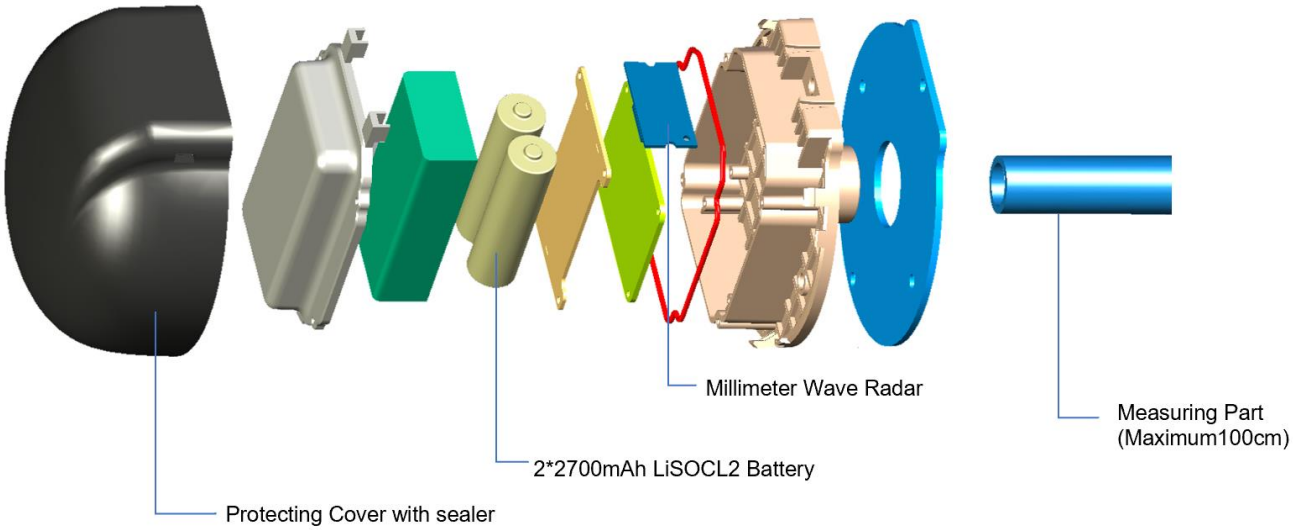
All-in-one Capacitive Fuel Level Sensor
With built-in Bluetooth & Radar

Model: CPM212



ATO

1. Features

- Wireless installation to prevent from tamper
- Built-in long life battery supports maximum 7 years
- Built-in Millimeter Wave Radar (optional) to detect human being to prevent fuel theft
- Built-in temperature and tilt sensor for flexible algorithm
- Easy installation and cuttable capacitive tube
- Support harsh environment from -40℃~85℃ with IP69 waterproof
- Support Gasoline, Diesel, LPG and all non-conductive liquid

2. Specification

Specification		
Accuracy	99.5%	
Resolution	0.1mm	
Battery	Life	Maximum 6 years
	Capacity	2*2700mAh, Li-SOCl2 replicable industrial battery
	Working Temperature	-55~ 85℃
Bluetooth	Bluetooth Version	BLE 5.4
	Transmission Mode	iBeacon Broadcasting
	Broadcasting Interval	1s as default, programmable
	Range of wireless connection (direct sight without interference and obstacles)	Maximum 100 meters
	Transmission power	- 96 ~ 4 dBm
Millimeter Wave Radar	Average Current	50 uA
	Working Temperature	-40~ 85℃
	Transmission power (EIRP)	10 dBm
	Detection Range	0.2~5 meters
	Detection Resolution	0.2m
	Horizontal Detection Angle	100 degrees
	Vertical Detection Angle	120 degrees
Tilt Angle Sensor	0~180 degrees	
Temperature Sensor	-40~120 ℃	
Working Environment	Working Temperature	-40℃~85℃
	Storage Temperature	-45℃~85℃
Capacitive Tube Range	0~1000mm (support cutting at site)	
Dimensions(mm)	98x45x(L), L: length of the measuring tube part, 10~100cm	
Weight	1kg when L=70cm	
Waterproof Class	IP69	
Explosion-proof Class	II 1 G Ex ia IIB T6 Ga	
Application		
Tank Material	Aluminum, Plastic, Metal, Ion, Stainless Steel	
Liquid	Gasoline, Diesel, LPG or other Non-conductive liquid	

3. Quick Installation Guide

Before test the fuel sensor, need to download and install the following APP. The APP is only for Android phones and does not support iOS phones.

Scan the code to download the APP

1) APP to configure fuel tank parameter

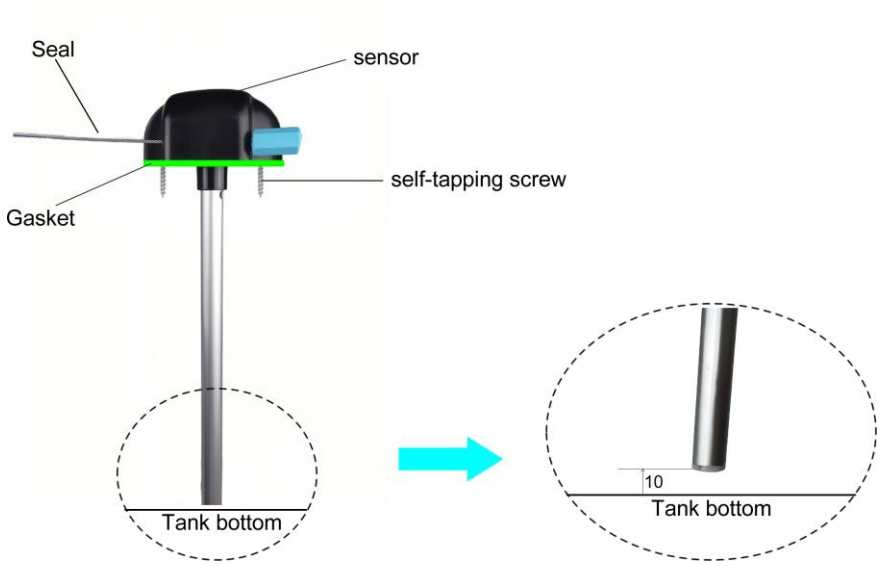
BleController_SW3.0.6

BLE Controller

2) APP to read original iBeacon RAW data for diagnostic

nRF Connect

3.1 Measure tank depth and cut the tube to fit the tank

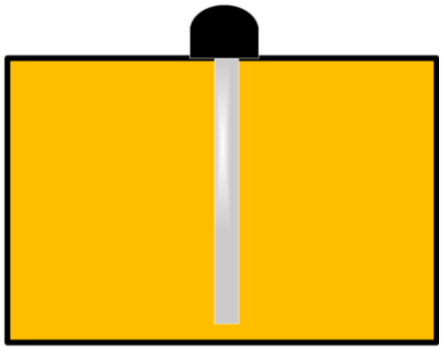


3.2 Configure Full

Option 1: Fill the tube outside the tank (this option can be used once fuel tank is NOT FULL)

Closing the drain holes, rotating the sensor, and fllingthe tubes with fuel

Option 2: Dip the tube inside the tank directly and read full data when fuel tank is FULL

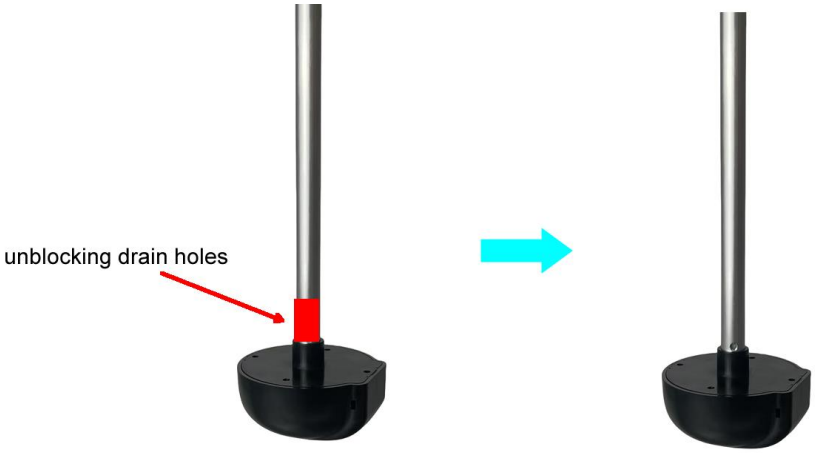


Filling the tubes by immersing the sensor in fuel (drainholes open)

Power on the sensor and place it in fuel. Click the "Full" button on the APP to perform full calibration

Noted: The testing liquid must be a non-conductive liquid, which can be lubricating oil, peanut oil, diesel, and water cannot be used for testing

3.3 Configure Empty

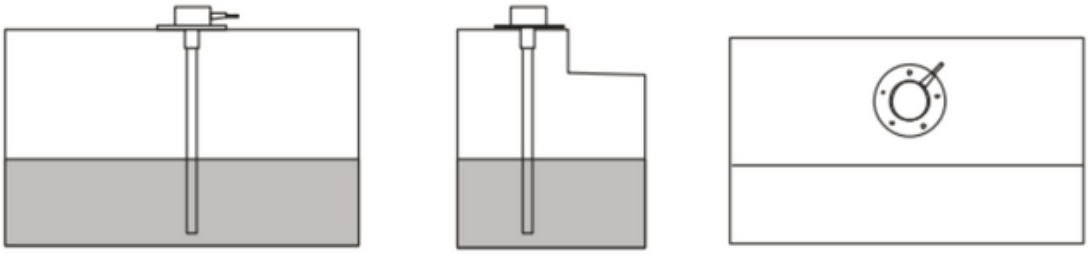


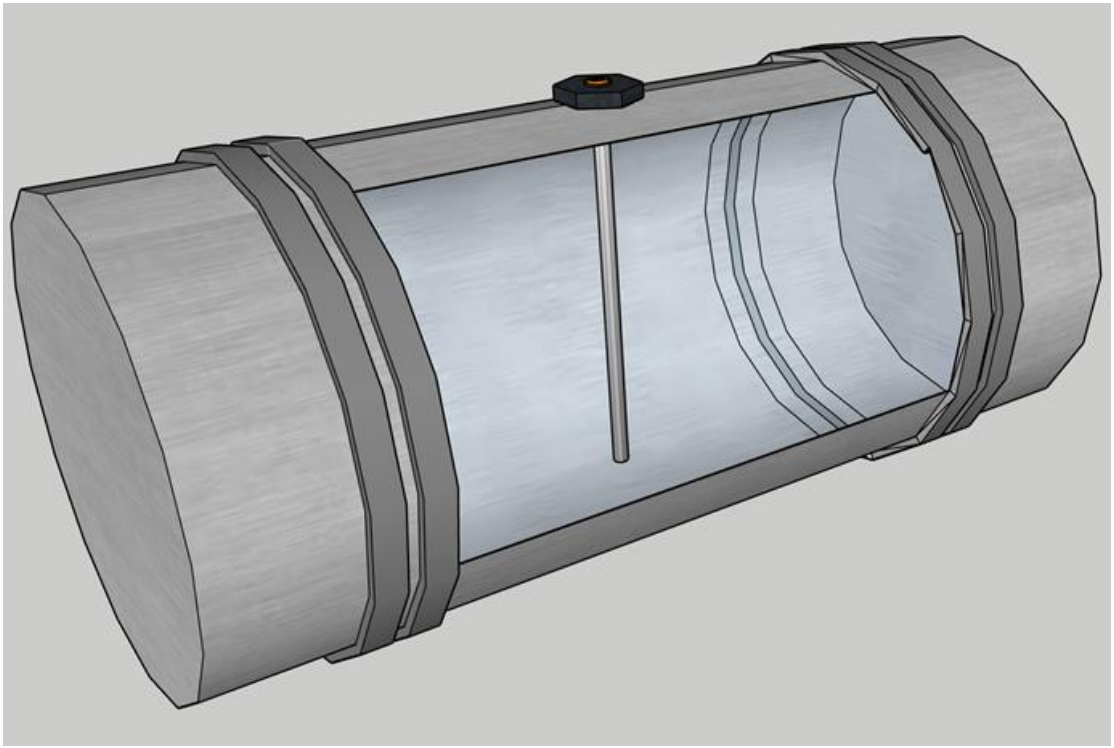
Then,drain the fuel from the tubes,wait 2~3 mintues,allowing the fuel to completely drain and the level to stabilize,and press“Empty”

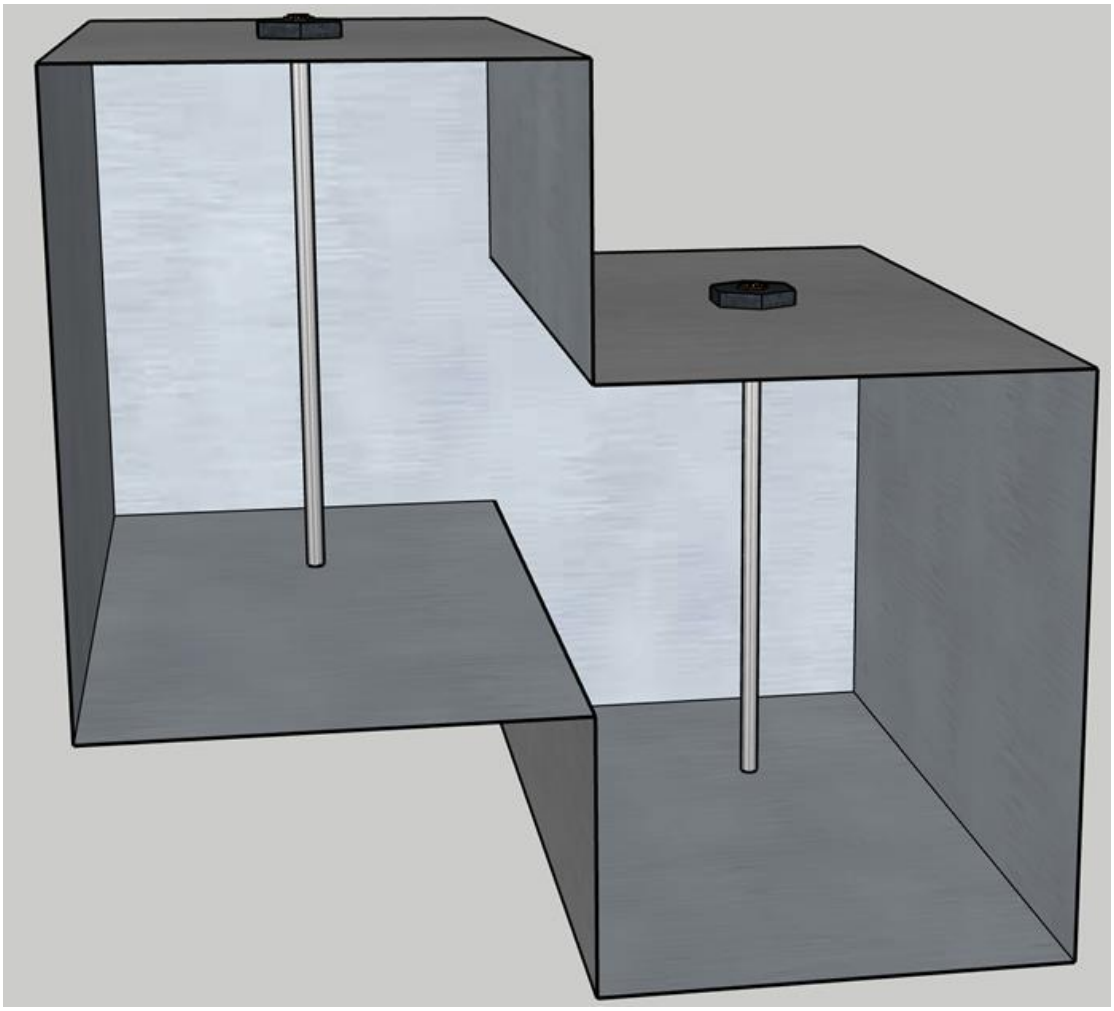
Power on the sensor and place it in the air. Click the "Empty" button on the app to perform empty calibration

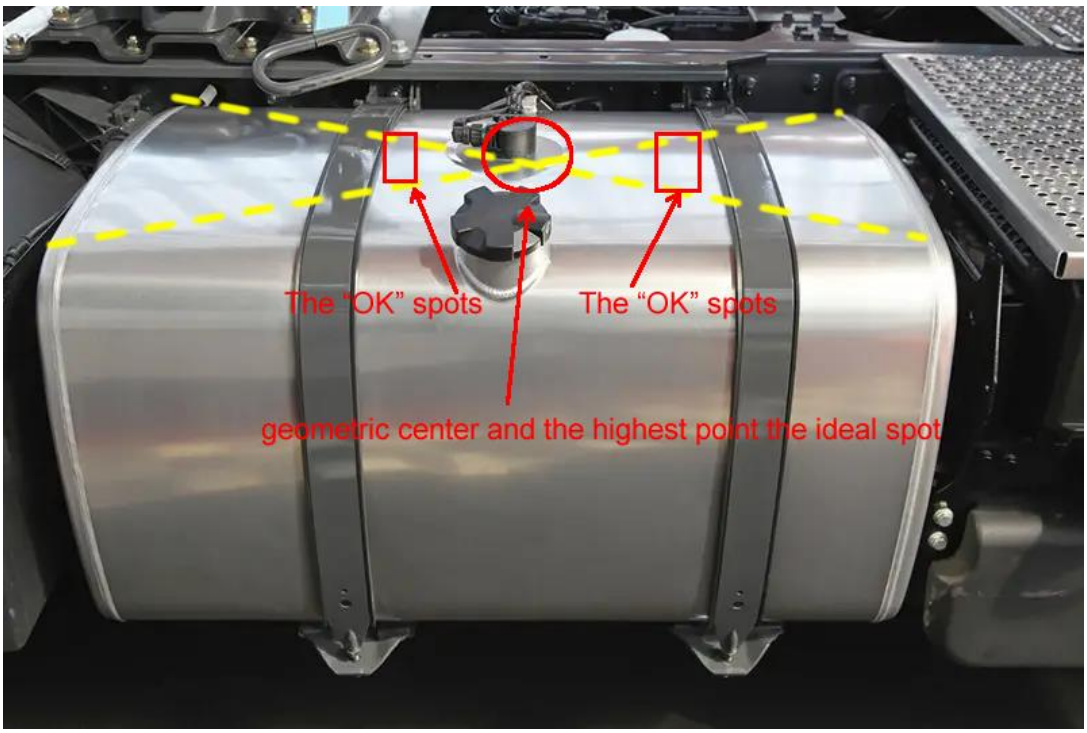
3.4 Draw Holes and Fix Sensor

1) Find geometric center of the tank and drill a hole

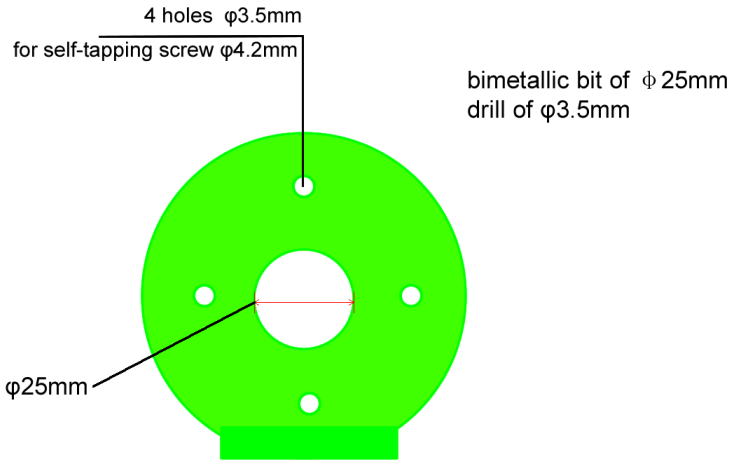







The "OK" spots
The "OK" spots
geometric center and the highest point the ideal spot

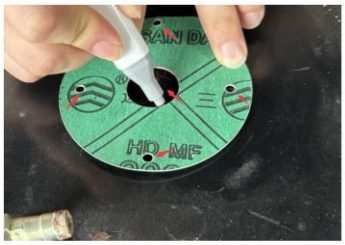
2) Use a screwdriver remove the cut place,avoid the metal shavings falling into the tank



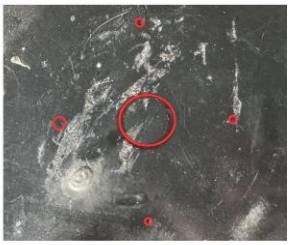
The diameters of the holes are given for self-tapping screws, if necessary, mark places for anotherfastening according to the centers of specified holes.

3) Mark Location

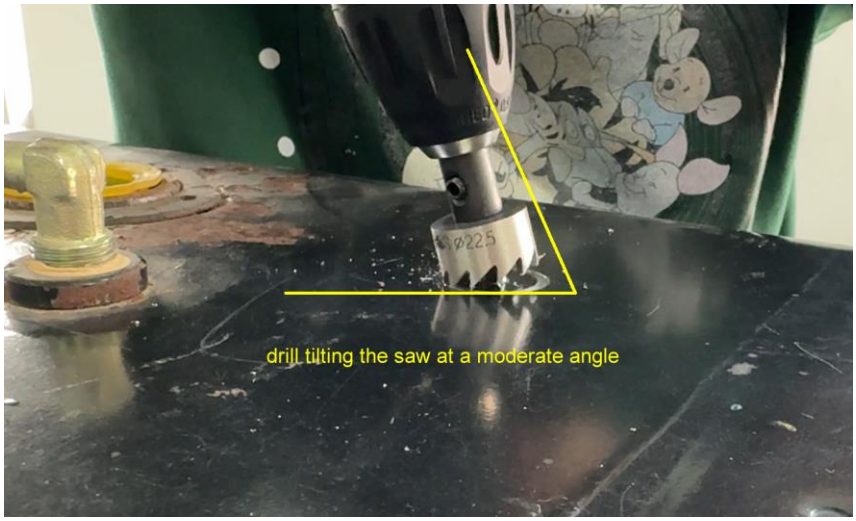
Clean the installation position of the oil sensor and remove dust and dirt from the surface of the fuel tank

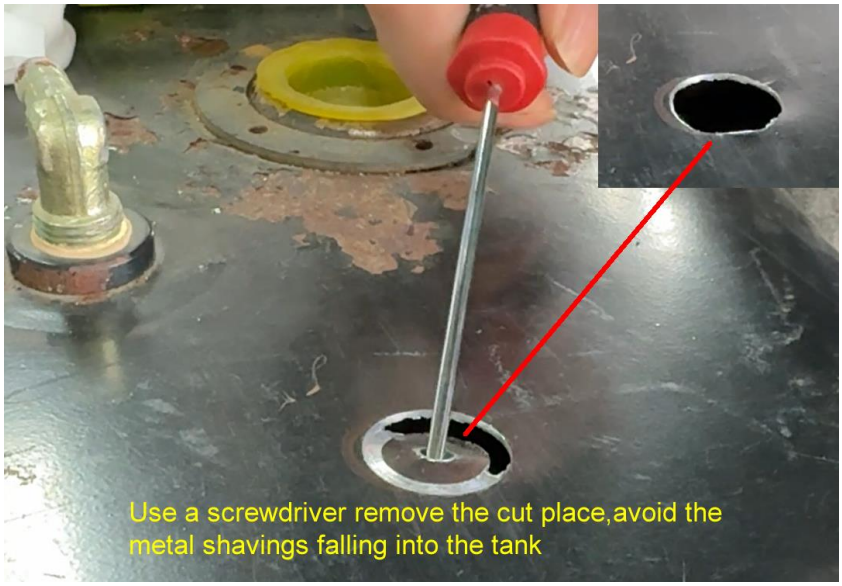


Mark the gasket points with a marker pen

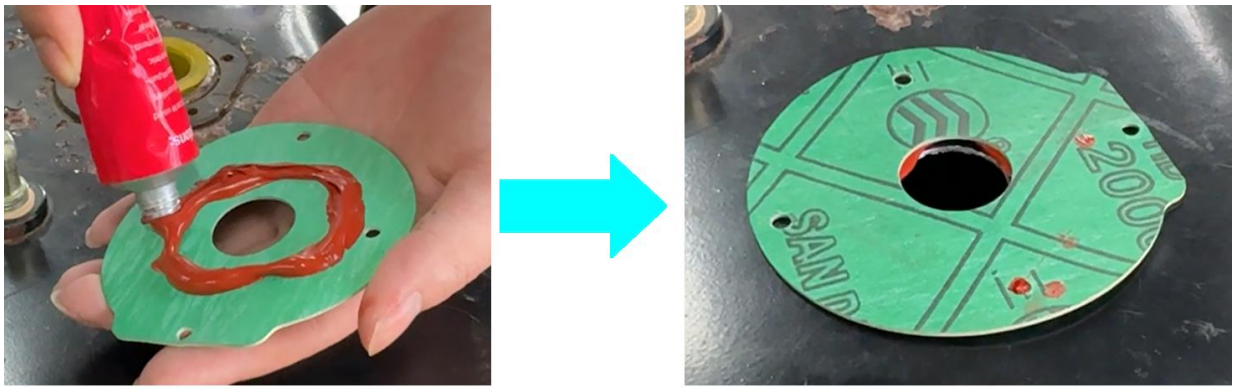


Remove the gasket



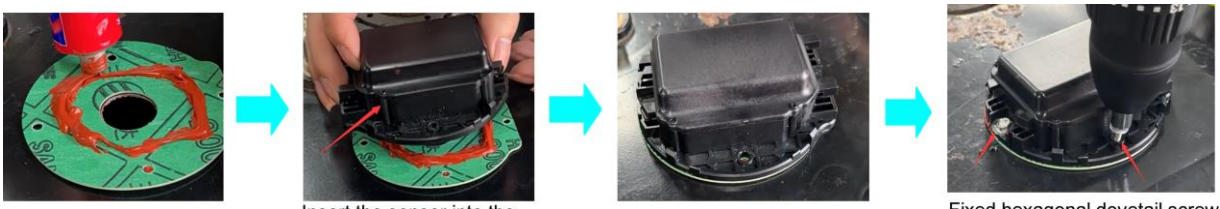


4) Install the gasket



Silicone gasket-free sealant to the back of the gasket and
Install the gasket above the hole position, paying attention to alignment

5) Insert the fuel sensor into the tank and secure it in place



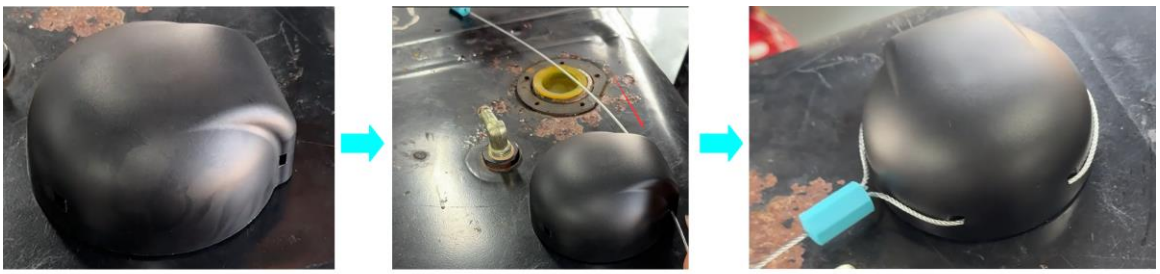
Silicone gasket-free sealant above the gasket

Insert the sensor into the fuel tank and align it with the gasket

Insert completed

Fixed hexagonal dovetail screw
All four screws need to be fixed

6) Fasten the seal



Cover the outer shell

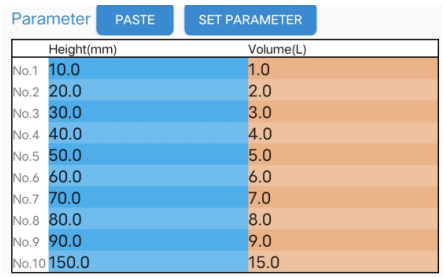
Insert the seal according to the direction of the arrow

Fasten the seal

3.5 Calibrate via mobile APP

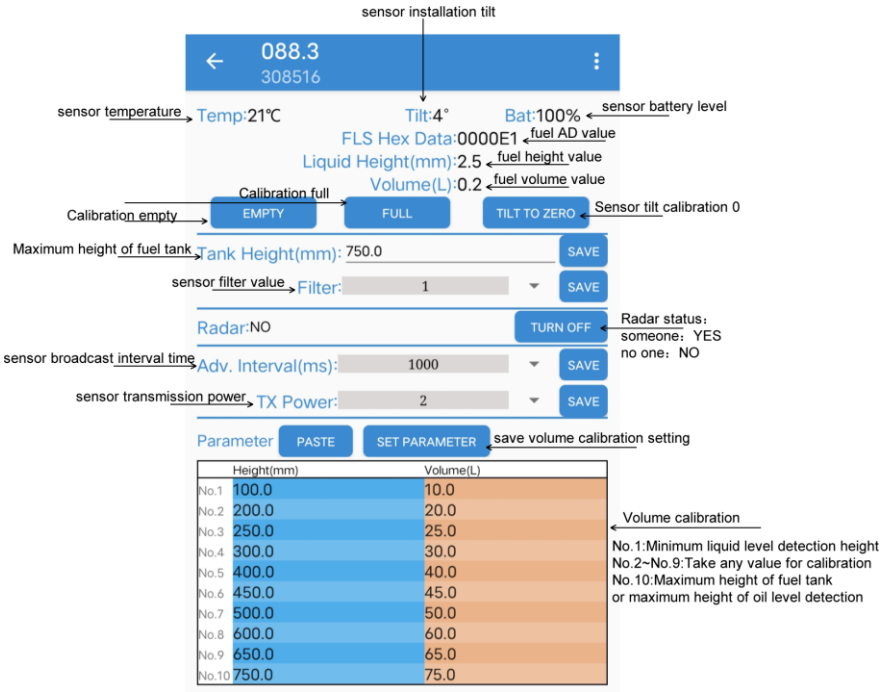
1) Enter the total height of the fuel tank, Based on the actual height of the fuel tank

2) Configure volume parameters:
No.1 input minimum volume, No.10 input maximum volume
Calibrate 10 points arbitrarily according to the actual situation



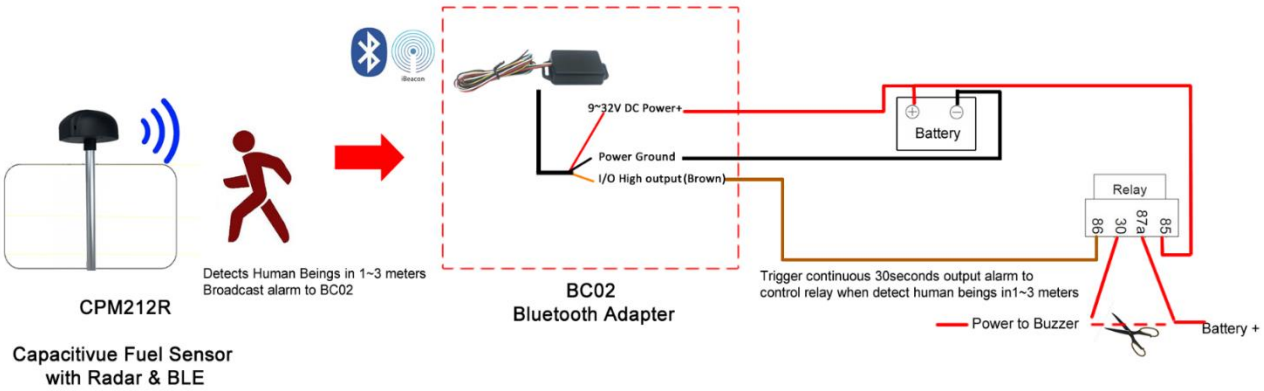
	Height(mm)	Volume(L)
No.1	10.0	1.0
No.2	20.0	2.0
No.3	30.0	3.0
No.4	40.0	4.0
No.5	50.0	5.0
No.6	60.0	6.0
No.7	70.0	7.0
No.8	80.0	8.0
No.9	90.0	9.0
No.10	150.0	15.0

3) Complete APP menu show and describe:

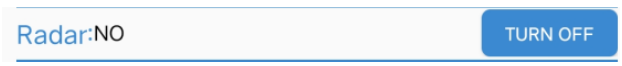


3.6 How does Millimeter Wave Radar function work?

(support disable/enable the Millimeter Wave Radar function via mobile APP)



1) Turn on rader



2) People walk close to the front of Dashcam in 1~3 meters.

If the APP status shows "YES" , it indicates that a person has been detected nearby.

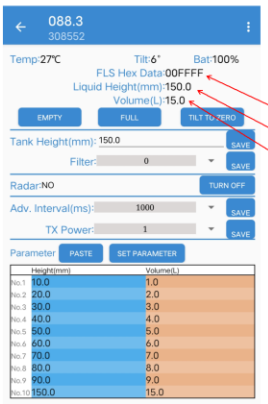
If the APP status shows "No", it indicates that no person has been detected nearby.

3.7 How to check fuel sensor Bluetooth broadcast data?

1) Open the APP "nRF connect"

2) Search and find the device with Bluetooth broadcast name "088"

3) Bluetooth broadcast protocol

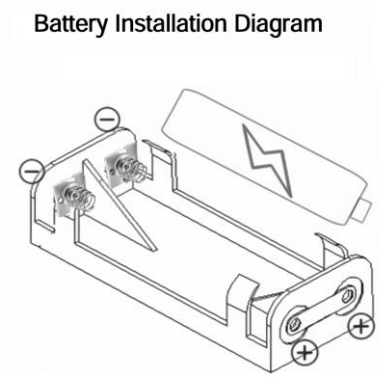


Example：0xFF071B407A4EE0430700FFFF05DC00966400

0xFF data	Data Length	Data Denfinition	unit	Description
071B407A4EE0	6Bety	MAC address，Little Endian		
0x43	1Byte	temperature data	celsius degree	0x43 means 67 in deciaml, which equals to 67-40=27℃
0x07	1Byte	tilt angle	degree	range 0~180
0x00FFFF	3Byte	FLS diagnostic data		
0x05DC	2Byte	fuel height	0.1mm	0x05DC convers to decimal is 1500，1500x0.1mm=150mm
0x0096	2Byte	volume	0.1L	0x0096 convers to decimal is 150，150x0.1L=15L
0x64	1Byte	battery	1%	0x64 convers to decimal is 100，100x1%=100%
0x00	1Byte	Radar status		00: No one 01: Someone

4. FAQ:

4.1 If the battery needs to be replaced after being depleted, please refer to the picture below to replace the battery



4.2 How to connect Teltonika device via Bluetooth?