

# Configuring EYE beacons

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## EYE App Configuration

Devices work constantly and are ready to perform out of the box. Default basic Sensor settings are set to:

- Transmitting at 2 dBm power.
- Data advertising at 3 second intervals.
- Eddystone protocol

If you would like to change these settings you will need to:

1) Download and install EYE APP - Teltonika application to change sensor settings.

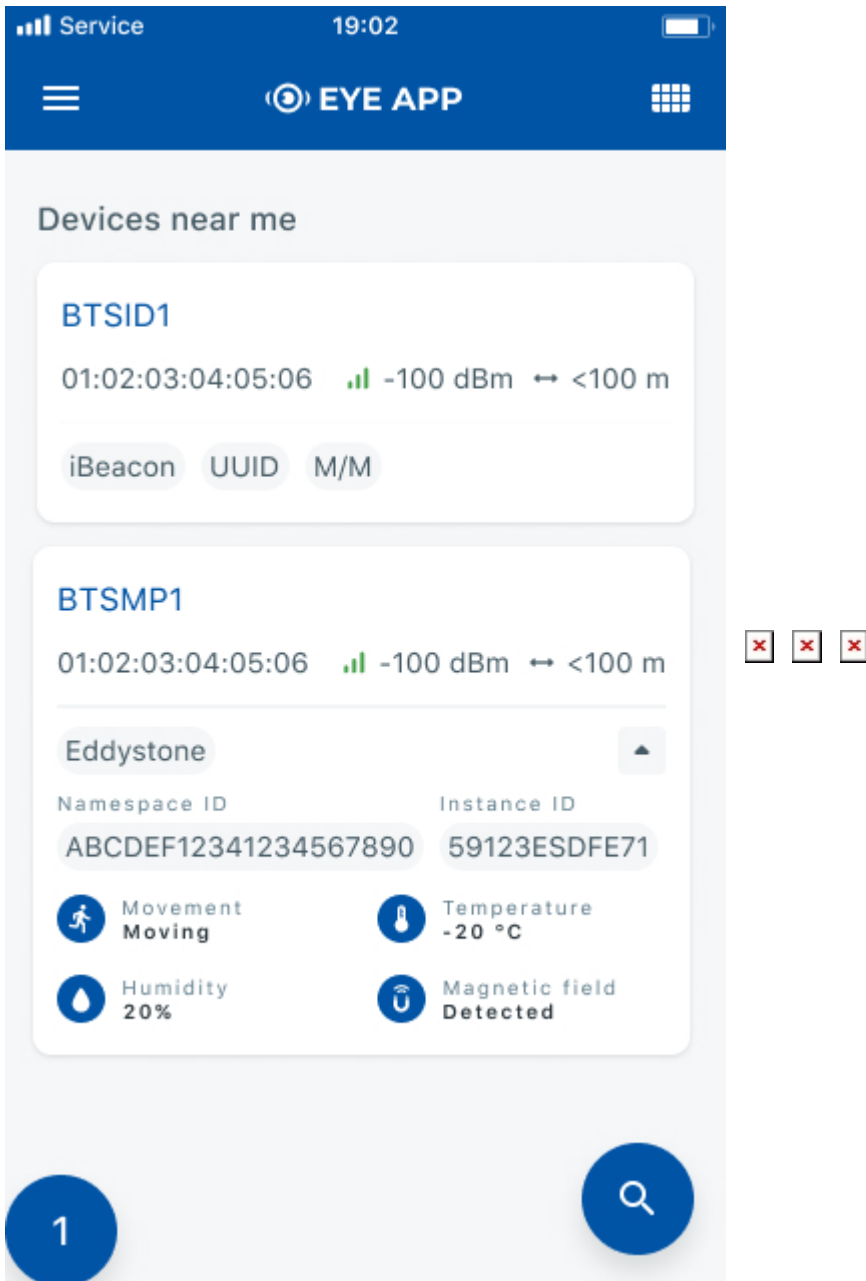





\*iOS doesn't show devices with iBeacon protocol

## Eye App Overview

With the application you will be able to scan for visible Teltonika EYE devices, check their

statuses or connect for configuration or firmware update.



✖ **Devices in view:** In this window you will see all visible devices. You have options to see devices in Short list  or in default list. When looking at devices in default list you will be able to open Detailed view  of devices and check transmitted data statuses. Additionally if you are looking for specific devices you will be able to use Search  function to filter search options. When in this window select a device of your choice to connect and after passing pin code (default pin code is 123456) you will go to device overview window

✖ **Overview window:** In overview window you can see device details, check firmware version and update if available , go to device configuration settings. If you select to Configure device new window will open with Basic and Advanced settings.

✖ **Configure window:** In this window you can check and change device configuration settings. In main tab Basic Settings you can change main settings. Change Device name, Power signal strength,

Advertising interval and Packet transmission type\*. For more settings go to Advanced settings tab to enable various events.

**Advanced configuration window:** Beacon information (iBeacon ID\*, Eddystone ID). UUID/MINOR/MAJOR parameter can be changed for iBeacon ID\*. Namespace ID/Instance ID can be changed for Eddystone ID



**\*iOS doesn't show devices with iBeacon protocol**

## Configuring device

**Before Beacon configuration, visit how to set up your device for the very first data sending to the server:** [Setting up your configuration for the very first data sending to the server](#)

These are instructions on how to easily configure EYE beacon with Teltonika Configurator on GH5200 device.

1. First the device **Bluetooth® settings** need to be configured. These are the required steps:

- Press Bluetooth® settings
- Turn on BT Radio by pressing Enable (hidden) or Enable (visible)

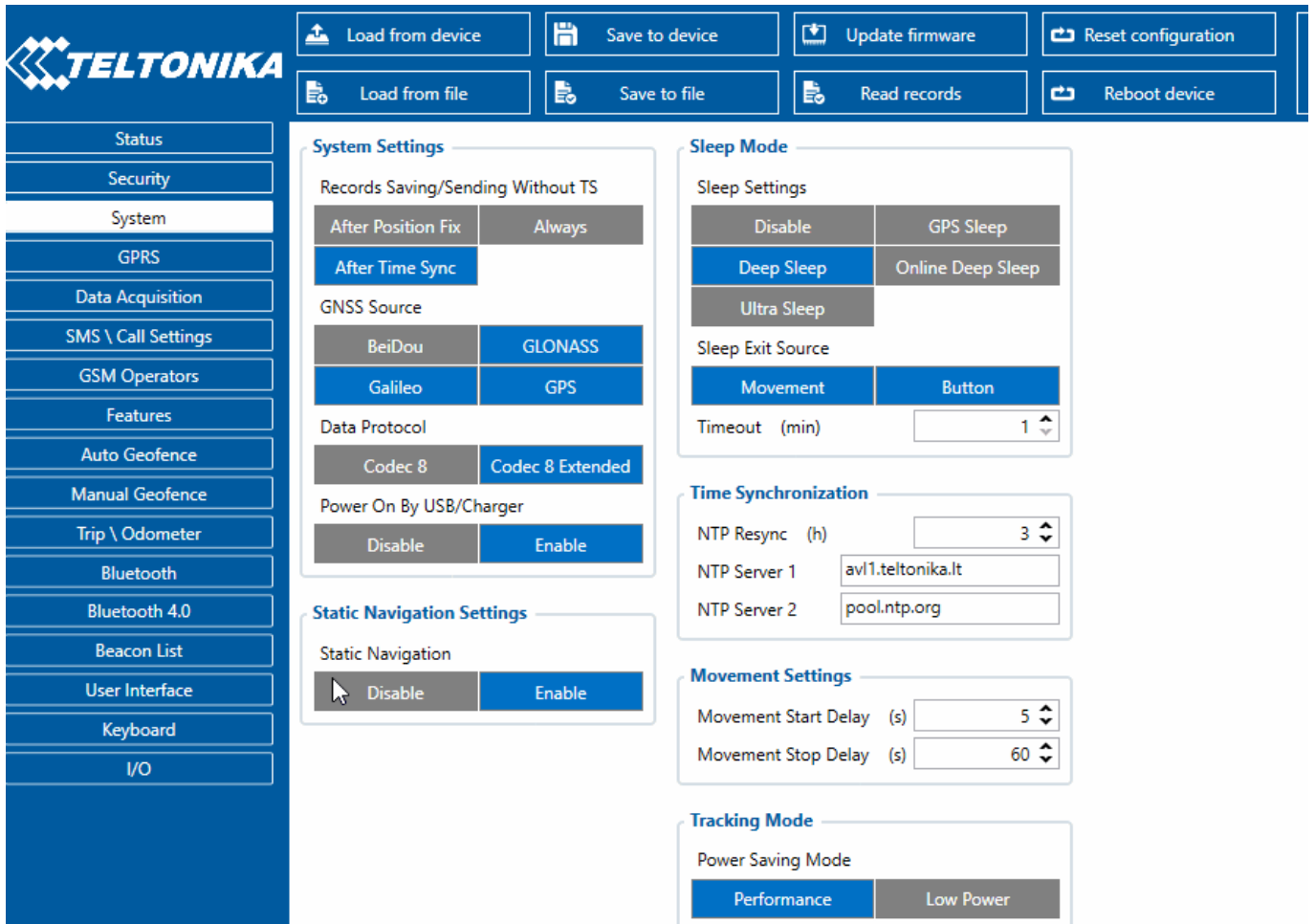
The screenshot displays the Teltonika Configurator interface. On the left is a vertical navigation menu with buttons for: Status, Security, System, GPRS, Data Acquisition, SMS \ Call Settings, GSM Operators, Features, Auto Geofence, Manual Geofence, Trip \ Odometer, Bluetooth, Bluetooth 4.0, Beacon List, User Interface, Keyboard, and I/O. The main content area is divided into several sections:

- SIM 1 [Active]**: Shows SIM Status as 'Ready' and 'Attempts Left: 3'.
- Enable PIN**: Includes a text input field for 'Current PIN' and a blue 'Enable' button.
- Keyword Settings**: Includes a 'Set keyword' section with 'New Keyword' and 'Repeat Keyword' text input fields, and a blue 'Set' button.
- Certificates**: Shows 'Certificate files in device:' with a checkbox for 'root.pem (Root certificate)'.

2. Press **Beacon list** tab.

- Select All or Configured (for seeing only preferred beacons) in Beacon Detection options.
- If you have selected Configured to see preferred beacons, you must add beacons to the Beacons list.
- Select Periodic option
- Set **Periodic settings** according to your needs.
- After all these steps press Save to device to save the configuration.

✘ **To find out how to add beacons to the Beacons list, click on one of the devices: [TST100](#) | [TFT100](#) | [GH5200](#) | [TMT250](#)**



3. Now you can see detected Beacons in **Status -> Beacons List**



4. Example of the server view:



In the server view picture above, displayed:

- The date when the packet arrived to the server

- Device IMEI number
- AVL ID 385 - Beacon AVL ID
- Beacon ID and RSSI

Beacon 1 ID: 0102030405060708090A0B0C0D0E0F00020B010A  
 Beacon 1 Major: 020B  
 Beacon 1 Minor: 010A  
 RSSI: -60

Beacon 2 ID: AAAAAAAAAAAAAAAAAABBCC526F6F6D31  
 Beacon 2 Major: 5231  
 Beacon 2 Minor: 010A  
 RSSI: -56

## EYE Beacon Protocol Overview

### Beacon advertising



#### Protocol description

At the highest-level Bluetooth® LE advertising packet consists of Advertising Indication and Scan Response. Both packets can be maximum of 31 bytes in size. Advertising Indication packet is always broadcasted when Scan Response is broadcasted only if Observer device requests it by using Active Scan.

BTSMP1 uses Advertising Indication to send beacon data which can be configured to select between iBeacon and Eddystone protocols or to be disabled at all. In that case, data which is shown as Scan Response in protocol overview will be sent as Advertising Indication without Scan Response following it.

Scan Response is used to send device name and manufacturer specific data. Manufacturer specific data includes Teltonika Company ID (0x089A) and protocol version (0x01). It is followed by Flag Encoded Data.

Device Name has the following default value for Beacon - ID1\_XXXXXXX

#### Flag Encoded Data

Data	Size(Bytes)	Description
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Flags	1	Each set bit (0-7) means the presence of value (0-7). Bits:  0 - Temperature value presence 1 - Humidity value presence 2 - Magnetic sensor presence 3 - Magnetic sensor state (1 magnetic field is detected/0 magnetic field is not detected) Valid value is present only if bit 2 flag is set. 4 - Movement sensor counter 5 - Movement sensor angle <b>6 - Low Battery indication (if set to 1 low battery voltage detected)</b> <b>7 - Battery voltage value presence</b> <b>Note:</b> only bolded bits (6 and 7) can have value 1, on BTSID1
7 - Battery voltage value presence	1	Battery Voltage  Battery voltage in mV = 2000 + VALUE * 10 <b>Note:</b> present only if bit 7 is set, otherwise is not being sent

## GATT Characteristics

Name	Service UUID	Characteristic UUID	Data Type	Min	Max	Default Value	Notes
Device Name	e61c0000-7df2-4d4e-8e6d-c611745b92e9	e61c0016-7df2-4d4e-8e6d-c611745b92e9	ASCII	0	11	Unique for each device	-
Tx Power Lever	1804	00002a07-0000-1000-8000-00805f9b34fb	SINT8	-14	8	2	Possible values: -14, -11, -8, -5, -2, 2, 4, 8
Protocol Type	e61c0000-7df2-4d4e-8e6d-c611745b92e9	e61c0001-7df2-4d4e-8e6d-c611745b92e9	UINT8	0	4	1 for EYE_Beacon, 4 for EYE_Sensor	0 - iBeacon 1 - EddyStone 2 - EYE Sensor 3 - iBeacon + EYE Sensor 4 - Eddystone + EYE Sensor
Advertising Interval	e61c0000-7df2-4d4e-8e6d-c611745b92e9	e61c0002-7df2-4d4e-8e6d-c611745b92e9	UINT16	20	10000	1000	milliseconds
Sub Advertising Interval	e61c0000-7df2-4d4e-8e6d-c611745b92e9	e61c0003-7df2-4d4e-8e6d-c611745b92e9	UINT16	20	1000	100	Used by repeats, milliseconds
Advertising Repeats	e61c0000-7df2-4d4e-8e6d-c611745b92e9	e61c0004-7df2-4d4e-8e6d-c611745b92e9	UINT16	1	10	1	Repeats work only if Advertising Interval is more than 2000 ms and Repeats set to more than 1
iBeacon ID	e61c0000-7df2-4d4e-8e6d-c611745b92e9	e61c0005-7df2-4d4e-8e6d-c611745b92e9	BYTE ARRAY	20 bytes	20 bytes	Unique for each device	16 B - UUID 2 B - major 2 B - minor
Eddystone ID	e61c0000-7df2-4d4e-8e6d-c611745b92e9	e61c0006-7df2-4d4e-8e6d-c611745b92e9	BYTE ARRAY	16 bytes	16 bytes	Unique for each device	10 B - Namespace 6 B - Instance
Password	e61c0000-7df2-4d4e-8e6d-c611745b92e9	e61c0008-7df2-4d4e-8e6d-c611745b92e9	BYTE ARRAY	4 bytes	4 bytes	123456	Always 6 Digits
Manufacturer 180A		2A29	BYTE ARRAY	-	-	Not Configurable	Read Only. Ex. "Teltonika"
Model 180A		2A24	BYTE ARRAY	-	-	Not Configurable	Read Only. Ex. "BTSID1"
Serial 180A		2A25	BYTE ARRAY	-	-	Not Configurable	Not used
Hardware 180A		2A27	BYTE ARRAY	-	-	Not Configurable	Read Only. Ex. "Table:1 Volt:325"
Firmware 180A		2A26	BYTE ARRAY	-	-	Not Configurable	Read Only. Ex. "1.1.0-beta"
System ID 180A		2A23	BYTE ARRAY	-	-	Not Configurable	Not used

MAC	180A	652143dc-dec6-4fb1-bd46-3e919d2410a6	BYTE ARRAY	6	6	Not Configurable	Read Only. ex. 112233445566 -> 11:22:33:44:55:66
Scan Response Data	e61c0000-7df3-4d4e-8e6d-c611745b92e9	e61c0001-7df3-4d4e-8e6d-c611745b92e9	BYTE ARRAY	17	17	Not Configurable	Scan Response Data, see picture for detail view of data structure



## Packet parsing example

Beacon AVL ID:385 has the following structure:

### AVL ID 385 Parsing

Data part	BLE beacon flags #1	Beacon ID #1	Signal Strength #1	Beacon data #2
1 Byte	1 Byte	20/16 Bytes	1 Byte	...
First half byte - current data part	Bitwise parameter, specify BLE beacon type and parameters.	Beacon - 20B (UUDI, major, minor)		
Second half byte - total number of data parts	Two options available are: 21 iBeacon with RSSI 01 Eddystone with RSSI	Eddystone - 16B (Namespace, Instance ID)	Signed 2's complement	

## Eddystone example with 1 beacon

### AVL Data Packet

AVL Data Packet Part	HEX Code Part
Zero Bytes	00 00 00 00
Data Field Length	00 00 00 40
Codec ID	8E (Codec8 Extended)
Number of Data 1 (Number of Total Records)	01

	Timestamp	00 00 01 70 1F 9B 3F A9 (GMT: Friday, 07 February 2020 12:23:53.001)
	Priority	01
	Longitude	0F 0E 50 2A
	Latitude	20 9A B4 61
	Altitude	00 74
	Angle	00 C6
	Satellites	0E
	Speed	00 00
	Event IO ID	01 81 (385)
AVL Data	N of Total ID	00 01
	N1 of One Byte IO	00 00
	N2 of Two Bytes IO	00 00
	N4 of Four Bytes IO	00 00
	N8 of Eight Bytes IO	00 00
	NX of X Bytes IO	00 01
	N'th IO ID - AVL ID.	01 81 (385)
	Length of Variable Length IO	00 13
	Value of Variable Length IO	1101E39B606AA38255AA8E460B154E 2D0055CF
	Number of Data 2 (Number of Total Records)	01
	CRC-16	00 00 00 56

### iBeacon example with 2 beacons

#### AVL Data Packet

AVL Data Packet Part	HEX Code Part
Zero Bytes	00 00 00 00
Data Field Length	00 00 00 5A
Codec ID	8E (Codec8 Extended)
Number of Data 1 (Number of Total Records)	01



	Timestamp	00 00 01 6B 69 B0 C9 51(GMT: Tuesday, 18 June 2019 08:25:22.001)
	Priority	00
	Longitude	00 00 00 00
	Latitude	00 00 00 00
	Altitude	00 00
	Angle	00 00
	Satellites	00
	Speed	00 00
	Event IO ID	01 81 (385)
	N of Total ID	00 01
AVL Data	N1 of One Byte IO	00 00
	N2 of Two Bytes IO	00 00
	N4 of Four Bytes IO	00 00
	N8 of Eight Bytes IO	00 00
	NX of X Bytes IO	00 01
	N'th IO ID - AVL ID.	01 81 (385)
	Length of Variable Length IO	00 2D
	Value of Variable Length IO	11216B817F8A274D4FBDB62D33E184 2F8DF8014D022B BF21A579723675064DC396A7C35201 29F61900000000BF
	Number of Data 2 (Number of Total Records)	01
	CRC-16	00 00 3E 5D