

# UL202 Ultrasonic Fuel Sensor

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## Introduction to the product

UL202 Ultrasonic Fuel Level Sensor connected to FMB640 using the RS232 interface.

### UL202

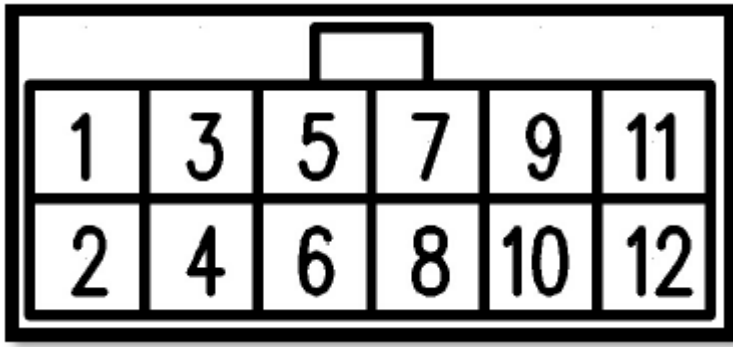
Color	Definition of LED light
Green light	the probe works normally
Red light	the probe is abnormal (the probe line is not inserted or probe drops off)



### UL202 sensor technical parameters:

Description	Physical Specification
Operating voltage	9-36VDC
Maximum power consumption	0.8W/12VDC
Work temperature	-40°C - +85°C
Measurement range	Determined according to materials and thickness of the container
Pressure bearing scope	<0.8kg or 0.8MPa
Liquid measurement accuracy	+/-0.5%
Equipment interface	Provided output port of RS232

**Port definition of user interface** - User interface port is used to connect **UL202 Ultrasonic Fuel Level Sensor** connected to FMB640 using with RS232 interface



**Port definition**

PIN Position Nr.	Function	Description	Color
1	Positive pole of Power supply	9-36VDC	Red
2	Negative pole of Power supply	-	Black
3	RS232 TX	RS232 transmitting terminal	Yellow
4	RS232 RX	RS232 receiving terminal	Red
10	GND	Ground	Black

**Installation**

Before installation, make sure the UL202 Ultrasonic Fuel Level Sensor is not powered ON. The RED and BLACK wires of the User Interface line have to be connected to the Power Supply of the vehicle with the RED wire connecting the positive role and BLACK wire connecting the ground. UL202 has RS232 serial port output:



**FMB640, FMC640, FMM640 configuration**

In order to configurate FMB640, FMC640, FMM640 to read UL202 Fuel Sensor information, COM1/2 port have to be selected as “UL202-2 Fuel Sensor”. Baudrate is 9600.

The image shows a configuration interface with a sidebar menu on the left and three settings panels on the right.

**Sidebar Menu:**

- Security
- System
- GPRS
- Data Acquisition
- SMS \ Call Settings
- SMS Events
- GSM Operators
- Features
- Accelerometer Features
- Auto Geofence
- Manual Geofence Settings
- Manual Geofence Zones
- Trip \ Odometer
- Bluetooth
- iButton List
- I/O
- LVCAN
- FMS IO
- Manual CAN IO
- Tachograph Data
- RS232 \ RS485**
- CAN \ Tachograph
- Continental TPMS
- Custom scenarios
- Mobileye
- Freezer IO

**Garmin Settings**

Garmin Features

- Ping Filter
- Unicode filter

**RS485 Settings**

Mode: Disabled

Baudrate: Default

**RS232 Settings**

**COM1 settings**

Mode: UL202 Fuel Sensor

Baudrate: 9600

**COM2 settings**

Mode: Silent

Baudrate: Default

To receive UL202 Fuel Sensor information to the configured server, the Ultrasonic UL202 Fuel level and status have to be enabled in the "I/O" section.

GPRS

Data Acquisition

SMS \ Call Settings

SMS Events

GSM Operators

Features

Accelerometer Features

Auto Geofence

Manual Geofence Settings

Manual Geofence Zones

Trip \ Odometer

Bluetooth

I/O

LVCAN

FMS IO

Manual CAN IO

Tachograph Data

RS232 \ RS485

CAN \ Tachograph

Continental TPMS

Custom scenarios

Mobileye

I/O

Input Name	Units	Priority			
RFID2		None	Low	High	Panic
LLS 1 Fuel Level	kvants or l	None	Low	High	Panic
LLS 2 Fuel Level	kvants or l	None	Low	High	Panic
LLS 3 Fuel Level	kvants or l	None	Low	High	Panic
LLS 4 Fuel Level	kvants or l	None	Low	High	Panic
LLS 5 Fuel Level	kvants or l	None	Low	High	Panic
LLS 1 Temperature	°C	None	Low	High	Panic
LLS 2 Temperature	°C	None	Low	High	Panic
LLS 3 Temperature	°C	None	Low	High	Panic
LLS 4 Temperature	°C	None	Low	High	Panic
LLS 5 Temperature	°C	None	Low	High	Panic
Ultrasonic UL220 Fuel level 1		None	Low	High	Panic
Ultrasonic UL220 Fuel level 2		None	Low	High	Panic
Ultrasonic UL220 Status 1		None	Low	High	Panic
Ultrasonic UL220 Status 2		None	Low	High	Panic
Network Type		None	Low	High	Panic

## FMB125, FMM125, FMC125, FMU125 configuration

In order to configure FMB125, FMM125, FMC125, FMU125 to read UL202 Fuel Sensor information, COM1/2 port have to be selected as "UL202-2 Fuel Sensor". Baud rate is 9600.

Security  
System  
GPRS  
Data Acquisition  
SMS \ Call Settings  
GSM Operators  
Features  
Accelerometer Features  
Auto Geofence  
Manual Geofence  
Trip \ Odometer  
Bluetooth  
Bluetooth 4.0  
1-Wire  
I/O  
OBD II  
CAN Adapter  
RS232 \ RS485

Mode  
External UART Mode  
Disable RS232 RS485

RS232 Mode  
Mode  
Log Mode NMEA  
LLS LCD  
RFID HID RFID MF7  
Garmin FMI TCP Ascii  
TCP Binary TCP Ascii Buffered  
TCP Binary Buffered Mercury C4  
UL202-02 Fuel Sensor

TCP Binary Mode Settings  
Prefix 1 0  
Prefix 2 0  
Prefix 3 0

Garmin Mode Settings  
Garmin Features  
Ping Filter Unicode filter

RS232 Settings  
Baudrate  
Default 1200  
2400 4800  
9600 14400  
19200 38400  
57600 115200  
Parity  
Default None  
Odd Even  
Message Timestamp  
Disable Enable

To receive UL202 Fuel Sensor information to the configured server, the Ultrasonic UL202-2 Fuel level and status have to be enabled in the “I/O” section.

Security  
System  
GPRS  
Data Acquisition  
SMS \ Call Settings  
GSM Operators  
Features  
Accelerometer Features  
Auto Geofence  
Manual Geofence  
Trip \ Odometer  
Bluetooth  
Bluetooth 4.0  
1-Wire  
I/O  
OBD II  
CAN Adapter  
RS232 \ RS485

I/O  

Input Name	Units	Priority
BLE Temp #1	°C	None Low High Panic
BLE Temp #2	°C	None Low High Panic
BLE Temp #3	°C	None Low High Panic
BLE Temp #4	°C	None Low High Panic
BLE Battery #1	%	None Low High Panic
BLE Battery #2	%	None Low High Panic
BLE Battery #3	%	None Low High Panic
BLE Battery #4	%	None Low High Panic
BLE Humidity #1	%RH	None Low High Panic
BLE Humidity #2	%RH	None Low High Panic
BLE Humidity #3	%RH	None Low High Panic
BLE Humidity #4	%RH	None Low High Panic
Battery Level %	%	None Low High Panic
BT Status		None Low High Panic
UL202-02 Sensor Fuel level		None Low High Panic
UL202-02 Sensor Status		None Low High Panic

## FM63XY/FMB630 configuration

With FM63 00.03.XX version, FM63XY/FMB630 can support Ultrasonic UL202 Fuel sensors. In order to configure the device to read UL202 Sensor information, the COM1/2 port has to be selected as “UL202-2 Fuel Sensor”.

Profile 1 Profile 2 Profile 3 Profile 4 Global Parameters External Devices Recommended Configuration IMEI Version

**CAN bus settings**

CAN used for: CAN baudrate: CAN mode:

CAN 1: FMS/MCAN1/MCF 250 kbps Silent

CAN 2: TACHO 250 kbps Normal

**Tachograph settings**

Tachograph ignition source: Digital input 1

Tachograph device: Auto Detect

TACHO web enable: Disable

TACHO web domain:

TACHO web port: 0

TACHO web start delay: 5 min.

**Analog Inputs Settings**

Analog inputs 1-2 value range: 10 V

Analog input 3 value range: 10 V

**j1708 Line**

Power: Disable

Comment: If Enabled Fuel Level will be taken from j1708 line

**COM1 Settings**

Baudrate: 9600

Mode: Sensor UL20

Time Stamp: Disable

CMD ID: 5

Start Byte: 0

End Byte: 0

**COM2 Settings**

Baudrate: 115200

Mode: Silent Mode

Time Stamp: Disable

CMD ID: 5

Start Byte: 0

End Byte: 0

**TCP LINK mode buffering**

Disable/Enable: Enable

**RS485 Settings**

Active: Disable

Baudrate: 115200

Mode: Silent Mode

**LLS Sensors Settings**

Addr 1: 0

Addr 2: 0

Addr 3: 0

Addr 4: 0

Addr 5: 0

To receive UL202 Fuel Sensor information to the configured server, in preferred device Profile Ultrasonic UL202-2 Fuel level and status have to be enabled in the "I/O" section.

Profile 1 Profile 2 Profile 3 Profile 4 Global Parameters External Devices Recommended Configuration IMEI Version

**System**

**GSM**

**Features**

**CAN**

**LVCAN**

**K-Line Data**

**IO**

**Camera**

**Mobileye**

**Thermoking**

**Backup satellite**

**I/O**

Property Input	Enabled	Priority	LowLevel	HighLevel	GenerateEvent	Averaging Constant
Dallas ID 4	<input type="checkbox"/>	Disable	0	0	Monitoring	
Dallas Temperature 4	<input type="checkbox"/>	Disable	0	0	Monitoring	10
Dallas ID 5	<input type="checkbox"/>	Disable	0	0	Monitoring	
Dallas Temperature 5	<input type="checkbox"/>	Disable	0	0	Monitoring	10
Dallas ID 6	<input type="checkbox"/>	Disable	0	0	Monitoring	
Dallas Temperature 6	<input type="checkbox"/>	Disable	0	0	Monitoring	10
Fuel Counter	<input type="checkbox"/>	Disable	0	0	Monitoring	
Ignition	<input type="checkbox"/>	Disable	0	0	Monitoring	10
Rfid Id	<input type="checkbox"/>	Disable	0	0	Monitoring	10
Total Odometer	<input type="checkbox"/>	Disable	0	0	Monitoring	
RFID COM2	<input type="checkbox"/>	Disable	0	0	Monitoring	
Axis X	<input type="checkbox"/>	Disable	0	0	Monitoring	10
Axis Y	<input type="checkbox"/>	Disable	0	0	Monitoring	10
Axis Z	<input type="checkbox"/>	Disable	0	0	Monitoring	10
IMSI	<input type="checkbox"/>	Disable	0	0	Monitoring	
CCID	<input type="checkbox"/>	Disable	0	0	Monitoring	
SD Status	<input type="checkbox"/>	Disable	0	0	Monitoring	
LLS #1 Fuel	<input type="checkbox"/>	Disable	0	0	Monitoring	10
LLS #1 Temperature	<input type="checkbox"/>	Disable	0	0	Monitoring	10
LLS #2 Fuel	<input type="checkbox"/>	Disable	0	0	Monitoring	10
LLS #2 Temperature	<input type="checkbox"/>	Disable	0	0	Monitoring	10
LLS #3 Fuel	<input type="checkbox"/>	Disable	0	0	Monitoring	10
LLS #3 Temperature	<input type="checkbox"/>	Disable	0	0	Monitoring	10
LLS #4 Fuel	<input type="checkbox"/>	Disable	0	0	Monitoring	10
LLS #4 Temperature	<input type="checkbox"/>	Disable	0	0	Monitoring	10
LLS #5 Fuel	<input type="checkbox"/>	Disable	0	0	Monitoring	10
LLS #5 Temperature	<input type="checkbox"/>	Disable	0	0	Monitoring	10
Ultrasonic Fuel Level 1	<input checked="" type="checkbox"/>	Low	0	0	Monitoring	10
Ultrasonic Fuel Level 2	<input checked="" type="checkbox"/>	Low	0	0	Monitoring	10
Ultrasonic Soft. Status 1	<input checked="" type="checkbox"/>	Low	0	0	Monitoring	10
Ultrasonic Soft. Status 2	<input checked="" type="checkbox"/>	Low	0	0	Monitoring	10



## RS232 connection

RS232 Communication: The Yellow wire (TX) is connected with PIN6 RS232 Rx and the Blue wire

(RX) is connected with PIN5 RS232 Tx. The Black wire (GND) connected to the Teltonika GNSS device ground.

 **NOTE: RS232 is available on both PORT1 and PORT2**

## Installation steps

1. Requirements: main body of the sensor, probe, extension line, user interface line, coupling agent, 2.8-meter long hose clamp, sandpaper, and glue.
2. The customers need to prepare: 12V power supply, isolating tape, and duster cloth and paper tissue (used to wipe off grease dirt).
3. Before installing on the vehicle, ensure that the vehicle is at the horizontal ground and the fuel tank is placed on frame horizontally.
4. The installation area of the probe should avoid the fuel filler, fuel outlet, fuel return pipe, fuel float, and baffle.
5. Select the flat part at the fuel tank bottom or as close to the central area as possible.
6. For circular oil tank, in addition to avoiding the barrier, the tangent plane closest to the ground should be selected.
- 
7. Connect the main body of the sensor with user interface line, extension line, probe connection line.
8. Power ON control box. The fuel level is displayed 000.0 at the moment.
9. Apply coupling agent on the probe surface. Press the probe at the selected installation position. The display of the main body displays the currently measured liquid level.
10. Hold down "Key 1" for more than 8 seconds and release it to enter input state of total fuel tank height. F030 in the figure below means that the total height of the fuel tank is 30cm. Press "Key 2" to increase and press "Key 3" to decrease. Hold down "key 1" for 8 seconds to confirm the parameters.
11. After the total height of the fuel tank is put properly, it enters the input state for the current liquid level of the oil tank. E030 in the figure below means that the current liquid level height is 30cm. Press "key 2" to increase and press "key 3" to decrease.
- 
12. After the current liquid level of the oil tank is put properly, press "key 1" for more than 8 seconds to enter the automatic adjustment state of oil tank signal strength.
  1. At the moment, you may observe whether the displayed height on the display screen is consistent with the actual fuel level (for example, the predicted level is about 300mm and displayed 285.2mm).
  2. If the display screen displays 000.0 or the displayed height is quite different from the actual condition, the probe may be moved slightly or grind the fuel tank wall more. In addition, the buzzer in the equipment sounds continuous (if the buzzer sounds on and off or does not sound, it needs to seek the installation point or grind the fuel tank wall more until the buzzer does not sound).
  3. Hold down "key 1" for more than 8 seconds to complete the search and test of installation point.