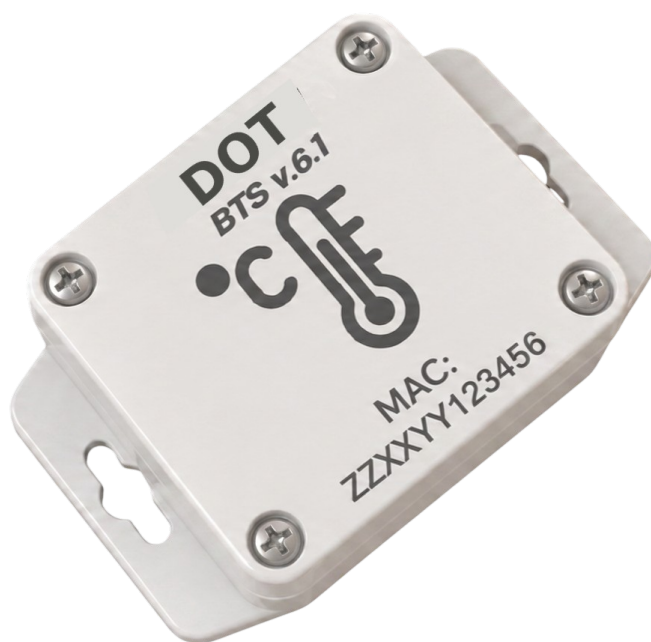




WIRELESS SENSOR

DOT BTS v.6.1

Temperature and opening monitoring
iBeacon mode



User Manual

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INTENDED USE

The **BTS v6.1 wireless sensor** is a versatile device that provides:

- Ambient **temperature** monitoring using an external wired or internal temperature sensor.
- **Monitoring of an external dry-contact circuit** to detect the state of mechanisms (doors, buttons, reed switches, etc.) without running cables to the monitoring device.
- **iBeacon** identification of drivers and other objects (trailers, containers and warehouse inventory).



Figure 1 — Device kit with an external temperature sensor

Data is transmitted to third-party devices over Bluetooth (BLE) using several protocols:

- Closed — data is transmitted over an established connection (for specialized applications).
- Open — data is transmitted in advertising packets using the Escort TL sensor format.
- Mini — an enhanced advertising format for minimal power consumption. For the data format, see “Mini Advertising Packet Format”.

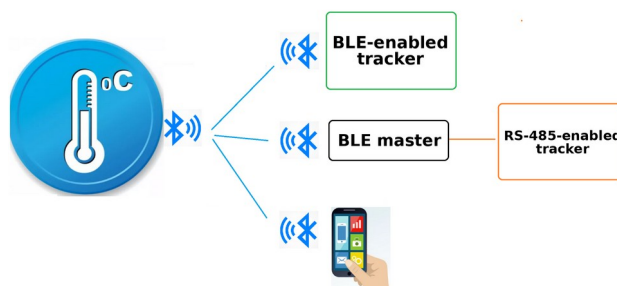


Figure 2 — Examples of using the sensor with external devices

The sensor has a terminal-block connector for convenient connection of circuit monitoring wires and a 1-WIRE temperature sensor, greatly simplifying wiring.

The sensor housing is fitted with a cable gland to maintain a sealed enclosure.

An external temperature sensor is connected using three wires (with a separate sensor power connection). This allows third-party temperature sensors, including metrologically verified sensors, to be used. Two-wire temperature sensors can also be connected; in this case, the sensor power terminal is not used.

The bolts are deliberately installed with the nuts on the front side, preventing third-party access without removing the temperature sensor from its mounting.

The supplied temperature sensor cable is 10–50 cm long. It can easily be extended or shortened to suit the application.

Disconnect the battery before connecting the temperature sensor and circuit monitoring wires!

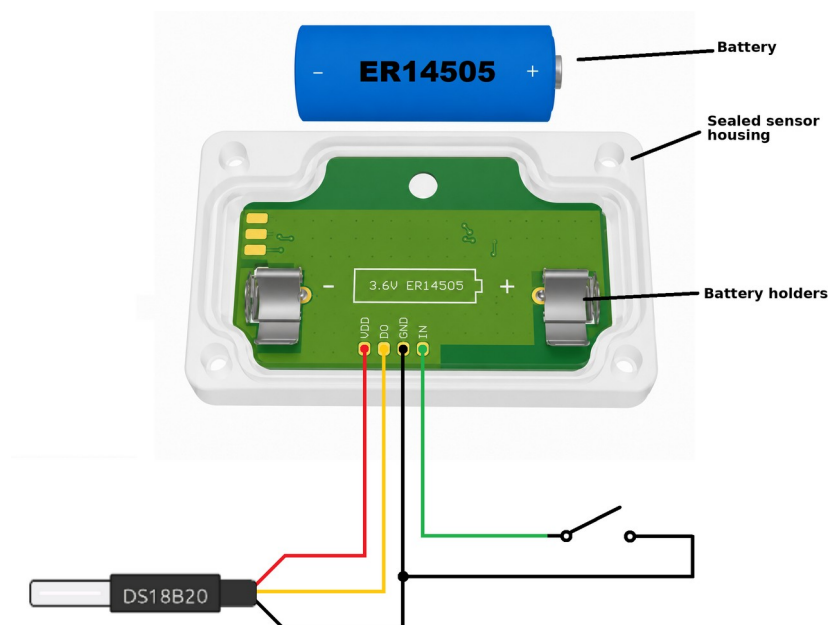


Figure 3 — Device components and wiring diagram

The sensor is powered by a replaceable **ER14505 battery**.

Always observe the correct polarity when replacing the battery!

Example application: simultaneous monitoring of door opening/closing and the temperature in a vehicle cargo compartment.

This installation eliminates the need to run cables from the sensor in the cargo body to the monitoring device in the cab.

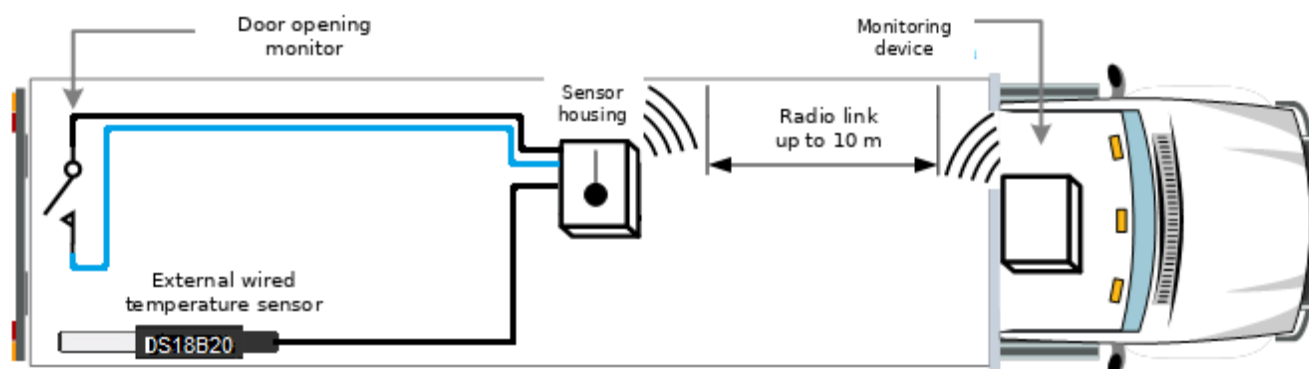


Figure 4 — Example installation for door and temperature monitoring

Important! Only an external temperature sensor and a four-core cable are included for these connections. Any other circuit monitoring devices must be purchased separately.

Do not apply voltage to the circuit monitoring wires!

TECHNICAL SPECIFICATIONS

The main sensor specifications are listed in Table 1.

Table 1 — Main Technical Specifications

Parameter	Note	BTS v6.1 External sensor	BTS v6.1 Internal sensor
Housing dimensions, mm	Including mounting and cable gland	77*95*35	58*95*35
Weight, g	Including battery and wired temperature sensor (1 m cable)	125	105
Battery capacity, mAh	Replaceable ER14505 battery	2700	
Current consumption, μ A		23	
Estimated operating life, years*		4.4	
Temperature measurement error, $^{\circ}$ C		No more than 0.5	
Circuit monitoring	Detects closure between two contacts	Supported	
Operating temperature range, $^{\circ}$ C	Limited by battery specifications	–55 to +85	
Data transmission interface	Bluetooth	Compatible with BLE 4.0–5.3	
Programmable transmission power, dBm	Range up to 40–50 m in open areas	+6	
Configuration and diagnostics		Mobile app	
Ingress protection rating	Dust-tight; temporary immersion to a depth of up to 1 m	IP67	

**Actual operating life may differ from laboratory results due to additional factors: battery manufacturer and shelf life, advertising packet type and interval, and radio signal power.*

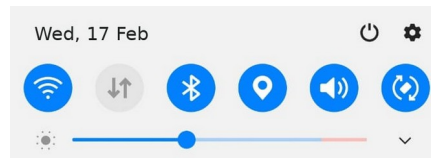
MOBILE APP — SENSOR CONFIGURATOR

The DOT Sensor Configurator mobile app for Android and iOS lets you view live readings and change sensor settings.

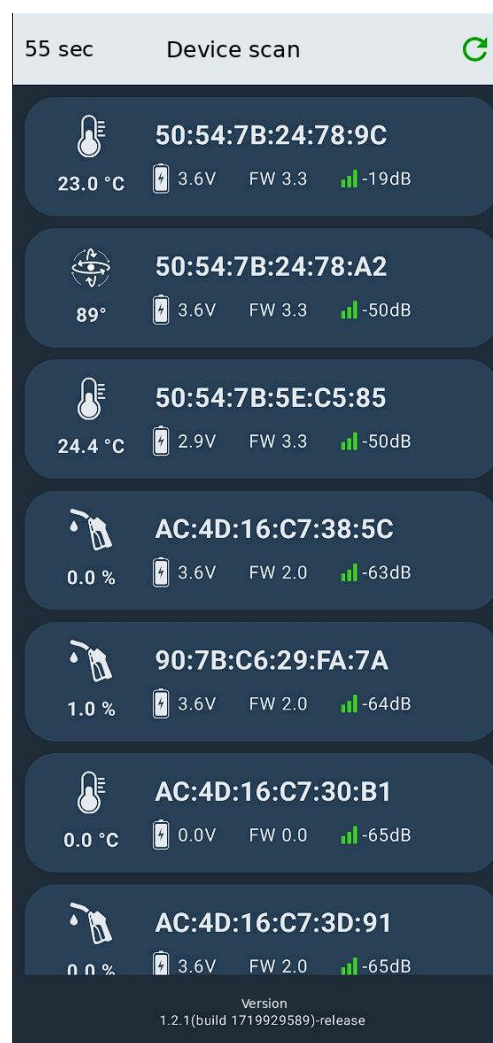
Android and iOS app download links: contact your supplier for the current links.

Procedure for working with the sensor in the app:

1. Download the latest version of the app, launch it and follow the on-screen instructions.
2. On first launch, the app asks you to enable Bluetooth and location services. Grant the permissions requested by the app.

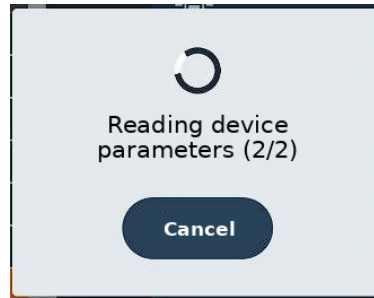


3. The scan screen then lists all detected sensors. Sensors are automatically sorted by signal strength and identified by icons for their type: fuel level sensor, temperature sensor, relay, etc.



Each sensor tile shows its type (icon), MAC address, battery charge level, sensor firmware version and signal strength. The closer the sensor is to the phone, the higher it appears in the list.

4. To connect to and interact with a sensor, tap its tile. A connection status pop-up appears.

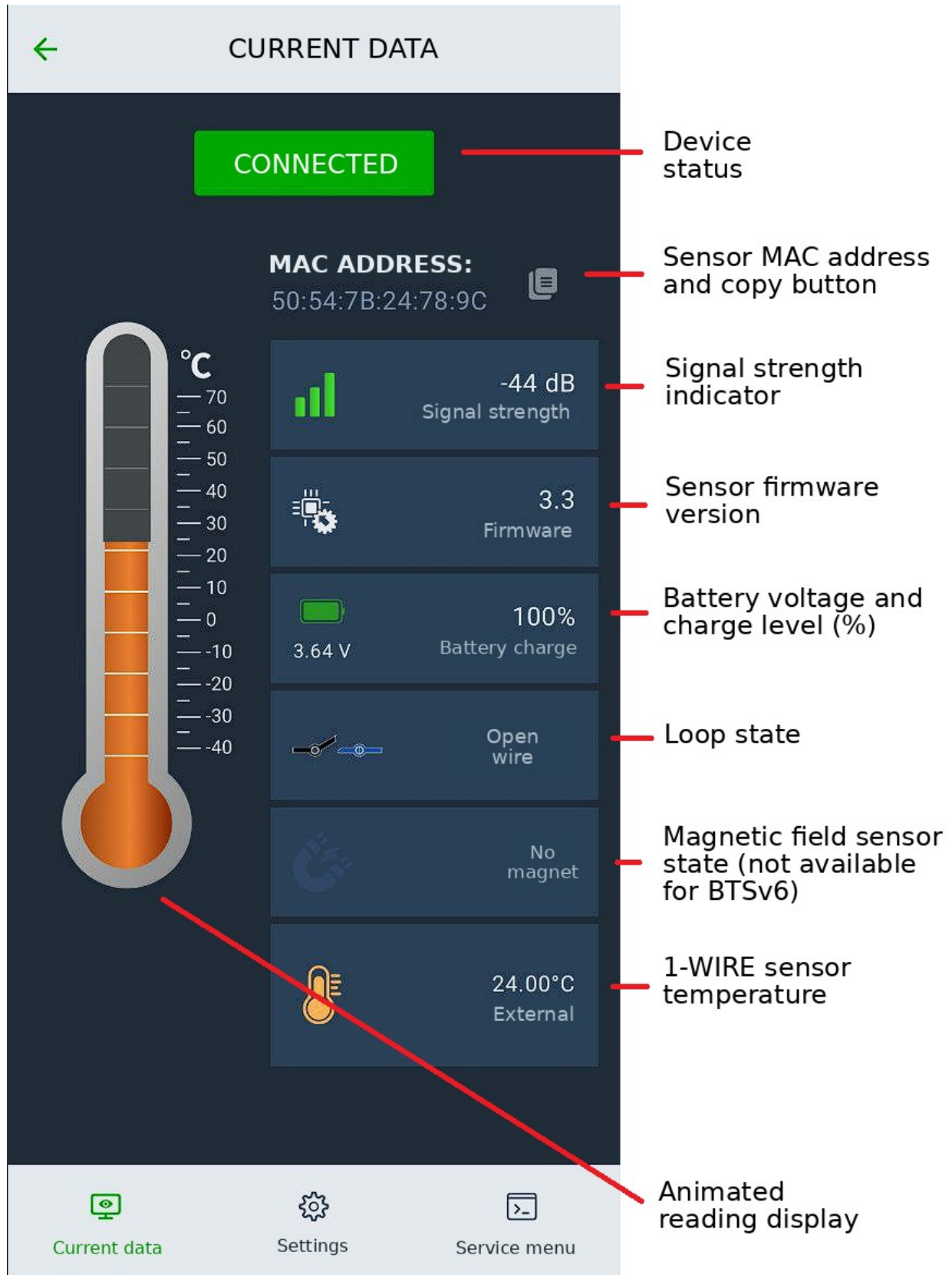


After a few seconds, the sensor connects and the app provides access to three main screens: “Live Data”, “Settings” and “Service Menu”.

Switch between these screens using the tabs at the bottom of the display.

CURRENT DATA

The app reads data from the sensor and displays it in the corresponding sections on the right side of the Live Data screen.



Device status shows the current connection state and any errors. Detailed error codes can be checked on the Service Menu screen.

A button next to the sensor MAC address copies the address to the clipboard for easy sharing.

The signal strength indicator has a dynamic icon. As the sensor moves farther away and the signal level falls to -75 dB, the icon changes from green to red.

Battery status is displayed as the current voltage and a percentage (%).

The circuit status indicator has a dynamic icon. Its circuit diagram changes to match the actual state of the circuit.

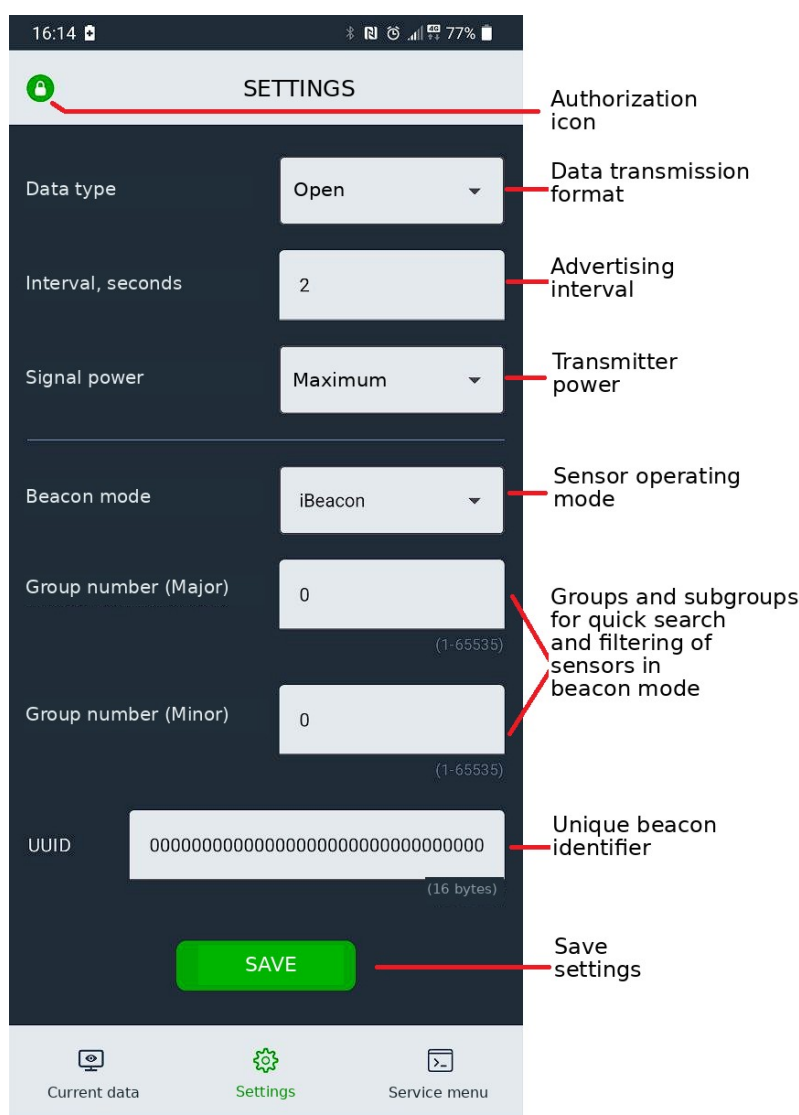
The magnetic field icon is active only on models equipped with a magnetic field sensor.

This function is not supported by BTS v6.

The temperature field displays the current temperature measured by the wired DS18B20 sensor connected to the device.

An animated thermometer indicator is displayed on the left side of the Live Data screen.

SETTINGS



 To enable the Settings screen, authenticate by tapping the lock icon in its upper-left corner. The default password for every sensor is “00000000”.

After authentication, you can change the password on the Service Menu screen.

The “Data type” setting offers three advertising data formats:

Closed — data is transmitted only over an established connection to the sensor.

- Closed — no public advertising packet; data is encrypted and transmitted over an established connection.
- Open — sensor data (level, temperature and battery voltage) is transmitted in advertising packets using the Escort TL format.
- Mini — an advertising packet optimized for low power consumption, containing only essential data (level, temperature and battery charge in %).

The “Interval” setting selects the advertising transmission interval (1–10 seconds).

The “Signal power” setting selects the radio output power and thus adjusts the detection range.

Short transmission intervals and maximum power increase sensor power consumption and reduce operating life.

We recommend retaining the factory settings.

The “Additional advertising” setting enables identification data transmission in iBeacon format:

- Disabled — no additional advertising packet is transmitted.
- iBeacon — data is transmitted in iBeacon format using UUID, MAJOR and MINOR.

UUID is a unique identifier that must be the same for all devices in a fleet. MAJOR and MINOR identify device groups and subgroups for quick classification, filtering and exclusion during searches.

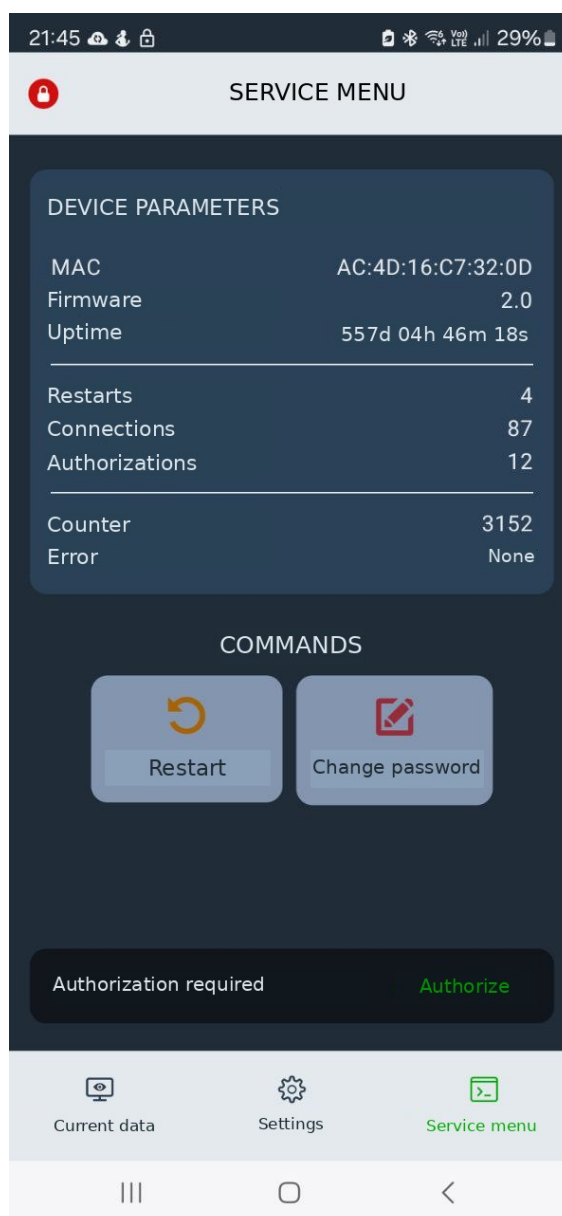
SERVICE MENU

This section provides technical information about the device:

- Firmware version
- Uptime
- Number of restarts, connections and authentications
- Errors

Control commands

- Restart device
- Change password



MINI ADVERTISING PACKET FORMAT

Example sensor packet (components are highlighted in different colors):

09FF160F63D700010063

These packets transmit two types of data:

- Manufacturer data — sensor parameters (temperature, etc.)

09FF — type 0xFF = “Manufacturer data”; length = 0x09

160F63D700010063 — payload transmitted by the sensor

Table 2 — Description of the Sensor Payload

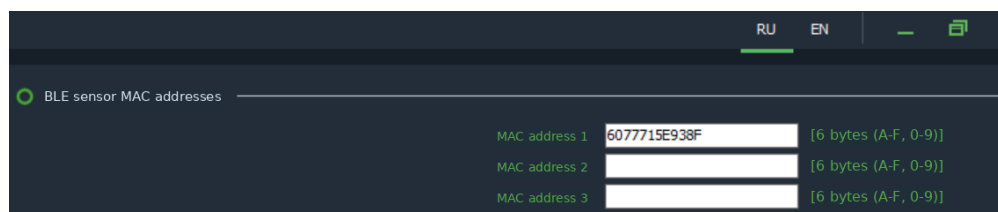
Offset, bytes	Field size, bytes	Value	Description
0	2	0x160F	Prefix (manufacturer code)
+2	1	63h	Sensor type — temperature sensor
+3	2	0000h...FFFFh	Temperature in degrees Celsius (the transmitted value is multiplied by 10) 00D7h = 215, or 21.5 °C
+5	2	0000h...FFFFh	Bit field Bit 14 — magnet (0: absent; 1: present) Bit 15 — circuit status (0: open; 1: closed)
+7	1	00h...FFh	Battery charge, % 63h = 99%

INTEGRATION WITH A TRACKER (BLE) AND WIALON / LOCAVIST

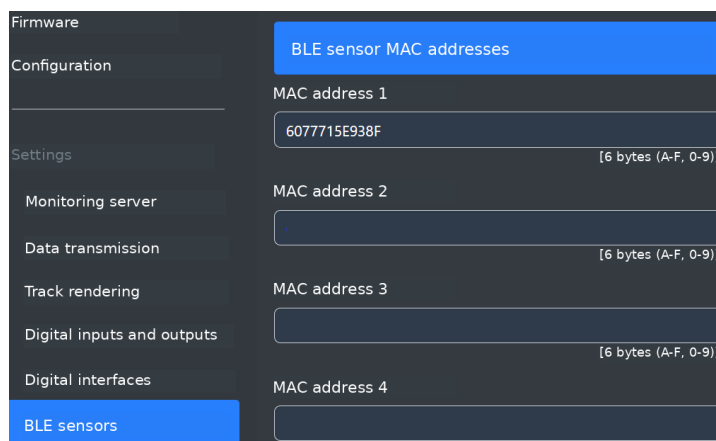
To use the temperature sensor, enter its MAC address in the tracker's BLE sensor address fields. Note the slot number: the sensor state is transmitted with reference to that slot.

For this example, enter the sensor MAC address in slot 1.

You can do this using the desktop application



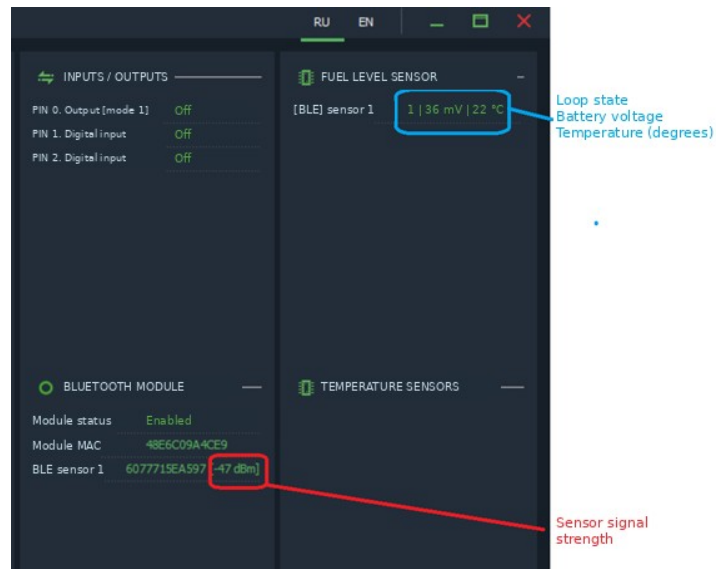
or the web configurator.



The following server parameters can be used to monitor the temperature sensor:

Monitoring platform	Wialon	Locavist	
Protocol	DOT	DOT 4/5/6/Integral	DOT A/L series
Temperature to one decimal place	temp_1wire_X	TEMP_X	TEMP_X
Circuit status (1: closed; 0: open)	llsX_val	LLS_L_X	llsX_val
Temperature to the nearest degree	llsX_temp	LLS_T_X	llsX_temp
Battery voltage, V	llsX_bat	llsX_bat	llsX_bat

X is the number of the MAC address slot in which the temperature sensor is registered.



iBeacon mode identifies different objects and can be configured in the tracker as follows:

Select:

- ☐ Operating mode

Configure:

- ☐ Distance filter
- ☐ UUID filter
- ☐ MAJOR filter
- ☐ MINOR filter

iBeacon settings

Operating mode

V1: all filters
✓

Distance filter

[0-255]

UUID filter

Leave blank if no filter is required

MAJOR filter

Leave blank if no filter is required

MINOR filter

Leave blank if no filter is required

WARRANTY TERMS

The equipment is designed for a long service life in autonomous, maintenance-free operation.

THE PRODUCT IS NOT ELIGIBLE FOR WARRANTY REPAIR / REPLACEMENT IN THE FOLLOWING CASES:

- ☐ Failure to comply with the product operating instructions;
- ☐ Mechanical damage (external or internal);
- ☐ Faults caused by foreign objects, insects or liquids entering the equipment;
- ☐ Chemical, electrochemical, electrostatic or extreme thermal damage;
- ☐ Damage caused by power supply, communication or cable networks that do not comply with national standards;
- ☐ Damage caused by installing components that do not meet the manufacturer's technical requirements;
- ☐ Repairs or preventive maintenance during the warranty period performed by persons not authorized by the manufacturer;
- ☐ Damage to the manufacturer's seals on the equipment;
- ☐ Equipment malfunctions resulting from external influences on the equipment or the electrical circuit to which it is connected;
- ☐ Faults caused by third-party actions or other unforeseen circumstances unrelated to the equipment manufacturer's obligations.

PACKAGE CONTENTS

The sensor package contents are listed in Table 3.

Table 3 — Package Contents

N o.	Item	Qty	Note
1	BTS v6.1 universal sensor	1	Including battery
2	Wired 1-WIRE temperature sensor	1	Length: 50 cm
3	Four-core connection cable	1	Length: 50 cm
4	ER14505 battery	1	
5	Packaging	1	Optional
6	Product passport	1	Optional

Note: The manufacturer reserves the right to change the package contents without reducing the product's performance or functionality.