EYE BEACON / BTSID1

Introduction

Wireless solutions open up new horizons for your business and help to keep an eye on your assets. Discover our brand-new and certified Bluetooth® Low Energy ID beacon model from Teltonika with robust waterproof casing and a long-lifetime battery. The model designed for a low-cost fast and easy configuration and integration to save precious time, resources, and ensure accountability.

About BTSID1

Perfect for traceability use cases, delivery tracking, monitoring of various movable objects in logistics (trailers, containers), agriculture (tractor attachments), and constructions (tools and inventory). Also, it suitable for indoor tracking solutions for items tracking in warehouses, hospitals, transport hubs and other types of industrial areas. EYE beacon supports iBeacon and Eddystone protocols. The device is fully compatible with the Teltonika firmware platform which provides extended functionality. Configure, scan, and update anytime anywhere with a dedicated Teltonika mobile app.

Product Specification

Features

Functionalities	
Beacon ID, LED	

Dimensions and weight	
Dimensions	56,6 mm x 38 mm x 13 mm
Weight 19 g	18g

Battery and power (not confirmed)	
Model	CR2450
Type	Type Lithium, Manganese Dioxide
Total Capacity	600 mAh
Replaceable	No
Battery life (Tx=2 dBm; interval: 3 s)	4 years
Battery life (Tx=2 dBm; interval: 5 s), default	8 years
Battery life (Tx=2 dBm; interval: 10 s)	10 years

Electronic	
Microcontroller	ST Microelectronics BlueNRG-2

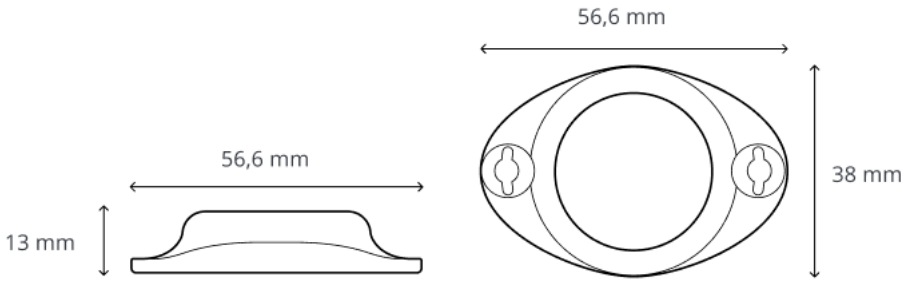
Connectivity	
Bluetooth®	Bluetooth® 4.2 compliant
Range	80 m
Available transmission power levels	Up to 8 dBm
Sensitivity	-88 dBm

Casing	
Protection	IP67
Mounting	Two holes to screw/leash/strip, tape
Customization	Custom logo upon request (Special conditions)

Environmental Requirements	
Operational temperature	-20 °C / +60 °C (-4 °F / +140 °F)

Protocols compatibility	
iBeacon	Yes *iOS doesn't show devices with iBeacon protocol
Eddystone	Yes

Dimensions



Value-adding Features

Hibernate mode

Hibernated mode means that the EYE device is OFF when shipping from the factory, preserving battery life. PLEASE NOTE that EYE devices are available in two modes: factory-activated (ON) or Hibernated (OFF). You may order the device version which better suits your needs. Order codes are described on eye page (https://teltonika-gps.com/products/accessories/sensors-beacons/eye)

Value of hibernate mode

Hibernated versions of EYE devices simplify stock management for our partners while maximizing battery life.
1. **Accelerated delivery times:**

By stocking up on hibernated EYE devices, you ensure readiness to deploy EYE devices with full battery capacity at any moment. This proactive approach provides fastest possible service, increases your reputation for efficiency and positions you as an industry frontrunner, enhancing your competitive edge.

2. **Mitigated project risks:**

In scenarios where projects encounter unforeseen challenges, our hibernated EYE devices offer a buffer. Hibernate feature allows to safeguard your investments and potential revenue streams. This means that even if projects encounter delays or complications, you can still deploy EYE devices with full battery capacity, ensuring optimal performance when the time is right.

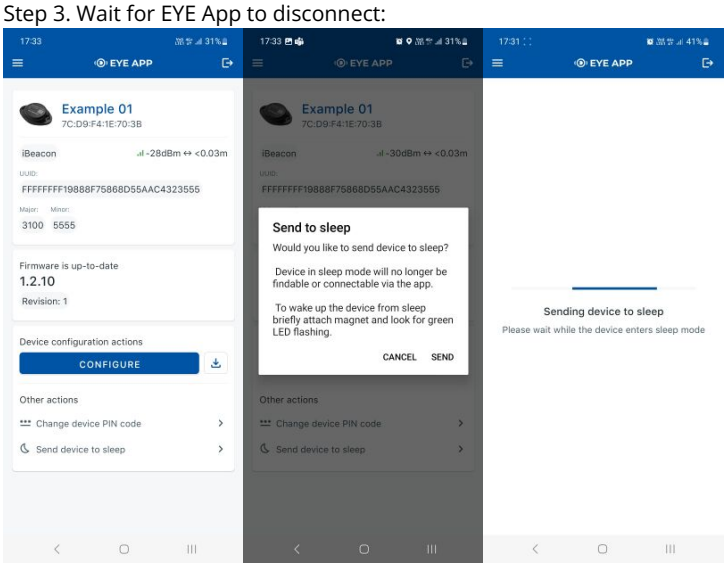
How to activate hibernated eye device?

Attach any magnet to sleeping device and wait for LED to blink.
NOTE: ANY MAGNET CAN BE USED

Now device is discoverable, scannable, connectable via BLE.

How to send the device to hibernate mode?

If you want to put the EYE device back to hibernate mode after accidental activation or simply pause its use, you may do that following steps below:
Step 1. While connected and in overview tap "Send device to sleep":
Step 2. Confirm your selection:
Step 3. Wait for EYE App to disconnect:

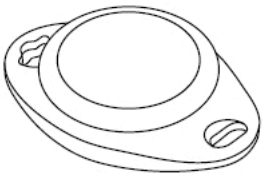


Can All devices hibernate?

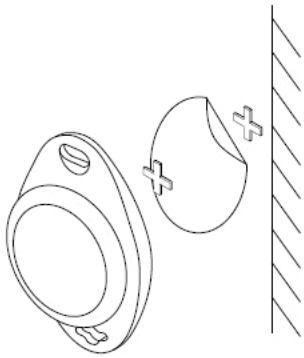
1. All EYE Sensors with firmware version starting from 1.2.9.R.8 can hibernate.

2. Only new EYE Beacons bought with order codes that have hardware modification can hibernate standard codes are available in eye page (https://teltonika-gps.com/products/accessories/sensors-beacons/eye), for special order codes consult your sales manager.

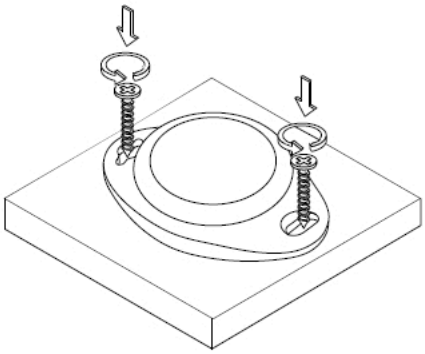
Mounting recomendations



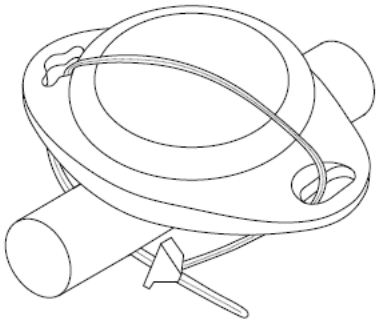
1 Placing: Directly place the monitor on the surface such as table, shelf



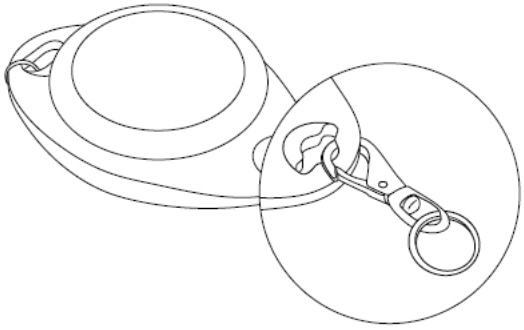
2 Using the adhesive sticker: Remove the release liner from one side of the adhesive sticker to stick it on the back of the device, then remove the release liner from the other side to stick it at the desired place on the wall



3 Using screws: Place device on the surface and secure it to the surface using two screws



4 Ziptie: Lead ziptie thru both device holes and around an object you want device secured to



5 Hanging: Attach lanyard's snap hook to one of the holes

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 5 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, connect for configuration, download it or update the firmware.

12:59

EYE APP

Default

7C:D9:F4:1E:70:3B

iBeacon

-99dBm

UUID:

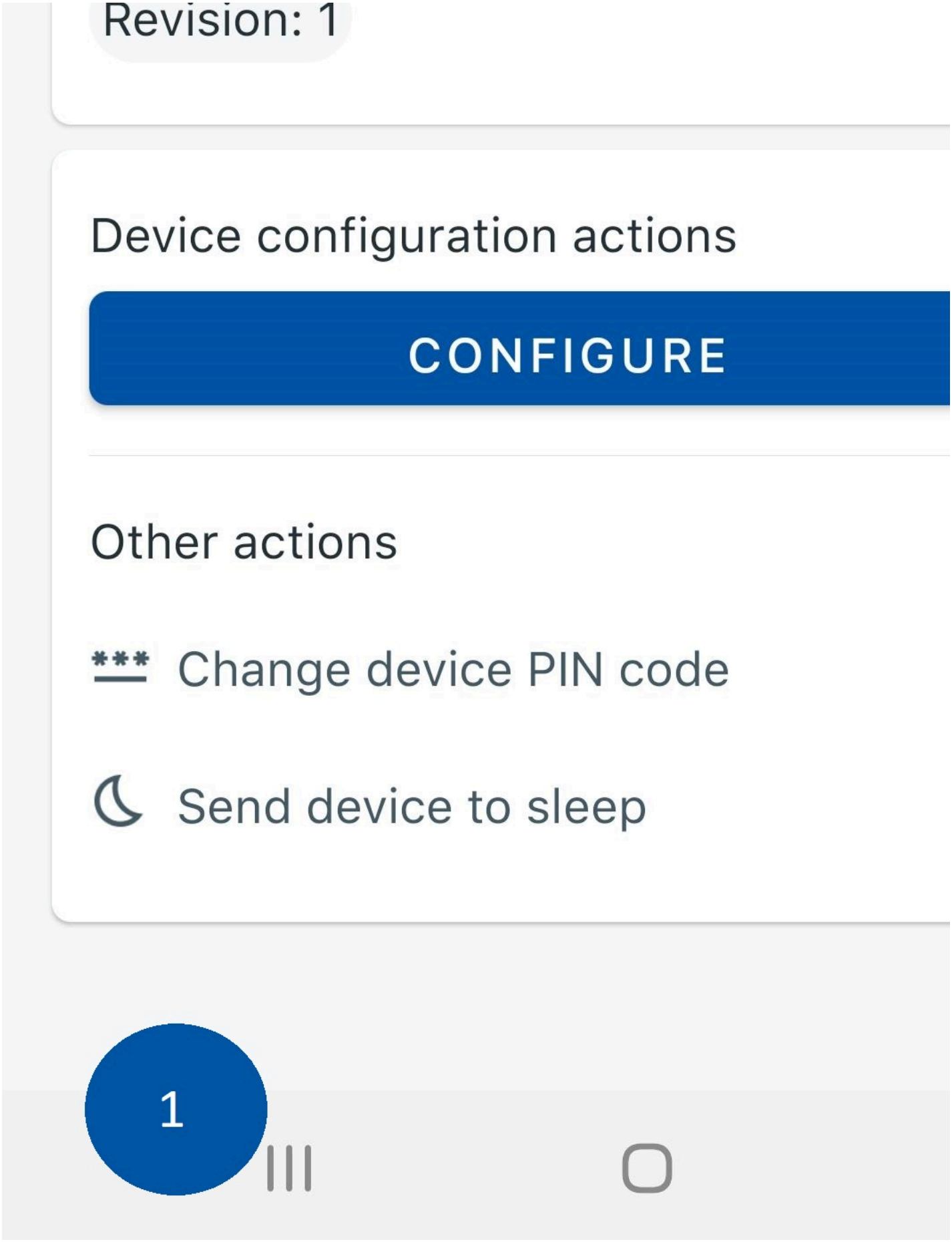
FFFFFFFF19888F75868D55AAC4323

Major: 3100

Minor: 5555

Firmware is up-to-date

1.2.10



1 **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. Additionaly 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

2

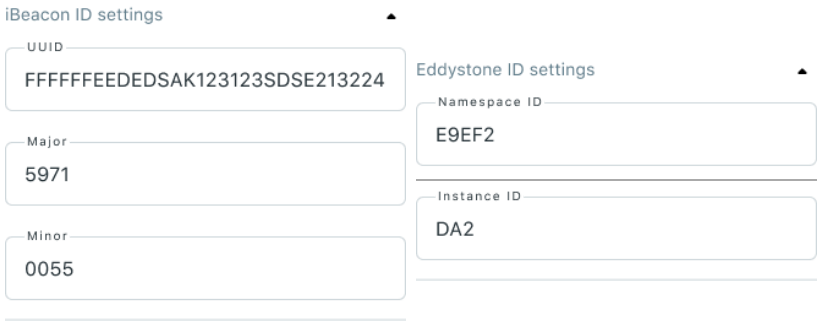
Overview window: In overview window you can see device details, check firmware version and update if available, go to device configuration settings and download the configuration. If you select to Configure device new window will open with Basic and Advanced settings. Other actions include changing the device PIN code and putting the device to sleep. A device in sleep mode will no longer be findable or connectable via the app. To wake it up, you need to attach a magnet and look for a green LED flashing.

3

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.

4

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**

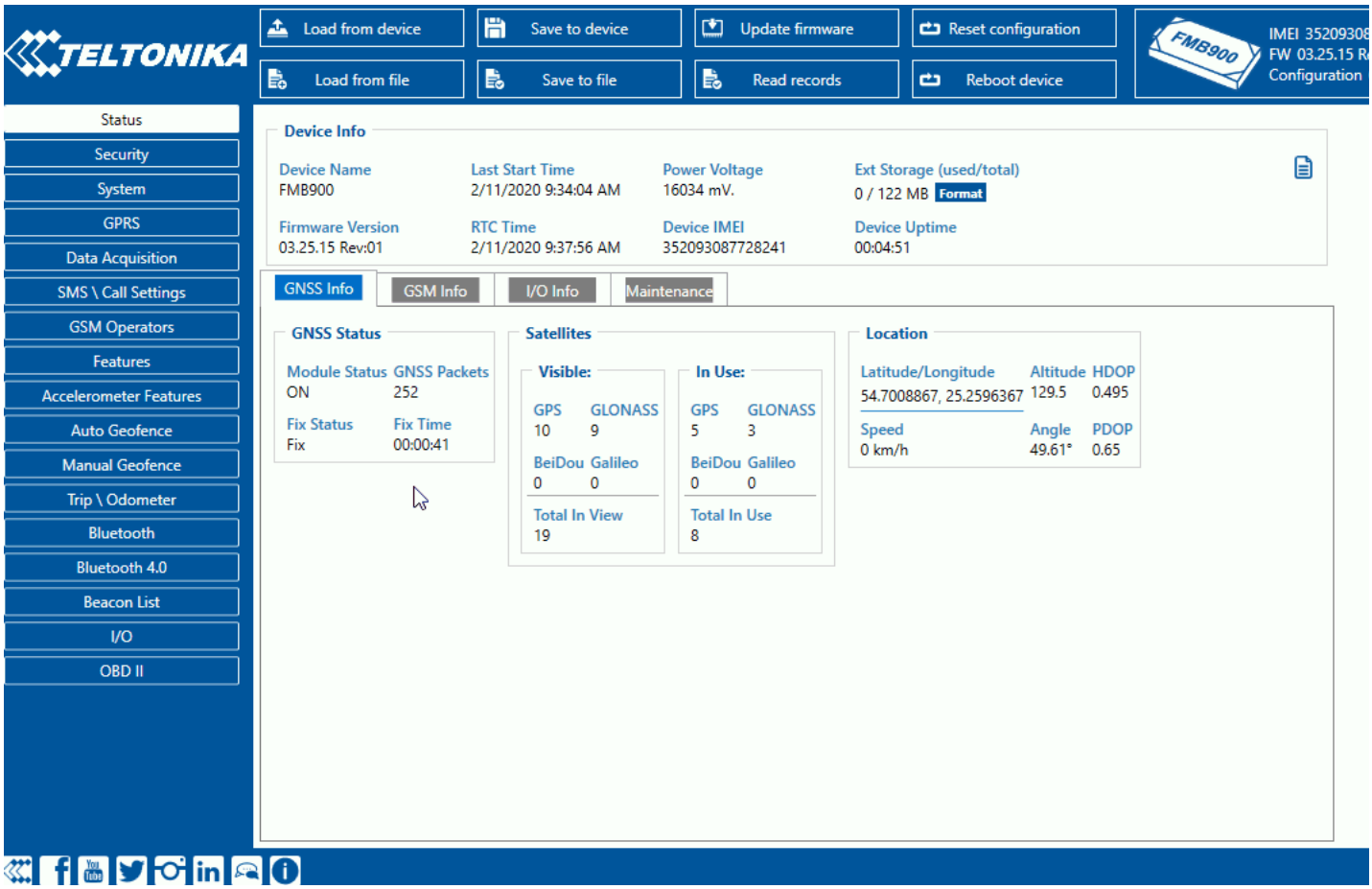
FM Tracker Configuration

Teltonika configurator (Base firmware)

If you have firmware / configurator which does not support EYE Beacon tab in Bluetooth® 4.0 section, then you can use Beacon list section of the configurator to scan available EYE Beacons.
Below are short instructions which show how we recommend configuring the device to Enable the Beacon functionality for testing.

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.

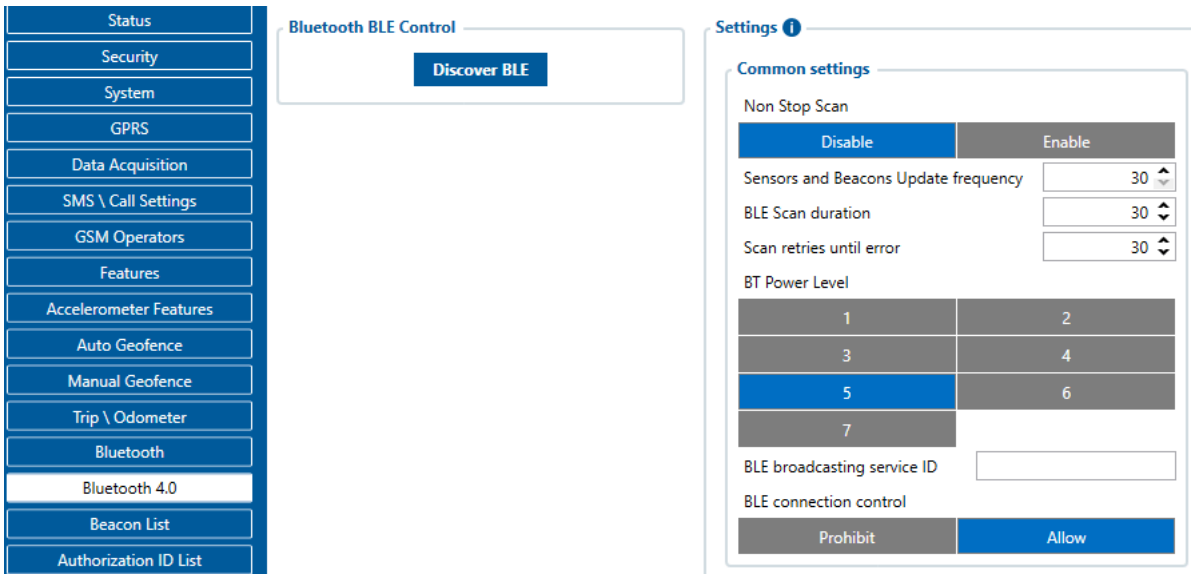


Teltonika configurator new functionalities (Evaluation firmware)

Bluetooth® 4.0

Common settings

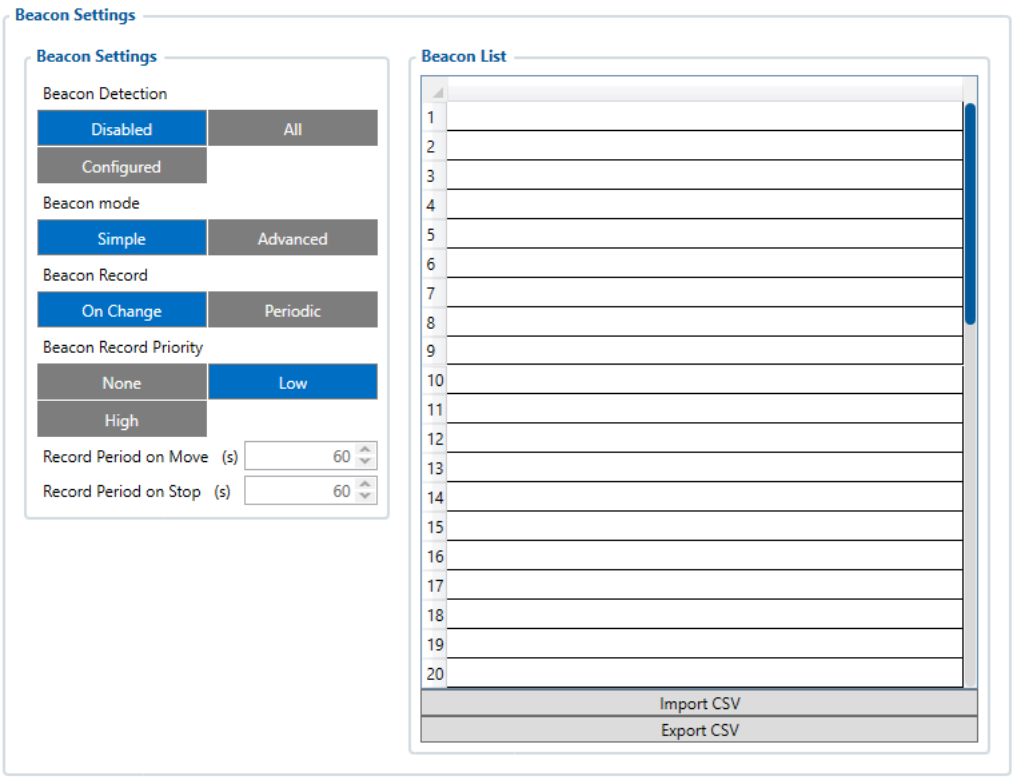
- **Non Stop Scan** - Enable Non Stop Scan feature, the device will try to scan for the sensors all the time if any of them are configured.
- **Sensors and Beacons Update frequency** - changes sensors temperature/humidity/battery voltage data update frequency. Minimum value: 30s, maximum value: 65535s. Recommended value 30.
- **BLE Scan Duration** - Sensors data reading time. Recommended value 30.
- **Scan retries until error** - Scan retries count, till start to show the value as Error '3000' - sensor disconnected. Recommended value 30.
- **BT Power Level** - Telematics device Bluetooth® power level setting.
- **BLE Broadcasting service ID** - Telematics device can broadcast configured ID.
- **BLE connection control** - Connection mode settings. If broadcasting ID is configured, parameter should be set to Prohibit.



Beacon List

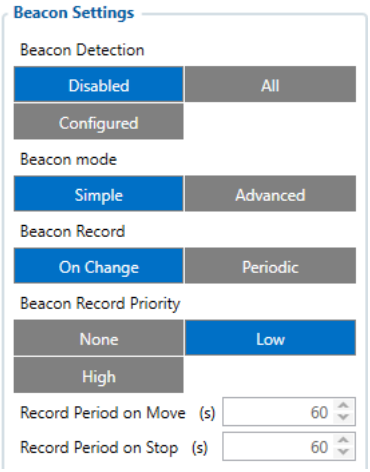
Beacons configuration instruction: How to start with FMB devices and Beacons? (https://wiki.teltonika-gps.com/view/How_to_start_with_FMB_

devices_and_Beacons%3F)



Beacon detection - Parameter controls over all Beacons scanning:

- **Disabled** – Beacon scanning and transmitting disabled.
- **All** – Read all visible beacons;
- **Configured** – Read only beacons set in Beacon List;



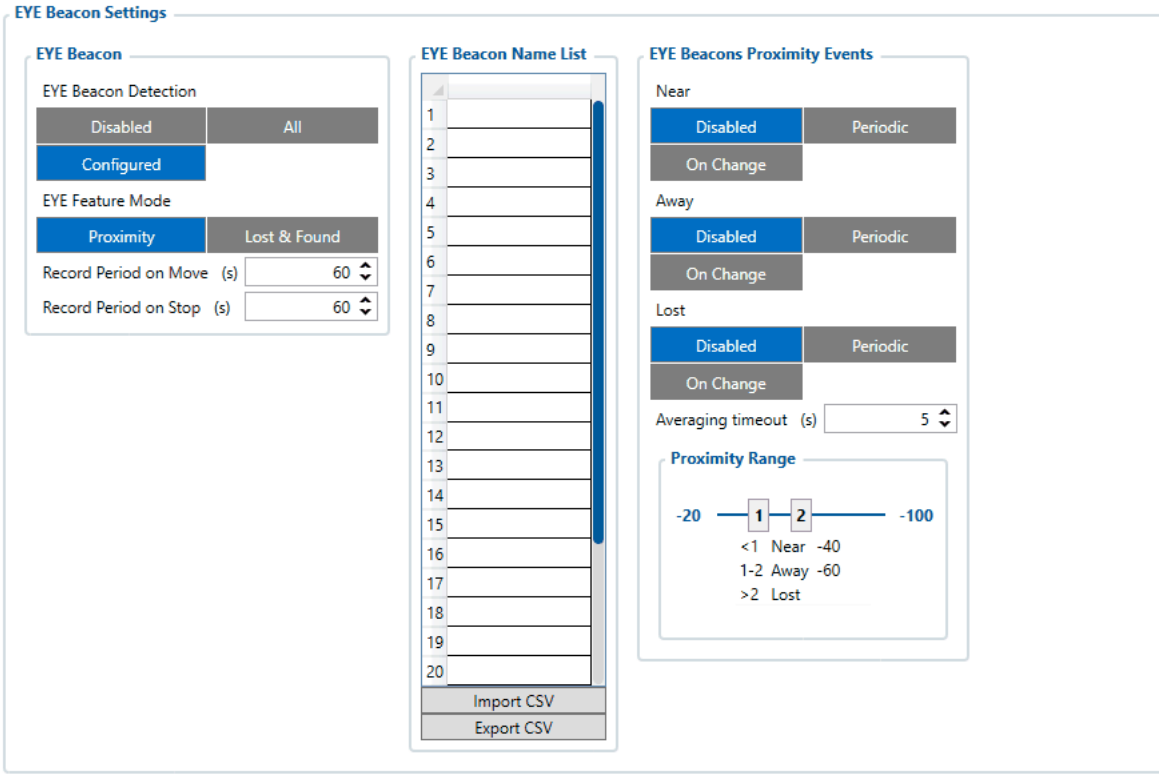
Beacon Mode

- **Simple** - beacon parsing is done automatically (Eddystone and iBeacon protocols are supported).
- **Advanced** - beacon data capturing can be configured.

Beacon record

- **On change** - Beacon records are generated only when there are changes in scanned list.
- **Periodic** - Beacon record generating according to the configured Record Period on Move and Record Period on Stop parameters.
- **Beacon Record Priority** - When set to **None** Records will not be generated. **Low priority** means the Module makes an additional record which will be sent according to configured send period. When **High Priority** is configured, the Beacon record will be sent immediately to the server as soon as it is generated.

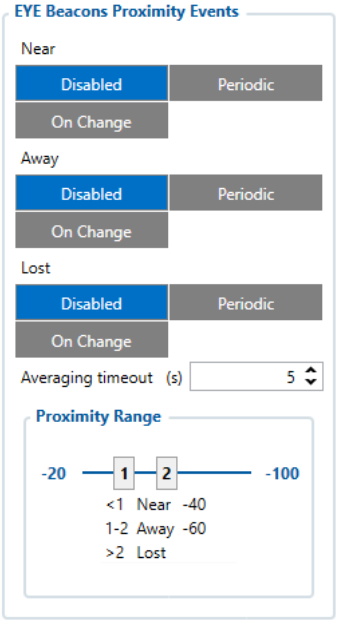
EYE Beacon Settings



- The New firmware has two Beacon lists, so it is possible to create two separate lists of beacons, standard one with Beacons ID (UUID:Major:Minor, or Namespace:InstanceID) and new one according Beacon Name (by name or prefix, for example all beacons with prefix "ID1" can be saved.)

- **Beacon ID** - configurator allows to configure beacon ID in iBeacon or Eddystone format in Beacon List.
- **Beacon Name** - The names of beacons which need to be filtered can be entered. Only the beginning part of the EYE Beacon local name has to match. For example, if in the EYE Beacon name list “EYE_Beacon” is added and the FM tracker detects EYE_Beacon1, EYE_Beacon2, EYE_BeaconXYZ, all these EYE Beacons will be added to EYE Beacon name list.

Both ID and Name filters can work at the same time. If beacon doesn’t match ID filter, but matches the name, it will be added to beacon list. However, Filtering only works Beacon Mode is set to Simple.



Eye feature mode: Proximity

EYE beacon Proximity events is a functionality which creates three different types of records, depending on the captured Beacons RSSI level. This functionality is only supported with Teltonika EYE beacons. Proximity events consist of near, away and lost events:

- When EYE beacon RSSI level is below the first configured threshold, the beacon will be added to Near Beacon Record **(AVL ID: 10828)**
- When EYE BEACON RSSI level is between the second and first configured threshold, beacon is added to Away Beacon record **(AVL ID: 10829)**
- When EYE Beacon RSSI level is above the second configured threshold, beacon is added to Lost Beacon record **(AVL ID: 10831)**. In the case of EYE Beacon disappearing from the environment and not being detected by the FM tracker anymore, the beacon will be added to Lost Beacon record and will be removed from Beacon list.

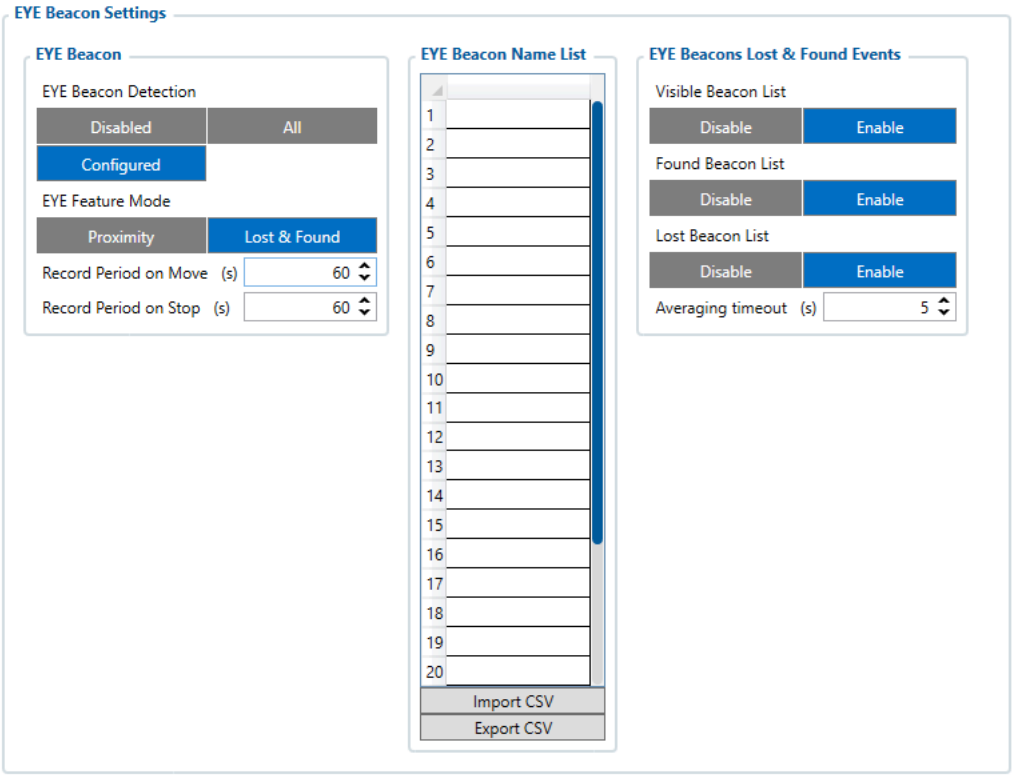
Event modes

- Disabled – Record generating is disabled for the selected range
- Periodic – Records will be periodically generated for the selected range, according to the configured record period on move or on stop value.
- On Change – Records will be generated as soon as the Eye Beacon number changes for the selected range.

Averaging Timeout

This parameter specifies how long it will take current RSSI value to reach new RSSI value. For example, current EYE Beacon RSSI value is -40 dBm. FMB captures same EYE Beacon with RSSI value of -60 dBm. If averaging timeout is configured to be 10 seconds, it will take 10 seconds for RSSI value to reach -60 dBm from -40 dBm. Keep in mind that this is assuming perfect conditions and subsequent EYE Beacon RSSI

Eye feature mode: Lost & Found



Lost & Found EYE Beacon feature.

Purpose of this functionality is to **periodically** generate records with all EYE Beacon list (AVL ID: 10828) and create eventual **On Change** records only when EYE Beacon is lost (AVL ID: 10831) or found (AVL ID: 10829).

Lost and Found Beacon records only include EYE Beacon which was lost or found, not the full Beacon list.

- If multiple EYE Beacons were found or lost at the same time, multiple will be included into the record.
- If Visible Beacon List is enabled, Beacon records containing the list of visible beacons will be generated according to the configured period parameters *Record Period on Move* and *Record Period on Stop*

Advanced Beacon protocol is being used to send Lost & Found records.

Note:Same AVL ID's as for Proximity events are being used, since two features cannot work at the same time.

- **AVL ID: 10828** Visible Beacon List (periodic)
- **AVL ID: 10829** Found Beacon List (On Change)
- **AVL ID: 10831** Lost Eye Beacon List (On Change)

Proximity and Lost & found AVL ID elements have the following structure:

	1st beacon									2nd beacon			
Protocol Version (1B)	1st Beacon len (1B)	1st Beacon param id (1B)	1st Beacon param len (1B)	1st Beacon param data (n B)	2nd Beacon param id (1B)	2nd Beacon param len (1B)	2nd Beacon param data (n B)	n-th param id	...	2nd beacon len (1B)	...	...	...
Const 0x01													

When Proximity or Lost & Found events are sent, the records will always include Beacon RSSI, Beacon ID, low battery indicator and Battery Voltage.

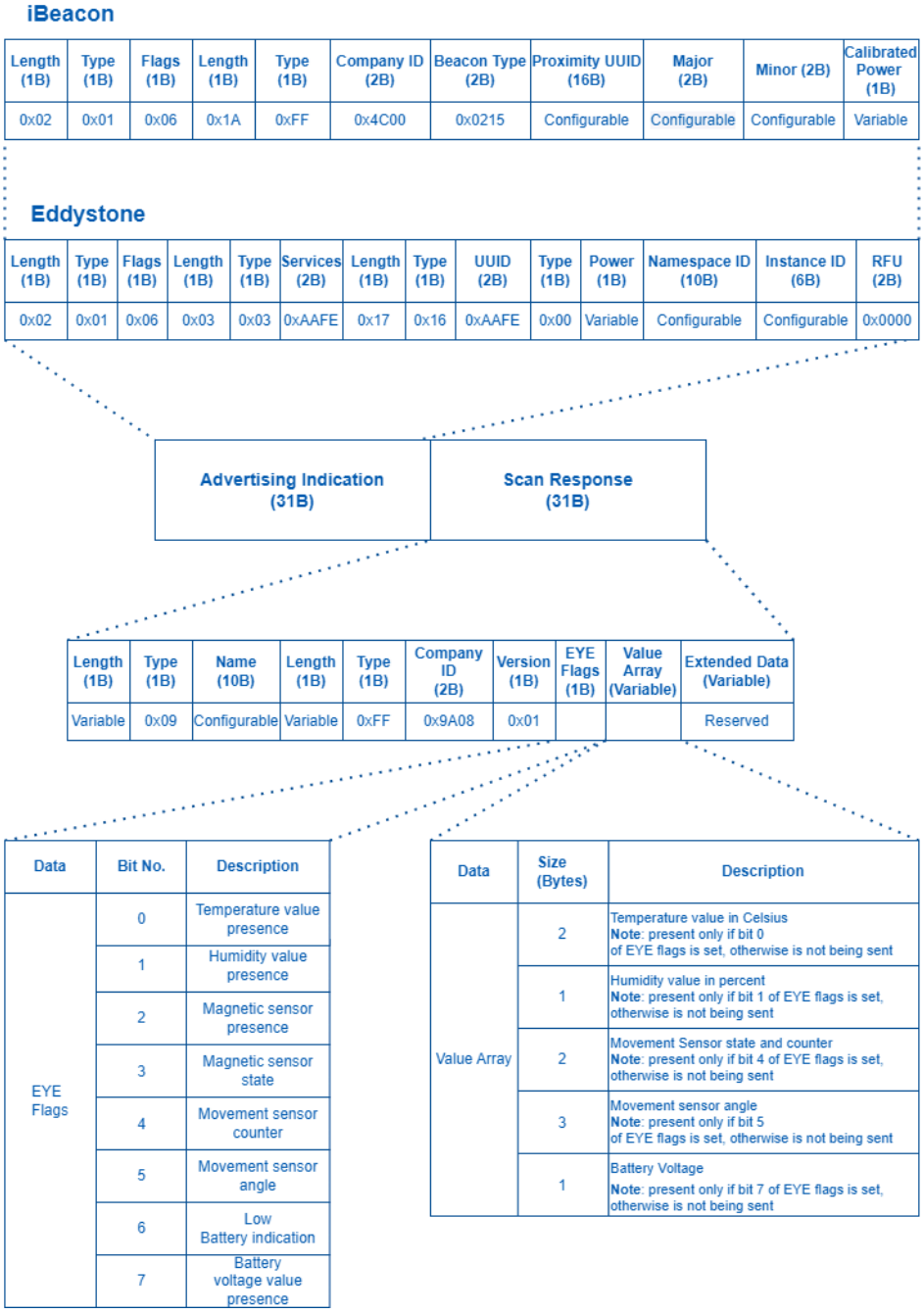
Below is the mentioned Parameters description:

Table 1. EYE Beacon Parameter IDs

Parameter ID	Name	Data type	Description
0	Beacon RSSI Level	1 byte unsigned integer	Received signal strength indication (RSSI) value in dBm. Hex value must be converted to decimal from signed 2s complement.
1	Beacon ID	Array	For EYE Beacons that are transmitting using Eddystone protocol: Beacon ID is Namespace , InstanceID (16 bytes) For EYE beacons that are transmitting using iBeacon protocol: Beacon ID is UUID, Major, Minor (20 bytes)
13	EYE Beacon Low battery indicator	1 byte integer	Low battery state measured by EYE beacon; value is either 0 (low voltage not detected) or 1 (low voltage detected)
14	EYE Beacon battery Voltage	2 byte unsigned integer	EYE Beacon battery voltage value in mV
15	EYE Beacon MAC	6 byte unsigned integer	Device's MAC address is sent if it's enabled in FMB configuration

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 (Table 1).

Device Name has the following default value for Beacon – ID1_XXXXXXX

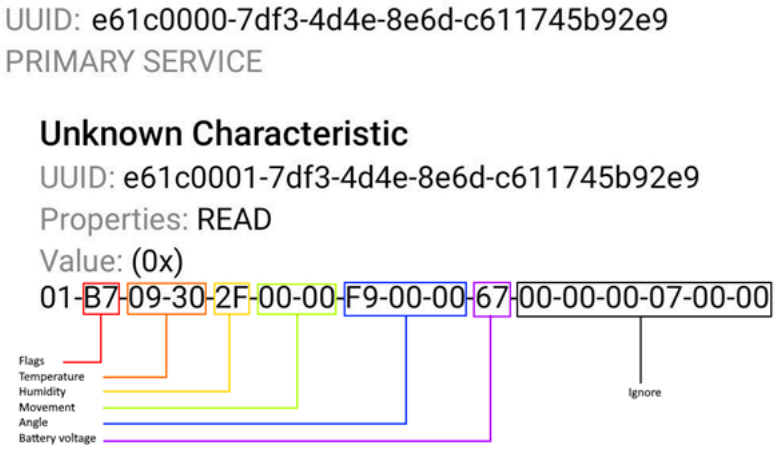
Table 1. Flag Encoded Date

Data	Size (Bytes)	Description
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 4 – Movement sensor counter 5 – Movement sensor angle **6 – Low Battery indication (if set to 1 low battery voltage detected)** **7 – Battery voltage value presence** **Note:** only bolded bits (6 and 7) can have value 1, on BTSID1
Value 7	1	Battery Voltage Battery voltage in mV = 2000 + VALUE * 10 NOTE: 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	12	Unique for each device	-
Tx Power Lever	1804	2a07	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* *Max 2 with 01.02.10+ firmware	1 for EYE_Beacon, 4 for EYE_Sensor* *with 01.02.10+ firmware 1 for both EYE_Beacon & EYE_Sensor	0 - iBeacon 1 - Eddystone 2 - EYE Sensor 3 - iBeacon + EYE Sensor* 4 - Eddystone + EYE Sensor* *01.02.10+ sensors are enabled over *Activate / Deactivate Sensors*
Activate / Deactivate Sensors* *from 01.02.10+ firmware	e61c0000-7df2-4d4e-8e6d-c611745b92e9	e61c0021-7df2-4d4e-8e6d-c611745b92e9	UINT8	0	15 (0b1111)	4 (0b0100) for EYE_Beacon, 15 (0b1111) for EYE_Sensor	(LSb) bit 0 – Temperature Bit 1 – Humidity Bit 2 – Magnetic Bit 3 - Movement E.g. EYE_Sensor disabled movement & enabled temperature, humidity, magnetic sensors 7 (0b0111)
Advertising Interval	e61c0000-7df2-4d4e-8e6d-c611745b92e9	e61c0002-7df2-4d4e-8e6d-c611745b92e9	UINT16	1000	10000	5000	miliseconds
Sub Advertising Interval	e61c0000-7df2-4d4e-8e6d-c611745b92e9	e61c0003-7df2-4d4e-8e6d-c611745b92e9	UINT16	20	1000	100	Used by repeats, miliseconds
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
Command	e61c0000-7df2-4d4e-8e6d-c611745b92e9	e61c0007-7df2-4d4e-8e6d-c611745b92e9	Command characteristic				
Password	e61c0000-7df2-4d4e-8e6d-c611745b92e9	e61c0008-7df2-4d4e-8e6d-c611745b92e9	BYTE ARRAY	6 bytes	6 bytes	123456	Always 6 Digits
Movement Start	e61c0000-7df2-4d4e-8e6d-c611745b92e9	e61c0013-7df2-4d4e-8e6d-c611745b92e9	UINT16	0	300	5	seconds
Movement Stop	e61c0000-7df2-4d4e-8e6d-c611745b92e9	e61c0014-7df2-4d4e-8e6d-c611745b92e9	UINT16	0	300	5	seconds
Password Counter	e61c0000-7df2-4d4e-8e6d-c611745b92e9	e61c0019-7df2-4d4e-8e6d-c611745b92e9	UINT8	0 (counter)	10 (counter)	0	Byte 0 – counter, Byte 1 and 2 - timeout
Master Password (PUK)	e61c0000-7df2-4d4e-	e61c0020-7df2-4d4e-	UINT8	8 bytes	8 bytes	MAC address dependency	Byte array

	8e6d-c611745b92e9	8e6d-c611745b92e9					
Manufacturer sleep (Hibernate mode)	e61c0000-7df2-4d4e-8e6d-c611745b92e9	e61c0018-7df2-4d4e-8e6d-c611745b92e9	UINT8	0	1	1	0 – sleep disabled, 1 – sleep enabled
Activate / Deactivate Sensors	e61c0000-7df2-4d4e-8e6d-c611745b92e9	e61c0021-7df2-4d4e-8e6d-c611745b92e9	UINT8	0	15 (0b1111)	15 (0b1111)	(LSb) bit 0 – Temperature Bit 1 – Humidity Bit 2 – Magnetic Bit 3 - Movement
User ADV Spam Duration	e61c0000-7df2-4d4e-8e6d-c611745b92e9	e61c0022-7df2-4d4e-8e6d-c611745b92e9	UINT16	1	300	30	WakeUp Advertising Spam Duration in seconds
RSSI Calibration Value	e61c0000-7df2-4d4e-8e6d-c611745b92e9	e61c0023-7df2-4d4e-8e6d-c611745b92e9	INT8	-100	127	127	RSSI value in dBm 127 – Use default calib. table
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



Command characteristic

Command's name	Data to send	Description
Write to flash	0x0010	Writes set parameters to flash
General boot	0x0011	Enter boot mode
Instant reset	0x0012	Software reset
Reset after connection	0x0013	Reset after disconnect
Get hw voltage	0x0014	Sets detected hw voltage in response data
Keep connection alive	0x0015	Resets disconnect timer
Restore defaults	0x0016	Sets all configurable parameters to default values

FM packet parsing example

Beacon (AVL ID:385) has the following structure:

AVL 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 Second half byte – total number of data parts	Bitwise parameter, specify BLE beacon type and parameters. Two options available are: 21 iBeacon with RSSI 01 Eddystone with RSSI	Beacon – 20B (UUID, major, minor) 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
AVL Data	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)
	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	1101E39B606AA38255AA8E460B154E2D0055CF
	Number of Data 2 (Number of Total Records)	01
	CRC-16	00 00 00 56

AVL 385 Parsing

Data part	BLE beacon flags #1	Beacon ID #1	Signal Strength #1	Beacon data #2	
1 Byte	1 Byte	20/16 Bytes Eddystone – 16B (Namespace, Instance ID)	1 Byte	…	
11 – Data part, 1 Record out of 1 Beacon Packet.	01 – Eddystone with RSSI	E39B606AA38255AA8E46 – BLE Beacon Namespace 0B154E2D0055 – BLE Beacon Instance ID	-49	-	- -

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
AVL Data	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
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	11216B817F8A274D4FBDB62D33E1842F8DF8014D022BBF21A579723675064DC396A7C3520129F61900000000BF	
Number of Data 2 (Number of Total Records)		01
CRC-16		00 00 3E 5D

AVL 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	…	
11 – Data part, 1 Record out of 1 Beacon Packet.	21 – iBeacon with RSSI	6B817F8A274D4FBDB62D33E1842F8DF8 – UUID 014D – Major 022B – Minor	-65	21A579723675064DC396A7C3520129F61900000000BF	
-	21 – iBeacon with RSSI	A579723675064DC396A7C3520129F619 – UUID 0000 – Major 0000 – Minor	-65	-	- -

FM EYE Beacon record parsing example with the new firmware

Below You will find an example on how to parse lost (AVL ID 10831) or found (AVL ID 10829) EYE Beacon record.

Lost & found EYE Beacon records parsing example

Unparsed data

Received data in hexadecimal stream: `000000000000004b8e010000018368952793000f0e54fc209ab05800b300b40e0000`

`2a4f00010000000000000000000012a4f001e011c0001a40110eb47706aa38255aa96f21a154e2d00550d01000e020bd6010000823f`

AVL Data Packet

	AVL Data Packet Part	HEX Code Part
	Zero Bytes	00 00 00 00
	Data Field Length	00 00 00 4b
	Codec ID	8E (Codec8 Extended)
	Number of Data 1 (Number of Total Records)	01
AVL Data	Timestamp	00 00 01 83 68 95 27 93 (GMT: Tuesday, 18 June 2019 08:25:22.001)
	Priority	00
	Longitude	0f 0e 54 fc
	Latitude	20 9a b0 58
	Altitude	00 b3
	Angle	00 b4
	Satellites	0e
	Speed	00 00
	Event IO ID	2a 4f (10831)
	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.	2a 4f (10831)
	Length of Variable Length IO	00 1e (30 bytes)
	Value of Variable Length IO 10831	**011c0001a40110eb47706aa38255aa96f21a154e2d00550d01000e020bd6**
	Number of Data 2 (Number of Total Records)	01
	CRC-16	00 01 2a 4f

AVL ID 10831 Unparsed data

011c0001a40110eb47706aa38255aa96f21a154e2d00550d01000e020bd6

Parsing the data

	AVL Data packet part	HEX Code Part
AVL Data	Constant	01
	Eye Beacon #1 data length	1c (28 bytes)
	Parameter ID	00 (Eye Beacon RSSI)
	Parameter data length	01 (1 byte)
	Parameter data	a4 (Converted to Decimal from signed 2s complement = -92dBm)
	Parameter ID	01 (Beacon ID)
	Parameter data length	10 (16 bytes)
	Parameter data	eb 47 70 6a a3 82 55 aa 96 f2 **1a 15 4e 2d 00 55** (Eddystone Namespace + **Instance ID**)
	Parameter ID	0d (parameter ID #13 low battery voltage indicator)
	Parameter data length	01 (1 byte)
	Parameter data	00 (no low battery voltage detected)
	Parameter ID	0e (Eye Beacon Battery voltage)
	Parameter data length	02 (2 bytes)
	Parameter Data	0b d6 (3030mV)

NOTE: The record structure for Lost Beacon Record (AVL ID:10829) is the same

Visible EYE Beacons record parsing example with 3 EYE Beacons

Below You will find an example on how to parse visible Beacons list (AVL ID 10828) EYE Beacon record.

Unparsed data

Received data in hexadecimal stream:

```
000000000000000898e0100000183a1c8fbe3000f0e310b209ab02600e900760d00002a4c0001000000000000000000012a4c005c011c0001c00110eb5
0e020c1c1c0001b60110ef3f3f74868d55aa9aeae91e313800550d01000e020bae200001a50114faffffff34b6f6aa38255aa9ef619154d0e200050d0
```

AVL Data Packet

AVL Data Packet Part	HEX Code Part
Zero Bytes	00 00 00 00
Data Field Length	00 00 00 89
Codec ID	8E (Codec8 Extended)
Number of Data 1 (Number of Total Records)	01
AVL Data Timestamp	00 00 01 83 a1 c8 fb e3 (GMT: Tuesday, 18 June 2019 08:25:22.001)
Priority	00
Longitude	0f 0e 31 0b
Latitude	20 9a b0 26
Altitude	00 e9
Angle	00 76
Satellites	0d
Speed	00 00
Event IO ID	2a 4c (10828)
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.	2a 4c (10828)
Length of Variable Length IO	00 5c (92 bytes)
Value of Variable Length IO 10831	**011c0001c00110eb577075868d55aa96021b20313800550d01000e020c1c1c0001b60110ef3f3f74868d55aa9aeae91e313800550d0200001a50114faffffff34b6f6aa38255aa9ef619154d0e200050d01000e020ad2**
Number of Data 2 (Number of Total Records)	01
CRC-16	00 00 88 11

AVL ID 10828 Unparsed data

011c0001c00110eb577075868d55aa96021b20313800550d01000e020c1c1c0001b60110ef3f3f74868d55aa9aeae91e31380055
0d01000e020bae200001a50114faffffff34b6f6aa38255aa9ef619154d0e200050d01000e020ad2

Parsing the data

	AVL Data packet part	HEX Code Part
AVL Data	Constant	01
	Eye Beacon #1 data length	1c (28 bytes)
	Parameter ID	00 (Eye Beacon RSSI)
	Parameter data length	01 (1 byte)
	Parameter data	c0 (Converted to Decimal from signed 2s complement = -64dBm)
	Parameter ID	01 (Beacon ID)
	Parameter data length	10 (16 bytes)
	Parameter data	eb 57 70 75 86 8d 55 aa 96 02 **1b 20 31 38 00 55** (Eddystone Namespace + **Instance ID**)
	Parameter ID	0d (parameter ID #13 low battery voltage indicator)
	Parameter data length	01 (1 byte)
	Parameter data	00 (no low battery voltage detected)
	Parameter ID	0e (Eye Beacon Battery voltage)
	Parameter data length	02 (2 bytes)
	Parameter Data	0c 1c (3100mV)
	Eye Beacon #2 data length	1c (28 bytes)
	Parameter ID	00 (Eye Beacon RSSI)
	Parameter data length	01 (1 byte)
	Parameter data	b6 (Converted to Decimal from signed 2s complement = -74dBm)
	Parameter ID	01 (Beacon ID)
	Parameter data length	10 (16 bytes)
	Parameter data	ef 3f 3f 74 86 8d 55 aa 9a ea **e9 1e 31 38 00 55** (Eddystone Namespace + **Instance ID**)
	Parameter ID	0d (parameter ID #13 low battery voltage indicator)
	Parameter data length	01 (1 byte)
	Parameter data	00 (no low battery voltage detected)
	Parameter ID	0e (Eye Beacon Battery voltage)
	Parameter data length	02 (2 bytes)
	Parameter Data	0b ae (2990mV)
	Eye Beacon #3 data length	20 (32 bytes)
	Parameter ID	00 (Eye Beacon RSSI)
	Parameter data length	01 (1 byte)
	Parameter data	a5 (Converted to Decimal from signed 2s complement = -91dBm)
	Parameter ID	01 (Beacon ID)
	Parameter data length	14 (20 bytes)
	Parameter data	fa ff ff ff 34 b6 f6 aa 38 25 5a a9 ef 61 91 54 ***d0 e2*** **00 05** (iBeacon UUID + ***Major*** + **Minor**)
	Parameter ID	0d (parameter ID #13 low battery voltage indicator)
	Parameter data length	01 (1 byte)
	Parameter data	00 (no low battery voltage detected)
	Parameter ID	0e (Eye Beacon Battery voltage)
	Parameter data length	02 (2 bytes)
	Parameter Data	0a d2 (2770mV)

Safety information

This message contains information on how to operate BTSID1 safely. By following these requirements and recommendations, you will avoid dangerous situations. You must read these instructions carefully and follow them strictly before operating the device!

1. To avoid mechanical damage, it is advised to transport the device in an impact-proof package.

2. In case of malfunction contact your Teltonika account manager or write to the technical support team over the Partner Portal/Helpdesk.

Opening and self fixing devices is strictly forbidden

The device must be firmly fastened in a predefined location.

All wireless data transferring devices produce interference that may affect other devices which are placed nearby.

Installation and/or handling during a lightning storm is prohibited.

Risk of explosion if battery is replaced by an incorrect type. Dispose of used batteries according to the instructions.

The device must be connected only by qualified personnel.

This marking on the product, accessories or literature indicates that product ant its electronic accessories should not be disposed of with other household waste.

The Bluetooth® word mark and logos are registered trademarks owned by Bluetooth SIG, Inc. and any use of such marks by UAB Teltonika Telematics is under license. Other trademarks and trade names are those of their respective owners.

This Marking on the battery, manual or packaging indicates that batteries in this product should not be disposed with other household waste.

Certification & Approvals

Certificates	Links	Valid for Model
E-Mark (EU)	Yes	All
FCC (USA)	Yes	All
CE/RED (EU)	Yes	All
RoHS (EU)	Yes	All
REACH (EU)	Yes	All
Anatel (BR) (PR)	Yes	All
IP rating	Yes	All
SIRIM QAS	Yes	All
SDPPI POSTEL	Yes	All
TELEC	Yes	All
ATEX	Yes	ATEX

Memberships

Name	Links
Bluetooth® SIG	Yes
WEEE	Yes
Battery WEEE	Yes

Nomenclature & Classification codes

Name	Links
EAN	Yes
HS	Yes
ECCN	Yes

External Links

Product Page

https://teltonika-gps.com/eye/

Product Change Notifications

The latest Product Change Notifications can be found: Product Change Notifications

Software Errata

Firmware Errata: BTS firmware errata (https://wiki.teltonika-gps.com/view/BTS_firmware_errata)

EYE App Errata: EYE APP errata (https://wiki.teltonika-gps.com/view/EYE_APP_errata)

Promotional Material

Product Promotional Material Page (https://wiki.teltonika-gps.com/view/BTSXXX_Promotional_Material)

Compatibilty with other Teltonika Devices

Teltonika Networks: https://wiki.teltonika-networks.com/view/Bluetooth_EYE_Sensor_and_EYE_Beacon_support

https://wiki.teltonika-networks.com/view/Teltonika_EYE_device_pairing_and_data_sender_configuration_example

Partner Providers Supporting Software

- 3Dtracking
- GPS-server
- Wialon
- Mapon
- WhiteLabel Tracking

Frequently asked questions (FAQ)

- Questions about Power and Electrical characteristics
- Questions about EYE Accessory configuration (EYE APP)
- Questions about FMBxxx compatibility with EYE Accessories
- Questions about Protocols
- Other questions (Questions without category)

Documents

Eye Beacon Datasheet (Updated on: 2024-03-15)

Eye Beacon ATEX Datasheet (Updated on: 2024-05-29)

BTSID1 Quick Manual (EN) (Updated on: 2024-01-17)

Additional information

For EOL policy please refer to link here (https://teltonika-gps.com/support/eol-products).