

# CAR2FMS Interface v2

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## General description

The device is designed as generator of information from digital tachographs VDO SIEMENS, ACTIA, and STONERIDGE at CAN bus and as transducer of information from CAN bus of cars at CAN bus in FMS format. Thus, it forms FMS gateway for cars.

At the bus, the information about driver's ID, set working activity etc. are generated from tachograph.

From the car CAN bus, available data is converted into FMS format. Some data can be provided in adjusted format.

In case of VOLVO trucks without FMS gateway, no messages about gas are available at CAN. However, some information can be read from J1708/J1587 diagnostic bus. New version of CAR2FMS v2 supports reading of several quantities from J1708/J1587 and its transmission to output CAN. Transmitted data are automatically converted into ranges according to SAE J1939, excluding data stated below.

Version CAR2FMS E is designed for new VOLVO trucks manufactured from year 2013. In this car it is necessary to connect second bus CAN instead of J1708. Thus, version CAR2FMS is provided with second CAN input instead of J1708 bus.



## ***Technical information***

- 2x CAN interface, high-speed type. Output CAN speed is 250 kbit. Input CAN speed depends on car settings.
- Version E provided with second input CAN.
- Without galvanic separation of CAN.
- VDO SIEMENS, ACTIA a STONERIDGE digital tachographs connection with galvanic separation.
- Connection of J1708/J1587 diagnostic bus at cars with VOLVO motors and transformation of several quantities at output CAN.
- Connection of 1 analog quantity and its generating at output CAN (float).
- Output data converted from the car into the FMS format generated approx. every 250 ms.
- Allows to connect signal 15 (ignition) and automatic device switch-off.
- Synchronous digital output switching with generating of each segment of tachograph message at CAN.
- 5 x signal LED
- Consumption of 30 mA at 12 V (0.36 W), approx. 20 mA at 24 V (0.48 W)
- Dimensions: 10 x 5 x 3 cm.

## Structure of messages generated from tachograph

On the CAN bus, the device generates information from tachograph at the moment of change of this information. Message with PGN FE6B is used for generating. Information is generated in sequence of several of these messages. After generating of sequence fragment digital output is shortly activated. For example by connection to digital output of TELTONICA, it is possible to enforce sending of the fragment to the server.

From firmware version 1.50, Driver ID transmission in SAE J1939 / FMS format is supported.

FE6B h							
65131							
Data Byte 1	Data Byte 2	Data Byte 3	Data Byte 4	Data Byte 5	Data Byte 6	Data Byte 7	Data Byte 8
Data Marker - data type - index	Data	Data	Data	Data	Data	Data	Data

Data marker:

It indicates type of data transferred, this type also defines its length (number of segments of CAN messages that have to be connected). It also indicates segment index.

Bit 7..5 data type

Bit 4 odd/even sequence, bit changes state in each sequence

Bit 3..0 segment index

Data type:

- 0: Driver ID
- 1: Extinfo 1
- 2: Extinfo 2
- 3: Extinfo 3
- 4: DM1

From firmware version 3.0 it is possible to set mode when the sequence bit of message Driver ID is extended from one bit to 2. In this mode, packets Extinfo 1 and Extinfo 2 are not supported. In case of Driver ID, the segment index is limited to 3 bits. Packets Extinfo 3 and DM1 have not been changed.

Data type:

- 5: Driver ID

Bit 7..5 data type

Bit 4..3 sequence counter

Bit 2..0 segment index

The function is activated using option "Extended sequence number" on the first screen in the setting plugin.

Driver ID	000A BBBB	101A AB BB
Extinfo 1	001A BBBB	
Extinfo 2	010A BBBB	
Extinfo 3	0110 0000	0110 0000
DM1	100A BBBB	100A BBBB
Stat	11CC CBBB	11CC CBBB

### Data type 0 – Driver ID – CANLAB format

This data type is made of 7 segments

Data Byte 1	Data Byte 2	Data Byte 3	Data Byte 4	Data Byte 5	Data Byte 6	Data Byte 7	Data Byte 8
Data Marker - data type 0 - index 0	Work states	Driver 1 states	Driver 2 states	Tachogra ph status	Driver 1 ID length	Driver 1 ID length	Not used (255)
Data Marker - data type 0 - index 1	Driver 1 ID, character #1	Driver 1 ID, character #2	Driver 1 ID, character #3	Driver 1 ID, character #4	Driver 1 ID, character #5	Driver 1 ID, character #6	Driver 1 ID, character #7
Data Marker - data type 0 - index 2	Driver 1 ID, character #8	Driver 1 ID, character #9	Driver 1 ID, character #10	Driver 1 ID, character #11	Driver 1 ID, character #12	Driver 1 ID, character #13	Driver 1 ID, character #14
Data Marker - data type 0 - index 3	Driver 1 ID, character #15	Driver 1 ID, character #16	Driver 1 ID, character #17	Driver 1 ID, character #18	Driver 1 ID, character #19	Driver 1 ID, character #20	Not used (255)
Data Marker - data type 0 - index 4	Driver 2 ID, character #1	Driver 2 ID, character #2	Driver 2 ID, character #3	Driver 2 ID, character #4	Driver 2 ID, character #5	Driver 2 ID, character #6	Driver 2 ID, character #7
Data Marker - data type 0 - index 5	Driver 2 ID, character #8	Driver 2 ID, character #9	Driver 2 ID, character #10	Driver 2 ID, character #11	Driver 2 ID, character #12	Driver 2 ID, character #13	Driver 2 ID, character #14
Data Marker - data type 0 - index 6	Driver 2 ID, character #15	Driver 2 ID, character #16	Driver 2 ID, character #17	Driver 2 ID, character #18	Driver 2 ID, character #19	Driver 2 ID, character #20	Not used (255)

Driver 1 ID, character #1 and Driver 2 ID, character #1 can be ignored, character #2 contains country code. For nationality please follow table below. Card code begins from character #3. In some cases, text country code is transmitted on the first three positions. In this case, the character 1 is printable digit.

Austria A (01)H Albania AL (02)H Andorra AND (03)H Armenia ARM (04)H Azerbaijan AZ (05)H Belgium B (06)H Bulgaria BG (07)H Bosnia Herzegovina BIH (08)H Belarus BY (09)H Switzerland CH (0A)H Cyprus CY (0B)H Czech Republic CZ (0C)H Germany D (0D)H Denmark DK (0E)H Spain E (0F)H Estonia EST (10)H France F (11)H	Iceland IS (1C)H Kazakhstan KZ (1D)H Luxembourg L (1E)H Lithuania LT (1F)H Latvia LV (20)H Malta M (21)H Monaco MC (22)H Moldova MD (23)H FYROM (Macedonia) MK (24)H Montenegro MNE (34)H Norway N (25)H Netherlands NL (26)H Portugal P (27)H Poland PL (28)H Romania RO (29)H San Marino RSM (2A)H Russia RUS (2B)H
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Finland FIN (12)H Liechtenstein FL (13)H Faroe Islands FR (14)H United Kingdom UK (15)H Georgia GE (16)H Greece GR (17)H Hungary H (18)H Croatia HR (19)H Italy I (1A)H Ireland IRL (1B)H	Sweden S (2C)H Slovakia SK (2D)H Slovenia SLO (2E)H Serbia SRB (35)H Turkmenistan TM (2F)H Turkey TR (30)H Ukraine UA (31)H Uzbekistan UZ (36)H Vatican City V (32)H Yugoslavia YU (33)H
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## Tachograph information structure

### **Work states**

#### *Bit 2..0: Driver 1 working state*

- 000 = Break/Rest
- 001 = Driver available
- 010 = Work
- 011 = Drive
- 110 = Error
- 111 = Not available

#### *Bit 5..3: Driver 2 working state*

- 000 = Rest
- 001 = Driver available
- 010 = Work
- 011 = Drive
- 110 = Error
- 111 = Not available

#### *Bit 7..6: Drive recognize*

- 00 = Vehicle motion not detected
- 01 = Vehicle motion
- 10 = Error
- 11 = Not available

### **Driver 1 states**

#### *Bit 3..0: Driver 1 time rel states*

- 0000 = normal
- 0001 = 15 min bef. 4 ½ h
- 0010 = 4 ½ h reached
- 0011 = 15 min before warning 1 (9h)
- 0100 = warning 1 reached
- 0101 = 15 min before warning 2 (16h)
- 0110 = warning 2 reached
- 1101 = Other
- 1110 = Error
- 1111 = Not available

#### *Bit 5..4: Driver 1 card*

- 00 = Card not present
- 01 = Card present
- 10 = Error
- 11 = Not available

#### *Bit 7..6: Overspeed*

00 = No overspeed  
01 = Overspeed  
10 = Error  
11 = Not available

### ***Driver 2 states***

#### ***Bit 3..0 : Driver 1 time rel states***

0000 = normal  
0001 = 15 min bef. 4 ½ h  
0010 = 4 ½ h reached  
0011 = 15 min before warning 1 (9h)  
0100 = warning 1 reached  
0101 = 15 min before warning 2 (16h)  
0110 = warning 2 reached  
1101 = Other  
1110 = Error  
1111 = Not available

#### ***Bit 5..4: Driver 1 card***

00 = Card not present  
01 = Card present  
10 = Error  
11 = Not available

#### ***Bit 7..6: Overspeed***

00 = No overspeed  
01 = Overspeed  
10 = Error  
11 = Not available

### ***Tachograph***

#### ***Bit 0..1: System event***

00 = No tachograph event  
01 = Tachograph event  
10 = Error  
11 = Not available

#### ***Bit 2..3: Handling information***

00 = No handling information  
01 = Handling information  
10 = Error  
11 = Not available

#### ***Bit 5..4: Tachograph performance***

00 = Normal performance  
01 = Performance  
10 = Error  
11 = Not available

#### ***Bit 7..6: Direction indicator***

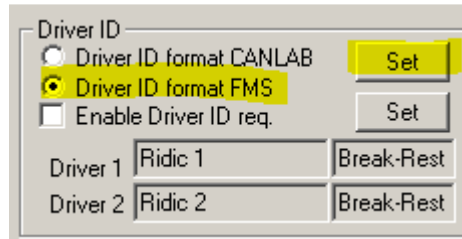
00 = Forward  
01 = Reverse  
10 = Error

11 = Not available

### Data type 0 – Driver ID – FMS format

This transmission follows the FMS standard documentation. Thus, single message, if no card inserted. Multipacket transmission available, if at least one card inserted. Each card identification has 17 bytes (numerical one-byte country code + 16 identification bytes). Digit ‘\*’ used as separator.

In this mode, Extinfo packets transmission mode is not supported.



### Data type 1 – Extinfo 1

Data is generated with 10 seconds period consisted of 3 segments.

Data Byte 1	Data Byte 2	Data Byte 3	Data Byte 4	Data Byte 5	Data Byte 6	Data Byte 7	Data Byte 8
Data Marker - data type 1 - index 0	Hours	Minutes	Seconds	Day	Month	Year	Not used (255)
Data Marker - data type 1 - index 1	RPM 0.125 rpm/bit	RPM	Totat vehicle distance 5m/bit	Totat vehicle distance	Totat vehicle distance	Totat vehicle distance	Not used (255)
Data Marker - data type 2 - index 2	Tachograph vehicle speed 1/256 km/h / bit	Tachograph vehicle speed	Trip vehicle distance 5m/bit	Trip vehicle distance	Trip vehicle distance	Trip vehicle distance	Not used (255)

### Data type 2 – Extinfo 2

Data is generated only after the start of device.

Data Byte 1	Data Byte 2	Data Byte 3	Data Byte 4	Data Byte 5	Data Byte 6	Data Byte 7	Data Byte 8
Data Marker - data type 2 - index 0	Vehicle REG length	Vehicle REG, character #1	Vehicle REG, character #2	Vehicle REG, character #3	Vehicle REG, character #4	Vehicle REG, character #5	Vehicle REG, character #6
Data Marker - data type 2 - index 1	Vehicle REG, character #7	Vehicle REG, character #8	Vehicle REG, character #9	Vehicle REG, character #10	Vehicle REG, character #11	Vehicle REG, character #12	Vehicle REG, character #13
Data Marker - data type 2	Vehicle REG, character	Vehicle REG, character	Vehicle REG, character	Vehicle REG, character	Vehicle REG, character	Vehicle REG, character	Vehicle REG, character



- index 2	#14	#15	#16	#17	#18	#19	#20
Data Marker - data type 2 - index 3	<b>Vehicle ID length</b>	Vehicle ID, character #1	Vehicle ID, character #2	Vehicle ID, character #3	Vehicle ID, character #4	Vehicle ID, character #5	Vehicle ID, character #6
Data Marker - data type 2 - index 4	Vehicle ID, character #7	Vehicle ID, character #8	Vehicle ID, character #9	Vehicle ID, character #10	Vehicle ID, character #11	Vehicle ID, character #12	Vehicle ID, character #13
Data Marker - data type 2 - index 5	Vehicle ID, character #14	Vehicle ID, character #15	Vehicle ID, character #16	Vehicle ID, character #17	Vehicle ID, character #18	Vehicle ID, character #19	Vehicle ID, character #20
Data Marker - data type 2 - index 6	CAR2FMS FW, character #2	CAR2FMS FW, character #3	CAR2FMS FW, character #4	CAR2FMS FW, character #5	CAR2FMS FW, character #6	CAR2FMS FW, character #7	CAR2FMS FW, character #8
Data Marker - data type 2 - index 7	Segments period low byte	Segments period high byte	Startup delay	Shutdown delay	DIP	Remove fuel level	Not used (255)
Data Marker - data type 2 - index 8	J1708 bit flags	J1708 bit flags	J1708 bit flags	J1708 enabled	Not used (255)	Not used (255)	Not used (255)

### Data type 3 – Extinfo 3

This packet can be generated instead of Driver ID if driver's ID is not changed and only mode of his action is changed. Setting of packet generating is made by means of CAN message sent to output CAN.

Data Byte 1	Data Byte 2	Data Byte 3	Data Byte 4	Data Byte 5	Data Byte 6	Data Byte 7	Data Byte 8
Data Marker - data type 3 - index 0	Work states	Driver 1 states	Driver 2 states	Tachograph status	Total vehicle distance	Total vehicle distance	Total vehicle distance

Resolution of Total vehicle distance in this packet is not 5 m as in case of Extinfo 1, but is lowered to 250 m.

### Data type 4 – DM1

Bit 4..0 segment index (extended of parity bit that is not used). Sending of 32 error codes is supported. Error codes are saved into internal memory during the ride (CAR2FMS on) and are transmitted during shut-off after disconnection of signal 15. Each segment contains one error code that consists of several parts.

DM1 message generating must be enabled with configuration plug-in (option Enable DM1).

Data Byte 1	Data Byte 2	Data Byte 3	Data Byte 4	Data Byte 5	Data Byte 6	Data Byte 7	Data Byte 8
Data Marker - data type 4 - index n	ECU address	Lamp status	SPN LB	SPN MB	SPN HB	FMI	Bit 0-6 OC Bit 7 Data flag

**ECU address:**

0 Engine #1	34 Auxiliary Valve Control	66 Ramp Control
1 Engine #2	35 Hitch Control	67 Clutch/Converter Unit
3 Transmission #1	36 Power TakeOff (Front or Secondary)	68 Auxiliary Heater #1
4 Transmission #2	37 Off Vehicle Gateway	69 Auxiliary Heater #2
5 Shift Console - Primary	38 Virtual Terminal (in cab)	70 Engine Valve Controller
6 Shift Console - Secondary	39 Management Computer #1	71 Chassis Controller #1
7 Power TakeOff - (Main or Rear)	40 Cab Display #1	72 Chassis Controller #2
8 Axle - Steering	41 Retarder, Exhaust, Engine #1	73 Propulsion Battery Charger
9 Axle - Drive #1	42 Headway Controller	74 Communications Unit, Cellular
10 Axle - Drive #2	43 On-Board Diagnostic Unit	75 Communications Unit, Satellite
11 Brakes - System Controller	44 Retarder, Exhaust, Engine #2	76 Communications Unit, Radio
12 Brakes - Steer Axle	45 Endurance Braking System	77 Steering Column Unit
13 Brakes - Drive axle #1	46 Hydraulic Pump Controller	78 Fan Drive Controller
14 Brakes - Drive Axle #2	47 Suspension - System Controller #1	79 Seat Control #2
15 Retarder - Engine	48 Pneumatic - System Controller	80 Parking brake controller
16 Retarder - Driveline	49 Cab Controller - Primary	81 thru 127 are reserved for future assignment by SAE
17 Cruise Control	50 Cab Controller - Secondary	248 File Server / Printer
18 Fuel System	51 Tire Pressure Controller	249 Off Board Diagnostic-Service Tool #1
19 Steering Controller	52 Ignition Control Module #1	250 Off Board Diagnostic-Service Tool #2
20 Suspension - Steer Axle	53 Ignition Control Module #2	251 On-Board Data Logger
21 Suspension - Drive Axle #1	54 Seat Control #1	252 Reserved for Experimental Use
22 Suspension - Drive Axle #2	55 Lighting - Operator Controls	253 Reserved for OEM
23 Instrument Cluster #1	56 Rear Axle Steering Controller #1	254 Null Address
24 Trip Recorder	57 Water Pump Controller	255 GLOBAL (All-Any Node)
25 Passenger-Operator Climate Control #1	58 Passenger-Operator Climate Control #2	
26 Alternator/Electrical Charging System	59 Transmission Display - Primary	
27 Aerodynamic Control	60 Transmission Display - Secondary	
28 Vehicle Navigation	61 Exhaust Emission Controller	
29 Vehicle Security	62 Vehicle Dynamic Stability Controller	
30 Electrical System	63 Oil Sensor	
31 Starter System	64 Suspension - System Controller #2	
32 Tractor-Trailer Bridge #1	65 Information System Controller #1	
33 Body Controller		

**Lamp status:**

- bit 2-3      Amber warning lamp status
- bit 4-5      Red stop lamp status
- bit 6-7      Malfunction lamp status

00 – Lamp off, 01 – Lamp on

**SPN:**

Suspect Parameter Number: number that identifies error. First 511 digits correspond to PIDs that are defined in SAE 1587. From 512 SPN are defined by J1939 standard. SPN 520192 (0x7F000) to 524287 (0x7FFFF) are designed to be defined by manufacturer.

**FMI:****Failure Mode Indicator**

- 0: Data Valid but above Normal Operating Range
- 1: Data Valid but below Normal Operating Range
- 2: Data Erratic, Intermittent or Incorrect
- 3: Voltage above Normal or Shorted to High Source
- 4: Voltage below Normal or Shorted to Low Source
- 5: Current below Normal or Open Circuit
- 6: Current above Normal or Grounded Circuit
- 7: Mechanical System Not Responding or out of adjustment
- 8: Abnormal frequency or pulse width or period
- 9: Abnormal Update Rate
- 10: Abnormal Rate of Change
- 11: Root Cause Not Know
- 12: Bad Intelligent Device or Component
- 13: Out of Calibration
- 14: Special Instructions
- 15: Data Valid But Above Normal Operating Range (Least Severe Level)
- 16: Data Valid But Above Normal Operating Range (Moderate Sever Level)
- 17: Data Valid But Below Normal Operating Range (Least Severe Level)

- 18: Data Valid But Below Normal Operating Range (Moderate Severe Level)
- 19: Received Network Data in Error: (Multiplexed Data)
- 20: Data Drifted High (rationality high)
- 21: Data Drifted Low (rationality low)
- 31: Condition Exists
- 21..30 Reserved for SAE Assignment.

**OC:**



Occurrence counter

Counter of number of errors occurrence (0..126). Value 127 – not applicable.

Bit 7 (the highest) has a special significance. In case of setting on 1 it is necessary to change order of SPN bits. It can differ for each manufacturer of the truck or ECU. Please contact us for more information.

**Structure of messages generated from the car  
VW settings (and others)**

Mentioned data describes ideal situation, some car types do not have to support all mentioned data.

-  - data format corresponds to FMS standard
-  - data format has different interpretation

**Cruise Control/Vehicle Speed: CCVS**

00FEF1							
65265							
Data Byte 1	Data Byte 2	Data Byte 3	Data Byte 4	Data Byte 5	Data Byte 6	Data Byte 7	Data Byte 8
Not used for FMS-Standard	Wheel based speed 1/256 km/h Bit gain 0 km/h offset SPN 84	Wheel based speed 1/256 km/h Bit gain 0 km/h offset SPN 84	Not used for FMS-Standard	Not used for FMS-Standard	Not used for FMS-Standard	Not used for FMS-Standard	Not used for FMS-Standard

**Electronic Engine Controller #2: EEC2**

00F003							
61443							
Data Byte 1	Data Byte 2	Data Byte 3	Data Byte 4	Data Byte 5	Data Byte 6	Data Byte 7	Data Byte 8
Not used for FMS-Standard	Accelerator pedal position 1 0,4 % / Bit gain 0 % offset SPN 91	Not used for FMS-Standard	Not used for FMS-Standard	Not used for FMS-Standard	Not used for FMS-Standard	Not used for FMS-Standard	Not used for FMS-Standard

**Dash Display: DD**

00FEFC							
65276							
Data Byte 1	Data Byte 2	Data Byte 3	Data Byte 4	Data Byte 5	Data Byte 6	Data Byte 7	Data Byte 8
Not used for FMS-Standard	Fuel Level 1 1L / Bit gain 0 % offset	Not used for FMS-Standard	Not used for FMS-Standard	Not used for FMS-Standard	Second Fuel Level *	Not used for FMS-Standard	Not used for FMS-Standard

\* Second Fuel level is used for some cars (e.g. VW MQB) for information about state of tank for alternative fuel – for example CNG.

**Electronic Engine Controller #1: EEC1**

00F004							
61444							
Data Byte 1	Data Byte 2	Data Byte 3	Data Byte 4	Data Byte 5	Data Byte 6	Data Byte 7	Data Byte 8
Not used for FMS-Standard	Not used for FMS-Standard	Not used for FMS-Standard	Engine speed 0.125 rpm / Bit gain 0 rpm offset SPN 190	Engine speed 0.125 rpm / Bit gain 0 rpm offset SPN 190	Not used for FMS-Standard	Not used for FMS-Standard	Not used for FMS-Standard

**High Resolution Vehicle Distance: VDHR**

00FEC1							
65217							
Data Byte 1	Data Byte 2	Data Byte 3	Data Byte 4	Data Byte 5	Data Byte 6	Data Byte 7	Data Byte 8
High resolution total vehicle distance 5 m / Bit gain 0 m offset SPN 917	High resolution total vehicle distance 5 m / Bit gain 0 m offset SPN 917	High resolution total vehicle distance 5 m / Bit gain 0 m offset SPN 917	High resolution total vehicle distance 5 m / Bit gain 0 m offset SPN 917	Not used for FMS-Standard	Not used for FMS-Standard	Not used for FMS-Standard	Not used for FMS-Standard

**Engine Temperature 1: ET1**

00FEEE							
65262							
Data Byte 1	Data Byte 2	Data Byte 3	Data Byte 4	Data Byte 5	Data Byte 6	Data Byte 7	Data Byte 8
Engine coolant temperature 1 °C / Bit gain - 40 °C offset SPN 110	Not used for FMS-Standard	Not used for FMS-Standard	Not used for FMS-Standard	Not used for FMS-Standard	Not used for FMS-Standard	Not used for FMS-Standard	Not used for FMS-Standard

**Ambient Conditions: AMB**

00FEF5							
65269							
Data Byte 1	Data Byte 2	Data Byte 3	Data Byte 4	Data Byte 5	Data Byte 6	Data Byte 7	Data Byte 8
Not used for FMS-Standard	Not used for FMS-Standard	Not used for FMS-Standard	Ambient Air Temperature 0.03125 °C / Bit gain - 273 °C offset SPN 171	Ambient Air Temperature 0.03125 °C / Bit gain - 273 °C offset SPN 171	Not used for FMS-Standard	Not used for FMS-Standard	Not used for FMS-Standard

**Fuel Economy: LFE**

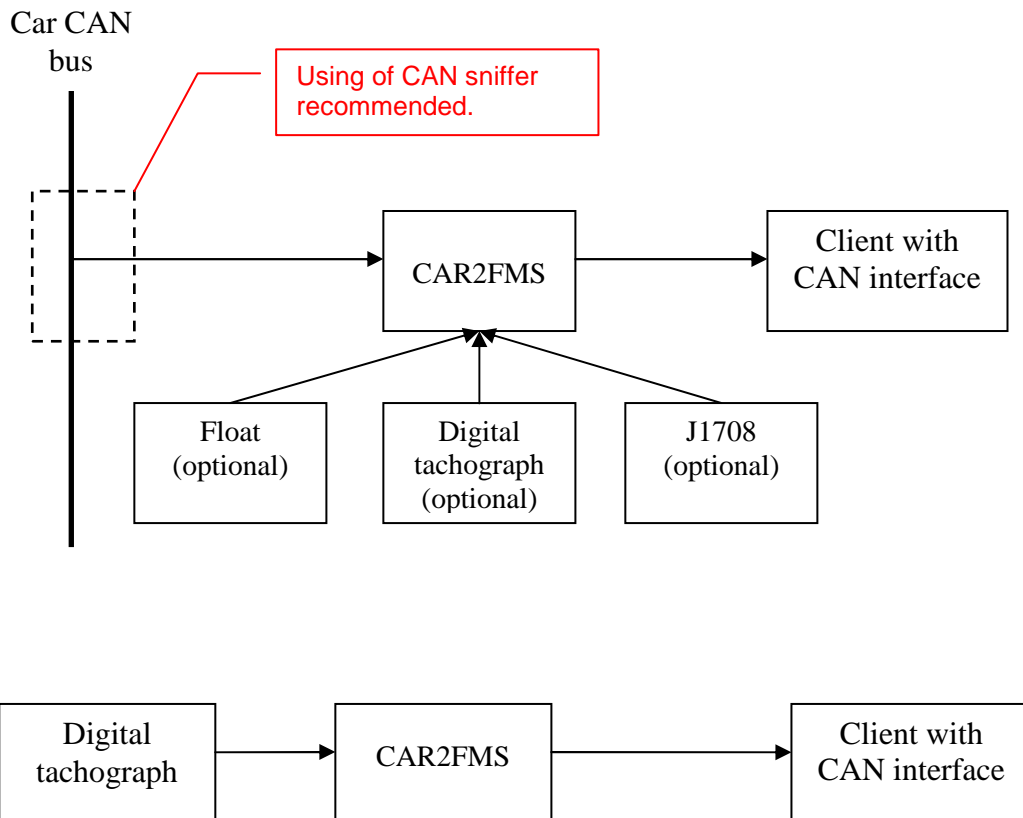
00FEF2							
65266							
Data Byte 1	Data Byte 2	Data Byte 3	Data Byte 4	Data Byte 5	Data Byte 6	Data Byte 7	Data Byte 8
Fuel Used 1 mL per bit	Fuel Used 1 mL per bit	Average Fuel Economy 1/512 km/L per bit 0 offset 0 to 125,5 km/L	Average Fuel Economy 1/512 km/L per bit 0 offset 0 to 125,5 km/L	Not used for FMS-Standard	Not used for FMS-Standard	Not used for FMS-Standard	Not used for FMS-Standard

**Door Control 2: DC2**

00FDA5							
64,933							
Data Byte 1	Data Byte 2	Data Byte 3	Data Byte 4	Data Byte 5	Data Byte 6	Data Byte 7	Data Byte 8
bit 7..0	bit 7..0	bit 7..0	bit 7..0	bit 7..0	bit 7..0	bit 7..0	bit 7..0
<b>Open Status Door 1</b> bit 3,2 00 = Closed 01 = Open 11 = Not available	<b>Open Status Door 2</b> bit 1,0 00 = Closed 01 = Open 11 = Not available  <b>Open Status Door 3</b> bit 7,6 00 = Closed 01 = Open 10 = Error 11 = Not available	<b>Open Status Door 4</b> bit 5,4 00 = Closed 01 = Open 11 = Not available	<b>Open Status Door 5</b> bit 3,2 00 = Closed 01 = Open 11 = Not available	<b>Open Status Door 6</b> bit 1,0 00 = Closed 01 = Open 11 = Not available	Not used	Not used	Not used

- Door 1 – driver's door
- Door 2 – co-driver's door
- Door 3 – left rear door
- Door 4 – right rear door
- Door 5 – engine bonnet
- Door 6 – baggage compartment bonnet

**Connection variants**



## Digital tachograph connection

Device is connected to digital tachographs using D-connector, pin 8. Signal ground of tachograph is connected using A-connector, pin 6. Connector for tachograph connection is not provided with the delivery, however, it can be ordered.

## Analog input connection

CAR2FMS provides possibility of external analog quantity connection and replace information Fuel level in output CAN. This equipment contains 12bit AD transducer. Its value can be amended using correction curve to output quantity Fuel level with range 0-250 (0-100 percent).

Connection of analog input with 0..5 V, 0..10 V ranges or float monitoring 0 to 250 Ohm is supported. **Specify the variation in order.**

Another option is to use analog output as secondary float (or for other analog quantity measurement). In this case, Fuel level is generated at output CAN as original value from input CAN, as well as value from analog input. Fuel level message has this form:

00FEFC							
65276							
Data Byte 1	Data Byte 2	Data Byte 3	Data Byte 4	Data Byte 5	Data Byte 6	Data Byte 7	Data Byte 8
Not used for FMS-Standard	Fuel Level 1 1L / Bit gain 0 % offset	CAR2FMS v2 Analog input	Not used for FMS-Standard	Not used for FMS-Standard	Not used for FMS-Standard	Not used for FMS-Standard	Not used for FMS-Standard

Option:

- AN off: Fuel level from information at input CAN is generated.
- Replace: Fuel level from information at analog input is generated.
- 2nd fuel level Original fuel level as well as information from analog input are generated.

Correction curve is configured during calibration by means of progressive refuelling and inserting of required output value to AD transducer measured value.

The screenshot shows a software window titled "Nahradit zprávu Fuel level informací z AN vstupu". It contains three radio buttons: "AN off" (selected), "Replace", and "2nd fuel level". To the right are buttons for "Direct read", "Set correction", and "Set". Below this is a table with columns "#", "In", and "Out". At the bottom are buttons for "Add", "Rem", "Input", "Output", "Load", and "Save".

Recording of calibration curve to CAR2FMS v2.

Allows replacement of Fuel level at output CAN by value from analog input or generating of information as secondary float.

Correction table. Points are ranged automatically according to column "In". It can contain from 2 to 10 points. From version FW 2.04, the number of points is extended to 32 points.

Adding or removing of correction point.

Press to start reading AD transducer value. Read value is displayed in "Input" field. Correction point is set by inserting required output value to "Output" field and by adding the point by pressing "Add". "Output" value is set in range 0..250. Direct read is designed only for calibration. Measurement is allowed by "Replace" and pressing "Set".

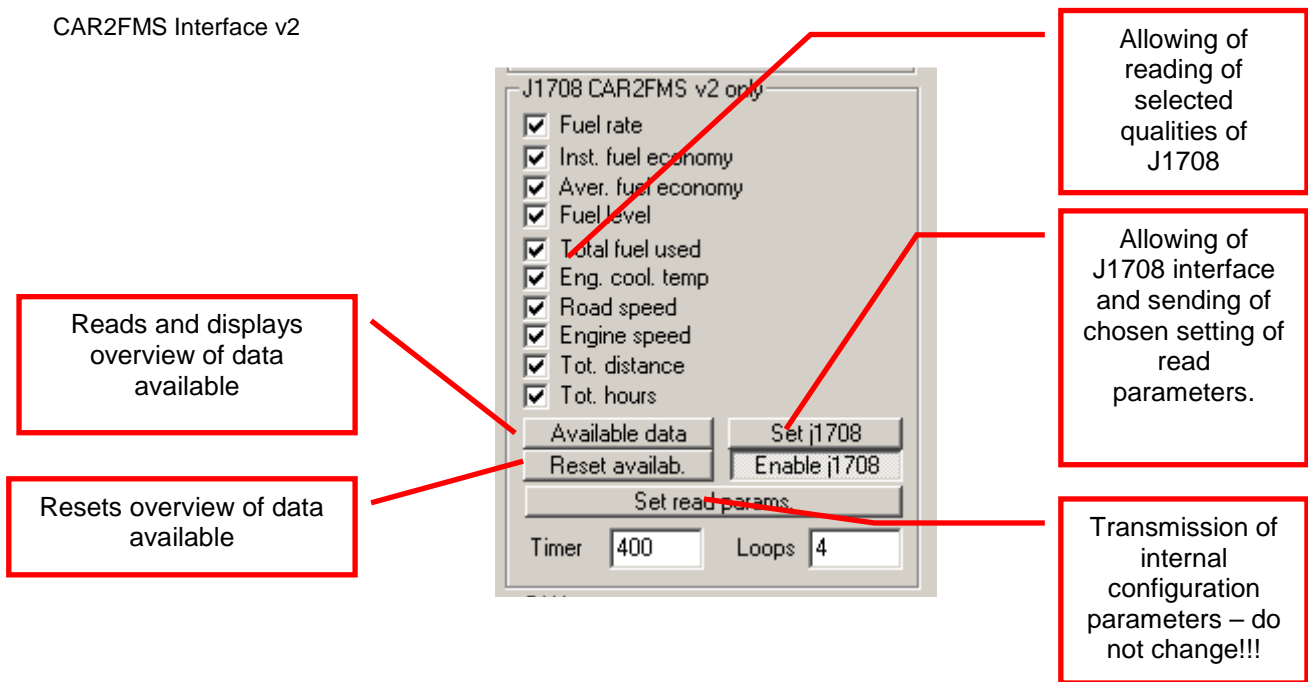
Saving and reading of curve from/to file.

## J1708/J1587 connection

J1708/J1587 bus is connected by means of MOLEX 4-pin connector. Data that can be generated at output CAN from data from this bus are:

- Fuel Rate (Instantaneous)
- Instantaneous Fuel economy
- Average Fuel Economy
- Fuel Level
- Total Fuel Used
- Vehicle Speed
- Engine Speed
- Engine Coolant Temperature
- Total vehicle distance
- Total Engine Hours

Generated data configuration and allowing of this interface is made in configuration plug-in.



If any data is available at CAN bus, it is possible to try to read them from J1708/J1587 bus. For configuration follow steps stated below:

- 1) Connect CAR2FMS v2 to J1708/J1587 bus. To output CAN connect USB2CAN adapter (speed 250k) and start SW PP2CAN on PC together with configuration plug-in. **DO NOT LAUNCH listen only mode.**
- 2) Connect power source and signal 15 (key).
- 3) For now do not connect input CAN and tachograph.
- 4) Press **Enable** and activate J1708/J1587 bus and press **Set** to transmit the setting.
- 5) If yellow LED starts to flash together in 1-3second intervals, the data is read from the J1708/J1587 bus.
- 6) Press **Available data** to find out data available. If any data is available, it will be checked in data selection.
- 7) Selection can be adjusted and again set to device by pressing **Set J1708**.
- 8) Selected data is generated at CAN now.



From version FW 2.00 it is possible to set data reading about gas (first 5 items) via DIP. This option on DIP sets reading of these data “hardly” without configuration with plug-in. Specifically these data are read:

- Fuel Rate (Instantaneous)
- Instantaneous Fuel economy
- Average Fuel Economy
- Fuel Level
- Total Fuel Used

Quantities Total vehicle distance and Total Fuel Used are not generated at CAN in the range according to SAE J1939, but in the range according to SAE J1708/J1587, see information stated below:

### **Total vehicle distance**

Bit Resolution: 0.161 km (0.1 mi)

Maximum Range: 0.0 to 691 207 984.6 km (0.0 to 429 496 729.5 mi)

### **Total Fuel Used**

Bit Resolution: 0.473 L (0.125 gal)

Maximum Range: 0.0 to 2 032 277 476 L (0.0 to 536 870 911.9 gal)

From version FW 2.03 it is possible to set data reading about gas (first 5 items) + engine temperature via DIP. This option on DIP sets reading of these data “hardly” without configuration with plug-in. Specifically these data are read:

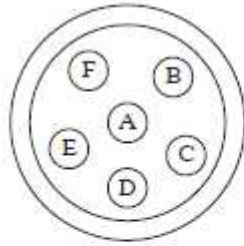
- Fuel Rate (Instantaneous)
- Instantaneous Fuel economy
- Average Fuel Economy
- Fuel Level
- Total Fuel Used
- Engine Coolant Temperature

This option supports conversion of Total Fuel Used from Anglo-Saxon system to metric system and resolution according to SAE J1939. Conversion is burden with slight error because the conversion can be made just within 32-bit space with floating decimal point.

### **Recognition of signals A and B using oscilloscope**

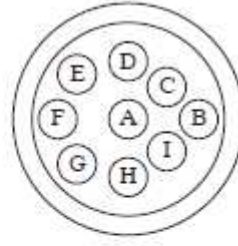
Individual conductors are marked as A / B or - / +, A (-) indicates inverted conductor and B (+) non-inverted conductor.

Signal B (+,J1708+) has quiescent high level. Signal A (-,J1708-) has quiescent low level. In Volvo cars, J1708+ is marked by code 400, conductor J1708- as 401. Colors of twisted pair – J1708+ usually green, J1708- orange or grey and orange. On round diagnostic connectors the signal is available this way: 6-pin variant of connector J1708+ = pin A, J1708- = pin B, 9-pin variant of connector J1708+ = pin F, J1708- = pin G. Eventually, it is possible to connect to connectors that lead from yellow connector under the cover in the area for driver's feet.



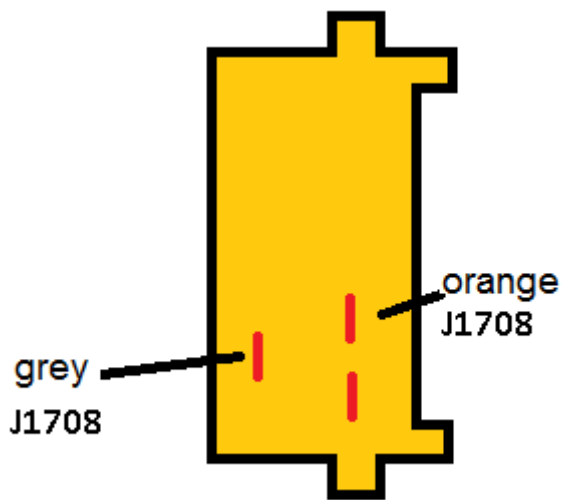
*Six-Pin Diagnostic*

- A - Data Link +
- B - Data Link -
- C - Power
- E - Ground



*Nine-Pin Diagnostic*

- A - Ground
- B - Power
- C - J1939 Data Link +
- D - J1939 Data Link -
- E - J1939 Common
- F - Data Link +
- G - Data Link -



## Secondary can connection – variant E

Primary and secondary CAN is connected under fuse block. On loosely laid connector 2 pairs of twisted conductors are brought. Primary CAN: yellow – CAN H, green CANL, secondary CAN: yellow CAN H, orange CAN L. Tank level of this car is stated in liters as 16bit value.

00FEFC							
65276							
Data Byte 1	Data Byte 2	Data Byte 3	Data Byte 4	Data Byte 5	Data Byte 6	Data Byte 7	Data Byte 8
Not used for FMS-Standard	Not used for FMS-Standard	Fuel Level 1 1L / Bit gain 0 % offset	Fuel Level 1 1L / Bit gain 0 % offset	Not used for FMS-Standard	Not used for FMS-Standard	Not used for FMS-Standard	Not used for FMS-Standard

## Settings

Basic setting is made using DIP switch. Other optional parameters can be preset during production according to customer needs or using CAN bus.

## DIP setting



### Variant A, B, C, D

DIP	Description
1	Car type setting
	<b>Table 1</b>
3	<i>Reverse order to DIP – binary code</i>
4	<b>POS 54321</b>
5	00000 = off 00001 = VW 00010 = Mercedes Sprinter 00011 = Mercedes Vito 00100 = Ford Tranzit 00101 = Ford C-MAX 00110 = Nissan V1 00111 = Nissan V2 01000 = Citroen V1 01001 = Audi A4 01010 = Chrysler Voyager 01011 = Renault Master from 2011 01100 = Renault Master from 2010 01101 = Mercedes C180 01110 = Toyota Auris 01111 = Renault Megane 10000 = Opel Astra J 10001 = Fiat Ducato 10010 = Some cars Mercedes Actros, Atego, Axor 10011 = Ducato , Citroen Jumper with ExtID 10100 = SAE 1939, 500kb 10101 = SAE 1939, 500kb, trip fuel calculated from fuel rate 10110 = Citroen Jumper (CAN low speed, 50kb) 10111 = Cars VW/Škoda, platform MQB 11000 = SAE1939 250kb, trip fuel calculated from fuel rate 11001= VOLVO-J1708 – resolution according to SAE J1939 11010= Some Mercedes buses 11011 = VOLVO-J1708 – resolution according to SAE J1708/J1587  11100 = JCB8250 11101 = CASEIII-MX230 11110 = SAE1939/FMS 250kb 11111 = boot mode
	<b>Table 2</b>
	<b>POS 54321</b>
	00000 = off

	00001 = VW/Škoda 00010 = Fiat Doblo till 2006 00011 = Fiat Doblo from 2006 00100 = Takeuchi
6	Setting of input CAN into Listen only mode.
7	Tachograph type setting.
8	<b>POS 87</b> 00-VDO 01-Stoneridge 10-ACTIA (not tested) 11-not connected

## Variant E

DIP	Description
1	Car type setting
2	<b>POS 54321</b>
3	00000 = off
4	00001 = VOLVO manufactured. 2013
5	00011 = SAE1939 primary CAN 250k / CAN float secondary CAN 00100 = SAE1939 primary CAN 500k / CAN float secondary CAN 11111 = boot mode
6	Setting of input CAN into Listen only mode.
7	Tachograph type setting. <b>POS 87</b> 00-VDO 01-Stoneridge 10-not used 11-not connected

## Calculation of trip fuel from fuel rate

This setting allows approximately count gas consumption in cars without parameter total fuel used from parameter fuel rate. Calculation is made every 100 ms on the basis of actual fuel rate value.

Similar algorithm is used for Mercedes (Actros) trucks.

CAR2FMS V2 generates information as engine trip fuel used (FEE9, DB0-3) and high resolution engine trip fuel used (FD09, DB0-3).

## Settings through CAN bus

Other settings saved in EEPROM memory can be changed by sending data to output CAN.

### Setting of time distance among tachograph information segments at CAN:

11 bit (standard ID) 0x333, DLC=4, DB0=67 (0x43), DB1=76 (0x4C), DB2+3 = TIME.- TIME is 16bit number in the range 40..2000. Resolution 5 ms. Value 40 corresponds to 200 ms interval, value 2,000 corresponds to 10,000 ms (10s). Value preset by manufacturer is 200, 1s.

#### **Setting of lag after start.**

This lag influences generating of the first tachograph information. Other information is generated only after the change of tachograph data.

11bit (standard ID) 0x334, DLC=3, DB0=67 (0x43), DB1=76 (0x4C), DB2 = TIME. TIME is 8bit number in the range 0..20. Resolution is 1s.

#### **Setting of disconnection lag after ignition switch-off**

This lag influences delay of device switch-off after signal 15 disconnection (key).

11bit (standard ID) 0x335, DLC=3, DB0=67 (0x43), DB1=76 (0x4C), DB2 = TIME. TIME is 8bit number in the range 0..180. Resolution is 1s.

In case of high rate of errors of output CAN this interval can be automatically extended up to 3 minutes. During this time, the device tries to transfer tachograph data.

#### **Deletion of Fuel level message at output CAN.**

If the parameter is set, message Fuel level is not generated at output CAN. This function is suitable for example when using external float with CAN interface that is connected between CAR2FMS and equipment for reading of FMS data.

11 bit (standard ID) 0x336, DLC=3, DB0=67 (0x43), DB1=76 (0x4C), DB2 = 0 (fuel level generated), DB2=1 (fuel level deleted). In default setting this function is disabled.

#### **Switch off of packet Extinfo1 and Extinfo2 generating.**

If the parameter is set, packets Extinfo1 and Extinfo2 are not generated at output CAN.

11 bit (standard ID) 0x337, DLC=3, DB0=67 (0x43), DB1=76 (0x4C), DB2 = 0 (Extinfo1 and Extinfo2 generated), DB2=1 (Extinfo1 a Extinfo2 not generated). In default setting this function is disabled.

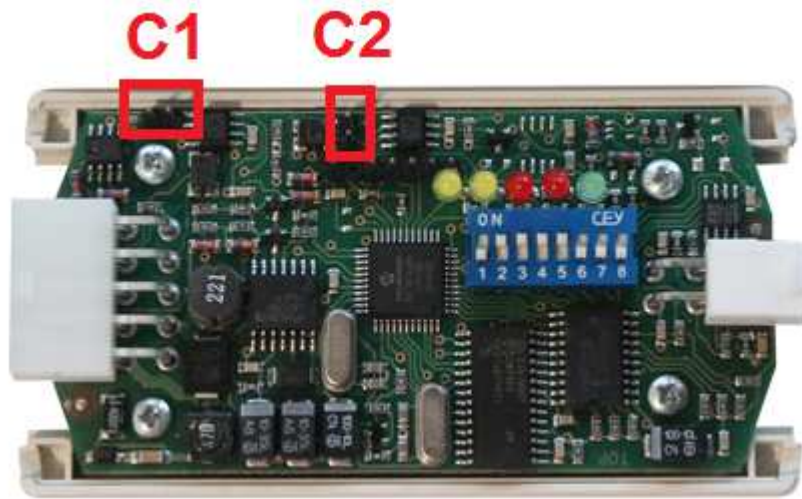
#### **Activation of packet Extinfo3 generating instead of Driver ID if driver's ID is not changed.**

If the parameter is set, after change of Work states, Driver 1 states, Driver 2 states and Tachograf parameters sequence of packets Driver ID is not generated, but only packet Extinfo3 is generated. If ID of any driver changed, whole data format of sequences Driver ID is generated. This selection also causes that the packet Extinfo3 is generated shortly before interface switch off after signal "15" disconnection.

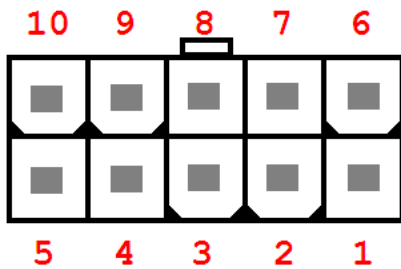
11 bit (standard ID) 0x338, DLC=3, DB0=67 (0x43), DB1=76 (0x4C), DB2 = 0 (generated Driver ID after each change), DB2=1 (generated Driver ID when driver's ID changed, after mode change Extinfo3 generated). In default setting this function is disabled.

### Terminal resistance setting

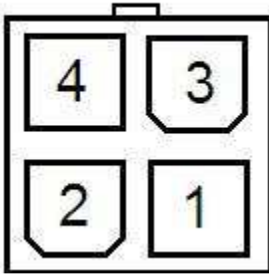
On the device, switching of terminate resistance of 120 ohm for both CANs can be done using short-circuit connectors. C2 activates terminate resistance for input CAN. C1 activates terminate resistance for output CAN.



### Connector wiring



Pin	Description
1	Power 8..32V
2	Output – signal switched on (5V) during tachograph information segment generating at CAN with lag of 70 ms, pulse duration 50 ms. Signal used for example for preferred data sending from car unit to the server.
3	CAN OUT, high.
4	CAN IN, high.
5	Tachograph GND (pin 6 at tachograph A-connector)
6	Signal 15 (key, ignition). If continuous run required, connect with power.
7	GND
8	CAN OUT, low.
9	CAN IN, low.
10	Tachograph (pin 8, tachograph D-connector).



	Variant A, B, C, D	Variant E
Pin	Description	Description
1	J1708 A orange Volvo	CAN H, secondary CAN
2	J1708 B grey Volvo	CAN L, secondary CAN
3	Analog input (float)	
4	AGND	

### Signal LED



LED	Description
1	Power signalizing.
2	Input CAN error signalizing.
3	Output CAN error signalizing.
4	Signalizing incoming data at input CAN.
5	Signalizing incoming data at tachograph input.
2+3	Simultaneous flashing of both LED signalizes sending of tachograph information segment to CAN.
4+5	Simultaneous flashing of both LED signalizes reception of information from J1708 bus.

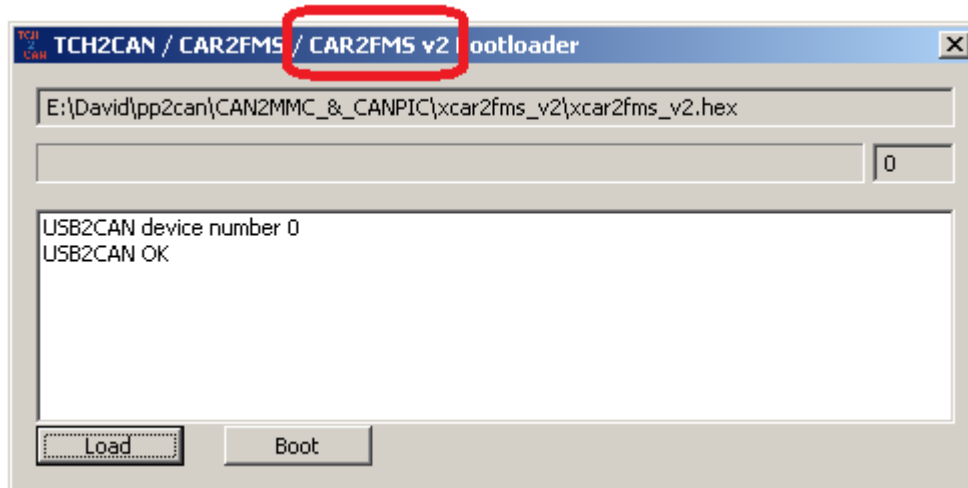


LED	Description
1	Power signalizing.
2	Signalizing incoming data at tachograph input.
3	Output CAN error signalizing.
4	Signalizing incoming data at input primary CAN 1.
5	Signalizing incoming data at input secondary CAN 2.

## Firmware update

Firmware update is realized through CAN bus. Transducer USB2CAN with special application TCH2CAN\_Bootloader.exe must be used.

**For FW change in case of CAR2FMS it is possible to use only bootloader marked CAR2FMS v2 in heading.** Older versions without this marking are not working – change of FW is not made correctly.



### Procedure:

- 1) On CAR2FMS switch DIP 1 to 5 to ON position.
- 2) Connect USB2CAN at output CAN and activate TCH2CAN\_Bootloader.
- 3) Click Load to read firmware.
- 4) Click Boot to start the firmware recording process.
- 5) After the firmware has been loaded, disconnect the power from CAR2FMS.
- 6) At DIP 1 and 5, set respective tachograph.
- 7) When power connected, new firmware will be launched.



## Test plug-in for PP2CAN – plug-in version 1.xx

Test plug-in for SW PP2CAN is on dll file form. This file has to be saved into SW PP2CAN directory. After launch of SW PP2CAN, “Plug-ins” will be displayed in upper menu as item TCH2CAN-CAR2FMS.

The screenshot shows the TCH2CAN / CAR2FMS v2 / CAR2FMS plugin interface. Red callout boxes point to the following elements:

- Data from Extinfo1 packet:** Points to the Extinfo1 RPM field.
- Data from Driver ID packet:** Points to the Driver ID format FMS field.
- Log of arriving data:** Points to the list of data packets on the right side of the window.
- Data from Extinfo2 packet:** Points to the Extinfo2 Vehicle REG field.
- Get packet of Extinfo2:** Points to the Get button for Extinfo2.
- Data from Extinfo3 packet:** Points to the Extinfo3 Total distance field.

If you want to find out for example data from Extinfo2 packet, it is necessary to reset CAR2FMS or TCH2CAN interface. This packet sequence is generated only once, shortly after connection of power. Information Vehicle REG and Vehicle ID is available only if digital tachograph is connected.

The close-up shows the 'CAN RANGE CAR2FMS v1 only' section with radio buttons for 'Table 1' (selected) and 'Table 2', and a 'Set' button. A red callout box explains:

For now, this option is designed only for CAR2FMS v1. It serves for switching to secondary table of cars set at DIP switch. CAR2FMS v2 allows to set double amount of cars at DIP. Selection is not used at this moment.

CAN requests

Id		DLC	D0	D1	D2	D3	D4	D5	D6	D7	TIME
4294967295	<input type="checkbox"/> St/Ext	15	255	255	255	255	255	255	255	255	0
4294967295	<input type="checkbox"/> St/Ext	15	255	255	255	255	255	255	255	255	0
4294967295	<input type="checkbox"/> St/Ext	15	255	255	255	255	255	255	255	255	0
4294967295	<input type="checkbox"/> St/Ext	15	255	255	255	255	255	255	255	255	0
4294967295	<input type="checkbox"/> St/Ext	15	255	255	255	255	255	255	255	255	0

Setting of request for data at output CAN. Setting actively generates data at input CAN that can be potentially dangerous. It is not recommended to use. It is suitable for example in case of FMS gates supporting REQUESTs, when this reading is safe.

Nastavení

Nastavení časového rozestupu mezi segmenty tachografové informace na CAN  
 ms

Nastavení prodlevy po startu  
 s

Nastavení prodlevy odpojení po vypnutí zapalování  
 s

Vymazání zprávy Fuel level na výstupním CANu  
 Remove

Nahradit zprávu Fuel level informací z AN vstupu  
  
 AN off  
 Replace   
 2nd fuel level

#	In	Out

Input    
 Output

Negenerovat Extinfo pakety  
 Disable

Pri zmenach rezimu ridice generovat jen Extinfo3  
 Enable

Set distance between fragments of DriverID and ExtinfoX packets.

Set delay of start after signal "15" connection.

Set delay of switching-off after signal „15“ disconnection.

Switch off Fuel level message generating at output CAN (use with external float sensor with CAN output between CAR2FMA and device).

Switch on reading of direct analog input value.

Record correction table of analog input into the device.

Allows replacement of Fuel level information at output CAN by value from analog input. Eventually allows AN as secondary fuel level.

Insert of correction point of curve. Input field is automatically read after pressing of Direct read.

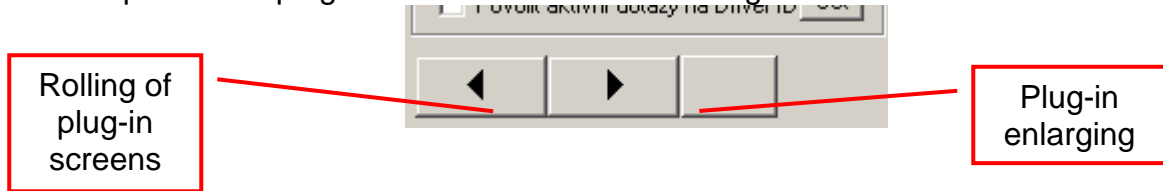
Switch off Extinfo1 and Extinfo2 packet generating.

Activate Extinfo3 packet generating.

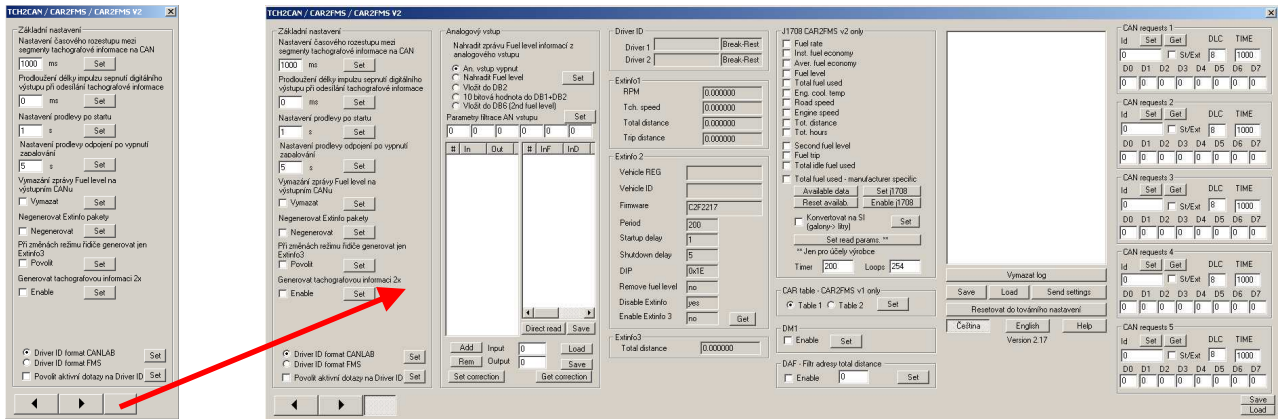
# Test plug-in for PP2CAN – plug-in version 2.xx

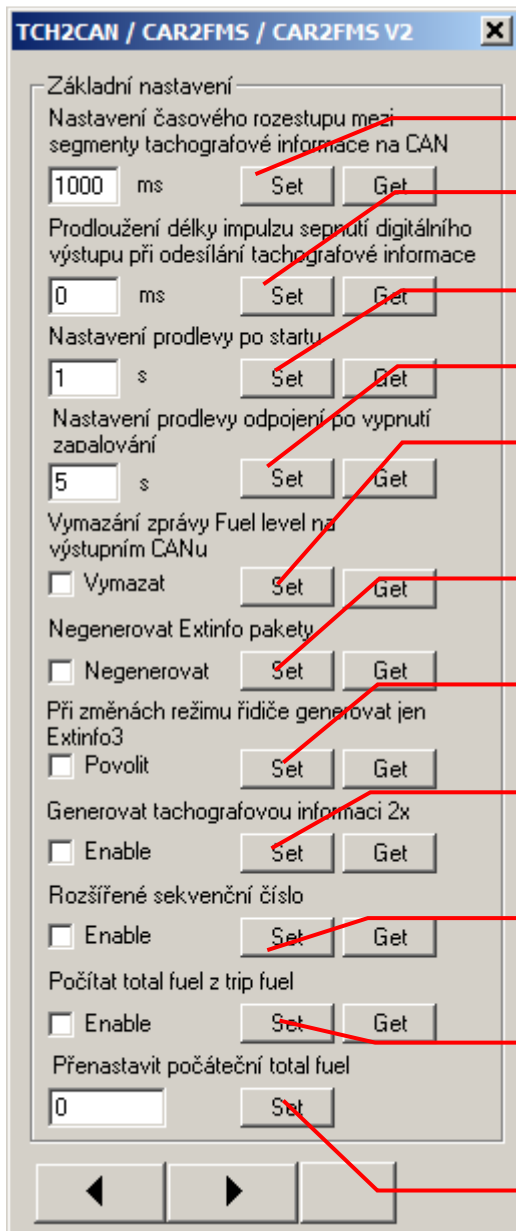
Test plug-in for SW PP2CAN is on dll file form. This file has to be saved into SW PP2CAN directory. After launch of SW PP2CAN, “Plug-ins” will be displayed in upper menu as item TCH2CAN-CAR2FMS- CAR2FMS CAR2FMS V2.

Plug-in in new version was divided into separate screens to save space. Control buttons in the lower part of the plug-in window are used for rolling between screens.

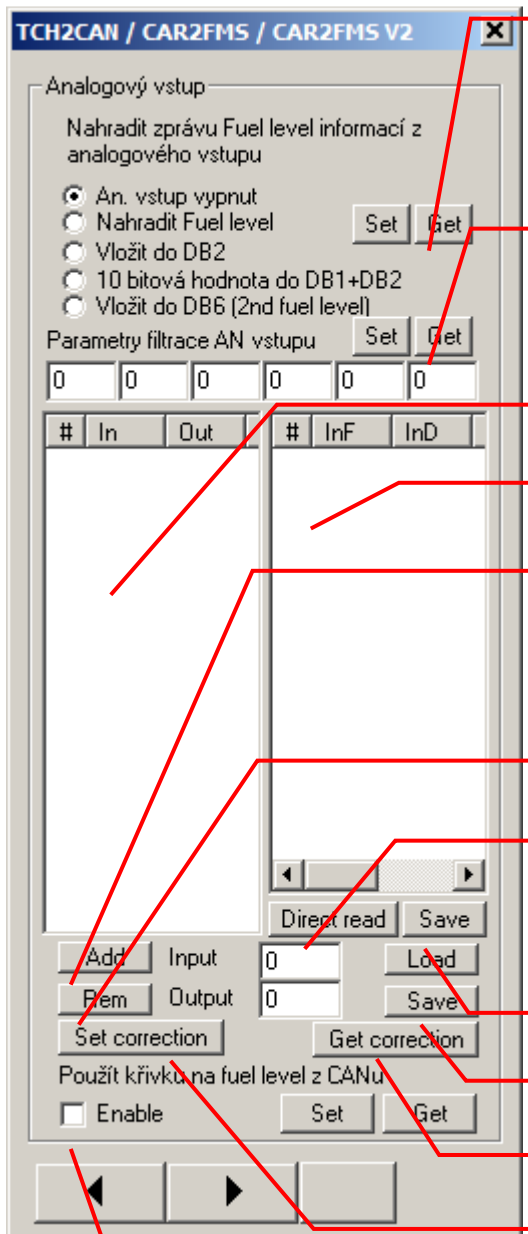


Plug-in can be enlarged on full screen; press button to see all pages.





- GET function is available from FW 2.2.65 and above.**
- Set distance between fragments of DriverID and ExtInfoX packets.
- Allows to extend time of switching of digital output after generating fragment of DriverID and ExtInfoX packets.
- Set delay of start after signal „15“ connection.
- Set delay of switching-off after signal „15“ disconnection.
- Switch off Fuel level message generating at output CAN (use with external float sensor with CAN output between CAR2FMA and device).
- Press Set to disable generating of Extinfo1 and Extinfo2 packets.
- Press Set to enable generating of Extinfo3 packet.
- Set to enable generating of tachograph information in case of change of its format CANLAB two times.
- Enable extension of sequence bit to 2 bits.
- Allow to continuously save calculated consumption of gas to EEPROM and send this value as „total fuel used“.
- Preset of „total fuel used“ from which fuel rate is calculated.



Set function of analog input. Value of analog input can be replaced with information Fuel level (PGN FEFC, DB1) or assigned to DB2 or send original information from AN converter as 10bits information or send as information about second gas tank.

Data from analog filter can be corrected with correction curve and filtered. Then, they can be used for filter parameter setting. Values have different meaning for each type of filter. Setting for individual filters contains following tables.

List of points of correction curve.

Log of analog values.

Add correction point (from Input and Output fields). The range of entered value in Output field is 0..250. It can mean liters or percentage of the tank. In case of percentage, value 250 corresponds 100 percent of the tank. Treatment with this information depends on interpretation of data on server.

Delete correction point.

Launch reading of raw value of analog input. Value is displayed in the Input field. AN converter range is 10 bits, thus values 0..1023.. Values are also recorded into log of analog values.

Save content of log of analog values.

Read and save data of correction curve from/to file.

Read correction curve from CAR2FMS V2 device.

Load correction curve into CAR2FMS V2 device.

From version FW 2.74 it is possible to use correction curve also for correction of data about gas level from CAN. E.g. in case of cars with information on CAN stated in liters it is possible to correct behavior into percentage using the curve. E.g. in case of the car, where the full tank is signaled by value 100, it is necessary to input points (input-output format) 0-0 and 100-250.

Field 1	Description
<b>0 – Arithmetic average.</b>	Arithmetic average is calculated from entered number of samples.
<b>1 - Arithmetic average with difference</b>	Arithmetic average is calculated from entered number of samples, then, samples with higher than set difference from average are excluded. Average is calculated again from the rest of the samples.
<b>2 – Median</b>	Samples are ranged and median (middle) sample is used.
<b>3 – Average from ranging</b>	All 9 (maximum) samples are ranged. Average is calculated within set area of ranged range.
<b>4 – Harmonious mean</b>	Harmonious mean is calculated from entered number of samples. Description of harmonious mean: <a href="http://cs.wikipedia.org/wiki/Harmonický_průměr">cs.wikipedia.org/wiki/Harmonický_průměr</a>
<b>5 – Geometric mean</b>	Geometric mean is calculated from entered number of samples. Description of geometric mean: <a href="http://cs.wikipedia.org/wiki/Geometrický_průměr">cs.wikipedia.org/wiki/Geometrický_průměr</a>

Field 1 Filter type	Field 2	Field 3	Field 4	Field 5	Field 6
<b>0 – Arithmetic average.</b>	Filter length, maximum value 9	N/A Reserved for future use.	N/A Reserved for future use.	N/A Reserved for future use..	N/A Reserved for future use.
<b>1 - Arithmetic average with difference</b>	Filter length, maximum value 9	Difference	N/A Reserved for future use.	N/A Reserved for future use.	N/A Reserved for future use.
<b>2 – Median</b>	Filter length, maximum value 9	N/A Reserved for future use.	N/A Reserved for future use.	N/A Reserved for future use.	N/A Reserved for future use.
<b>3 – Average from ranging</b>	Index of the first sample for calculation (indexed from zero)	N/A Reserved for future use.	N/A Reserved for future use.	N/A Reserved for future use.	N/A Reserved for future use.
<b>4 – Harmonious mean</b>	Filter length, maximum value 9	N/A Reserved for future use.	N/A Reserved for future use.	N/A Reserved for future use.	N/A Reserved for future use.
<b>5 – Geometric mean</b>	Filter length, maximum value 9	N/A Reserved for future use.	N/A Reserved for future use.	N/A Reserved for future use.	N/A Reserved for future use.

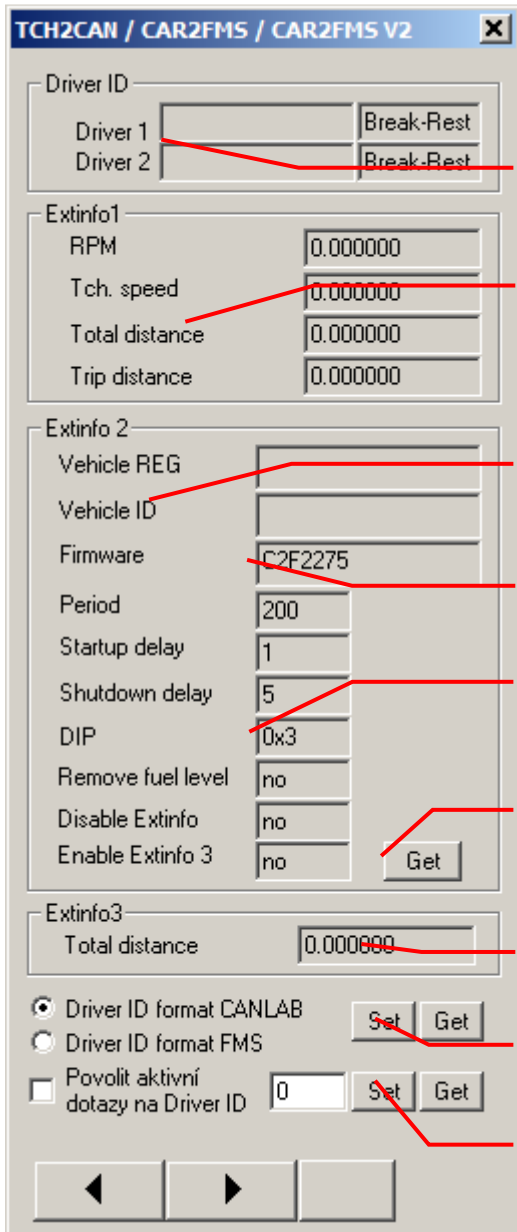
### Correction curve of analog input

Set linear behavior without calibration using two points.

First point: input 0, output 0. Second point: input 1023, output 250. For 1bits variant: second point input 1023, output 1023.

If it is necessary to generate more complex curve, enable Direct read function. Actual data are read from the input and are displayed in the input field. Fill up part of the gas and calculate desired value on the output. For FMS format convert into percent, deactivate Direct read and enter the value into the Output field. Then add correction point. Enable Direct read again and repeat the process. Maximum number of points for FW 2.17 is 30.

If the curve is done, save it into the file and press Set correction to load it into CAR2FMS.



If format CANLAB is set, it displays Driver ID.

Display data from ExtInfo1 packet.

Display data from ExtInfo2 packet.

Firmware number.

DIP value in hexadecimal format – control if the DIP is read correctly.

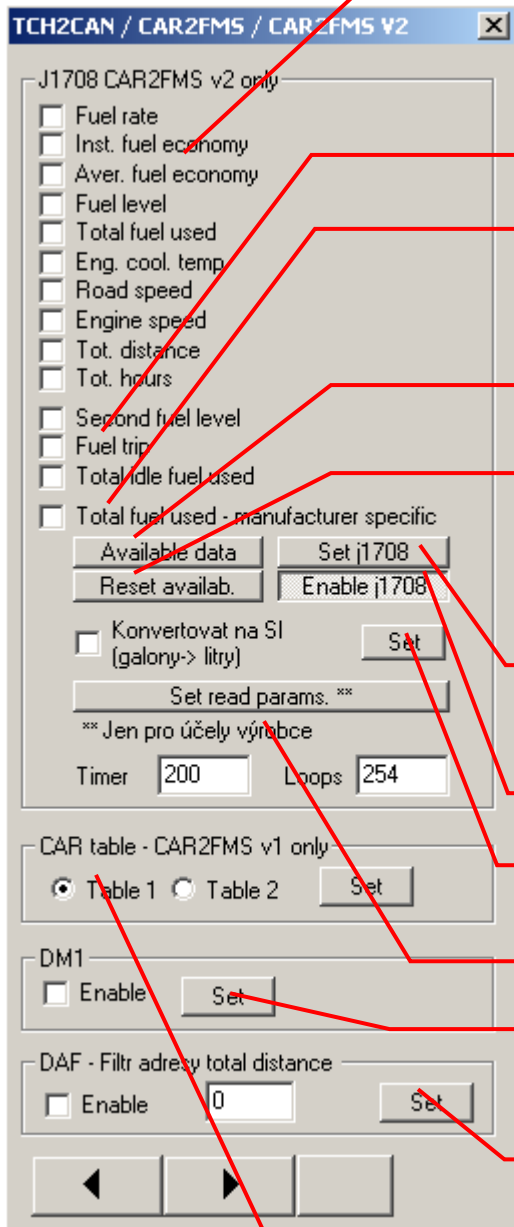
Packet claim. Packet – if enabled – is generated only after the start or rit is possible to claim it.

Display data from ExtInfo3 packet, if enabled.

Set Driver ID format (CANLAB / FMS).

Enable sending of query of Driver ID to input CAN. Cannot be used in Listen only mode and with CAN Sniffer device. This option is not recommended.





In SAE1939/FMS mode it is possible to manually enable J1708 interface and select data read and sent from J1708 to output CAN.

Data added from version FW 2.17.

This item has only information character, only if Total fuel used is enabled, data are read. Only informs about data existence in this format.

Press to read data available. Available data are selected.

Reset available data list in v CAR2FMS V2. After receiving, available data are set again in internal list in CER2FMS and availability can be repeatedly verified.

Enable or disable J1708 interface. If enabled, it sets read data list (selected items).

Enable disabling of J1708 interface.

Set enabling / disabling liters-gallons or miles-kilometers conversion.

Only for manufacturer's purpose.

If selected, it allows reading of DM1 errors and generating in CANLAB format on output CAN.

Setting of ECU address filter in cars that send different kilometers number. For more information contact manufacturer.

Only for CAR2FMS V1 and V2 from FW 2.75. Used for switching of car range on DIP switch.



The screenshot shows the CAR2FMS v2 interface. At the top, the title bar reads 'TCH2CAN / CAR2FMS / CAR2FMS v2'. Below it is a scrollable list of log entries, including 'Extinfo 2, segment 8', 'Data type 2, index 8, parity 1', and 'Driver ID, segment 6'. Below the list are several control buttons: 'Vymazat log', 'Save', 'Load', 'Send settings', 'Resetovat do továrního nastavení', and language buttons 'Čeština', 'English', and 'Help'. At the bottom are three navigation buttons: left arrow, right arrow, and a blank button. Red lines connect these elements to callout boxes on the right.

- Log window displays information about receiving of Driver ID and ExtInfoX packets.
- Delete content of log window.
- Save plug-in setting into file.
- Load plug-in setting from file.
- Send complete setting – all plug-in items to CAR2FMS device.
- Reset CAR2FMS to factory mode.
- Switch plug-in language.
- Open help window (pinout, DIP).

TCH2CAN / CAR2FMS / CAR2FMS V2

CAN requests 1

Id	Set	Get	DLC	TIME			
0	<input type="checkbox"/>	St/Ext	8	1000			
D0	D1	D2	D3	D4	D5	D6	D7
0	0	0	0	0	0	0	0

CAN requests 2

Id	Set	Get	DLC	TIME			
0	<input type="checkbox"/>	St/Ext	8				
D0	D1	D2	D3	D4	D5	D6	D7
0	0	0	0	0	0	0	0

CAN requests 3

Id	Set	Get	DLC	TIME			
0	<input type="checkbox"/>	St/Ext	8	1000			
D0	D1	D2	D3	D4	D5	D6	D7
0	0	0	0	0	0	0	0

CAN requests 4

Id	Set	Get	DLC	TIME			
0	<input type="checkbox"/>	St/Ext	8	1000			
D0	D1	D2	D3	D4	D5	D6	D7
0	0	0	0	0	0	0	0

CAN requests 5

Id	Set	Get	DLC	TIME			
0	<input type="checkbox"/>	St/Ext	8	1000			
D0	D1	D2	D3	D4	D5	D6	D7
0	0	0	0	0	0	0	0

Navigation: Left Arrow, Right Arrow, Save, Load

CAR2FMS allows to set queries that are sent to CAN – data query.

For use please contact manufacturer, usage is not recommended, if it is not approved by manufacturer / distributor of the car.

Cannot be used in Listen only mode and by CAN Sniffer device.

## Order specification

The device is supplied in four variants that differ in price. Actual price is available at our web sites.

Variant	Shoulder
<b>A</b>	Input and output CAN, tachograph. Basic variant that replaces CAR2FMS v1.
<b>B</b>	Input and output CAN, tachograph, J1708.
<b>C</b>	Input and output CAN, tachograph, analog input.
<b>D</b>	Input and output CAN, tachograph, J1708, analog input.
<b>E</b>	2 input and output CAN, tachograph

In case of C and D variant **specify** required qualities of analog input: 0..5 V or 0..10 V range or float detection 0 to 250 Ohm, eventually other.

## Warning

Customer attaches the chip to the car **at his own risk**. Incorrect setting of the chip can cause incorrect function of car control units. CANLAB s.r.o. is not liable for any damage of the car. We recommend use in Listen only mode or with CAN Sniffer device. Listen only mode or CAN sniffer is not used in case of connection to FMS gate.