How to start with FMB devices and Sensors?

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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:

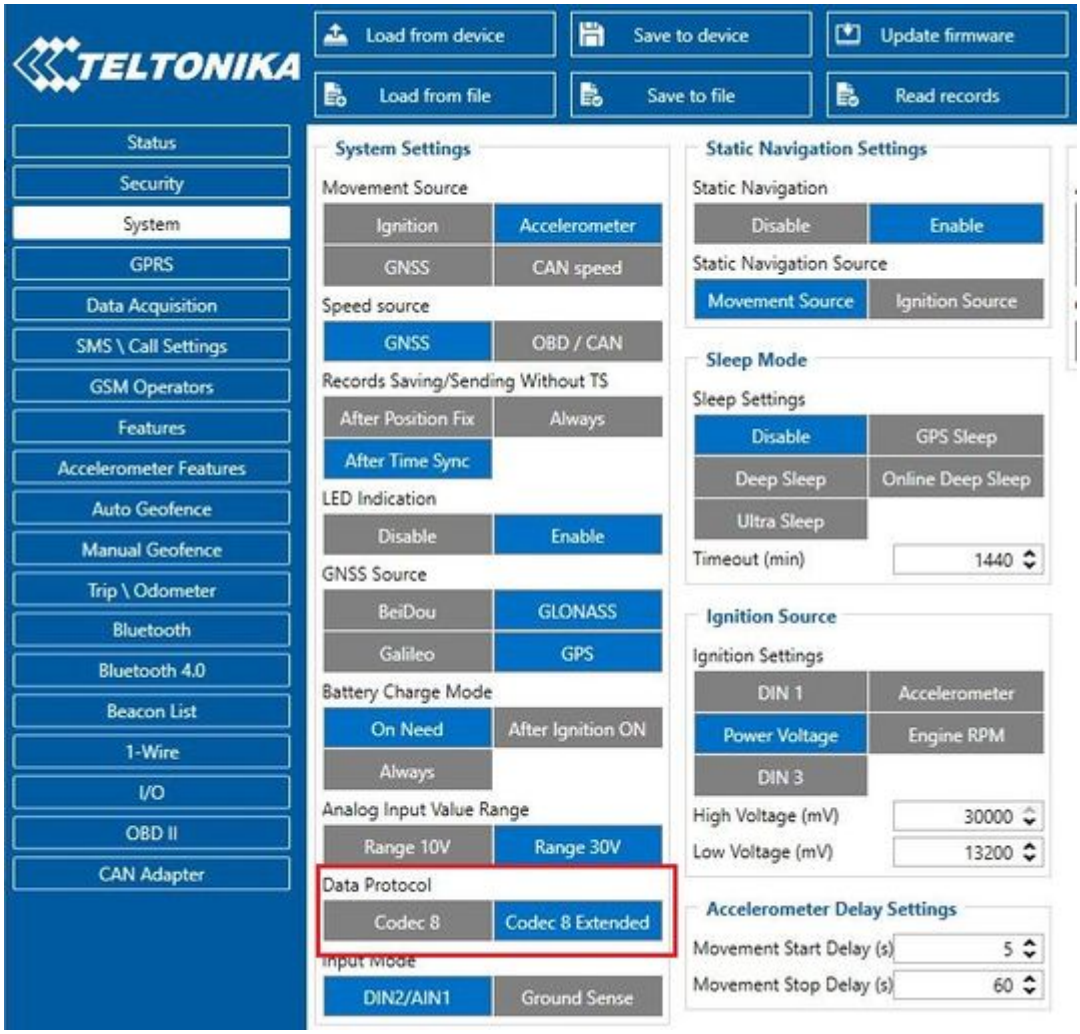
- Enable `Bluetooth®` and `NFC` on your Android-powered device.
- Launch **Device Manager Mobile** on your Android-powered device.
- Select *Configuration*.
- Place your Android-powered device on top of BLE Sensors to scan it.
- Click *Enable* to allow BLE Sensors transmit advertising data.
- We recommend 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.

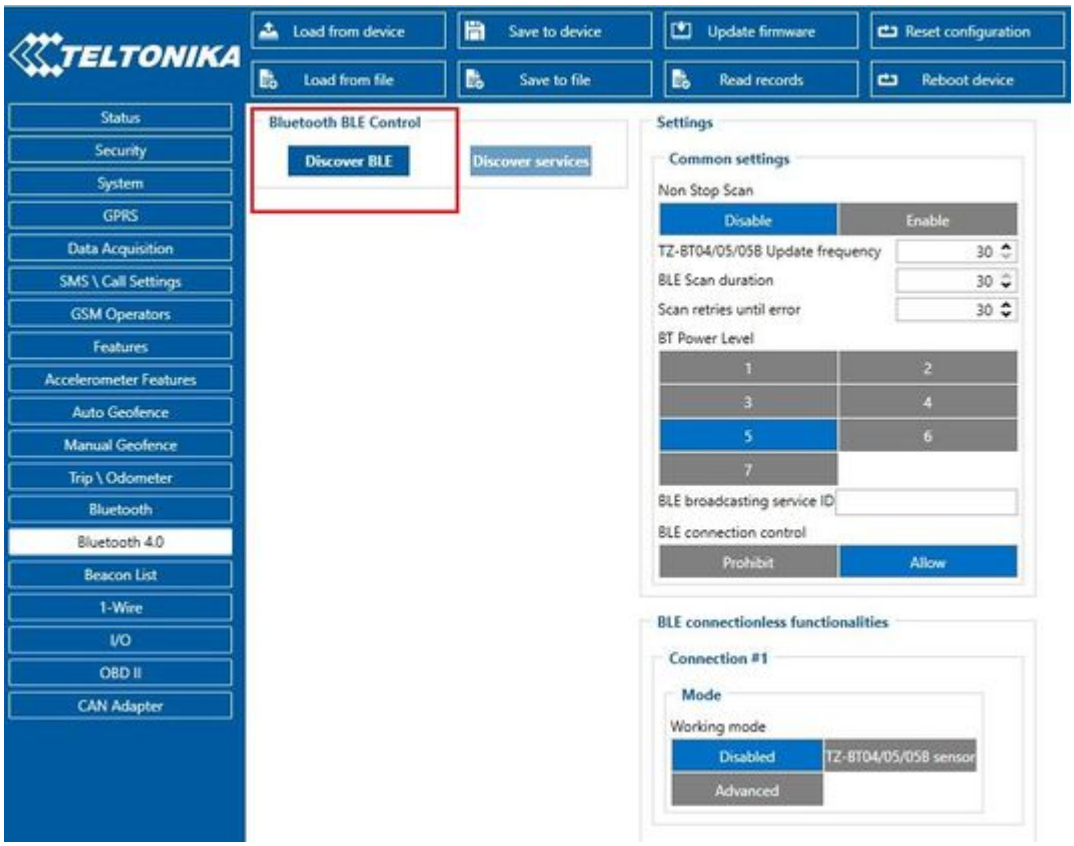
Sensor Configuration and data sending

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:

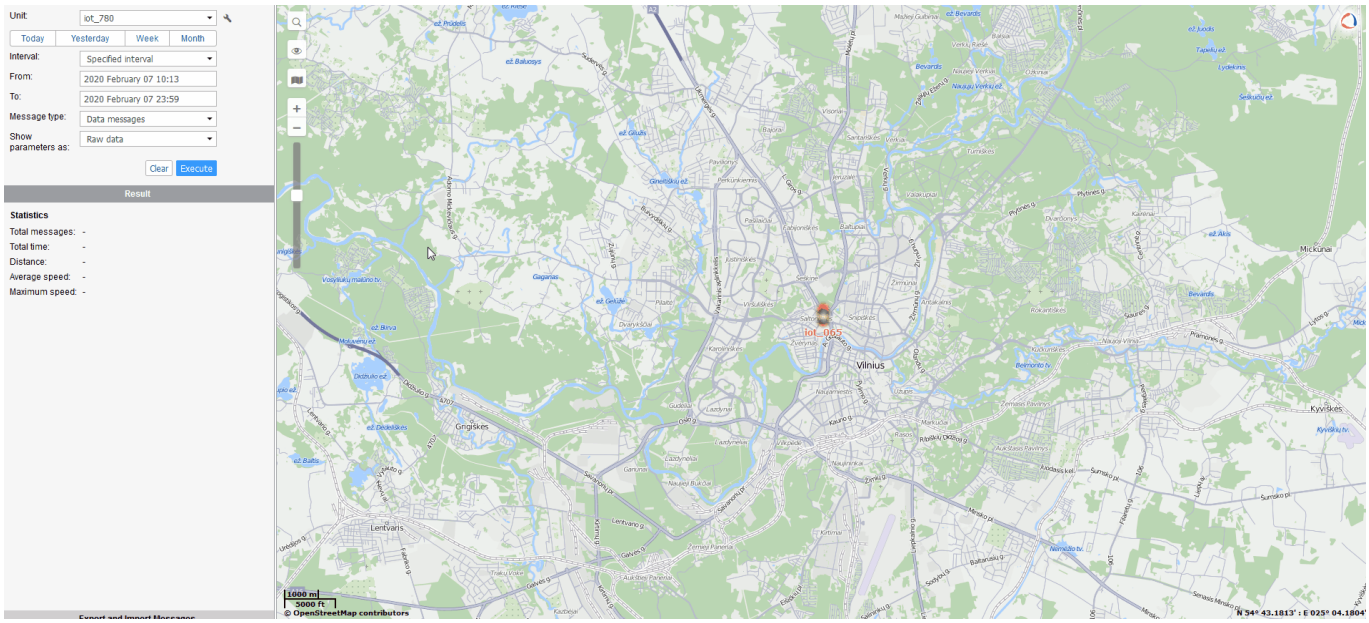
Configure the terminal for the data transfer from the fuel level sensor:

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