# How to start with FMB devices and Sensors?



## Contents



### Configuring BLE Sensor

Bluetooth® BLE Sensor are disabled by default.
Configurations to these beacons are written through NFC.
To do this download **Device Manager Mobile** by Ela from *Google Play Store* to your Android-powered device.
**Note!** Android-powered device that is used for configuring BLE sensors must support NFC read/write functionality.

Follow these instructions to easily configure BLE Sensor:

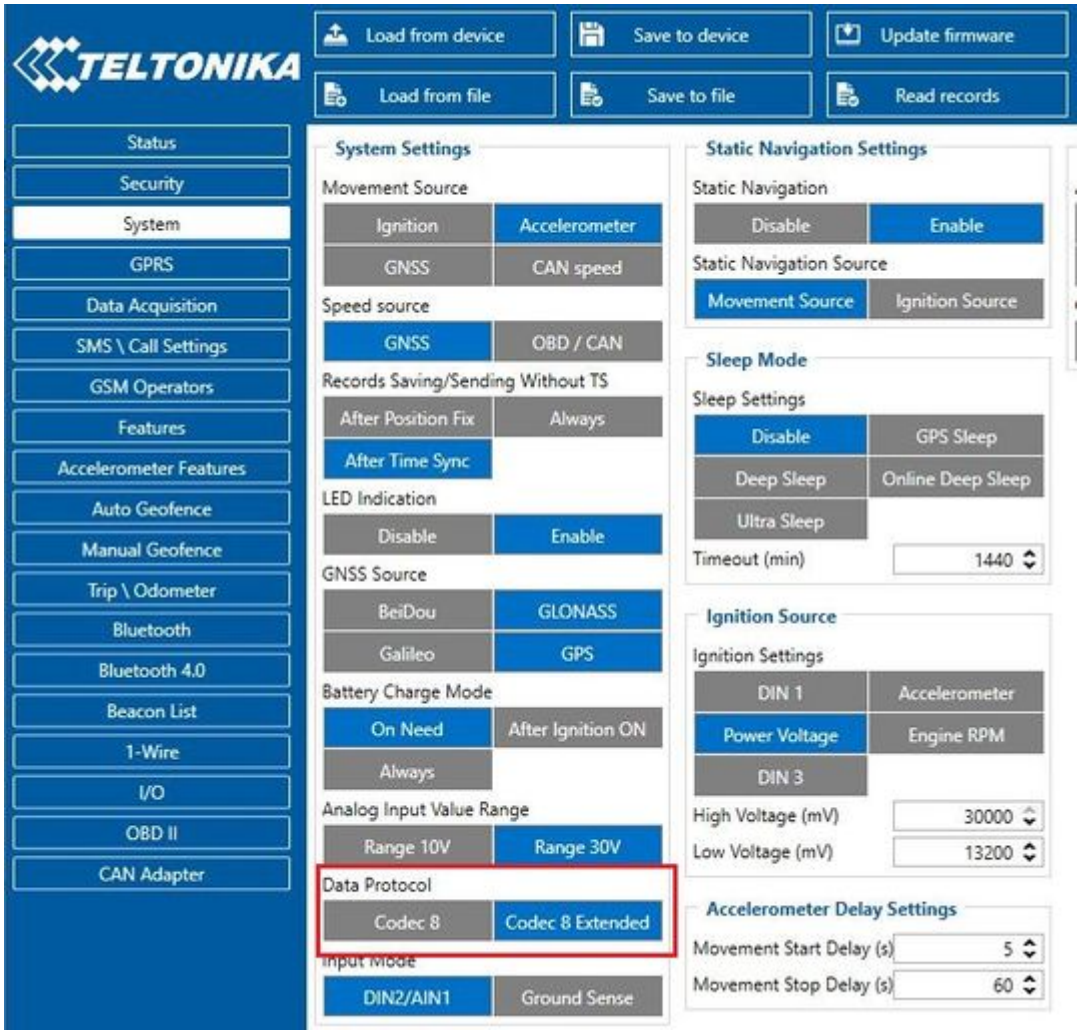
- Enable `Bluetooth®` and `NFC` on your Android-powered device.
- Launch **Device Manager Mobile** on your Android-powered device.
- Select *Configuration*.
- Place your Android-powered device on top of BLE Sensors to scan it.
- Click *Enable* to allow BLE Sensors transmit advertising data.
- We recommend to set *Power* to 4 to get the best possible distance.
- Set *TAG Format* to Sensor.
- Set *BLE Emit Period* to 1 second to get the best possible sensor detection.
- Click *Write* button.
- Place your Android-powered device on top of BLE sensor to write configuration to it.

Once the configuration is written successfully, the BLE Sensor will be enabled and use the settings configured in the APP.
**Note!** Make sure that *Manufacturer data mode* is Disabled, otherwise Sensor will not be detected without additional changes in configuration.

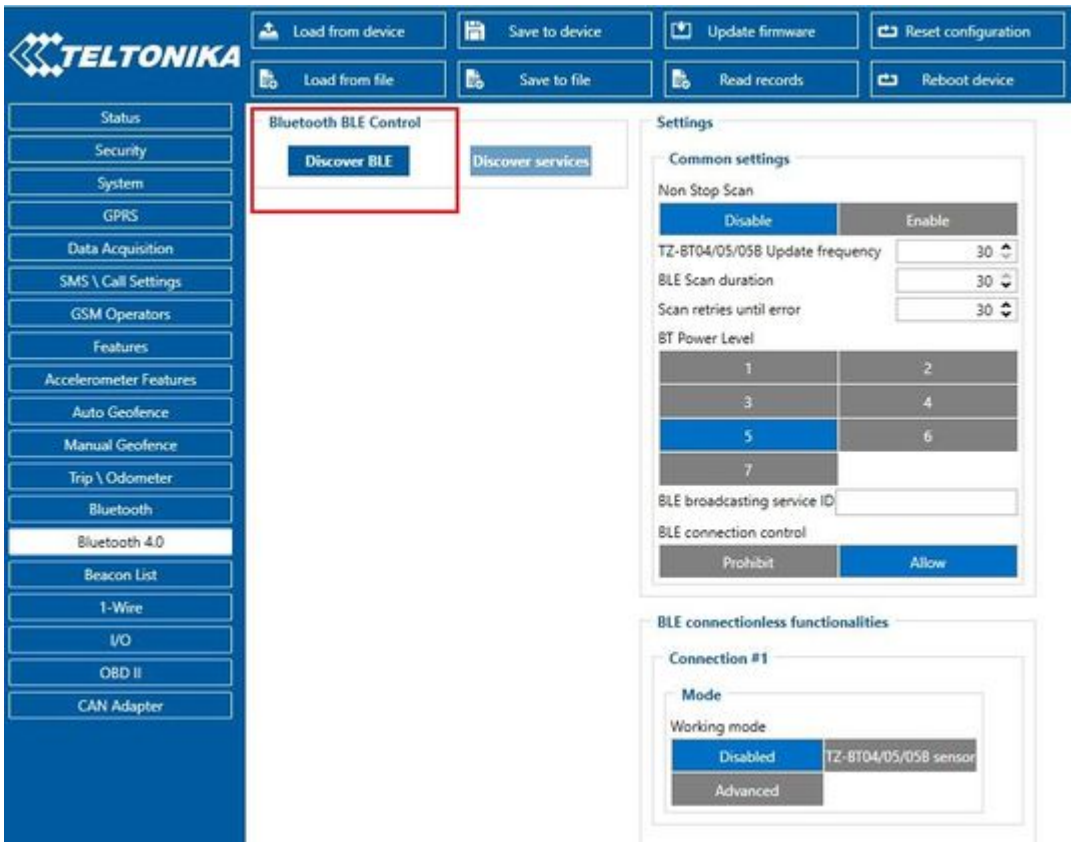
# Sensor Configuration and data sending

Open FM device configurator.

In System Settings Enable Codec8 Extended;



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;




In the discover BLE find the sensor you need:

Fill the MAC address in the field:

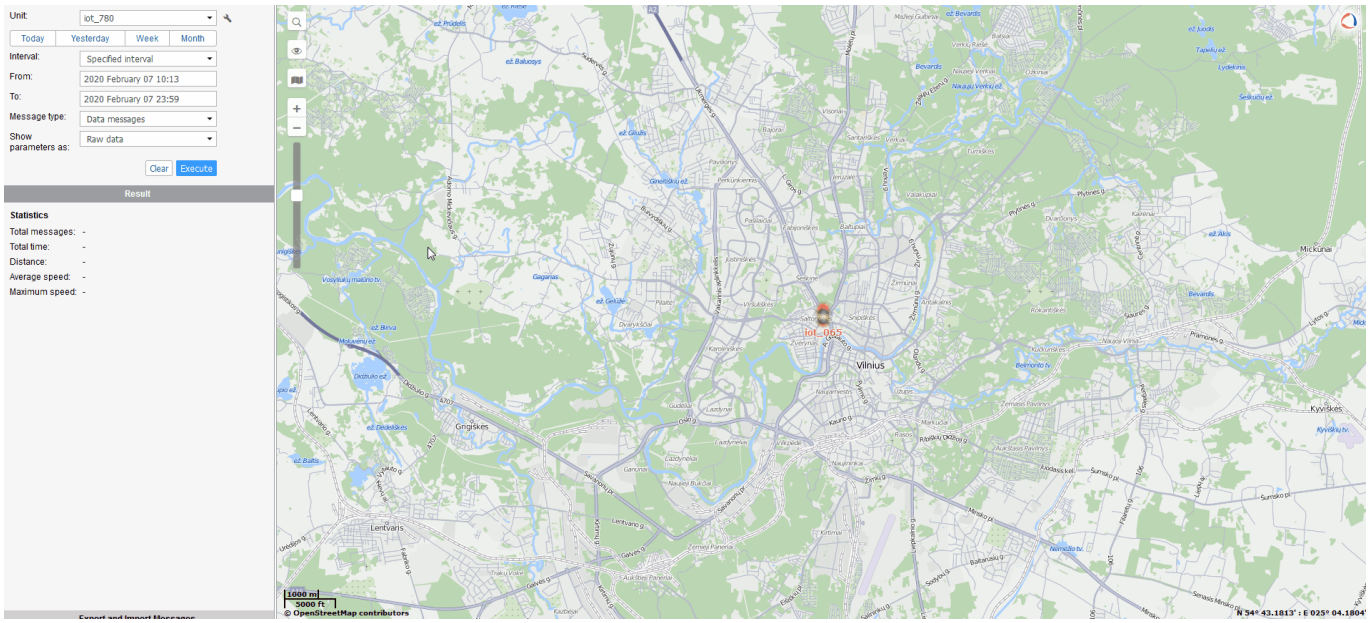
Configure the terminal for the data transfer from the fuel level sensor:

The sensor settings are similar; you only need to change the MAC address.

### Sensor and FM device mounting position in car:

### 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:
`00000000000000D68E01000001701F9B3FA9000F0E5732209AB450006800290400000181000100000000000000000001018100A911214B5C049F515341`

`FCA950D2C264414E1000050006BA21E2C56DB5DFFB48D2B060D0F5A71096E000000000A92131A74BB76A79423196C916CFB9FAED45002D00159F0700112`

`233445566778899ABCDE0810047AE0BE80015210F86676BEC91420A94409110029AFAC415B31A0AA101DE9C18E92CA5AA689697365434663222BA21EBBB`

`DE835D7F4965B5F06C2EDCB3A55300010080A501736B79686F73742E646B000010000128AD01000030CB`

## Example Beacon Record

| AVL Data Packet | | |
|---|---|---|
| | **AVL Data Packet Part** | **HEX Code Part** |
| AVL Data | 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 |
| | Length of Variable Length IO | 00 A9 |
| | Value of Variable Length IO | 11214B5C049F515341FCA950D2C264414E1000050006BA21E2C56DB5 DFFB48D2B060D0F5A71096E000000000A92131A74BB76A79423196C916CFB9FAED45002D00159F07001122334455667788999ABCDE081004 7AE0BE80015210F86676BEC91420A94409110029AFAC415B31A0AA101DE9C18E92CA5AA689697365434663222BA21EBBBDE835D7F4965B5 F06C2EDCB3A55300010080A501736B79686F73742E646B000010000128AD |
| | 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 DFFB48D2B060D0F5A71096E000000000A92131A74BB76A79423196C916CFB9FAED45002D00159F07001122334455667788999ABCDE081004 7AE0BE80015210F86676BEC91420A94409110029AFAC415B31A0AA101DE9C18E92CA5AA689697365434663222BA21EBBBDE835D7F4965B5 F06C2EDCB3A55300010080A501736B79686F73742E646B000010000128AD |

## Beacon Flags

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

| Flags | |
|---|---|
| **21** | iBeacon with RSSI |
| **23** | iBeacon with RSSI, Battery Voltage |

| | |
|---|---|
| **27** | iBeacon with RSSi, Battery Voltage, Temperature |
| **01** | Eddystone with RSSI |
| **03** | Eddystone with RSSI, Battery Voltage |
| **07** | Eddystone with RSSi, Battery Voltage, Temperature |

**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 |