

# ELA BLUE T/RHT Temperature Monitoring Sensor

## 1 Introduction

### 1.1 About the Functionality

The ELA BLUE T/RHT temperature monitoring sensor is used to measure temperature in areas where dust-tight, water-proof, or wireless long-range solutions are required. The collected data is then transmitted to the tracking device.

The sensor operates at  $\pm 0.3^{\circ}\text{C}$  accuracy from  $0^{\circ}\text{C}$  to  $-65^{\circ}\text{C}$  and  $\pm 0.5^{\circ}\text{C}$  accuracy from  $-40^{\circ}\text{C}$  to  $85^{\circ}\text{C}$  with a 500 m (open field) range and has a life expectancy of up to 4 years.

### 1.2 Legal Information

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### 1.3 Compatibility

The ELA BLUE temperature sensors are compatible with the following devices with the newest firmware version:

- HCV5
- LCV5
- Pro5

## 1.4 Contact Information

### General enquiries

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## 1.5 Document Changelog

Version	Date	Modification
1.0	2020-09-01	Initial draft.
1.1	2020-03-23	Updated: Legal Information. Updated: Sensor Installation and Maintenance.

## 1.6 Notations

The following notations are used in this document to highlight important information:

### **Bold text**

Used to indicate user interface elements or for emphasis.

### *Italic text*

Used to indicate items that belong to a list and can be selected.

### **Note**



Used to highlight important information or special conditions.

## 1.7 References

Datasheet: <https://doc.ruptela.lt/pages/viewpage.action?pageId=37683326>

## 2 Configuration



This functionality requires the use of the advanced configurator and a smartphone with NFC enabled.

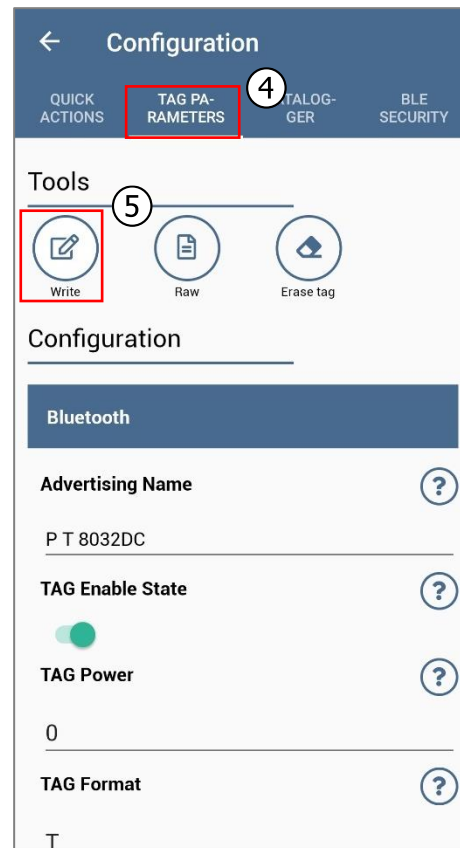
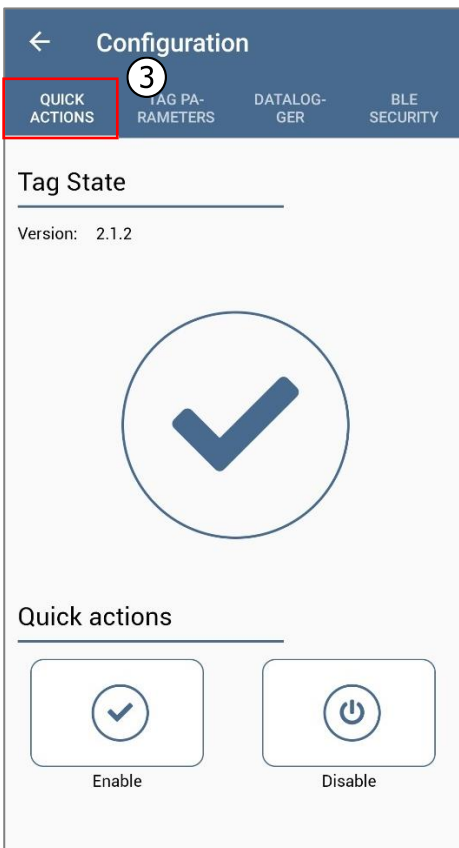
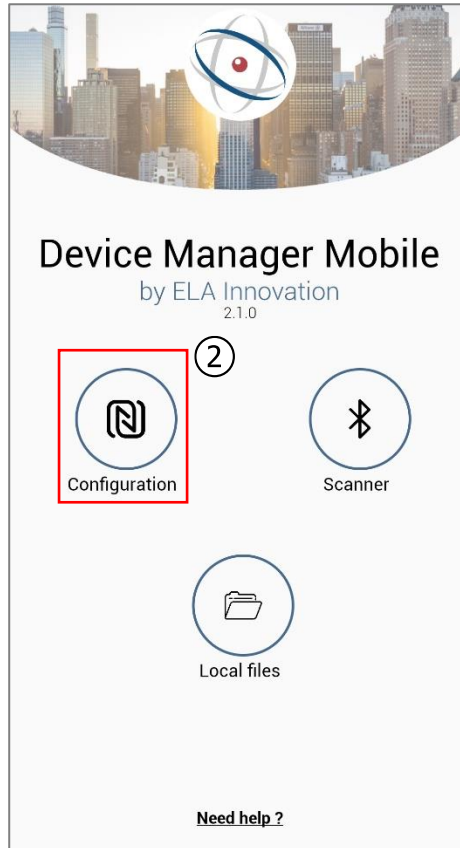
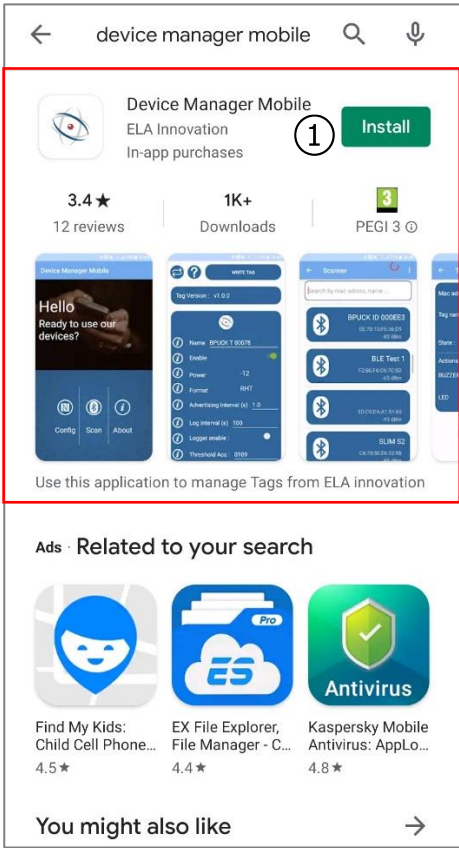
### 2.1 Sensor configuration through the App

Follow these steps to configure the sensor:

1. On your smartphone open **Google Play** (Android OS) or **App Store** (iOS) and download the **Device Manager Mobile** app.
2. Open the app, tap **Configuration** and hold your phone's NFC antenna (usually found on the backside near the camera) over the sensor. Once the app reads the sensor's configuration, you will be able to see the sensor state and edit sensor parameters.
3. In the **Quick actions** tab, you can enable or disable the sensor. Select an action and hold your phone over the sensor to write the configuration. The sensor is enabled by default.
4. If required, you can modify the following values in the **Tag parameters** tab:

<b>Advertising Name</b>	Change the advertising name. Default value: Model
<b>TAG Enable State</b>	Same functionality as in the <b>Quick actions</b> tab. Used to enable or disable the sensor. Default value: Enabled
<b>TAG Power</b>	Set the power at which the sensor operates. A lower value saves power while reducing range, a higher value uses more power to increase range. Default value: <i>0 dBm</i>
<b>TAG Format</b>	Select whether temperature ( <i>T</i> ) or temperature and humidity ( <i>RHT</i> ) should be monitored. Default value: <i>T</i> or <i>RHT</i>
<b>BLE Emit Period</b>	The period between consecutive advertisement bursts. Default value: <i>3 s</i>
<b>Manufacturer Data Mode</b>	This parameter is not used and must be disabled.
<b>Manufacturer ID</b>	This parameter is not used and must be disabled.
<b>Data Logger Enable</b>	Enable or disable the internal data logger. Once enabled, it allows reading of the data from the sensor via the app or PC/laptop. Default value: Disabled
<b>Data Logger period</b>	Record period of the sensor data in the data logger in seconds. Default value: 86400

5. To make changes to the configuration, tap **Write** at the Tools section and hold your phone over the sensor until the configuration is successful.



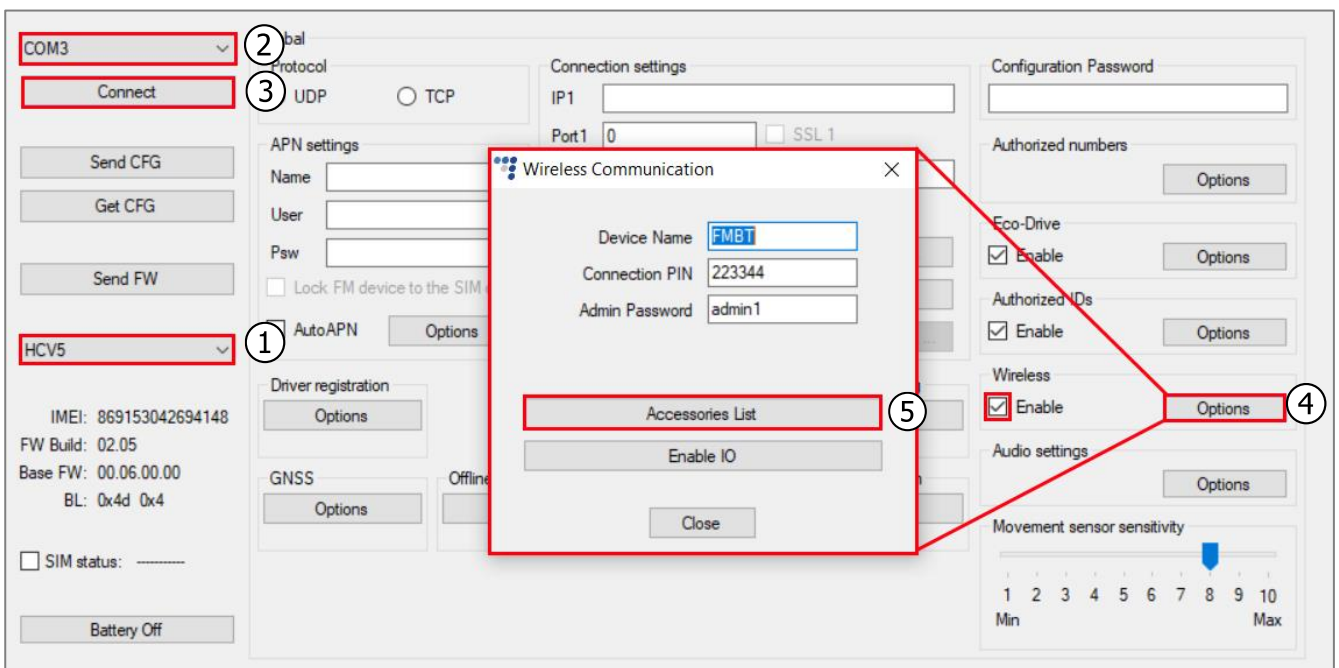
## 2.2 Device configuration through the Advanced Configurator



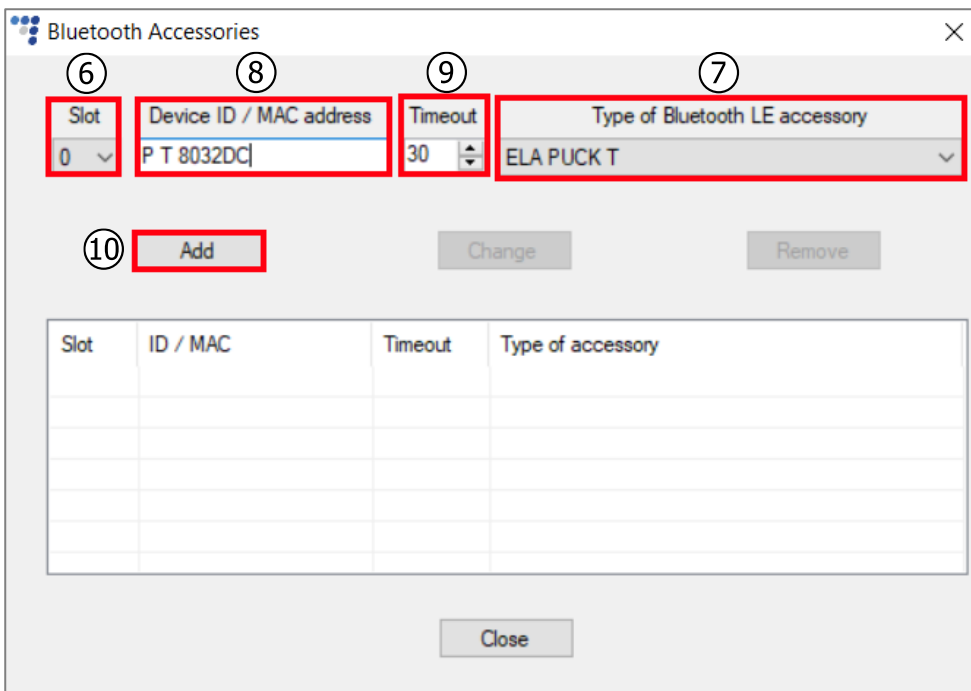
The sensor configuration through the app should be completed before starting the configuration via the advanced configurator.

Follow these steps to configure the sensor:

1. Open the advanced configurator. Select your tracking device.
2. Select the COM port to which your device is connected.
3. Click **Connect**.
4. Tick the **Enable** checkbox in the **Wireless** section. Click **Options** to open the **Wireless Communication** window.
5. Click **Accessories List** to open the **Bluetooth Accessories** window.

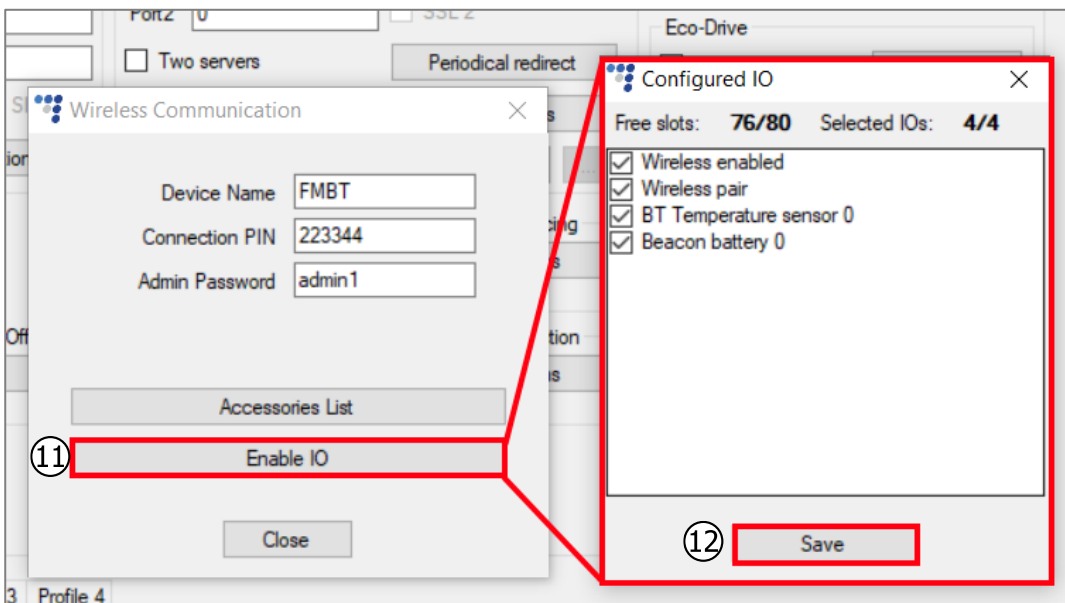


6. Select a free slot for the sensor.
7. Select *ELA PUCK T* or *ELA PUCK RHT* from the drop-down list.
8. Enter the sensor ID.
9. If required, adjust the timeout. The default value is 30 s. Increasing this value reduces the amount of error values when no data from the sensor is received.
10. Click **Add**.



11. Close the **Bluetooth Accessories** window and click **Enable IO** to open the **Configured IO** window. Select *BT Temperature sensor x* and *Beacon battery x* (where x – is the slot number from the accessories table).

12. Click **Save**.



## 2.3 Finishing the Configuration

To finish the configuration, close the **Wireless Communication** window. Click **Send CFG** to send the configuration to the device.

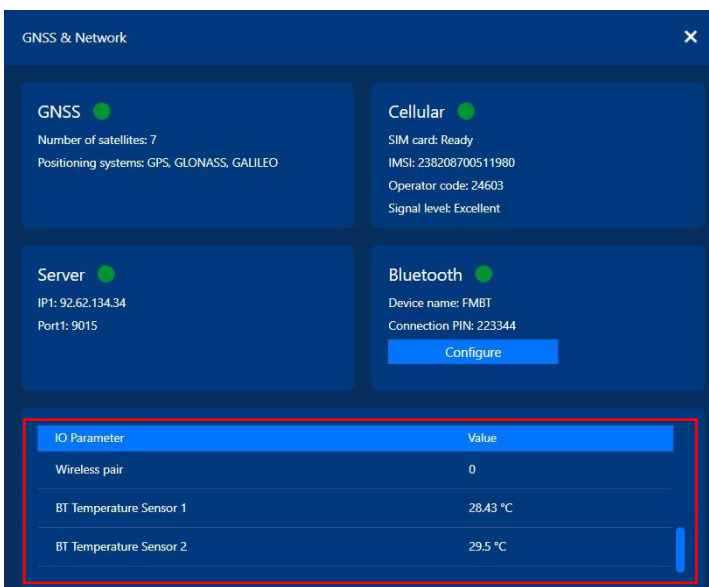
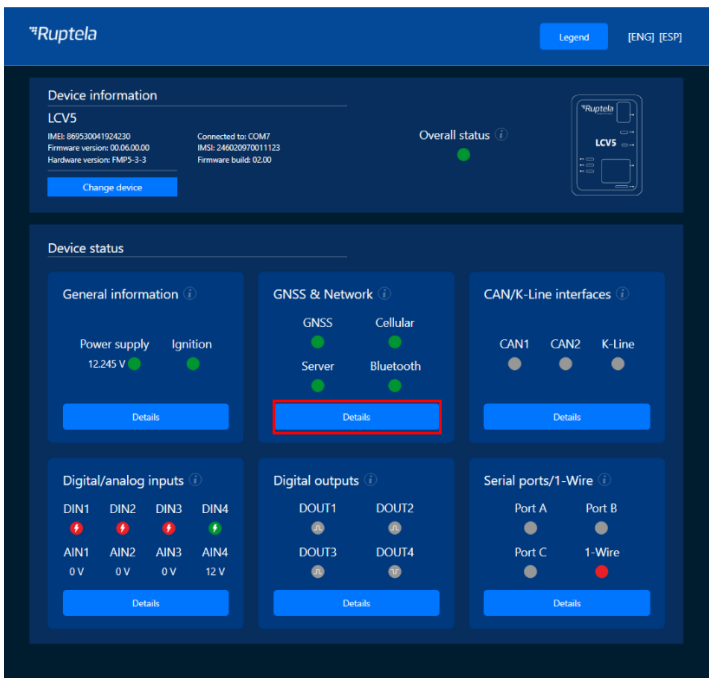
The screenshot displays a configuration window for a device. On the left side, there is a sidebar with a dropdown menu showing 'COM3' and 'HCV5'. Below the dropdown are buttons for 'Disconnect', 'Send CFG' (highlighted with a red border), 'Get CFG', and 'Send FW'. Further down, there is a 'Battery Off' button. The main area is divided into several sections: 'Global' with 'Protocol' (UDP selected, TCP unselected); 'APN settings' with fields for 'Name', 'User', and 'Psw', and checkboxes for 'Lock FM device to the SIM card' and 'AutoAPN'; 'Connection settings' with fields for 'IP1', 'Port1', 'IP2', and 'Port2', and checkboxes for 'Two servers', 'SSL 1', and 'SSL 2'; 'Configuration Password' with a text field and an 'Options' button; 'Eco-Drive' with a checked 'Enable' checkbox and an 'Options' button; 'Authorized IDs' with a checked 'Enable' checkbox and an 'Options' button; 'Wireless' with a checked 'Enable' checkbox and an 'Options' button; 'Audio settings' with an 'Options' button; and 'Movement sensor sensitivity' with a slider set to 8 out of 10. Other sections include 'Driver registration', 'Geofencing', 'Auto-geofencing', 'GNSS', 'Offline tracking', 'Towing detection', and 'Impact detection', each with an 'Options' button.

## 2.4 Testing the Sensor

You can test if your data is coming successfully from the sensor via Device Center installation assistant tool. Follow these steps:

1. Open Device Center.
2. Click **Test Device**.
3. Select your device by clicking on it.
4. In the appeared installation tool window click **Details** in the **GNSS & Network** section.

If the Bluetooth status is green, the tracking device is receiving data from the sensors and other Bluetooth accessories.





# 3 Sensor Installation and Maintenance

There are several points to consider for the sensor mounting:

- The configuration of the sensor
- The configuration of the tracking device
- The mounting location of the sensor and tracking device
- Interference



All of the points mentioned above are related and must be carefully evaluated to achieve a fully working solution. Check if the advertisement packets successfully reach the tracking device before mounting the Ruptela device and the sensors firmly. You can do that using the Device Center installation tool/Advanced configurator live IO data.





Mounting location recommendations:

- Avoid mounting near thick metal parts, as it may cause reflections and/or attenuation of the signal.
- Take into account that interference with other signals in the 2.4 GHz range may cause loss of data packets. Try to avoid environments where interference is likely.
- Take moving parts into consideration – refrigerator partitions, curtains. They might damage or dismount the sensor when moved.
- Take into account how the cargo might be loaded and positioned. Mount the sensor at the top, as lower positions are more vulnerable to damage during loading/unloading of the cargo. Also, from lower positions, the signal might be attenuated more by the cargo itself.
- Take into account what temperature you want to measure, as the distribution of temperature may vary greatly inside the refrigerator. The temperature is usually lower near the outlet and higher further from it.

Sensor configuration recommendations:

- For the sensors, that are mounted at the back of the truck, it is recommended to set the signal strength to +4 dBm.
- For the sensors, that are mounted at the front of the truck, use the recommended default value (0 dBm). You must check if the tracking device can receive the data.
- When testing the signal strength, you must take into account the attenuation that might be caused by the cargo, so it is always more reliable to use higher signal strength.

The following image shows the recommended locations for mounting **the tracking device** in a truck and truck with a trailer to ensure connectivity with the sensor:

Color	Definition
	Most favourable location. This placement ensures data accuracy and the proper connectivity with the sensor.
	Not optimal location, as there is more probability for metal obstacles to cause interference.
	Unsuitable location, the sensors in the trailer are too far away and the signal may be attenuated or reflected.
	<b>Sensor</b> mounting location suggestions based on the mounting location recommendations above.

