

Compatibility Declaration

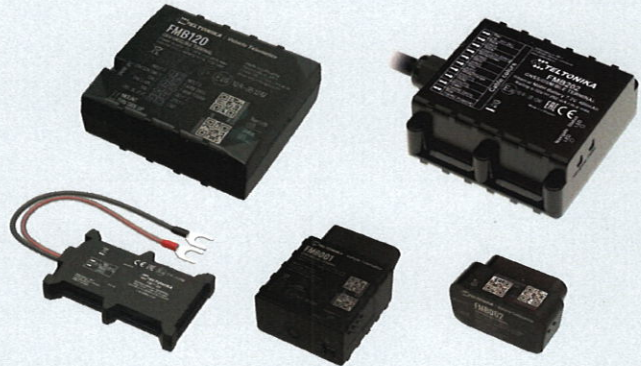
Technoton and Teltonika confirm:

fuel flow meters
DFM S7



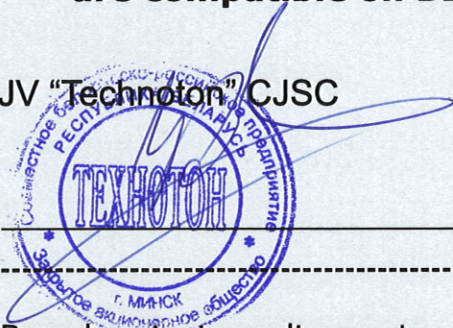
and

telematics units Teltonika
FMB1YX, FMU1YX, FMC1YX, FMM1YX
FMB9YX, FMB2YX, MTB100, FMT100
FMB001/FMB010, FMC001, FMM001
FMB002/FMB020, FMB003



are compatible on BLE/S7 wireless data transfer specification

JV "Technoton" CJSC



UAB "Teltonika Telematics"



Based on test result report.

Recommendations on connection and configuration - see Annex.



Recommendations on connecting and configuring Teltonika FMB1YX, FMU1YX, FMC1YX, FMM1YX, FMB9YX, FMB2YX, MTB100, FMT100, FMB001/FMB010, FMC001, FMM001, FMB002/FMB020, FMB003 terminals and single-chamber fuel flow meter DFM S7

1. DFM S7 connection.

Switch the DFM S7 flowmeter to the operating mode according to the operating instructions. To obtain the MAC address of the DFM S7 flowmeter, you need to transfer the sensor number from decimal to hexadecimal code.



236 001 300 007	
HEX	36 F2C6 0E27
DEC	236 001 300 007
OCT	3 336 261 407 047
BIN	0011 0110 1111 0010 1100 0110 0000 1110 0010 0111
	QWORD MS M*

2. Teltonika FMB 120 connection (firmware 03.27.01 Rev:00) or latest.

Install the SIM card and supply voltage to the terminal.

3. Terminal configuration and fuel level sensor calibration.

3.1. Terminal settings in the Configurator v1.6.4B.3.27 R2 or latest according to the firmware version

Configure the data of the GPRS operator of the SIM card and the address of the telematics server (Figure 1):

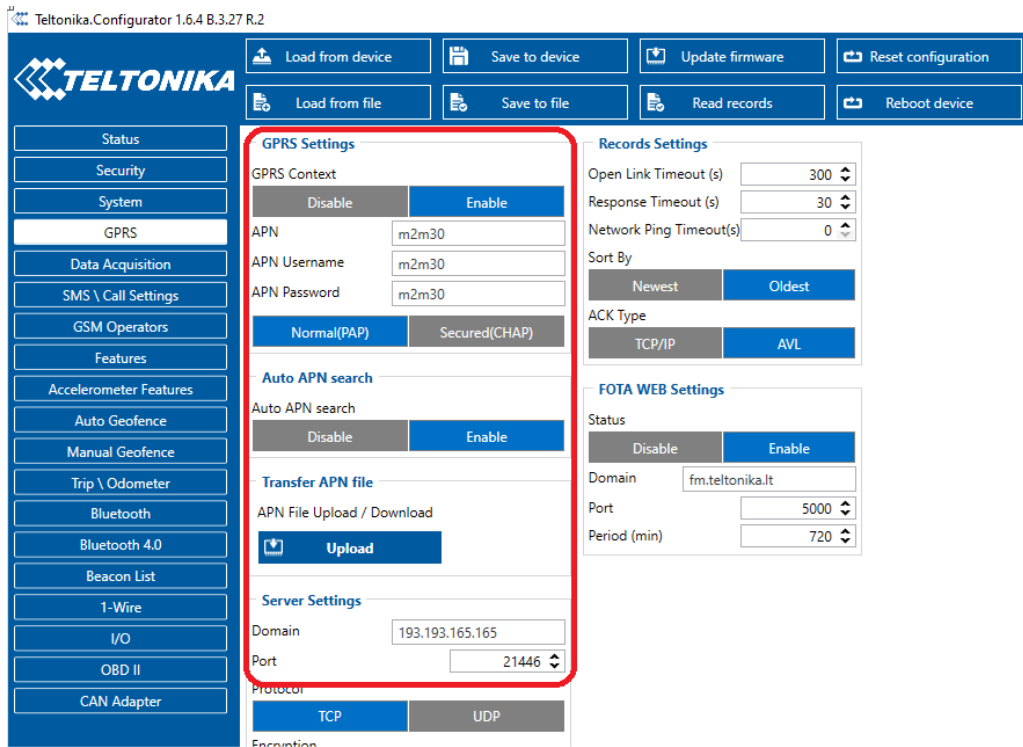


Figure 1

Choose the protocol as shown below (Figure 2):

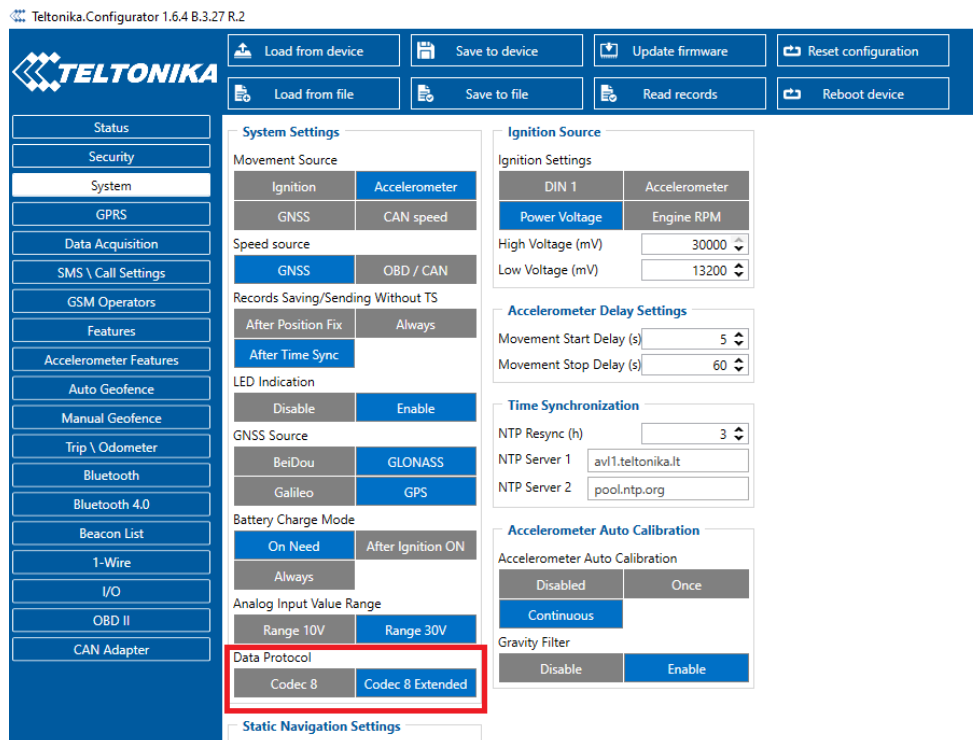


Figure 2

3.2.Sensor connection.

Put the sensors near the terminal.
Make 'Discovering' of the sensors.

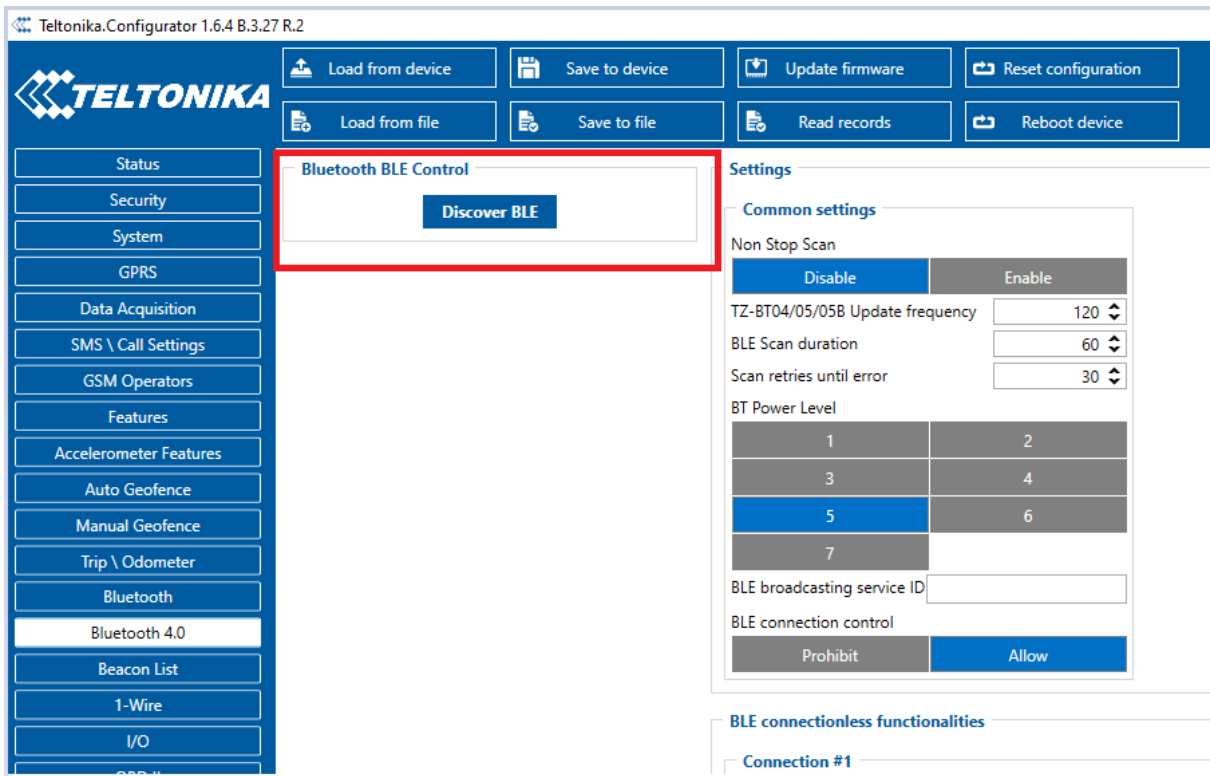


Figure 3

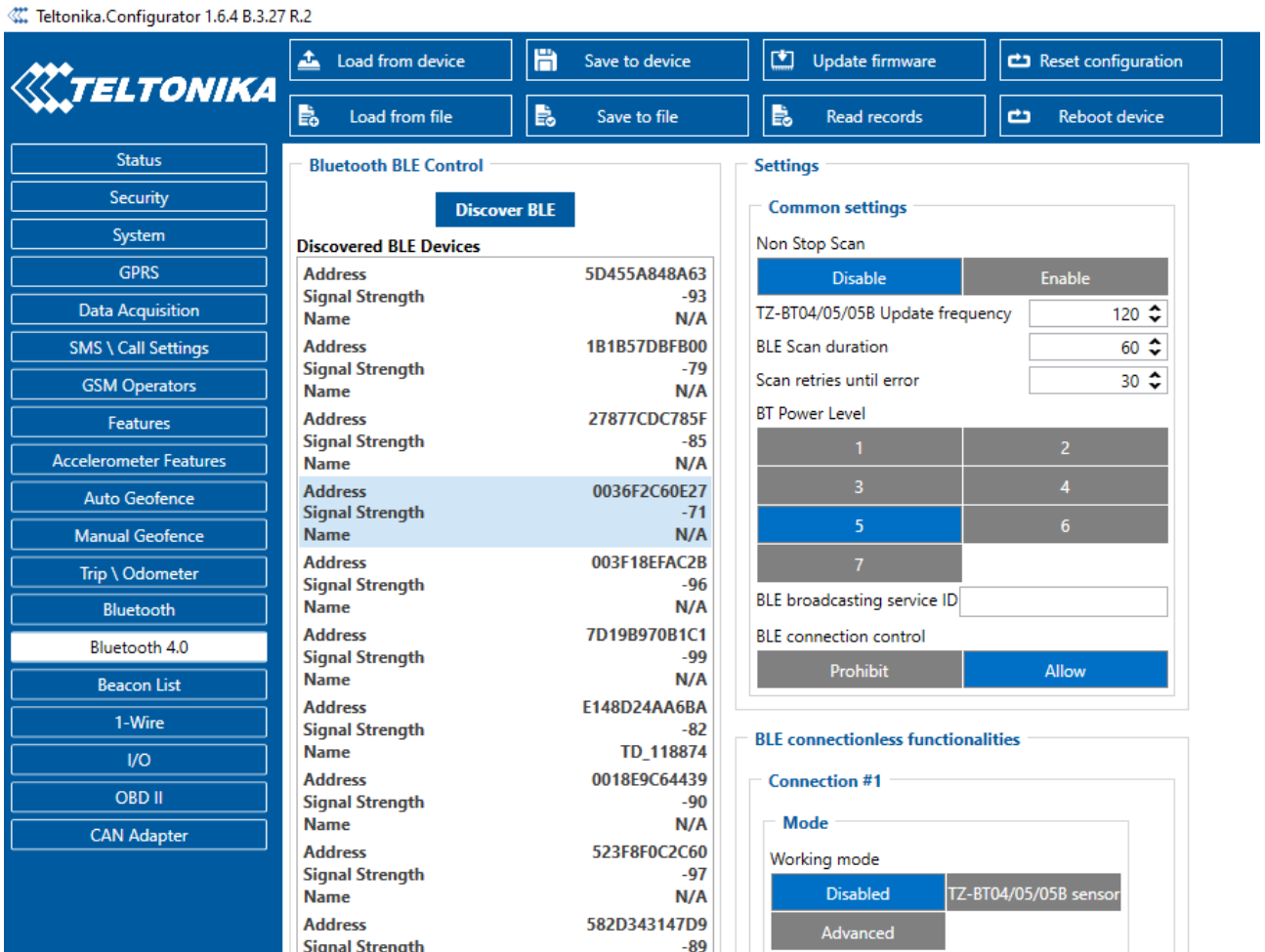


Figure 4

In DFM S7, data is transferred in 3 PGNs (messages). Since only 1 PGN can be configured in one connection (Connection 1), to receive all data from the fuel flow meter, we use three connections with the same MAC address (Connection 1, Connection 2, Connection 3).

Write down the MAC address of the sensor in the settings field and select the PGN settings (Figure 5):

Teltonika.Configurator 1.6.4 B.3.27 R.2

The screenshot shows the Teltonika Configurator interface. On the left is a navigation menu with categories like 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, 1-Wire, and I/O. The main area displays various sensor settings. Under 'BLE connectionless functionalities', 'Connection #1' is selected, and its 'Mode' is set to 'Advanced'. A context menu is open over the MAC address field, showing 'Copy MAC' and 'Copy name' options.

Figure 5

PGN 63287 configuration (Figures 6-9).

The screenshot shows the configuration for PGN 63287. Under 'BLE connectionless functionalities', 'Connection #1' is selected, and its 'Mode' is set to 'Advanced'. A 'Settings' field is highlighted with a red box, showing the MAC address '0036F2C60E27'. Below this is a table for '1st Sensor' with columns for Type, Data Offset, Data Size, Action, IO, Match, Endianness, Multiplier, and Offset.

Type	Data Offset	Data Size	Action	IO	Match	Endianness	Multiplier	Offset
FF	3	4	Match	None	37F7	Little Endian	1	0
FF	5	2	Save	Fuel		Big Endian	1	0
FF	8	2	Save	Custom1		Little Endian	1	0
FF	10	2	Save	Custom2		Big Endian	1	0
FF	13	1	Save	Temperature		Little Endian	1	-40
FF	14	2	Save	Custom3		Big Endian	1	0
FF	16	4	Save	Custom4		Big Endian	1	0
FF	20	4	Save	Custom5		Big Endian	1	0
FF	24	1	Save	Battery		Little Endian	1	0
	0	0	Match	None		Little Endian	1	0

Figure 6

The screenshot shows the configuration for PGN 63287. Under 'BLE connectionless functionalities', 'Connection #1' is selected, and its 'Mode' is set to 'Advanced'. A 'Settings' field is highlighted with a red box, showing the MAC address '0036F2C60E27'. Below this is a table for '1st Sensor' with columns for Type, Data Offset, Data Size, Action, IO, Match, Endianness, Multiplier, and Offset.

Type	Data Offset	Data Size	Action	IO	Match	Endianness	Multiplier	Offset
FF	3	4	Match	None	37F7	Little Endian	1	0
FF	5	2	Save	Fuel		Big Endian	1	0
FF	8	2	Save	Custom1		Little Endian	1	0
FF	10	2	Save	Custom2		Big Endian	1	0
FF	13	1	Save	Temperature		Little Endian	1	-40
FF	14	2	Save	Custom3		Big Endian	1	0
FF	16	4	Save	Custom4		Big Endian	1	0
FF	20	4	Save	Custom5		Big Endian	1	0
FF	24	1	Save	Battery		Little Endian	1	0
	0	0	Match	None		Little Endian	1	0

Figure 7

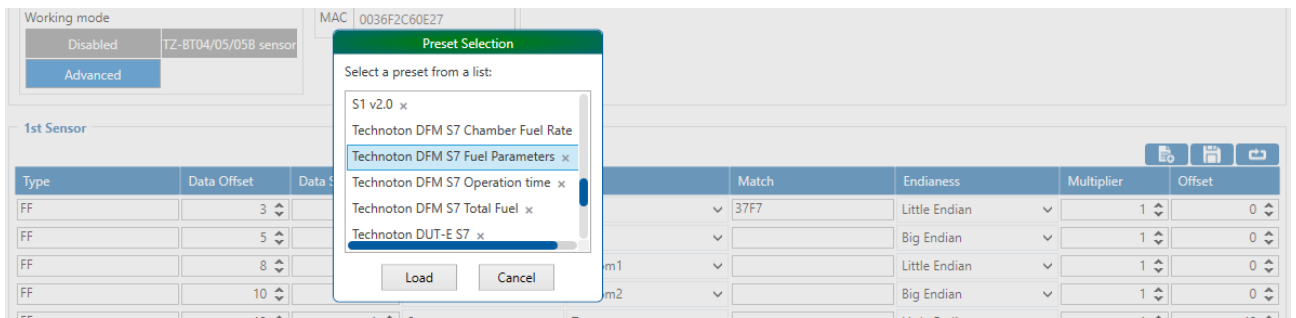


Figure 8

1st Sensor

Type	Data Offset	Data Size	Action	IO	Match	Endianess	Multiplier	Offset
FF	3	2	Match	None	37F7	Little Endian	1	0
FF	5	2	Save	Fuel		Big Endian	1	0
FF	8	2	Save	Custom1		Little Endian	1	0
FF	10	2	Save	Custom2		Big Endian	1	0
FF	13	1	Save	Temperature		Little Endian	1	-40
FF	14	2	Save	Custom3		Big Endian	1	0
FF	16	4	Save	Custom4		Big Endian	1	0
FF	20	4	Save	Custom5		Big Endian	1	0
FF	24	1	Save	Battery		Little Endian	1	0
	0	0	Match	None		Little Endian	1	0

Figure 9

PGN 63288 configuration (Figures 10-13).

Connection #2

Mode

Working mode

Disabled TZ-BT04/05/05B sensor

Advanced

Settings

MAC 0036F2C60E27

2nd Sensor

Type	Data Offset	Data Size	Action	IO	Match	Endianess	Multiplier	Offset
FF	3	2	Match	None	38F7	Little Endian	1	0
FF	5	4	Save	Custom1		Little Endian	1	0
FF	9	4	Save	Custom2		Big Endian	1	0
FF	13	4	Save	Custom3		Big Endian	1	0
FF	17	4	Save	Custom4		Big Endian	1	0
FF	21	4	Save	Custom5		Big Endian	1	0
	0	0	Match	None		Little Endian	1	0
	0	0	Match	None		Little Endian	1	0
	0	0	Match	None		Little Endian	1	0
	0	0	Match	None		Little Endian	1	0

Figure 10

2nd Sensor

Type	Data Offset	Data Size	Action	IO	Match	Endianness	Multiplier	Offset
FF	3	2	Match	None	38F7	Little Endian	1	0
FF	5	4	Save	Custom1		Little Endian	1	0
FF	9	4	Save	Custom2		Big Endian	1	0
FF	13	4	Save	Custom3		Big Endian	1	0
FF	17	4	Save	Custom4		Big Endian	1	0
FF	21	4	Save	Custom5		Big Endian	1	0
	0	0	Match	None		Little Endian	1	0
	0	0	Match	None		Little Endian	1	0
	0	0	Match	None		Little Endian	1	0
	0	0	Match	None		Little Endian	1	0

Figure 11

2nd Sensor

Type	Data Offset	Data Size	Action	IO	Match	Endianness	Multiplier	Offset
FF	3	2	Match	None	38F7	Little Endian	1	0
FF	5	4	Save	Custom1		Little Endian	1	0
FF	9	4	Save	Custom2		Big Endian	1	0
FF	13	4	Save	Custom3		Big Endian	1	0
FF	17	4	Save	Custom4		Big Endian	1	0
FF	21	4	Save	Custom5		Big Endian	1	0
	0	0	Match	None		Little Endian	1	0
	0	0	Match	None		Little Endian	1	0
	0	0	Match	None		Little Endian	1	0
	0	0	Match	None		Little Endian	1	0

Preset Selection

Select a preset from a list:

- S1 v2.0 x
- Technoton DFM S7 Chamber Fuel Rate
- Technoton DFM S7 Fuel Parameters x
- Technoton DFM S7 Operation time x
- Technoton DFM S7 Total Fuel x
- Technoton DUT-E S7 x

Load Cancel

Figure 12

2nd Sensor

Type	Data Offset	Data Size	Action	IO	Match	Endianness	Multiplier	Offset
FF	3	2	Match	None	38F7	Little Endian	1	0
FF	5	4	Save	Custom1		Little Endian	1	0
FF	9	4	Save	Custom2		Big Endian	1	0
FF	13	4	Save	Custom3		Big Endian	1	0
FF	17	4	Save	Custom4		Big Endian	1	0
FF	21	4	Save	Custom5		Big Endian	1	0
	0	0	Match	None		Little Endian	1	0
	0	0	Match	None		Little Endian	1	0
	0	0	Match	None		Little Endian	1	0
	0	0	Match	None		Little Endian	1	0

Figure 13

PGN 63289 configuration (Figures 14-17).

Connection #3

Mode

Working mode

Disabled TZ-BT04/05/05B sensor

Advanced

Settings

MAC 0036F2C60E27

3rd Sensor

Type	Data Offset	Data Size	Action	IO	Match	Endianness	Multiplier	Offset
FF	3	2	Match	None	39F7	Little Endian	1	0
FF	5	4	Save	Custom1		Little Endian	1	0
FF	9	4	Save	Custom2		Big Endian	1	0
FF	13	4	Save	Custom3		Big Endian	1	0
FF	17	4	Save	Custom4		Big Endian	1	0
FF	21	4	Save	Custom5		Big Endian	1	0
	0	0	Match	None		Little Endian	1	0
	0	0	Match	None		Little Endian	1	0
	0	0	Match	None		Little Endian	1	0
	0	0	Match	None		Little Endian	1	0

Figure 14

3rd Sensor

Type	Data Offset	Data Size	Action	IO	Match	Endianess	Multiplier	Offset
FF	3	2	Match	None	39F7	Little Endian	1	0
FF	5	4	Save	Custom1		Little Endian	1	0
FF	9	4	Save	Custom2		Big Endian	1	0
FF	13	4	Save	Custom3		Big Endian	1	0
FF	17	4	Save	Custom4		Big Endian	1	0
FF	21	4	Save	Custom5		Big Endian	1	0
	0	0	Match	None		Little Endian	1	0
	0	0	Match	None		Little Endian	1	0
	0	0	Match	None		Little Endian	1	0
	0	0	Match	None		Little Endian	1	0

Figure 15

FF	3	2	Match	None	39F7	Little Endian	1	0
FF	5	4	Save	Custom1		Little Endian	1	0
FF	9	4	Save	Custom2		Big Endian	1	0
FF	13	4	Save	Custom3		Big Endian	1	0
FF	17	4	Save	Custom4		Big Endian	1	0
FF	21	4	Save	Custom5		Big Endian	1	0
	0	0	Match	None		Little Endian	1	0
	0	0	Match	None		Little Endian	1	0
	0	0	Match	None		Little Endian	1	0
	0	0	Match	None		Little Endian	1	0

Preset Selection

Select a preset from a list:

- S1 v2.0 x
- Technoton DFM S7 Chamber Fuel Rate
- Technoton DFM S7 Fuel Parameters x
- Technoton DFM S7 Operation time x
- Technoton DFM S7 Total Fuel x
- Technoton DUT-E S7 x

Connection #4

Figure 16

3rd Sensor

Type	Data Offset	Data Size	Action	IO	Match	Endianess	Multiplier	Offset
FF	3	2	Match	None	39F7	Little Endian	1	0
FF	5	4	Save	Custom1		Little Endian	1	0
FF	9	4	Save	Custom2		Big Endian	1	0
FF	13	4	Save	Custom3		Big Endian	1	0
FF	17	4	Save	Custom4		Big Endian	1	0
FF	21	4	Save	Custom5		Big Endian	1	0
	0	0	Match	None		Little Endian	1	0
	0	0	Match	None		Little Endian	1	0
	0	0	Match	None		Little Endian	1	0
	0	0	Match	None		Little Endian	1	0

Figure 17

Data from the DFM S7 flowmeter are displayed in the configurator. Press the Low button to select the parameter to be sent to the server (Figure 18):

TELTONIKA

Input Name	Current Value	Units	Priority	Low Level	High Level	Event Only
iButton	0x0000000000000000		None Low High Panic	0	0	Crash Yes No
Eco Score	0		None Low High Panic	0	0	Crash Yes No
User ID	0x0000000000000000		None Low High Panic	0	0	Crash Yes No
BLE Temperature #1	26	°C	None Low High Panic	-4000	8500	Crash Yes No
BLE Temperature #2	3000	°C	None Low High Panic	-4000	8500	Crash Yes No
BLE Temperature #3	3000	°C	None Low High Panic	-4000	8500	Crash Yes No
BLE Temperature #4	3000	°C	None Low High Panic	-4000	8500	Crash Yes No
BLE Battery #1	67	%	None Low High Panic	0	0	Crash Yes No
BLE Battery #2	0	%	None Low High Panic	0	0	Crash Yes No
BLE Battery #3	0	%	None Low High Panic	0	0	Crash Yes No
BLE Battery #4	0	%	None Low High Panic	0	0	Crash Yes No
BLE Humidity #1	3000	%RH	None Low High Panic	0	0	Crash Yes No

TELTONIKA

Input Name	Current Value	Units	Priority	Low Level	High Level	Event Only
BLE Custom 1	0x0000		None Low High Panic	0	0	Crash Yes No
BLE 1 Custom 2	0		None Low High Panic	0	0	Crash Yes No
BLE 1 Custom 3	153		None Low High Panic	0	0	Crash Yes No
BLE 1 Custom 4	0		None Low High Panic	0	0	Crash Yes No
BLE 1 Custom 5	0		None Low High Panic	0	0	Crash Yes No
BLE 2 Custom 1	0x00015DB4		None Low High Panic	0	0	Crash Yes No
BLE 2 Custom 2	2574		None Low High Panic	0	0	Crash Yes No
BLE 2 Custom 3	66500		None Low High Panic	0	0	Crash Yes No
BLE 2 Custom 4	20450		None Low High Panic	0	0	Crash Yes No
BLE 2 Custom 5	37587		None Low High Panic	0	0	Crash Yes No
BLE 3 Custom 1	0x000010E7		None Low High Panic	0	0	Crash Yes No
BLE 3 Custom 2	1357		None Low High Panic	0	0	Crash Yes No
BLE 3 Custom 3	2613		None Low High Panic	0	0	Crash Yes No
BLE 3 Custom 4	357		None Low High Panic	0	0	Crash Yes No
BLE 3 Custom 5	405		None Low High Panic	0	0	Crash Yes No
BLE Luminosity #1	0	lx	None Low High Panic	0	0	Crash Yes No
BLE Luminosity #2	0	lx	None Low High Panic	0	0	Crash Yes No
BLE Luminosity #3	0	lx	None Low High Panic	0	0	Crash Yes No
BLE Luminosity #4	0	lx	None Low High Panic	0	0	Crash Yes No
BLE Fuel Level #1	0	kvants	None Low High Panic	0	0	Crash Yes No
BLE Fuel Level #2	0	kvants	None Low High Panic	0	0	Crash Yes No

Figure 18

PGN 63287 (Fuel parameters).

- BLE Fuel level 1 - fuel consumption per hour;
- BLE Temperature 1 - temperature;
- BLE Battery 1 - battery charge level;
- BLE Custom1 - hourly fuel consumption (feed);

BLE 1 Custom2 - hourly fuel consumption (reverse);
 BLE 1 Custom3 - flow meter operation time (interference);
 BLE 1 Custom4 - Unit DTCs Mask;
 BLE 1 Custom5 - Unit Events Mask.

PGN 63288(Total fuel).

BLE 2 Custom1 - High Resolution Engine Total Fuel Used;
 BLE 2 Custom2 - High Resolution Engine Total Fuel Used. Idle;
 BLE 2 Custom3 - High Resolution Engine Total Fuel Used. Optimal;
 BLE 2 Custom4 - High Resolution Engine Total Fuel Used. Overload;
 BLE 2 Custom5 - High Resolution Engine Total Fuel Used. Cheating.

PGN 63289(Operation time).

BLE 3 Custom1 - Flowmeter Hours Of Operation;
 BLE 3 Custom2 - Flowmeter Hours Of Operation. Idle;
 BLE 3 Custom3 - Flowmeter Hours Of Operation. Optimal;
 BLE 3 Custom4 - Flowmeter Hours Of Operation. Overload;
 BLE 3 Custom5 - Flowmeter Hours Of Operation. Cheating.

4. Displaying data on a telematics server.

Register the terminal on the telematics server.

The data on the server looks like this (Figure 19):

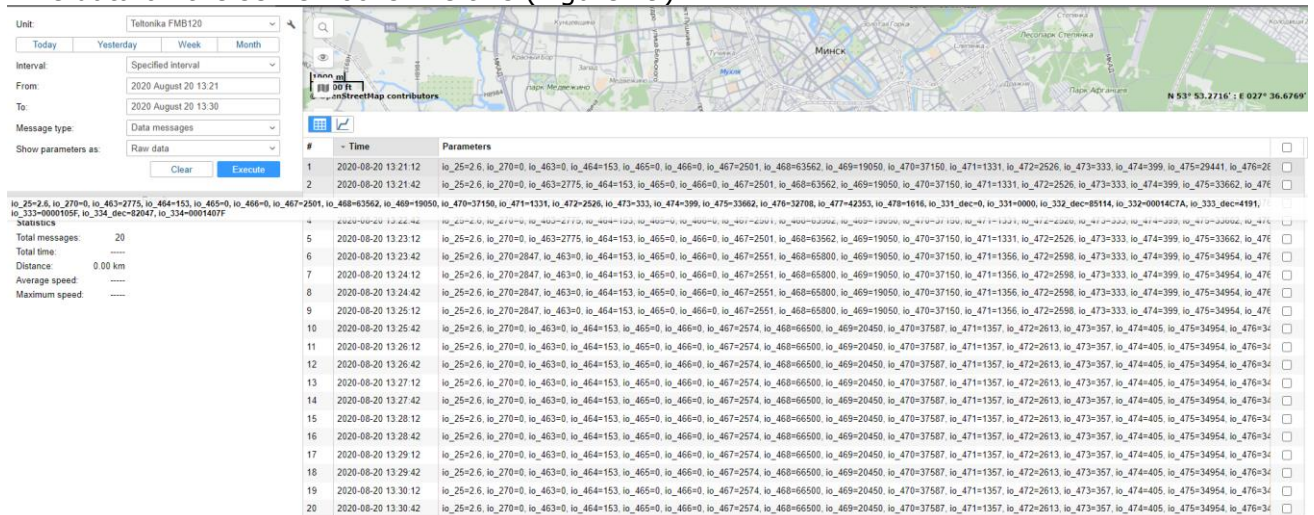


Figure 19

4.1 Sensors configuration

To configure sensors on the server, we use the data in the table

Parameter	Parameter on a server	Measurement value
1. Engine Fuel Rate/ Часовой расход топлива	IO_270*const0.05	L/h
2. Chamber Fuel Rate/Feed chamber Часовой расход топлива (подача)	IO_331_dec*const0.05	L/h
3. Chamber Fuel Rate/Reverse chamber Часовой расход топлива (обратка)	IO_463*const0.05	L/h
4. Engine Fuel Temperature 1 Температура	IO_25*const10	T°C
5. Flowmeter Hours Of Operation Время работы расходомера (вмешательство)	IO_464/const3600	h
6. Unit DTCs Mask Маска неисправностей Юнита	IO_465	-
7. Unit Event Mask Маска событий Юнита	IO_466	-
8. Battery Charge Level Уровень заряда аккумулятора	IO_29	%
9. High Resolution Engine Total Used Суммарный расход высокого разрешения	IO_332_dec*const0.001	L
10. High Resolution Engine Total Used/Idle Суммарный расход высокого разрешения (холостой ход)	IO_467*const0.001	L
11. High Resolution Engine Total Used/Optimal Суммарный расход высокого разрешения (оптимальный)	IO_468*const0.001	L
12. High Resolution Engine Total Used/Overload Суммарный расход высокого разрешения (перегруз)	IO_469*const0.001	L
13. High Resolution Engine Total Used/Cheating Суммарный расход высокого разрешения (накрутка)	IO_470*const0.001	L
14. Flowmeter Hours Of Operation Время работы расходомера	IO_333_dec/const3600	h
15. Flowmeter Hours Of Operation/Idle Время работы расходомера (холостой ход)	IO_471/const3600	h
16. Flowmeter Hours Of Operation/Optimal Время работы расходомера (оптимальный)	IO_472/const3600	h
17. Flowmeter Hours Of Operation/Overload Время работы расходомера (перегруз)	IO_473/const3600	h
18. Flowmeter Hours Of Operation/Cheating Время работы расходомера (накрутка)	IO_474/const3600	h

An example of setting the fuel consumption per hour on the server (Figures 20-23):

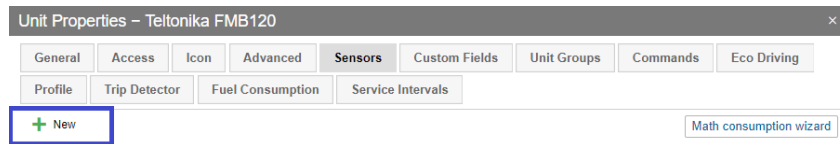


Figure 20

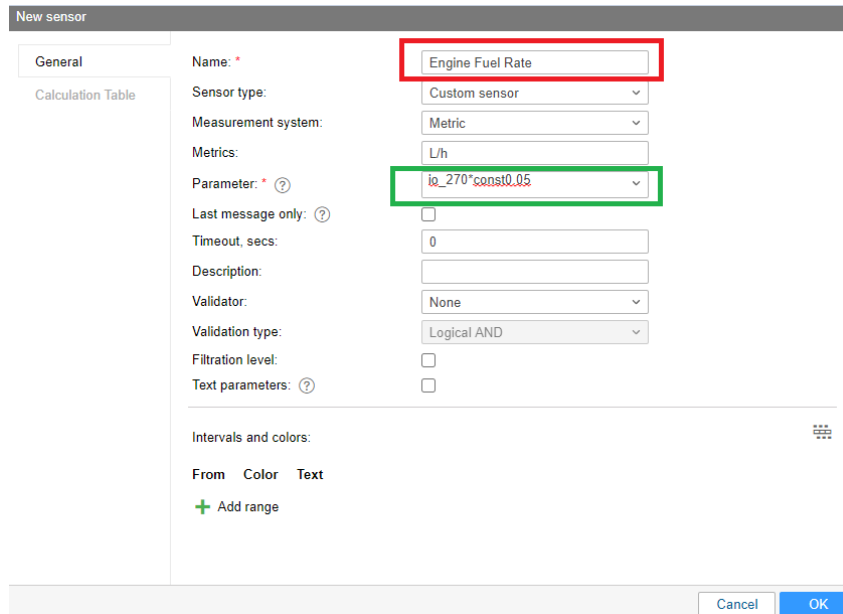


Figure 21

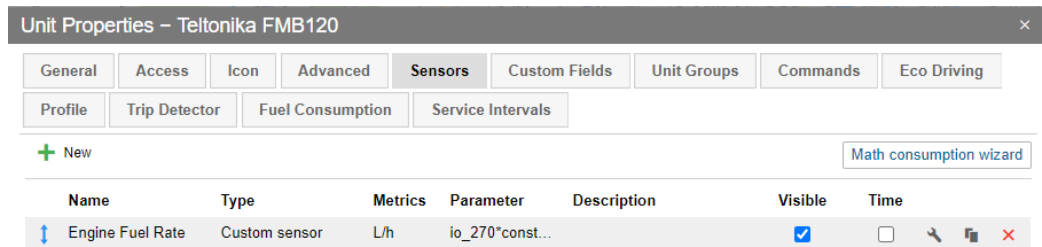


Figure 22

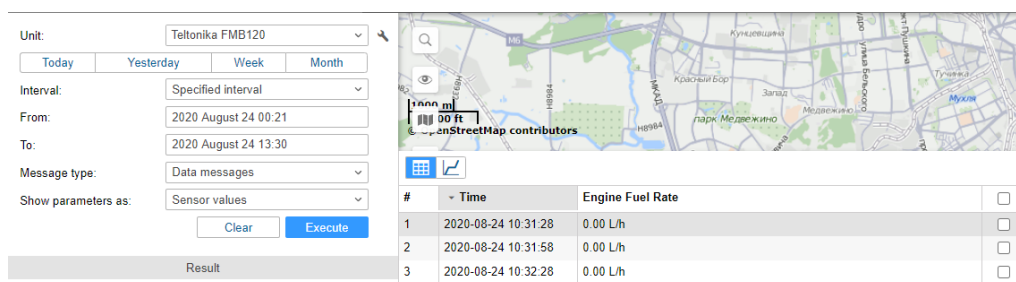


Figure 23

In the case of using several sensors, it is necessary to limit the number of transmitted messages (PGN).

4 PGNs are available for configuring at any MAC addresses.

Configuration is finished.

Head of Technical Department

V.A. Panasiyk