



# Fuel level sensor Omnicom LLS

Integration manual  
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# Fuel level sensor Omnicomm LLS. Integration manual

## General information

Integration manual contains guidelines on integration of Omnicomm LLS fuel level sensors into the systems of monitoring and control of transport of different manufacturers (the external devices).

## Description of Omnicomm fuel level sensor

Information exchange with the sensor is performed via interface RS-232 or RS-485. The sensor supports exchange speed from 1200 to 115200 bit/sec. Default value is 19200 bit/sec.

Omnicomm LLS sensor can work in two modes:

1. In the slave mode Omnicomm LLS sensor responds to all requests from the master device in the network. Each Omnicomm LLS sensor in the network shall be assigned with a network address

To switch on slave mode on Omnicomm Configurator, set the following parameters:

- Automatic data output — no
- Network addresses of Omnicomm LLS fuel level sensors

2. The master mode can be used only if one LLS sensor is connected to the external device. In this mode the sensor without request from the external device sends package with data on measured level of fuel and temperature

To switch on master mode on Omnicomm Configurator set the following parameters:

- Automatic data output — binary or character-coded
- Data output interval

## Requirements to the external device

External device shall have a continuous interface RS-485 or RS-232 and support Omnicomm LLS protocol.

## Description of exchange protocol

# Description of exchange protocol

The protocol supports two types of exchange protocol: binary (HEX) and character view (transmission of ASCII sequences). It is recommended to use binary exchange protocol.

After the power is supplied to Omnicomm LLS fuel level sensor and before the first command of the request it is required to wait for at least 100 ms.

When working with Omnicomm LLS being in the slave mode, after sending the request command it is required to wait for the response from the sensor. The time of response delay depends on exchange speed and type of exchange protocol (100 ms maximum).

The data between the sensor and external device are transferred in the form of messages (bytes packages). The transmission of each byte begins with the START bit and terminates with the STOP bit:

The data are transmitted with a lower byte ahead.

The time interval between consecutive bytes in the packet ( $T_T$ ) must be either shorter than the duration of a 35-bit transmission or less than 1 ms (if the speed is 35/<1 ms).

$T_{byte}$  is time of transmission of one byte of information;

$T_t$  is an interval between the consecutive bytes in the packet.

The end bytes packet is when the following byte does not arrive during time ( $T_p$ ) exceeding maximum interval ( $T_t$ ) = 1 ms.

Description of commands of binary exchange protocol

## Format of messages for binary protocol

All the commands of the binary communication protocol have the same standardized format which is given in the Table:

Sequential number of the field	Field name	Field size, byte	Description
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## Description of exchange protocol

Sequential number of the field	Field name	Field size, byte	Description
1	Prefix	1	The field is a marker of the message beginning shall have prefix 31h, and an outgoing messages shall be displayed with 3Eh prefix by the program.
2	Network address	1	For prefix 31h specify the network address of the recipient For prefix 3Eh specify the network address of the sender
3	Operation code	1	For prefix 31h specify the code of operation which the program shall perform For Eh prefix specify the code of operation to which the response is given
4	Data	It depends on the operation code	Data composition and format of the field depends on the operation code
5	Checksum	1	The field is used to control over data integrity

## Single-stage reading of the data (command 06h)

The command is designed for reading of the current data: relative level, temperature, frequency. The data are transmitted with a lower byte ahead.

Command format:

## Description of exchange protocol

Offset, bytes	Field size, bytes	Value	Description
0	1	31h	Prefix
+1	1	00h..FFh	Network address of the recipient
+2	1	06h	Operation code
+3	1	00h..FFh	The checksum

Response format:

Offset, bytes	Field size, bytes	Value	Description
0	1	3Eh	Prefix
+1	1	00h..FFh	Network address of recipient
+2	1	06h	Operation code
+3	1	-128...127	Temperature in in degrees Celsius
+4	2	0000h...FFFFh	Relative level
+6	2	0000h...FFFFh	Frequency value
+8	1	00h..FFh	Checksum

## Periodic output of data (command 07h)

Command is designed to switch on periodic data output.

After the command is processed, the sensor starts sending data periodically — level,

## Description of exchange protocol

temperature, and frequency — with the time interval prescribed by the 13h command.

Turning off of the periodic data output is performed after receipt of any true command, reset of the processor or disconnection of power power supply (if the data output mode is not installed by default).

Command format:

Offset, bytes	Field size, bytes	Value	Description
0	1	31h	Prefix
+1	1	00h..FFh	The Network address of the sender
+2	1	07h	Operation code
+3	1	00h..FFh	Checksum

Response format:

Offset, bytes	Field size, bytes	Value	Description
0	1	3Eh	Prefix
+1	1	00h..FFh	Network address of recipient
+2	1	07h	Operation code
+3	1	00h	The command has been executed successfully
			The command cannot be executed
+4	1	00h..FFh	Checksum

## Description of exchange protocol

Periodic data output format:

Offset, bytes	Field size, bytes	Value	Description
0	1	3Eh	Prefix
+1	1	00h..FFh	The Network address of the sender
+2	1	07h	Operation code
+3	1	-128...127	Temperature in in degrees Celsius
+4	2	0000h...FFFFh	Relative level
+6	2	0000h...FFFFh	Frequency value
+8	1	00h..FFh	Checksum

## Adjustment of the periodic data output interval (13h command)

Command is designed to set up interval of periodic data output.

Command format:

Offset, bytes	Field size, bytes	Value	Description
0	1	31h	Prefix
+1	1	00h..FFh	Network address of the recipient
+2	1	13h	Operation code



### Default data output mode (command 17h)

Offset, bytes	Field size, bytes	Value	Description
+3	1	0...255	Interval of the data output in seconds
+4	1	00h..FFh	Checksum

Response format:

Offset, bytes	Field size, bytes	Value	Description
0	1	3Eh	Prefix
+1	1	00h..FFh	The Network address of the sender
+2	1	13h	Operation code
+3	1	00h	The command has been executed successfully
+3	1	01h	The command cannot be executed
+4	1	00h..FFh	Checksum

## Default data output mode (command 17h)

This command determines the order of data output after the sensor is powered on or the processor is reset. After the power is on or the processor is reset, the program will send data periodically via the interface at the time interval prescribed by the 13h command.

Command format:

### Default data output mode (command 17h)

Offset, bytes	Field size, bytes	Value	Description
0	1	31h	Prefix
+1	1	00h..FFh	Network address of the recipient
+2	1	17h	Operation code
+3	1	00h	The command has been executed successfully
+3	1	01h	The data are output in binary form
+3	1	02h	The data are output in character-coded form
+4	1	00h..FFh	Checksum

Response format:

Offset, bytes	Field size, bytes	Value	Description
0	1	31h	Prefix
+1	1	00h..FFh	Network address of the recipient
+2	1	17h	Operation code
+3	1	00h	The command has been executed successfully
+3	1	01h	The command cannot be executed

### Setting the filtration rating (0Eh command)

Offset, bytes	Field size, bytes	Value	Description
+4	1	00h...FFh	Checksum

## Setting the filtration rating (0Eh command)

This command is intended to determine the value of the filter's length on Omnicomm LLS 30160 sensor.

Command format:

Offset, bytes	Field size, bytes	Value	Description
0	1	31h	Prefix
+1	1	00h..FFh	Network address of the recipient
+2	1	0Eh	Operation code
+3	1	00h	The command has been executed successfully
+3	1	from 0 to 20	The data are output in binary form
+3	1	02h	Filter length
+4	1	00h..FFh	Checksum

Response format:

Offset, bytes	Field size, bytes	Value	Description
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### Reading the history of changes to sensor's configuration settings (0Fh)

Offset, bytes	Field size, bytes	Value	Description
0	1	3Eh	Prefix
+1	1	00h..FFh	Network address of the recipient
+2	1	0Eh	Operation code
+3	1	00h	The command has been executed successfully
+3	1	01h	The command cannot be executed
+4	1	00h...FFh	Checksum

### Reading the history of changes to sensor's configuration settings (0Fh)

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