FMB640 Manual CAN IO

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Introduction

Controller Area Network (CAN or CAN-bus) is a computer network protocol and bus standard designed to allow microcontrollers and devices to communicate with each other and without a host computer. It was designed specifically for automotive applications but is now also used in other areas.

SAE J1939 and J1708* is the vehicle bus standard used for communication and diagnostics among vehicle components. Based on the same architecture FMS protocol dedicated to telematics systems is available. It has certain standardized parameters available, such as fuel consumption, engine work-hours, etc. Please visit http://www.fms-standard.com/ for more information and message structure.

The FMS-interface is an optional interface of different truck manufacturers. Supporting information is dependent upon vehicle equipment. For the full information set, additional Electronic Control Units (ECU) may be required. Please contact the manufacturer or your dealer for more details.

Vehicle brands supported:

- Mercedes Benz
- Volvo
- MAN
- DAF
- Iveco
- Scania
- Renault

Available parameters:

- Total Fuel
- Total Distance
- Status of brake pedal *
- Engine Torque *
- Actual fuel
- Accelerator pedal position *
- Status engine brake

- Speed *
- RPM
- Engine hours
- Vehicle Weight *
- Fuel level
- Tachograph data *

Availability of parameter depends on vehicle's model and configuration of the FMS interface of the truck.

J1708 is an additional FMS protocol used by some vehicle manufacturers. If your vehicle supports J1939 and J1708 both protocols then you must disable J1708 in configuration to receive fuel data.

General description

- Uses six different speeds: 50 kbps, 100 kbps, 125 kbps, 250 kbps, 500 kbps, 1000kbps;
- Auto Baud rate detection;
- Filtering messages (StId, ExtId) according to configuration;
- Using mask, filters required bytes;
- Different CAN configurations.

Configuration

[FMB640](#) has 70 configurable Manual CAN elements.

CAN message ID type: Message ID type two types according to SAEJ1939 standard: Standard ID (value: `0` to `0x7FFh`) and Extended ID (value: `0` to `0x1FFFFFFFh`).

Message ID value is entered in HEX format. This parameter is used to configure the hardware message filter. All messages contain 8 bytes of data, to select particular data/bytes "Output Data Mask" is used, it's done by ticking the required bytes, only selected bytes are sent to the server.

Example: A sample CAN message has the following structure: `X18FEE9018FFFFFFFF23840300`, where essential parts are `FEE9` – identifier and `FFFFFFFF23840300` – data bytes.

CAN messages are configured like any other I/O parameters. They consist of 4 identifier bytes and 8 data bytes. Below you will find a sample configuration for fuel consumption parameter:

- **ID type** – is always 29 bits.
- **Output data mask** – defines which data bytes are sent to the server (sometimes not all data bytes are necessary).
- **CAN ID** – this is 4 byte identifier. Messages use 4 bytes, but the first and last bytes may differ in different vehicle models while the middle four bytes are the same for all vehicles. The first and last bytes may have any value. Because of this reason, it is recommended to write `FF` in the first byte and the same in the last byte.

Example

All Mercedes Benz Actros 2 models with Vehicle Identification Number (VIN) starting with WDB93 have a possibility to connect [FMB640](#) module to the CAN bus. This can be done by connecting to a special PSM module (which may or may not be included in the truck) or ground module of the vehicle. For the CAN signal to be available, parameter 520 must be enabled in "kommunikationsschnittstelle" in the vehicle with Mercedes Stardiagnose.

CAN wires can be found on the X5 connector located in the fuse box:

- PIN 5: CAN Low signal (yellow wire)
- PIN 2: CAN High signal (blue wire)

In the example [FMB640](#) will filter all CAN messages with identifier FFFEE9FF (fuel consumption).

Note: Averaging constant cannot be used with CAN data, because this information comes in digital format. So in order to prevent data loss, set Averaging constant parameter to 1.

Most parameters have a certain resolution. FEE9 parameter has 0.5L/bit gain, so the value that is sent to the server has to be multiplied by 0.5.

Data parsing is preceded by selecting the correct message from all available on the CAN bus. FMS standard interface description indicates that fuel consumption is a parameter with ID FEE9:

00FEE9								PGN HEX
65,257								PGN
1000 ms								Rep. Rate
Data Byte 1	Data Byte 2	Data Byte 3	Data Byte 4	Data Byte 5	Data Byte 6	Data Byte 7	Data Byte 8	Byte No.
Not used for FMS-Standard	Not used for FMS-Standard	Not used for FMS-Standard	Not used for FMS-Standard	Total fuel used 0,5 L/Bit gain 0 L offset 5.2.5.66 SPN 250	Total fuel used 0,5 L/Bit gain 0 L offset 5.2.5.66 SPN 250	Total fuel used 0,5 L/Bit gain 0 L offset 5.2.5.66 SPN 250	Total fuel used 0,5 L/Bit gain 0 L offset 5.2.5.66 SPN 250	Name Values Values Values SAE ref SPN

Note: This information is provided only as an example and Teltonika takes no responsibility for information accuracy or damage that may be done to the vehicle or [FMB640](#) module while integrating it.