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DIAGNOSTIC INSTRUCTION FOR FUEL LEVEL SENSORS

OMNICOMM

CONTENT

INTRODUCTION

This document is intended for the diagnosis of fuel level sensors Omnicomm. It covers diagnostic methods and the sequence of steps for completing the Diagnostic Report.

Before starting the diagnostics, it is necessary to inspect the fuel level sensors Omnicomm for the absence of mechanical damage and signs of chemical exposure. The housing, connecting cable, and connector must be free from damage and oxidation.

1. DIAGNOSTIC EQUIPMENT

For diagnosing fuel level sensors Omnicomm, the following equipment is required:

- Multimeter capable of measuring voltage, current, and resistance.
- Power supply: a 12 V DC source with a current capacity of 1 to 3 A, or a laboratory (adjustable) DC power supply with voltage range 0–30 V and current up to 3 A.

Each type of diagnostic equipment must have a valid certificate of conformity and a calibration certificate to ensure accuracy and safety during measurements.

These requirements align with standard procedures and official documentation for fuel level sensors Omnicomm, ensuring reliable diagnostics and accurate assessment of sensor performance. Proper certified equipment helps prevent damage to sensors and guarantees measurement precision during troubleshooting and commissioning.

2. GENERAL RECOMMENDATIONS

Before starting diagnostics, it is recommended to carefully read the instructions and follow the provided information to prevent measurement errors and avoid damage to the fuel level sensors Omnicomm.

Special Control Points During Diagnostics:

1. The color coding of the connecting wires differs for all types of fuel level sensors Omnicomm. To avoid connection errors during diagnosis, use the mounting cable included in the supply kit for fuel level sensors Omnicomm LLS4 and/or LLS 5.
2. Do not allow uninsulated connecting wires to short-circuit each other during diagnosis to prevent short circuits and damage to the fuel level sensors Omnicomm.
3. Unused connecting wires during diagnosis must be insulated to avoid short circuits and damage to the sensor.
4. For accurate measurements, ensure a reliable contact of connecting wires with diagnostic equipment.
5. When connecting and/or joining wires, it is recommended to use electrical terminals (quick-release connectors).
6. All measurements should be performed:
    - For fuel level sensors Omnicomm LLS 4, LLS-AF 4, and LLS 5 relative to the white wire (power minus).
    - For fuel level sensor Omnicomm LLS-Ex 5 relative to the gray wire (power minus).
7. When measuring resistance, the power supply (positive) to the fuel level sensors Omnicomm must be disconnected.
8. The fuel level sensor Omnicomm LLS-Ex 5 sensor must be connected only through the Spark protection unit Omnicomm BIS-MX.

This guidance ensures safe and correct diagnostics, prevents damage to sensors, and guarantees reliable measurement results.

3. DESIGNATION OF PINS IN THE CONNECTORS OF FUEL LEVEL SENSORS OMNICOMM

This pinout applies for models such as fuel level sensors Omnicomm LLS4, LLS 5, LLS-AF 4, and LLS-Ex 5, facilitating power supply and digital communication over the RS-485 interface with external devices like Indicator fuel volume Omnicomm LLD or data GPS trackers.

Additional signals such as RS-232 Tx (pink) and Rx (gray) lines exist in some variants but are less commonly used for standard fuel level sensor Omnicomm integration. The power supply voltage range is typically 7 to 50 V DC depending on sensor model.

This pin assignment ensures proper connection, enabling accurate and stable fuel level measurement and data transmission in fleet monitoring systems.

The pin designations and functions for the connectors of fuel level sensors Omnicomm are generally as follows:

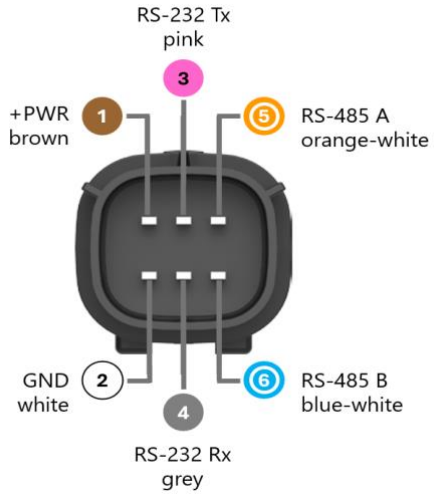
Pin Name	Wire Color	Function
Power Supply +V	Brown	Positive power supply input (typically 7–80 V DC depending on sensor model)
Ground (Power -)	White (or Gray*)	Negative power supply (ground); white for most models, gray for LLS-Ex 5 explosion-proof models
RS-485 A	Orange-white	RS-485 interface line A (Data +) for digital communication with monitoring equipment
RS-485 B	White-blue	RS-485 interface line B (Data -) for digital communication
RS-232 Tx*	Pink	Optional RS-232 transmit line in some sensor variants
RS-232 Rx*	Gray	Optional RS-232 receive line in some sensor variants

* RS-232 lines are not present or used in all fuel level sensor Omnicomm models and are less common compared to RS-485 interface.
These fuel level sensors Omnicomm communicate digitally over the RS-485 protocol with GPS trackers or indicators such as Omnicomm LLD, providing precise fuel level measurements with

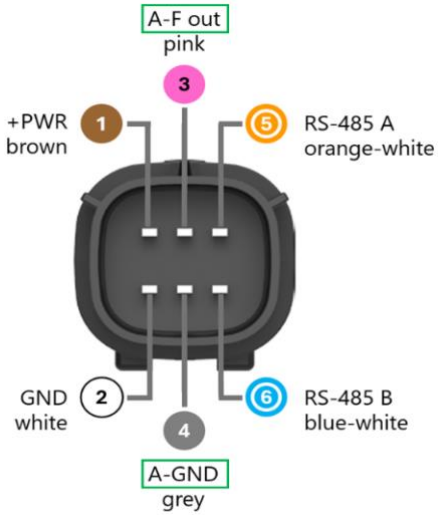
accuracies typically within ±1%. Power supply voltage ranges and pin functions may be slightly different for specialized models like explosion-proof fuel level sensors Omnicomm LLS-Ex 5 sensors, which use a gray wire as ground and require intrinsic safety barriers during connection.

The exact color coding and pin assignments should always be verified with the specific sensor's user manual or wiring diagram to avoid misconnection and damage.

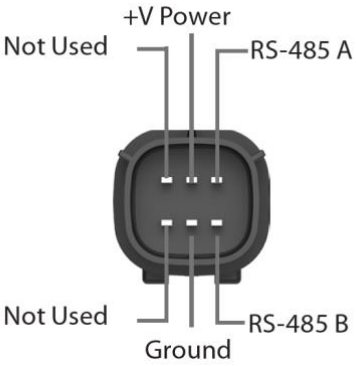
This pinout enables powering the fuel level sensors Omnicomm and establishing reliable digital communication for fuel level sensors Omnicomm monitoring in vehicles, stationary tanks, and diesel generators.



Fuel level sensors fuel level sensors Omnicomm 4/LLS 5 (Digital)



Fuel level sensors Omnicomm LLS4-AF 4 (Analog)



Fuel level sensor Omnicomm LLS5-Ex 5 (Explosion-proof)

4. MEASUREMENT OF CONTROL POINTS OF THE FUEL LEVEL SENSORS OMNICOMM

Measurement of control points of the fuel level sensors Omnicomm involves verifying key operational parameters to ensure sensor accuracy and reliability.

The typical control points include:

- Power Supply Voltage: Confirm the sensor is powered within its specified voltage range, generally from 7 to 75 V DC depending on the model.
- Signal Interface Integrity: Measure the resistance and continuity on the RS-485 interface lines (usually labeled RS-485 A and RS-485 B) to ensure proper digital communication with connected monitoring devices.
- Fuel level sensors Omnicomm Output Response: Check the digital output values over RS-232 or RS-485 to verify correct level readings correspond to actual fuel levels. The fuel level sensors Omnicomm provide a digital code range (e.g., 0 to 4095) proportional to the measured fuel height.
- Intrinsic Safety Compliance: For explosion-proof models (Fuel level sensors Omnicomm LLS-Ex 5), ensure proper connection through the Spark protection unit Omnicomm BIS-MX to prevent hazards in explosive environments.

Undertaking measurements at these control points ensures the fuel level sensors Omnicomm operates within specifications, providing accurate and reliable real-time fuel level data for fleet management and tank monitoring applications.

4.1 Power Supply Voltage Check of the fuel level sensors Omnicomm

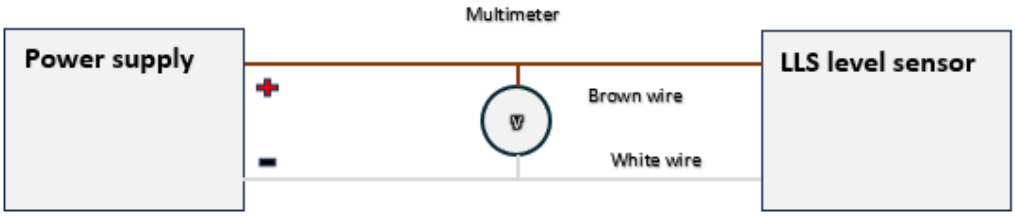


Fig. 1 Connection Diagram

1. Set the power supply voltage to 12 Volts.
2. Switch the multimeter to voltage measurement mode (range 20 Volts).
3. Assemble the connection circuit according to «Fig. 1 Connection Diagram»
4. Connect the brown wire (+ power supply) of the fuel level sensors Omnicomm to the positive GPS tracker of the power supply.
5. Connect the white wire (– power supply) of the Fuel level sensor to the negative GPS tracker of the power supply.
6. Turn on the power supply.
7. Verify with the multimeter reading that the sensor power supply voltage is present and matches the voltage set on the power supply.
8. Record the multimeter readings in the Diagnostic Report under the item: «Power Supply Voltage»

This procedure ensures proper powering of the fuel level sensors Omnicomm and is a fundamental step in the diagnostic process to confirm that the fuel level sensors Omnicomm receives the correct voltage for normal operation. The typical supply voltage range for fuel level sensors Omnicomm is from 7 to 75 V DC depending on the model.

Summary for power supply voltage check:

Sensor Model	Power Supply Voltage (V DC)	Power Consumption (W)	Notes
Fuel level sensors Omnicomm Standard	7 – 75	~0.4	Typical universal sensor
Fuel level sensors Omnicomm LLS-AF (analog-frequency)	7 – 45	0.6 max	Includes analog and frequency outputs
Fuel level sensors Omnicomm 3 Series	7 – 50	0.4 max	Used in multiple implementations

4.2 Current Consumption Check of the fuel level sensors Omnicomm

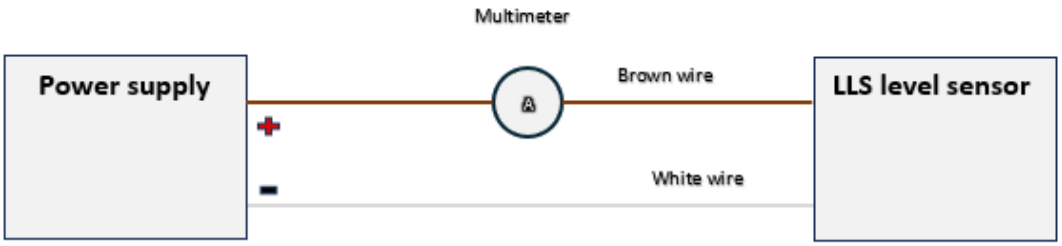


Fig. 2 Connection Diagram

1. Set the power supply voltage to 12 volts.
2. Switch the multimeter to current measurement mode, using the 10 A range.
3. Assemble the connection circuit according to "Fig.2 Connection Diagram."
4. Connect the brown wire (+ power supply) of the fuel level sensors Omnicomm to the positive GPS tracker of the power supply through the ammeter (multimeter).
5. Connect the white wire (- power supply) of the fuel level sensors Omnicomm to the negative GPS tracker of the power supply.
6. Turn on the power supply.
7. Check the multimeter reading to ensure there is no short circuit in the fuel level sensors Omnicomm power supply.
8. If the sensor's current consumption does not exceed 100 mA, switch the multimeter to the mA current measurement mode.
9. Record the multimeter reading in the Diagnostic Report under the item: "Current consumption at 12 V".

This procedure ensures safe and accurate verification of the fuel level sensors Omnicomm current draw, which should typically be under 40–60 mA depending on the sensor model.

Summary Table:

Sensor Model	Max Current Consumption (mA)	Power Consumption (W)	Supply Voltage (V DC)
fuel level sensors Omnicomm 3	40	0.4	7 – 50
Omnicomm LLS-AF 4	80	0.6 – 0.9	7 – 45
fuel level sensors Omnicomm 5	40	0.4	7 – 75

4.3 Measurement of the Power Supply Circuit Resistance of the fuel level sensors Omnicomm

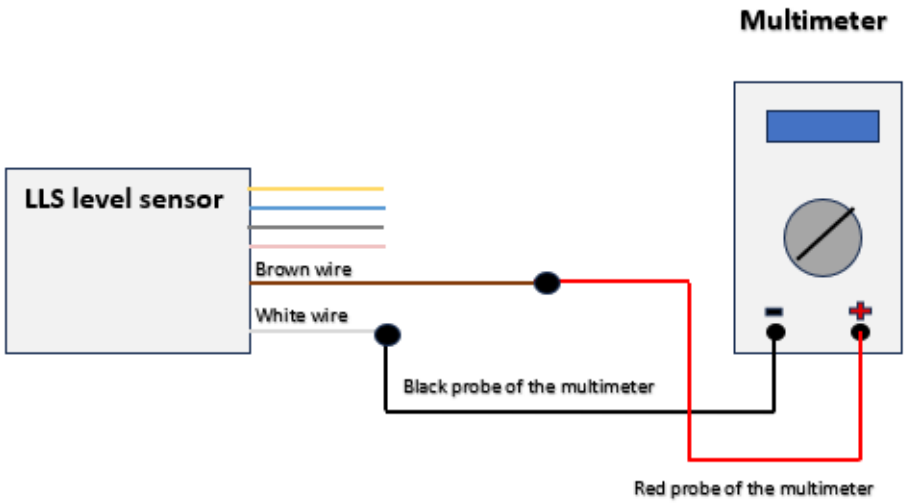


Fig. 3 Connection Diagram

1. Set the multimeter to resistance measurement mode with a range of 10 mΩ.
2. Assemble the connection circuit according to «Fig.3 Connection Diagram»
3. Connect the brown wire of the fuel level sensors Omnicomm to the red probe of the multimeter.
4. Connect the white wire of the fuel level sensors Omnicomm to the black probe of the multimeter.
5. Record the multimeter reading in the Diagnostic Report under the section: «Power Supply Positive (+) »

This procedure allows assessment of the wiring resistance in the fuel level sensors Omnicomm power circuit to verify the absence of faults such as breaks or poor contacts. Typical internal pull-up resistance to the supply positive is approximately 1500 Ω for fuel level sensors Omnicomm.

4.4 Measurement of the resistance of the RS 485A interface line of the fuel level sensors Omnicomm

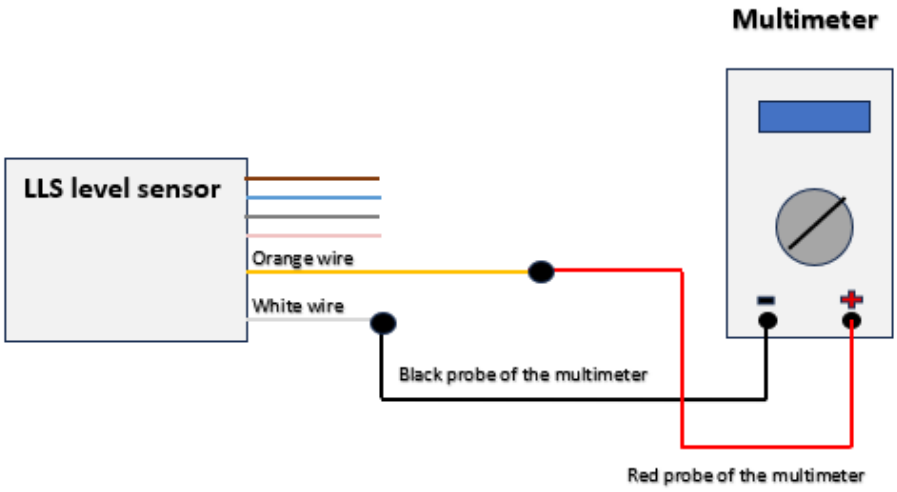


Fig. 4 Connection Diagram

1. Set the multimeter to resistance measurement mode with a range of 10 mΩ.
2. Assemble the connection circuit according to «Fig.4 Connection Diagram»
3. Connect the orange wire of the fuel level sensors Omnicomm to the red probe of the multimeter.
4. Connect the white wire of the fuel level sensors Omnicomm to the black probe of the multimeter.
5. Record the multimeter reading in the Diagnostic Report under the section: «RS 485A»

4.5 Measurement of the RS-485 interface line resistance of the fuel level sensors Omnicomm

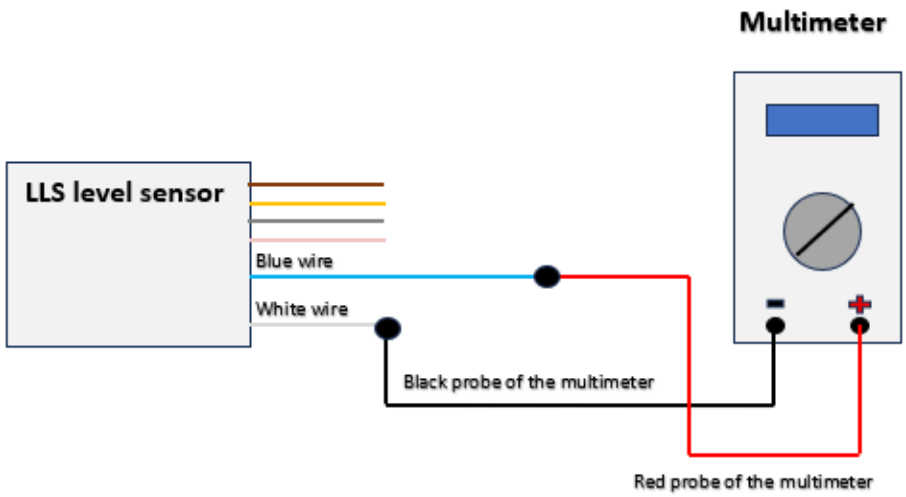


Fig. 5 Connection Diagram

1. Switch the multimeter to resistance measurement mode (range 10 mΩ).
2. Assemble the connection circuit according to "Fig. 5 Connection Diagram".
3. Connect the blue wire of the fuel level sensors Omnicomm to the red wire of the multimeter.
4. Connect the white wire of the fuel level sensors Omnicomm to the black wire of the multimeter.
5. Record the multimeter readings in the Diagnostic Report under the item: "RS 485B".

4.6 Measurement of the resistance of the RS 232Tx interface line of the fuel level sensors Omnicomm

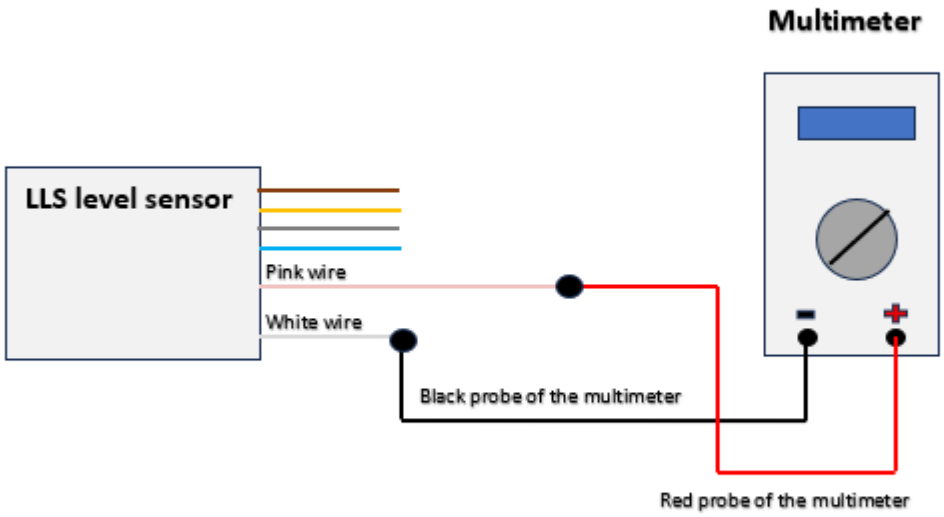


Fig. 6 Connection Diagram

1. Switch the multimeter to resistance measurement mode (range 10 mΩ).
2. Assemble the connection circuit according to "Fig. 6 Connection Diagram".
3. Connect the pink wire of the fuel level sensors Omnicomm to the red wire of the multimeter.
4. Connect the white wire of the fuel level sensors Omnicomm to the black wire of the multimeter.
5. Record the multimeter readings in the Diagnostic Report under the item: "RS 232Tx".

4.7 Measurement of the resistance of the RS 232Rx interface line of the fuel level sensors Omnicomm LLS 4 and/or LLS 5

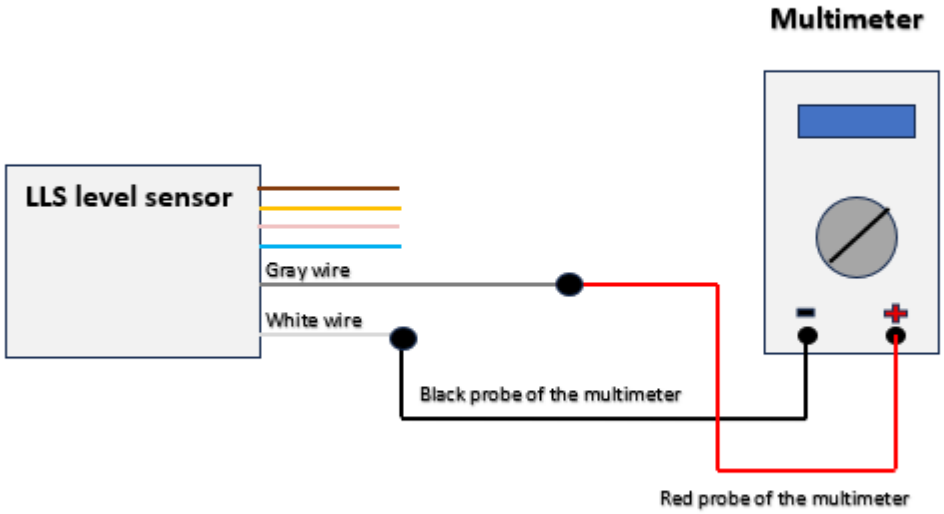


Fig. 7 Connection Diagram

1. Switch the multimeter to resistance measurement mode (range 10 mΩ).
2. Assemble the connection circuit according to "Fig. 7 Connection Diagram".
3. Connect the gray wire of the fuel level sensors Omnicomm LLS 4 and/or LLS 5 to the red wire of the multimeter.
4. Connect the white wire of the fuel level sensors Omnicomm LLS 4 and/or LLS 5 to the black wire of the multimeter.
5. Record the multimeter readings in the Diagnostic Report under the item: "RS 232Rx".

4.8 Measurement of the voltage at the output of the fuel level sensor Omnicomm LLS-AF 4

Attention!
Wire colors in the connection diagram should be used as a guide only when connecting the installation cable from the supply kit of fuel level sensors Omnicomm LLS 4 and/or LLS 5.

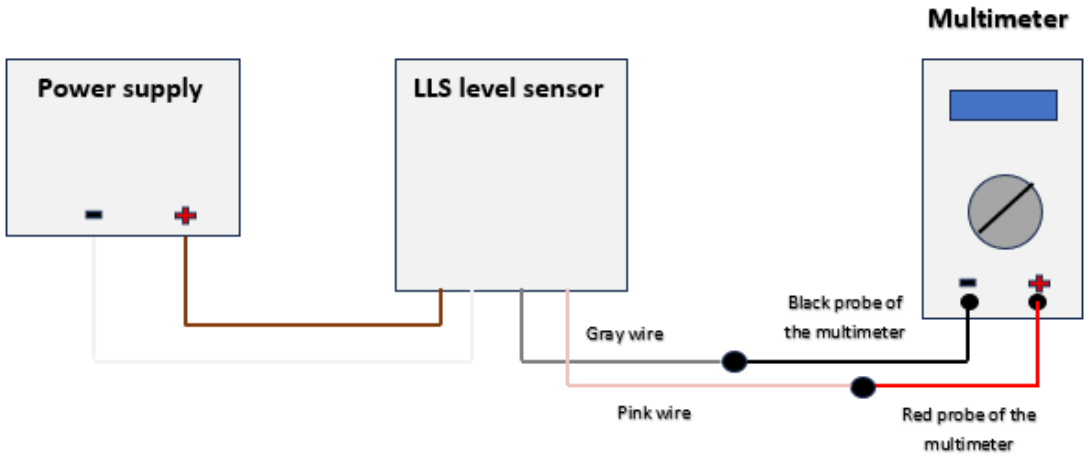


Fig. 8 Connection Diagram

1. Switch the multimeter to voltage measurement mode (range 200 Volts).
2. Assemble the connection circuit according to "Fig. 8 Connection Diagram".
3. Connect the pink wire of the fuel level sensors Omnicomm LLS-AF 4 to the red (positive) wire of the multimeter.
4. Connect the gray wire of the fuel level sensor Omnicomm LLS-AF 4 to the black (common) wire of the multimeter.
5. Connect the brown wire (+ power supply) of the fuel level sensor Omnicomm LLS-AF 4 to the positive GPS tracker of the power supply.
6. Connect the white wire (- power supply) of the fuel level sensor Omnicomm LLS-AF 4 to the negative GPS tracker of the power supply.
7. Turn on the power supply.
8. Record the multimeter readings in the Diagnostic Report under the item: "Voltage at analog output set/measured".
9. Without changing the position of the fuel level sensor Omnicomm LLS-AF 4 and the connection circuit, connect the fuel level sensor Omnicomm LLS-AF 4 through the USB adapter Omnicomm UNU-USB to the Omnicomm Configurator (Version 6).
10. Record the voltage displayed in the Omnicomm Configurator in the Diagnostic Report under the item: "Voltage at analog output set/measured".

4.9 Measurement of the resistance of the power supply circuit of the fuel level sensor Omnicomm LLS-Ex 5

Attention!
Wire colors in the connection diagram should be used as a guide only when connecting the installation cable from the supply kit of fuel level sensors Omnicomm LLS 4 and/or LLS 5.

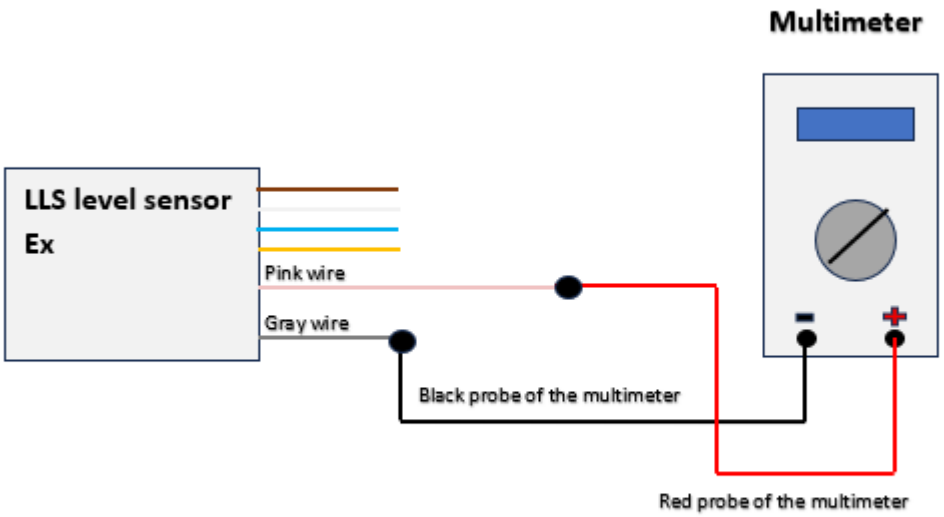


Fig. 9 Connection Diagram

1. Switch the multimeter to the resistance measurement mode (range 10 mΩ).
2. Assemble the connection circuit according to "Fig. 9 Connection Diagram".
3. Connect the pink wire of the fuel level sensor Omnicomm LLS-Ex 5 to the red wire of the multimeter.
4. Connect the gray wire of the fuel level sensor Omnicomm LLS-Ex 5 to the black wire of the multimeter.
5. Record the multimeter readings in the Diagnostic Report under the item: "Power supply plus".

4.10 Measurement of the resistance of the power supply circuit of the fuel level sensor Omnicomm LLS-Ex 5

Attention!
Wire colors in the connection diagram should be used as a guide only when connecting the installation cable from the supply kit of fuel level sensors Omnicomm LLS 4 and/or LLS 5.

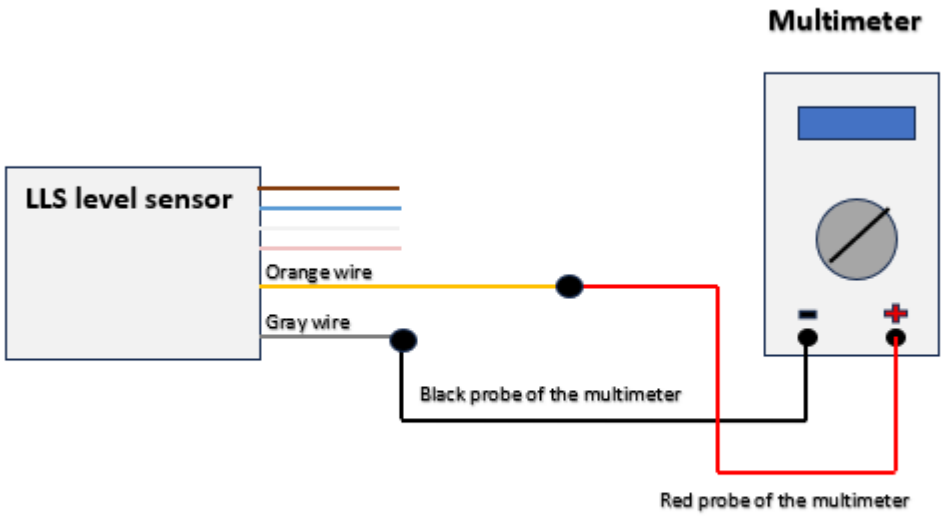


Fig. 10 Connection Diagram

1. Switch the multimeter to resistance measurement mode (range 10 mΩ).
2. Assemble the connection circuit according to "Fig. 10 Connection Diagram".
3. Connect the orange wire of the fuel level sensor Omnicomm LLS-Ex 5 to the red wire of the multimeter.
4. Connect the gray wire of the fuel level sensor Omnicomm LLS-Ex 5 to the black wire of the multimeter.
5. Record the multimeter readings in the Diagnostic Report under the item: "RS 485A".

4.11 Measurement of the resistance of the RS 485B interface line of the fuel level sensor Omnicomm LLS-Ex 5

Attention!
Wire colors in the connection diagram should be used as a guide only when connecting the installation cable from the supply kit of fuel level sensors Omnicomm LLS 4 and/or LLS 5.

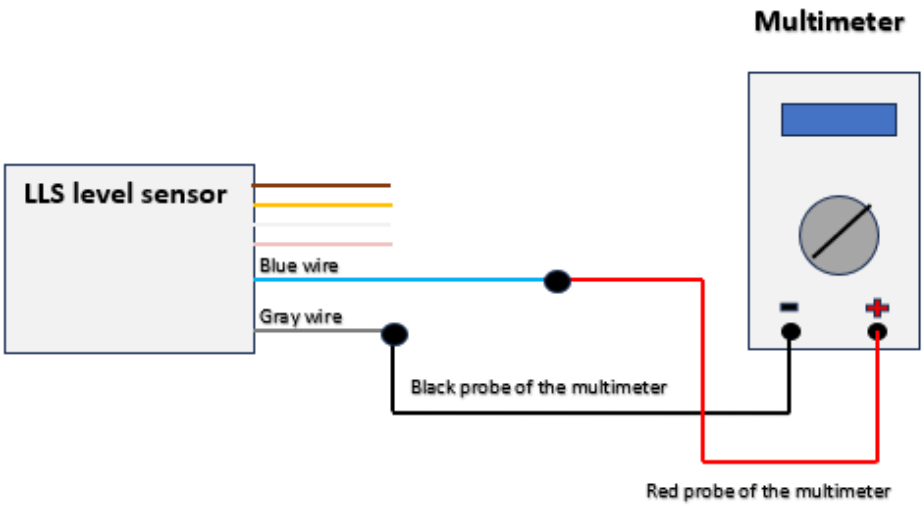


Fig. 11 Connection Diagram

1. Switch the multimeter to resistance measurement mode (range 10 mΩ).
2. Assemble the connection circuit according to "Fig. 11 Connection Diagram".
3. Connect the blue wire of the fuel level sensor Omnicomm LLS-Ex 5 to the red wire of the multimeter.
4. Connect the gray wire of the fuel level sensor Omnicomm LLS-Ex 5 to the black wire of the multimeter.
5. Record the multimeter readings in the Diagnostic Report under the item: "RS 485B".

4.12 Measurement of the resistance of the probe of the fuel level sensors Omnicomm

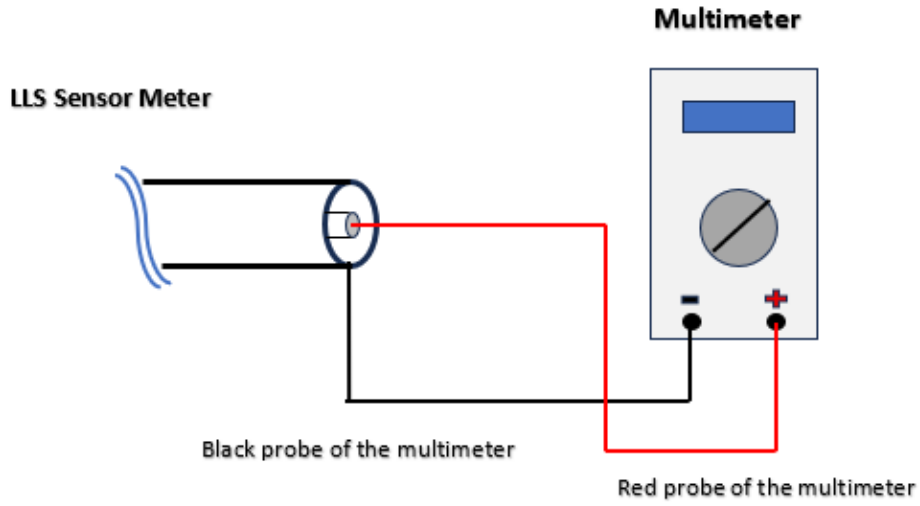


Fig. 12 Connection Diagram

1. Switch the multimeter to resistance measurement mode (range 10 mΩ).
2. Assemble the connection circuit according to "Fig. 12 Connection Diagram".
3. Connect the red wire of the multimeter to the probe rod of the fuel level sensors Omnicomm (to the bare end of the rod, not covered by paint).
4. Connect the black wire of the multimeter to the tube of the fuel level sensors Omnicomm (to the bare section of the tube, not covered by paint).
5. Record the multimeter readings in the Diagnostic Report under the item: "R of the probe".