



Fuel level sensor Omnicommm LLS-HD

User manual
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General information

Omnicomm LLS-HD fuel level sensors (hereinafter referred to as the “sensor”) are designed to measure fuel level in vehicle tanks and stationary fuel tanks. Omnicomm LLS-HD fuel level sensors perform additional measurement of fuel temperature. Information exchange with the sensor is carried out through RS-232 and RS-485 interfaces.

The sensor is suitable for the following types of fuel: petrol, “summer” and “winter” types of diesel fuel, and other liquid petroleum, that maintain their aggregation state within the range of operating temperature.

Omnicomm LLS-HD fuel level sensors are available in different designs depending on the probe length: 2000 mm, 2500 mm, 3000 mm.

Attention

While installing this device, you should observe the safety precautions and measures, as well as meet the requirements of the regulatory documentation for this type of works.

When cutting the measuring piece, the minimum cut-off length is 150 mm.

Technical specifications

Name of the parameter	Value
Power supply voltage	7 – 75 VDC
Power consumption, max	0.4 W
Size of internal filter of measurement results	0 to 30 points

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Name of the parameter	Value
Measurement period	1 s
Measuring range depending on the model	2000, 2500, 3000 mm
Interface for output of measured values	RS-232, RS-485
Programmable baud rate	2400, 4800, 9600, 19200, 38400, 57600, 115200 bit/s
Ambient temperature	From - 40 to + 80 °C
Critical temperature points	- 60 and + 85 °C
Relative humidity at 25 °C	From 5 to 95 %
Air pressure	From 84 to 107 kPa
Maximum allowed humidity level	100 %
Accuracy	> 99.2 %
Range of digital code readings corresponding to the maximum value of measured level	1...4095
Range of digital code readings corresponding to the minimum value of measured level	0...1023
Temperature measuring range	From - 40 to + 80 °C
Absolute error in temperature measurement throughout the range of operation temperature	± 5 °C

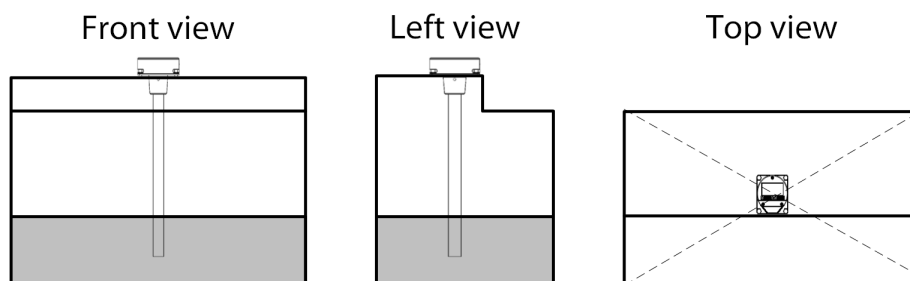
Name of the parameter	Value
Dielectric strength of galvanic isolation, min	1500 V
Dimensions	78x74x(24 + the probe length) mm
Ingress protection rating	IP67
Operation mode	Continuous
Weight max	2 kg
Average shelf life	8 years

Preparing

Preparation to installation on a fuel tank

1. Select a place for the sensor installation, taking in account the following:

A manner of sensor installation shall depend on the tank geometry, for reference please see the diagram:

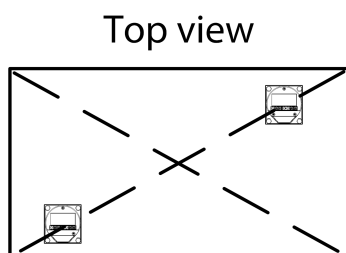


Installation of the sensor in such manner ensures independence of the fuel level from the inclination of a vehicle. In cases, when it is impossible to install the sensor in the specified areas, the sensor installation place must be as close to them as possible.

Installation of two sensors in a fuel tank can significantly reduce dependence of the

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fuel level from the angle of inclination of vehicle:



2. To ensure the safety requirements are met, perform the tank ventilate.

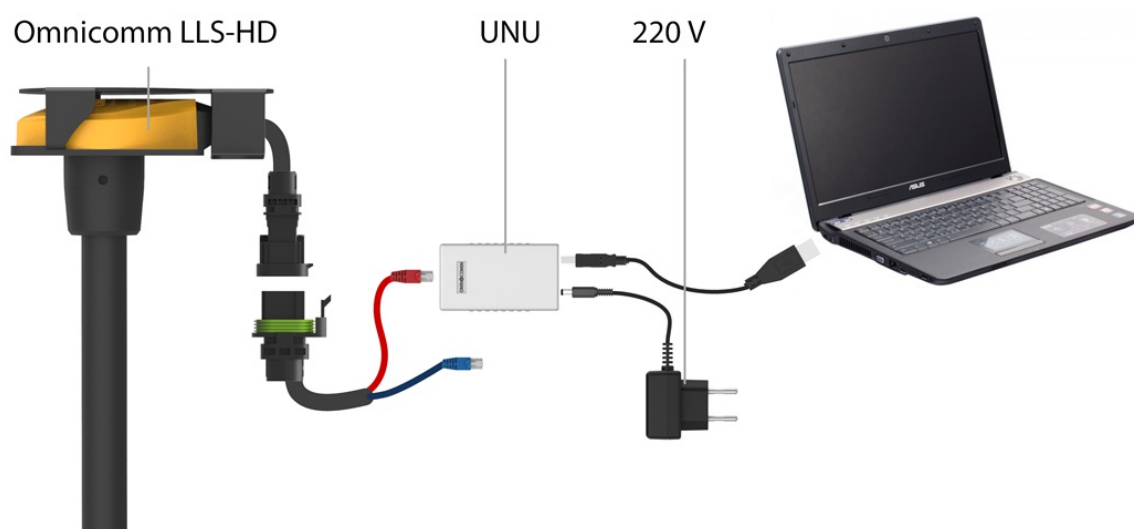
3. Drill the center hole and four attachment holes.

Sensor preparation

1. Cut the sensor probe, its length must be to 20 mm shorter than the tank depth.
2. Fill the insulation cap with a drop of oil-and-petrol resistant nonconductive compound and mount it to the sensor edge where the probe is cut.

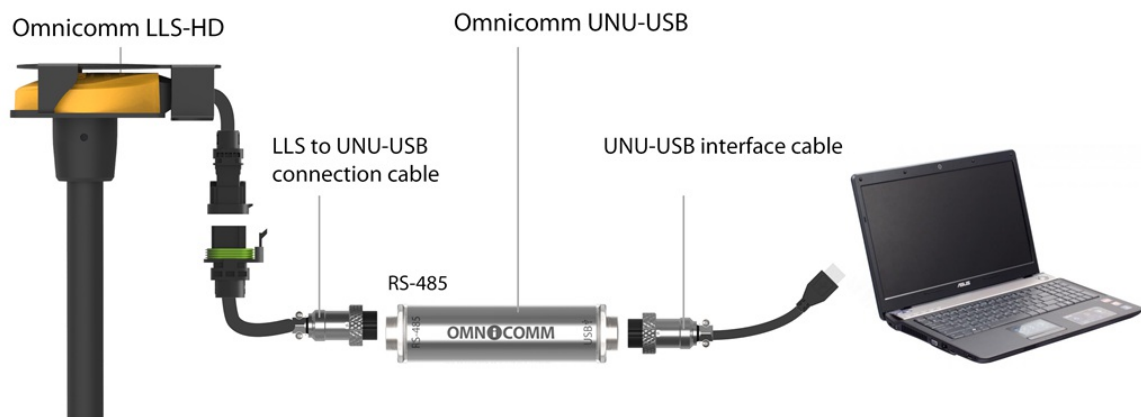
Setting up

Connect the sensor to the PC using USB adapter Omnicomm USB-USB (or the "UNU") according to the scheme:

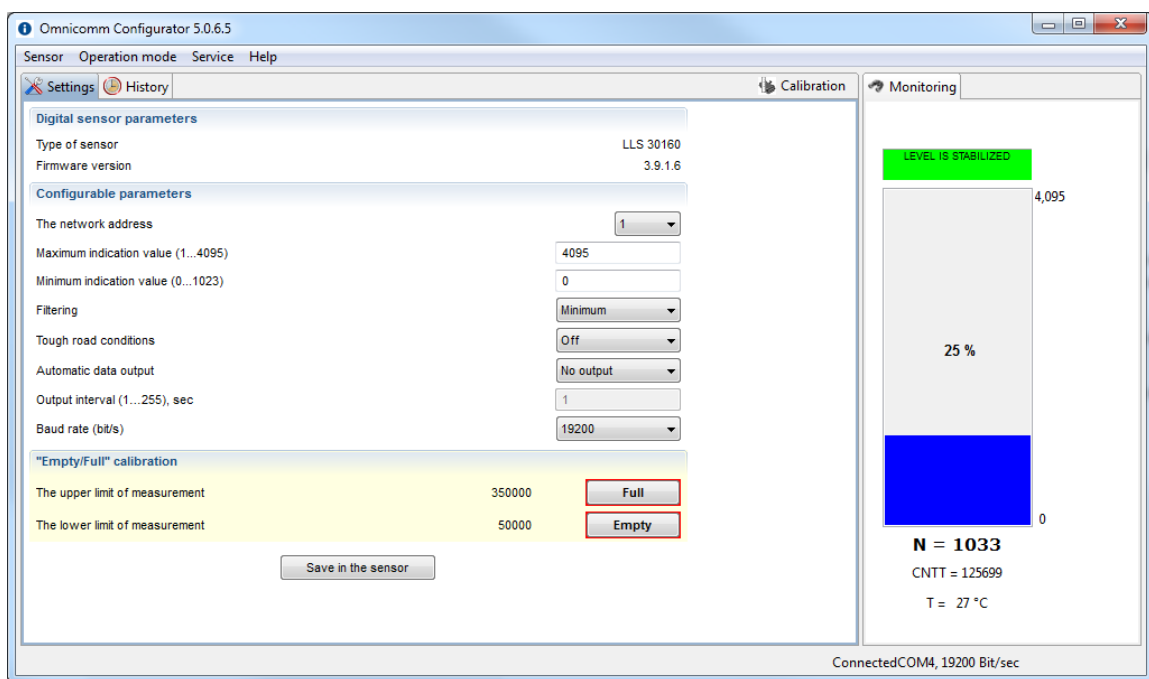


or

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Launch Omnicomm Configurator:



In the menu, click "Tools" / "Settings" / "Connection" and specify the connection port and speed for the Omnicomm LLS-HD indicator when connected via the USB-USB (or UNU) adjusting tool.

Full/Empty Calibration

1. Fill the calibration pipe with fuel.
2. Immerse the Omnicomm LLS-HD sensor into fuel so that the probe is completely covered with fuel.
3. Wait until the green indicator lights up "The level is stabilized". In the "Settings" tab in the "Full/Empty calibration" section press the "Full" button, and a value corresponding to the full tank will be recorded.
4. Remove the Omnicomm LLS-HD sensor from the tank and let the fuel drip from the probe. Please wait 1 minute at least. In the "Full/Empty calibration" section press the "Empty" button, and a value corresponding to the empty tank will be recorded.
5. Press the "Save to sensor" button.

General settings

In the "Settings" tab in the section "Configurable parameters":

The "Network address" (from 1 to 254), set the network address of the LLS-HD fuel level sensor. When several sensors are connected to one external device, the network addresses must be unique.

The "Maximum indication value" (from 1 to 4095), please select the maximum LLS-HD sensor reading. The default value is 4095.

The "Minimum indication value" (from 0 to 1023), please select the minimum LLS-HD sensor reading. The default value is 0.

In the "Filtering" section select the parameters for input signal filtering:

- "No", the filtering is off. It is used in cases when the filtering is performed with the external device.
- "Minimum" filtration is used in cases, when the sensor is installed in stationary fuel tanks.
- "Medium" filtering is used when the vehicle operates under normal road conditions.
- "Maximum" filtering is used when the vehicle operates under tough road conditions.

The "Automatic data output", please select accordingly:

- “No” means that automatic data output (without request) is not performed.
- “Binary” means automatic output of data in binary format.
- “Character-coded” means automatic output of data in character-coded format.

“Data output interval” (from 1 to 255 sec), please select the interval of automatic data output.

“Tough road conditions”, please turn on if additional filtering of values is required, taking in account tough road conditions.

“Baud rate”, select a speed at which the data transmission with the external device will be performed. The default value is 19 200 bit/sec.

Installation and connection

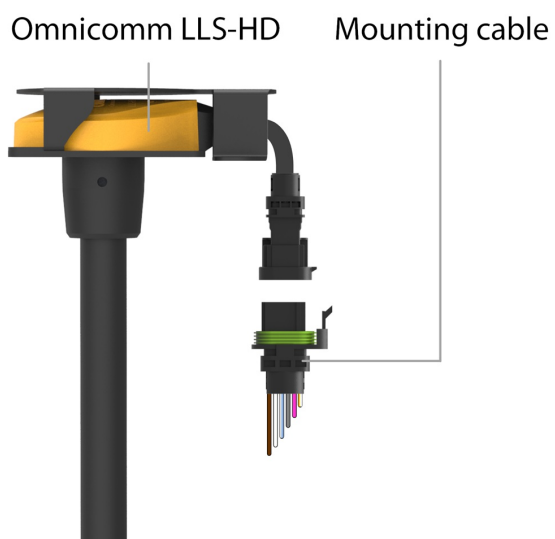
Put a gasket on the probe of Omnicomm LLS-HD for the place of installation. Install the Omnicomm LLS-HD sensor in the fuel tank. Put the protective cover on.

Fasten the Omnicomm LLS-HD sensor:

- When fastening with rivets, use the riveter.
- When fastening with bolts, first put on the security seal on one bolt, spring washer and flat washer.
- When fastening on plastic fuel tanks with wall thickness over 3 mm, use self-tapping screws and a security seal (for one selftapping screw) included in the installation kit.

Connect the product according to the diagram:

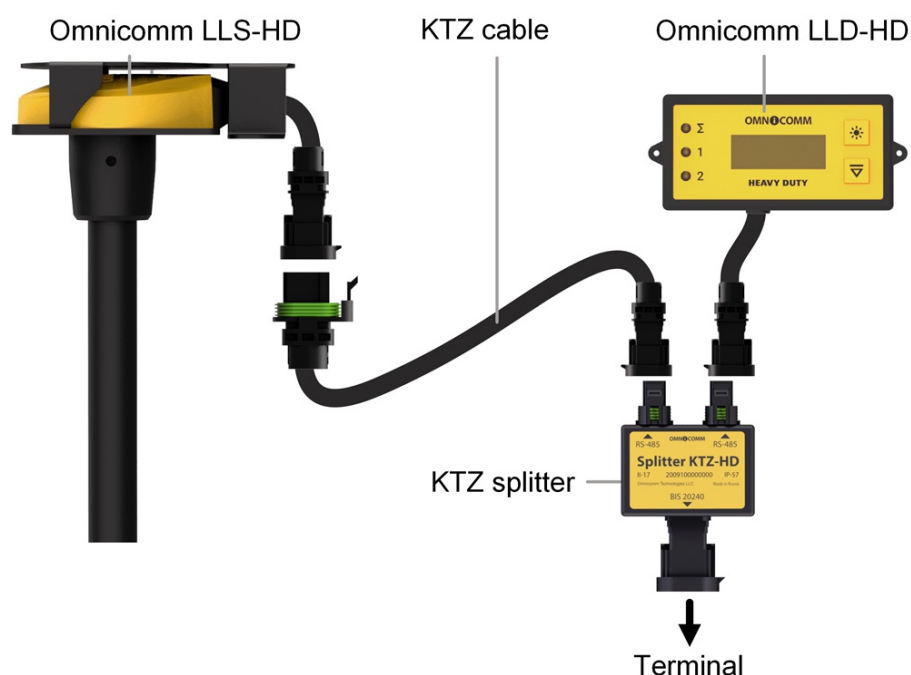
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Wiring diagram:

Pin name	Wire colour
RS-485 A	Orange-white
RS-485 B	Blue-white
RS-232 Tx	Pink
RS-232 Rx	Grey
+PWR	Brown
Ground	White

Connection of Omnicomm LLS-HD sensor with Omnicomm LLD-HD display shall performed in accordance with the diagram:



Fuel tank calibration

Fuel tank calibration process intended for the creation of calibration table, which provides the mapping of LLS-HD fuel level code to the volume.

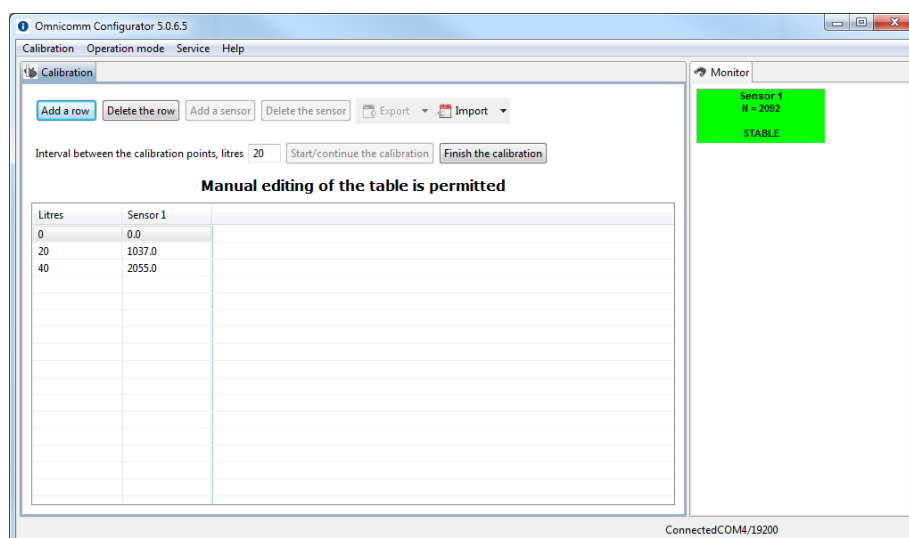
The fuel tank calibration process is the step-by-step fuel tank refueling from “Empty” up to the “Full”, with predefined amount of fuel for each step, and fixing the mapping between the level code and volume in the calibration table.

It's also possible to change this process and calibrate with draining from “Full” to “Empty”.

Fuel tank calibration with single LLS-HD installed:

1. Empty the fuel tank.
2. Connect the LLS-HD to the PC with Omnicomm USB-USB adapter according the scheme ([Setting up](#)).
3. Start the Omnicomm Configurator. Choose the “Fuel tank calibration” in the “Operation mode” menu.
4. In case if “Sensor 1” column not displayed, press the “Add a sensor” button. Select the sensor type. Select the “Sensor network address” set during the initial setup.

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5. Set the "Interval between the calibration points" in litres.

Conduct refueling with gauge tank or with fuel flow counter with predefined volume for each step.

6. Press "Start/continue the calibration" button.
7. Add the fuel in amount of "Interval between calibration points".
8. Press "Add a row" button.

The amount of fuel will be displayed in the “Litres” column.

The measured level will be displayed in the "Sensor 1" column.

9. Press "Add a row" button.
10. Repeat steps 7,8 and 9 until the fuel tank will be full. Omnicomm recommends the minimum of 20 steps for fuel tank calibration.
11. Press "Fimish the calibration" button.
12. Save the calibration table into the fuel tank calibration file (.ctb) / Omnicomm Online (.xml) / Terminal or LLS-HD with "Export" button.

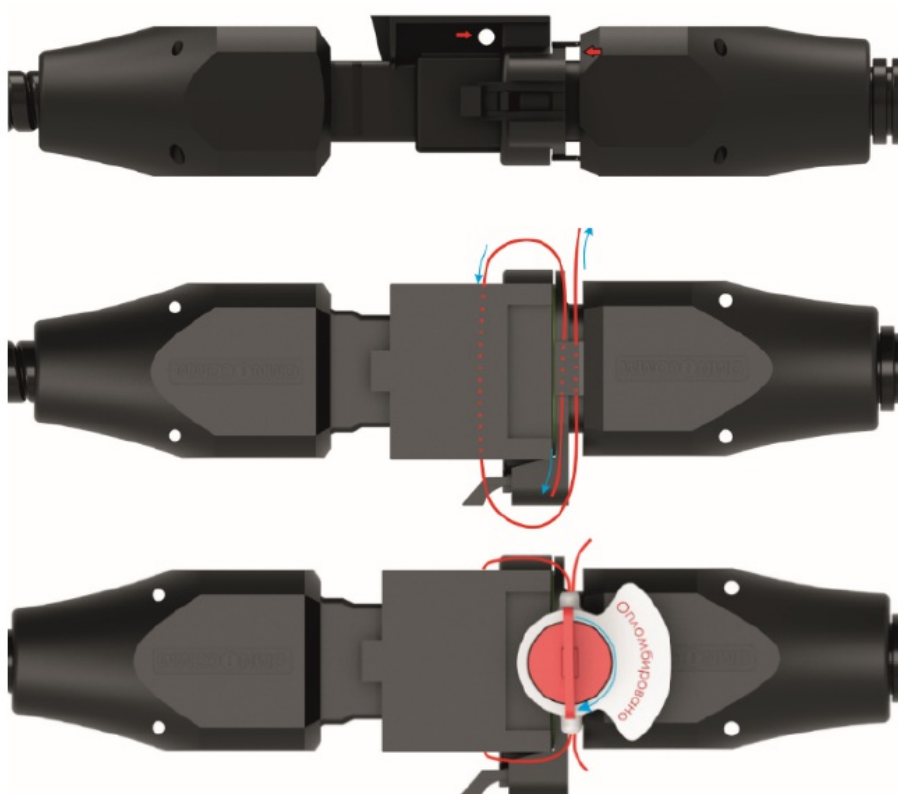
In case if fuel tank has more than one LLS-HD installed, proceed the calibration procedure the same way as for single LLS-HD, but all sensors need to be added into the Omnicomm configurator before calibration start. Fuel tank calibration will be done for all installed sensors simultaneously. Multiply LLS-HD can be connected to the PC at the same time with KTZ-splitter.

Sealing

1. Tighten the bolt or screw through the hole in the security seal:



2. Press the security seal cap to make it snap shut.
3. Enter the security seal/cap numbers into the installation log.
4. Install the rotary seal on the connector (not included to Installation kit):



Appendix. List of required equipment

№	Name	Number
1	Bimetal hole saw $\varnothing 35$ mm	1
2	Shank for the hole saw	1
3	Metal drill $\varnothing 7$ mm or $\varnothing 4$ mm	1
4	Hacksaw	1
5	Wrench 8 mm	1
6	Screw tap M5 with the holder	1
7	Rotor seal	2
8	Sealing wire $\varnothing 0.7$ mm	up to 0.8 m
9	Personal computer	1
10	Omnicom Configurator Software	1
11	USB adapter Omnicomm USB-USB (или UNU)	1
12	D.C. Power supply unit 10–15 V, 0.5 A	1
13	Measuring tank	1
14	Fuel	

Appendix. List of required equipment

№	Name	Number
15	Tank for calibration	1

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