

# How to start with FMB devices and Beacons?

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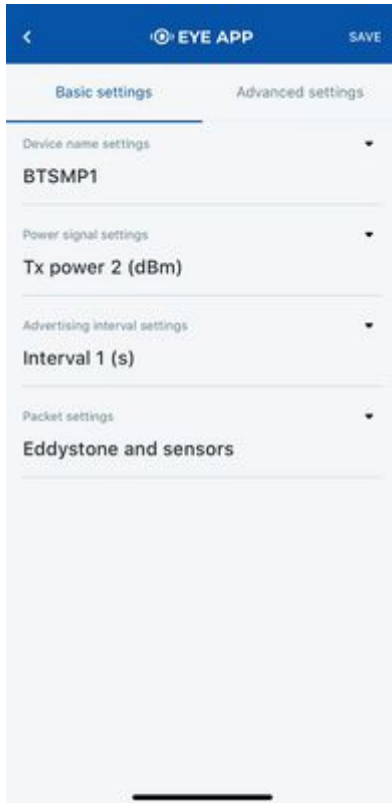
## Eye Devices ready to use

The easiest way to get started with beacons is to use the Teltonika's Eye Devices. All you need to do is just unbox them.

[Eye Beacons](#) are designed to make your wireless experience effortless, there is not need to make adjustments configuration, the devices are pre-configured and ON from factory, this ensures rapid deployment.

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 5 second intervals.
- Eddystone(for EYE Beacon) Eddystone and Sensors(for EYE Sensor) protocol



You can find detailed information about how to configure those parameters below:

## Beacon Configuration and data sending

### EYE APP Overview

Eye sensors are ready to use from factory, however, you can change your beacon parameters according to your needs. Eye App is Teltonika dedicated application for Eye sensor/beacon configuration.



1. Eye App first screen will show you available Eye Beacons/sensors reachable, press on you beacon to access next screen
2. Eye App second screen shows ID information and Firmware information, press on the icon to access beacon parameters
3. Eye App third screen allows you to change Beacon Name, TX power, Advertising interval, Packet settings.

### Beacon configuration (Setting your tracking device for Beacon usage)

Below are short instructions which show how we recommend configuring the device to Enable the Beacon functionality for testing.

The screenshot displays the TELTONIKA FMB900 web interface. At the top, there are navigation buttons for 'Load from device', 'Save to device', 'Update firmware', 'Reset configuration', 'Load from file', 'Save to file', 'Read records', and 'Reboot device'. The device name is FMB900, and the IMEI is 352093087728241. The interface is divided into several sections:

- Device Info:**
  - Device Name: FMB900
  - Last Start Time: 2/11/2020 9:34:04 AM
  - Power Voltage: 16034 mV.
  - Ext Storage (used/total): 0 / 122 MB [Format](#)
  - Firmware Version: 03.25.15 Rev:01
  - RTC Time: 2/11/2020 9:37:56 AM
  - Device IMEI: 352093087728241
  - Device Uptime: 00:04:51
- GNSS Info:**
  - GNSS Status:**
    - Module Status: ON
    - GNSS Packets: 252
    - Fix Status: Fix
    - Fix Time: 00:00:41
  - Satellites:**

Visible:		In Use:	
GPS	GLONASS	GPS	GLONASS
10	9	5	3
BeiDou	Galileo	BeiDou	Galileo
0	0	0	0
Total In View: 19		Total In Use: 8	
  - Location:**

Latitude/Longitude	Altitude	HDOP
54.7008867, 25.2596367	129.5	0.495
Speed	Angle	PDOP
0 km/h	49.61°	0.65

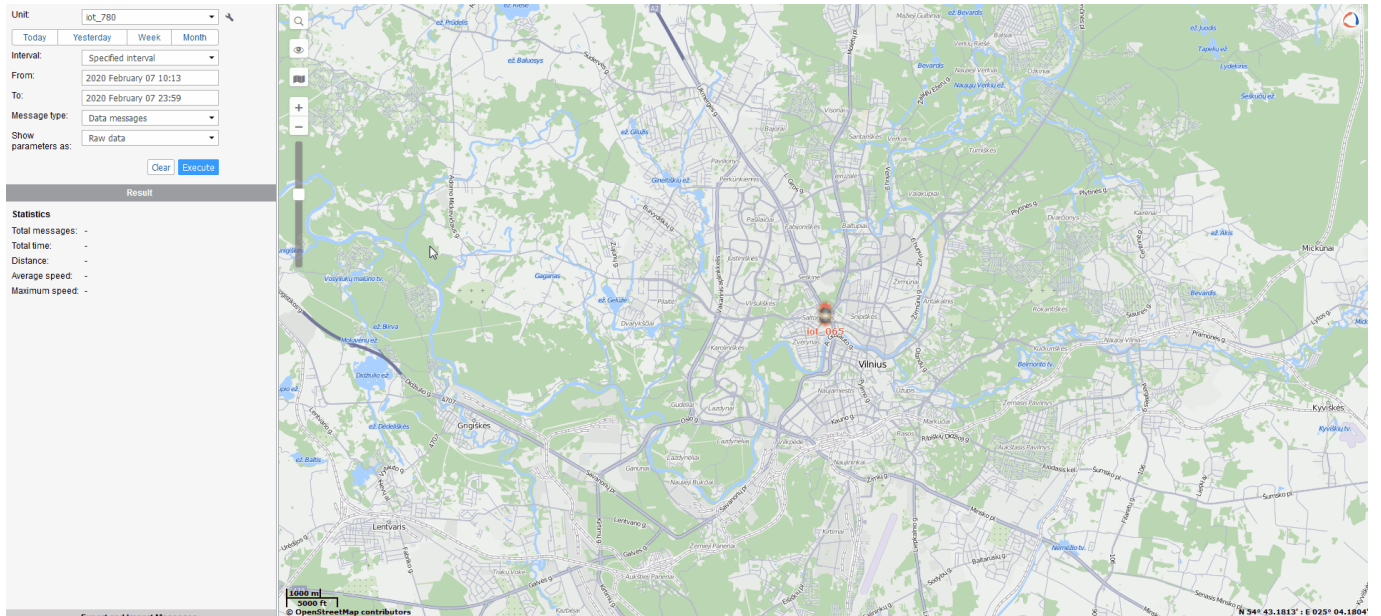
The left sidebar contains various settings categories: Status, Security, System, GPRS, Data Acquisition, SMS \ Call Settings, GSM Operators, Features, Accelerometer Features, Auto Geofence, Manual Geofence, Trip \ Odometer, Bluetooth, Bluetooth 4.0, Beacon List, I/O, and OBD II. The bottom of the interface features social media icons and a settings gear.

## Steps to follow according to the visual representation

1. In System Settings Enable [Codec8 Extended](#);
2. In [Bluetooth®](#) settings Enable Bluetooth®, set this setting as either "Enable (hidden)" or "Enable (visible)", otherwise Bluetooth® will be disabled;
3. In [Bluetooth® 4.0](#) settings, set Non Stop Scan to "Disable", configure "Update Frequency" and "Scan duration" as 30 seconds. These settings will bring the best results for BLE scanning with our device;
4. In [Beacon list](#) settings, configure Beacon Detection as "All" and Beacon Record as "Eventual". This will detect all surrounding Beacons and create Beacon records every 30 seconds.

## Beacon data parsing

Shown how Beacon data is represented on [Wialon platform](#).



## Parsing of Beacon records

Beacon records are sent as separate Records with Event I/O ID 385 and also include I/O element 385 (Codec8 Extended has to be used because the I/O element 385 uses Variable size IO element).

Received data in hexadecimal stream:

```
0000000000000000D68E01000001701F9B3FA9000F0E5732209AB45000680029040000018100010
000000000000000001018100A911214B5C049F515341
```

```
FCA950D2C264414E1000050006BA21E2C56DB5DFFB48D2B060D0F5A71096E000000000A92131A
74BB76A79423196C916CFB9FAED45002D00159F0700112
```

```
233445566778899ABCDE0810047AE0BE80015210F86676BEC91420A94409110029AFAC415B31A
0AA101DE9C18E92CA5AA689697365434663222BA21EBBB
```

```
DE835D7F4965B5F06C2EDCB3A55300010080A501736B79686F73742E646B000010000128AD010
00030CB
```

## Example Beacon Record

### AVL Data Packet

AVL Data Packet Part	HEX Code Part
Zero Bytes	00 00 00 00
Data Field Length	00 00 00 D6
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	00
	Longitude	0F 0E 57 32
	Latitude	20 9A B4 50
	Altitude	00 68
	Angle	00 29
	Satellites	04
	Speed	00 00
	Event IO ID	01 81 (385)
	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)
AVL Data	Length of Variable Length IO	00 A9
	Value of Variable Length IO	11214B5C049F515341FCA950D2C264414E1000050006BA21E 2C56DB5 DFFB48D2B060D0F5A71096E00000000A92131A74BB76A794 23196C916CFB9FAED45002D00159F070011223344556677889 9ABCDE081004 7AE0BE80015210F86676BEC91420A94409110029AFAC415B3 1A0AA101DE9C18E92CA5AA689697365434663222BA21EBBB DE835D7F4965B5 F06C2EDCB3A55300010080A501736B79686F73742E646B000 010000128AD
	Number of Data 2 (Number of Total Records)	01
	CRC-16	00 00 30 CB

## Parsing Beacon data from record

### Beacon data

#### Unparsed Beacon data

```

11214B5C049F515341FCA950D2C264414E1000050006BA21E2C56DB5
DFFB48D2B060D0F5A71096E00000000A92131A74BB76A79423196C916CFB9FAED45002D00159F0700112233445566778899ABCDE081004
7AE0BE80015210F86676BEC91420A94409110029AFAC415B31A0AA101DE9C18E92CA5AA689697365434663222BA21EBBBDE835D7F4965B5
F06C2EDCB3A55300010080A501736B79686F73742E646B000010000128AD

```

## Beacon Flags

The below table represents possible Beacon flags. Supported Beacon protocols are iBeacon and Eddystone.

Flags	
<b>21</b>	iBeacon with RSSI
<b>23</b>	iBeacon with RSSI, Battery Voltage
<b>27</b>	iBeacon with RSSI, Battery Voltage, Temperature
<b>01</b>	Eddystone with RSSI

- 03 Eddystone  
with RSSI,  
Battery  
Voltage
- 07 Eddystone  
with RSSi,  
Battery  
Voltage,  
Temperature

NOTE! Standard iBeacon protocol does not support Battery voltage or temperature sending.

### Parsed Beacon data

Parsed Beacon data part	HEX Code Part
Data part (First half byte - current data part, Second half byte - total number of data parts)	11
BLE beacon flags #1 21 - iBeacon, RSSI is sent	21
BLE Beacon UUID #1	4B5C049F515341FCA950D2C264414E10
BLE Beacon Major #1	0005
BLE Beacon Minor #1	0006
BLE Beacon RSSI #1	BA - Signed 2's Complement -70 dBm
BLE beacon flags #2 21 - iBeacon, RSSI is sent	21
BLE Beacon UUID #2	E2C56DB5DFFB48D2B060D0F5A71096E0
BLE Beacon Major #2	0000
BLE Beacon Minor #2	0000
BLE Beacon RSSI #2	A9 - Signed 2's Complement -87 dBm
BLE beacon flags #3 21 - iBeacon, RSSI is sent	21
BLE Beacon UUID #3	31A74BB76A79423196C916CFB9FAED45
BLE Beacon Major #3	002D
BLE Beacon Minor #3	0015
BLE Beacon RSSI #3	9F - Signed 2's Complement -97 dBm
BLE beacon flags #4 07 - Eddystone, Battery Voltage, Temperature, RSSI is sent	07
BLE Beacon Namespace #4	00112233445566778899
BLE Beacon Instance ID #4	ABCDE0810047
BLE Beacon RSSI #4	AE - Signed 2's Complement -82 dBm
BLE Beacon Battery Voltage #4	0BE8 - 3048 mV
BLE Beacon Temperature #4	0015 - 21°C
BLE beacon flags #5 21 - iBeacon, RSSI is sent	21
BLE Beacon UUID #5	0F86676BEC91420A94409110029AFAC4
BLE Beacon Major #5	15B3
BLE Beacon Minor #5	1A0A
BLE Beacon RSSI #5	A1 - Signed 2's Complement -95 dBm
BLE beacon flags #6 01 - Eddystone, RSSI is sent	01
BLE Beacon Namespace #6	DE9C18E92CA5AA689697
BLE Beacon Instance ID #6	365434663222
BLE Beacon RSSI #6	BA - Signed 2's Complement -70 dBm
BLE beacon flags #7 21 - iBeacon, RSSI is sent	21

