

ELA BLUE PUCK DI Digital Input Sensor

1 Introduction

1.1 About the Accessory

The ELA BLUE PUCK DI digital input sensor is used for the wireless status transmission of connected accessories 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 is compatible with accessories providing a binary output and is working in a temperature range from -40°C to +85°C with a 500 m (open field) range and has a life expectancy of up to 20 years.

1.2 Legal Information

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1.3 Compatibility

The ELA BLUE PUCK DI digital input sensors are compatible with the following devices with the newest firmware version:

- HCV5
- LCV5
- Pro5

1.4 Contact Information

General enquiries

Website: ruptela.com

E-mail: info@ruptela.com

Phone: +370 5 2045188

Technical support

E-mail : support@ruptela.com

Phone: +370 5 2045030

1.5 Document Changelog

Version	Date	Modification
1.0	2021-03-05	Initial draft.

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/display/AB/Accessories>

2 Configuration



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

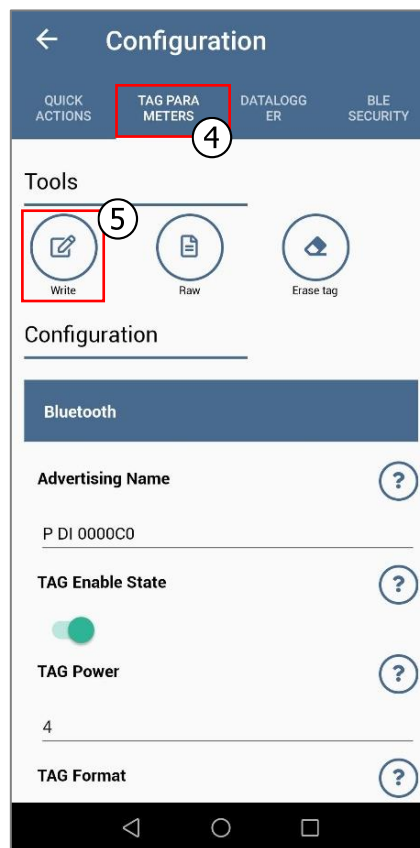
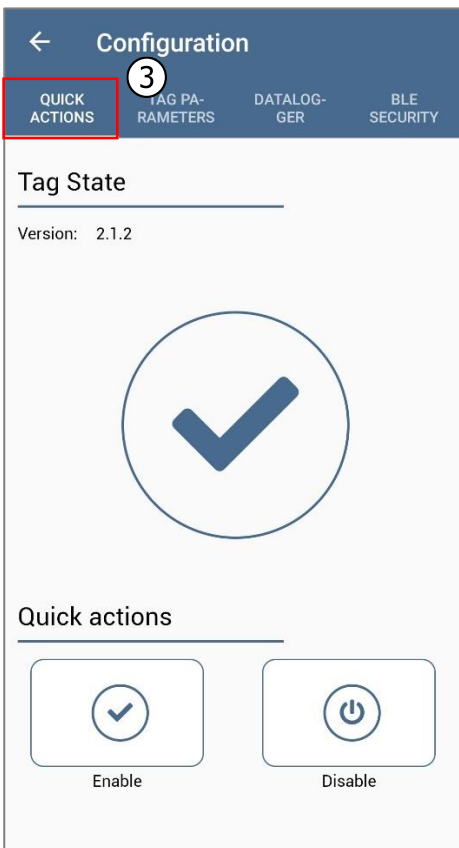
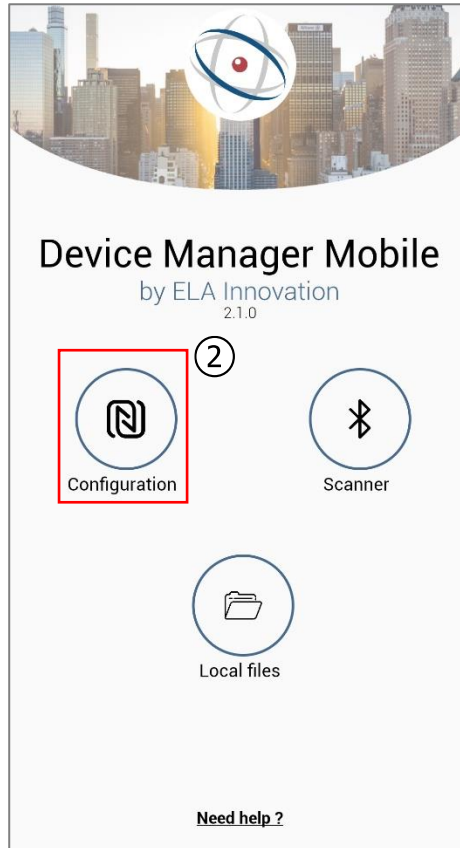
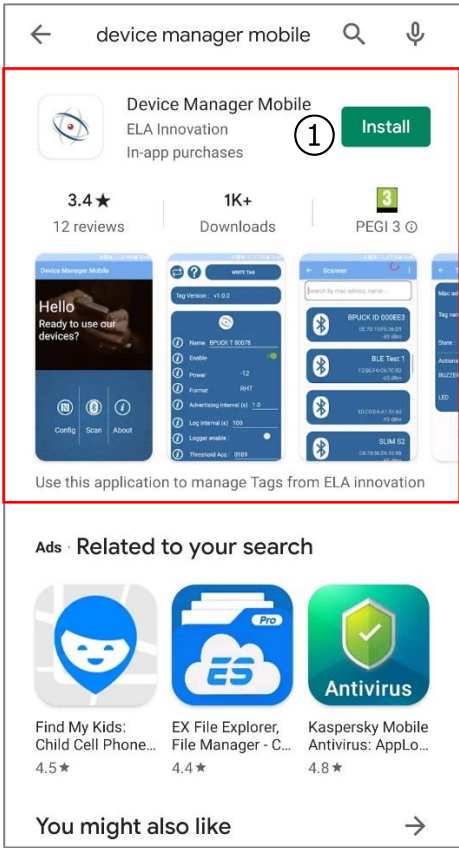
2.1 Sensor configuration through the App

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:

Advertising Name	Change the advertising name. Default value: Model
TAG Enable State	Same functionality as in the Quick actions tab. Used to enable or disable the sensor. Default value: Enabled
TAG Power	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>
TAG Format	Select whether the digital input (<i>DI</i>) or ID should be monitored. Default value: <i>DI</i>
BLE Emit Period	The period between consecutive advertisement bursts. Default value: <i>3 s</i>
Manufacturer Data Mode	This parameter is not used and must be disabled.
Manufacturer ID	This parameter is not used and must be disabled.
Data Logger Enable	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
Data Logger period	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.



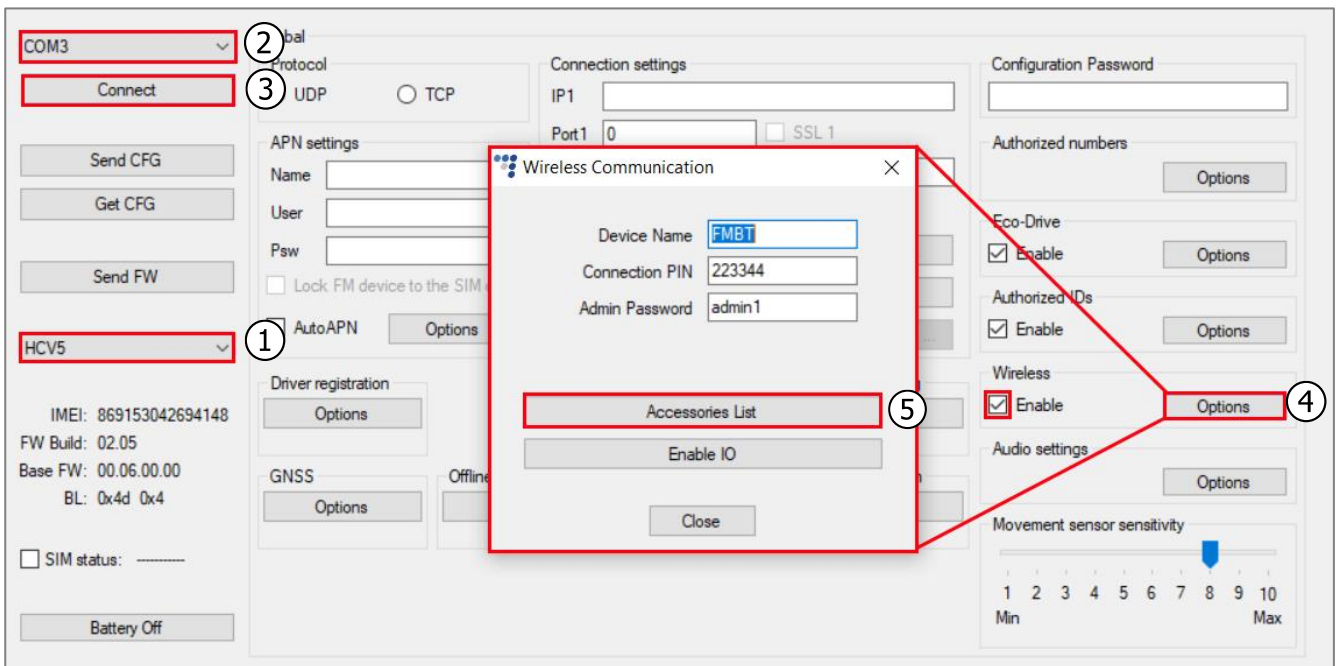
2.2 Device configuration through the Advanced Configurator



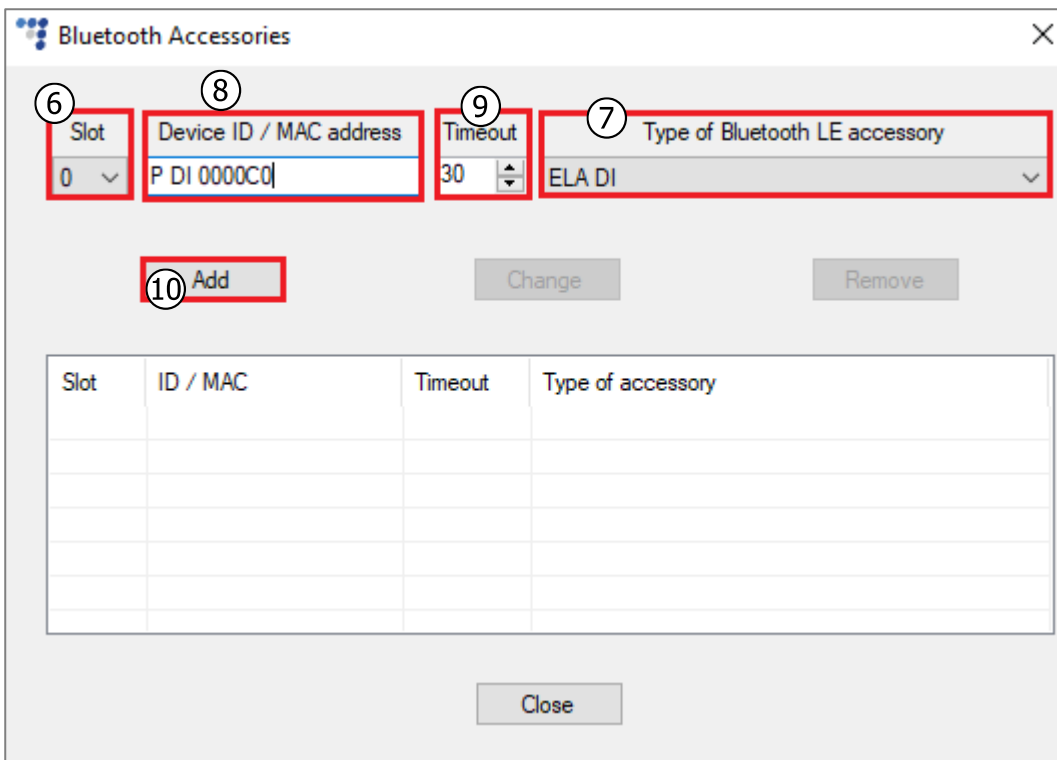
The sensor configuration through the app should be completed before starting the configuration via the advanced configurator.

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.

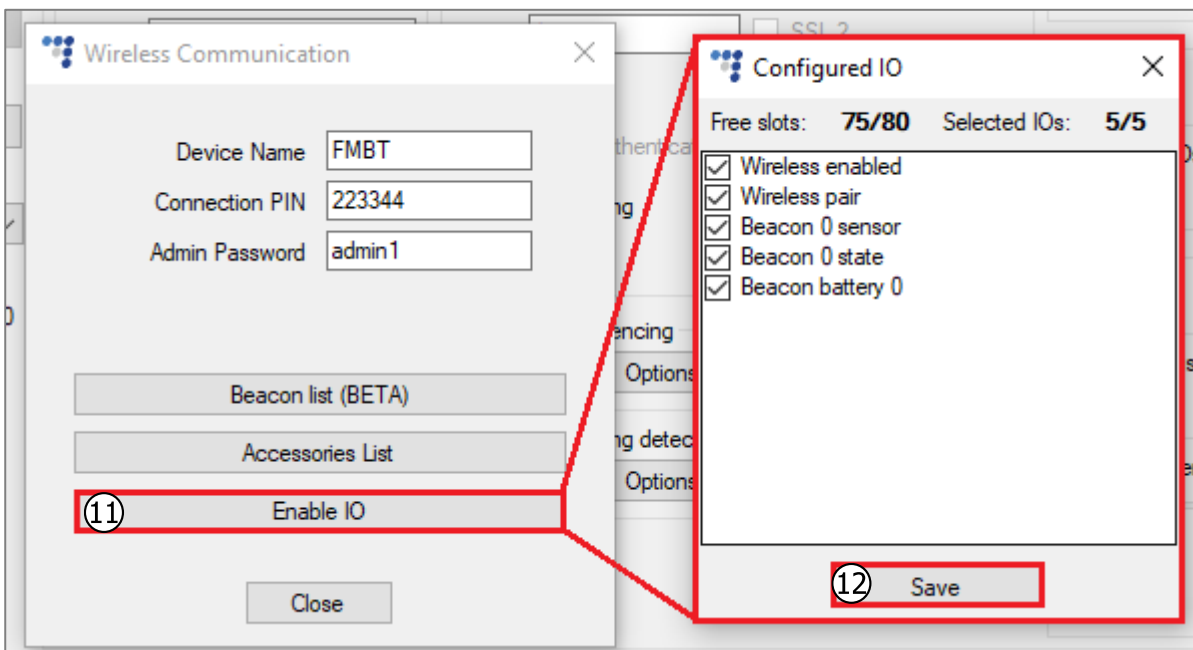


6. Select a free slot for the sensor.
7. Select *ELA DI* from the drop-down list.
8. Enter the sensor ID.
9. If required, adjust the timeout. The default value is 30 s. Increasing this value reduces the amount of error values when no data from the sensor is received.
10. Click **Add**.



11. Close the **Bluetooth Accessories** window and click **Enable IO** to open the **Configured IO** window. Select *Beacon x state*, *Beacon x sensor* 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.

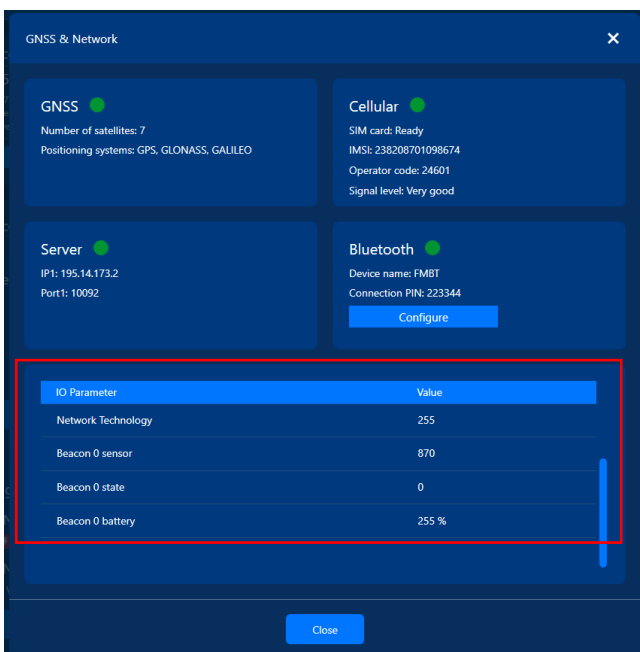
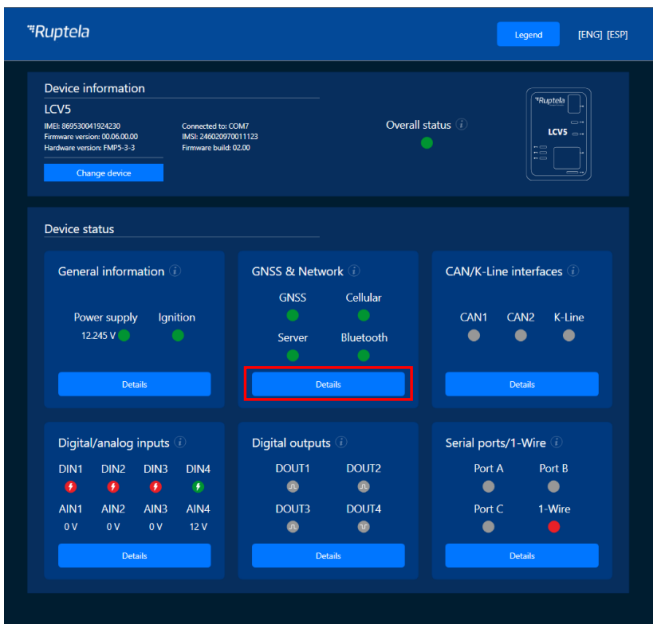
The screenshot displays a configuration window for a device. On the left side, there is a sidebar with a dropdown menu showing 'COM3' and 'HCV5'. Below the dropdown are buttons for 'Disconnect', 'Send CFG' (highlighted with a red border), 'Get CFG', and 'Send FW'. Further down, there is a 'Battery Off' button. The main area contains several sections: 'Global' with 'Protocol' set to 'UDP'; 'APN settings' with fields for 'Name', 'User', and 'Psw'; 'Connection settings' with 'IP1', 'IP2', 'Port1', and 'Port2' fields; 'Configuration Password' section; 'Eco-Drive' with 'Enable' checked; 'Authorized IDs' with 'Enable' checked; 'Wireless' with 'Enable' checked; and 'Movement sensor sensitivity' with a slider set to 8. 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

3.1 Installation

There are several points to consider for the sensor mounting:

- Connection of the wireless sensor to an accessory with a digital output
- The configuration of the sensor
- The configuration of the tracking device
- The mounting location of the 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 tracking device and the sensors firmly. You can do that using the Device Center installation tool/Advanced configurator live IO data.

Sensor pinout:

- Grey wire – GND
- Red wire – Digital Input

The definition of the sensor state is the following:

- $(0 - 0.7) V - 1$
- $(2.1 - 3.0) V - 0$

There are 3 ways to connect the sensor:

- Connect the Red wire to the open collector of digital output accessory that you want to monitor
- Connect the Grey wire to the voltage source (2.1 V – 3.0 V) that you want to detect
- Connect the Red and Grey wires via actuator (e.g. button) that closes the circuit



In case a different voltage range is needed, please consider using relay or consult our technical support regarding connection schematics.

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.

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.