

# Bluetooth sensor ADM31

**Operation manual** 

Edition 1.0

Neomatica, +7 (342) 2-111-500 (ext.42), http://neomatica.com

This Operation manual relates to the Bluetooth sensor ADM31 measuring temperature and illumination (hereinafter referred 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's proper work can be 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 temperature and illumination rates.

## 2 Technical features

- Range of temperature measured: from 40°C up to + 85°C;
- Margin of error for temperature measurement: ±0,5°C;
- Operation temperature: from 30°C up to + 60°C (depending on the type of power supplying element);
- Power supply: CR2450 Panasonic;
- Range of illumination measured: 0,01 lux ... 83000 lux;
- 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 the 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 ADM31 contains a temperature detector, an illumination detector, a microcontroller. Power supply to the sensor ADM31 is made with a lithium power element CR2450. Temperature and illumination values measured are available with the radio channel and using Bluetooth Low Energy 4.1 (BLE) technology.

### 4 Installation and Setting

#### 4.1 Installation

For saving the charge of the lithium power element 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. The transparent lid of the sensor should be clean. Impurities present in the sensor lid or housing may result in decrease in precision when measuring temperature and illumination. 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.

#### 4.2 Using ADM31 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 sensors might 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 sensors found. 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's 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 might be increased up to 600 seconds.

BLEAUTOCATCH - start scanning for 120 s;

BLEAUTOCATCH X – start scanning for X sec, X=1..600;

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 parameters displays the information for all configured sensors.

## 4.3 ADM BLE-Configurator

Android-application "ADM BLE-Configurator" allows viewing data received from the sensors ADM31.

The following parameters are available for viewing:

- Model of the sensor;
- MAC-address of the sensor;
- Temperature;
- Illumination;
- Voltage of the battery;
- Software version;
- Level of the received radio signal RSSI.

In this way, the following issues might be fixed with this Application: sensor checking, viewing of values of temperature and illumination sensors, evaluation of signal level when passing obstacles, evaluation of battery condition, identification of the sensor address.

## 5. Storage and Transportation

Bluetooth sensors ADM31 should be stored in a warehouse at a temperature of +5°C to +40°C 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 ADM31 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;
- sensors with signs of electrical and/or other damages caused as a result of unacceptable changes in external power network parameters or improper use of the terminal;

The device software is licensed, terms related to the manufacturer's limited liability in the framework of the License Agreement are provided at the web site http://en.neomatica.ru/upload/files/license.pdf

## 7. Marking and Packaging

Marking is placed on the housing of the Bluetooth sensor ADM31. Both multipack and individual package are is possible.

Маркировка помещается на корпус Bluetooth-датчика ADM31. Поставка производится в индивидуальной или групповой таре.

## 8. Disposal

Disposal of the Bluetooth sensor ADM31 is performed according to national and local norms and requirements.

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## Appendix B. ISO 9001:2015



«Standart-Garant»

#### SYSTEM CERTIFICATION OF MANAGEMENT SYSTEM, WORKS AND SERVICES «STANDART-GARANT»

Registered with the Federal Agency for Technical Regulation and Metrology. Registration number in the register of voluntary certification : POCC RU. И556.04ЖЖ00 Body forming system : ANO Certification headquarter of quality management system «STANDART» 121374 , Moscow, Krasnih Zor street, 21, b.1

Leading certification body: LLC «Bureau conformity assessment and certification» 105187, Moscow, Tkatskaya street, 48A

# **CONFORMANCE CERTIFICATE**

№ SMQ.RU/01.17. - 5520

Granted to:

# "Neomatica" LLC

614033, Perm Region, Perm, str. Serginskoye, 38A, apartment 608 TIN 5904267825

THIS CERTIFICATE IS TO CERTIFY THAT:

## THE QUALITY MANAGEMENT SYSTEM

With respect to

the implementation of scientific research, design, production and sale of electronic circuits, modules, equipment, including communications equipment, satellite monitoring, computer technology; development and implementation of software

### CONFORMS WITH REQUIREMENTS OF GOST R ISO 9001-2015 (ISO 9001:2015)

This Certificate obliges the company to maintain the state of works being executed in conformity with requirements of the above-said standard, and it will be under control of main authority of the system certification STANDART-GARANT and be confirmed at passing annual inspection control

Its number in the unified register of the System: 5520
Date of registration: January 20, 2017
Head of authority A B Vacellay Chairman of Committee ever LB Balash
Head of additionly A.D. reserves "Chalinan of Commutee get 1.0. Datasi