

# **DATASHEET**

**GPS/GLONASS TRACKING EQUIPMENT**

**START S-4010 E, S-4010 SA, S-4011 E,  
S-4011 SA, S-4012 E, S-4012 SA,  
S-4013 E, S-4013 SA**



## Purpose of the System

START S-4010x, S-4011x, S-4012x и S-4013x devices (hereinafter SMART) manufactured by Navtelecom LLC, are GPS-GSM based vehicle tracking system with internal GLONASS/GPS- and LTE/GSM-antennas.

SMART system is designed for:

- vehicle monitoring: location, track, mileage, fuel consumption, engine hours;
- emergency informing about vehicle hijacking;
- emergency informing about attacks on the driver or passengers and other accidents;
- monitoring the temperature using wired and wireless temperature sensors;
- remote control of connected devices and vehicle systems, such as a siren, engine and door lock system, etc.

More detailed information about functional characteristics of the equipment can be obtained at [www.navtelecom.ru](http://www.navtelecom.ru) in the Equipment section.

## Standard Delivery Kit

| № | Name                                    | Number of pieces |
|---|-----------------------------------------|------------------|
| 1 | START device unit with connection wires | 1                |
| 2 | Datasheet                               | 1 (optional)     |

## Technical Specifications

|                                                                                                      |    | S-4010x*                                                                                                                                                                                                      | S-4011x*             | S-4012x* | S-4013x*             |
|------------------------------------------------------------------------------------------------------|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|----------|----------------------|
| LTE/GSM/BT                                                                                           |    |                                                                                                                                                                                                               |                      |          |                      |
| Frequency bands                                                                                      |    |                                                                                                                                                                                                               |                      |          |                      |
| LTE-FDD                                                                                              | E  | B1/B3/B5/B7/B8/B20                                                                                                                                                                                            |                      |          |                      |
|                                                                                                      | SA | B1/B2/B3/B4/B5/B7/B8/B28/B66                                                                                                                                                                                  |                      |          |                      |
| LTE-TDD                                                                                              | E  | -                                                                                                                                                                                                             |                      |          |                      |
|                                                                                                      | SA | -                                                                                                                                                                                                             |                      |          |                      |
| GSM (2G)                                                                                             | E  | 900/1800MHz                                                                                                                                                                                                   |                      |          |                      |
|                                                                                                      | SA | 850/900/1800/1900MHz                                                                                                                                                                                          |                      |          |                      |
| Category                                                                                             |    | CAT1                                                                                                                                                                                                          |                      |          |                      |
| Protocols                                                                                            |    | TCP, UDP                                                                                                                                                                                                      |                      |          |                      |
| Transmitting power                                                                                   |    | GSM/GPRS power class:<br>- EGSM900: 4 (33dBm±2dB)<br>- DCS1800: 1 (30dBm±2dB)<br><br>EDGE power class:<br>- EGSM900: E2 (27dBm±3dB)<br>- DCS1800: E1 (26dBm+3dB/-4dB)<br><br>LTE power class: 3 (23dBm±2.7dB) |                      |          |                      |
| Max (LTE) data downlink/uplink transfer (LTE), mbps                                                  |    | 5 / 10                                                                                                                                                                                                        |                      |          |                      |
| Max (GPRS/EDGE) data downlink/uplink transfer, kbps                                                  |    | 236,8 / 236,8                                                                                                                                                                                                 |                      |          |                      |
| Number of SIM cards                                                                                  |    | 1                                                                                                                                                                                                             |                      |          |                      |
| SIM card holder #1                                                                                   |    | nano-SIM                                                                                                                                                                                                      |                      |          |                      |
| SIM card holder #2                                                                                   |    | no                                                                                                                                                                                                            |                      |          |                      |
| eSIM                                                                                                 |    | no                                                                                                                                                                                                            |                      |          |                      |
| Bluetooth                                                                                            |    | Yes, BLE 4.0 (5.0 support)                                                                                                                                                                                    |                      |          |                      |
| GNSS                                                                                                 |    |                                                                                                                                                                                                               |                      |          |                      |
| Supported navigation systems                                                                         |    | GLONASS/GPS/BeiDou/GALILEO/QZSS                                                                                                                                                                               |                      |          |                      |
| GLONASS operating bands, MHz                                                                         |    | 1597.5~1605.8                                                                                                                                                                                                 |                      |          |                      |
| GPS operating bands, MHz                                                                             |    | 1575.42±1.023                                                                                                                                                                                                 |                      |          |                      |
| BeiDou operating bands, MHz                                                                          |    | 1561.098±2.046                                                                                                                                                                                                |                      |          |                      |
| Sensitivity (in laboratory conditions)                                                               |    | tracking: -159.5 dBm<br>cold start: -146 dBm                                                                                                                                                                  |                      |          |                      |
| Time-To-First-Fix (for GPS and GLONASS systems with a signal of -130 dBm)                            |    | cold start: <40 sec<br>hot start: <1 sec                                                                                                                                                                      |                      |          |                      |
| Accuracy (50% CEP, 24 hours in static mode, with signal level -130 dBm), m                           |    | 2                                                                                                                                                                                                             |                      |          |                      |
| Receiver update rate, Hz                                                                             |    | 1                                                                                                                                                                                                             |                      |          |                      |
| GNSS jammer detector                                                                                 |    | no                                                                                                                                                                                                            |                      |          |                      |
| Power Supply                                                                                         |    |                                                                                                                                                                                                               |                      |          |                      |
| Supply voltage, V <sup>1</sup>                                                                       |    | 9,5...47                                                                                                                                                                                                      | 9,5...47             | 9,5...47 | 9,5...47             |
| Current consumption at 12 V voltage in operating mode on average <sup>2</sup> , mA                   |    | 75                                                                                                                                                                                                            | 75                   | 75       | 75                   |
| Current consumption at 12 V voltage with turned off GLONASS and GSM modules, no more than, mA        |    | 25                                                                                                                                                                                                            | 25                   | 25       | 25                   |
| Maximum current consumption at 12 V voltage in operating mode with charged battery, no more than, mA |    | 200                                                                                                                                                                                                           | 200                  | 200      | 200                  |
| Reverse polarity protection                                                                          |    | yes                                                                                                                                                                                                           | yes                  | yes      | yes                  |
| Overvoltage protection up to 200 V                                                                   |    | yes                                                                                                                                                                                                           | yes                  | yes      | yes                  |
| Backup battery <sup>3</sup>                                                                          |    | no                                                                                                                                                                                                            | Li-Po 3,7 V, 130 mAh | no       | Li-Po 3,7 V, 130 mAh |
| Battery protection from recharge, full discharge, short circuit <sup>4</sup>                         |    | no                                                                                                                                                                                                            | yes                  | no       | yes                  |

|                                                                                                                      |                     |                     |                |                |
|----------------------------------------------------------------------------------------------------------------------|---------------------|---------------------|----------------|----------------|
| Battery of the RTC clock and the navigation module                                                                   | yes                 | yes                 | yes            | yes            |
| RTC keeping time and ephemerides retention time (when the power is off and the backup is discharged), at least, days | 5                   | 5                   | 5              | 5              |
| Battery charging with USB                                                                                            | yes                 | yes                 | yes            | yes            |
| <b>Interfaces/Sensors</b>                                                                                            |                     |                     |                |                |
| Inputs protection from power surges, V                                                                               | yes                 | yes                 | yes            | yes            |
| Digital inputs                                                                                                       | 4                   | 4                   | 2              | 2              |
| Analog inputs                                                                                                        | 1                   | 1                   | 1              | 1              |
| Analog inputs configured as digital                                                                                  | 1                   | 1                   | 1              | 1              |
| Built-in pull-up resistor for digital inputs                                                                         | yes (IN2, IN4, IN5) | yes (IN2, IN4, IN5) | yes (IN2)      | yes (IN2)      |
| Analog inputs voltage range, V                                                                                       | 0 – 31              | 0 – 31              | 0 – 31         | 0 – 31         |
| USB interface                                                                                                        | yes (Type-C)        | yes (Type-C)        | yes (Type-C)   | yes (Type-C)   |
| RS-485 interface                                                                                                     | no                  | no                  | yes            | yes            |
| RS-232 interface                                                                                                     | no                  | no                  | no             | no             |
| CAN interface                                                                                                        | no                  | no                  | no             | no             |
| 1-Wire interface                                                                                                     | no                  | no                  | no             | no             |
| Digital outputs                                                                                                      | 1                   | 1                   | 1              | 1              |
| Maximum switching current by the outputs, mA                                                                         | 500                 | 500                 | 500            | 500            |
| Maximum switching voltage by the outputs, V                                                                          | 48                  | 48                  | 48             | 48             |
| Accelerometer                                                                                                        | yes                 | yes                 | yes            | yes            |
| Measurement range of acceleration by the device, not less than, g                                                    | 8                   | 8                   | 8              | 8              |
| <b>Environmental Specifications</b>                                                                                  |                     |                     |                |                |
| Ingress Protection Rating                                                                                            | IP54                | IP54                | IP54           | IP54           |
| Maximum allowable shock overload, g                                                                                  | 24                  | 24                  | 24             | 24             |
| Storage temperature with battery <sup>5</sup> , °C                                                                   | -                   | 0 ... +40           | -              | 0 ... +40      |
| Storage temperature without battery, °C                                                                              | -40 ... +85         | -40 ... +85         | -40 ... +85    | -40 ... +85    |
| Operating temperature with battery, °C                                                                               | -                   | -20 ... +60         | -              | -20 ... +60    |
| Operating temperature without battery, °C                                                                            | -40 ... +85         | -40 ... +85         | -40 ... +85    | -40 ... +85    |
| Battery charge temperature, °C                                                                                       | -                   | 0 ... +50           | -              | 0 ... +50      |
| Maximum operating humidity at 35 °C, %                                                                               | 95                  | 95                  | 95             | 95             |
| Device dimensions without wires, mm                                                                                  | 65,5x38,4x14,3      | 65,5x38,4x14,3      | 65,5x38,4x14,3 | 65,5x38,4x14,3 |
| Device weight without wires, kg                                                                                      | 0,031               | 0,035               | 0,031          | 0,035          |

The manufacturer reserves the right to change product specifications for the purpose of improvement without prior notice.

<sup>1</sup> When the maximum operating voltage is exceeded, power protection is activated. In this case, device continues to work from backup battery (if any).

<sup>2</sup> Working with GPRS in poor communication conditions, the peak (~10ms) consumption of the device can exceed 500 mA.

<sup>3</sup> Attention! Lithium polymer battery (Li-Po) is used in the device. The following rules must be observed during its operation: do not heat, keep away from heat sources, do not throw the battery into fire, do not expose to direct sunlight. Do not operate the device powered by a lithium-polymer (Li-Po) battery in conditions of high humidity, at high and low ambient temperatures. Operation is permitted under conditions specified by the manufacturer. Do not impact, deform, disassemble, close contacts.

<sup>4</sup> When the device is stored and used outside the specified temperatures, it is recommended to turn it off and remove the battery from the device to avoid damage to the battery and to the device.

<sup>5</sup> When storing and operating the device outside the specified temperatures, it is recommended to disconnect and remove the built-in battery from the device to avoid damage to the battery and the device.

## Warranty

The manufacturing company guarantees that the START products meet the requirements of the technical conditions 4372-002-82520404-2010 subject to the customer complies with the rules for storage, transportation, installation and operation, established by the existing set of the operational documentation. The device enclosure has a dustproof and a dropproof execution of IP54 type according to the system of classification of the enclosure protection levels of electrical equipment from the penetration of solid objects and water.

The warranty period for the product is 3 years. The warranty for the built-in accumulator and the battery is provided separately and amounted to 1 year.

The warranty starts on the date of sale.

During the warranty period, the manufacturing company undertakes to carry out a free repair of the START product, subject to the customer complies with the rules of transportation, storage, installation and operation.

The present warranty is valid only upon presentation of complete, correct and legibly filled passport (showing serial number, name, date of sale of the START product, presence of the trade organization seal, signature of the buyer about the familiarity with the warranty terms and the operating rules) with the START product itself.

The manufacturing company shall not guarantee the software and the hardware compatibility of the START product with software and equipment not included in the delivery set, except as specified in the Operating manual.

The manufacturing company is not liable for the possible material, moral and other damage, suffered by the owner of the START product and/or the third-party as a result of the violation of requirements of the Operating manual during use, storage or transportation of the product.

Rubbing marks and other minor damages to the START product surfaces that do not affect its technical characteristics and that were appeared as a result of its normal use do not result in loss of the right to warranty services.

The life of the equipment with the exception of the built-in accumulator and battery is 10 years.

### The present guarantee does not apply to:

- documentation and packaging materials supplied with the START product;
- modernization of the START product.

### The right to the warranty service is lost in the following cases:

- if the defects of the START product are caused by the violation of rules for its operation, storage or transportation;
- if the defects of the START product are caused by the direct or indirect effects of mechanical forces, chemical, thermal or physical effects, radiation, aggressive or neutral liquids, gases or other factors, toxic or biological environments and any other effects of artificial or natural origin of a destructive nature;
- if the repairs, maintenance or upgrading of the START product are made by persons, who are not authorized to do so by the manufacturing company;
- if the defects of the START product are caused by the force majeure circumstances which the manufacturing company could not foresee, control and prevent;
- if there are no or damaged warranty seals or stickers set up in the START product by the manufacturing company or the service center authorized by the manufacturing company;
- if the defects of the START product are caused by its joint use with an equipment or a software that are not included in the delivery set, unless otherwise specified in the Operating manual;
- if the defects of the START product are caused by its operation as part of a set of defective equipment.