

ITB-DC-J1939

Device: ITB-DC

Protocol: J1939

Protocol Version: 1

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1 Introduction

1.1 Purpose of the Document

This document describes the proprietary and standardized J1939 PGNs used to communicate with this device.

1.2 Validity of the Document

This document applies only to device *ITB-DC COP*, hereinafter referred to as *ITB-DC*. It does not apply to devices *ITB-DC ESP* or *ITB-DC HTQ*.

1.3 Applicable Documents

- SAE J1939
- SAE J1939-21, revised April 2001
- SAE J1939-71, revised June 2006
- SAE J1939-71
- SAE J1939-81

1.4 Definitions of Terms and Abbreviations

ITB-DC	Integrated T hrottle B ody – D irect C ontrol
ITB-DC COP	ITB-DC C ontinuous O peration
ITB-DC ESP	ITB-DC E mergency S tandby
ITB-DC HTQ	ITB-DC H igh T orque
LSB	L east S ignificant B it
MSB	M ost S ignificant B it
MICT	M OTORTECH I ntegrated C onfiguration T ool
PGN	P arameter G roup N umber
PF	P DU F ormat
PS	P DU S pecific
SPN	S uspect P arameter N umber

1.5 Notation Notes

2 J1939 Communication

2.1 Address Configuration

During configuration, you can select address assignment via harness coding. See: [Command 65296](#) and [Position and Diagnostic 65304](#)

2.1.1 Configuration with Harness Coding

Via harness coding a instance number from 0 to 3 is given to the ITB-DC. This instance number is used in the address claiming name and selects the PGN of command and diagnostic messages. The default values are shown in the table below:

ID1 / Pin L	ID2 / Pin E	Instance Number	Source Address	PGN (Rx) Command	PGN (Tx) Diagnostic
HIGH (open)	HIGH (Open)	0	19	0xFF40	0xFFFFB
LOW (GND)	HIGH (open)	1	20	0xFF41	0xFFFFB
HIGH (open)	LOW (GND)	2	21	0xFF42	0xFFFFB
LOW (GND)	LOW (GND)	3	22	0xFF43	0xFFFFB

The PGNs are selected according to harness coded instance number and configured number via MICT. The J1939 source address of the device, selected by harness coding, can be configured via MICT.

2.1.2 Configuration without Harness Coding

The source address and the PGNs can be configured via MICT. The default values are shown in the table below:

SourceAddress	PGN (Rx)Command	PGN (Tx)Diagnostic
90	0xFF10	0xFF18

2.2 Bit/Byte Numbering

Unlike SAE J1939-71, bits and bytes in this document are numbered from 7 (MSB) to 0 (LSB) and not from 8 (MSB) to 1 (LSB).

Byte 0								Byte 1								Byte 3								Byte 4							
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0

Byte 4								Byte 5								Byte 6								Byte 7							
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0

2.3 Data Ranges

According to J1939-71 the transmitted data ranges are defined as follows:

2.3.1 Transmitted Signal Ranges

Common representation of integer values:

Range Name	1 byte	2 byte	4 byte	ASCII
Valid Signal	0x00 to 0xFA	0x0000 to 0xFAFF	0x00000000 to 0xFAFFFFFF	Latin-1 0x20 to 0x7E
Parameter specific indicator	0xFB	0xFB00 to 0xFBFF	0xFB000000 to 0xFBFFFFFF	—
Reserved range for future indicator bits	0xFC to 0xFD	0xFC00 to 0xFDFF	0xFC000000 to 0xFDFFFFFF	—
Error indicator	0xFE	0xFExx	0xFExxxxxx	—
Not available or not requested	0xFF	0xFFxx	0xFFxxxxxx	—

The character set used for text is a restricted Latin-1 (ISO 8859-1) character set. The string end is marked by '*'.

2.3.2 Transmitted Values for Discrete Parameters

Two bits are usually used for this purpose.

Range Name	Transmitted Value
Disabled (off, passive, etc.)	0b00
Enabled (on, active, etc.)	0b01
Error indicator	0b10
Not available or not installed	0b11

2.3.3 Transmitted Values for Control Commands

Two bits are usually used for this purpose.

Range Name	Transmitted Value
Command to disable function (turn off, etc.)	0b00
Command to enable function (turn on, etc.)	0b01
Reserved	0b10
Don't care/take no action (leave function as is)	0b11

3 Used PGNs

The following chapters list and describe the PGNs used to communicate with the ITB-DC. The Rx/Tx prefix of the PGN name indicates the direction as seen from the ITB-DC.

Rx Received by the ITB-DC.

Tx Transmitted by ITB-DC.

The Data page is always 0

3.1 Request 59904 - RQST

Description	Value
Direction	Rx/Receive
Acronym	RQST
Data length in bytes	3
Default Priority	6
Parameter Group Number	59904 / 0x0.EA.00

A client can request a transmit PGN using this request message. In case of a request of a non-existing transmit message the device sends a negative acknowledgement via PGN 0xE8xx (see SAEJ1939-21).

xx = Source Address of the respondent. Thus, from this device.

Byte(.Bit)	Size [Bit]	SPN	Name	Value	Unit and Scaling
0	24	12341	Requested PGN	0x000000 - 0x03FFFF	

3.2 Acknowledgement Message 59392 - ACK

Description	Value
Direction	Tx/Send
Acronym	ACK
Data length in bytes	8
Default Priority	6
Parameter Group Number	59392 / 0x0.E8.00

xx = Address of requestor

In case of requesting a non-existing Tx message via a peer to peer RxRequest message the ITB-DC answers with a negative acknowledge.

Requested parameter group number (Byte 5 = LSB, Byte 7 = MSB)

Byte(.Bit)	Size [Bit]	SPN	Name	Value	Unit and Scaling
------------	------------	-----	------	-------	------------------

0	8		Control byte	0x00 - 0x03	0 = Positive Acknowledge 1 = Negative Acknowledge 2 = Access Denied 3 = Busy
1	8		Group function	0xFF	Unused
2	24		Reserved	0xFFFFFF	Unused
5	24		Requested PGN	0x000000 - 0x03FFFF	Non-existing PGN

3.3 Stop Start Broadcast 57088 - DM13

Description	Value
Direction	Rx/Receive
Acronym	DM13
Data length in bytes	8
Default Priority	6
Parameter Group Number	57088 / 0x0.DF.00

According to SAE-J1939-73 (DM13) the broadcasts can be stopped for 6 seconds via this PGN. This command is intended for troubleshooting and must not be used when engine is running. All cyclically transmitted Tx messages are stopped. Identifiable by the set 'Transmission repetition rate'.

Broadcasts can be enabled or disabled via global (0xDFFF) or specific (0xDFxx, xx = own address) request. Hold signal can only be sent via global request.

- To disable broadcasts of the above mentioned PGNs bits 7:6 of byte 0 must be set to 00_b, and bytes 1 to 7 to FF_h.
- To enable broadcasts before 6 seconds are elapsed, bits 7:6 of byte 0 must be set to 01_b, and bytes 1 to 7 to FF_h.
- To extend the disable time a hold signal must be sent before 6 seconds are elapsed. Bits 7:4 of byte 3 must be set to 0000_b or 0001_b, all other bytes must be set to FF_h.

Byte(.Bit)	Size [Bit]	SPN	Name	Value	Unit and Scaling
0.0	2		J1939 Network 1 Primary vehicle network	0x3	Unused
0.2	2		J19299	0x3	Unused
0.4	2		J1787	0x3	Unused.
0.6	2		Current Data Link	0x0 - 0x3	0 = Stop Broadcast 1 = Start Broadcast 2 = Reserved 3 = Don't care, no action
1	8		more networks 1	0xFF	Unused

2	8		more networks 2	0xFF	Unused
3.0	4		Suspend Signal	0xF	Unused
3.4	4		Hold Signal	0x0 - 0xF	0 = All Devices 1 = Modified Devices
4	16		Suspend Duration	0xFFFF	Unused
6	16		SAE Reserved	0xFFFF	Unused

3.4 Software Identification 65242 - SOFT

Description	Value
Direction	Tx/Send
Acronym	SOFT
Data length in bytes	51
Default Priority	6
Transmission repetition rate	on Request
Parameter Group Number	65242 / 0x0FEDA

The software identification PGN can be requested via PGN 0xEAxy. The size varies between 17 and 51 bytes, depending on the content.

In case of a global request with xy = 0xFF software identification is sent via broadcast multi-packet transmission described in J1939/21 (transport protocol, broadcast transfer).

In case of a peer to peer request with xy = own address the software identification will be sent via peer to peer multi-packet transmission described in J1939/21 (transport protocol, connection mode transfer).

The software identification uses the following template:

- FW_Major.FW_Minor.FW_Bugfix.FW_SVN*
- BL_Major.BL_Minor.BL_Bugfix.BL_SVN*

FW abbreviates firmware and BL bootloader.

Major and minor number ranges are from 0 to 255, bugfix range is from 0 to 65535 and SVN release from 0 to 4294967295.

Every digit is transmitted in ASCII.

Byte	Description	Value Range
0	Number Of Identification Fields	2
up to 3 bytes	Firmware Version Major	0x30 ... 0x39
1 bytes		0x2E '.'
up to 3 bytes	Firmware Version Minor	0x30 ... 0x39
1 bytes		0x2E '.'
up to 5 bytes	Firmware Version Bugfix Number	0x30 ... 0x39
1 bytes		0x2E '.'
up to 10 bytes	Firmware Version SVN version	0x30 ... 0x39
1 bytes		0x2A '*'
up to 3 bytes	Bootloader Version Major	0x30 ... 0x39
1 bytes		0x2E '.'
up to 3 bytes	Bootloader Version Minor	0x30 ... 0x39
1 bytes		0x2E '.'
up to 5 bytes	Bootloader Version Bugfix Number	0x30 ... 0x39
1 bytes		0x2A '*'

Byte(.Bit)	Size [Bit]	SPN	Name	Value	Unit and Scaling
0	408		Identification String		See above

3.5 Command 65296

Description	Value
Direction	Rx/Receive
Data length in bytes	8
Default Priority	6
Parameter Group Number	65296 / 0x0FF10

- The PGN depends on the instance number assigned by the harness coding and the configured values. Default: 0xFF10, 0xFF40 ... 0xFF43 See: [Address Configuration](#)
- The Shutdown / Reboot command causes an unconditional software reset.
- The Error Reset command works only in error state. A new reference drive is executed. In case of Over Current, Over Temperature or Low Power Error a software reset is triggered.
- The Position Demand command can only be executed in Operational State.
- Fieldbus must be configured via MICT as target input.

Byte(.Bit)	Size [Bit]	SPN	Name	Value	Unit and Scaling
0	16		Position Demand in percent	0x0000 - 0x9C40	Value = raw * 0.0025 + 0 [%]

2.0	2		unused		
2.2	2		Logged Diagnostic		0 = No Action 1 = Clear/Reset 2 = Reserved 3 = Reserved
2.4	2		Control Cmd		0 = No Action 1 = Shutdown / Reboot 2 = Error Reset 3 = Reserved
2.6	2		unused		
3	40		unused		

3.6 Position and Diagnostic 65304

Description	Value
Direction	Tx/Send
Data length in bytes	8
Default Priority	6
Transmission repetition rate	100 [ms]
Parameter Group Number	65304 / 0x0FF18

- The PGN depends on the instance number assigned by the harness coding and the configured values. Default: 0xFF18, 0xFF1B. See: [Address Configuration](#)
- The repetition rate and the PGN are configurable via MICT. See: [Address Configuration](#)
- The current values of bytes 4 and 5 are stored as logged values in bytes 6 and 7 until they are reset by the Logged Diagnostic Reset command described in the command message chapter.

Byte(.Bit)	Size [Bit]	SPN	Name	Value	Unit and Scaling
0	8		Current position	0x00 - 0xFA	Value = raw * 0.4 [%]
1	8		Target position	0x00 - 0xFA	Value = raw * 0.4 [%]
2	8		Current Temperature	0x00 - 0xFA	Value = raw - 40.0 [°C]
3	8		Status		
4.0	1		Current Error State		
4.1	1		Current Non Operational State		0 = Operational 1 = Non Operational
4.2	1		Current Low Power IRQ		
4.3	1		Current Step Loss Error		
4.4	1		Current Temperature Sensor Fault		

4.5	1		unused		
4.6	1		Current Over Temperature IRQ		
4.7	1		Current Over Current IRQ		
5.0	5		unused		
5.5	1		Current CAN Position Demand Timeout		
5.6	2		unused		
6.0	1		Logged Error State		
6.1	1		Logged Non Operational State		0 = Operational 1 = Non Operational
6.2	1		Logged Low Power IRQ		
6.3	1		Logged Step Loss Error		
6.4	1		Logged Temperature Sensor Fault		
6.5	1		unused		
6.6	1		Logged Over Temperature IRQ		
6.7	1		Logged Over Current IRQ		
7.0	5		unused		
7.5	1		Logged CAN Position Demand Timeout		
7.6	2		unused		

I Revision History

Date	Name	Comment	Rev.
2025-11-24	Zabe, Volker	Approved	1

II Used Tools

Tool	Version
MUSE-Link	0.2
MUSE	1.0
MUSE-J1939	0.2
MUSE-Link	0.2
MUSE-Latex	0.3

III Copyright

English:

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