DESCRIPTION

DUT-E CAN Fuel Level Sensor

Data Transfer Protocol

Version 1.2

1 Purpose

The protocol is used for data transfer between DUT-E CAN digital fuel level sensors, developed by JV Technoton, Minsk, Belarus.

2 Description

Data Link Layer of the DUT-E CAN output protocol meets the requirements of SAE J1939/21 standard and sets the data transfer procedure via CAN bus according to the specifications of CAN 2.0B interface.

DUT-E CAN messages are transferred at 250 Kbit/s and consist of 6 fields of an extended 29-bit CAN ID, that meets the requirements of CAN 2.0B interface, and of a data field (0-8 bytes) (see Figure 1).

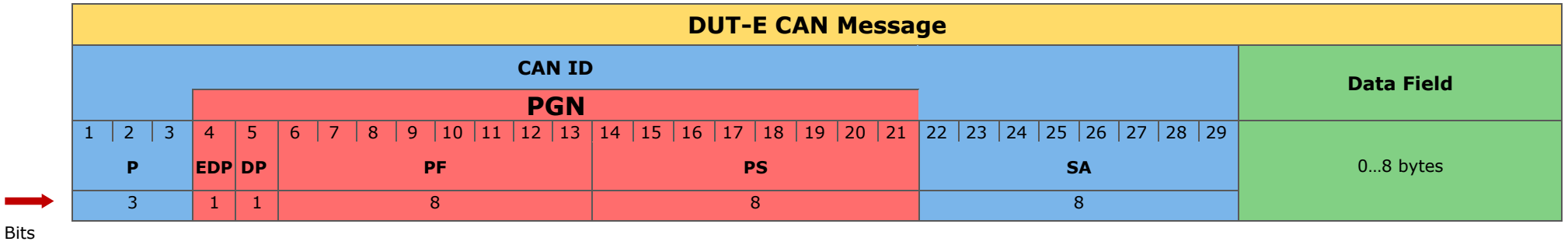

Figure 1 — DUT-E CAN message output according to J1939/21 protocol

The first 3 bits of the CAN ID are used for identifying the priority of the message (field **P**). With $P=000_2$ the message bears the highest priority, and with $P=111_2$ – the lowest priority.

The field **EDP** (1 bit) is reserved. For transferred messages EDP is always set to 0_2.

The field **DP** (1 bit) serves for selecting the data page from the whole PGN range (can possess the values 0_2 or 1_2).

PGN (Parameter Group Number) is a number of a group of parameters that defines the contents of its related DUT-E CAN message, in accordance with SAE J1939/21.

The totality of single-byte fields **PF** (sets PDU format) and **PS** (sets PDU specification) forms a PGN.

PDU (Protocol Data Unit) is a data transfer packet, in accordance with SAE J1939/21 protocol.

If the field PS takes a value from 0 to 239, then it contains a decimal identity address of the device receiving the DA (Destination Address) message, which designates as PDU1. The PDU1 format allows direct data transfer to the address recorded into the DA of the device-receptor of the message.

If the field PS takes a value from 240 to 255, then it has a large-format addressing, designated as PDU2. The PDU2 format can only be used for data transfer where no address of the DA device-receptor of the message was specified.

The last single-byte field **SA** (Source Address) contains a decimal identity address of the device-sender of the message. For DUT-E CAN, select the identity address from range 101-108.

Packet data transfer of up to 8 bytes inclusive is done in one message.

If you need to transfer more than 8 bytes of data, the packet is divided into several messages of up to 8 bytes. The maximum packet size for one PGN is 1785 bytes.

DUT-E CAN fuel level sensor transfers useful data either automatically (main mode), or by request.

DUT-E CAN configuration is done via K-Line interface (ISO 14230) using SK DUT-E service kit or other devices that support S6 bus service protocol.

The parameters, structure, and contents of DUT-E CAN messages are defined by the application level of Vehicle Application Layer protocol, according to SAE J1939/71. Refer to Table 1 for this data.

Table 1 — The description of the messages of DUT-E CAN data transfer protocol ***(open part of the DUT-E CAN Protocol)***

#	Message name	Message parameters								Message contents			
		Transfer interval	Data length	Extended data page (EDP)	Data page (DP)	PDU format (PF)	PDU specified (PS)	Default priority (P)	Parameter group number (PGN)	Start position	Length	Useful data in the message	Parameter codes according to SAE J1939/71 (SPN)
1	***PGN 62982 (DUTAll)*** Fuel level and fuel volume in the tank	1 s	8	0	0	246	6	6	62982 (0xF606)	1	2 bytes	Fuel level (in 0.1 mm)	521023
										3	2 bytes	Fuel volume in tank (in 0.1 l)	521024
										5	2 bytes	Reserved	521025
										7	1 byte	Fuel temperature (1 degree step, displacement minus 40 degrees) For example: a value of 0 degrees equals a temperature of -40 degrees	174
										8	1 byte	Reserved	524000
2	***PGN 65276 (DD)*** Dash Display	1 s	8	0	0	254	252	6	65276 (0xFEFC)	1	1 byte	Reserved	80
										2	1 byte	Fuel level	96
										3	1 byte	Reserved	95
										4	1 byte		99
										5-6	2 bytes		169
										7-8	2 bytes		-
— these fields are currently not in use.													

Please notice! The closed part of the Protocol is only provided at written request to the manufacturers of vehicle tracking devices with permission from director of Technoton.