



RS485. Integration with SENS Measuring System

User Manual

Contents

Necessary Tools, Equipment and Materials	3
General Information	4
Connecting MS SENS Units to the Tracking Devices.....	6
Device Setting for Working with MS SENS Devices.....	7
Monitoring software set-up for receiving messages from SENS MS	9
APPENDIX N°1	10

Necessary Tools, Equipment and Materials

In order to connect Galileosky tracking device (hereinafter – tracking device) you should have:

1. Electrical-installation tools.
2. A set of connecting wire.
3. A computer with Windows-based operating system and an installed configuration program for Galileosky tracking devices– «Configurator». You can download it here <https://galileosky.com/podderzhka/programmyi.html>

General Information

Galileosky tracking devices of versions v.5.x, v.4.0, 7.0 and Base Block (hereinafter – tracking device) with RS485 interface have a function, that enables to work with devices of SENS measuring system (Picture 1).



Pic. 1

SENS Measuring System Units

SENS Measuring System (hereinafter – MS SENS) is designed to measure (control) the parameters of liquid and gaseous medium and automatize the technological processes in oil and gas, chemical, food and other industries.

MS SENS is used for:

- fiscal measurement of fuel in gas filling stations, oil depots;
- controlling the parameters of liquid and gaseous medium that are transported in oil tanks and tank containers, based on gas pipeline control system, petrol tanks, spirit tanks, sea and river crafts;
- technological control of the parameters of liquid and gaseous medium (oil products, food and chemical environment) in fixed tanks;
- emergency prevention, that is - tanks' overflow, pumps' running dry, leaks, increase in combustible gases concentration;
- automation of gas distribution stations and automated gas distribution stations

The description of MS SENS components and principles is presented at the manufacturer's site <http://www.nppsensor.ru/catalog/showproduct/1>.

Galileosky tracking device enables to set the parameters of the device and send them to the monitoring software. Such function is realized by means of algorithms.

RS485. Integration with SENS Measuring System.

ATTENTION! Such functionality is implemented in the tracking devices by means of Easy logic technology (<https://galileosky.com/products/easylogic.html>). It is necessary to use tracking devices with support of Easy Logic. You can find out whether the tracking device supports Easy Logic or not in the following ways:

- in tracking device's specification there should be abbreviation (AI) or sticker on the back of the device should have abbreviation (2) near IMEI (Pic.2).
- send Hardversion command to the tracking device, if you receive numbers different from zero after comma in response, algorithms are supported (example of reply: HARDVERSION=21,**8243**)



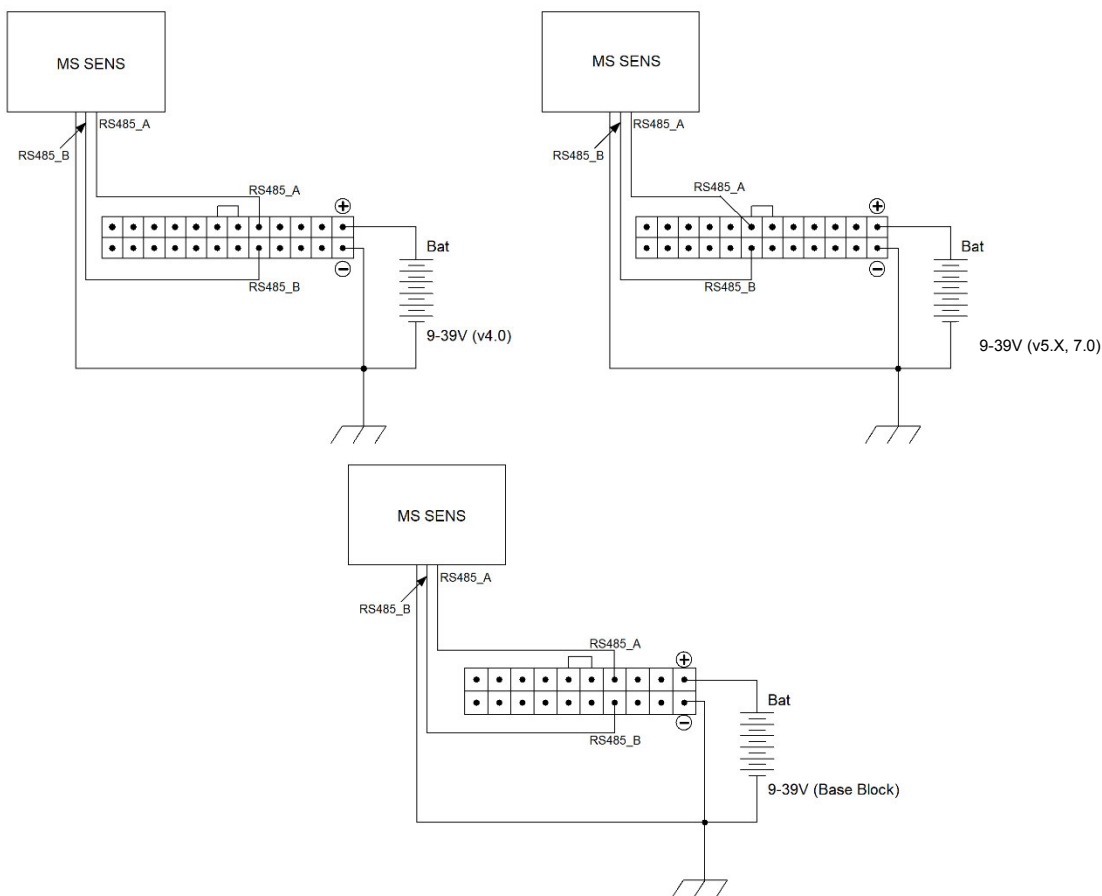
Pic. 2

Defining tracking device support of Easy Logic by the sticker

To work with MS SENS minimal firmware version for Galileosky v.5.X, v.4.0 tracking devices should be 229 or higher. Galileosky Base Block and 7.0 can cooperate with MS SENS with any firmware version installed.

Connecting MS SENS Units to the Tracking Devices

MS SENS devices are connected to the tracking device through an interface RS485, according to the schemes shown in Picture 3.



Pic. 3

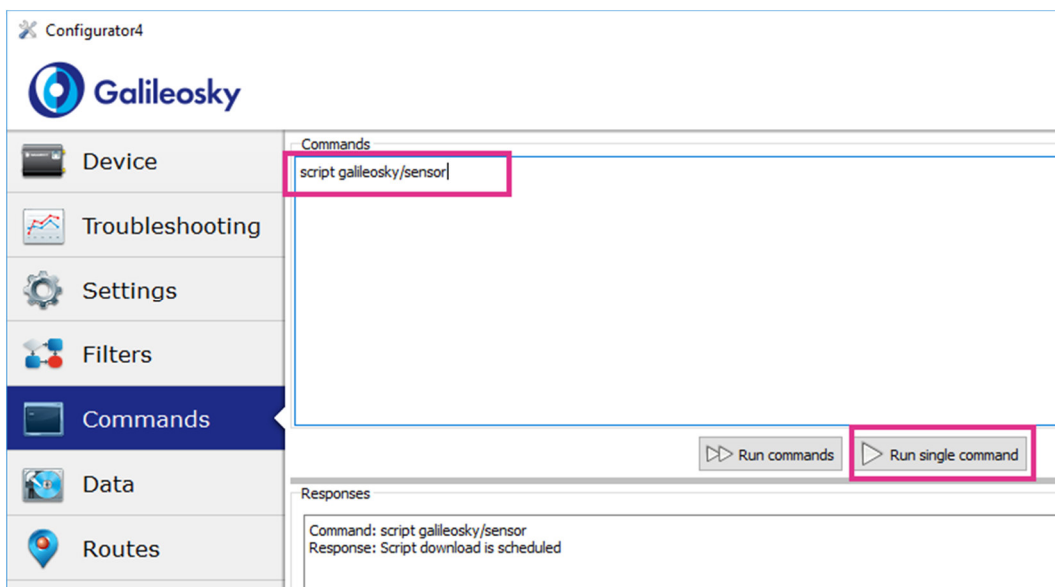
Scheme of Connecting MS SENS devices to the tracking device

ATTENTION! Tracking device grounds (GND) and MS SENS devices must be connected; power to the devices is served separately.

Device Setting for Working with MS SENS Devices

You can set Galileosky tracking device for working with MS SENS in the Configurator software in the following order:

1. Connect the tracking device to the computer via mini-USB cable and run «Configurator» software;
2. Make sure that the tracking device has an active sim-card inside, with access to the Internet through GPRS;
3. Go to the tab «Commands», enter "script galileosky/sensor" in the empty field and wait till the command is confirmed by the tracking device (Picture 4);

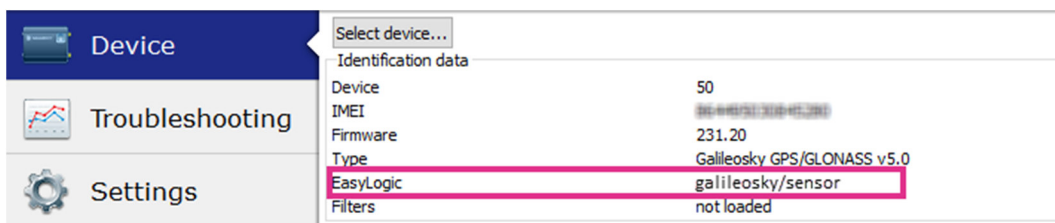


Pic. 4

Running the command

ATTENTION! Algorithm is downloaded from the server, that is why a SIM-card with established GPRS-connection should be installed in the tracking device.

4. go to Device tab and check the Easy Logic parameter and make sure it includes information on the algorithm (Pic. 5);

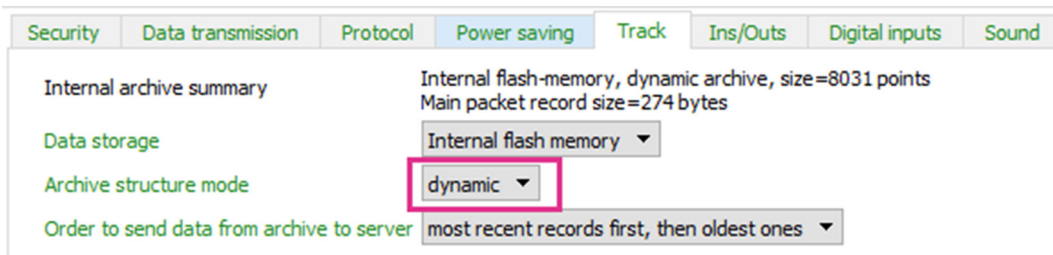


Pic. 5

Checking of algorithm downloading

5. Go to the tab «Settings → Track» and choose «Dynamic» in the field «Archive structure mode» (Picture 6);

RS485. Integration with SENS Measuring System.

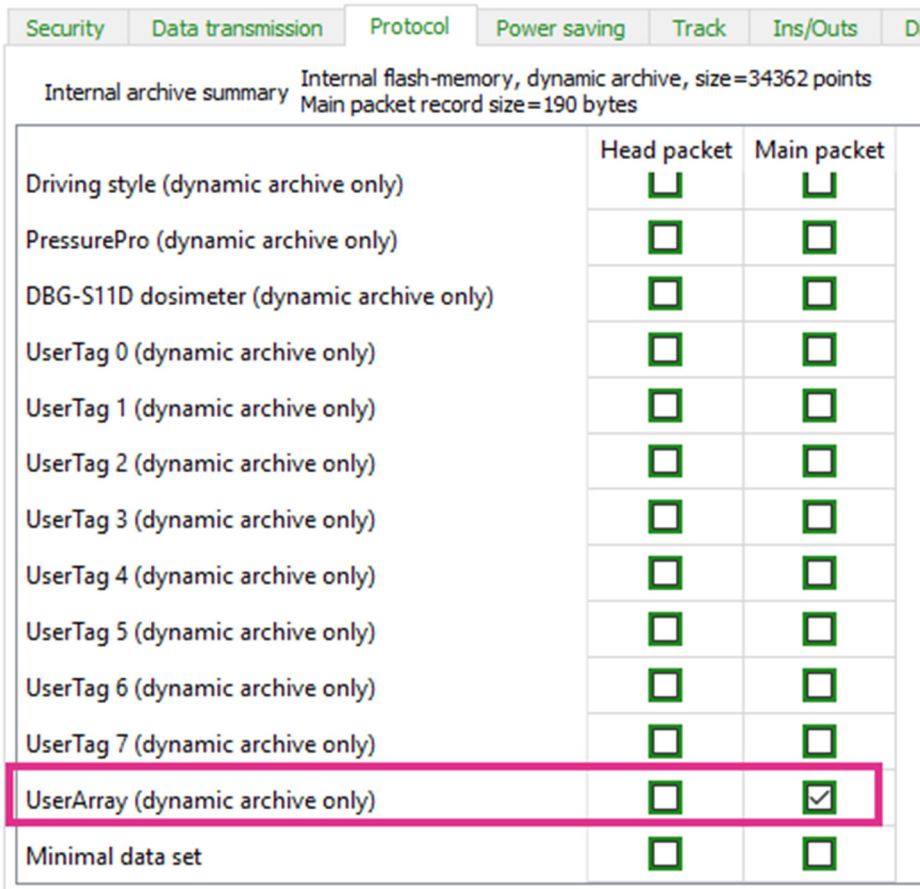


Pic. 6

Setting the internal archive structure

ATTENTION! For tracking devices Galileosky Base Block and 7.0 versions the setting of dynamic structure mode is not needed.

- Go to the tab «Settings -Protocol» and tick the option «User Array» of the main pack (Picture 6);



Pic. 7

Setting of the main pack

- Enter the settings in the tracking device by clicking «Apply» button.

Monitoring software set-up for receiving messages from SENS MS

Galileosky tracking device enables to fix and display the following SENS MS features:

0x01 : Liquid amount (PMP-118, PMP-128, PMP-201)

0x02 : Liquid temperature (PMP-118, PMP-128, PMP-201)

0x03 : Filling in percent (PMP-118, PMP-128, PMP-201)

0x04 : Liquid volume (PMP-118, PMP-128, PMP-201)

0x05 : Mass (PMP-118, PMP-128, PMP-201)

0x06 : Density (PMP-118, PMP-128, PMP-201)

0x07 : Basic product volume (PMP-128, PMP-201)

0x08 : Media division level (PMP-128, PMP-201)

0x09 : Pressure (SENS PD)

0x10 : Content, % of NKPR (SENS SG)

A tracking device can be connected to 31 devices with addresses from 1 to 31. Each device is scanned by the tracking device every 5 minutes. The device data are stored in the tracking device archive. The tracking device archive data are periodically transmitted to the monitoring software server.

So that the monitoring software could show the above-mentioned SENS MS features, it is necessary to activate the data parsing, that are sent in the tag «User Array» of Galileosky protocol. Data structure and description are shown in Appendix №1 of this instruction.

The connection of the SENS MS devices to the tracking device is completed; the tracking device is ready for use.

RSA "Galileosky", LLC produces satellite monitoring equipment for GPS and GLONASS real time vehicles monitoring. The tracking devices determine the mobile object location recording the time and route as points with geographical coordinates and send the data to the server to be further processed and sent to the traffic controller panel.

In addition, a number of other vehicle parameters are recorded: the state of analog and discrete inputs of the tracking device and the state of digital interfaces.

The tracking devices can be used in any vehicle.

APPENDIX Nº1

Structure and description of SENS MS data

Device parameters display

SENS MS device data are stored and transmitted in Galileosky protocol tag "User Array";

The data size can be:

- 43 bytes, if the data are relevant;
- 3 bytes, if the data are not relevant;

Stored data format (byte order – little-endian):

Field name	Size in bytes	Description
data_type	1	Data type: 0x04 – device data
device_address	1	Device address: From 1 to 31
data_state	1	Data state: 0 – there is no response from the device – <i>the data are irrelevant</i> 1 – response is received – <i>the data are relevant</i>
		Device parameters (40 bytes) (only if the data are relevant: data_state=1)
liquid_level	4	Liquid level, m
liquid_temperature	4	Liquid temperature, °C
filling	4	Filling, %
liquid_volume	4	Liquid volume, m ³
mass	4	Mass, t
density	4	Density, t/m ³
basic_volume	4	Basic volume, m ³
division_level	4	Medium division level, m
pressure	4	Pressure, standard units
content	4	Content, % of NKPR

Parameters format – 32-bit float (IEEE 754 32bit).

If the parameter is not measured yet, measured with error or is not supported by the device, all bits of the parameter value are set in "1" (0xFFFFFFFF).