

Radar level transmitter

WE-T161 Instruction Manual



Hainan Shidian Technology Co., Ltd. U-WES-T161-CN2

Preface

- This manual is an instruction manual for various functions, wiring methods, operation methods, etc. of the product.

- Please read this manual carefully before operation, use this product correctly, and avoid unnecessary losses caused by incorrect operation.

- After you finish reading, please keep it in a place where it is easy to access it at any time for easy reference.

Note

- If there are any changes to the contents of this manual due to function upgrades, please refer to the newly released document.

- We strive to be correct in the content of this manual, so if you find an error, please contact us.

- The content of this manual is strictly prohibited from reprinting or copying.

- The final interpretation of this manual is the property of the Company.

version

U-WES-T161-CN2 2nd Edition August 2025

Confirm the package contents

After opening the box, check the contents of the package before you begin. If you find that the model and quantity are wrong, or if there is physical damage to the appearance, please contact us.

The product packaging content is shown in the standard configuration list.

Product standard configuration list

Serial number	Name	quantity	Note:
1	Radar level transmitter	1	
2	Instructions	1	
3	Antenna	1	
4	Certificate of conformity	1	

Note: Customized products may be slightly different from standard products, please refer to the order.

Table of contents

Radar level transmitter	1
Preface	III
Note	III
version	IV
Confirm the package contents.....	IV
Chapter I Product Overview:	1
1.1 Product Introduction.....	1
1.2 Measurement principle.....	2
1.3 Product features:	3
Chapter II Technical parameters	4

Chapter III Product structure and size	7
3.1 Dimensions	7
3.2 Process connection	8
3.3 Connect the cables	8
3.4 Material:	8
Chapter IV Installation and wiring	9
4.1 Arrival inspection	9
4.2 Installation conditions:	9
4.3 Installation notes	10
4.4 Installation diagram	11
Chapter 5 operation	12
5.1 Display and operating unit	12
5.2 On-site operation	15
5.3 The device is on the cloud	19
5.4 Device local Bluetooth configuration	22
5.5 Precautions for use	23
Chapter 6 Fault analysis and troubleshooting	25
Chapter VII Warranty and after-sales service	28
Appendix Selection and Ordering	29

第1章 Product Overview:

1.1 Product Introduction

WE-T161 is a series of radar level monitoring transmitters, including LoRa, 4G, NB, etc., and the power supply mode is battery power supply and 24V power supply. The radar level transmitter adopts millimeter-wave radar sensors to calculate the on-site liquid level in real time according to the installation height and the height of the radar antenna from the liquid level. It uses LoRa, 4G, NB and other communications to achieve long-distance communication, combined with Shidian Technology's industrial edge computing gateway products, and uploads them to the Shidian Technology equipment management platform to realize real-time collection, analysis, calculation, storage and display of on-site liquid level physical quantities.

The split design of the transmitter host and probe provides a variety of ranges for different

needs such as the medium to be measured on site, the liquid level range, and the installation method, and can be widely used in water conservancy measurement such as rivers and reservoirs, tank level, sewage cellar well and sewage well level measurement.

1.2 Measurement principle

The radar probe measurement principle of radar level transmitter is to calculate the distance between the target object and the radar by using the time difference between the transmitted and received signals. The radar system emits an electromagnetic wave, which travels through the atmospheric medium, reflects off the target object and returns to the radar receiver. The receiver compares the received signal with the transmitted signal, determining the distance of the target object by calculating the time difference.

Radar level transmitters generally consist of a radar sensor and a transmitter, connected by cables. According to the set installation height, the radar sensor measures the distance from the probe to the target object, internally calculates the distance

value (empty height), liquid level value, and transmits it to the transmitter via cable.

1.3 Product features:

- The mobile app can monitor the meter anytime and anywhere.
- 3 communication methods to choose from.
- Battery and external power supply mode selection.
- Operating temperature range (-20~70)° C.
- Fully sealed waterproof design with IP67 protection.
- High-gain antenna and multiple verification mechanisms ensure always-on.
- It supports high-definition LCD display, with LED indicators and buttons, and can view liquid level values, alarm information, battery level prompts, etc. in real time on the spot.

第2章 Technical parameters

表1 Technical parameters

Input	
Measure variables	level
Measurement range	0m~20m, other measurement ranges can be customized
Radar probe blind zone	$\leq 0.15\text{m}$
Beam angle	2.75°
Performance parameters	
Accuracy	$\pm 2\text{mm}$
resolution	1mm
Signal transmission	LoRa network communication It supports the 410.125~490.125MHz frequency band The maximum transmit power is 22dbm, the maximum -147dbm reception sensitivity, and the signal coverage capability is 5KM in the open viewing distance
	4G network communication, 3 years of traffic (100M/month)
	It supports MQTT, HTTP, and WES cloud

	service protocols LTE FDD B1/3/5/8 LTE TDD B34/38/39/40/41 (Full Band) Rate(Mbps) LTE FDD:10.3(DL)/5.1(UL) LTE TDD: 9.1(DL)/3.1(UL)
	NB network communication, five-year traffic (300M/year) LTE Cat NB2: B3/B5/B8 Rate(kbps):Single-Tone:25.5(DL)/16.7(UL) Multi-Tpne: 127(DL)/158.5(UL)
Sampling period	It can be set in 1min~18 hours
Reporting cycle	It can be set in 1min~18 hours
Electrical specifications	
Power supply	19000mAh, lithium battery 9~30DC, typical 24V
Battery life	Subject to specific usage conditions and reporting cycles. Typical values LoRa: 5~8 years @ 1 time/1h NB: 4~6 years @ 1 time/1h 4G: 2~3 years @ 1 time/1h
environmental conditions	

Work environment	Temperature: (-20~70)° C Relative humidity: 5%~95%
Storage temperature	(-40~85) °C
Protection level	IP67

第3章 Product structure and size

3.1 Dimensions

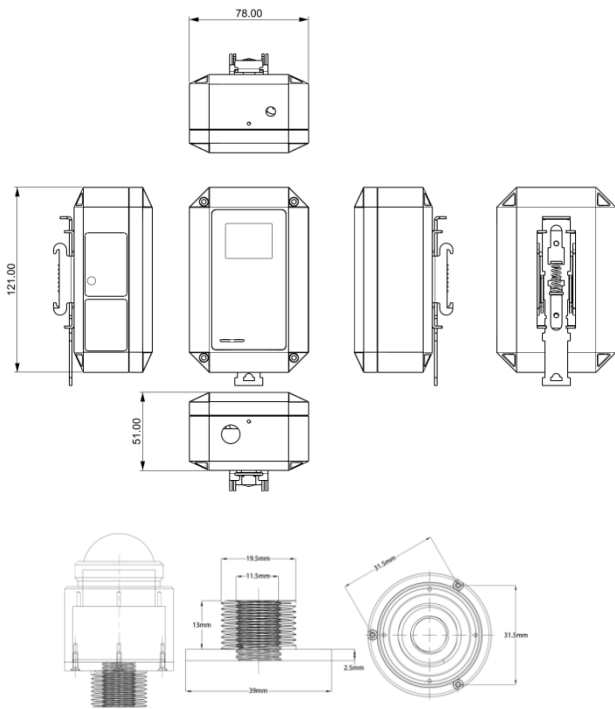


图1 Product dimensions

3.2 Process connection

表2 Process connection

Thread type	M32×1.5
D (mm)	10mm

3.3 Connect the cables

Cable length: 1.5m, other lengths need to be customized.

3.4 Material:

Housing material: ABS/PC

Cable sheath material: PVC or polyurethane PU

第4章 Installation and wiring

4.1 Arrival inspection

After the product arrives, the user should first check the packaging quality of the product, the packaging box should be intact and the logo should be clear. If the packaging has been obviously damaged, contact the storage and transportation department in time to find out the problem and responsibility and notify our company. If the packaging is not damaged and other problems, the product can be taken out of the box and the integrity of the product can be counted.

4.2 Installation conditions:

(1) When the radar level transmitter is installed, the radar probe should be placed vertically on the surface of the medium for optimal measurement results.

(2) A place that is easy to operate and maintain should be chosen for installation.

(3) It should be installed as far away from the vibration source as possible.

(4) It should be installed as far away from heat sources as

possible.

4.3 Installation notes

(1) Determine the measurement range required by the process to be consistent with the range of the transmitter to be installed.

(2) The thread specification of the fitting for process installation must be matched with the product.

(3) When installing and fixing the radar probe, it must be at least 20cm away from the side wall of the container, and it should be installed perpendicular to the liquid level to ensure that there is no interference within the beam range.

(4) The wire should be equipped with drip protection, that is, the cable entry port of the radar probe, and the cable and threading pipe should be bent downward to avoid short circuit caused by water ingress. During installation and use, wear, puncture and scratching of the wire should be eliminated. If there are the above problems on site, protective measures should be taken for the conductor.

4.4 Installation diagram

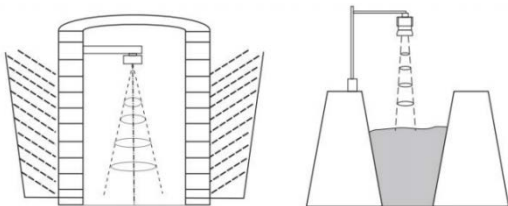


图2 Schematic diagram of the installation of the radar level transmitter probe

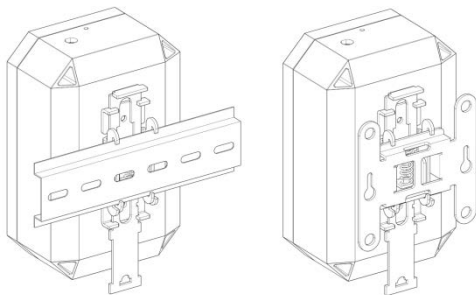


图3 Schematic diagram of the installation of the main engine of the radar level transmitter

第5章 operation

5.1 Display and operating unit



图4 Panel schematic

5.1.1 Interface Description

表3 Interface description

Serial number	Description
1	System time
2	Bluetooth: After the Bluetooth connection between the phone and the device is successful, the Bluetooth logo will be displayed
3	Upside signal
4	Battery level
5	Empty height measurement
6	Level measurement
7	Units of measurement
8	Recognition Countdown, after the device is recognized, start a 600-second countdown
9	Alarm information

5.1.2 Key Instructions

1 operation button on the left side of the main unit.

表4 Key definitions

operation	Description
Click	1. Light up the screen and backlight

operation	Description
	2. Switch pages 3. List wraps, option switching 4. Modify the parameter value by 1
Double click	1. Enter the parameter modification sub-interface 2. Determine the options
Three strikes	1. Identify the device 2. Enter the parameter setting interface
Long press	Long press for 5~6 seconds, the system light will flash white, and the device will restart after releasing the button.

5.1.3 Indicator Light Description

Communication indicator: flashing green, indicating normal communication

System light: Flashing green, indicating that the device is normal

Flashing orange indicates that the device is alarmed

Flashing red indicates a faulty device

5.1.4 Alarm and fault information

表5 Alarm code

Status code	Problem location
1	Plate temperature
2	battery
3	Bluetooth
4	Uplink network
5	shown
6	sensors
7	Other

For example, the status code in the figure shows 6, which indicates the sensor alarm, indicating that the current collected liquid level value triggers the alarm threshold.

5.2 On-site operation

The device button operation is as follows:

Operation instructions: Click the button to light up the screen and display the monitoring value and other information; Click the button again to light up the background light, and click the button again to display the QR code. Under the QR code interface, click the button three times to enter the parameter setting interface.

Parameter settings: After entering the parameter setting

interface, you can set parameters such as device address and LORA network (Net, Channel). In the Setting interface, click the button to wrap the list, as shown in the figure below, double-click the button to enter the parameter setting interface.



图5 Parameter interface

After entering a parameter modification interface, as shown in the figure below, the first row is the parameter value,  which means to save, and  to return to the previous level; With a single click, the action flag cycles through the four options, and the background of the action flag changes to a dark color when the action flag is on one option.



图6 Schematic diagram of the parameter subinterface

Parameter modification example, the operation flag moves to the first row, double-click the key, as shown in the figure below, after the triangle appears, click the key, click once, the value is added by 1, and the cycle of 0-9 is repeated. Once the value is determined, double-click the key and the triangle disappears. The action flag moves to , double-click the button to save the settings. The operation flag moves to the  Setting interface.



图7 Operation diagram

The page parameters table is as follows:

表6 Parameter list

page	Parameter Name	Value range	Note:
Setting	Address	1-99	Device address (LoRa only)
	Net	1-99	LoRa Network ID (LoRa only)
	Channel	0-83	LoRa Network Channel (LoRa Only)
	Calibration	/	Zero point calibration zero
	Exit	/	Exit
Address	/	1-99	You can modify the device address
Net	/	1-99	You can modify the LoRa network ID of the device
Channel	/	0-83	You can modify the LoRa network channel of the device

5.3 The device is on the cloud

This product can be bound to devices through the "World Power Device Assistant Mini Program" or the web terminal to realize remote monitoring, abnormal alarms, data reports and other functions.

5.3.1 Device cloud platform

(1) Mini program

Search for the mini program "World Electric Device Assistant" in WeChat and add the mini program.

(2) Web

Web address: <https://www.west-iot.com/wessass>

5.3.2 Adding Devices

Step 1: Enter the mini program project device management interface

Click Projects - Select Projects - Click  - Click - Device Management.



图8 Enter the project equipment management interface

Step 2: Add the device

Click the + sign in the upper right corner of the device management page, select the product, select the addition method, you can add it manually, scan the code to add or scan the QR code to add.

Scan the code to add:



图9 Scan the device QR code to add

Add manually:



图10 Add manually

Bluetooth adds:



图11 Bluetooth added

5.3.3 Guidelines for using the device cloud platform and mini program

Once the device is successfully added, you can view the device in the project. The detailed operation guide of the cloud platform and mini program can be viewed in the Mini Program Documentation Center.

5.4 Device local Bluetooth configuration

Step 1: Enter the mini program and search for the device via Bluetooth

Tap  - Tap Search Device. When you search for the device you want to connect to, you can click Stop search.

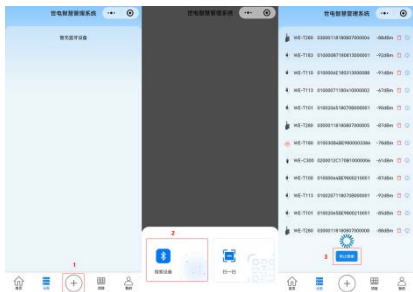


图12 Bluetooth search device

Step 2: Bluetooth connection device

Click the device name to connect the device.

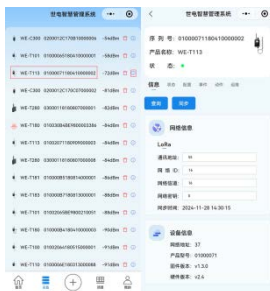


图13 Bluetooth connected devices

Step 3: Operate the equipment

After the device is successfully connected, you can view the device status data in the status, modify the device attributes during configuration, and restart, identify, and upgrade the device during O&M.

5.5 Precautions for use

This product has the function of instant threshold reporting: during the reporting week interval, if there is an abnormality in the

collection data (exceeding the set threshold, it needs to be set in advance), the set of data will be reported immediately (the device collection cycle is 30 seconds by default, and the reporting period is 5 minutes by default, both can be adjusted).

第6章 Fault analysis and troubleshooting

The following table lists the problems that may arise with the radar level transmitter and the solutions, if your problem is not listed or the solution does not handle your problem, please contact us.

表7 Common fault analysis and troubleshooting

Fault phenomenon	Cause analysis	Elimination methods
The meter is not displayed	The battery is low	Replace the battery with a new one
The collection value is abnormal	The probe connection is disconnected	Check if the field host is properly connected to the probe
Unable to receive data	The 4G/NB network can judge the meter status through the indicator light, and if it is not successfully stationed on the	(1) Install the SIM card correctly, (2) Contact the network operator to set up the network, or check the signal strength of the local 4G network.

	network, it will check: Whether the SIM card is installed correctly and whether it is in the Wi-Fi service area.	
	The LoRa network is not connected	Check whether the supporting gateway is connected Whether the parameters of LoRa and the gateway are consistent
The meter is not displayed	The battery is low	Replace the battery with a new one
The card is unreadable	The card is not inserted/the card is not charged/the card is bound	Reinsert Check card fee renewal The card is unbound
There is no	There are bugs in	Check the procedure

data on the platform	general procedures	
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第7章 Warranty and after-sales service

The company promises to customers that if there is a product quality problem during the warranty period, the company will implement an unconditional three-guarantee service for products with quality problems, that is, free repair, replacement or return. All non-customized products are guaranteed to be returned or exchanged within 7 days (excluding damaged products), and customized products are subject to the warranty agreed in the contract.

Disclaimer

During the warranty period, product failures caused by the following reasons are not covered by the three guarantees:

- (1) Product failure caused by improper use by the customer.
- (2) The customer disassembles, repairs and modifies the product by himself

Appendix Selection and Ordering

WE-T161 product selection parameter table	
Parameter	Selection code and specification
Communication mode	LR: LoRa
	4G: 4G/Cat1
	NB: NB
A accuracy level	N/A
R range range	R20: 20m
Power supply mode	P0: Battery powered
	P1: 9~30VDC power supply
Sensor mounting	N/A
Note: The range range and power supply method can be	

Example:

WE-T161-LR-R20-P0

LoRa radar level transmitter, 0~20m detection range, battery powered



For more inquiries, please scan
the QR code

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