CiA Draft Standard Proposal 447

Application profile for special-purpose car add-on devices

Part 4: Pre-defined CAN-IDs and communication objects

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HISTORY

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CONTENTS

1 Scope

This CANopen application profile specifies the CAN physical layer as well as application, configuration and diagnostic parameters for the add-on devices used in special-purpose passenger cars such as taximeter, roof bar, etc. The specification comprises the following parts:

- Part 1: General definitions
- Part 2: Virtual device definition
- Part 3: Detailed process data specification
- Part 4: Pre-defined CAN-IDs and communication objects

This part specifies the pre-defined communication objects.

2 Normative references

/CiA447-1/ CiA 447, CANopen application profile for special-purpose car add-on devices – Part 1: General definitions

The normative references given in /CiA447-1/ apply for this specification, too.

3 Definitions and abbreviations

3.1 Definitions

The definitions given in /CiA447-1/ apply to this specification, too.

3.2 Abbreviations

The abbreviations given in /CiA447-1/ apply to this specification, too.

4 Communication parameters

4.1 Introduction

This clause defines the set of communication principles specific for this profile. For those the pre-defined CAN-IDs of /CiA301/ shall not be valid. For all communication services not covered in chapter 4 such as default SDO CAN-IDs, NMT functionality, Emergency message and Heartbeat functionality the pre-defined CAN-IDs of /CiA301/ shall be valid, but reduced by using the node-IDs 1 to 16.

4.2 SDO communication

4.2.1 Basic principles

The SDO services are used to realize the full meshed SDO communication. Therefore every car add-on device shall provide 15 SDO servers and may provide 1 to 15 SDO clients.

Diagnostic testers or other tools shall apply the rules of the CAN-ID distribution. For this they shall have a node-ID. The node-ID may be assigned via LSS FastScan procedure (see /CiA305/) or by setting a fixed free node-ID. It is recommended to assign node-IDs starting from 2 and ascending for car add-on CANopen devices and tools to use node-IDs starting with 16 and descending. In a network with 16 installed devices no further tool may be attached.

NOTE: It has to be considered that for devices of category LSS-ID the SSDO parameters, CSDO parameters and PDO parameters are calculated after the node-ID assignment. After the calculation these parameters are stored in RAM of the device.

The used CAN-IDs for full meshed SDO communication are specified in clause 4.2.2.

4.2.2 SDO CAN-ID assignment

Table 1 and Table 2 specify the CAN-IDs that shall be used for SDO communication services. The SDO parameter entries $12XX_h$ shall be implemented with access type *ro* (read only).

The CAN-IDs for SDO communication were calculated by means of CAN-ID structure and formula as given in annex A (informative).

Table 1 – SDO CAN-IDs for request client (C) to server (S)

Node-ID	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15	S16
C1	-	241_h	242_h	243_h	244_h	245_h	246_h	247_h	248_h	249_h	$24A_h$	$24B_h$	$24C_h$	$24D_h$	$24E_h$	$24F_h$
C2	250_h	-	252_h	253_h	254_h	255_h	256_h	257_h	258_h	259_h	$25A_h$	$25B_h$	$25C_h$	$25D_h$	$25E_h$	$25F_h$
C3	260_h	261_h	-	263_h	264_h	265_h	266_h	267_h	268_h	269_h	$26A_h$	$26B_h$	$26C_h$	$26D_h$	$26E_h$	$26F_h$
C4	270_h	271_h	272_h	-	274_h	275_h	276_h	277_h	278_h	279_h	$27A_h$	$27B_h$	$27C_h$	$27D_h$	$27E_h$	$27F_h$
C5	340_h	341_h	342_h	343_h	-	345_h	346_h	347_h	348_h	349_h	$34A_h$	$34B_h$	$34C_h$	$34D_h$	$34E_h$	$34F_h$
C6	350_h	351_h	352_h	353_h	354_h	-	356_h	357_h	358_h	359_h	$35A_h$	$35B_h$	$35C_h$	$35D_h$	$35E_h$	$35F_h$
C7	360_h	361_h	362_h	363_h	364_h	365_h	-	367_h	368_h	369_h	$36A_h$	$36B_h$	$36C_h$	$36D_h$	$36E_h$	$36F_h$
C8	370_h	371_h	372_h	373_h	374_h	375_h	376_h	-	378_h	379_h	$37A_h$	$37B_h$	$37C_h$	$37D_h$	$37E_h$	$37F_h$
C9	440_h	441_h	442_h	443_h	444_h	445_h	446_h	447_h	-	449_h	$44A_h$	$44B_h$	$44C_h$	$44D_h$	$44E_h$	$44F_h$
C10	450_h	451_h	452_h	453_h	454_h	455_h	456_h	457_h	458_h	-	$45A_h$	$45B_h$	$45C_h$	$45D_h$	$45E_h$	$45F_h$
C11	460_h	461_h	462_h	463_h	464_h	465_h	466_h	467_h	468_h	469_h	-	$46B_h$	$46C_h$	$46D_h$	$46E_h$	$46F_h$
C12	470_h	471_h	472_h	473_h	474_h	475_h	476_h	477_h	478_h	479_h	$47A_h$	-	$47C_h$	$47D_h$	$47E_h$	$47F_h$
C13	540_h	541_h	542_h	543_h	544_h	545_h	546_h	547_h	548_h	549_h	$54A_h$	$54B_h$	-	$54D_h$	$54E_h$	$54F_h$
C14	550_h	551_h	552_h	553_h	554_h	555_h	556_h	557_h	558_h	559_h	$55A_h$	$55B_h$	$55C_h$	-	$55E_h$	$55F_h$
C15	560_h	561_h	562_h	563_h	564_h	565_h	566_h	567_h	568_h	569_h	$56A_h$	$56B_h$	$56C_h$	$56D_h$	-	$56F_h$
C16	570_h	571_h	572_h	573_h	574_h	575_h	576_h	577_h	578_h	579_h	$57A_h$	$57B_h$	$57C_h$	$57D_h$	$57E_h$	-

Table 2 – SDO CAN-IDs for response server (S) to client (C)

Node-ID	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15	S16
C1	-	$1C1_h$	$1C2_h$	$1C3_h$	$1C4_h$	$1C5_h$	$1C6_h$	$1C7_h$	$1C8_h$	$1C9_h$	$1CA_h$	$1CB_h$	$1CC_h$	$1CD_h$	$1CE_h$	$1CF_h$
C2	$1D0_h$	-	$1D2_h$	$1D3_h$	$1D4_h$	$1D5_h$	$1D6_h$	$1D7_h$	$1D8_h$	$1D9_h$	$1DA_h$	$1DB_h$	$1DC_h$	$1DD_h$	$1DE_h$	$1DF_h$
C3	$1E0_h$	$1E1_h$	-	$1E3_h$	$1E4_h$	$1E5_h$	$1E6_h$	$1E7_h$	$1E8_h$	$1E9_h$	$1EA_h$	$1EB_h$	$1EC_h$	$1ED_h$	$1EE_h$	$1EF_h$
C4	$1F0_h$	$1F1_h$	$1F2_h$	-	$1F4_h$	$1F5_h$	$1F6_h$	$1F7_h$	$1F8_h$	$1F9_h$	$1FA_h$	$1FB_h$	$1FC_h$	$1FD_h$	$1FE_h$	$1FF_h$
C5	$2C0_h$	$2C1_h$	$2C2_h$	$2C3_h$	-	$2C5_h$	$2C6_h$	$2C7_h$	$2C8_h$	$2C9_h$	$2CA_h$	$2CB_h$	$2CC_h$	$2CD_h$	$2CE_h$	$2CF_h$
C6	$2D0_h$	$2D1_h$	$2D2_h$	$2D3_h$	$2D4_h$	-	$2D6_h$	$2D7_h$	$2D8_h$	$2D9_h$	$2DA_h$	$2DB_h$	$2DC_h$	$2DD_h$	$2DE_h$	$2DF_h$
C7	$2E0_h$	$2E1_h$	$2E2_h$	$2E3_h$	$2E4_h$	$2E5_h$	-	$2E7_h$	$2E8_h$	$2E9_h$	$2EA_h$	$2EB_h$	$2EC_h$	$2ED_h$	$2EE_h$	$2EF_h$
C8	$2F0_h$	$2F1_h$	$2F2_h$	$2F3_h$	$2F4_h$	$2F5_h$	$2F6_h$	-	$2F8_h$	$2F9_h$	$2FA_h$	$2FB_h$	$2FC_h$	$2FD_h$	$2FE_h$	$2FF_h$
C9	$3C0_h$	$3C1_h$	$3C2_h$	$3C3_h$	$3C4_h$	$3C5_h$	$3C6_h$	$3C7_h$	-	$3C9_h$	$3CA_h$	$3CB_h$	$3CC_h$	$3CD_h$	$3CE_h$	$3CF_h$
C10	$3D0_h$	$3D1_h$	$3D2_h$	$3D3_h$	$3D4_h$	$3D5_h$	$3D6_h$	$3D7_h$	$3D8_h$	-	$3DA_h$	$3DB_h$	$3DC_h$	$3DD_h$	$3DE_h$	$3DF_h$
C11	$3E0_h$	$3E1_h$	$3E2_h$	$3E3_h$	$3E4_h$	$3E5_h$	$3E6_h$	$3E7_h$	$3E8_h$	$3E9_h$	-	$3EB_h$	$3EC_h$	$3ED_h$	$3EE_h$	$3EF_h$
C12	$3F0_h$	$3F1_h$	$3F2_h$	$3F3_h$	$3F4_h$	$3F5_h$	$3F6_h$	$3F7_h$	$3F8_h$	$3F9_h$	$3FA_h$	-	$3FC_h$	$3FD_h$	$3FE_h$	$3FF_h$
C13	$4C0_h$	$4C1_h$	$4C2_h$	$4C3_h$	$4C4_h$	$4C5_h$	$4C6_h$	$4C7_h$	$4C8_h$	$4C9_h$	$4CA_h$	$4CB_h$	-	$4CD_h$	$4CE_h$	$4CF_h$
C14	$4D0_h$	$4D1_h$	$4D2_h$	$4D3_h$	$4D4_h$	$4D5_h$	$4D6_h$	$4D7_h$	$4D8_h$	$4D9_h$	$4DA_h$	$4DB_h$	$4DC_h$	-	$4DE_h$	$4DF_h$
C15	$4E0_h$	$4E1_h$	$4E2_h$	$4E3_h$	$4E4_h$	$4E5_h$	$4E6_h$	$4E7_h$	$4E8_h$	$4E9_h$	$4EA_h$	$4EB_h$	$4EC_h$	$4ED_h$	-	$4EF_h$
C16	$4F0_h$	$4F1_h$	$4F2_h$	$4F3_h$	$4F4_h$	$4F5_h$	$4F6_h$	$4F7_h$	$4F8_h$	$4F9_h$	$4FA_h$	$4FB_h$	$4FC_h$	$4FD_h$	$4FE_h$	-

4.3 Unified diagnostic services and ISO-TP

4.3.1 Basic principles

For diagnostic services each car add-on device shall implement the objects 1000_h, 1001_h, 1003_h, 1018_h sub-indices 00_h to 04_h and 6000_h inclusive all sub-indices.

For extended diagnostic functions each device may implement services according to /ISO14229-1/ (UDS). The used communication protocol then shall be /ISO15765-3/ (ISO-TP). The data content shall be according to /ISO14229-1/ and /ISO15765-3/. The used CAN-IDs are specified in clause 4.3.2.

For enhanced functionality on accessing car-specific resources like the vehicle display the car add-on devices may implement a communication channel from the requesting device to the IVN gateway using /ISO15765-3/. The data content structure shall be according to /ISO15765-3/ and is not specified in this profile. The used CAN-IDs are specified in clause 4.3.2.

4.3.2 CAN-ID assignment for UDS and ISO-TP

Table 3 specifies the CAN-IDs that shall be used for diagnostic communication using /ISO14229-1/ (UDS) and /ISO15765-3/ (ISO-TP). Table 4 specifies the CAN-IDs that shall be used for communication to car resources using /ISO15765-3/.

The CAN-IDs for ISO-TP access to car resources were calculated by means of the formula as given in annex A (informative).

Table 3 – CAN-IDs for usage of UDS

Usage	CAN-ID
CAN-ID for functional addressing (broadcast)	780_h
CAN-ID for diagnostic channel from IVN gateway to node 2	781_h
CAN-ID for diagnostic channel from IVN gateway to node 3	782_h
to	*to*
CAN-ID for diagnostic channel from IVN gateway to node 16	$78F_h$
CAN-ID for diagnostic channel from node 2 to IVN gateway	791_h
CAN-ID for diagnostic channel from node 3 to IVN gateway	792_h
to	*to*
CAN-ID for diagnostic channel from node 16 to IVN gateway	$79F_h$

Table 4 – CAN-IDs for ISO-TP access to car resources

Node-ID	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
To IVN gateway	251_h	262_h	273_h	344_h	355_h	366_h	377_h	448_h	459_h	$46A_h$	$47B_h$	$54C_h$	$55D_h$	$56E_h$	$57F_h$
From IVN gateway	$1D1_h$	$1E2_h$	$1F3_h$	$2C4_h$	$2D5_h$	$2E6_h$	$2F7_h$	$3C8_h$	$3D9_h$	$3EA_h$	$3FB_h$	$4CC_h$	$4DD_h$	$4EE_h$	$4FF_h$

4.4 PDO communication

4.4.1 Basic principles

This application profile specifies the PDO communication between the virtual devices. If virtual devices are implemented in the very same CANopen device, they may exchange the process data locally not using the CANopen network.

The PDO parameters of RPDOs are located in the object dictionary starting with the index 1400_h (communication parameters) and 1600_h (mapping parameters). The explicit assignment

of a dedicated RPDO to a pre-defined virtual device is not specified. The RPDO parameters shall be supported for each activated RPDO. The RPDO mapping parameters shall match to the mapping of the corresponding TPDO.

NOTE: Be aware that the adjustment of CAN-IDs for the RPDOs takes place during the start-up phase of the network. While this phase a CANopen device gathers information about virtual devices located on other CANopen devices. Based on this information the activation of the corresponding RPDO may occur.

If several functional clients of the same type are located in one CANopen device, the data of the additional functional clients shall be located in the manufacturer-specific area (2000_h to $5FFF_h$) of the object dictionary. The local application takes care of assigning this data to the related functional client. The RPDO mapping parameters shall reflect this special configuration case.

The value definitions of object and entry descriptions for PDO communication and mapping parameters are given in /CiA301/. The sub-index 04_h of the PDO communication parameter is reserved for compatibility reasons. Sub-index 02_h (transmission type) shall be 255. TPDOs with transmission type of 255 shall be sent immediately after transition into NMT operational state or if one of the mapped process data changes its value. RPDOs with transmission type of 255 shall update the mapped objects immediately.

If a PDO is supported, all objects mapped in this PDO shall be supported in the object dictionary.

The virtual device IVN gateway (function group car body electronics, light and signaling and power train) exists only once in the network and shall be always implemented in the physical device with node-ID 1. Therefore the COB-IDs of PDOs transmitted from this virtual device are set to fix values.

Other virtual devices may be implemented in multiple physical devices. Several virtual devices of the same type shall not be implemented in one physical CANopen device.

4.4.2 PDO parameters

In the following the PDO communication and mapping parameter attributes are specified. For all PDO communication and mapping parameters the access attribute shall be set to *ro* (read only).

Table 5 specifies the communication and mapping parameter objects that shall be used by certain virtual devices. For differentiation of virtual devices, a *vdfg* (virtual device function group) number as specified in Table 5 is assigned. The *vdfg* is different from the bit number identifying certain virtual devices in *virtual device support* (object 6000_h).

Table 5 – Assignment of PDOs to virtual devices

***vdfg* number**	**Virtual device**	**Objects used for PDO definition $18XX_h$ (TPDO communication parameter) $1AXX_h$ (TPDO mapping parameter)**
0	Car body electronics (IVN gateway)	1800_h to $180F_h$, $1A00_h$ to $1A0F_h$
1	Power train, Light and signaling (IVN gateway)	1810_h to $181F_h$, $1A10_h$ to $1A1F_h$
2	Radio hand-free conversation	1840_h, $1A40_h$
3	“Blue” light flasher module	1841_h, $1A41_h$
4	Driver identification	1842_h, $1A42_h$
5	Emergency fresh-air system	1843_h, $1A43_h$
6	Fire extinguishing system	1844_h, $1A44_h$

vdfg number	Virtual device	Objects used for PDO definition $18XX_h$ (TPDO communication parameter) $1AXX_h$ (TPDO mapping parameter)
7	GPS	1845_h, $1A45_h$
8	Taxi alarm system	1846_h, $1A46_h$
9	Printer	1847_h, $1A47_h$
10	Roof bar light	1848_h, $1A48_h$
11	Roof bar light	1849_h, $1A49_h$
12	Roof bar light	$184A_h$, $1A4A_h$
13	Roof bar sound	$184B_h$, $1A4B_h$
14	Tariff display	$184C_h$, $1A4C_h$
15	Tariff display	$184D_h$, $1A4D_h$
16	Discrete inputs	$184E_h$, $1A4E_h$
17	Taximeter	$184F_h$, $1A4F_h$
18	Terminal	1850_h, $1A50_h$
19	Terminal	1851_h, $1A51_h$
20	Radio	1852_h, $1A52_h$
21	Power supply	1853_h, $1A53_h$
22 to 31	Reserved	1854_h to $185D_h$, $1A54_h$ to $1A5D_h$

Table 6 specifies the value range and default value of the PDO communication parameter entries sub-index 01_h (COB-ID). The node-ID and the *vdfg* shall apply to the corresponding functional server (transmitter of the source signal). All implemented PDOs shall be valid. The usage of CAN remote frames is not allowed.

The CAN-IDs for PDO communication as given in Table 6 were calculated by means of CAN-ID structure and formula as given in annex A (informative).

Table 6 – Assignment of COB-IDs to PDOs

Node-ID	*vdfg* number	Index $18XX_h$ 01_h (TPDO COB-ID)	CAN-ID	Resulted COB-ID
1	0	1800_h	180_h	4000 0180_h
1	0	1801_h	200_h	4000 0200_h
1	0	1802_h	280_h	4000 0280_h
1	0	1803_h	300_h	4000 0300_h
1	0	1804_h	380_h	4000 0380_h
1	0	1805_h	400_h	4000 0400_h
1	0	1806_h	480_h	4000 0480_h
1	0	1807_h	500_h	4000 0500_h
1	0	1808_h	$1A0_h$	4000 $01A0_h$
1	0	1809_h	220_h	4000 0220_h
1	0	$180A_h$	$2A0_h$	4000 $02A0_h$
1	0	$180B_h$	320_h	4000 0320_h
1	0	$180C_h$	$3A0_h$	4000 $03A0_h$
1	0	$180D_h$	420_h	4000 0420_h
1	0	$180E_h$	$4A0_h$	4000 $04A0_h$
1	0	$180F_h$	520_h	4000 0520_h
1	1	1810_h	181_h	4000 0181_h

Node-ID	*vdfg* number	Index $18XX_h$ 01_h (TPDO COB-ID)	CAN-ID	Resulted COB-ID
1	1	1811_h	201_h	4000 0201_h
1	1	1812_h	281_h	4000 0281_h
1	1	1813_h	301_h	4000 0301_h
1	1	1814_h	381_h	4000 0381_h
1	1	1815_h	401_h	4000 0401_h
1	1	1816_h	481_h	4000 0481_h
1	1	1817_h	501_h	4000 0501_h
1	1	1818_h	$1A1_h$	4000 $01A1_h$
1	1	1819_h	221_h	4000 0221_h
1	1	$181A_h$	$2A1_h$	4000 $02A1_h$
1	1	$181B_h$	321_h	4000 0321_h
1	1	$181C_h$	$3A1_h$	4000 $03A1_h$
1	1	$181D_h$	421_h	4000 0421_h
1	1	$181E_h$	$4A1_h$	4000 $04A1_h$
1	1	$181F_h$	521_h	4000 0521_h
1	2	1840_h	182_h	4000 0182_h
1	3	1841_h	183_h	4000 0183_h
1	4	1842_h	184_h	4000 0184_h
1	5	1843_h	185_h	4000 0185_h
1	6	1844_h	186_h	4000 0186_h
1	7	1845_h	187_h	4000 0187_h
1	8	1846_h	188_h	4000 0188_h
1	9	1847_h	189_h	4000 0189_h
1	10	1848_h	$18A_h$	4000 $018A_h$
1	11	1849_h	$18B_h$	4000 $018B_h$
1	12	$184A_h$	$18C_h$	4000 $018C_h$
1	13	$184B_h$	$18D_h$	4000 $018D_h$
1	14	$184C_h$	$18E_h$	4000 $018E_h$
1	15	$184D_h$	$18F_h$	4000 $018F_h$
1	16	$184E_h$	190_h	4000 0190_h
1	17	$184F_h$	191_h	4000 0191_h
1	18	1850_h	192_h	4000 0192_h
1	19	1851_h	193_h	4000 0193_h
1	20	1852_h	194_h	4000 0194_h
1	21	1853_h	195_h	4000 0195_h
1	22 to 31	1854_h to $185D_h$	196_h to $19F_h$	4000 0196_h to 4000 $019F_h$
2	2	1840_h	202_h	4000 0202_h
2	3	1841_h	203_h	4000 0203_h
2	4	1842_h	204_h	4000 0204_h
2	5	1843_h	205_h	4000 0205_h
2	6	1844_h	206_h	4000 0206_h

Node-ID	*vdfg* number	Index $18XX_h$ 01_h (TPDO COB-ID)	CAN-ID	Resulted COB-ID
2	7	1845_h	207_h	4000 0207_h
2	8	1846_h	208_h	4000 0208_h
2	9	1847_h	209_h	4000 0209_h
2	10	1848_h	$20A_h$	4000 $020A_h$
2	11	1849_h	$20B_h$	4000 $020B_h$
2	12	$184A_h$	$20C_h$	4000 $020C_h$
2	13	$184B_h$	$20D_h$	4000 $020D_h$
2	14	$184C_h$	$20E_h$	4000 $020E_h$
2	15	$184D_h$	$20F_h$	4000 $020F_h$
2	16	$184E_h$	210_h	4000 0210_h
2	17	$184F_h$	211_h	4000 0211_h
2	18	1850_h	212_h	4000 0212_h
2	19	1851_h	213_h	4000 0213_h
2	20	1852_h	214_h	4000 0214_h
2	21	1853_h	215_h	4000 0215_h
2	22 to 31	1854_h to $185D_h$	216_h to $21F_h$	4000 0216_h to 4000 $021F_h$
3	2	1840_h	282_h	4000 0282_h
3	3	1841_h	283_h	4000 0283_h
3	4	1842_h	284_h	4000 0284_h
3	5	1843_h	285_h	4000 0285_h
3	6	1844_h	286_h	4000 0286_h
3	7	1845_h	287_h	4000 0287_h
3	8	1846_h	288_h	4000 0288_h
3	9	1847_h	289_h	4000 0289_h
3	10	1848_h	$28A_h$	4000 $028A_h$
3	11	1849_h	$28B_h$	4000 $028B_h$
3	12	$184A_h$	$28C_h$	4000 $028C_h$
3	13	$184B_h$	$28D_h$	4000 $028D_h$
3	14	$184C_h$	$28E_h$	4000 $028E_h$
3	15	$184D_h$	$28F_h$	4000 $028F_h$
3	16	$184E_h$	290_h	4000 0290_h
3	17	$184F_h$	291_h	4000 0291_h
3	18	1850_h	292_h	4000 0292_h
3	19	1851_h	293_h	4000 0293_h
3	20	1852_h	294_h	4000 0294_h
3	21	1853_h	295_h	4000 0295_h
3	22 to 31	1854_h to $185D_h$	296_h to $29F_h$	4000 0296_h to 4000 $029F_h$
4	2	1840_h	302_h	4000 0302_h
4	3	1841_h	303_h	4000 0303_h
4	4	1842_h	304_h	4000 0304_h

Node-ID	*vdfg* number	Index $18XX_h$ 01_h (TPDO COB-ID)	CAN-ID	Resulted COB-ID
4	5	1843_h	305_h	4000 0305_h
4	6	1844_h	306_h	4000 0306_h
4	7	1845_h	307_h	4000 0307_h
4	8	1846_h	308_h	4000 0308_h
4	9	1847_h	309_h	4000 0309_h
4	10	1848_h	$30A_h$	4000 $030A_h$
4	11	1849_h	$30B_h$	4000 $030B_h$
4	12	$184A_h$	$30C_h$	4000 $030C_h$
4	13	$184B_h$	$30D_h$	4000 $030D_h$
4	14	$184C_h$	$30E_h$	4000 $030E_h$
4	15	$184D_h$	$30F_h$	4000 $030F_h$
4	16	$184E_h$	310_h	4000 0310_h
4	17	$184F_h$	311_h	4000 0311_h
4	18	1850_h	312_h	4000 0312_h
4	19	1851_h	313_h	4000 0313_h
4	20	1852_h	314_h	4000 0314_h
4	21	1853_h	315_h	4000 0315_h
4	22 to 31	1854_h to $185D_h$	316_h to $31F_h$	4000 0316_h to 4000 $031F_h$
5	2	1840_h	382_h	4000 0382_h
5	3	1841_h	383_h	4000 0383_h
5	4	1842_h	384_h	4000 0384_h
5	5	1843_h	385_h	4000 0385_h
5	6	1844_h	386_h	4000 0386_h
5	7	1845_h	387_h	4000 0387_h
5	8	1846_h	388_h	4000 0388_h
5	9	1847_h	389_h	4000 0389_h
5	10	1848_h	$38A_h$	4000 $038A_h$
5	11	1849_h	$38B_h$	4000 $038B_h$
5	12	$184A_h$	$38C_h$	4000 $038C_h$
5	13	$184B_h$	$38D_h$	4000 $038D_h$
5	14	$184C_h$	$38E_h$	4000 $038E_h$
5	15	$184D_h$	$38F_h$	4000 $038F_h$
5	16	$184E_h$	390_h	4000 0390_h
5	17	$184F_h$	391_h	4000 0391_h
5	18	1850_h	392_h	4000 0392_h
5	19	1851_h	393_h	4000 0393_h
5	20	1852_h	394_h	4000 0394_h
5	21	1853_h	395_h	4000 0395_h
5	22 to 31	1854_h to $185D_h$	396_h to $39F_h$	4000 0396_h to 4000 $039F_h$
6	2	1840_h	402_h	4000 0402_h

Node-ID	*vdfg* number	Index $18XX_h$ 01_h (TPDO COB-ID)	CAN-ID	Resulted COB-ID
6	3	1841_h	403_h	4000 0403_h
6	4	1842_h	404_h	4000 0404_h
6	5	1843_h	405_h	4000 0405_h
6	6	1844_h	406_h	4000 0406_h
6	7	1845_h	407_h	4000 0407_h
6	8	1846_h	408_h	4000 0408_h
6	9	1847_h	409_h	4000 0409_h
6	10	1848_h	$40A_h$	4000 $040A_h$
6	11	1849_h	$40B_h$	4000 $040B_h$
6	12	$184A_h$	$40C_h$	4000 $040C_h$
6	13	$184B_h$	$40D_h$	4000 $040D_h$
6	14	$184C_h$	$40E_h$	4000 $040E_h$
6	15	$184D_h$	$40F_h$	4000 $040F_h$
6	16	$184E_h$	410_h	4000 0410_h
6	17	$184F_h$	411_h	4000 0411_h
6	18	1850_h	412_h	4000 0412_h
6	19	1851_h	413_h	4000 0413_h
6	20	1852_h	414_h	4000 0414_h
6	21	1853_h	415_h	4000 0415_h
6	22 to 31	1854_h to $185D_h$	416_h to $41F_h$	4000 0416_h to 4000 $041F_h$
7	2	1840_h	482_h	4000 0482_h
7	3	1841_h	483_h	4000 0483_h
7	4	1842_h	484_h	4000 0484_h
7	5	1843_h	485_h	4000 0485_h
7	6	1844_h	486_h	4000 0486_h
7	7	1845_h	487_h	4000 0487_h
7	8	1846_h	488_h	4000 0488_h
7	9	1847_h	489_h	4000 0489_h
7	10	1848_h	$48A_h$	4000 $048A_h$
7	11	1849_h	$48B_h$	4000 $048B_h$
7	12	$184A_h$	$48C_h$	4000 $048C_h$
7	13	$184B_h$	$48D_h$	4000 $048D_h$
7	14	$184C_h$	$48E_h$	4000 $048E_h$
7	15	$184D_h$	$48F_h$	4000 $048F_h$
7	16	$184E_h$	490_h	4000 0490_h
7	17	$184F_h$	491_h	4000 0491_h
7	18	1850_h	492_h	4000 0492_h
7	19	1851_h	493_h	4000 0493_h
7	20	1852_h	494_h	4000 0494_h
7	21	1853_h	495_h	4000 0495_h
7	22 to 31	1854_h to $185D_h$	496_h to $49F_h$	4000 0496_h to 4000 $049F_h$

Node-ID	*vdfg* number	Index $18XX_h$ 01_h (TPDO COB-ID)	CAN-ID	Resulted COB-ID
8	2	1840_h	502_h	4000 0502_h
8	3	1841_h	503_h	4000 0503_h
8	4	1842_h	504_h	4000 0504_h
8	5	1843_h	505_h	4000 0505_h
8	6	1844_h	506_h	4000 0506_h
8	7	1845_h	507_h	4000 0507_h
8	8	1846_h	508_h	4000 0508_h
8	9	1847_h	509_h	4000 0509_h
8	10	1848_h	$50A_h$	4000 $050A_h$
8	11	1849_h	$50B_h$	4000 $050B_h$
8	12	$184A_h$	$50C_h$	4000 $050C_h$
8	13	$184B_h$	$50D_h$	4000 $050D_h$
8	14	$184C_h$	$50E_h$	4000 $050E_h$
8	15	$184D_h$	$50F_h$	4000 $050F_h$
8	16	$184E_h$	510_h	4000 0510_h
8	17	$184F_h$	511_h	4000 0511_h
8	18	1850_h	512_h	4000 0512_h
8	19	1851_h	513_h	4000 0513_h
8	20	1852_h	514_h	4000 0514_h
8	21	1853_h	515_h	4000 0515_h
8	22 to 31	1854_h to $185D_h$	516_h to $51F_h$	4000 0516_h to 4000 $051F_h$
9	2	1840_h	$1A2_h$	4000 $01A2_h$
9	3	1841_h	$1A3_h$	4000 $01A3_h$
9	4	1842_h	$1A4_h$	4000 $01A4_h$
9	5	1843_h	$1A5_h$	4000 $01A5_h$
9	6	1844_h	$1A6_h$	4000 $01A6_h$
9	7	1845_h	$1A7_h$	4000 $01A7_h$
9	8	1846_h	$1A8_h$	4000 $01A8_h$
9	9	1847_h	$1A9_h$	4000 $01A9_h$
9	10	1848_h	$1AA_h$	4000 $01AA_h$
9	11	1849_h	$1AB_h$	4000 $01AB_h$
9	12	$184A_h$	$1AC_h$	4000 $01AC_h$
9	13	$184B_h$	$1AD_h$	4000 $01AD_h$
9	14	$184C_h$	$1AE_h$	4000 $01AE_h$
9	15	$184D_h$	$1AF_h$	4000 $01AF_h$
9	16	$184E_h$	$1B0_h$	4000 $01B0_h$
9	17	$184F_h$	$1B1_h$	4000 $01B1_h$
9	18	1850_h	$1B2_h$	4000 $01B2_h$
9	19	1851_h	$1B3_h$	4000 $01B3_h$
9	20	1852_h	$1B4_h$	4000 $01B4_h$

Node-ID	*vdfg* number	Index $18XX_h$ 01_h (TPDO COB-ID)	CAN-ID	Resulted COB-ID
9	21	1853_h	$1B5_h$	4000 $01B5_h$
9	22 to 31	1854_h to $185D_h$	$1B6_h$ to $1BF_h$	4000 $01B6_h$ to 4000 $01BF_h$
10	2	1840_h	222_h	4000 0222_h
10	3	1841_h	223_h	4000 0223_h
10	4	1842_h	224_h	4000 0224_h
10	5	1843_h	225_h	4000 0225_h
10	6	1844_h	226_h	4000 0226_h
10	7	1845_h	227_h	4000 0227_h
10	8	1846_h	228_h	4000 0228_h
10	9	1847_h	229_h	4000 0229_h
10	10	1848_h	$22A_h$	4000 $022A_h$
10	11	1849_h	$22B_h$	4000 $022B_h$
10	12	$184A_h$	$22C_h$	4000 $022C_h$
10	13	$184B_h$	$22D_h$	4000 $022D_h$
10	14	$184C_h$	$22E_h$	4000 $022E_h$
10	15	$184D_h$	$22F_h$	4000 $022F_h$
10	16	$184E_h$	230_h	4000 0230_h
10	17	$184F_h$	231_h	4000 0231_h
10	18	1850_h	232_h	4000 0232_h
10	19	1851_h	233_h	4000 0233_h
10	20	1852_h	234_h	4000 0234_h
10	21	1853_h	235_h	4000 0235_h
10	22 to 31	1854_h to $185D_h$	236_h to $23F_h$	4000 0236_h to 4000 $023F_h$
11	2	1840_h	$2A2_h$	4000 $02A2_h$
11	3	1841_h	$2A3_h$	4000 $02A3_h$
11	4	1842_h	$2A4_h$	4000 $02A4_h$
11	5	1843_h	$2A5_h$	4000 $02A5_h$
11	6	1844_h	$2A6_h$	4000 $02A6_h$
11	7	1845_h	$2A7_h$	4000 $02A7_h$
11	8	1846_h	$2A8_h$	4000 $02A8_h$
11	9	1847_h	$2A9_h$	4000 $02A9_h$
11	10	1848_h	$2AA_h$	4000 $02AA_h$
11	11	1849_h	$2AB_h$	4000 $02AB_h$
11	12	$184A_h$	$2AC_h$	4000 $02AC_h$
11	13	$184B_h$	$2AD_h$	4000 $02AD_h$
11	14	$184C_h$	$2AE_h$	4000 $02AE_h$
11	15	$184D_h$	$2AF_h$	4000 $02AF_h$
11	16	$184E_h$	$2B0_h$	4000 $02B0_h$
11	17	$184F_h$	$2B1_h$	4000 $02B1_h$
11	18	1850_h	$2B2_h$	4000 $02B2_h$

Node-ID	*vdfg* number	Index $18XX_h$ 01_h (TPDO COB-ID)	CAN-ID	Resulted COB-ID
11	19	1851_h	$2B3_h$	4000 $02B3_h$
11	20	1852_h	$2B4_h$	4000 $02B4_h$
11	21	1853_h	$2B5_h$	4000 $02B5_h$
11	22 to 31	1854_h to $185D_h$	$2B6_h$ to $2BF_h$	4000 $02B6_h$ to 4000 $02BF_h$
12	2	1840_h	322_h	4000 0322_h
12	3	1841_h	323_h	4000 0323_h
12	4	1842_h	324_h	4000 0324_h
12	5	1843_h	325_h	4000 0325_h
12	6	1844_h	326_h	4000 0326_h
12	7	1845_h	327_h	4000 0327_h
12	8	1846_h	328_h	4000 0328_h
12	9	1847_h	329_h	4000 0329_h
12	10	1848_h	$32A_h$	4000 $032A_h$
12	11	1849_h	$32B_h$	4000 $032B_h$
12	12	$184A_h$	$32C_h$	4000 $032C_h$
12	13	$184B_h$	$32D_h$	4000 $032D_h$
12	14	$184C_h$	$32E_h$	4000 $032E_h$
12	15	$184D_h$	$32F_h$	4000 $032F_h$
12	16	$184E_h$	330_h	4000 0330_h
12	17	$184F_h$	331_h	4000 0331_h
12	18	1850_h	332_h	4000 0332_h
12	19	1851_h	333_h	4000 0333_h
12	20	1852_h	334_h	4000 0334_h
12	21	1853_h	335_h	4000 0335_h
12	22 to 31	1854_h to $185D_h$	336_h to $33F_h$	4000 0336_h to 4000 $033F_h$
13	2	1840_h	$3A2_h$	4000 $03A2_h$
13	3	1841_h	$3A3_h$	4000 $03A3_h$
13	4	1842_h	$3A4_h$	4000 $03A4_h$
13	5	1843_h	$3A5_h$	4000 $03A5_h$
13	6	1844_h	$3A6_h$	4000 $03A6_h$
13	7	1845_h	$3A7_h$	4000 $03A7_h$
13	8	1846_h	$3A8_h$	4000 $03A8_h$
13	9	1847_h	$3A9_h$	4000 $03A9_h$
13	10	1848_h	$3AA_h$	4000 $03AA_h$
13	11	1849_h	$3AB_h$	4000 $03AB_h$
13	12	$184A_h$	$3AC_h$	4000 $03AC_h$
13	13	$184B_h$	$3AD_h$	4000 $03AD_h$
13	14	$184C_h$	$3AE_h$	4000 $03AE_h$
13	15	$184D_h$	$3AF_h$	4000 $03AF_h$
13	16	$184E_h$	$3B0_h$	4000 $03B0_h$

Node-ID	*vdfg* number	Index $18XX_h$ 01_h (TPDO COB-ID)	CAN-ID	Resulted COB-ID
13	17	$184F_h$	$3B1_h$	4000 $03B1_h$
13	18	1850_h	$3B2_h$	4000 $03B2_h$
13	19	1851_h	$3B3_h$	4000 $03B3_h$
13	20	1852_h	$3B4_h$	4000 $03B4_h$
13	21	1853_h	$3B5_h$	4000 $03B5_h$
13	22 to 31	1854_h to $185D_h$	$3B6_h$ to $3BF_h$	4000 $03B6_h$ to 4000 $03BF_h$
14	2	1840_h	422_h	4000 0422_h
14	3	1841_h	423_h	4000 0423_h
14	4	1842_h	424_h	4000 0424_h
14	5	1843_h	425_h	4000 0425_h
14	6	1844_h	426_h	4000 0426_h
14	7	1845_h	427_h	4000 0427_h
14	8	1846_h	428_h	4000 0428_h
14	9	1847_h	429_h	4000 0429_h
14	10	1848_h	$42A_h$	4000 $042A_h$
14	11	1849_h	$42B_h$	4000 $042B_h$
14	12	$184A_h$	$42C_h$	4000 $042C_h$
14	13	$184B_h$	$42D_h$	4000 $042D_h$
14	14	$184C_h$	$42E_h$	4000 $042E_h$
14	15	$184D_h$	$42F_h$	4000 $042F_h$
14	16	$184E_h$	430_h	4000 0430_h
14	17	$184F_h$	431_h	4000 0431_h
14	18	1850_h	432_h	4000 0432_h
14	19	1851_h	433_h	4000 0433_h
14	20	1852_h	434_h	4000 0434_h
14	21	1853_h	435_h	4000 0435_h
14	22 to 31	1854_h to $185D_h$	436_h to $43F_h$	4000 0436_h to 4000 $043F_h$
15	2	1840_h	$4A2_h$	4000 $04A2_h$
15	3	1841_h	$4A3_h$	4000 $04A3_h$
15	4	1842_h	$4A4_h$	4000 $04A4_h$
15	5	1843_h	$4A5_h$	4000 $04A5_h$
15	6	1844_h	$4A6_h$	4000 $04A6_h$
15	7	1845_h	$4A7_h$	4000 $04A7_h$
15	8	1846_h	$4A8_h$	4000 $04A8_h$
15	9	1847_h	$4A9_h$	4000 $04A9_h$
15	10	1848_h	$4AA_h$	4000 $04AA_h$
15	11	1849_h	$4AB_h$	4000 $04AB_h$
15	12	$184A_h$	$4AC_h$	4000 $04AC_h$
15	13	$184B_h$	$4AD_h$	4000 $04AD_h$
15	14	$184C_h$	$4AE_h$	4000 $04AE_h$

Node-ID	*vdfg* number	Index $18XX_h$ 01_h (TPDO COB-ID)	CAN-ID	Resulted COB-ID
15	15	$184D_h$	$4AF_h$	4000 $04AF_h$
15	16	$184E_h$	$4B0_h$	4000 $04B0_h$
15	17	$184F_h$	$4B1_h$	4000 $04B1_h$
15	18	1850_h	$4B2_h$	4000 $04B2_h$
15	19	1851_h	$4B3_h$	4000 $04B3_h$
15	20	1852_h	$4B4_h$	4000 $04B4_h$
15	21	1853_h	$4B5_h$	4000 $04B5_h$
15	22 to 31	1854_h to $185D_h$	$4B6_h$ to $4BF_h$	4000 $04B6_h$ to 4000 $04BF_h$
16	2	1840_h	522_h	4000 0522_h
16	3	1841_h	523_h	4000 0523_h
16	4	1842_h	524_h	4000 0524_h
16	5	1843_h	525_h	4000 0525_h
16	6	1844_h	526_h	4000 0526_h
16	7	1845_h	527_h	4000 0527_h
16	8	1846_h	528_h	4000 0528_h
16	9	1847_h	529_h	4000 0529_h
16	10	1848_h	$52A_h$	4000 $052A_h$
16	11	1849_h	$52B_h$	4000 $052B_h$
16	12	$184A_h$	$52C_h$	4000 $052C_h$
16	13	$184B_h$	$52D_h$	4000 $052D_h$
16	14	$184C_h$	$52E_h$	4000 $052E_h$
16	15	$184D_h$	$52F_h$	4000 $052F_h$
16	16	$184E_h$	530_h	4000 0530_h
16	17	$184F_h$	531_h	4000 0531_h
16	18	1850_h	532_h	4000 0532_h
16	19	1851_h	533_h	4000 0533_h
16	20	1852_h	534_h	4000 0534_h
16	21	1853_h	535_h	4000 0535_h
16	22 to 31	1854_h to $185D_h$	536_h to $53F_h$	4000 0536_h to 4000 $053F_h$

Table 7 specifies the value range and default value of the PDO communication parameter entries with sub-index 03_h (inhibit time) and 05_h (event timer) for specific TPDOs. The value range and default value in sub-index 03_h (inhibit time) and 05_h (event timer) for all other TPDOs shall be set to 0_h.

Table 7 – Inhibit time and event timer for specific TPDOs

Index	Inhibit time	Event timer
1800_h	1000 (= 100 ms)	100 (= 100 ms)
1810_h	1000 (= 100 ms)	100 (= 100 ms)
1845_h	10000 (= 1 s)	0 (no timer)

4.4.3 PDO mapping parameters

In the following the PDO mapping parameters and attributes are specified.

For all PDO mapping parameters the access attribute shall be set to *const* (constant). The field *value* in Table 8 specifies the value range and the default value of the PDO mapping entries.

Table 8 – PDO mapping

Index	Sub-Index	Value	Description
$1A00_h$	00_h	01_h	
	01_h	6007 00 08_h	Ignition switch status
$1A01_h$	00_h	03_h	
	01_h	6010 00 18_h	Car flap status
	02_h	6005 00 08_h	Switch illumination level status
	03_h	601A 00 10_h	Wiper system status
$1A02_h$	00_h	01_h	
	01_h	6033 00 08_h	Tester present
$1A03_h$	00_h	03_h	
	01_h	6027 00 10_h	Occupant classification status
	02_h	6028 00 10_h	Buckle switch status
	03_h	6009 00 08_h	Central locking system status
$1A04_h$	00_h	04_h	
	01_h	600B 00 18_h	Window status
	02_h	600D 00 10_h	Door status
	03_h	601D 00 08_h	Turn Indicator reset status
	04_h	6030 00 08_h	Day/night detection
$1A05_h$	00_h	02_h	
	01_h	6019 01 18_h	Seat adjustment status (sub-index 01_h: driver)
	02_h	6019 02 18_h	Seat adjustment status (sub-index 01_h: passenger)
$1A06_h$	00_h	01_h	
	01_h	6032 00 10_h	Accident detection
$1A07_h$ to $1A0F_h$			Reserved
$1A10_h$	00_h	03_h	
	01_h	6050 00 10_h	Actual engine revolutions
	02_h	6053 00 10_h	Wheel rpm
	03_h	6055 00 18_h	Wheel pulse counter
$1A11_h$	00_h	01_h	
	01_h	6051 00 08_h	Engine status
$1A12_h$	00_h	05_h	
	01_h	6040 00 20_h	Car light status
	02_h	6047 00 08_h	Anti theft warning system status
	03_h	604A 00 08_h	Horn status
	04_h	6049 00 08_h	Mirror anti-dazzle position
	05_h	6031 00 08_h	Environment light intensity
$1A13_h$ to $1A1F_h$			Reserved
$1A40_h$	00_h	01_h	
	01_h	6150 00 08_h	Radio hand-free status

Index	Sub-Index	Value	Description
$1A41_h$	00_h	01_h	
	01_h	6141 00 20_h	“Blue” light flasher status
$1A42_h$	00_h	01_h	
	01_h	60FA 00 08_h	Driver ID status
$1A43_h$	00_h	01_h	
	01_h	606C 00 08_h	Emergency fresh-air system status
$1A44_h$	00_h	01_h	
	01_h	6069 00 08_h	Fire extinguishing system status
$1A45_h$	00_h	02_h	
	01_h	60B0 01 20_h	GPS current position (sub-index 01_h: latitude)
	02_h	60B0 02 20_h	GPS current position (sub-index 02_h: longitude)
$1A46_h$	00_h	01_h	
	01_h	6110 00 10_h	Taxi alarm system status
$1A47_h$	00_h	02_h	
	01_h	60E0 00 08_h	Printer status
	02_h	60E1 00 10_h	Printer errors
$1A48_h$	00_h	02_h	
	01_h	6131 01 20_h	Light status roof bar (sub-index 01_h)
	02_h	6131 02 20_h	Light status roof bar (sub-index 02_h)
$1A49_h$	00_h	02_h	
	01_h	6131 03 20_h	Light status roof bar (sub-index 03_h)
	02_h	6131 04 20_h	Light status roof bar (sub-index 04_h)
$1A4A_h$	00_h	01_h	
	01_h	6131 05 20_h	Light status roof bar (sub-index 05_h)
$1A4B_h$	00_h	02_h	
	01_h	613B 01 20_h	Sound status roof bar (sub-index 01_h)
	02_h	613B 02 20_h	Sound status roof bar (sub-index 02_h)
$1A4C_h$	00_h	02_h	
	01_h	6101 00 20_h	Tariff display lamp failures 1
	02_h	6104 00 20_h	Tariff display lamps status 1
$1A4D_h$	00_h	01_h	
	01_h	6103 00 20_h	Tariff display inputs status
$1A4E_h$	00_h	01_h	
	01_h	6078 00 10_h	Discrete inputs status
$1A4F_h$	00_h	01_h	
	01_h	60D8 00 08_h	Taximeter status
$1A50_h$	00_h	08_h	
	01_h	6080 00 08_h	Number pad status
	02_h	6082 00 08_h	Number pad user interaction
	03_h	6085 00 08_h	Function keys status
	04_h	6087 00 08_h	Function keys user interaction
	05_h	608A 00 08_h	Control keys status
	06_h	608C 00 08_h	Control keys user interaction
	07_h	6097 00 08_h	Display status 1

Index	Sub-Index	Value	Description
	08_h	609B 00 08_h	Display status 2
$1A51_h$	00_h	04_h	
	01_h	6090 00 08_h	Steering wheel switch pad status
	02_h	6092 00 08_h	Steering wheel switch pad user interaction
	03_h	6093 00 08_h	Emergency key status
	04_h	6095 00 08_h	Emergency key user interaction
$1A52_h$	00_h	02_h	
	01_h	6115 00 08_h	Radio status
	02_h	6117 00 08_h	Radio device status
$1A53_h$	00_h	02_h	
	01_h	6070 00 08_h	Radio power supply status
	02_h	6073 00 08_h	Periphery power supply status

Annex A - Calculation of CAN-IDs (informative)

A.1 Calculation of CAN-IDs for SDO communication

The CAN-IDs for SDO communication were calculated by means of CAN-ID structure as shown in Figure 1 and formula as given in Table 10. Table 9 describes the CAN-ID structure values for SDO CAN-IDs calculation.

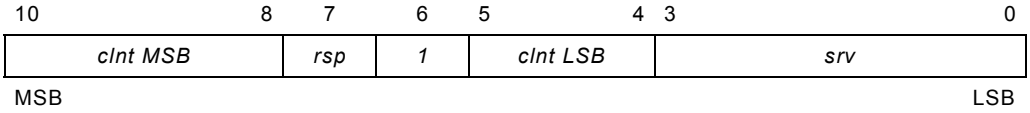

Figure 1 – CAN-ID structure for SDO CAN-IDs calculation

Table 9 – CAN-ID structure description for SDO CAN-IDs calculation

CAN-ID part	Description
srv	Server node-ID decremented by one
clnt	Client node-ID decremented by one (as an Unsigned5 value)
rsp	0_b = SDO request (client to server) 1_b = SDO response (server to client)
clnt LSB	The two least significant bits of *clnt*
clnt MSB	If *rsp* = 0_b: (The three most significant bits of *clnt*) incremented by two If *rsp* = 1_b: (The three most significant bits of *clnt*) incremented by one

Table 10 – SDO CAN-IDs calculation

Usage	CAN-ID
Request from client with node-ID i to server with node-ID j	$(240_h + (((i-1)\&C_h)<<6) + (((i-1)\&3_h)<<4) + (j-1))$
Response from server with node-ID j to client with node-ID i	$(1C0_h + (((i-1)\&C_h)<<6) + (((i-1)\&3_h)<<4) + (j-1))$

A.2 Calculation of CAN-IDs for ISO-TP access to car resources

The CAN-IDs for ISO-TP access to car resources were calculated by means of the formula as given in Table 11.

Table 11 – CAN-IDs calculation for ISO-TP access to car resources

Usage	CAN-ID
CAN-ID for display transport protocol from node i to IVN gateway	$(240_h + (((i-1)\&C_h)<<6) + (((i-1)\&3_h)<<4) + (i-1))$
CAN-ID for display transport protocol from IVN gateway to node i	$(1C0_h + (((i-1)\&C_h)<<6) + (((i-1)\&3_h)<<4) + (i-1))$

A.3 Calculation of CAN-IDs for PDO communication

The CAN-IDs for PDO communication were calculated by means of CAN-ID structure as shown in Figure 2 and formula as given in Table 13. Table 12 describes the CAN-ID structure values for PDO CAN-IDs calculation. This calculation is only valid for CAN-IDs specified in Table 6.

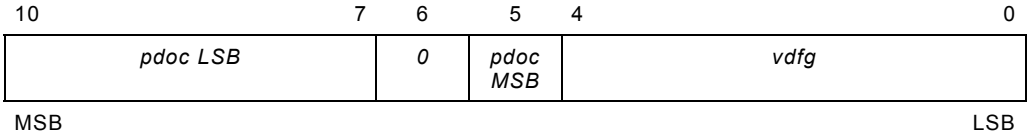

Figure 2 – CAN-ID structure for PDO CAN-IDs calculation

Table 12 – CAN-ID structure description for PDO CAN-IDs calculation

CAN-ID part	Description
vdfg	Virtual device function group number
pdoc	IVN gateway virtual device: PDO number decremented by one No IVN gateway virtual device: Node-ID decremented by one
pdoc LSB	The three least significant bits of *pdoc* + 11_b
pdoc MSB	The most significant bit of *pdoc*

Table 13 – PDO CAN-IDs calculation

CAN-ID
180_h + (((pdoc)&7_h)<<7) + (((pdoc)&8_h)<<2) + (vdfg)

