DFL-SJ1939 Simulator IC Ver 2.00

(Pb free)

Features:

- Compatible with J1939
- Supports 2 more customized PGNs in addition to lots of fixed PGNs
- Simulates Truck and Car ECUs
- Supports both 8 bytes data and length up to 1785 bytes data
- ECU source address and Device Name are customized by user
- VIN# can be customized by user
- DTC format (J1939 Frame Format) can be configured from version 1 to version 4
- Free PC software for configuration
- Free PC software for monitoring
- Available in 18 pin DIP (300mils) or SOIC Packages
- Cost effective for OEM applications

Description:

The DFL-SJ1939 IC is designed to simulate the truck or car's ECU using J1939 protocol. The IC is intended to help the programmers who write the code for J1939 protocol. The IC can be used in the test equipment for J1939 device in the production line. The simulator has two work ways. One is called "PC Monitor". The other is called "Standalone". For "PC Monitor" way, you connects the simulator with PC by RS232 port, and you will set the parameters of truck in real time. The simulator will generate the value of PGNs according to data from PC in real time. For "Standalone" way, you don't need PC, it's convenient for the field. In "Standalone" way, the simulator has two working mode, one is static mode, the other is dynamic mode. In the static mode, the live parameters values are set by "up" or "Down" key. Any parameter value except some special ones will be increased by 25% until 100% when "Up" key is only pressed Similarly, Any parameter value except some special ones will be decreased by 25% until 0% when "Down" key is only pressed The default live parameters values are 50% when entering the static mode first time. In the dynamic mode, the live parameters values are changed automatically except some special ones.

You can toggle the mode by press the "Up" and the "Down" key at the same time. The IC can remember the mode even though the power off. Of cause, you can select mode by the PC configuration software.

Every time, when you press a key, you can hear a "short time" sound. When you press two keys at the same time , you can hear a "longer time" sound. You can cancel the sound and it will be silence by pressing the "DTC" and

"Down" key at the same time. You can resume the sound by pressing the "DTC" and "Up" key at the same time.

When you press the "DTC" key, one DTC will be generated and "MIL" LED will be on. If you press the "DTC" key second time, it will generate the second "DTC". if you press the "DTC" key third time, it will generate the third "DTC". But if you press the "DTC"key over 3 times, it only generate total 3 different "DTC". All "DTC" will be erased and "MIL" LED will be dark when the IC receives a erase "DTC" command such as "DM11 request". Fig.1 is the chip's pin footprint.

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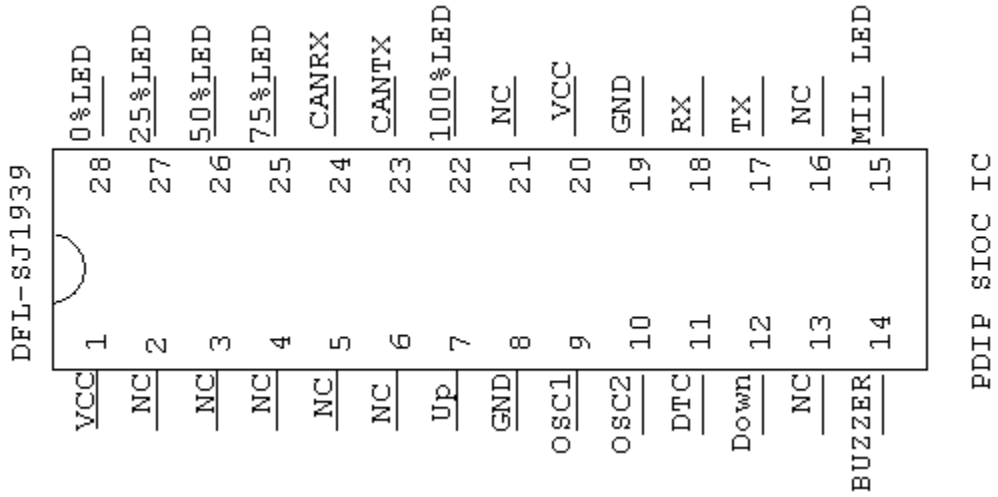

Fig.1 DFL-SJ1939 Pin footprint

Pin 1	Vcc	Pin 15	MIL LED
Pin 2	NC	Pin 16	NC
Pin 3	NC	Pin 17	TX
Pin 4	NC	Pin 18	RX
Pin 5	NC	Pin 19	GND
Pin 6	NC	Pin 20	Vcc
Pin 7	Up	Pin 21	NC
Pin 8	Gnd	Pin 22	100% LED
Pin 9	Osc1	Pin 23	CANTX
Pin 10	Osc2	Pin 24	CANRX
Pin 11	DTC	Pin 25	75% LED
Pin 12	Down	Pin 26	50% LED
Pin 13	NC	Pin 27	25%LED
Pin 14	Buzzer	Pin 28	0% LED

TX: output pin. UART transmitting pin (8-N-1), 9600 Baudrate, TTL/CMOS Voltages, It is used to configure

the IC.

RX: input pin. UART receiving pin (8-N-1), 9600 Baudrate, TTL/CMOS Voltages, It is used to configure the IC.

DTC: input pin. "DTC" key input. low voltage level is active. TTL/CMOS Voltages

Up: input pin. "Up" key input. low voltage level is active. TTL/CMOS Voltages

Down: input pin. "Down" key input. low voltage level is active. TTL/CMOS Voltages

Buzzer: Output pin. it only outputs high or lower voltage level, No square waveform output. The high voltage level denotes sound output. You can connect to an active Buzzer through a transistor.

CANTX: Output pin. It is CAN Bus Transmitting pin. User has to connect it to transceiver's transmitting pin such as MCP2551's TXD

CANRX: Input pin. It is CAN Bus receiving pin. User has to connect it to transceiver's receiving pin such as MCP2551's RXD

MIL LED: Output pin. It will be high when some "DTC"s exist and low when any "DTC" does not exist.

0% LED: Output pin. It will be high when live parameter values are 0% in the static mode. It will blink in 1 Hz frequency in dynamic mode. It will be always high in the "PC Monitor"

25% LED: Output pin. It will be high when live parameter values are 25% in the static mode. It will blink in 1 Hz frequency in dynamic mode.. It will be always high in the "PC Monitor"

50% LED: Output pin. It will be high when live parameter values are 50% in the static mode. It will blink in 1 Hz frequency in dynamic mode.. It will be always high in the "PC Monitor"

75% LED: Output pin. It will be high when live parameter values are 75% in the static mode. It will blink in 1 Hz frequency in dynamic mode.. It will be always high in the "PC Monitor"

100% LED: Output pin. It will be high when live parameter values are 100% in the static mode. It will blink in 1 Hz frequency in dynamic mode. It will be always high in the "PC Monitor"

OSC1: input pin. It's one pin of 4MHz Parallel-cut crystal or resonator, or a direct clock input

OSC2: Output pin. It's other pin of 4MHz Parallel-cut crystal or resonator, or leave it unconnected if OSC1 driven with a clock input

Vcc: Power pin. Connect to the positive side of DC power supply which is from 4.2 to 5.5 VDC

Gnd: Power pin. Connect to the negative side of DC power supply

Fig 2 is a reference schematic for the simulator.

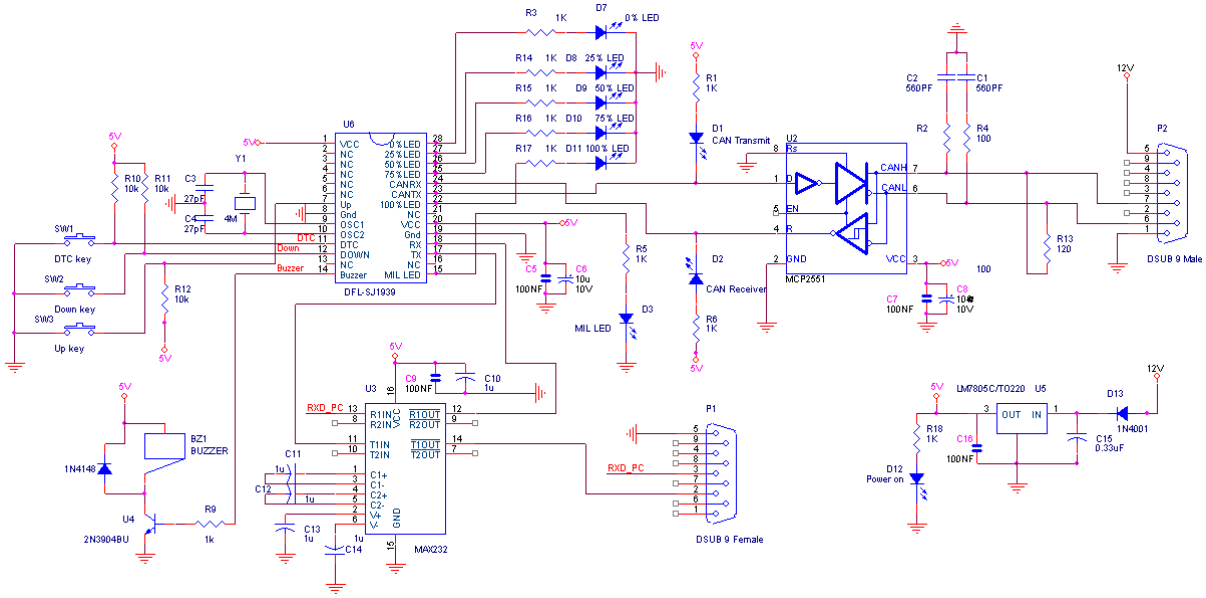

Fig.2 Reference Design

The IC can be configured by free software config_j1939.exe. Before configuration, the default value are below

1. mode is "Static "
2. all parameter except special ones is the 50% maximum.
3. no two additional PGNs
4. Simulator address is 0x0
5. Device name is 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00
6. VIN# is DafulaiElectronic
7. DTC Format is Version4

You can download config_j1939.exe from http://www.dafulaielectronics.com/Documents/J1939Simulator.zip

Fig.3 is config_j1939.exe's running windows

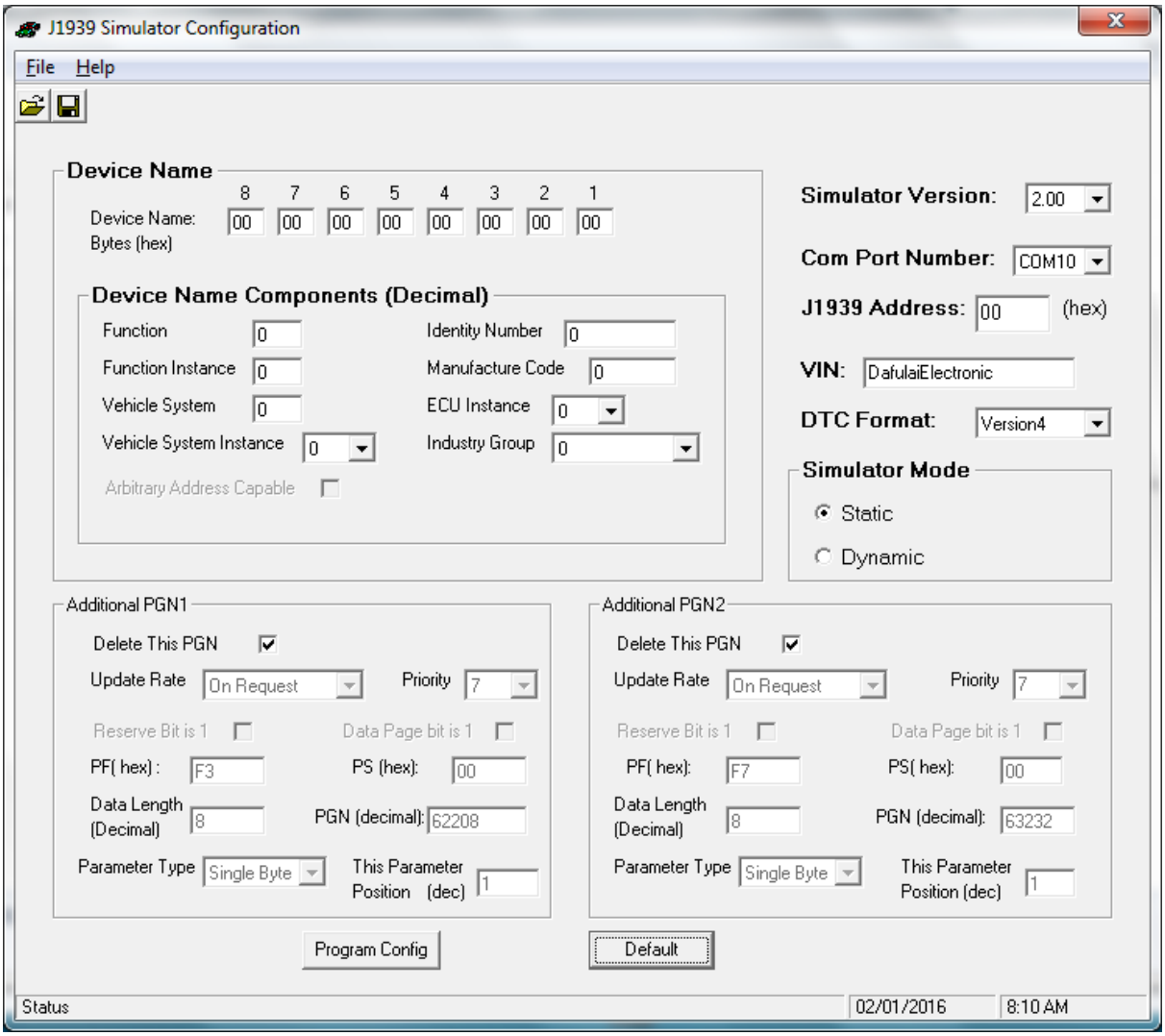

Fig.3 config_j1939

Notes: When you finish the configuration, you must restart the IC (Power off, and Power On again)

If you use "PC Monitor" way, you must download PCtool.exe from
http://www.dafulaielectronics.com/Documents/PCtool.zip
Fig.4 is PCtool.exe's running windows

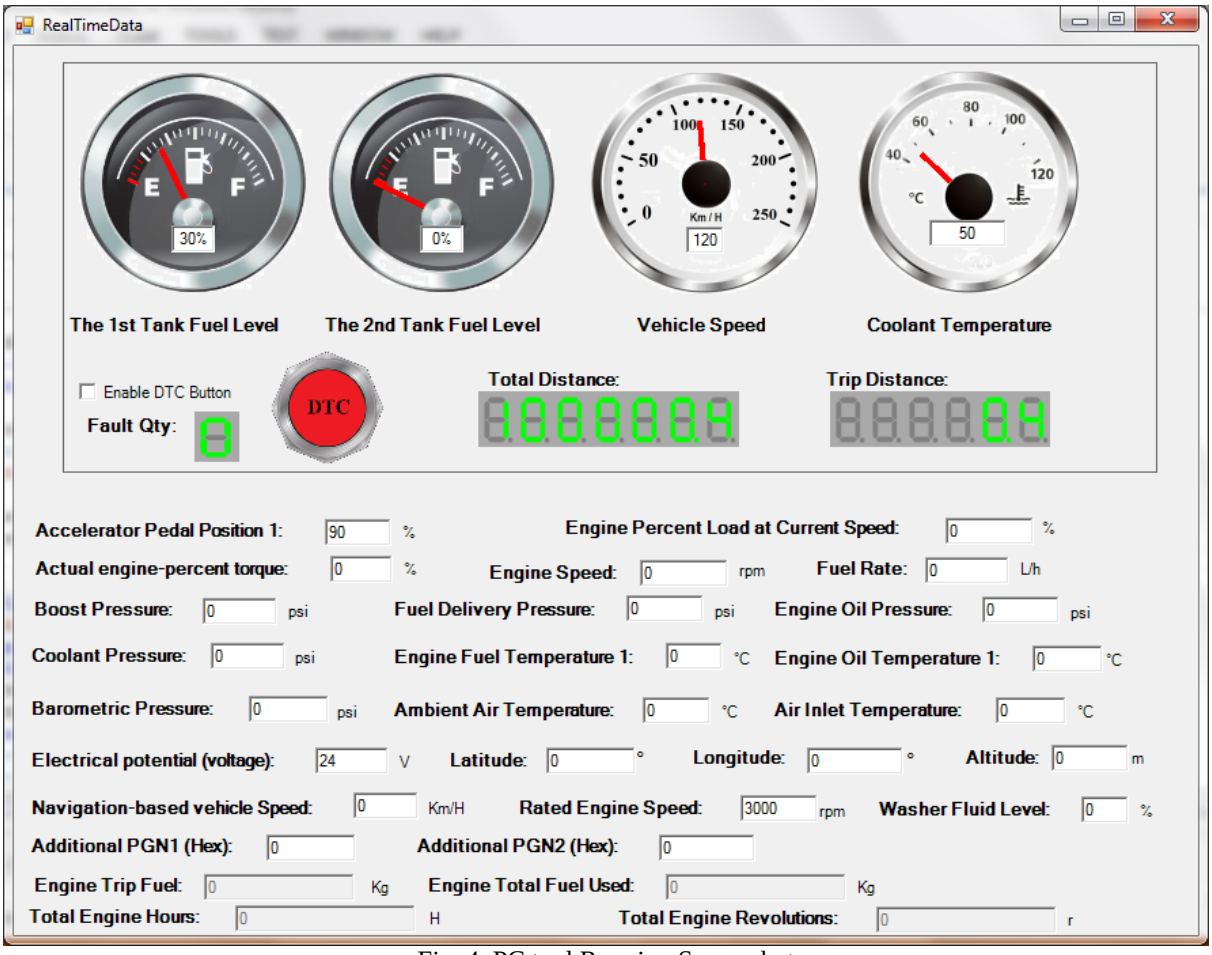

Fig. 4 PC tool Running Screenshot

Value Ranges for Signals

	1 Byte	2 Byte	4 Byte
Signal Ranges	0 – 0XFA	0 – 0XFAFF	0 – 0XFAFFFFFF
Range reserved for future status info	0XFB – 0XFD	0XFB00 – 0XFDFF	0XFB000000 – 0XFDFFFFFF
Defect status	0XFE	0XFEXX	0XFEXXXXXX
Not available	0XFF	0XFFXX	0XFFXXXXXX

Presentation of switch status (2 bits)

Switch off 00

Switch on 01

Defect 10

Not available 11

In dynamic mode, how does the IC modify the parameter? we discuss the following situation:

1. Transmission Repetition Rate is 50ms:

   All live data will be modified every 50ms. For single byte data, they will be increased by 0x1 from the current value every time until becoming the oxfa. For double bytes data, they will be increased by 0x10 from the current value every time until becoming the oxfaff.

   When all data except that from 2 additional configurable PGNs achieve the maximum, for single byte data, they will be decreased by 0x1 from the current value every time until becoming the ox0, and for double bytes data, they will be decreased by 0x10 from the current value every time until becoming the ox0000. When all data except that from 2 additional configurable PGNs achieve the minimum 0x0, they will change to increasing direction again.

2. Transmission Repetition Rate is 100ms:

   All live data will be modified every 100ms. For single byte data, they will be increased by 0x1 from the current value every time until becoming the oxfa. For double bytes data, they will be increased by 0x10 from the current value every time until becoming the oxfaff.

   When all data except that from 2 additional configurable PGNs achieve the maximum, for single byte data, they will be decreased by 0x1 from the current value every time until becoming the ox0, and for double bytes data, they will be decreased by 0x10 from the current value every time until becoming the ox0000. When all data except that from 2 additional configurable PGNs achieve the minimum 0x0, they will change to increasing direction again.

3. Transmission Repetition Rate is 0.5s:

   All live data will be modified every 0.5s. For single byte data, they will be increased by 0x1 from the current value every time until becoming the oxfa. When all data except that from 2 additional configurable PGNs achieve the maximum, for single byte data, they will be decreased by 0x1 from the current value every time until becoming the ox0. When all data except that from 2 additional configurable PGNs achieve the minimum 0x0, they will change to increasing direction again.

4. Transmission Repetition Rate is 1s:

   All live data will be modified every 100ms. For single byte data, they will be increased by 0x1 from the current value every time until becoming the oxfa. For double bytes data, they will be increased by 0x10 from the current value every time until becoming the oxfaff.

   When all data except that from 2 additional configurable PGNs achieve the maximum, for single byte data, they will be decreased by 0x1 from the current value every time until becoming the ox0, and for double bytes data, they will be decreased by 0x10 from the current value every time until becoming the ox0000. When all data except that from 2 additional configurable PGNs achieve the minimum 0x0, they will change to increasing direction again.

5. Transmission Repetition Rate is 5s:

   All live data will be modified every 5s. For 4 bytes data, they will be increased by 0x20 from the current value every time until becoming the oxfaffffff. When all data except that from 2 additional configurable PGNs achieve the maximum, for 4 bytes data, they will be decreased by 0x20 from the

current value every time until becoming the ox00000000. When all data except that from 2 additional configurable PGNs achieve the minimum 0x00000000, they will change to increasing direction again.

When the live data is from 2 additional configurable PGN and the transmission Repetition Rate is on request, these live data's change direction is decided by the change direction of 5s transmission repetition. Change value is 0x01 if single byte data, 0x10 if double bytes data, and 0x20 if 4 bytes data.

Some data are never changed or changed by some condition, we will explain them in the PGN description.

Live Data

PGN 65267 Vehicle Position

Transmission Repetition Rate : 5 s
Data Length : 8
Reserve Bit : 0
Data Page : 0
PDU Format : 254
PDU Specific : 243
Default Priority : 6
Parameter Group Number : 65267 (0xFEF3)

Start Position	Length	Parameter Name	SPN
1-4	4 byte	Latitude	584
5-8	4 bytes	Longitude	585

With ECU simulated parameter value

Latitude: -210°(south) to 211.108122°(north) 10^{-7} °/bit

Longitude: -210°(west) to 211.108122°(east) 10^{-7} °/bit

PGN 65256 VEHICLE DIRECTION/SPEED

Transmission Repetition Rate :on request
Data Length : 8

Reserve Bit : 0

Data Page : 0

PDU Format : 254

PDU Specific : 232

Default Priority : 6

Parameter Group Number : 65256 (0xFEE8)

Start Position	Length	Parameter Name	SPN
1-2	2 bytes	Compass bearing	165
3-4	2 bytes	Navigation-based vehicle speed	517
5-6	2 bytes	Pitch	583
7-8	2 bytes	Altitude	580

With ECU simulated parameter value

Navigation-based vehicle speed: 0 to 250.996km/h 1/256 km/h/bit

Altitude: -2500m to 5531.875m 0.125m/bit

Another position are all 0xFF (not yet implemented)

PGN 65262 Engine Temperature 1

Transmission Repetition Rate : 1 s

Data Length : 8

Reserve Bit : 0

Data Page : 0

PDU Format : 254

PDU Specific : 238

Default Priority : 6

Parameter Group Number : 65262 (0xFEEE)

Start Position	Length	Parameter Name	SPN
1	1 byte	Engine Coolant Temperature	110
2	1 bytes	Engine Fuel Temperature 1	174
3-4	2 bytes	Engine Oil Temperature 1	175
5-6	2 bytes	Engine Turbocharger Oil	176

Start Position	Length	Parameter Name	SPN
		Temperature	
7	1 bytes	Engine Intercooler Temperature	52
8	1 bytes	Engine Intercooler Thermostat Opening	1134

With ECU simulated parameter value

Engine Coolant Temperature: -40 to 210°C 1°C/bit

Engine Fuel Temperature 1: -40 to 210°C 1°C/bit . We use the fixed value of 80 °C when "standalone" way

Engine Oil Temperature 1: -273 to 1735°C 0.03125°C/bit

Another position are all 0xFF (not yet implemented)

PGN 65269 AMBIENT CONDITIONS

Transmission Repetition Rate : 1 s

Data Length : 8

Reserve Bit : 0

Data Page : 0

PDU Format : 254

PDU Specific : 245

Default Priority : 6

Parameter Group Number : 65269 (0xFEF5)

Start Position	Length	Parameter Name	SPN
1	1 byte	Barometric pressure	108
2-3	2 bytes	Cab interior temperature	170
4-5	2 bytes	Ambient air temperature	171
6	1 bytes	Air inlet temperature	172
7-8	2 bytes	Road surface temperature	79

With ECU simulated parameter value

Barometric pressure:0 to 125 kPa (0 to 18.1psi) 0.5kPa/bit

Ambient air temperature: -273 to 1735°C 0.03125°C/bit. We use the fixed value of 25 °C when "standalone" way

Air inlet temperature: -40 to 210°C 1°C/bit. We use the fixed value of 35 °C when "standalone" way

Another position are all 0xFF (not yet implemented)

PGN 65257 FUEL CONSUMPTION

Transmission Repetition Rate : 1 s

Data Length : 8

Reserve Bit : 0

Data Page : 0

PDU Format : 254

PDU Specific : 233

Default Priority : 6

Parameter Group Number : 65257 (0xFEE9)

Start Position	Length	Parameter Name	SPN
1-4	4 bytes	Engine trip fuel	182
5-8	4 bytes	Engine total fuel used	250

With ECU simulated parameter value

Engine trip fuel: 0 to 2105540607.5 kg 0.5kg/bit. We give the value according to "Fuel rate"

Engine total fuel used: 0 to 2105540607.5 kg 0.5kg/bit. We give the value according to "Fuel rate"

PGN 61444 ELECTRONIC ENGINE CONTROLLER #1: EEC1

Transmission Repetition Rate : 100ms

Data Length : 8

Reserve Bit : 0

Data Page : 0

PDU Format : 240

PDU Specific : 4

Default Priority : 3

Parameter Group Number : 61444 (0xF004)

Start Position	Length	Parameter Name	SPN
1	4 bits	Status_EEC1	899
2	1 byte	Driver's demand engine - percent torque	512
3	1 byte	Actual engine - percent torque	513
4-5	2 bytes	Engine speed	190
6-8	3 bytes	not defined	

With ECU simulated parameter value

Actual engine - percent torque: -125% to 125% 1%/bit

Engine speed: 0 to 8031.875rpm 0.125rpm/bit

Another position are all 0xFF (not yet implemented)

PGN 61443 Electronic Engine Controller 2 - EEC2

Transmission Repetition Rate : 50ms

Data Length : 8

Reserve Bit : 0

Data Page : 0

PDU Format : 240

PDU Specific : 3

Default Priority : 3

Parameter Group Number : 61443 (0xF003)

Start Position	Length	Parameter Name	SPN
1.1	2 bits	Accelerator Pedal 1 Low Idle Switch	558
1.3	2 bits	Accelerator Pedal Kickdown Switch	559
1.5	2 bits	Road Speed Limit Status	1437
1.7	2 bits	Accelerator Pedal 2 Low Idle Switch	2970
2	1 byte	Accelerator Pedal Position 1	91
3	1 byte	Engine Percent Load at Current Speed	92
4	1 byte	Remote Accelerator Pedal Position	974
5	1 byte	Accelerator Pedal Position 2	29

Start Position	Length	Parameter Name	SPN
6.1	2 bits	Vehicle Acceleration Rate Limit Status	2979

With ECU simulated parameter value

Accelerator Pedal Position 1: 0% to 100% 0.4%/bit

Engine Percent Load at Current Speed: 0% to 125% 1%/bit

Another position are all 0xFF (not yet implemented)

PGN 65270 Electronic Engine Controller 2 - EEC2

Transmission Repetition Rate : 0.5s

Data Length : 8

Reserve Bit : 0

Data Page : 0

PDU Format : 254

PDU Specific : 246

Default Priority : 6

Parameter Group Number : 65270 (0xFEF6)

Start Position	Length	Parameter Name	SPN
1	1 byte	Particulate trap inlet pressure	81
2	1 byte	Boost pressure	102
3	1 byte	Intake manifold temperature	105
4	1 byte	Air inlet pressure	106
5	1 byte	Air filter differential pressure	107
6-7	2 bytes	Exhaust gas temperature	173
8	1 byte	Coolant filter differential pressure	112

With ECU simulated parameter value

Boost pressure: 0 to 500kPa (72.5psi) 2kPa/bit

Another position are all 0xFF (not yet implemented)

PGN 65132 Tachograph - TCO1

Transmission Repetition Rate : 50ms

Data Length : 8

Reserve Bit : 0

Data Page : 0

PDU Format : 254

PDU Specific :108

Default Priority : 6

Parameter Group Number : 65132 (0xFE6C)

Start Position	Length	Parameter Name	SPN
1.1	3 bits	Driver 1 working state	1612
1.4	3 bits	Driver 2 working state	1613
1.7	2 bits	Vehicle motion	1611
2.1	4 bits	Driver 1 Time Related States	1617
2.5	2bits	Driver card, driver 1	1615
2.7	2 bits	Vehicle Overspeed	1614
3.1	4 bits	Driver 2 Time Related States	1618
3.5	4 bits	Driver card, driver 2	1616
4.1	2 bits	System event	1622
4.3	2 bits	Handling information	1621
4.5	2 bits	Tachograph performance	1620
4.7	2 bits	Direction indicator	1619
5-6	2 bytes	Tachograph output shaft speed	1623
7-8	2 bytes	Tachograph vehicle speed	1624

With ECU simulated parameter value

Tachograph vehicle speed: 0 to 250.996km/h 1/256km/h/bit

Another positions are all 0xFF (not yet implemented)

PGN 65265 Cruise Control/Vehicle Speed

(This PGN is only supported for Version 2.00 of the year 2017 or after)

Transmission Repetition Rate : 100ms

Data Length : 8

Reserve Bit : 0

Data Page : 0

PDU Format : 254

PDU Specific :241

Default Priority : 6

Parameter Group Number : 65265 (0xFEF1)

Start Position	Length	Parameter Name	SPN
1.1	2 bits	Two Speed Axle Switch	69
1.3	2 bits	Parking Brake Switch	70
1.5	2 bits	Cruise Control Pause Switch	1633
1.7	2 bits	Park Brake Release Inhibit Request	3807
2-3	2 bytes	Wheel-Based Vehicle Speed	84
4.1	2 bits	Cruise Control Active	595
4.3	2 bits	Cruise Control Enable Switch	596
4.5	2 bits	Brake Switch	597
4.7	2 bits	Clutch Switch	598
5.1	2 bits	Cruise Control Set Switch	599
5.3	2 bits	Cruise Control Coast (Decelerate) Switch	600
5.5	2 bits	Cruise Control Resume Switch	601
5.7	2 bytes	Cruise Control Accelerate Switch	602
6	1 byte	Cruise Control Set Speed	86
7.1	5 bits	PTO Governor State	976
7.6	3 bits	Cruise Control States	527
8.1	2 bits	Engine Idle Increment Switch	968
8.3	2 bits	Engine Idle Decrement Switch	967
8.5	2 bits	Engine Test Mode Switch	966
8.7	2 bits	Engine Shutdown Override Switch speed	1237

With ECU simulated parameter value

Wheel-Based Vehicle Speed: 0 to 250.996km/h 1/256km/h/bit

Another positions are all 0xFF (not yet implemented)

PGN 65271 VEHICLE ELECTRICAL POWER

Transmission Repetition Rate : 1s

Data Length : 8

Reserve Bit : 0

Data Page : 0

PDU Format : 254

PDU Specific : 247

Default Priority : 6

Parameter Group Number : 65271 (0xFEF7)

Start Position	Length	Parameter Name	SPN
1	1 byte	Net battery current	114
2	1 bytes	Alternator current	115
3-4	2 bytes	Alternator potential (voltage)	167
5-6	2 bytes	Electrical potential (voltage)	168
7-8	2 bytes	Battery potential (voltage), switched	158

With ECU simulated parameter value

Electrical potential (voltage): 0 to 3212.75V 0.05V/bit. We use the fixed value of 24V when "standalone" way

Another positions are all 0xFF (not yet implemented)

PGN 65266 FUEL ECONOMY

Transmission Repetition Rate : 100ms

Data Length : 8

Reserve Bit : 0

Data Page : 0

PDU Format : 254

PDU Specific : 242

Default Priority : 6

Parameter Group Number : 65266 (0xFEF2)

Start Position	Length	Parameter Name	SPN
1-2	2 byte	Fuel rate	183
3-4	2 bytes	Instantaneous fuel economy	184
5-6	2 bytes	Average fuel economy	185
7-8	2 bytes	not defined	

With ECU simulated parameter value

Fuel rate: 0 to 3212.75L/h 0.05L/h/bit

Another positions are all 0xFF (not yet implemented)

PGN 65263 ENGINE FLUID LEVEL/PRESSURE

Transmission Repetition Rate : 0.5s

Data Length : 8

Reserve Bit : 0

Data Page : 0

PDU Format : 254

PDU Specific : 239

Default Priority : 6

Parameter Group Number : 65263 (0xFEEF)

Start Position	Length	Parameter Name	SPN
1	1 byte	Fuel delivery pressure	94
2	1 byte	Not defined	
3	1 byte	Engine oil level	98
4	1 byte	Engine oil pressure	100
5-6	2 bytes	Crankcase pressure	101
7	1 byte	Coolant pressure	109
8	1 byte	Coolant level	111

With ECU simulated parameter value

Fuel delivery pressure: 0 to 1000kPa 4kPa/bit

Engine oil pressure: 0 to 1000kPa 4kPa/bit

Coolant pressure: 0 to 500kPa 2kPa/bit

Another position are all 0xFF (not yet implemented)

PGN 65253 Engine Hours, Revolutions

Transmission Repetition Rate :on request

Data Length : 8

Reserve Bit : 0

Data Page : 0

PDU Format : 254

PDU Specific : 229

Default Priority : 6

Parameter Group Number : 65253 (0xFEE5)

Start Position	Length	Parameter Name	SPN
1-4	4 bytes	Total engine hours	247
5-8	4 bytes	Total engine revolutions	249

With ECU simulated parameter value

Total engine hours: 0 to 210554060.75h 0.05h/bit. We give the value according to actual running time.

Total engine revolutions: 0 to 4211081215000r 1000r/bit. We give the value according to engine speed and actual running time.

PGN 65214 ELECTRONIC ENGINE CONTROLLER #4: EEC4

Transmission Repetition Rate : on request

Data Length : 8

Reserve Bit : 0

Data Page : 0

PDU Format : 254

PDU Specific : 190

Default Priority : 7

Parameter Group Number : 65214 (0xFEBE)

Start Position	Length	Parameter Name	SPN
1-2	2 byte	Rated engine power	166

Start Position	Length	Parameter Name	SPN
3-4	2 bytes	Rated engine speed	189
5-8	4 bytes	not defined	

With ECU simulated parameter value

Rated engine speed: 0 to 8031.875rpm 0.125rpm/bit. We use the fixed value of 3000rpm when "standalone" way

Another positions are all 0xFF (not yet implemented)

PGN 65260 Vehicle Identification Number

Transmission Repetition Rate : on request

Data Length : variable and it can be more than 200, but this IC uses a fixed value 17 when the simulator is configured to ver 2.00 and fixed value 203 when the simulator is configured to ver 1.01

Reserve Bit : 0

Data Page : 0

PDU Format : 254

PDU Specific : 236

Default Priority : 6

Parameter Group Number : 65260 (0xFEEC)

must use long message broadcast.

With ECU simulated parameter value

Vehicle Identification number:

If the simulator is configured to Version 1.01, The VIN# will be Continuous 28 "Dafulai" followed by "CD. XIA" , Total 203 bytes. (Note: Space is "*" character)

If the simulator is configured to Version 2.00, The VIN# will be configured into 17 non-space characters. Default VIN# is "DafulaiElectronic"

PGN 65226 DM1 - When no any DTC

This is a healthy heart beat

Transmission Repetition Rate : 1s

Data Length : 8

Reserve Bit : 0

Data Page : 0

PDU Format : 254
PDU Specific : 202
Default Priority : 6
Parameter Group Number : 65226 (0xFECA)

Byte 1
bits 8-7 = 00
bits 6-5 = 00
bits 4-3 = 00
bits 2-1 = 11

Byte 2
bits 8-7 = 11
bits 6-5 = 11
bits 4-3 = 11
bits 2-1 = 11

Byte 3 to byte 6 = 0 no SPN

Byte 7 = 0
Byte 8 = 0

PGN 65226 DM1 - When there is a DTC

Transmission Repetition Rate : 1s
Data Length : 8
Reserve Bit : 0
Data Page : 0
PDU Format : 254
PDU Specific : 202
Default Priority : 6
Parameter Group Number : 65226 (0xFECA)

SPN 1208 is generated

SPN 1208 = 0x4B8 = 000 00000100 10111000 (19 bits)
FMI 3 = 3 = 00011 (5 bits)

OC 10 = 0xA = 0001010 (7 bits)

Byte 1

bits 8-7 = 01 (MIL LED on)

bits 6-5 = 00

bits 4-3 = 00

bits 2-1 = 11

Byte 2

bits 8-7 = 11 (flashing not yet implemented)

bits 6-5 = 11

bits 4-3 = 11

bits 2-1 = 11

DTC Format Version 1:

DTC (SPN=1208)																													
Byte3 8 most significant bits of 16 most significant bits of SPN (bit 8 most significant)								Byte4 8 least significant bits of 16 most significant bits of SPN (bit 8 most significant)								Byte5 3 least significant bits of SPN and the FMI (bit8 SPN msb and bit5 FMI msb)					Byte6							
SPN																			FMI					CM	OC						
8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1
0	0	0	0	0	0	0	0	1	0	0	1	0	1	1	1	0	0	0	0	0	0	1	1	1	0	0	0	1	0	1	0

DTC Format Version 2:

DTC (SPN=1208)																													
Byte3 8 least significant bits of 16 most significant bits of SPN (bit 8 most significant)								Byte4 8 most significant bits of 16 most significant bits of SPN (bit 8 most significant)								Byte5 3 least significant bits of SPN and the FMI (bit8 SPN msb and bit5 FMI msb)					Byte6							
SPN																			FMI					CM	OC						
8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1
1	0	0	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	1	0	1	0

DTC Format Version 3:

DTC (SPN=1208)																													
Byte3 8 least significant bits of SPN (bit 8 most significant)								Byte4 second byte of SPN (bit 8 most significant)								Byte5 3 most significant bits of SPN and the FMI (bit8 SPN msb and bit5 FMI msb)					Byte6							
SPN																			FMI					CM	OC						
8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1
1	0	1	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1	1	0	0	0	1	0	1	0

DTC Format Version 4:

DTC (SPN=1208)			
Byte3 8 least significant bits of SPN (bit 8 most significant)	Byte4 second byte of SPN (bit 8 most significant)	Byte5 3 most significant bits of SPN and the FMI (bit8 SPN msb and bit5 FMI msb)	Byte6

SPN																			FMI					CM	OC						
8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1
1	0	1	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	0	1	0

Byte7=0xff

Byte8=0xff

PGN 65226 DM1 - When there is two DTCs

Transmission Repetition Rate : 1s

Data Length : 14

Reserve Bit : 0

Data Page : 0

PDU Format : 254

PDU Specific : 202

Default Priority : 6

Parameter Group Number : 65226 (0xFECA)

SPN 1208 is generated

SPN 1208 = 0x4B8 = 000 00000100 10111000 (19 bits)

FMI 3 = 3 = 00011 (5 bits)

OC 10 = 0xA = 0001010 (7 bits)

SPN 656 is generated

SPN 656 =0x290=000 0000 0010 1001 0000 (19 bits)

FMI 3 = 3 = 00011 (5 bits)

OC 2 = 0x2 = 0000010 (7 bits)

Byte 1

bits 8-7 = 01 (MIL LED on)

bits 6-5 = 00

bits 4-3 = 00

bits 2-1 = 11

Byte 2

bits 8-7 = 11 (flashing not yet implemented)

bits 6-5 = 11

bits 4-3 = 11

bits 2-1 = 11

DTC Format Version 1:

DTC (SPN=1208)																															
Byte3 8 most significant bits of 16 most significant bits of SPN (bit 8 most significant)								Byte4 8 least significant bits of 16 most significant bits of SPN (bit 8 most significant)								Byte5 3 least significant bits of SPN and the FMI (bit8 SPN msb and bit5 FMI msb)					Byte6								
SPN																			FMI					CM	OC						
8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1
0	0	0	0	0	0	0	0	1	0	0	1	0	1	1	1	0	0	0	0	0	0	1	1	1	0	0	0	1	0	1	0

DTC Format Version 2:

DTC (SPN=1208)																															
Byte3 8 least significant bits of 16 most significant bits of SPN (bit 8 most significant)								Byte4 8 most significant bits of 16 most significant bits of SPN (bit 8 most significant)								Byte5 3 least significant bits of SPN and the FMI (bit8 SPN msb and bit5 FMI msb)					Byte6								
SPN																			FMI					CM	OC						
8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1
1	0	0	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	1	0	1	0

DTC Format Version 3:

DTC (SPN=1208)																															
Byte3 8 least significant bits of SPN (bit 8 most significant)								Byte4 second byte of SPN (bit 8 most significant)								Byte5 3 most significant bits of SPN and the FMI (bit8 SPN msb and bit5 FMI msb)					Byte6								
SPN																			FMI					CM	OC						
8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1
1	0	1	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1	1	0	0	0	1	0	1	0

DTC Format Version 4:

DTC (SPN=1208)																															
Byte3 8 least significant bits of SPN (bit 8 most significant)								Byte4 second byte of SPN (bit 8 most significant)								Byte5 3 most significant bits of SPN and the FMI (bit8 SPN msb and bit5 FMI msb)					Byte6								
SPN																			FMI					CM	OC						
8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1

1	0	1	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	0	1	0

DTC Format Version 1:

DTC (SPN=656)																															
Byte7 8 most significant bits of 16 most significant bits of SPN (bit 8 most significant)								Byte8 8 least significant bits of 16 most significant bits of SPN (bit 8 most significant)								Byte9 3 least significant bits of SPN and the FMI (bit8 SPN msb and bit5 FMI msb)					Byte10								
SPN																			FMI					CM	OC						
8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1
0	0	0	0	0	0	0	0	0	1	0	1	0	0	1	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	1	0

DTC Format Version 2:

DTC (SPN=656)																															
Byte7 8 least significant bits of 16 most significant bits of SPN (bit 8 most significant)								Byte8 8 most significant bits of 16 most significant bits of SPN (bit 8 most significant)								Byte9 3 least significant bits of SPN and the FMI (bit8 SPN msb and bit5 FMI msb)					Byte10								
SPN																			FMI					CM	OC						
8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1
0	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	1	0

DTC Format Version 3:

DTC (SPN=656)																															
Byte7 8 least significant bits of SPN (bit 8 most significant)								Byte8 second byte of SPN (bit 8 most significant)								Byte9 3 most significant bits of SPN and the FMI (bit8 SPN msb and bit5 FMI msb)					Byte10								
SPN																			FMI					CM	OC						
8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1
1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	1	0

DTC Format Version 4:

DTC (SPN=656)																															
Byte7 8 least significant bits of SPN (bit 8 most significant)								Byte8 second byte of SPN (bit 8 most significant)								Byte9 3 most significant bits of SPN and the FMI (bit8 SPN msb and bit5 FMI msb)					Byte10								
SPN																			FMI					CM	OC						
8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1
1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	0

Byte11=0xff

Byte12=0xff

Byte13=0xff

Byte14=0xff

PGN 65226 DM1 - When there is three DTCs

Transmission Repetition Rate : 1s

Data Length : 14

Reserve Bit : 0

Data Page : 0

PDU Format : 254

PDU Specific : 202

Default Priority : 6

Parameter Group Number : 65226 (0xFECA)

SPN 1208 is generated

SPN 1208 = 0x4B8 = 000 00000100 10111000 (19 bits)

FMI 3 = 3 = 00011 (5 bits)

OC 10 = 0xA = 0001010 (7 bits)

SPN 656 is generated

SPN 656 =0x290=000 0000 0010 1001 0000 (19 bits)

FMI 3 = 3 = 00011 (5 bits)

OC 2 = 0x2 = 0000010 (7 bits)

SPN 108 is generated

SPN 108 =0x6c=000 0000 0000 0110 1100 (19 bits)

FMI 11 = 0x0b = 01011 (5 bits)

OC 5 = 0x5 = 0000101 (7 bits)

Byte 1

bits 8-7 = 01 (MIL LED on)

bits 6-5 = 00

bits 4-3 = 00

bits 2-1 = 11

Byte 2

bits 8-7 = 11 (flashing not yet implemented)

bits 6-5 = 11

bits 4-3 = 11

bits 2-1 = 11

DTC Format Version 1:

DTC (SPN=1208)			
Byte3 8 most significant bits of 16 most significant bits of SPN (bit 8 most significant)	Byte4 8 least significant bits of 16 most significant bits of SPN (bit 8 most significant)	Byte5 3 least significant bits of SPN and the FMI (bit8 SPN msb and bit5 FMI msb)	Byte6

SPN																			FMI					CM	OC						
8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1
0	0	0	0	0	0	0	0	1	0	0	1	0	1	1	1	0	0	0	0	0	0	1	1	1	0	0	0	1	0	1	0

DTC Format Version 2:

DTC (SPN=1208)			
Byte3 8 least significant bits of 16 most significant bits of SPN (bit 8 most significant)	Byte4 8 most significant bits of 16 most significant bits of SPN (bit 8 most significant)	Byte5 3 least significant bits of SPN and the FMI (bit8 SPN msb and bit5 FMI msb)	Byte6

SPN																			FMI					CM	OC						
8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1
1	0	0	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	1	0	1	0

DTC Format Version 3:

DTC (SPN=1208)			
Byte3 8 least significant bits of SPN (bit 8 most significant)	Byte4 second byte of SPN (bit 8 most significant)	Byte5 3 most significant bits of SPN and the FMI (bit8 SPN msb and bit5 FMI msb)	Byte6

SPN																			FMI					CM	OC						
8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1
1	0	1	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1	1	0	0	0	1	0	1	0

DTC Format Version 4:

DTC (SPN=1208)			
Byte3 8 least significant bits of SPN (bit 8 most significant)	Byte4 second byte of SPN (bit 8 most significant)	Byte5 3 most significant bits of SPN and the FMI (bit8 SPN msb and bit5 FMI msb)	Byte6

SPN																			FMI					CM	OC						
8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1
1	0	1	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	0	1	0

DTC Format Version 1:

DTC (SPN=656)			
Byte7 8 most significant bits of 16	Byte8 8 least significant bits of 16	Byte9 3 least significant bits of	Byte10

most significant bits of SPN (bit 8 most significant)	most significant bits of SPN (bit 8 most significant)	SPN and the FMI (bit8 SPN msb and bit5 FMI msb)	

SPN																			FMI					CM	OC						
8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1
0	0	0	0	0	0	0	0	0	1	0	1	0	0	1	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	1	0

DTC Format Version 2:

DTC (SPN=656)			
Byte7 8 least significant bits of 16 most significant bits of SPN (bit 8 most significant)	Byte8 8 most significant bits of 16 most significant bits of SPN (bit 8 most significant)	Byte9 3 least significant bits of SPN and the FMI (bit8 SPN msb and bit5 FMI msb)	Byte10

SPN																			FMI					CM	OC						
8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1
0	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	1	0

DTC Format Version 3:

DTC (SPN=656)			
Byte7 8 least significant bits of SPN (bit 8 most significant)	Byte8 second byte of SPN (bit 8 most significant)	Byte9 3 most significant bits of SPN and the FMI (bit8 SPN msb and bit5 FMI msb)	Byte10

SPN																			FMI					CM	OC						
8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1
1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	1	0

DTC Format Version 4:

DTC (SPN=656)			
Byte7 8 least significant bits of SPN (bit 8 most significant)	Byte8 second byte of SPN (bit 8 most significant)	Byte9 3 most significant bits of SPN and the FMI (bit8 SPN msb and bit5 FMI msb)	Byte10

SPN																			FMI					CM	OC						
8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1
1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	0

DTC Format Version 1:

DTC (SPN=656)			
Byte11 8 most significant bits of 16 most significant bits of SPN (bit 8 most significant)	Byte12 8 least significant bits of 16 most significant bits of SPN (bit 8 most significant)	Byte13 3 least significant bits of SPN and the FMI (bit8 SPN msb and bit5 FMI msb)	Byte14

SPN																			FMI					CM	OC						
8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1
0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	1	0	0	0	1	0	1	1	1	0	0	0	0	1	0	1

DTC Format Version 2:

DTC (SPN=656)																													
Byte11 8 least significant bits of 16 most significant bits of SPN (bit 8 most significant)								Byte12 8 most significant bits of 16 most significant bits of SPN (bit 8 most significant)								Byte13 3 least significant bits of SPN and the FMI (bit8 SPN msb and bit5 FMI msb)								Byte14							
SPN																			FMI					CM	OC					
8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1
0	0	0	0	1	1	0	1	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	1	1	0	0	0	0	1	0	1

DTC Format Version 3:

DTC (SPN=656)																													
Byte11 8 least significant bits of SPN (bit 8 most significant)								Byte12 second byte of SPN (bit 8 most significant)								Byte13 3 most significant bits of SPN and the FMI (bit8 SPN msb and bit5 FMI msb)								Byte14							
SPN																			FMI					CM	OC					
8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1
0	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	0	0	0	0	1	0	1

DTC Format Version 4:

DTC (SPN=656)																													
Byte11 8 least significant bits of SPN (bit 8 most significant)								Byte12 second byte of SPN (bit 8 most significant)								Byte13 3 most significant bits of SPN and the FMI (bit8 SPN msb and bit5 FMI msb)								Byte14							
SPN																			FMI					CM	OC					
8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1	8	7	6	5	4	3	2	1
0	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	1	0	1

PGN 65248 Vehicle Distance

Transmission Repetition Rate : 100ms

Data Length : 8

Reserve Bit : 0

Data Page : 0

PDU Format : 254

PDU Specific : 224

Default Priority : 6

Parameter Group Number : 65248 (0x00FEE0)

Start Position	Length	Parameter Name	SPN
1-4	4 bytes	Trip Distance	244

Start Position	Length	Parameter Name	SPN
5-8	4 bytes	Total Vehicle Distance	245

With ECU simulated parameter value

Trip Distance: 0 to 526,385,151.9 km 0.125 km/bit. We give the value according to tachograph vehicle speed and actual running time.

Total Vehicle Distance: 0 to 526,385,151.9 km 0.125 km/bit. We give the initial value 100,000km when Simulator power on, and then we will accumulate the distance according to tachograph vehicle speed and actual running time.

PGN 65276 Dash Display

Transmission Repetition Rate : 1s

Data Length : 8

Reserve Bit : 0

Data Page : 0

PDU Format : 254

PDU Specific : 252

Default Priority : 6

Parameter Group Number : 65276 (0x00FEFC)

Start Position	Length	Parameter Name	SPN
1	1 byte	Washer Fluid Level	80
2	1 byte	Fuel Level 1	96
3	1 byte	Engine Fuel Filter Differential Pressure	95
4	1 byte	Engine Oil Filter Differential Pressure	99
5-6	2 bytes	Cargo Ambient Temperature	169
7	1 byte	Fuel Level 2	38

With ECU simulated parameter value

Washer Fluid Level: 0 to 100 % 0.4 %/bit.

Fuel Level 1: 0 to 100 % 0.4 %/bit.

Fuel Level 2: 0 to 100 % 0.4 %/bit.

Another positions are all 0xFF (not yet implemented)

PGN 59392 Acknowledgement

Transmission Repetition Rate : on request
Data Length : 8
Reserve Bit : 0
Data Page : 0
PDU Format : 232
PDU Specific : Destination address, or Global =255
Default Priority : 6
Parameter Group Number : 59392 (0xE800)

Byte1 =0x00 denotes positive acknowledgement (ACK), but 0x01 denotes negative acknowledgement (NACK)

Byte2 = Group Function Value (if applicable) , the IC sets it to 0xff

Byte3 to Byte5 reserved to CATARC assignment, the IC sets them to 0xff

Byte6 : Parameter Group Number of requested information (8 LSB of parameter group number, bit 8 most significant)

Byte7: Parameter Group Number of requested information (2nd byte of parameter group number, bit 8 most significant)

Byte8: Parameter Group Number of requested information (8 MSBs of parameter group number, bit 8 most significant)

at request for not implemented PGN, the IC sends a NACK setting the control byte to 1. When a request of DM11 is received by the IC, the IC clears all the DTCs and sends a ACK setting control byte to 0 and sends DM11.

PGN 60416 Transport Protocol - Connection Management (TP.CM)

Data Length : 8
Reserve Bit : 0

Data Page : 0

PDU Format : 236

PDU Specific : Destination address, or Global =255

Default Priority : 7

Parameter Group Number : 60416 (0xEC00)

Byte1 is control byte.

Byte1=16=0x10 denotes TP.CM_RTS

Byte1=17=0x11 denotes TP.CM_CTS

Byte1=19=0x13 denotes TP.CM_EndOfMsgAck

Byte1=255=0xff denotes TP.CM_abort

Byte1=32 =0x20 denotes TP.CM_BAM

Other bytes' meaning depends on control byte

When control byte is TP.CM_RTS,

byte3 and byte2 are message size (Number of bytes)

byte4 is total number of packages

byte5 is reserved to SAE (should be filled with oxFF)

Byte6 : Parameter Group Number of multi-packet message (8 LSB of parameter group number, bit 8 most significant)

Byte7: Parameter Group Number of multi-packet message (2nd byte of parameter group number, bit 8 most significant)

Byte8: Parameter Group Number of multi-packet message (8 MSB of parameter group number, bit 8 most significant)

When control byte is TP.CM_CTS,

byte2: number of packages, which is a maximum quantity the other side can transmitted after receiving this CTS.

byte3: Sequence Number which will be transmitted next time.

byte4 and byte5 are reserved to SAE (should be filled with oxFF)

Byte6: Parameter Group Number of multi-packet message (8 LSB of parameter group number, bit 8 most significant)

Byte7: Parameter Group Number of multi-packet message (2nd byte of parameter group number, bit 8 most significant)

Byte8: Parameter Group Number of multi-packet message (8 MSB of parameter group number, bit 8 most significant)

When control byte is TP.CM_EndOfMsgAck,
byte3 and byte2 are message size (Number of bytes)
byte4 is total number of packages
byte5 is reserved to SAE (should be filled with oxFF)
Byte6 : Parameter Group Number of multi-packet message (8 LSB of parameter group number, bit 8 most significant)
Byte7: Parameter Group Number of multi-packet message (2nd byte of parameter group number, bit 8 most significant)
Byte8: Parameter Group Number of multi-packet message (8 MSB of parameter group number, bit 8 most significant)

When control byte is TP.CM_abort,
byte2 to byte5 are reserved to SAE (should be filled with oxFF)
Byte6 : Parameter Group Number of multi-packet message (8 LSB of parameter group number, bit 8 most significant)
Byte7: Parameter Group Number of multi-packet message (2nd byte of parameter group number, bit 8 most significant)
Byte8: Parameter Group Number of multi-packet message (8 MSB of parameter group number, bit 8 most significant)

When control byte is TP.CM_BAM,
byte3 and byte2 are message size (Number of bytes)
byte4 is total number of packages
byte5 is reserved to SAE (should be filled with oxFF)
Byte6 : Parameter Group Number of multi-packet message (8 LSB of parameter group number, bit 8 most significant)
Byte7: Parameter Group Number of multi-packet message (2nd byte of parameter group number, bit 8 most significant)
Byte8: Parameter Group Number of multi-packet message (8 MSB of parameter group number, bit 8 most significant)

PGN 60160 Transport Protocol - Data Transfer (TP.DT)

Data Length : 8
Reserve Bit : 0
Data Page : 0
PDU Format : 235
PDU Specific : Destination address, or Global =255

Default Priority : 7
Parameter Group Number : 60160 (0xEB00)

Byte1: Sequence Number (1 to 255)
Byte2 to Byte8 are Data

PGN 60928 Address claimed or Cannot claim source address

Data Length : 8
Reserve Bit : 0
Data Page : 0
PDU Format : 238
PDU Specific : 255
Default Priority : 3
Parameter Group Number : 60928 (0xEE00)

when source address is 254, it becomes "Cannot claim source address"
when source address is 0 to 253, it becomes "Address claimed"

Byte1 to Byte8 are the 8 bytes of device name. Byte1 is LSB, Byte is MSB.

PGN 59904 - PGN Requests

Data Length : 3
Reserve Bit : 0
Data Page : 0
PDU Format : 234
PDU Specific : Destination address, or Global =255
Default Priority : 6
Parameter Group Number : 59904 (0xEA00)

Byte1 : Parameter Group Number of requested information (8 LSB of parameter group number, bit 8 most significant)

Byte2: Parameter Group Number of requested information (2nd byte of parameter group number, bit 8 most significant)

Byte3: Parameter Group Number of requested information (8 MSBs of parameter group number, bit 8 most significant)

PGN 65235 - Diagnostic Data Clear/Reset for Active DTCs (DM11)

All of the diagnostic information pertaining to the active diagnostic trouble codes will be erased.
This IC clears the DTCs and sends a Positive Acknowledgement to this request message.

Transmission Repetition Rate : On request using PGN 59904
Data Length : 0
Reserve Bit : 0
Data Page : 0
PDU Format : 254
PDU Specific : 211
Default Priority : 6
Parameter Group Number : 65235 (0xFED3)

Electrical Specification

Absolute Maximum ratings
Oscillator Frequency··· 4MHz
VCC··· .7.5V
Ambient Temperature under bias··· ··· ··· ··· ··· ··· ··· ··· ··· ··· ··· ··· ··· ··· ··· -40℃ to +125℃
Max output current sunk by any I/O Pin··· ··· ··· ··· ··· ··· ··· ··· ··· ··· ··· ··· ··· ··· ··· 25mA
Max output current sourced by any I/O Pin··· ··· ··· ··· ··· ··· ··· ··· ··· ··· ··· ··· ··· ··· 25mA

DC Characteristics:
Standard operating Temperature: -40℃ to 85℃
Supply Current: maximum: 20mA, typical: 16mA
Vcc: 4.2VDC to 5.5VDC
VIL --------- Input low voltage: max=0.3Vcc
VIH---------- Input high voltage: min=0.7Vcc
VOH----------Output high voltage: min=VCC-0.7
VOL----------Output low voltage: max=0.6 when Vcc=4.5V

Packaging Information

DFL-SJ1939/P is PDIP (300mils) packaging

DFL-SJ1939/S is SIOC packaging

18-Lead Plastic Dual In-Line (P)-300 mil Body [PDIP]

18-Lead Plastic Small Outline (SO)-Wide, 7.5 mm Body [SOIC]

IMPORTANT NOTICE

The information in this manual is subject to change without notice.

Dafulai's products are not authorized for use as critical components in life support devices or systems. Life support devices or systems are those which are intended to support or sustain life and whose failure to perform can be reasonably expected to result in a significant injury or death to the user. Critical components are those whose failure to perform can be reasonably expected to cause failure of a life support device or system or affect its safety or effectiveness.

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