

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



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

Change History

Copyright and Disclaimer

Copyright © 2024 MEITRACK. All rights reserved.

G meitrack and **G** are trademarks that belong to Meitrack Group.

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

Copyright and Disclaimer2 -
1 Product Functions and Specifications 4 -
1.1 Product Functions 4 -
1.2 Specifications 4 -
2 Accessories 5 -
3 Installation 6 -
3.1 WiFi tool (Optional Accessory)6 -
3.2 Installing the Sensor 6 -
3.3 Installing the Tracker 13 -
4 Configuring the Sensor 15 -
4.1 Configuring the Sensor by Meitrack Manager or MS03 15 -
5 Querying Reports 17 -
5.1 Historical Data 17 -
5.2 Sensor Report 17 -
6 Check the installation of the ultrasonic oil sensor using the APP 19 -
6.1 use coupler to find points suitable for mounting waveforms 20 -
6.2 Fit for installation waveform 20 -
6.3 The following waveforms are unsuitable for installation 21 -



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	A76-100	Measurement range is 6~100cm			
thick steel plate, in three models)	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 CT	6; flameproof Exd II CT5			
Water resistance rating	IP67				
Interface	A76-100 and A76-250 onl	y 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: ϕ 33 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.

Op	tional 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)	



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 <u>USR-WIFI</u> and click connect. Once connected, the green indicator light is on.



- O
 O

 A76
 ASUF

 Image: Constrained on the second on the se
- 4) Please scan the QR code with Android phone, download and install the APP.

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.

Meitrack Manager 6.0.2.9	- 0	×
Basic		
Tracking Type Input v 3 v Trigger Mode AD Input v		
Set		
Event R5232 EXT UIt fuel Sensor V Setting Baud rate V 115200 V Set		
Perpheral Fuel Sensor Fuel Sensor UR Fuel Sensor	_	
Maintain Oil Alarm High Oil Alarm Value(%) O Low Oil Alarm Value(%) O		
Add Ol Alarm Steal Ol Alarm Oil Change Time Range(min) 0 Oil Change Value(%) 0 Oil Change Value(%) 0		
RFID Operation Setting	-	
Quantity 1 C Query Single Delete Set		
Ignition Time After Swiping Cards/Ignition Off Setting Ignition time after swiping cards(secs) 60		
Option COM Tool Synchronize Parameters Factory Load Settings From File Save	Settings T	'o File

2) Connecting with AD input, connection as below.

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

Copyright © 2024 Meitrack Group All rights reserved.



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.

Meitrack Manager 6.0.2.9	- (- X
Basic	14* LINE	
Tracking	Type Input v 1 v Trigger Mode Negative v	
GeoFence	Type Input ~ 2 ~ Trigger Mode Postwe ~	
媒 Event	Type Input v 3 v Trigger Mode AD Input v	
Peripheral	Set	
╤ Maintain «	RS232 EXT LED display V Setting Baud rate V 115200 V Set	
	el Sensor	
	Fuel Sensor Type 3-Model V V OI Alarm 0-None	
	High Oil Alarm V 3-Model R E Usw Oil Alarm V 3-Model N E Low Oil Alarm V 3-Model V E	
L	Add Oil Alarm Steal Oil Alarm	
	Ol Change Time Range(min) 0 0 Ol Change Time Range(min) 0	
	Set	
	ID Operation Setting	
	Option COM Tool Synchronize Parameters Factory Load Settings From File Save Setting	js To File
et device settings succeed!	ID Library Version:2022	2.07.11.01

4 Configuring the Sensor

4.1 Configuring the Sensor by Meitrack Manager or MS03

 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.

) Tracking	RFID ignition(Output 1)			
GeoFence				
Event				
Perinheral 1	Eugl Concor		Set the a	actual tank height
	Fuel Sensor Type 5-Ultrasonic	v (3)		
Maintain	Oil Alarm			
	High Oil Alarm Value(%)	0	Full Oil Value(mm)	0
Network	Low Oil Alarm Value(%)	0	Empty Oil Value(mm)	0
	Add Oil Alarm		Steal Oil Alarm	
Video	Oil Change Time Range(min)	0	Oil Change Time Range(min)	0
	Oil Change Value(%)	0	Oil Change Value(%)	0
Other				
	Periphal			

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.
- 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.





Parameter settings							000
9	H425_T1B_0783						
Enter tracker/user name to be queried(emj Q	Bendenmannen	W.4	6t				
Tracker Transmit proces	read parameters						
🖬 T1 (14)	Track Main parar	neters Advanced par	ameters	Sensor parameters	Geo-fence	Set authorization	
T1A_3.0VV	Fuel sensor			1			
T1A_4242	Mode:	Ult Fuel Sensor	Ŧ				
181CX_T1A_4408(7	Tank capacity:	0	\$				
T1A_3813	Full alarm:	300					
T1A_7208	Empty alarm:	0					
T1B_0420	High alarm:	90					
■ 181CX_T1B_9384(日)	Low alarm:	0					
T1A_1652	Design diamatica bio	a diamatan					
T1A_1769	Period(min):	3 Alarm value:	2				
T1B_7815	Period(min):	3 Alarm value:	2				
T1B_8540	Rea	d Write					
T1B-9514							
✓ H425_T1B_0783							
- 181CX_T1B_0965(新)							
T622 (3)							
T622-5245							
T622-5260							
T622-8242							

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.

Historical data								4	00
Quick time 👻 From: 2015-08-11	00:00 - To:	2015-08-11	23:59 🔻 Speed:	>= - 0	Address	🗹 Ignore drift	Q 🔮		0
Enter tracker/user name to be queried(em $\ \mathbf{Q}$	Mileage	Running time	BaseStationID	HDOP	Tracker battery	Car battery	Engine state	Fuel perc	entage
Users	39.1	1Day05:39:31	460 0 2792	0.0	3.77	0.00	normal	88.55%	^
🔳 🗏 🤗 william									
T 🕄 🔔 ajun	39.1	1Day05:39:51	460 0 2792			0.00	normal	88.84%	
Entfoly									
	39.1	1Day05:40:11	460 0 2792	3.8	3.77	0.00	normal	88.97%	
1322-0007									
✓ ▲ MVT800-5031		1Day05:40:31					normal	88.88%	
Alex									
T622_Garmin	39.2	1Day05:40:51	460 0 2792	1.4	3.77	0.00	normal	88.84%	
	39.2	1Day05:41:11	460 0 2792	4.4	3.77	0.00	normal	88.91%	
	39.2	1Day05:41:31	460 0 2792		3.77	0.00	normal	88.84%	
								88.81%	-
	4								P.
		e 1 Total1	>>> C	Disp	lay1 - 60Total60				

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.											
Sensor re	eport	nu									•
Tracker:	H425_T1B_0783	✓ Fuel(%)	▼ Quick time	 From: 2016-03-28 	14:45 × To:	2016-03-28	23:59 👻	Show details	*	100 -	Q 🖬
16					•••••••••						
14											
12											
10 -											
8											
6											
4 -											
2											
:016-03-28	15:17:39 2016-03-28	15:19:20 2016-03-28 15:	21:01 2016-03-28 15:2	2:42 2016-03-28 15:24:13 2	016-03-28 15:25:55 2016-	03-28 15:27:36 2	016-03-28 15:29:1	7 2016-03-28 15:	30:58	21	016-03-28 15:34:
« (Page 💈	Total20	C Display:	301 - 400Total1913							



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



Raw data: 430.2mm Measured data: 430.2mm echo No: 3 Validity: 1 TEMP: 24.0°C Dip angle: X:-1 Y:-3 Z:1 Protocol No: 6 Firmware Ver: 0003 Protocol Ver: 1107Identify No: 00190033574D531720303438

Valid echo, ok to install

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.

TUB 安装工具 V2.5 TUB 安装工具 V2.5 Aftershock 余震 第一个回波 耦合剂找点余震 **First Echo Pattern** Aftershock Pattern Found Using **Coupling Agent** 原始值: 1467.2mm 测量值: 1466.7mm 原始值: 1273.6mm 测量值: 1270.4mm 输出值: 1435.0mm 倾斜状态: 0 输出值: 1263.2mm 倾斜状态: 0 有效性: 1 回波个数: 2 温度: 14.5℃ 有效性: 1 回波个数: 1 温度: 18.4℃ X轴: 1 Y轴: 1 Z轴: -2 X轴: 1 Y轴: 0 Z轴: 1 识别号: 002100395534570320353131 识别号: 002F001D5534571020353131 回波幅度符合要求,请在简易模式界面进行检测 回波幅度符合要求,请在简易模式界面进行检测

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









原始值: 286.2mm 测量值: 0.0mm 输出值: 0.0mm 倾斜状态: 0 有效性: 1 回波个数: 1 温度: 27.6℃ X轴: 0 Y轴: -1 Z轴: 1 识别号: 002D00364234571220393434

回波幅度不符合要求,不可安装 Invalid echo, installation not allowed. 回波幅度不符合要求,不可安装 Invalid echo, installation not allowed.

识别号: 0028002B4134570920383737

2

输出值: 273.2mm 倾斜状态: 0 有效性: 1 回波个数: 3 温度: 27.2℃

X轴: 0 Y轴: -2 Z轴: 2

原始值: 274.8mm 测量值: 273.5mm

回波振幅不够

Echo amplitude is insufficient.





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