2024

MANUAL

产品说明书

AiW-3648/MB Battery/Solar energy version

80GHz FMCW Smart Radar Level Gauges
Operation Instruction

chinasimba.com | 中国. 福州盛博电子有限公司

V1.1.210924 SW/App V1.12

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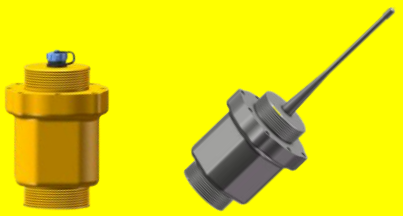
AIW-3648 SPECIFICATIONS

AiW-3648/3648MB

Product No	AiW-3648-R	AiW-3648-A	AiW-3648MB
Installation method	Threaded / Mounting bracket wall/ceiling		
Appearance Picture			
Parameter			
Measuring Frequency	77 to 80GHz Dynamic FM Sweep Bandwidth 3GHz (The adjustment FM range can be customized according to the ISM requirements of the customer's region)		
Instrument Range	18m		
Dead Band	<60mm		
Meas. Principle	FMCW Radar System		
Meas. Resolution	0.5mm		
Meas. Accuracy	±2mm		
Temperature Coefficient	±5ppm/°C		
Antenna Sensor Material	PVDF **{The antenna is integrated with the housing}**		
Beam Angle(α)	<6.5°/ Gain 23dB		
Output	**RS-485**	**4-20mA**	**RS-485 /or Mobile connectivity with NB-IoT, LTE-M or 4G/5G**
Power Supply	12-30 V DC		Battery powered: 5.0V Rechargeable lithium battery The amount of time a charge can last to run: 20Days~5years (Depends on the intermittent measuring cycle) * For more information, see Manu Measurement cycle items
Process Connection	G2 { Upper threaded G2 or Bracket mounted }		
Process Temperature	**-40 … +85 °C**		
Ambient Temperature	-40 … +85 °C		
Operating Pressure	**-300 to +300 KPa**		
Display/Adjustment	Software system: PCManager, MobileManager		
Bluetooth Standard	Bluetooth 4.0		
Bluetooth Range	25m		
Output & Protocol	ModBus	4-20mA	ModBus
Fault mA Output	**	22mA/4mA/20.5mA (option)	**
Live Display	Mobile / iPad / PC		
Housing Material	PVDF {The antenna is integrated with the housing}		
No.of Cable Entries	1 PVC Insulated cable (Aviation connectors)		
Explosion-proof grade	***	**Exia**	***
Ingress Protection / CE	**IP68 / CE**		
Package Dimensions	267mm x 97mm x 97mm		
Benefits / Application	Liquid/Solid application, Information access from everywhere at any time. The cloud connected radar level sensor from smart level monitoring to supply chain management		

NOTE:
CHINASIMBA provides a variety of CHINASIMBA products with various product options and configurations, including materials of construction that can be expected to perform well in a wide range of applications.
CHINASIMBA product information presented is intended as a guide for the purchaser to make an appropriate selection for the application.
It is the purchaser's sole responsibility to make a careful analysis of all process parameters (such as all chemical components, temperature, pressure, flow rate, abrasives, contaminants, etc.), when specifying product, materials, options, and components for the particular application.
CHINASIMBA is not in a position to evaluate or guarantee the compatibility of the process fluid or other process parameters with the product, options, configuration, or materials of construction selected.

For more information about our products, please refer to the website: https://www.chinasimba.com/products.htm
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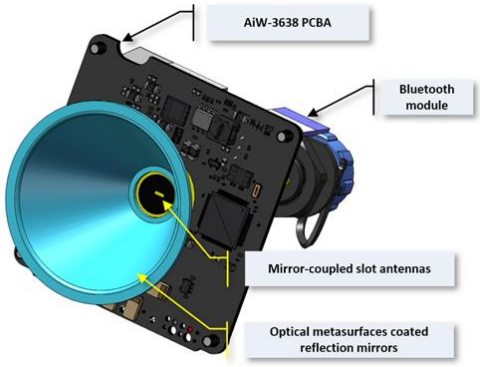
INTRODUCTION

The Hight Cost-effective's AiW-3648. What are its intrinsic factors?

When we focus on natural water resources, wastewater treatment, and municipal utility management applications, we should pay more attention to the natural environmental temperature adaptability of products, UV resistance, altitude and protection against pollution in the daily life environment.

The AIW-3648 radar level gauge, it does not adopt the traditional lens antenna design ideas, nor does it have a complex sealing and assembly structure design, which these original designs are designed to overcome the extreme and demanding environments of industrial process applications (process temp. & pressure).



AIW-3648's antenna uses a slit-in-the-top mirror radiation technology, which obsoletes the traditional lens antenna design that is expensive in terms of cost and materials. The overall construction cost of the antenna is only 0.25USD.
And It is also built inside the housing and does not need to be exposed (the housing material is PVDF, which has excellent UV and anti-aging properties). The performance of this antenna is sufficient for the measurement of liquid/solid levels in the range of 18M. The Beam Angle is 7˚ and the Gain is 18dB.

The electronic part of the AiW-3648 is designed with a highly integrated signal processing chip, which makes the hardware circuitry simple and reliable, while also greatly reducing the cost of the product.
With just one circuit board, it fulfills all the necessary functions and performance requirements: reverse polarity protection, surge protection, overvoltage protection, current limiting and lightning protection.

AiW-3648/MB Battery/Solar energy version Benefits / Application

It's a battery powered, mobile connectivity with Bluetooth radar level product, continuous simplicity from scratch in the field of application. Our AiW-3648 radar is a smart level transmitter with high-end technology in a very cost-effective sensor.

Together with the digital services, the wireless and battery powered level sensor, ensures reliable and remote level monitoring. The secure and certified solution provides access to information on asset and inventory status from everywhere at any time.

- Conformal antenna design is easy to install, and the products are wear-free and environmentally friendly
- Shorter wavelength/better signal reflection, and small beam angle/enhanced energy concentration echo while avoiding destruction
- Smart features designed to make life easy, communicating via Bluetooth, advanced diagnostics and verification
- The diameter 60mm antenna has a larger effective area better signal reflection, which can effectively avoid the influence of condensation on measurement
- Small blind zone, especially suitable for small tanks
- High signal-to-noise ratio for high performance in unstable echo wave conditions

Battery supply characteristic

AiW-3648 built-in flame retardant explosion-proof 5.0V/12000mAH rechargeable lithium battery, executive standard: GB31241-2014, maximum charging voltage 5.5VDC.

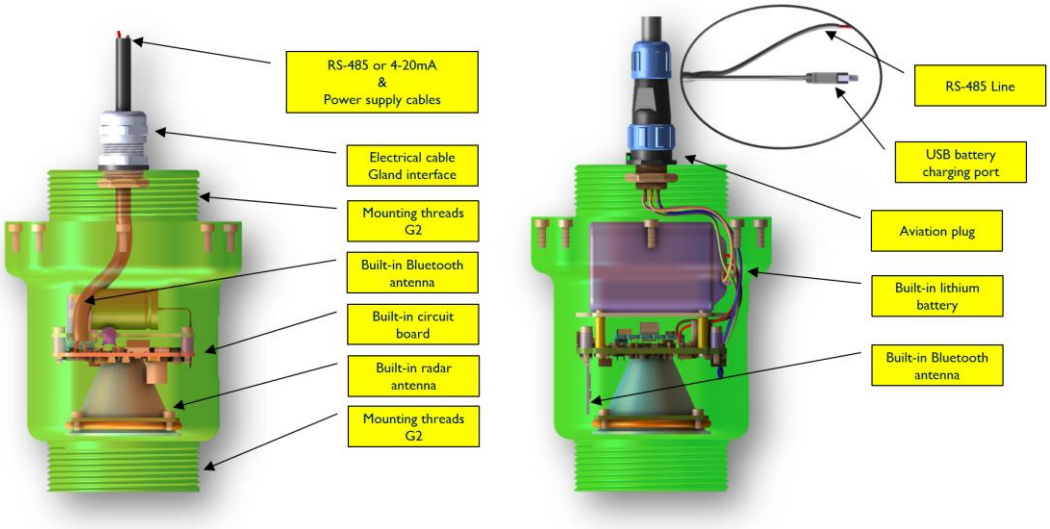
Warning: *The Lithium batteries do not support fast charging mode.*

Battery supply power operating parameters:

- Continuous Measurement running, the working time >=20 days @ 25˚C
- Measured each 1 minute, the continuous working > = 180 days @ 25˚C
- Measured each 5 minutes, the continuous operation > = 560 days @ 25˚C
- Measured each 10 minutes, the continuous working > = 1000 days @ 25˚C
- Measured each 20 minutes, the continuous working > = 1250 days @ 25˚C
- Measured each 30 minutes, the continuous working > = 1800 days @ 25˚C

NOTE:
When the operating ambient temperature is lower than -20˚C degrees, the battery efficiency decreases by 22%. When the tank-side monitor is connected to the AiW3648, the equipment automatically enters the continuous working mode.

Physical appearance & Constituent parts



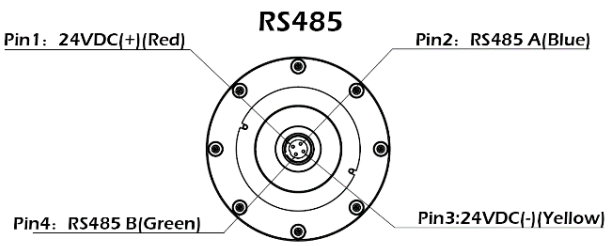
Power supply

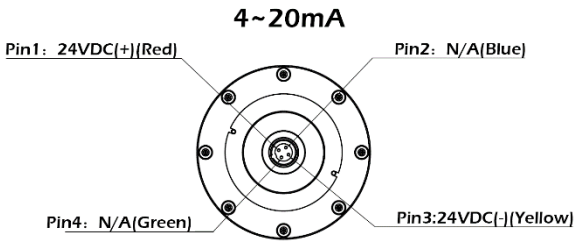
The AiW-3648 radar level transmitter operates on max. 30 Vdc transmitter terminal voltage and max. 22.5 mA.

Electrical connections

Use 24-16 AWG wire (0.20-1.5 mm2). Twisted pairs and shielded wiring are recommended for environments with high EMI (electromagnetic interference). Fine stranded conductors shall be equipped with a ferrule. One Cable/Circular Connector Φ13.8mm Specifications: (SP1312/IP68)

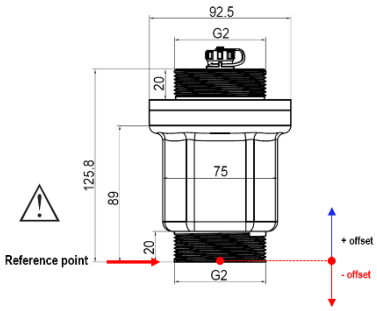
RS485/4-20mA Wiring diagram



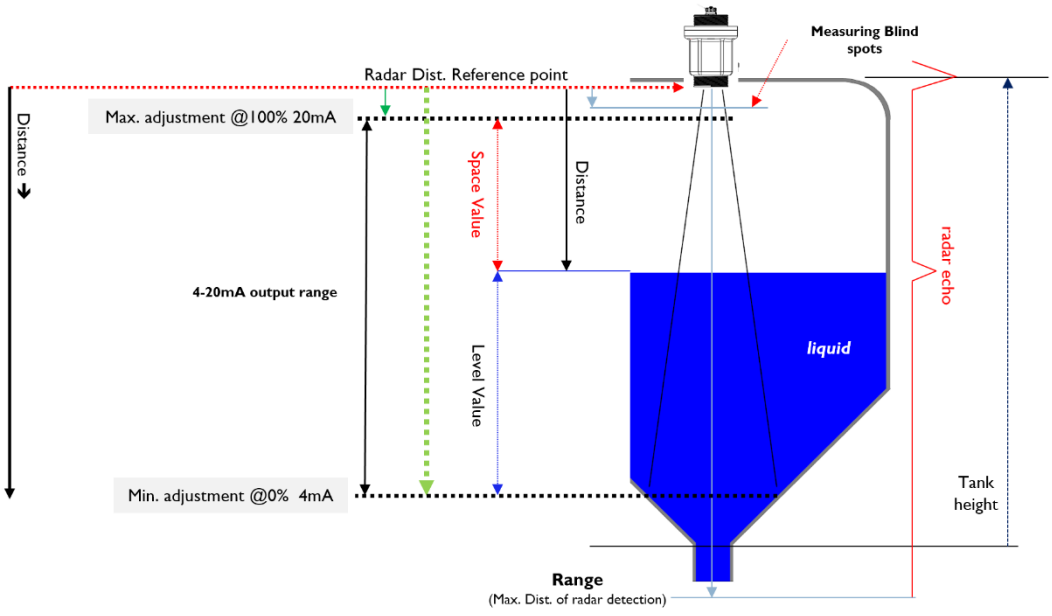


Adjust the reference point (datum) of the distance measurement

For the AiW-3648 radar level transmitter, when it is delivered from the factory, the distance reference point (datum) is set on the central lower surface of the antenna lens, which is the starting point of the distance measurement range, and at the same time, it is also the reference point for the minimum or maximum adjustment. (Min./Max. adjustment)



Measurement parameters meaning



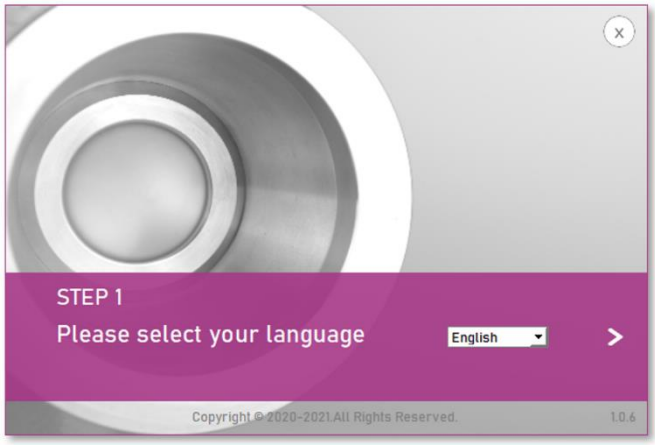
Note: The zero coordinate of the distance value displayed by the radar is at the reference point.

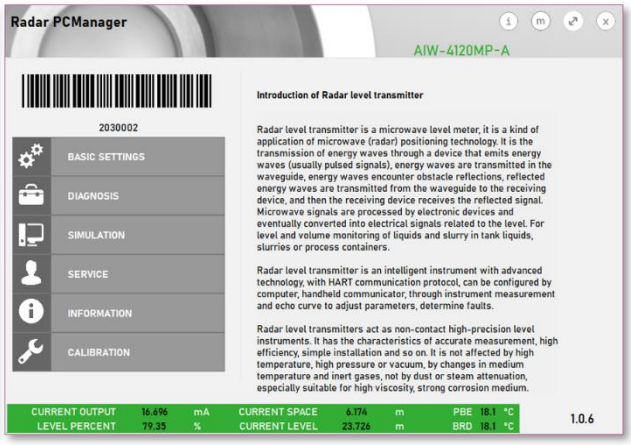
DISPLAY AND CONFIGURATION

Diagnostics tools

There are two ways to debug and configure AiW-3648 product diagnostics:
1. Wireless Mode: Connect mobile phone or iPad via Bluetooth to **CHINASIMBA® RadarMobileManager** APP.
2. Connection mode: Connect to a PC using an adapter via RS485 to **CHINASIMBA® AiW-Radar** software.

NOTE: *The content described in this document is based on the diagnostic software version:*
RadarMobileManager V1.1.9 for IOS *(*Note that different mobile OS platforms have different version numbers.)*
AiW-Radar V1.1.1



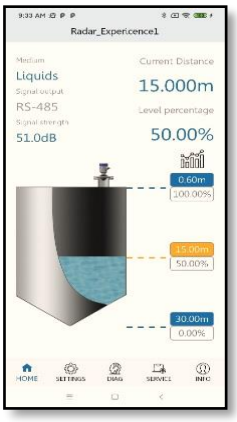


Smart Diagnostics Suite: *RadarPCManager*

CHINASIMBA® RadarPCManager is a software package for commissioning and maintaining process AiW-3648 radar level transmitters. Check https://www.chinasimba.com support page to make sure you have the latest version of **RadarPCManager** software.
How to get AiW-Radar software more information, contact the relevant product vendor.

Smart Diagnostics Suite: *RadarMobileManager*

The AiW-3648 connects with smart devices via Bluetooth. After running the RadarMobileManager APP, the smart mobile will automatically search for all radar transmitter devices in the area and will list the valid radar level transmitter devices in the area.
In the list of radar devices, you can select one AiW-3648 transmitter device that you want to connect to, the Bluetooth connection is a peer-to-peer device connection.
The **RadarMobileManager** App can be found in the App Store (**Android/IOS/HarmonyOS/WeChat**), downloading and installing. This is a free app and you can also contact the AiW-3648 radar level transmitter products vendors.



SET UP WITH THE MOBILE APP

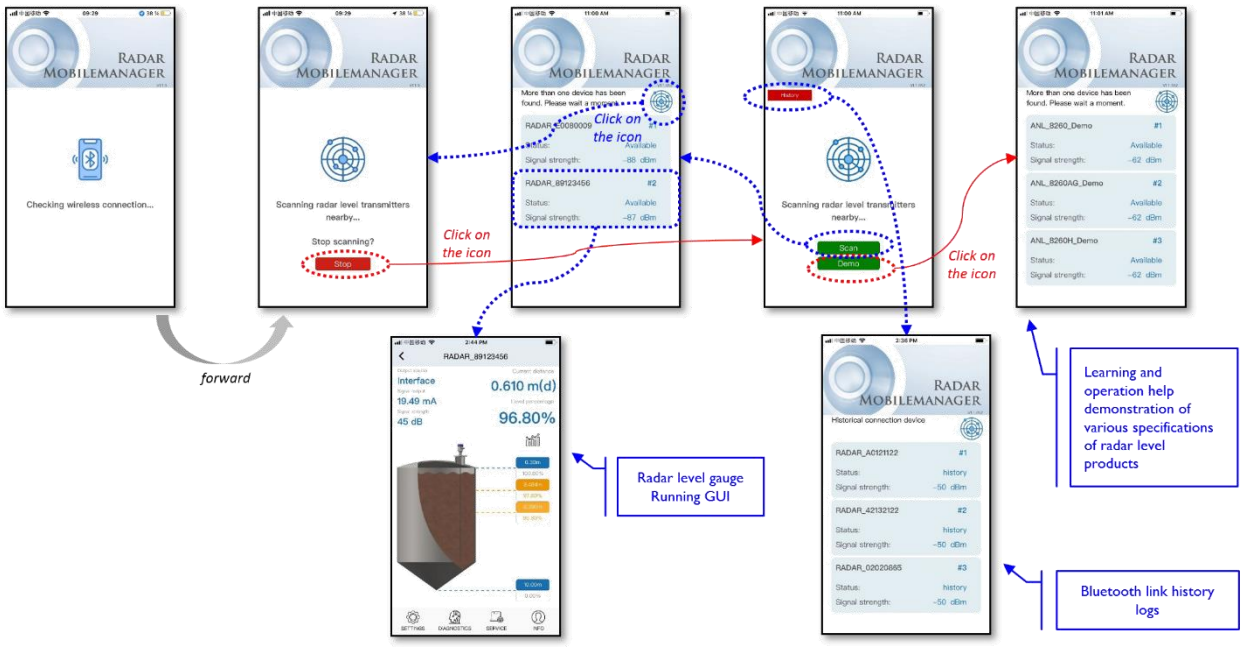
Basic GUI interface

The AiW-3648 radar level transmitters support different types of mobile phone systems (iPad, etc.), and the application software can be downloaded free of charge from the App Store on different platforms.
https://www.chinasimba.com/services/tools.html

NOTE: The first time you running the RadarMobileManager app, the mobile device and AiW-3648 radar level transmitter must be verified once. Once the first correct authentication is complete, subsequent connections will no longer require authentication queries.

Download/Setup/launch RadarMobileManager

Before launching the app on your mobile device, make sure that the Allow Location Access of your device is "**When using the App**" to turn on the setting, and the Bluetooth function is "**On**".
Between the mobile phone and the AiW-3648 radar level transmitters, they are paired one-to-one communication. When there are multiple radar level transmitter devices, they need to be connected separately one by one, first disconnect from the existing radar level transmitter to stop the Bluetooth communication with it, then choose another one to connect. (as shown in the figure below)

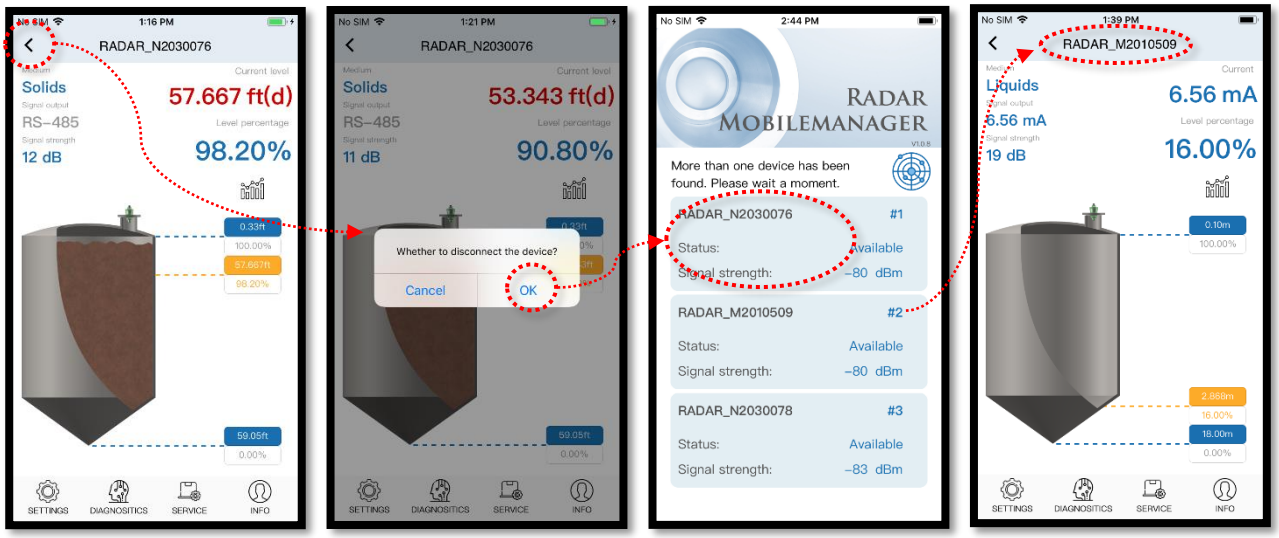


Note: *If mobile Bluetooth connection fails or the radar level transmitter device cannot be found, you can troubleshoot it by following these steps:*

- *Checking the mobile device has being Bluetooth function turned on, the radar level transmitter is powered on.*
- *Check the mobile device is discoverable with Bluetooth enabled and the location function is turned on.*
- *Check that the **RadarMobileManager** app is authenticated on the first running.*
- *If the fault is not troubleshooting to check the mobile network signal is too weak, or try to restart the mobile phone or contact the after-sales technical engineer.*

Exit the current connection to connect another radar transmitter

Click the back icon at the upper right corner of the screen to return to the device list GUI screen, then select a radar level transmitter device that you need to be connected in the device list.
For example:
As shown in the figure below, exit the **RADAR_N2030076** (device tag) connection, and then click the #2 icon to select **RADAR_M2010509** connection.

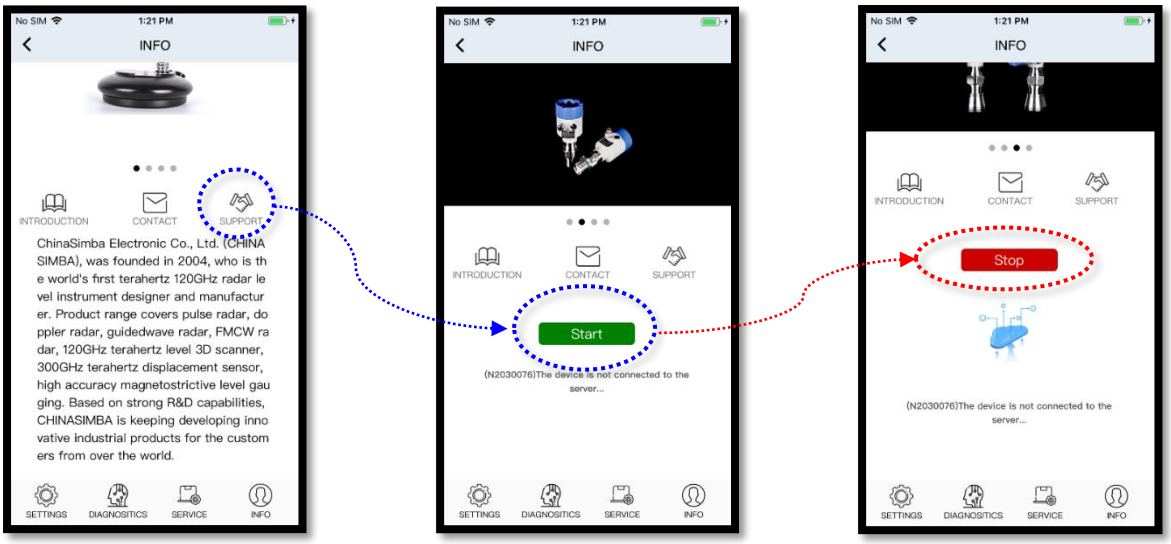


Running a remote/online/real-time technical support service

If you encounter difficulties in debugging the AiW-3648 radar level transmitter on site and want to get remote technical support from the product manufacturer immediately, you can click the remote assistance icon (as shown below) on your mobile phone to get remote online technical support. The remote support engineer will directly help you complete the real-time adjustment of the transmitter parameters through the Internet cloud service.

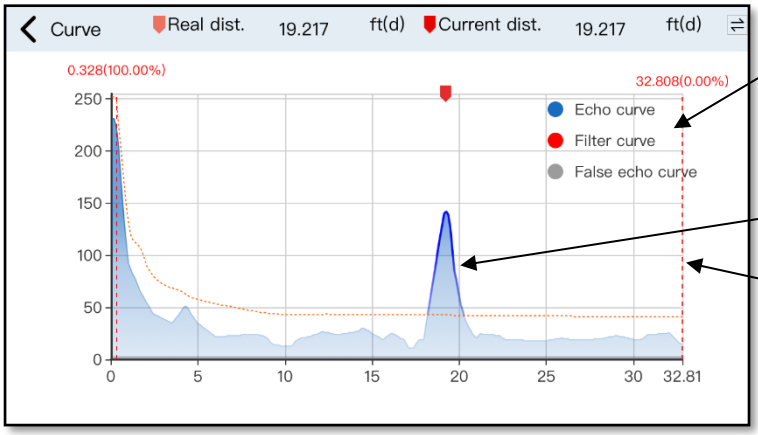
Warning: *When you click the **Support** icon, then click "**start**" icon and holding the mobile device awake, the remote online support function will be turned on. Thereafter, the radar level transmitter diagnostic commissioning will be taken over remotely by the plant support engineer. When you click the "**Stop**" icon, you can turn off remote online support at any time.*

***Note:** Before starting this service, you need to contact the manufacturer's support engineer to make an appointment.*



During this period, the remote technical support engineer takes over the control and commissioning of the radar level transmitter

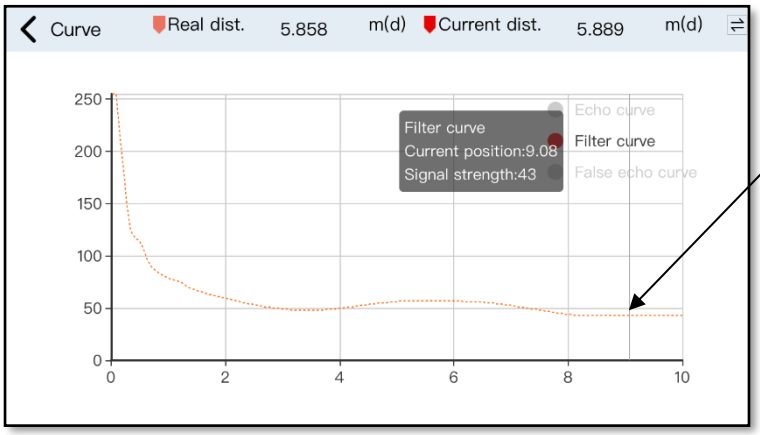
View the Echo/Filter/False signal waveform



Echo curve icon
Filtered curve icon
False echo curve icon
click the icon to off/on corresponding curve

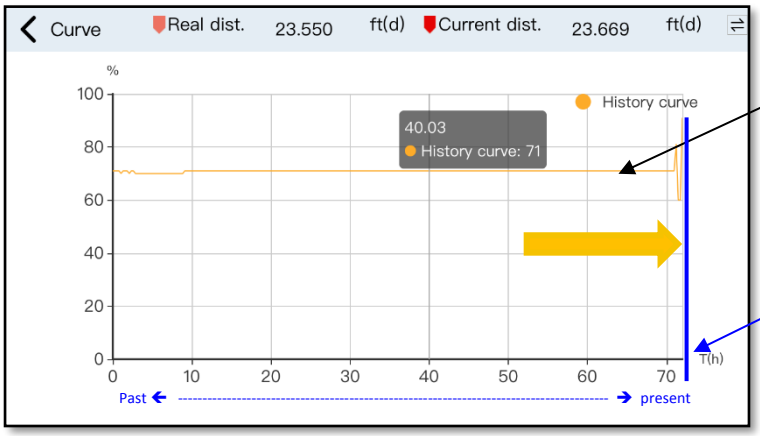
Echo signal curve

0%,100% demarcations



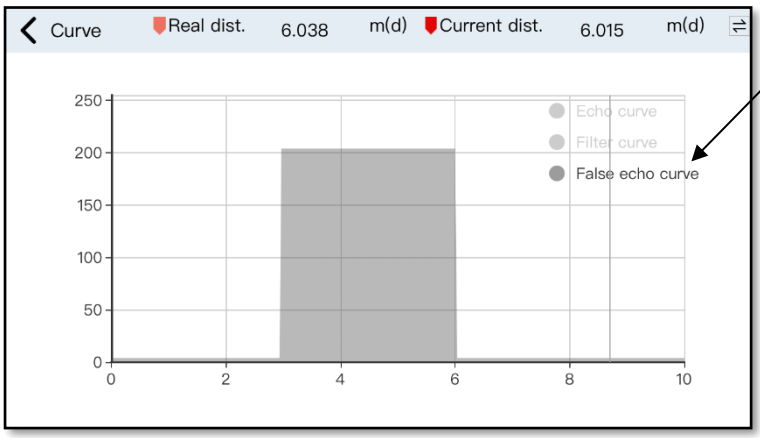
Noise filter curves

NOTE:
The filter curve shields the background noise in the echo signal, so that the radar does not identify echoes whose signal strength is lower than below the filter curve.



The Historical trend record curve, it's a radar running level (%) log, which records the trend in the past 72 hours.

The point in time



False echo rejection scope

NOTE:
Creating or plotting a false echo rejection curves, just to draw straight lines in segments.

Determine the coordinate parameters of 2 points, draw the false echo shielding interval, and then draw the next interval, and finally form the desired shielding shape.

MODBUS PROTOCOL

Version： V1.2.9

Item	LOI GUI	Base address	Registers Function	offset HEX	offset DEC	Registers	DB	Data stru.	R/W
	协议兼容 & 设备握手 The protocol is backwards compatible & Device handshake command	0x0000	Space (unit: cm)	0	0	1	2	short	R
			Space (unit: mm)	1	1	1	2	short	R
			Level (unit: cm)	2	2	1	2	short	R
			Level (unit: mm)	3	3	1	2	short	R
					25			char	
			Modbus protocol version	1A	26	5	10	char	R
			Device model Address	1F	31	1	2	char	RW
	主界面信息 Main GUI info.	0x1000	Space (m)/ft/in	0	0	2	4	float	R
			Level (m)/ft/in	2	2	2	4	float	R
			Current Level percentage	4	4	2	4	float	R
			Current current mA	6	6	2	4	float	R
					8			float	
			Echo Intensity (Measurement Reliability)	A	10	2	4	int	R
			Probe temperature	C	12	2	4	float	R
					14			float	
			SPACE (unit: cm)/ft/in	10	16	2	4	int	R
			SPACE (unit: mm)/ft/in	12	18	2	4	int	R
			LEVEL (unit: cm)/ft/in	14	20	2	4	int	R
			LEVEL (unit: mm)/ft/in	16	22	2	4	int	R
			Distance measurement (m)/ft/in	18	24	2	4	float	R
			Distance Measurement (cm)/ft/in	1A	26	2	4	int	R
			Distance measurement (mm)/ft/in	1C	28	2	4	int	R
	基本设置 Basic settings	0x2000	0% adjustment value	0	0	2	4	float	RW
			0% percentage	2	2	2	4	float	RW
			100% adjustment value	4	4	2	4	float	RW
			100% percentage	6	6	2	4	float	RW
			Damping time	8	8	2	4	int	RW
			Measuring range setting	A	10	2	4	float	RW
			Dead Zone (High Position for 8010)	C	12	2	4	float	RW
			Sensor tags	E	14	16	32	char	RW
			Material characteristics	1E	30	1	2	char	RW
			Liquid-surface fluctuations	1F	31	1	2	char	RW
			Liquid-foam	20	32	1	2	char	RW
			Solid - large stack angle	21	33	1	2	char	RW
			Solid - dust strong	22	34	1	2	char	RW
			The DK value is small	23	35	1	2	char	RW
			The shape of the material	24	36	1	2	char	RW
			Container type	25	37	1	2	char	RW
	诊断 Diagnosis	0x3000	Measure the peak-minimum SPACE value	0	0	2	4	float	R
			Measure the peak-maximum SPACE value	2	2	2	4	float	R
			Measurement Status - System Error Flag	4	4	2	4	int	R
			Simulation start/stop	6	6	1	2	char	W
			Save the simulation values	7	7	3	6	char+float	W
	服务 service	0x4000	Current output-output mode	0	0	1	2	char	RW
			Current output - failure mode	1	1	1	2	char	RW
			Current output - minimum current	2	2	1	2	char	RW
			reposition	3	3	1	2	char	RW
			unit	4	4	1	2	char	RW
			Menu language	5	5	1	2	char	RW
			Mailing address	6	6	1	2	char	RW
			Password enabled	7	7	1	2	char	RW
			password	8	8	4	8	int	RW
			Distance bias	C	12	2	4	float	RW
			Relay Settings - Relay status	E	14	1	2	char	RW
			Relay Setting - Low Closure Threshold	F	15	2	4	float	RW
			Relay Setting - High Closing Threshold	11	17	2	4	float	RW
			Relay alarm delay time, unit: s	13	19	2	4	int	RW
			False Echo - New	15	21	2	4	float	RW
			False Echo - Modified	17	23	2	4	float	RW
			False Echo - Delete	19	25	2	4	float	RW
			False echo - ed	1B	27	8	16	fl+int+fl+int	RW
			Whether the spurious echo operation is complete	23	35	1	2	char	RW
			Echo Strength - Automatic Gain Adjustment Switch	24	36	1	2	char	RW
			LCD backlight adjustment	25	37	2	4	int	RW
			Echo threshold, echo threshold	27	39	2	4	int	RW
			The current distance value of the spurious echo	29	41	2	4	float	RW

SETTINGS MENU NAVIGATION

Menu item: Level change rate (solid/liquid)

If the material in the tank is changing up and down rapidly, especially for the measurement of powders. When the emptying rate or filler speed > 10 m/min, it needs to be setting turn on. This parameter adjusts the radar device measuring speed to accommodate the rate of material change.
When the liquid inside the tank is agitated or the blades interfere with the radar beam during the filling process. It is especially important to set this parameter.

Menu item: Large angle repose (solid)

When the solid material in the tank has a large angle of inclined stack angle or concave angle during the filling process and emptying process, this parameter needs to be enabled, for example, in the measurement application of highly viscous solid/granular and stony materials.

Menu item: Agitated surface (liquid)

If the surface of the liquid material in the tank fluctuates violently, such as boiling water or turbulent current, the parameter needs to be enabled.

Menu item: Powder/Dust (solid)

If there is a large amount of dust or fugitive dust or vapor in the tank, then the parameter needs to be activated.

Menu item: Foaming surface (liquid)

If there is a thin layer of foam on the surface of the liquid in the tank, the parameter needs to be enabled.
***Note**: Thick foam layers will seriously affect the accuracy and stability of radar measurements, and the AiW-3648 product is not suitable for applications with very thick foam. For thick foam measurement applications, ANL9080 or ANL9107 series are recommended.*

Menu item: Low D_K (solid/liquid)

If the dielectric constant of the material medium is in 2.0~6.0 scope, it is defined as a low (dielectric constant) **D_K** material. **Low D_K** materials will cause the radar receiving a less reflected echo.
In this case, it needs to be enabled this parameter.

Menu item: Medium➔ Micro D_K (liquid)

If the dielectric constant of the material medium is in 1.2~1.8/<2.0 scope, it is defined as a Micro (dielectric constant) **D_K** material. **Micro D_K** materials will cause the radar barely receiving an echo, the reflected echo will be extremely weak. In this case, the radar level transmitter needs to be using a special method to measuring medium level.

NOTE:
It is important to provide accurate tank height (Empty span) and micro-dielectric constant (DK Val) values, as this will affect the accuracy of the measurement, so please provide as accurate data as possible.

Menu item: Meas. Algorithms (solid/liquid)

The Meas. algorithm selection is to guide the radar level transmitters software to identify the real echo strategy, so that it can correctly identify the real material surface echo (especially if there are many false echo waves in the tank or the secondary echo signal of the tank). For different tanks, silos, vessels and installation locations, we need to choose the right Meas. algorithm so that the radar level transmitters can complete the measurement reliably.

option	Description
Norm.	It is proposed to select the first strongest echo, when there are several strong echoes.
Small	It is proposed to choose one of the strongest and best echoes, it is located at a secondary distance. (i.e., echoes where the signal is always stable, but there is an unstable interference signal echo ahead)
Big, Big+, Big++	The echo signal is adjusted by DGC* (0/+1/++1), and then the echo with the largest and best waveform is selected. (i.e. signals with high echoic statistical energy) ** DGC: Distance gain compensation*
Frist	It is intended to choose the small echo that appears first. (i.e., echoes on top of the filter curve)
H. Amp	It is proposed to choose the most stable and reliable echo, which is highest echo peak.
x.Echo	It is proposed to choose the last echo. (It means choosing the echo that is the furthest away)

Menu item: Damping

Damping refers to the physical phenomenon in which an oscillating or vibrating system delays the dissipation of energy over time, and damping employs logarithmic attenuation to reduce signal noise. When the current input variable (echo distance) changes, the radar level transmitter output must follow the update and change accordingly. The amount of time it takes for the radar level transmitter's output to reach 63.2% of the final stable value when the input variable value is abruptly changed. (i.e. damping time)
When the radar level transmitter is operating, if it is not possible to stably capture the true echo signal and bounce back and forth, it is necessary to adjust the damping time factor (damping time), and the echo peak time is equal to half of the damping oscillation period.

Menu item: Range

The radar level transmitter has a maximum measuring range, which is the absolute range parameter of the device. In practice, it can be adjusted to the desired range according to actual needs, e.g. the range can be configured to the height range of the tank (not more than the absolute range).
Note: Range is the maximum distance from the reference point, within which any echo should be considered valid.

Menu item: Near blanking

In order to get the correct measurement result, it is necessary to set the scale range of the radar level transmitter, and when there is a fixed obstacle near the distance of the radar level transmitter surface to interfere with the measurement and the height does not reach the obstacle, the blind zone setting function can be used to avoid measurement errors.
Near blanking (dead zone): The range in front of the device (referenced from the flange down surface) within which any echoes will be ignored.

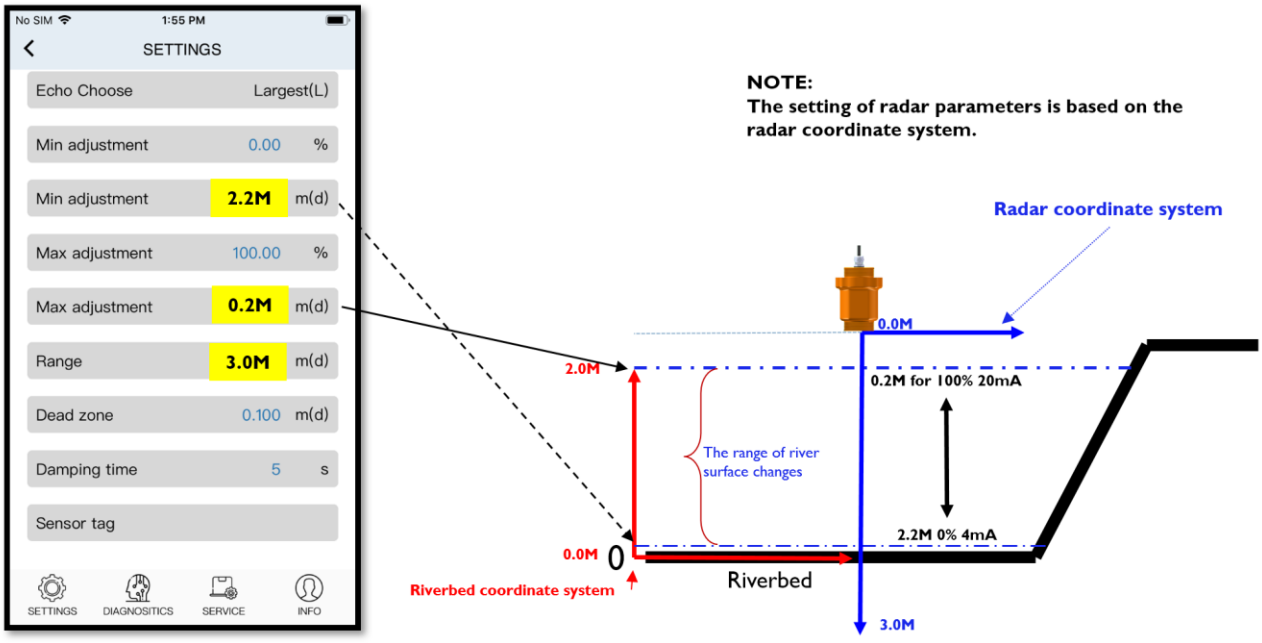
Menu item: Max./Min. adjustment

Set the effective measuring range of the radar level transmitter for level measurement. When the material level variation scope is in this range, the radar level transmitter outputs the corresponding percentage value (in the form of 4-20mA current).

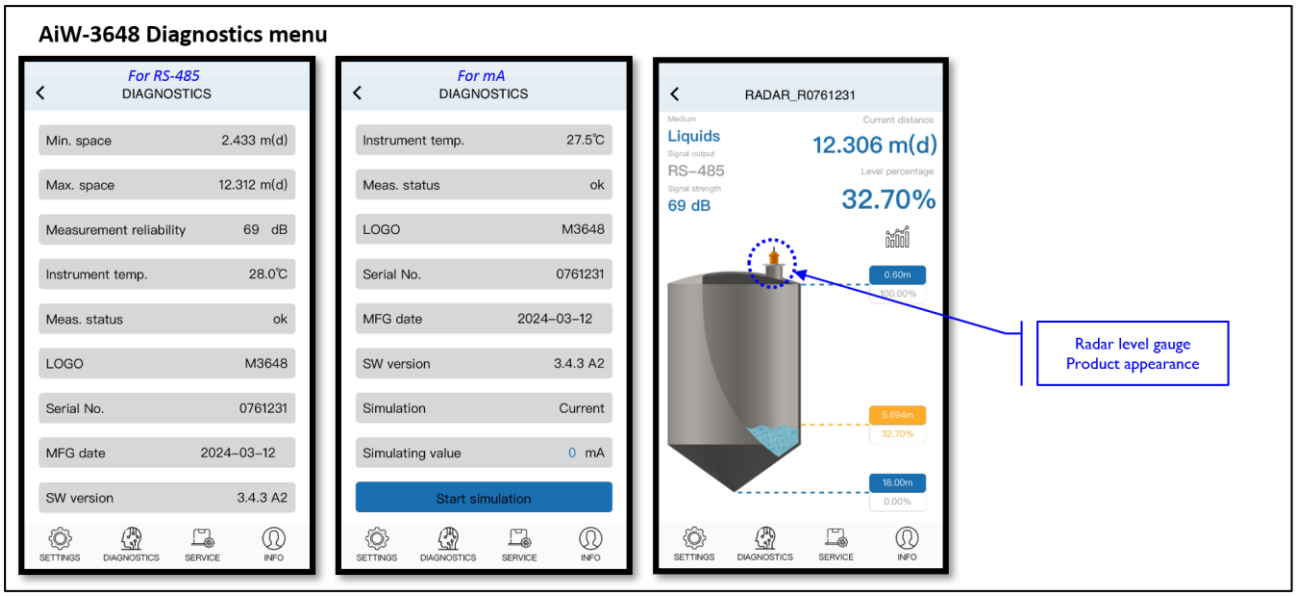
However, when the material changes beyond this range, an alarm will be triggered and an alarm current signal will be output. (20.5mA /or 22mA, etc. See Menu: Failure Modes)

The setting of Max. adjustment and Min. adjustment parameters is to determine the linear correspondence between the distance position and the percentage value, and the data of 2 points is entered to determine.

Example:



DIAGNOSTICS MENU NAVIGATION



The diagnostic menu is used to check and judge the operational health of the radar level transmitter, and the 4-20mA version also has an output current check (simulation) function.

INFO item: Max./Min. space

Logging the Max. and Min. space values of the radar level transmitter, which have occurred so far when it was turned on and running until now.

INFO item: Meas. reliability

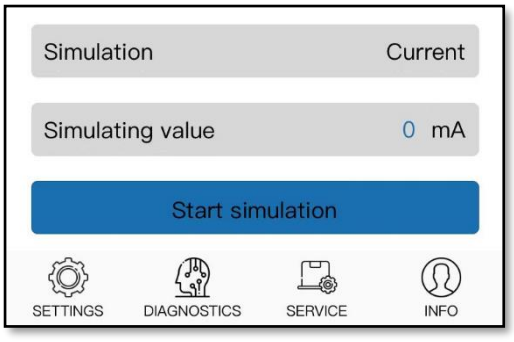
The reliability of the radar echo signal in the current running radar level transmitter. Generally, the reliability value is <10dB, which means that the echo signal is weak, between 10dB~40dB indicates that it is an acceptable echo signal, and the value >40dB (maximum: 150dB) indicates that the echo signal is very good.

INFO item: Device Temp.

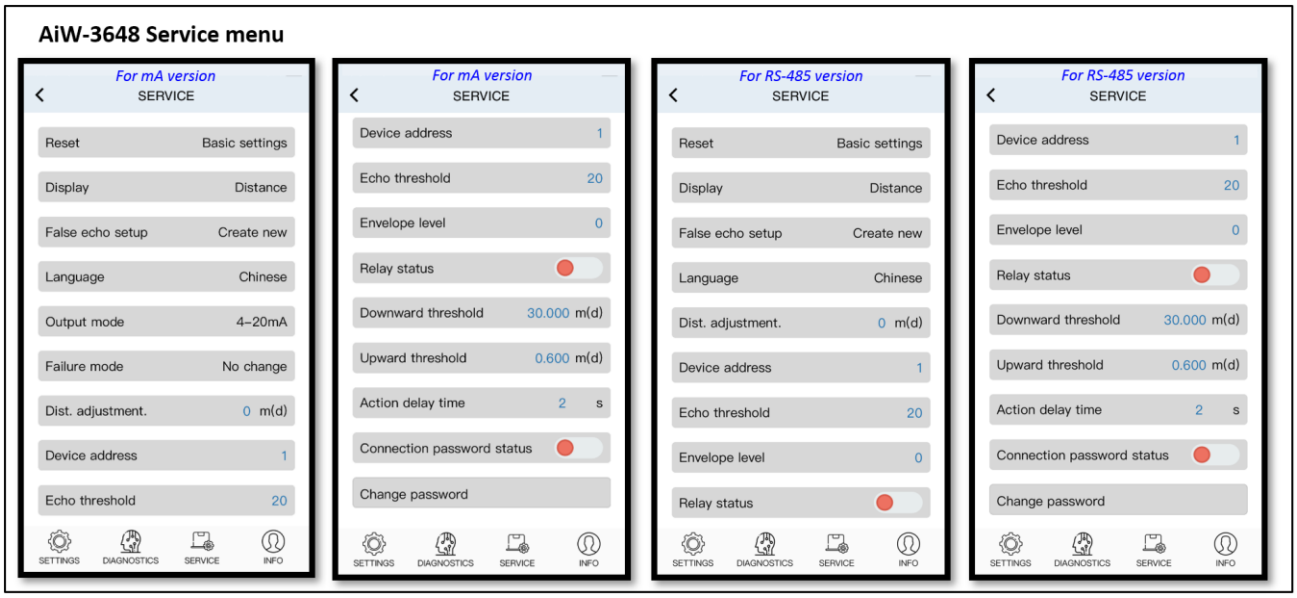
Logging the inside main circuit board and/or the microwave port current temperature of the running radar level transmitter.

INFO item: Simulating Value (for mA version)

Running the 4-20mA output current to check (simulation) function.



SERVICE MENU NAVIGATION

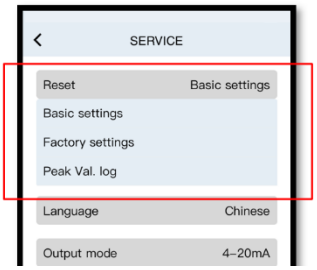


Menu item: Reset

Basic settings: Reset the parameters of the menu: Settings Menu items to the factory initial value.

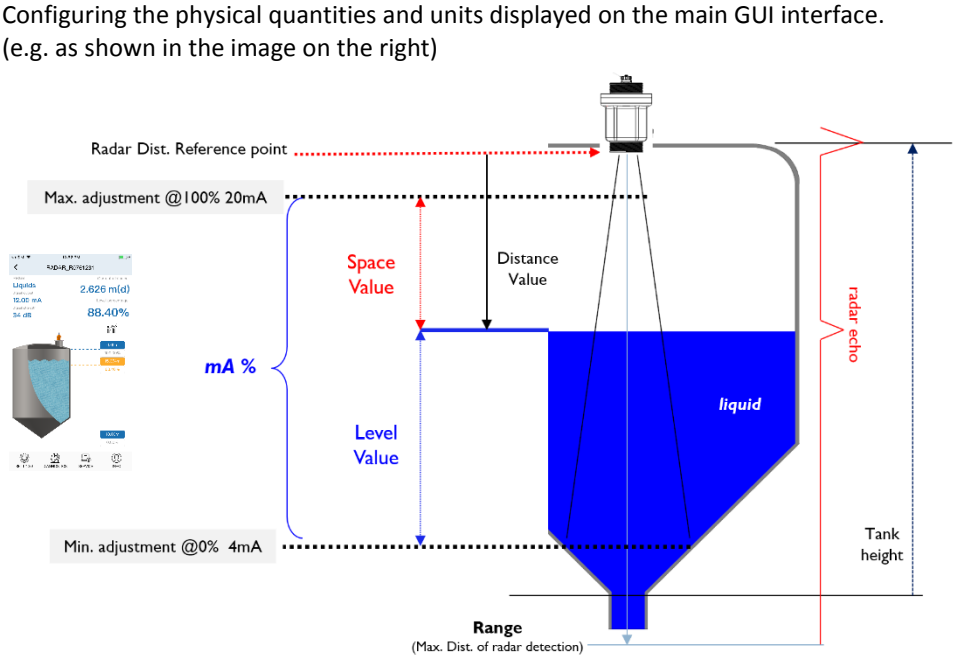
Factory settings: Reset the parameters of menu: Settings Menu & Service Menu items to the factory initial value.

Peak Val. Log: Reset the running log of Max./Min echo peak val..

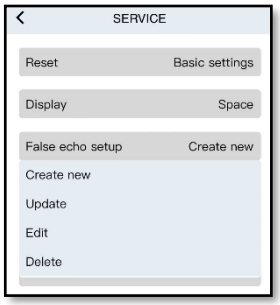


Menu item: Display

Configuring the physical quantities and units displayed on the main GUI interface. (e.g. as shown in the image on the right)



Menu item: False echo setup

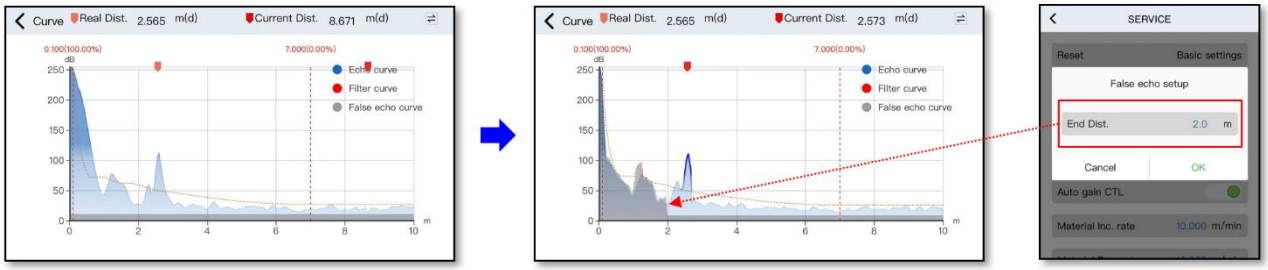


In radar level measurement applications, it is common to encounter echo reflections (known as false echoes) from structural parts in the tanks(vessels), which can interfere with radar recognizing the real echo of medium level.

In order to ensure radar level transmitter measuring correctly, it is necessary to shield and suppress some false echoes (that is, the shape and position of the false echo will be marked in the echo curve).
Item: Fake Echoes Setup including: '**Create new, Update, Edit, Delete**'.

False echo: Create new

Establish a false echo noise shielding zone from distance *0.0M* to a specified distance point, the setting is suitable for shielded multi-clutter echo noise at the near the radar antenna area.
When the setting is completed, the radar level transmitters software system will establish a shielding zone based on the noise statistics of the signal in this area. (as shown in the figure on the right)
***Example**:* Establish a [0.0...2.0m] distance zone

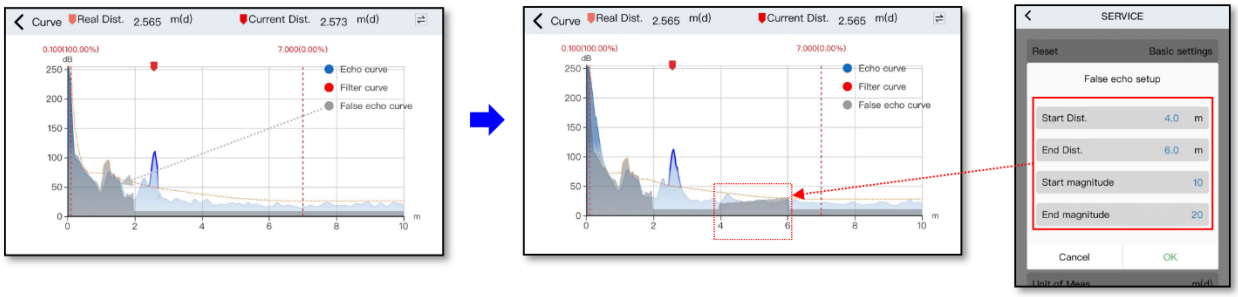


False echo: Update

Creating a newly false echo zone which from distance *0.0M* to a specified distance point too, then merge operate the previous false echo zone. (it created by the 'False echo: Create new' setup before)
When the setting is completed, the radar level transmitters software system will reconstruction a shielding zone based on the newly noise statistics of the signal in this area, then merge operate the previous false echo zone.

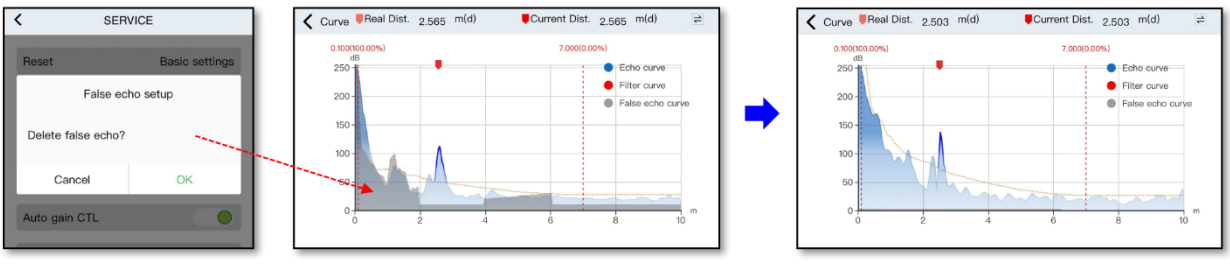
False echo: Edit

At any Distance zone [*(Start Dist., Start magnitude), (End Dist. End magnitude)*] within the radar level transmitters' range, to establishes a false echo interval. By Setting several *'Edit's*, you can define different shapes of false echo shielded shapes.
***Example**: edit a new false echo zone: {(2.0m,10dB), (6.0m, 20dB)}*



False echo: Delete

Clear all saved false echo interval in the radar level transmitters.



Menu item: Envelope level

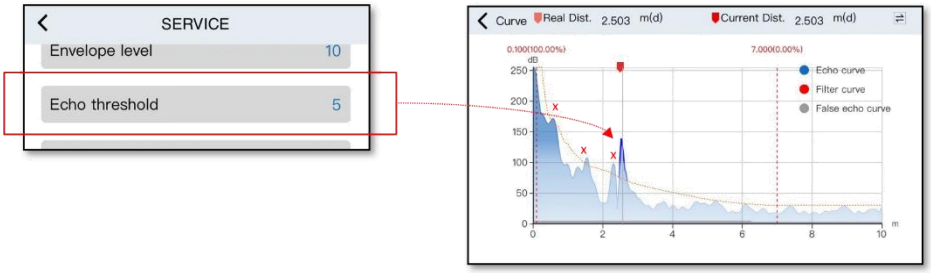
This parameter is CFAR threshold coefficient, it will adjust the position of the Filter curve line, the factory setting is 0dB (depending on the product model). If the real echo signal is too small and will be not finding this real echo when it is submerged under the Filter curve line, then the **Envelope level** parameter can be reduced to make the real echo signal visible.

Example:

Menu item: Echo threshold

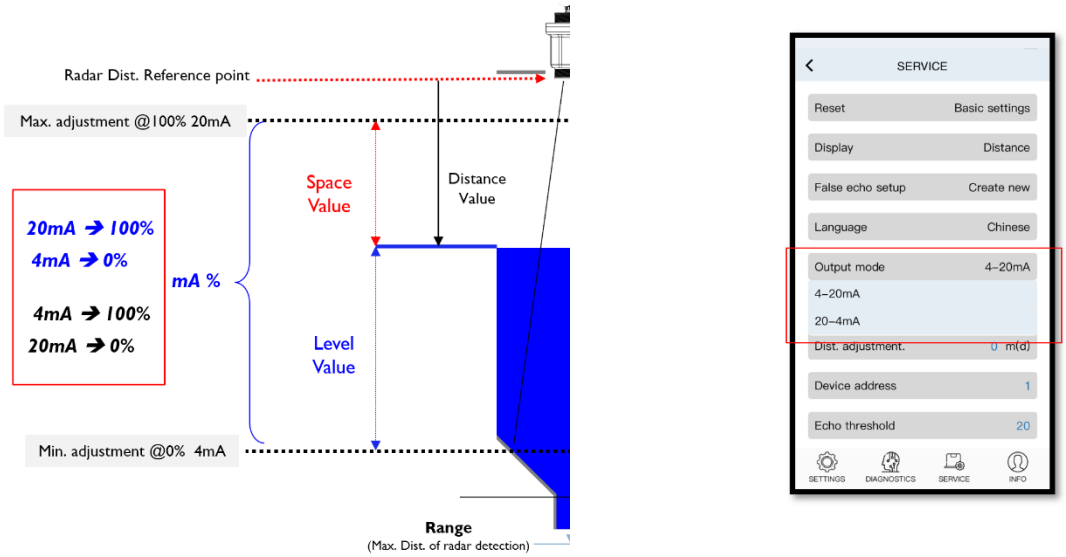
Setting Echo threshold (Scope: 0…99, Factory setting is 20dB, It is a signal-to-noise ratio weighting factor). When there are multiple strong echoes during the radar level transmitters measuring process, the radar will analyses the echo feasibility & credibility index according to the Echo threshold evaluation parameters, then determining which is the possible real reflection echoes from the medium surface, and which are the noise echoes (the peak of the echo amplitude that is less than Echo threshold x SNR) can be discarded.

(e.g. when there are secondary reflection echoes in tank etc.)



Menu item: Output mode

Setting transmitter current output 4-20mA ➔ 0~100%, or 20-4mA ➔ 0%~100%

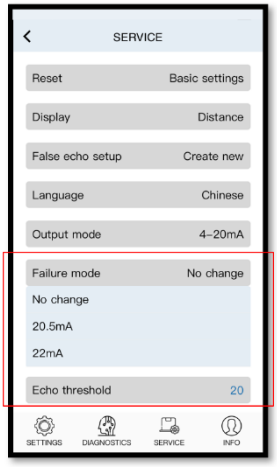


Menu item: Failure mode

When an alarm or fault state occurs in the radar level transmitter, specify an output value of the loop current.

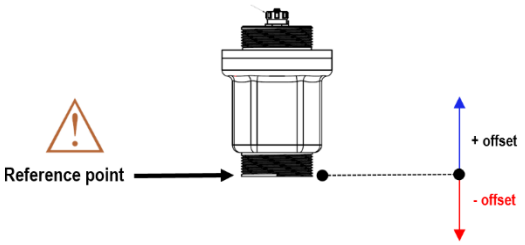
When the measured level value is out of the 0~100% range, or overflow out of bounds (@alarm state), or when the radar does not find an echo (called ***lost echo state***), the mA current output will be set by this parameter, and the radar level transmitter will output the corresponding value.
The mA current output scope: *'No change', 20.5mA, 20mA*.

'No change' indicates that the current output remains unchanged at the current value.



Menu item: Dist. Adjustment

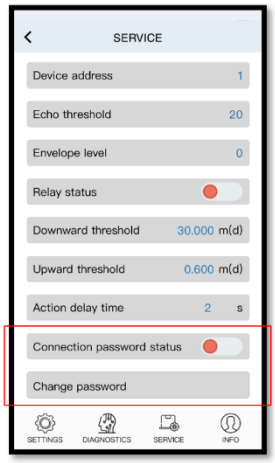
Adjust the distance reference point position.
For the AiW-3648 products, the factory setting: the reference point is set at the position of the apex of the antenna lens by default.



Menu item: Connection password

This function set a Bluetooth connection password for a radar level transmitter, and when the connection password status is turned on, the mobile device needs this password to connect to the radar level transmitters.
The initial password for the Bluetooth connection: **123456**

NOTE: *KEEP A RECORD OF THE PASSWORD. Otherwise, you will not be able to communicate with this device without entering the correct connection password next time.*



Warning:

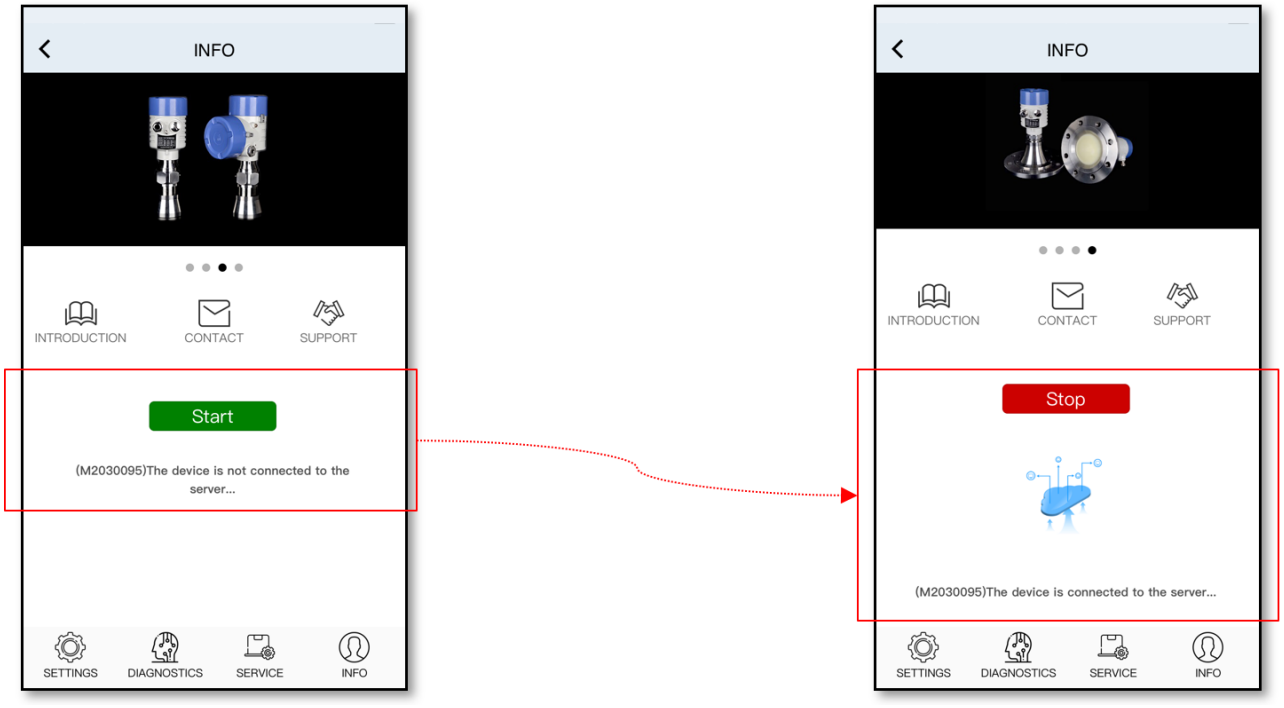
If you forget the password, you will no longer be able to connect to the radar level transmitter and you will need to contact the seller to solve the problem.

INFORMATION MENU NAVIGATION

How to turn on a remote technical service connection

In the process of commissioning the radar transmitter in the field, if the user encounters problems or difficulties that cannot be solved. The remote debugging function can be turned on, and a remote technical engineer can directly modify and debug the parameters of the equipment. If the user needs this on-site real-time technical assistance service, click the technical support icon on the right side of the screen to open the mobile network cloud service connection, and the remote technical engineer can directly debug the parameters of the field equipment.

Warning: *Before initiating this assistance, the user needs to contact the manufacturer's technical support engineer in advance to make an appointment. When remotely connecting to radar equipment, the on-site mobile phone (as a communication relay terminal) needs to remain awake from work. Once commissioning is complete, the on-site user can terminate the connection process. (as shown in the figure below)*

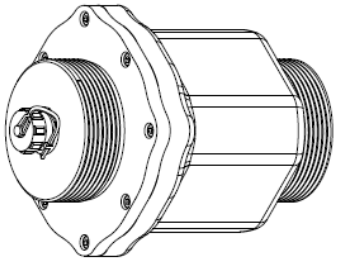


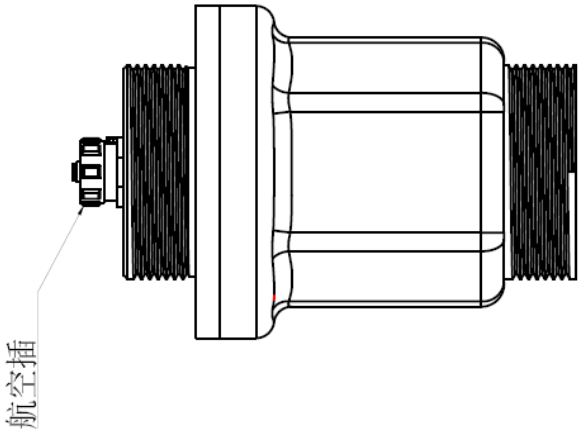
SYSTEM RUNNING FAULT CODES

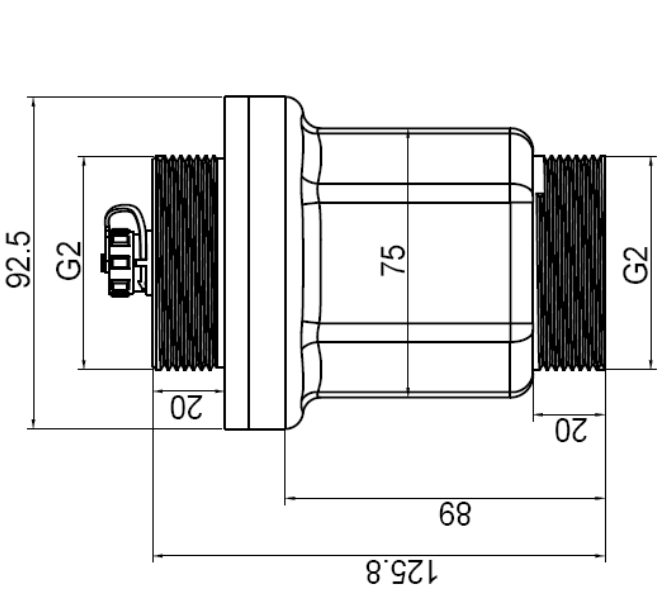
故障显示代码表 System_Running_Fault_Code Table			
NOTE: 如果同时发生多项运行故障，显示模块按故障的严重程度进行排序显示。 If multiple running faults occur at the same time, the LCD display module will sort and display according to the severity of the faults.			帮助信息 Help Information
严重故障 Critical Fault	Err15	产品硬件系统数据通信异常 The signal communication of the product hardware circuit is abnormal	设备部分功能损坏，需要联系厂家。 The function of the device is partially damaged, and the manufacturer needs to be contacted.
	Err11/Err12	产品硬件系统关键电压异常 The voltage of the key circuit in the hardware system is abnormal.	预计设备可能损坏，需要联系厂家。 It is expected that the equipment may be damaged and the manufacturer needs to be contacted.
	Err18	产品射频部件工作状态异常 The running state of the radio frequency components has a random failure phenomenon.	设备存在较严重的随机性干挠或损伤(过压/运行温度错过允许范围/雷击/强电磁干挠等)，联系技术支持人员。 There may be serious random interference or damage to the device (overvoltage / operating temperature missing the allowable range / lightning strike / strong electromagnetic interference, etc.), contact technical support engineer.
	Err25	射频传感器信号存在干挠 There is interference signal in the RF sensor signal.	设备存在干挠或系统参数错误 联系技术支持人员。 If the device is slightly dry or the system parameters are wrong, contact technical support engineer.
	Err14	雷达回波信号可靠性低于标准要求 The reliability of the radar echo signal is lower than the standard value.	设备参数设置错误，需要重新配置参数，或联系技术支持人员。 The device parameters are set incorrectly, you need to reconfigure the parameters, or contact technical support engineer.
	Err17	运行日志数据读写校验错误 Running log data read/write checksum error.	设备运行存在干挠引发错误，运行数据保存部分丢失，联系技术支持人员。 There is an error caused by interference during the operation of the equipment, and the saved part of the operation data is lost. Contact the technical support engineer.
	Err16	产品内部电路板温度值超出范围 The temperature value of the internal circuit board of the product is out of range.	设备温度超出许可范围，检查运行环境温度是否超出允许范围。 The device temperature is out of the allowable range, check whether the operating ambient temperature is out of the allowable range.
轻微故障 Minor Fault	Err13	HART/RS485/BT/Lora 通信协议出现随机错误 Random errors with HART/RS485/BT/Lora communication protocol	设备与外部的通讯数据发生错误，可能由通讯线路引起或连接线脱落故障。 There is an error in the communication data between the device and the outside, which may be caused by the communication line or the connection line is disconnected.
	Err22	系统数据密钥读写异常 System_Data_Encryption_Key read/write exception.	系统数据保护密码丢失，联系技术支持人员。 If the system data protection password is lost, contact the technical support engineer.
	Err23	软件固件数据读保护错误 Software firmware data read protection failed	系统软件代码固件被篡改，联系技术支持人员。 System software code firmware has been tampered with, contact technical support.
	Err24	显示模块数据通信错误 Display module data communication error	显示器部件存在故障，联系技术支持人员。 Faulty display unit, contact technical support.

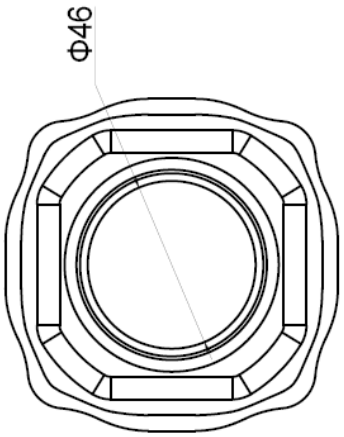
DIMENSIONAL DRAWINGS

AIW-3648









ORDERING INFORMATION

The ordering code contains detailed information about the specifications of each AiW-3648 radar level transmitter products.
Note that the annual subscription code is subject to change, please contact your regional sales representative to confirm.

https://chinasimba.com/

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