Check the [Change Rate] parameter; if necessary, manually increase the Damping. 2. Choose a more favorable installation position and optimize the mounting direction.
Measured value does not change during filling	Measured value is tracking an interference signal; excessive foam affects signal quality; filling speed is too fast; range setting is incorrect	Suppress interference signals; clean the antenna; select a suitable Change Rate speed; reconfigure the High Level and Low Level Adjustment values.

8.Fault Code Table

Fault Code (Hex)	Meaning
0x0001	Lost echo
0x0008	Warning: no-current device output
0x0010	Warning: current simulation / current calibration state
0x0080	Warning: low operating voltage
0x0200	Warning: no temperature sensor

9.FCC Warning

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter.

1. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body.

NOTE:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC ID: 2BFRQ-HCDAR8X

HCDAR-80_-----

Unit	Code	Parameters		
Instrument Type	P	Standard		
	I	Intrinsically Safe		
	D	Flameproof		
	F	Dust Ignition-proof		
Housing/Protection Grade	L	Aluminum Alloy/IP68		
	G	Aluminum Alloy Dual Chamber/IP67		
	D	316L Stainless Steel/IP68		
	Y	Special Custom		
Material	4	304		
	6	316		
	7	PTFE		
Antenna Type	2	Lens Type		
	3	Anti Corrosion Type/PTFE		
	4	High Temperature (0~200℃)		
Process Connection	Q	Thread G1	E	Thread NPT1½
	W	Thread NPT1	R	Thread G2
	G	Thread G1½	/	/
	T	Thread NPT2	A	Flange DN50
	J	Flange DN65	B	Flange DN80
	C	Flange DN100	F	Flange DN125
	D	Flange DN150	Y	Special Custom
Electronic Unit	2	2 Wires (4~20) mA 24V DC/HART		
	3	4 Wires (4~20) mA 220V AC (Dual Chamber Housing)		
	4	4 Wires RS485 MODBUS-RTU+(4~20)mA		
	5	4 Wires RS485 MODBUS-RTU		
	6	4 Wires (4~20)mA 24V DC		
	Y	Special Custom		
Cable Inlet	M	M20*1.5		
	N	NPT1/2		
Medium Type	L	Liquid		
Measuring Range	1	(0~30) m		
	2	(0~60) m		
	3	(0~120) m		
Special Custom	Y	Special Custom		

HCDAR-80S

Unit	Code	Parameters		
Instrument Type	P	Standard		
	I	Intrinsically Safe		
	D	Flameproof		
	F	Dust Ignition-proof		
Housing/Protection Grade	L	Aluminum Alloy/IP68		
	G	Aluminum Alloy Dual Chamber/IP67		
	D	316L Stainless Steel/IP68		
	Y	Special Custom		
Material	4	304		
	6	316		
	7	PTFE		
Antenna Type	2	Lens Type		
	3	Anti Corrosion Type/PTFE		
Process Connection	Q	Thread G1	E	Thread NPT1½
	W	Thread NPT1	R	Thread G2
	G	Thread G1½	/	/
	T	Thread NPT2	A	Flange DN50
	J	Flange DN65	B	Flange DN80
	C	Flange DN100	F	Flange DN125
	D	Flange DN150	Y	Special Custom
Electronic Unit	2	2 Wires (4~20) mA 24V DC/HART		
	3	4 Wires (4~20) mA 220V AC (Dual Chamber		
	Y	Special Custom		
Cable Inlet	M	M20*1.5		
	N	NPT1/2		
Medium Type	L	Liquid		
Measuring Range	1	(0~10) m		
	2	(0~20) m		
Special Custom	Y	Special Custom		

HCDAR-81_-----

Unit	Code	Parameters				
Instrument Type	P	Standard	I	Intrinsically Safe		
	D	Flameproof	F	Dust Ignition-proof		
Housing/Protection Grade	L	Aluminum Alloy/IP68				
	G	Aluminum Alloy Dual Chamber/IP67				
	D	316L Stainless Steel/IP68				
	Y	Special Custom				
Material	4	304	6	316		
Antenna Type	1	Lens Type	3	Anti Corrosion Type/PTFE		
	4	High Temperature (0~200℃)				
Process Connection	G	Thread G3½				
	P	Thread NPT 3½				
	A	Flange DN50 (Optional for anti-corrosion type only)				
	J	Flange DN65 (Optional for anti-corrosion type only)				
	B	Flange DN80 PN10				
	C	Flange DN100 PN10				
	F	Flange DN125 PN10				
	D	Flange DN150 PN10				
	L	Flange DN80 PN10 Universal flange				
	K	Flange DN100 PN10 Universal flange				
	E	Flange DN125 PN10 Universal flange				
	N	Flange DN150 PN10 Universal flange				
	R	Flange DN80 PN10 Universal flange with air purge				
	S	Flange DN100 PN10 Universal flange with air purge				
	H	Flange DN125 PN10 Universal flange with air purge				
	M	Flange DN150 PN10 Universal flange with air purge				
	Y	Special Custom				
Electronic Unit	2	2 Wires (4~20) mA 24V DC/HART				
	3	4 Wires (4~20) mA 220V AC (Dual Chamber Housing)				
	4	4 Wires RS485 MODBUS-RTU+(4~20)mA				
	5	4 Wires RS485 MODBUS-RTU				
	6	4 Wires (4~20) mA 24V DC				
	Y	Special Custom				
Cable Inlet	M	M20*1.5		N	NPT1/2	
Medium Type	L	Liquid	S	Soild	D	Powder
Measuring Range	1	(0~30) m	2	(0~60) m	3	(0~120) m
Special Custom	Y	Special Custom				

HCDAR-81S_-----

Unit	Code	Parameters		
Instrument Type	P	Standard	I	Intrinsically Safe
	D	Flameproof	F	Dust Ignition-proof
Housing/Protection Grade	L	Aluminum Alloy/IP68		
	G	Aluminum Alloy Dual Chamber/IP67		
	D	316L Stainless Steel/IP68		
	Y	Special Custom		
Material	4	304		
	6	316		
Antenna Type	1	Lens Type		
	3	Anti Corrosion Type/PTFE		
Process Connection	G	Thread G3½		
	P	Thread NPT 3½		
	A	Flange DN50		
	J	Flange DN65		
	B	Flange DN80 PN10		
	C	Flange DN100 PN10		
	F	Flange DN125 PN10		
	D	Flange DN150 PN10		
	L	Flange DN80 PN10 Universal flange		
	K	Flange DN100 PN10 Universal flange		
	E	Flange DN125 PN10 Universal flange		
	N	Flange DN150 PN10 Universal flange		
	R	Flange DN80 PN10 Universal flange with air purge		
	S	Flange DN100 PN10 Universal flange with air purge		
	H	Flange DN125 PN10 Universal flange with air purge		
	M	Flange DN150 PN10 Universal flange with air purge		
	Y	Special Custom		
Electronic Unit	2	2 Wires (4~20) mA 24V DC/HART		
	3	4 Wires (4~20) mA 220V AC (Dual Chamber		
	Y	Special Custom		
Cable Inlet	M	M20*1.5		
	N	NPT1/2		
Medium Type	L	Liquid		
	S	Soild		
Measuring Range	1	(0~10) m		
	2	(0~20) m		
Special Custom	Y	Special Custom		

Intrinsically safe apparatus for connection to associate dapparatus specified by entity parameters

Hazardous (Classified) Location

Class I, Division I, Groups A, B, C, D
 Ex ia IIC T4 Ga
 Class I, Zone 0, AEx ia IIC T4 Ga
 -40°C ≤ Ta ≤ +70°C

Unclassified Location

**HCDAR-8X SERIES
80GHz FMCW Radar
Level Transmitter**

Models: HCDAR-8_1 -----

UI/Vmax = 30V
 PI/PImax = 1W
 I/Imax = 130mA
 CI = 12nF
 LI = 200uH

**ASSOCIATED APPARATUS
WITH ENTITY PARAMETERS**

Uo ≤ UI(or Vmax)
 Po ≤ PI
 Io ≤ I(or Imax)
 Co ≥ CI
 Lo ≥ LI

Notes:

- For models details see User Manual,
- Install in accordance with Section 18 of the CEC or Article 500 of the NEC.

Title		Control drawing	
Drawing NO.	RDQ175050646	Issue date	2026-04-07
Drawn by	Lan Haobo	Create date	2026-04-07
Checked by	Neil	HCDAR-80/81	
Approved by			
Revision	Size	Page	Total
V1.0	A4	1	1

Intrinsically safe apparatus for connection to associate dapparatus specified by entity parameters

Hazardous (Classified) Location

Class I, Division I, Groups A, B, C, D
Ex Ia IIC T4 Ga
Class I, Zone 0, AEx Ia IIC T4 Ga
-40°C ≤ Ta ≤ +70°C

Unclassified Location

HCDAR-8X SERIES
80GHz FMCW Radar
Level Transmitter

Models: HCDAR-8 |

ASSOCIATED APPARATUS WITH ENTITY PARAMETERS

$$\begin{aligned} U_0 &\leq U_i(\text{or } V_{\max}) \\ P_0 &\leq P_i \\ I_0 &\leq I_i(\text{or } I_{\max}) \\ C_0 &\leq C_i \\ L_0 &\leq L_i \end{aligned}$$

HCDA-8X SERIES
80GHz FMCW Radar
Level Transmitter

Models: HCDAR-8 |

⊕ ASSOCIATED APPARATUS
WITH ENTITY PARAMETERS

$$\begin{aligned} U_0 &\leq U_i \text{ (or } V_{\max}) \\ P_0 &\leq P_i \\ I_0 &\leq I_i \text{ (or } I_{\max}) \\ C_0 &\geq C_i \\ L_0 &\geq L_i \end{aligned}$$

Title		Control drawing							
Drawing NO.		RDQ175050646							
Drawn by		Lan Haobo							
Checked by		Neil							
Approved by		HCDAR-80/81							
Revision						Size		Page 1 Total 1	
V1.0						A4		HBHICK	



