NAVTELECOM
TELEMATICS SYSTEMS

DATASHEET

GPS/GLONASS TRACKING EQUIPMENT
SIGNAL S-4751 E, S-4751 SA, S-4753 E, S-4753 SA

Moscow, Russia
2024

Purpose of the System

The SIGNAL S-4751x* and S-4753x* devices (hereinafter referred to as SIGNAL), manufactured by Navtelecom LLC, are wireless transport alert and monitoring systems that utilize cellular data transmission and satellite navigation technologies.

SIGNAL is designed for:

- Monitoring vehicle status, tracking location and movement, recording mileage and fuel consumption, and counting engine hours;
- Processing and transmitting data to a server from devices such as tachographs, tire pressure monitoring systems, CAN bus adapters, refrigeration controllers, RFID readers, and passenger flow counters;
- Reading data from a vehicle's CAN bus, processing it, and transmitting it to a telematics server;
- Monitoring temperature using temperature sensors;
- Observing and controlling in-vehicle situations via a connected photo camera;
- Assessing driving style (EcoDriving);
- Recording traffic accidents in accordance with GOST standards or the ASI crash severity index;
- Emergency notification of unauthorized vehicle access;
- Urgent alerts regarding robbery attacks on drivers or passengers and other emergency situations;
- Remote control of connected vehicle systems, such as sirens, external remote engine and door lock systems, etc.;
- Two-way hands-free communication with the driver;
- Automated passenger announcements about stops (entry and exit from geofences) using an information display and loudspeaker.

For more details on SIGNAL devices, visit the "Equipment" section at www.navtelecom.ru.

The SIGNAL series devices differ in the available interface set:

Model S-4751x:
- One CAN interface
- RS-232 and RS-485 interfaces available

Model S-4753x:
- Two CAN interfaces
- RS-485 interface available
- No RS-232 interface

The "x" in the model identifier denotes the intended geographical region.

Devices with **E modification** are equipped with a communication module incorporating LTE frequency bands configured for optimal performance in cellular networks across Russia and European countries.
Devices with **SA modification** are equipped with a communication module incorporating LTE frequency bands configured for optimal performance in cellular networks across South American countries.
The equipment is also compatible with operation in other regions, provided that the cellular network frequency bands are aligned with the transmitter's operating frequencies.

For detailed specifications and functional characteristics, please refer to the "Equipment" section on the website at www.navtelecom.ru

Standard Delivery Kit

No.	Name	Number of pieces
1	SIGNAL device unit	1
2	GLONASS/GPS-antenna	1
3	GSM-antenna	1
4	Fuse 1A	2
5	Fuse holder	1
6	Microfit-14 connector with power wires	1
7	Microfit-6 connector	1
8	Microfit-4 connector	1
9	Set of 10 connection wires	1
10	Datasheet	1 (optional)
11	MiniUSB cable	1 (optional)
12	Individual package	1 (optional)

Technical Specifications

GSM/GPRS/Bluetooth				
			S-4751x*	**S-4753x***
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	
IP Stack Protocols			TCP, UDP	
Transmitter Power			GSM/GPRS power class: - EGSM900: 4 (33dBm±2dB) - DCS1800: 1 (30dBm±2dB) EDGE power class: - EGSM900: E2 (27dBm±3dB) - DCS1800: E1 (26dBm+3dB/-4dB) LTE power class: 3 (23dBm±2.7dB)	
Maximum Data Transmission/Reception Speed (LTE), Mbps			5 / 10	5 / 10
Maximum Data Transmission/Reception Speed (GPRS/EDGE), Kbps			236,8 / 236,8	236,8 / 236,8
SIM Card Holder 1			external with ejector, miniSIM	external with ejector, miniSIM
SIM Card Holder 2			internal, nanoSIM	internal, nanoSIM
SIM chip[1]			2	2
GSM Jamming Detector			yes	yes
Bluetooth			yes, v5.0	yes, v5.0
GNSS				
Supported Navigation Systems			GLONASS/GPS/Beidou	
Operating Frequency Range of the System			GPS: L1 (1563,42–1587,42 MHz) GLONASS: L1 (1598,0625–1605,375)	
Number of Channels			tracking: 33, acquisition: 99	
Sensitivity (in Laboratory Conditions)			tracking: -165 dBm cold start: -148 dBm	

Time-To-First-Fix (for GPS and GLONASS systems at -130 dBm signal)	cold start: 35 sec warm start: 30 sec hot start: <1 sec	
Positioning Accuracy (50% CEP, 24 hours in static mode, at -130 dBm signal):	2.5 (horizontal), 5 (vertical)	
Receiver Update Rate, Hz	1	
GNSS Jamming Detector	yes	
Power Supply		
Operating Voltage, V[2]	9,5…47	9,5…47
Protection Against Extended Overvoltage up to 200 V	yes	yes
Average Current Consumption at 12 V in Operating Mode[3], mA	80	80
Current Consumption at 12 V with GLONASS and GSM Modules Disabled, Maximum, mA	30	30
Maximum Current Consumption at 12 V in Operating Mode while Charging Built-in Battery, Maximum, mA	200	200
Reverse Polarity Protection	yes	yes
Built-in Battery[4]	Li-Po 3,7 V, at least 800 mAh	Li-Po 3,7 V, at least 800 mAh
Built-in Battery Protection Against Overcharging, Deep Discharge, and Short Circuit[5]	yes	yes
Maximum continuous operation from a fully charged battery (GSM/UMTS, 1 min interval), ≥ h	6	6
Full battery charge time, ≤ h	5	5
Backup Power Supply for RTC Clock and Navigation Module	yes	yes
Time to Maintain RTC Clock and Ephemeris in Navigation Module (with Power Off and Built-in Battery Discharged), Minimum, Days	5	5
Charging of Built-in Battery via USB	yes	yes
Interfaces/Sensors		
Input Surge Voltage Protection, V	up to 200	up to 200
Universal Inputs (Analog, Digital, Impulse, Frequency)	6	6
Impulse Inputs Voltage Range, Hz	1 – 3000	1 – 3000
Analog Inputs Voltage Range, V	0…31	0…31
Built-in Pull-up for Digital , Impulse or Frequency Inputs	yes	yes
Digital Outputs	4	4
Maximum Switching Current for Outputs, mA	500	500
Maximum Switching Voltage for Outputs, V	48	48
USB interface	yes	yes
RS-485 Interface	yes	yes
RS-232 Interface	yes	yes
CAN Interface	1	2
1-Wire Interface	yes	yes
Audio interface for two-way voice communication and microphone monitoring	yes	yes
Impedance and power of the connected speaker	1.5–5W (4 Ohms) 1.0–3W (8 Ohms)	1.5–5W (4 Ohms) 1.0–3W (8 Ohms)
Accelerometer	yes	yes
Measured Acceleration Range, g	+/-24	+/-24
Measurement Accuracy of Acceleration in the Range of +/-24g, Maximum %	0,5	0,5
Calibration of the Accelerometer	yes	yes
Device Memory		
Memory Capacity, MB	16	16

Average Number of Records in Memory (Ring Buffer Type) with Data Packet Size Less Than 127 Bytes	100000	100000
Data Recording Period in Memory, s	1 — 3600 and/or on Event Trigger	1 — 3600 and/or on Event Trigger
MicroSD card support (up to 32 Gb)	yes	yes
Telemetry record to microSD card	yes	yes
Number of records on the microSD card	at least 2,000,000 per 1 GB	at least 2,000,000 per 1 GB
Operational Characteristics		
Storage Temperature with Battery[6], °C	0 … +40	0 … +40
Storage Temperature without Battery, °C	-40 … +85	-40 … +85
Operating Temperature with Battery[7], °C	-20 … +60	-20 … +60
Operating Temperature without Battery, °C	-40 … +85	-40 … +85
Charging Temperature for Battery, °C	0 … +50	0 … +50
Maximum Allowable Humidity at 35°C, %	95	95
Maximum Allowable Shock Overload, g	24	24
Device Design Features		
External GLONASS/GPS and GSM Antennas	yes	yes
Connector for Computer Connection	miniUSB	miniUSB
Разъёмы для подключения ГЛОНАСС/GPS- и GSM-антенны	SMA	SMA
Interface Connector	Microfit-14, Microfit-6, Microfit-4	Microfit-14, Microfit-6, Microfit-4
Housing Material	ABS plastic	ABS plastic
Enclosure Protection Rating	IP54	IP54
Dimensions of the Device with Connectors, mm	105x78x20,5	105x78x20,5
Device Weight, kg	0,087	0,087

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

[1] Optional.
[2] If the maximum operating voltage is exceeded, the power protection will activate. The device will continue to operate, but power will be supplied from the built-in battery, if available.
[3] When operating via GPRS in poor signal conditions, the peak (~1 ms) consumption of the device may exceed 500 mA.
[4] Attention! This device uses a Li-Po rechargeable battery. When using it, the following rules must be observed: do not heat, keep away from heat sources, do not throw the battery into fire, do not expose to direct sunlight. The device powered by a lithium-polymer (Li-Po) battery should not be used in high humidity conditions or at high and low ambient temperatures. Operation is allowed under conditions established by the manufacturer. Do not expose to impacts, do not deform, do not disassemble, and do not short-circuit the contacts.
[5] Protection against battery charging in case of overheating or overcooling.
[6] When storing the device outside the specified temperature ranges, it is recommended to disconnect and remove the built-in battery to avoid damage to the battery and the device. The battery should be stored separately in a charged state at a temperature of 0 … +40°C.
[7] Operating the device outside the specified temperature ranges may lead to irreversible changes in the properties of the built-in Li-Po battery, including reduced capacity, discharge rate, etc.

Warranty

The manufacturer guarantees that the SIGNAL device meets the requirements of the technical specifications TU 26.30.50-002-82520404-2010 (identical to 4372-002-82520404-2010) provided the consumer adheres to the rules for storage, transportation, installation, and operation established in the current set of operational documentation. The device housing has a dust and splash-proof design rated IP54 according to the classification system for degrees of protection of electrical equipment against the ingress of solid objects and water.

The warranty period for the product is 3 years. The warranty for the built-in battery and backup battery is provided separately and lasts for 1 year.

The warranty obligations commence on the date of sale.

During the warranty period, the manufacturer is obliged to replace the defective SIGNAL device with a new one if the defect is not caused by a violation of operating conditions due to user error.

The manufacturer does not guarantee software and hardware compatibility of the SIGNAL device with software and equipment not included in the delivery package, except in cases explicitly stated in the User Manual.

The manufacturer is not liable for any losses, damages, or other negative consequences arising from incorrect or improper connection of the equipment to the onboard circuits or CAN bus of the vehicle, as well as from improper storage, installation, adjustment, or operation of the equipment.

Scratches and other minor surface damages to the SIGNAL device that do not affect its technical characteristics and arise from normal use do not lead to the loss of warranty service rights.

The service life of the equipment, excluding the backup battery, is 10 years.

This warranty does not cover:

- documentation and packaging materials supplied with the SIGNAL device;
- upgrading of the SIGNAL device.

The right to warranty service is forfeited in the following cases:

- if defects in the SIGNAL device are caused by violations of its operating, storage, or transportation rules;
- if defects in the SIGNAL device are caused by direct or indirect mechanical forces, chemical, thermal, or physical effects, radiation, aggressive or neutral liquids, gases, or other factors, toxic or biological environments, or any other destructive influences of artificial or natural origin;
- if repairs, maintenance, or upgrades of the SIGNAL device are carried out by individuals not authorized by the manufacturer;
- if defects in the SIGNAL device are caused by unforeseen circumstances that the manufacturer could not anticipate, control, or prevent;
- if warranty seals or stickers installed on the SIGNAL device by the manufacturer or an authorized service center are missing or tampered with;
- if defects in the SIGNAL device are caused by its combined use with equipment or software not included in the delivery package, unless otherwise stated in the Operations Manual;
- if defects in the SIGNAL device are caused by its operation as part of a set of defective equipment.