A76-100\A76-250\ASUF105 Ultrasonic Fuel Level Sensor User Guide

Change History

File Name	MEITRACK Ultrasonic Fuel Level Sensor User Guide		
Project		Creation Date Update Date	2016-03-31 2024-11-15
Subproject	Accessory User Guide	Total Pages	18
Version	V2.3	Confidential	External Documentation

Copyright and Disclaimer

The user manual may be changed without notice.

Without prior written consent of Meitrack Group, this user manual, or any part thereof, may not be reproduced for any purpose whatsoever, or transmitted in any form, either electronically or mechanically, including photocopying and recording.

Meitrack Group shall not be liable for direct, indirect, special, incidental, or consequential damages (including but not limited to economic losses, personal injuries, and loss of assets and property) caused by the use, inability, or illegality to use the product or documentation.

Document update record

Version	date	modification
2.3	2024-11-15	Add notes for finding the installation location through the APP

Contents

1 Product Functions and Specifications

1.1 Product Functions

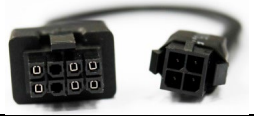
- Measure vehicle's fuel level.
- Detect an alarm when the fuel level is too high.
- Detect an alarm when the fuel level is too low.
- Detect a fuel filling alarm and a fuel theft alarm.

1.2 Specifications

Item	Specifications	
Operating voltage	9–36 V DC	
Maximum power consumption	0.36 W/12 V DC	
Operating temperature	-30°C to 80°C	
Storage temperature	-40°C to 85°C	
Operating humidity	5%–90%	
Measurement range （(for 5mm thick steel plate, in three models)	**A76-100**	Measurement range is 6~100cm
	A76-250	Measurement range is 6~250cm
	ASUF105	Measurement range is 6~400cm
Pressure range	≤0.8 kg or 0.8 MPa	
Measurement accuracy	±0.5%	
Measurement resolution	0.1 mm	
Explosion proof rating	Intrinsic Safety Exia Ⅱ CT6; flameproof Exd Ⅱ CT5	
Water resistance rating	IP67	
Interface	A76-100 and A76-250 only support RS232; ASUF105 supports RS232+AD;	
Communication port parameters	Baud rate 115200 by default; no parity bit; 8 data bits; 1 stop bit; no flow control	

2 Accessories

Standard accessories:

Standard Accessories	Quantity	Picture
Probe (integrated type)	1 pcs	 Diameter: ϕ33 mm Height: 12 mm Wire length: 1m (including the connector)
Protective holder and ring gasket	1 pcs	
Fuse	1 pcs	
8m extension cable	1 pcs	 Wire length: 8m (including the connector)
8 pin to 4 pin conversion cable	1 pcs	
rubber pad and 2.5m length steel clamp (Quantity is selected according to installation requirements)		 
Sandpaper	1 pcs	Used to clean the bottom of the fuel tank.

Note: There are two ways to fix the sensor probe, 1. ring gasket + steel clamp, 2. strong magnetic holder + AB glue. the standard for A76-100 and A76-250 is the first one, ASUF105 is the second one. If you choose A76 for fuel tanker, it is recommended to use the second one, please consult the sales for such case.

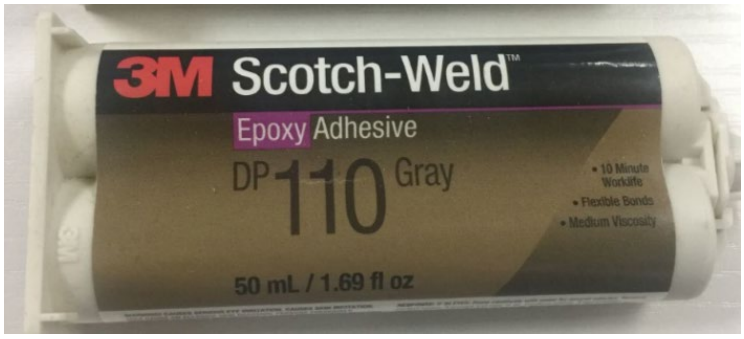
Optional accessories:

Optional Accessories	Picture
AB glue (unable to go through logistics, so cannot provide. Only for reference)	
Couplant (unable to go through logistics, so cannot provide. Only for reference)	

WiFI tool	

Note:

1. Because Couplant and AB glue are liquids, they cannot be transported by logistics.Please buy by yourself.
2. Couplant for medical use can be purchased at large pharmacies. If you can't get it, use toothpaste instead.
3. AB glue is available on websites such as amazon. The model is 3M DP110. As the following picture:



3 Installation

3.1 WiFi tool (Optional Accessory)

This WiFI tool is used to find the probe installation location, need to bring your own power bank for power supply.

3.2 Installing the Sensor

1. Important note: Prior to the installation, keep the fuel tank at least half full and park the vehicle on level ground.
2. Knock the fuel tank to determine the fuel level.

When there is fuel in the fuel tank, you can hear a muffled sound.

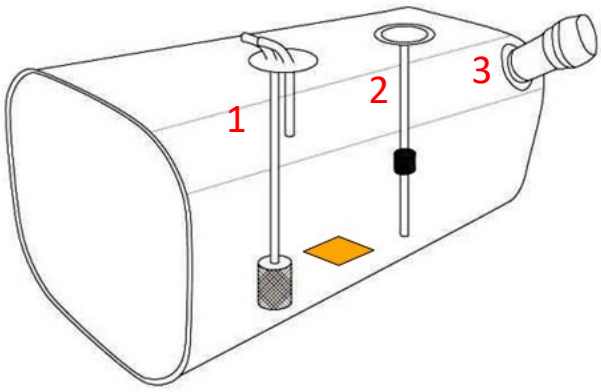
When there is no fuel in the fuel tank, it sounds clear.

At the meantime, you can open the fuel tank and check the fuel level.

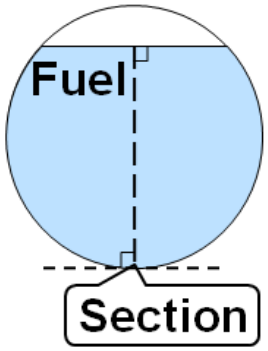
You can use any of the preceding ways to determine whether the fuel tank is half full and estimate the fuel level.

3. Know more information about probe installation.

When sticking the probe, keep it away from the fuel inlet and float. As shown in the following figure, the yellow area is suitable to install the probe.



If the fuel tank is cylindrical, choose the area that is closest to the ground such as the section shown in the following figure.



Clean up the dirt and oil stain in the probe installation area, and keep the area dry.

4. Configure the WiFi tool

1) Connect the sensor with WiFI tool first;

2) Connect the WiFi tool to power bank and power on.Once conncted,the red indicator light is on.

3) Turn on the list of available wireless networks on your mobile phone, select the network which start with USR-WIFI and click connect. Once connected, the green indicator light is on.

4) Please scan the QR code with Android phone, download and install the APP.

A76	ASUF
A76-100\A76-250	ASUF105

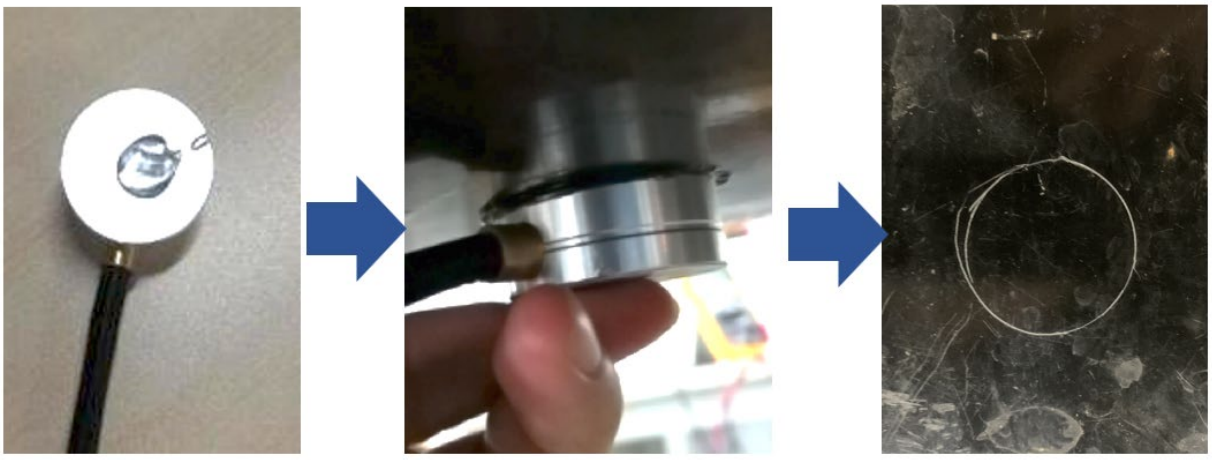
Note: The WiFi tool is only used to locate the installation position and can be reused.

5. Locate the installation position

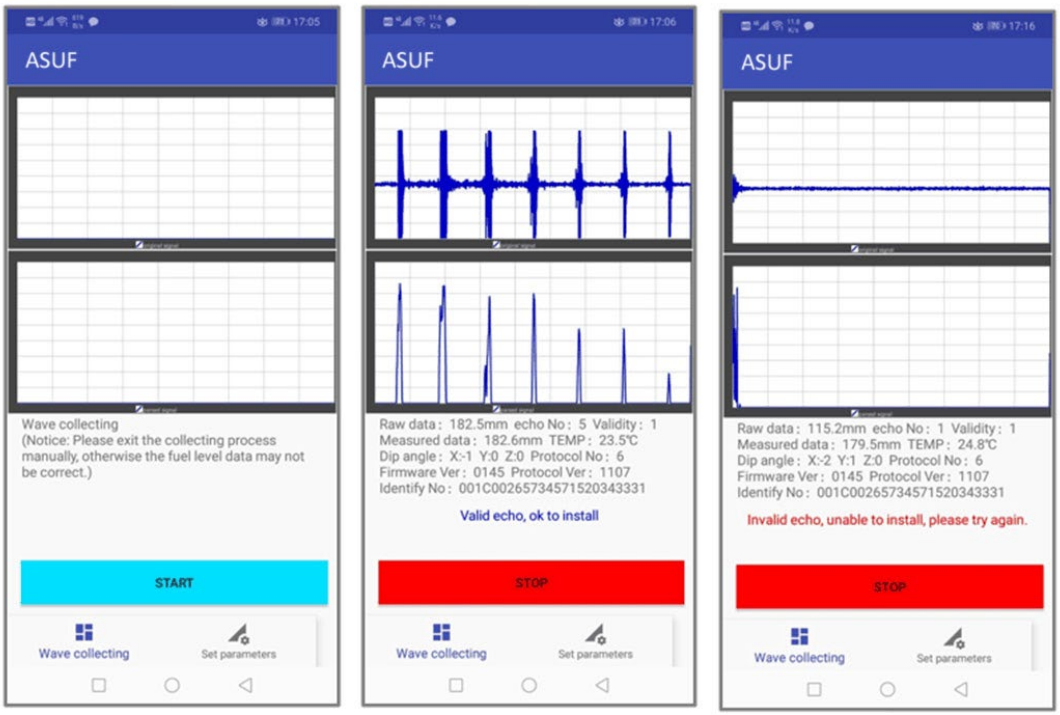
Clean up the couplant on the fuel tank and probe and keep the probe installation location dry. If the bottom of the fuel tank is covered with paint, use the putty knife or screwdriver to scrape paint. Then use the sandpaper to polish the installation location until the tank metal is exposed.

Put the couplant (pea size) on the surface of the senor (the side without the label).

Hold the sensor on the installation area, check the result on your phone. If the result is ok, make a circle mark with the screwdriver. If not, try another position.



WiFi Tool-APP results



Initial interface　　OK to install　　Invalid value

Note: The sensor's sensitivity is high. Hold the probe steady because shaking will make data unstable. If an angle alarm is generated, park the vehicle on level ground before installing the probe.

6. Install the sensor

After locate the installation position, please clear the testing couplant on the surface of fuel tank and sensor completely.

1) Install the A76-100 or A76-250

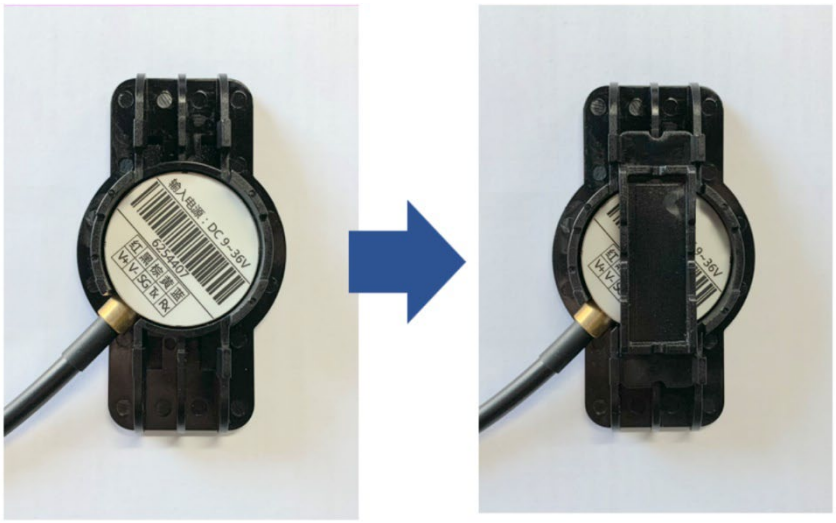
Install the protective holder:

Please make sure the center of the holder matches the marked round installation position, also the holder should be parallel to the vehicle frame (chassis).

Fix the probe

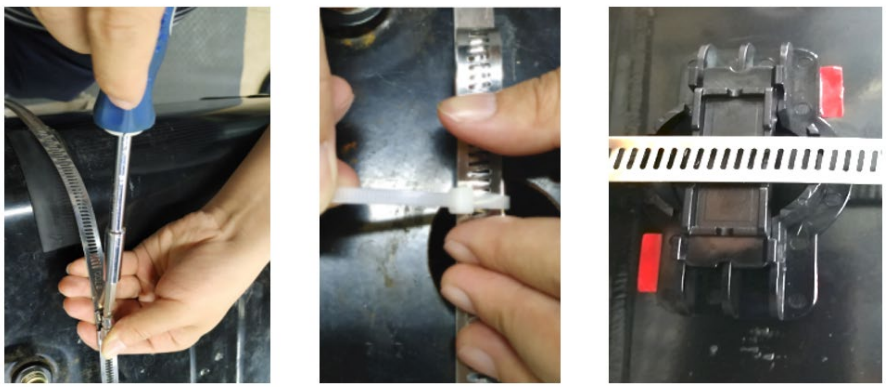
Put the ring gasket on the surface of the sensor, then fill the measuring area with grease, make it a bit higher than the ring gasket. There must be no air bubbles or dust or sand inside the grease. (If you don't have grease, please use toothpaste instead.)

Insert the sensor into the holder and install the cover plate.



install the steel clamp

- Stick the rubber pad on the four corners of tank;
- Fasten the steel clamp;
- Fasten the joint of the clamp with a cable tie;
- Check the installation status on the APP.



2) Install the ASUF-104

The previous steps are the same, fixing the probe need to use AB glue.apply the AB glue to the probe and holder, and evenly stir it(No need to place the gasket).

After the glue is stirred evenly, we will not see hot or green color.

Stick the probe on the marked location and check the app result is ok or invalid. If no, move the probe slowly within 2–3 mm and find the right installation location.

If the ambient temperature is 25°C, move the probe for 30 seconds after sticking the probe. In this way, if the result is unable to install, remove the probe, clean up all AB glue, and apply glue to the probe surface again. Because the AB glue does not work at this moment.

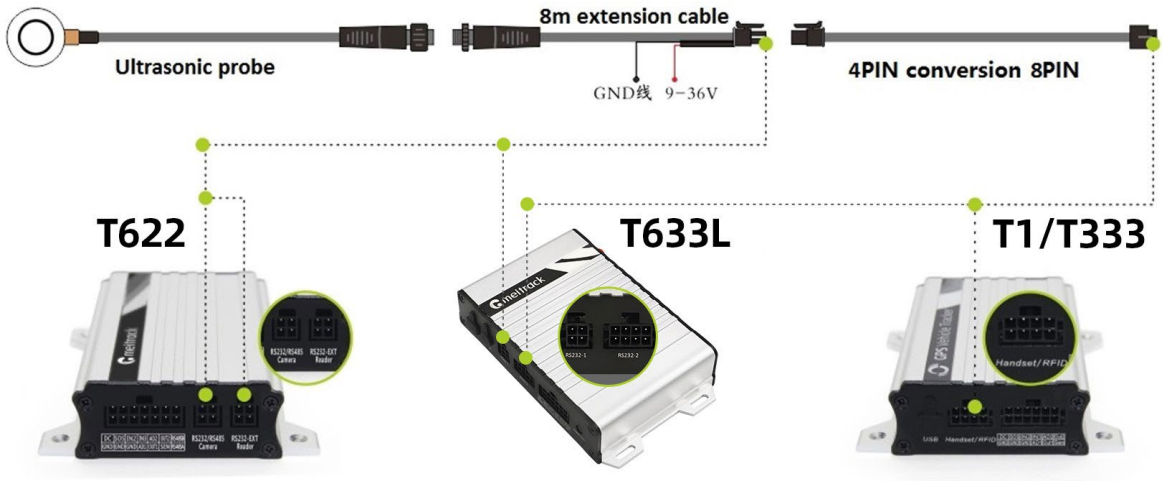
If the result is **ok to install**, hold the probe for 5–15 minutes until the glue is solidified. While pressing, ensure that the status code is always **ok to install**.

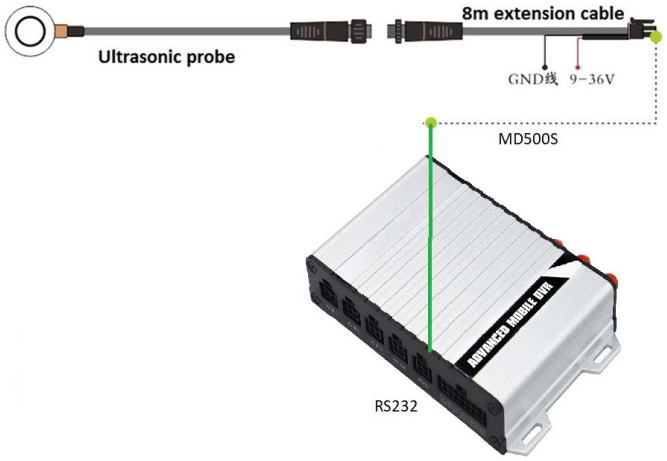
Note:

4. When the ambient temperature is 25°C, you are advised to finish the stir within 20 seconds.
5. When the ambient temperature is more than 30°C, finish the stir as soon as possible. Because the higher the temperature is, the shorter the solidification time is.
6. When the ambient temperature is less than 0°C, you are advised to heat the probe (at around 20°C) before applying AB glue to it.

3.3 Installing the Tracker

1) Using RS232 standard interface. The device wiring diagram is as follows:





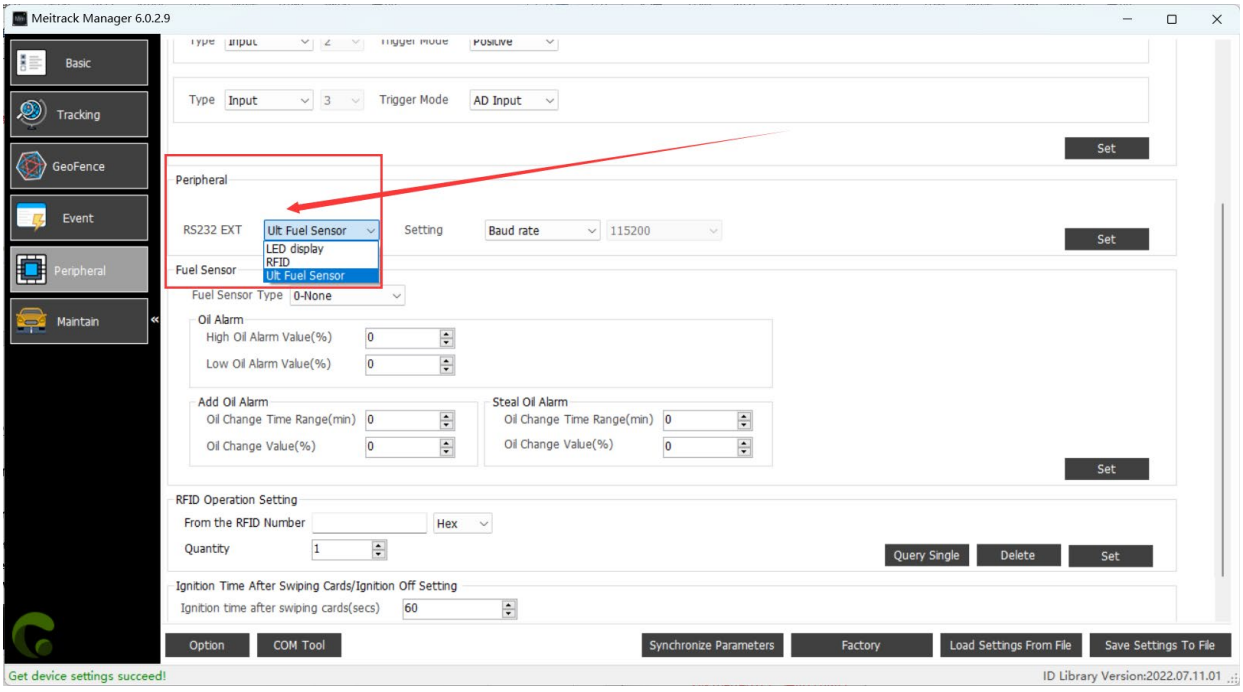
Note:

1. Both RS232 ports of T633L support the connection of ultrasonic fuel sensor, RS232-1 can be connected directly, RS232-2 needs to be connected with 4pin conversion 8pin cable.

2. T366 series and T399 series do not have 4pin RS232 interface, connecting sensor need to cut open the 4pin end of the extension cable for the following connection.

T366/T399 cables	Extension cables
Red(connect to external power supply)	Red （9~36VDC）
Black GND	Black
Purple （RS232-TX）	Blue （RS232-RX）
Brown （RS232-RX）	Yellow （RS232-TX）

3. Whether the device supports ultrasonic fuel sensor and which ports support it,you can open the accessory interface of Meitrack Manager, check the peripheral type setting, if there is an ultrasonic fuel sensor option, it means it is supported.



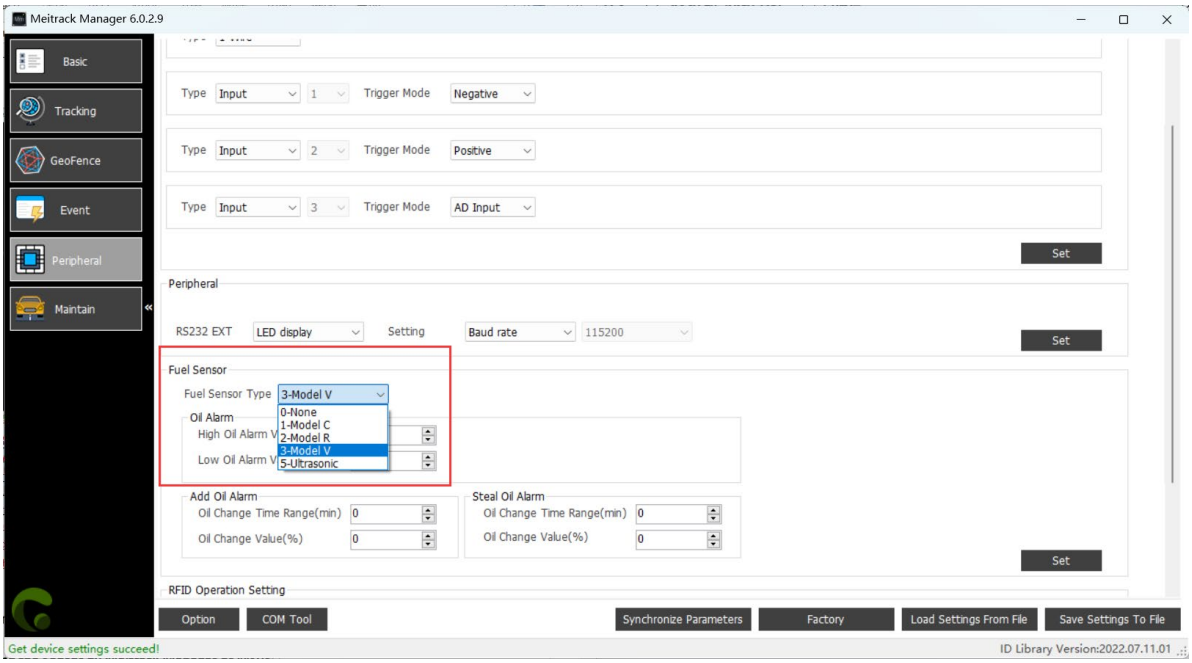
2) Connecting with AD input , connection as below.

Devoce I/O cables	Extention cables
Red(external power supply)	Red （9~36VDC）
Black GND	Black

AD input cable	Green （AD 0~5V）

Note: 1. The color of the AD input cable varies from model to model, please refer to the user manual of the corresponding model for details.

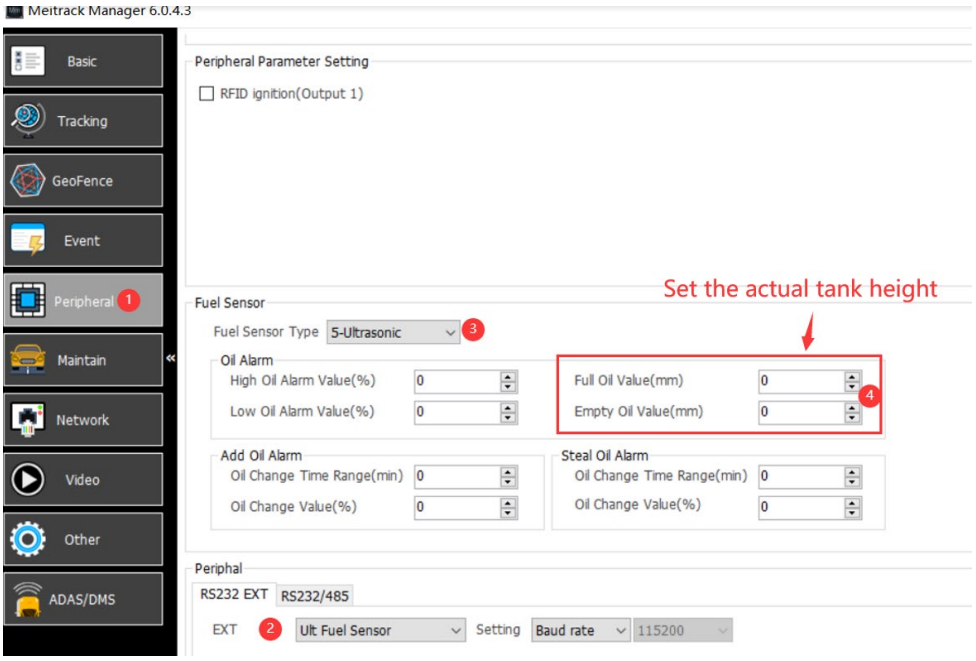
2. When connecting with the AD input, you need to change the fuel sensor type to V-type in Meitrack Manager.



4 Configuring the Sensor

4.1 Configuring the Sensor by Meitrack Manager or MS03

1. Turn on the tracker, connect it to a computer, and run Meitrack Manager. On the **Device** tab page, locate **Oil sensor setting**, set **Use model** to **5-Ultrasonic**, and set other parameters as required, as shown in the following figure. Click **Set** to save the configuration.



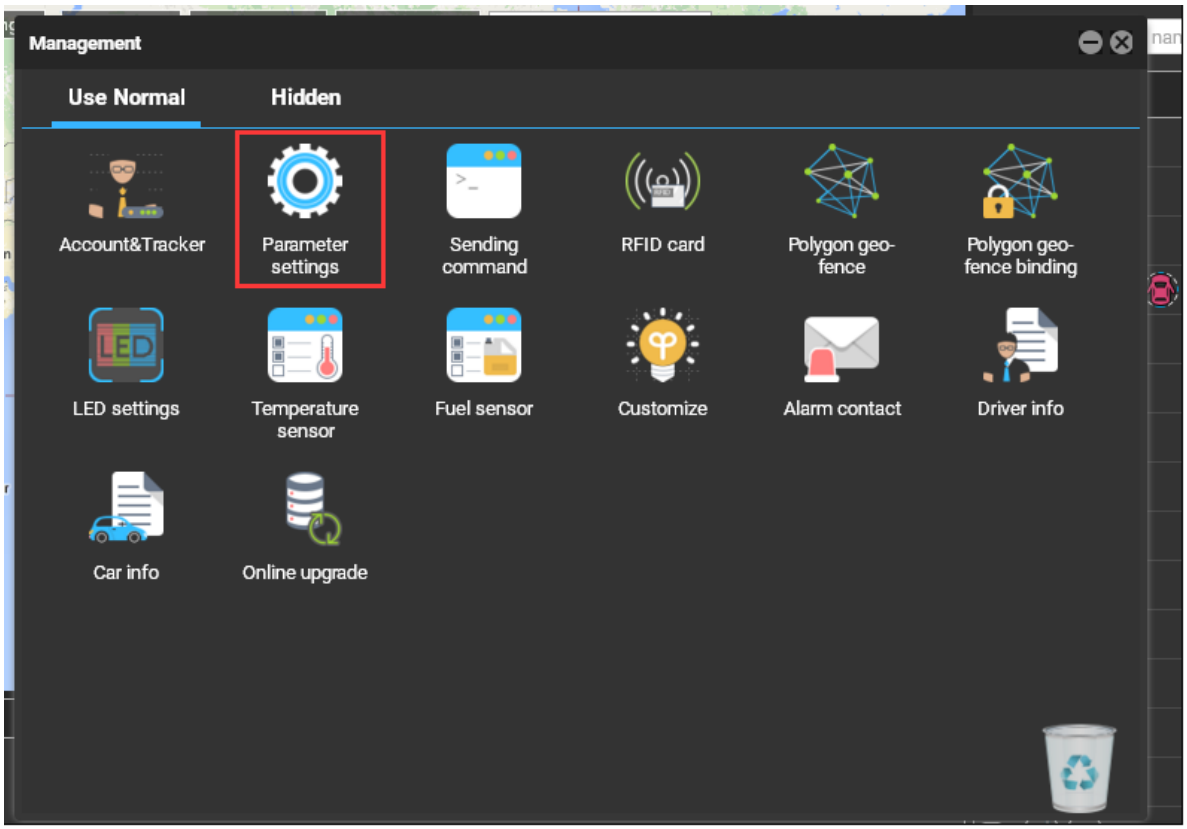
Note:

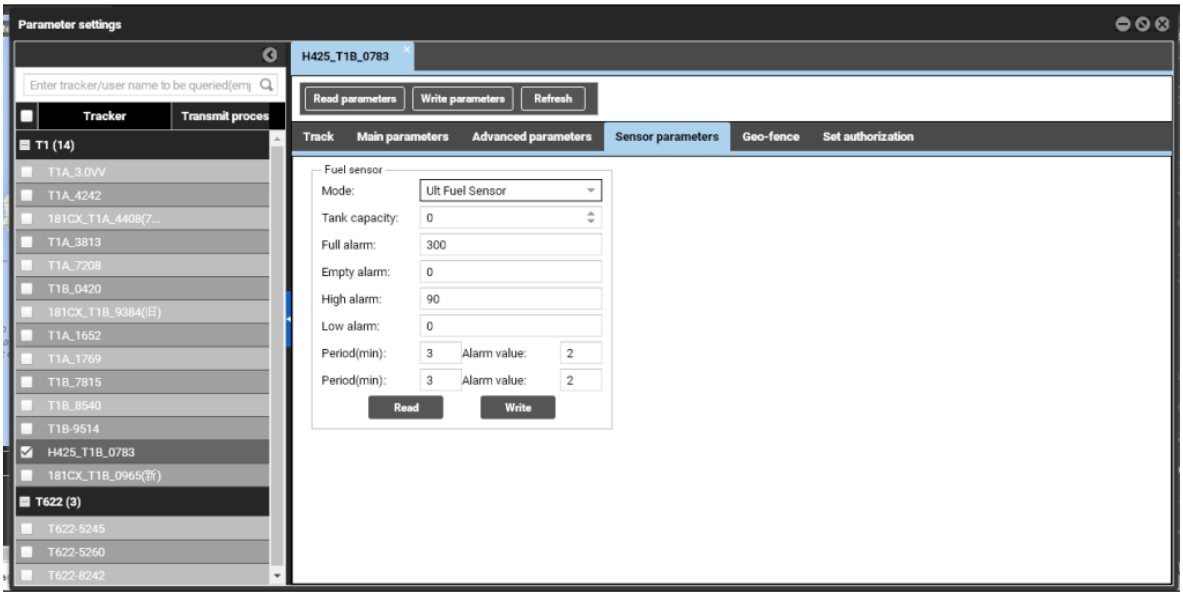
1) When connecting with RS232 port, the full oil value must be set according to the actual tank height , otherwise the oil percentage will not be displayed properly, and the empty oil value set to 0

2) When connecting with AD input, instead of setting full oil value in Meitrack Manager, you need to set the tank height in WiFi installation tool as shown below. the voltage value of AD port is 0~5V, the set tank height corresponds to the maximum voltage value 5V as the full fuel voltage value, default is the maximum range of sensor.

2. You can also set the sensor by MS03 tracking system. Please ensure that the tracker is online.

On MS03, choose **Management**. On the **Management** window, select **Parameter settings** from **Use Normal**. On the page that is displayed, select a tracker in the left navigation pane, click **Sensor parameters**, and then set related parameters.

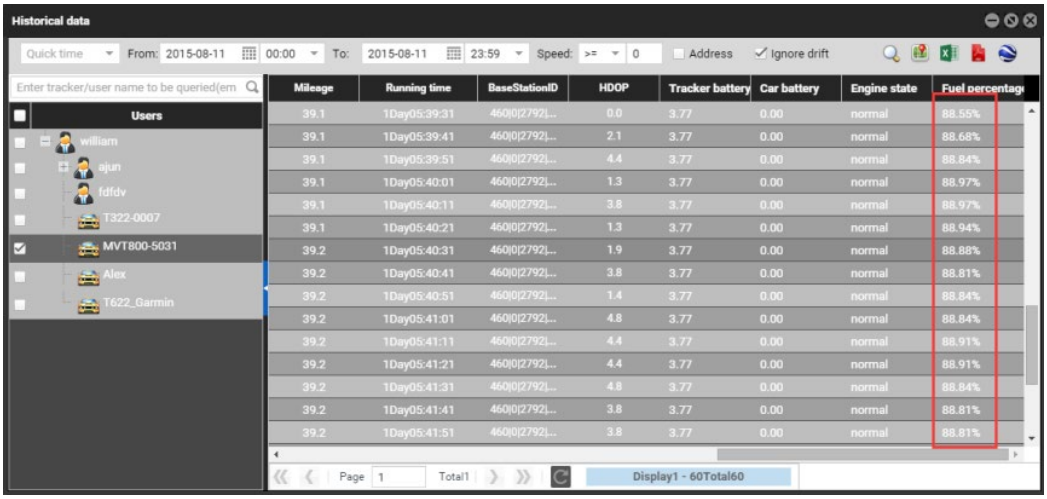




5 Querying Reports

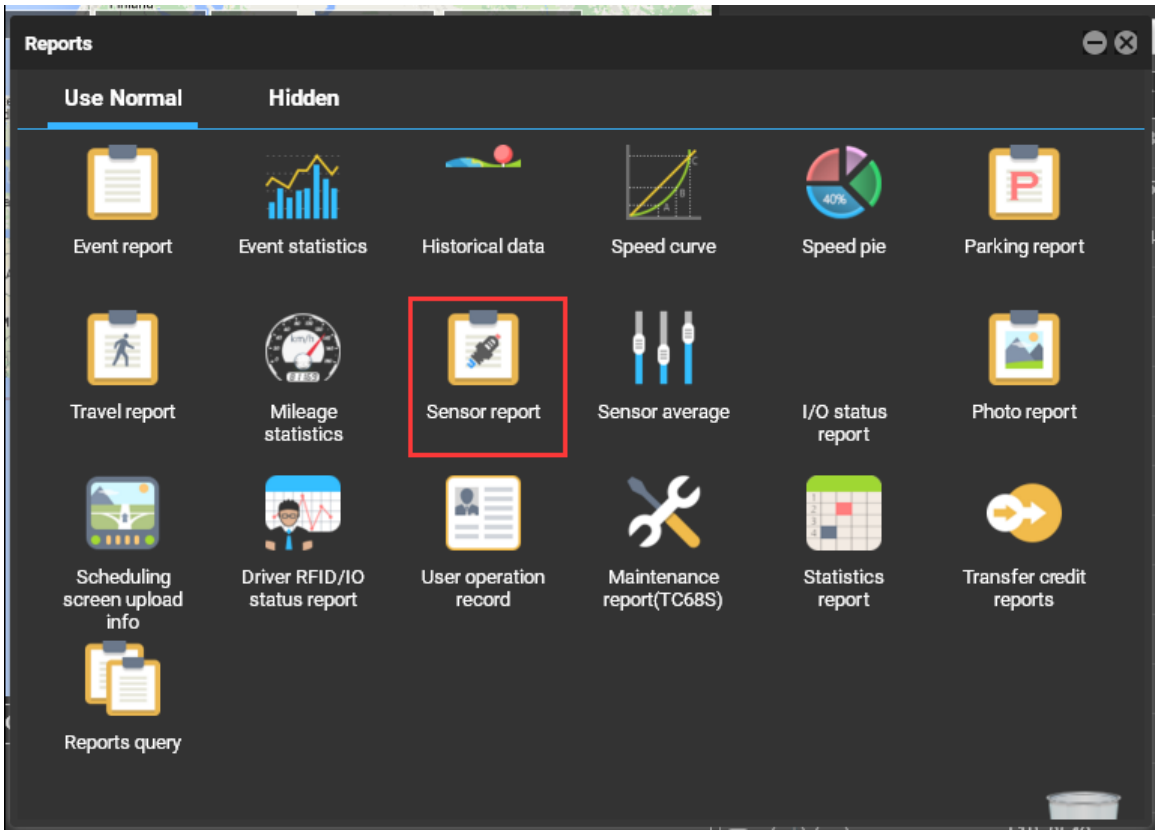
5.1 Historical Data

1. On the MS03, choose **Reports**.
2. On the **Reports** window, select **Historical data** from **Use Normal**. The **Historical data** window is displayed.
3. Select a tracker, set the query time, and click  . The results will be displayed, as shown in the following figure.

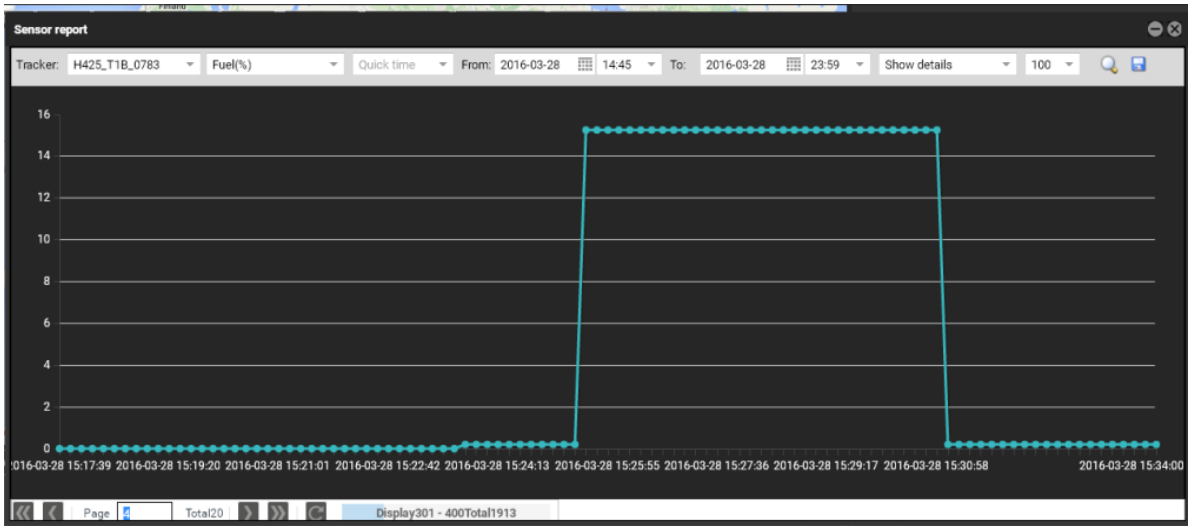


5.2 Sensor Report

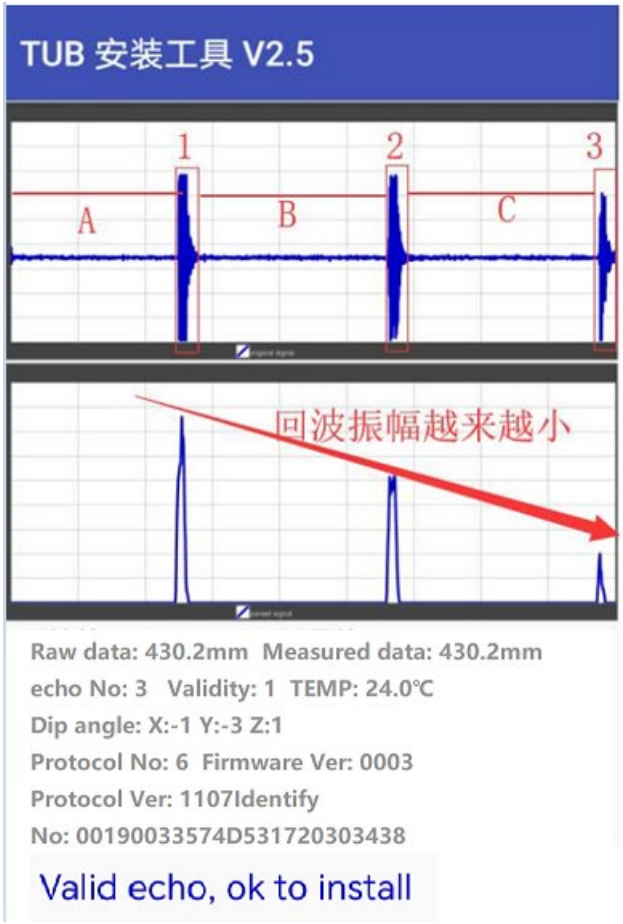
1. On the **Reports** window, choose **Sensor report** from **Use Normal**. The **Sensor report** window is displayed.



2. Select a tracker and sensor, set the query time, and click  . The results will be displayed, as shown in the following figure.



6 Check the installation of the ultrasonic oil sensor using the APP



1.In the image above, 1, 2, and 3 represent three echoes, while A, B, and C represent the echo spacing. The lower part of the image shows the waveform after shaping. The height of the echoes represents the amplitude of the echo.

2.The three echoes in the image should be relatively strong, and their heights must meet the requirement of the gray area in the lower part of the image, indicating that the echo strength is sufficient. Based on the on-site installation, the number of echoes should be controlled between 2 and 5.

3.A, B, and C represent the echo spacing. The spacing between the three echoes must be similar to ensure that the echoes are valid.

4.The lower part of the image shows the shaped echoes. From left to right, the echo heights decrease, indicating that the echo amplitude becomes weaker.

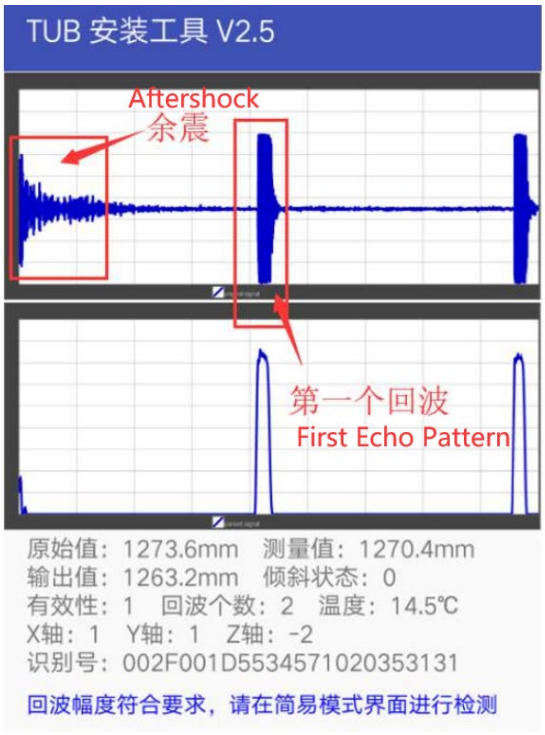
5.Observe the data area at the bottom to check whether the original values align with the current fuel level judgment.

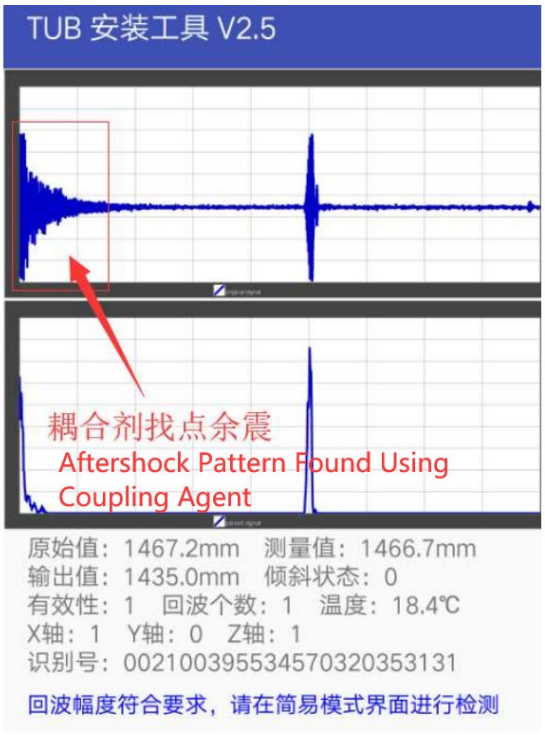
6.Validity must be 1. If the liquid level is within the blind zone, the validity value will be 2. It is recommended to refuel before installation.

7.When locating points on the X, Y, and Z axes during installation, try to keep the values less than or equal to 2 to avoid any tilted position.

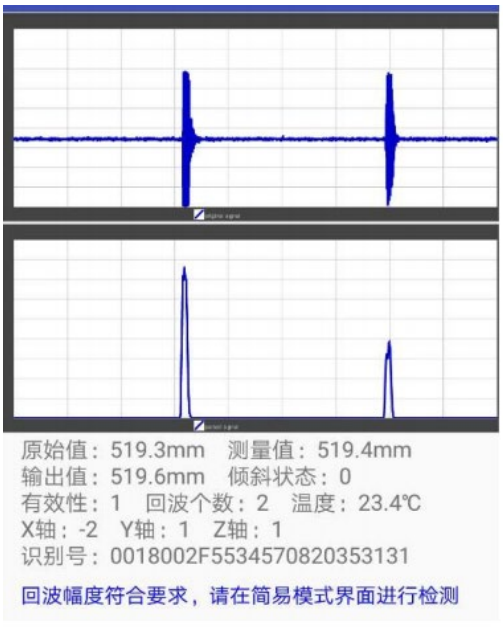
8.The blue horizontal line at the top of the image represents the ultrasonic bottom noise. The thinner this line, the better.

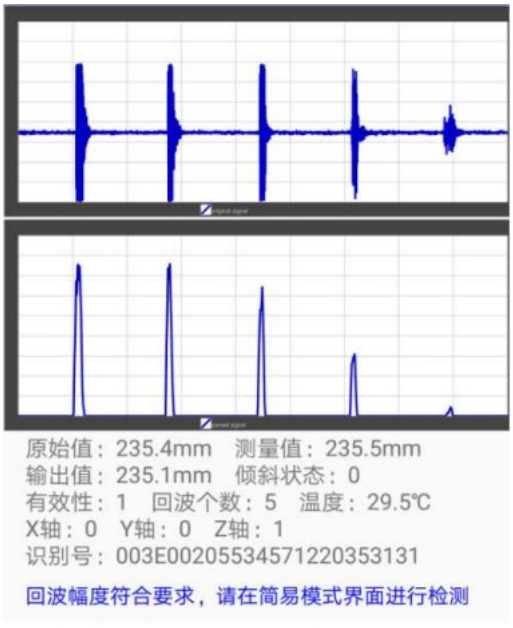
6.1 use coupler to find points suitable for mounting waveforms

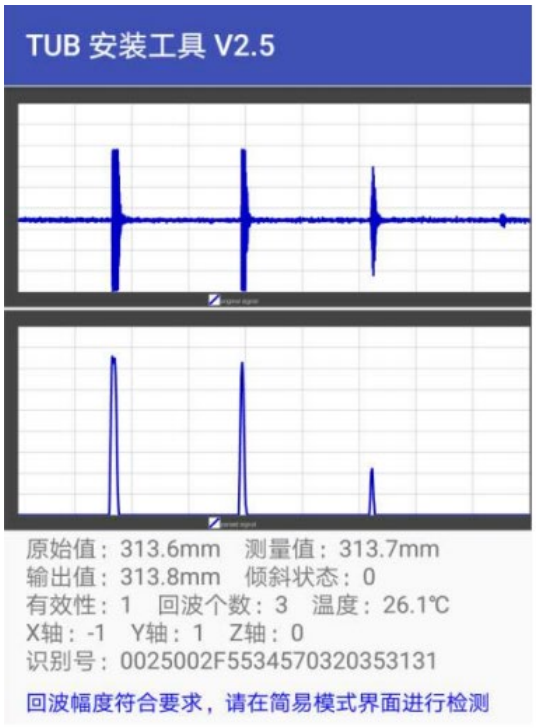


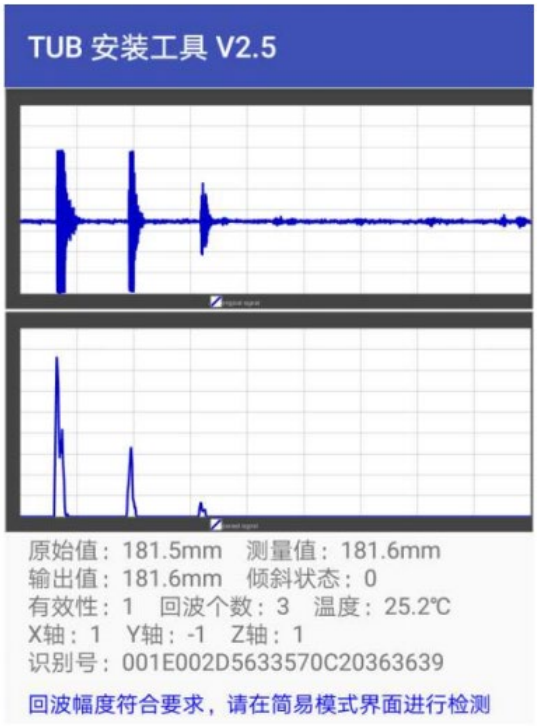


6.2 Fit for installation waveform

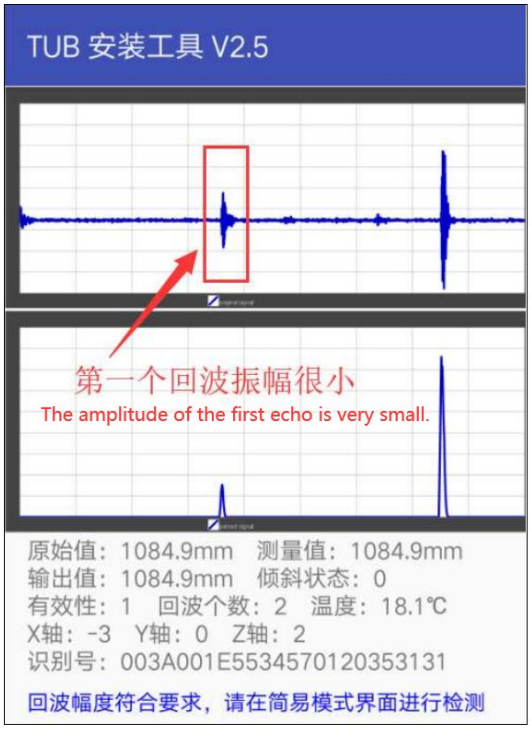


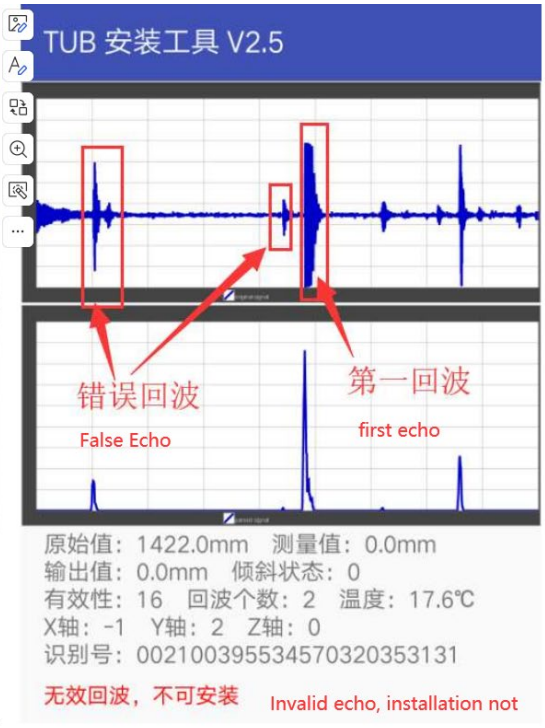


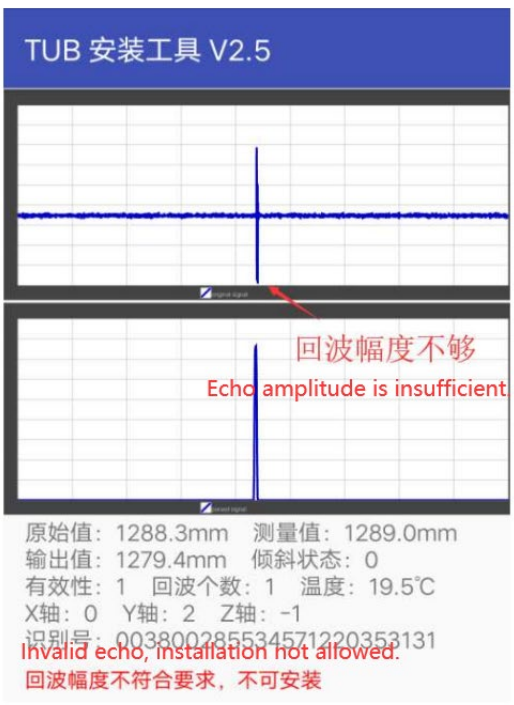


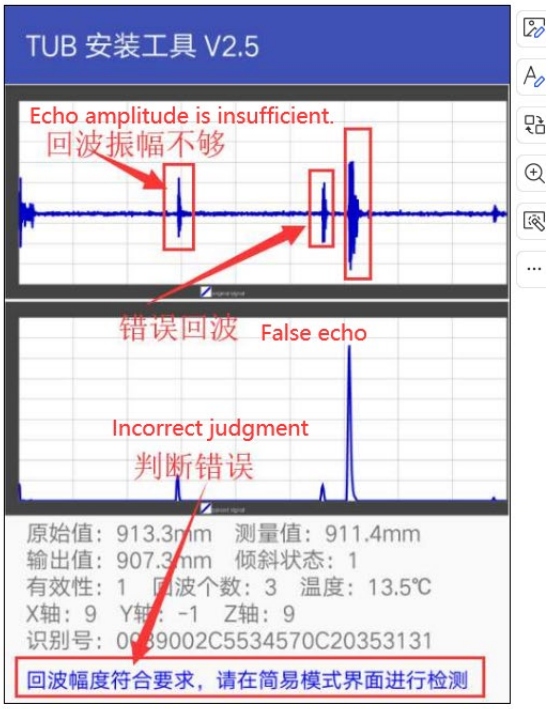


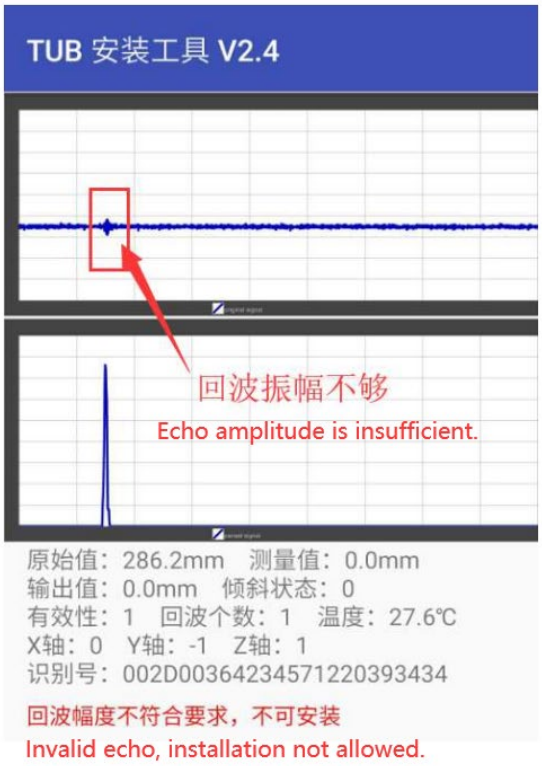
6.3 The following waveforms are unsuitable for installation

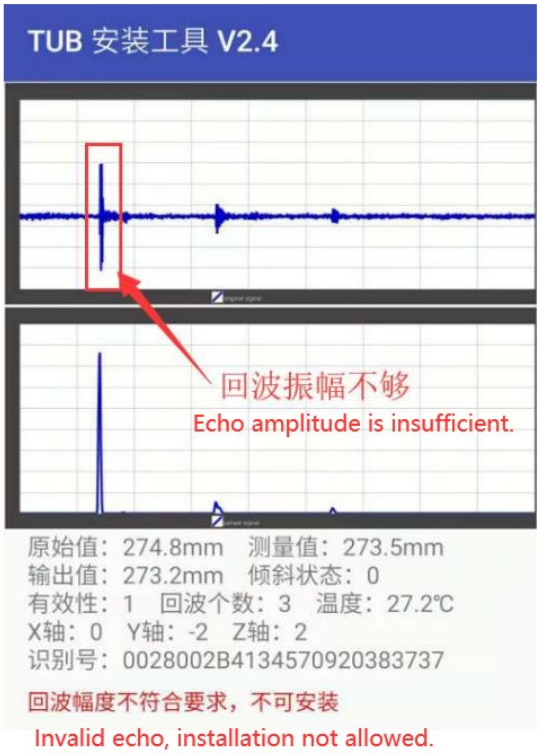


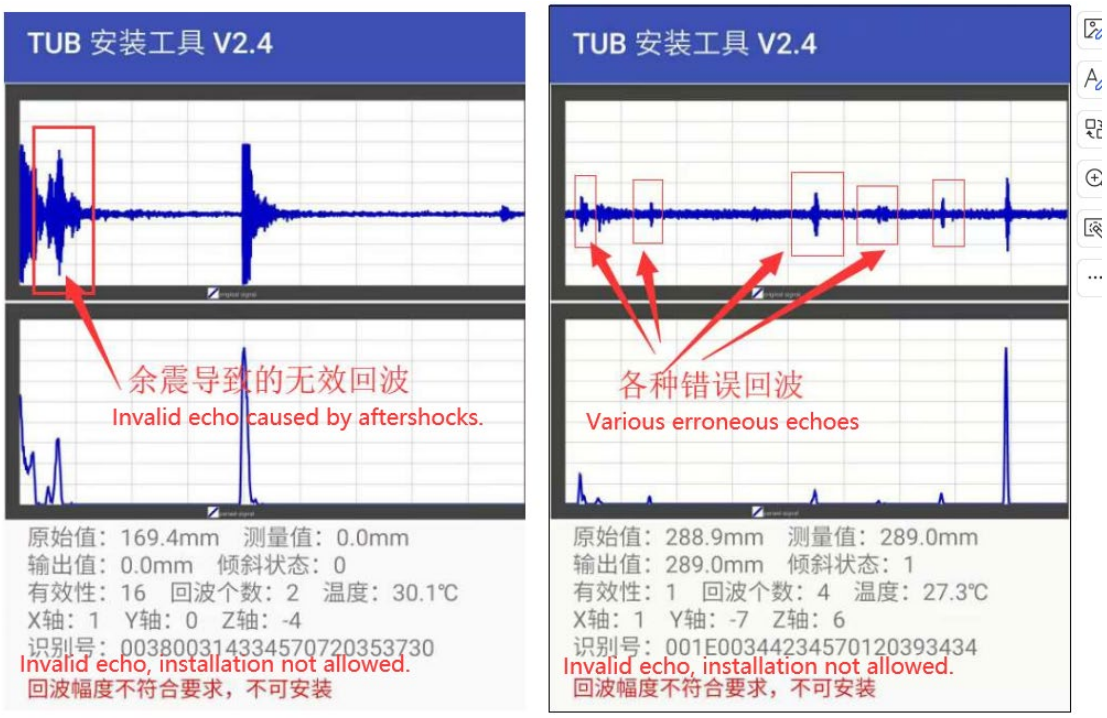












If you have any questions, do not hesitate to email us at info@meitrack.com.