NEOMATICA

Bleutooth inclination sensor
ADM32

Operation manual

Edition 1.0

This Operation manual relates to the Bluetooth sensor ADM32 (ШАИФ.401229.001) measuring inclination angle (hereinafter referred to as sensor). The manual describes sensor operation, procedure of its installation and its integration with the monitoring system using the tracker ADM007 BLE.

The Operation manual is designed for professionals who have familiarized themselves with the rules of repair and installation works execution in vehicles and who have special professional knowledge in electronic and electric equipment used on various transport means.

Sensor proper work is guaranteed if it is installed and set by qualified professionals. To use the sensor properly it is necessary to familiarize with the monitoring system work principles in general and to understand the function of all its components.

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1 Application

The sensor is used for being installed on moving and stationary objects to measure angle of inclination relative to a given axis.

2 Technical features

- Operation temperature: from - 30°C up to + 60°C;

- Range of angle measured: from 0 up to 180°;

- Margin of error for angle measurement: 2°;

- Battery: CR2477;

- Frequency range of radio interface: 2400...2483,5 MHz

- Transmitter power: +4 dBm;

- Receiver sensitivity: -96 dBm;

- Data exchange technology: Bluetooth Low Energy 4.1;

- Coverage: up to 50 m in line-of-sight

- Operation time with one battery: up to 1 year;

- Housing: IP65;

- Housing materials: polycarbonate;

- Size, mm: not more than 81 (52 without a flange) x 51 x 35;

- Mounting seat size, mm: not more than: 81 x 51;

- Weight: not more than 70 g

3 Design and Operation of the System

The sensor ADM32 contains an accelerometer and a microcontroller. Power supply to the sensor ADM32 is made with a lithium battery CR2477. The measured values of inclination angle are being transmitted via radio channel with the usage of Bluetooth Low Energy 4.1 (BLE).

4 Installation and Setting

4.1 Installation

For saving the charge of the lithium battery the sensor is supplied switched off. Before its activation or installation, it is necessary to extract the insulating spacer under the battery and

tighten the screws of the lid to ensure a full tightness of the housing. 30 seconds after extraction of the insulation spacer, the sensor may be used for operation.

The sensor is installed with two screws and a pressure-pad or with a double-sided tape appropriate for the operational conditions of the sensor. It is not allowed to use abrasive cleaning agents or organic solvents for cleaning the sensor housing. It is important to avoid the sensor installation near large metallic elements, since the coverage for data transmission via BLE may be reduced.

4.1.1 Installation of "0" sensor position

Before setting "0" sensor position you should:

• install the sensor;

• put the object on a plane surface;

• set a monitored mechanism in the position that should correspond to the "0" value of the sensor;

• exclude movements, vibrations of the object and mechanism while setting "0" value

To install "0" sensor position you should:

• start Android-application of ADM BLE-Configurator;

• search the sensor;

• press "install zero";

• wait for 35 seconds until the "0" position is set

4.2 Using ADM32 sensor together with the tracker ADM007 BLE

4.2.1 Methods of sensors catching

Integration of the sensor with the tracker ADM007 BLE is performed via sending commands to the tracker via Bluetooth, GPRS or SMS. Up to 5 ADM32 sensors can be connected to one tracker ADM007 BLE.

Catching the sensor may be performed manually and automatically.

Manual catching requires entering addresses of each sensor. This method is suitable for the situation when in the Bluetooth coverage range of the tracker ADM007 BLE there are activated sensors, which should not be caught by the tracker.

Automatic catching is based on searching for the sensors and automatic record of addresses of all found sensors. This method is suitable for the situation when in the tracker coverage Bluetooth range there are only the needed sensors.

4.2.2 Manual adding of sensors and checking the list of the sensors added

BLESENSOR command allows adding the sensors addresses as well as checking the list of addresses added. The sensor address is indicated on its sticker located on the housing.

When entering the address, no need to put the colon.

BLESENSOR X,Y – add the address Y in the box X where X=0..4;

BLESENSOR X,0 – clear the box X where X=0..4;

BLESENSOR Y – add the address Y in the end of the list;

BLESENSOR 0 – clear the list;

BLESENSOR – display the list of addresses added in the tracker.

Example of commands entering:

BLESENSOR 0,0C61CFEF5E31 – add the address 0C:61:CF:EF:5E:31 in the box 0;

BLESENSOR 0C61CFEF5E31 – add the address 0C:61:CF:EF:5E:31 in the end of the list.

4.2.3 Adding sensors automatically

BLEAUTOCATCH command launches the search for and automatic record of addresses of the sensors found. The search is performed within 2 minutes by default. When necessary, the search time can be increased up to 600 seconds.

BLEAUTOCATCH – start scanning for 120 s;

BLEAUTOCATCH 0 – stop the scanning in progress

4.2.4 Getting information from the sensors caught

BLESENSORINFO command allows requesting the last data received by the tracker from the sensor.

BLESENSORINFO X

where X=0..4 – number of the sensor (from the list of sensors BLESENSOR).

Command without parameter displays the information for all configured sensors.

5. Storage and Transportation

Bluetooth sensors ADM32 should be stored in a warehouse at a temperature of +5ºC to +40ºC and relative humidity at most 85 %.

After transportation of the sensors in sub-zero temperatures they should be stored at room temperature within 24 hours.

6. Warranty

The manufacturer guarantees the proper function of the Bluetooth sensor ADM32 within 12 months from the day of its sale if consumer meets all the requirements and follows all the rules of transportation, storage, installation and handling.

The warranty does not cover:

— Bluetooth sensors with mechanical damages and defects (cracks and chips, dents, signs of impacts, etc.) caused by consumer as a result of handling, storage and transportation rules violation. When there are signs of oxidation or other proofs of liquid penetration in the sensor housing;

— Bluetooth sensors with signs of electrical and/or other damages caused as a result of improper use of the device;

The device software of ADM32 sensor is licensed, terms related to the manufacturer's limited liability in the framework of the License Agreement are provided at the web site https://neomatica.com/upload/docs/license_en.pdf

7. Marking and Packaging

Marking is placed on the housing of the Bluetooth sensor ADM32. The delivery is possible in multipack or individual package.

8. Disposal

Disposal of the Bluetooth sensor ADM32 and discharged batteries are performed according to national and local norms and requirements.

9. Scope of supply

Name of item	Quantity	Comments
Bluetooth ADM32 sensors		
Passport		

10. Acceptance certificate

Bluetooth sensors ADM32 in quantity of _____ pcs. correspond to ШАИФ.401229.001 ТУ and are ready for operation.

Date of production: