BS ISO 16844-4:2015

BSI Standards Publication

Road vehicles — Tachograph systems

Part 4: CAN interface

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National foreword

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A list of organizations represented on this committee can be obtained on request to its secretary.

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Part 4: CAN interface

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Partie 4: Interface CAN

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT), see the following URL: Foreword — Supplementary information.

This second edition cancels and replaces the first edition (ISO 16844-4:2004), which has been technically revised.

The committee responsible for this document is ISO/TC 22, *Road vehicles*, Subcommittee SC 3, *Electrical and electronic equipment*.

ISO 16844 consists of the following parts, under the general title *Road vehicles — Tachograph systems*:

— *Part 1: Electrical connectors*

— *Part 2: Electrical interface with recording unit*

— *Part 3: Motion sensor interface*

— *Part 4: CAN interface*

— *Part 5: Secured CAN interface*

— *Part 6: Diagnostics*

— *Part 7: Parameters*

Introduction

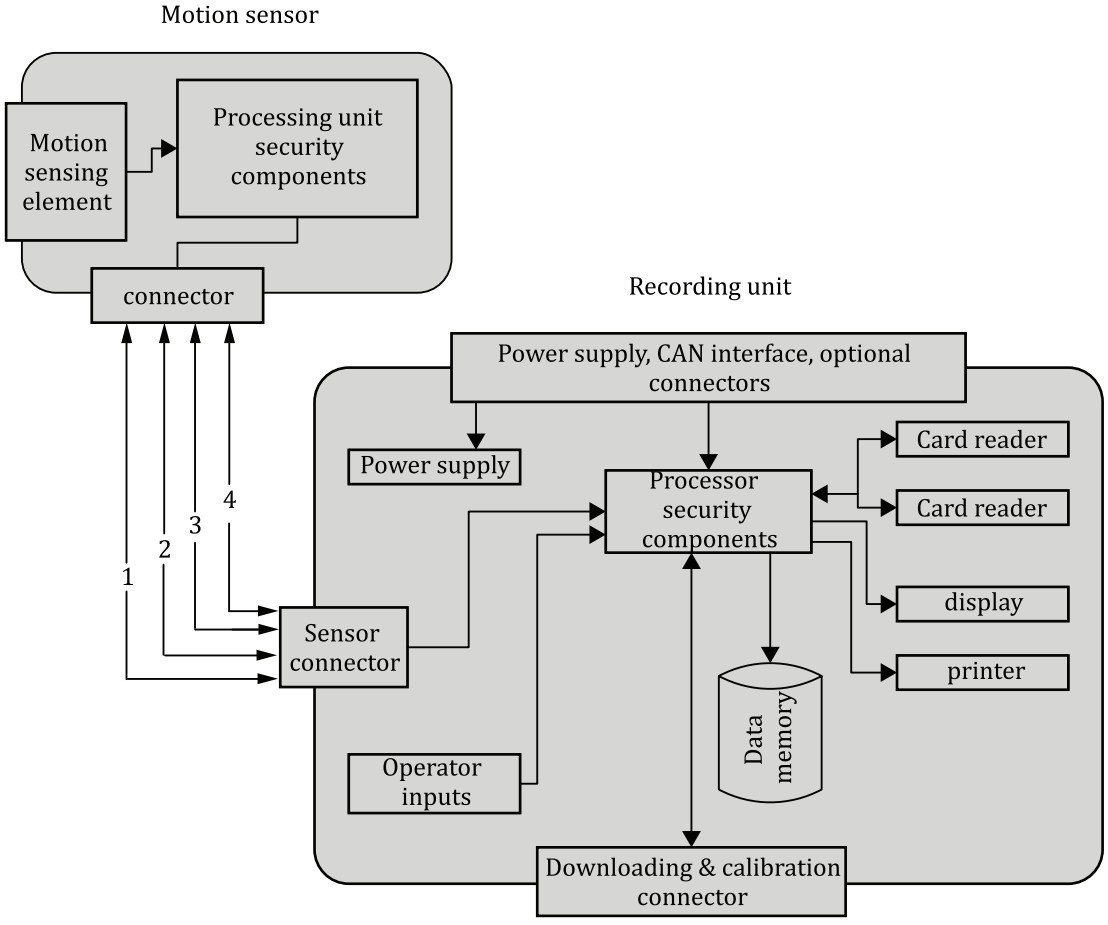
This International Standard supports and facilitates the communication between electronic control units and a tachograph. The tachograph is based upon the European Council Regulation (EC) No 561/2006[1] and (EEC) No 3821/85[2] as last amended.

The digital tachograph concept is based upon an RU storing data, related to the activities of the various drivers driving the vehicle, on which it is installed.

During the normal operational status of the RU, data stored in its memory are accessible to different entities (drivers, authorities, workshops, transport companies) in different ways (displayed on a screen, printed by a printing device, downloaded to an external device). Access to stored data is controlled by smart card inserted in the tachograph.

In order to prevent manipulation of the tachograph system, the speed signal sender (motion sensor) is provided with an encrypted data link.

A typical tachograph system is shown in Figure 1.



Key

1 positive supply
2 battery minus
3 speed signal, real time
4 data signal in/out

Figure 1 — Typical tachograph system

INTERNATIONAL STANDARD ISO 16844-4:2015(E)

Road vehicles — Tachograph systems —

Part 4: CAN interface

1 Scope

This part of ISO 16844 specifies the controller area network (CAN) interface for the interchange of digital information between a road vehicle's tachograph system and vehicle units, and within the tachograph system itself. It specifies parameters of, and requirements for, the application of physical and data link layers of the electrical connection used in the electronic systems.

2 Normative reference

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 11898-1, *Road vehicles — Controller area network (CAN) — Part 1: Data link layer and physical signalling*

ISO 16844-7, *Road vehicles — Tachograph systems — Part 7: Parameters*

3 Terms and definitions

For the purpose of this document, the following terms and definitions apply.

3.1
recording unit
RU
part of the tachograph system which acquires and stores data concerning the vehicle and its driver(s) and their activities

Note 1 to entry: A recording unit is also referenced as a vehicle unit in other standards, both are synonyms.

3.2
visual instrument
speedometer and display(s) for odometer and trip meter data

4 Symbols and abbreviated terms

ACK	positive acknowledge
BAM	broadcast announce message
CAN	controller area network
DA	destination address
DP	data page
ECU	electronic control unit

EDP	extended data page
EOL	end-of-line
LSB	least significant bit/byte
MSB	most significant bit/byte
NACK	negative acknowledge
P	priority
PDU	protocol data unit
PF	PDU format
PG	parameter group
PGN	parameter group number
Phase_Seg1	phase buffer segment 1
Phase_Seg2	phase buffer segment 2
Prop_Seg	propagation time segment
PS	PDU specific
RU	recording unit
SA	source address
Sync_Seg	synchronization segment
TP.DT	transport protocol data transfer
t_s	bit time
t_q	time quanta
t_{SEG1}	timing segment 1
t_{SEG2}	timing segment 2
t_{SJW}	synchronization jump width
VIN	vehicle identification number

5 Physical layer application requirements

5.1 General

The physical layer shall meet the requirements of SAE J1939-11[4] for 250 kbit/s and SAE J1939-14[5] for 500 kbit/s unless otherwise specified in this part of ISO 16844.

5.2 Bit timing requirements

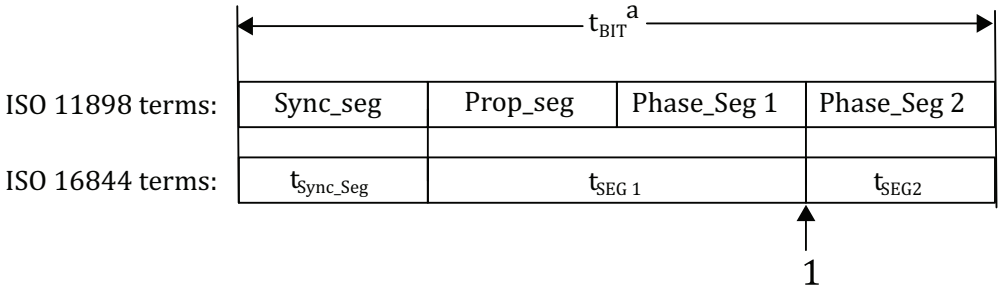
5.2.1 General

The following values of CAN bit timing parameters specified in ISO 11898-1 shall be used for the settings of the tachograph ECUs as given in Figure 2.

$t_{Sync\_Seg} = 1t_q$

$t_{SEG1} = t_{Prop\_Seg} + t_{Phase\_Seg1}$

$t_{SEG2} = t_{Phase\_Seg2}$



Key

1 sample point

a Nominal bit time.

Figure 2 — Partition of bit time

5.2.2 CAN bit timing requirements for 250 kbit/s

For a physical layer configured to 250 kbit/s, the parameter values given in Table 1 shall apply.

Table 1 — CAN bit timing parameter values for 250 kbit/s, single data sampling mode

Parameter	Timing setting		
	Min	Nominal	Max
t_B	3 980 ns	4 000 ns	4 020 ns
t_q	—	—	400 ns
t_{SEG1}	$t_{SEG1} = t_B - 1t_q - t_{SEG2}$	$t_{SEG1} = t_B - 1t_q - t_{SEG2}$	$t_{SEG1} = t_B - 1t_q - t_{SEG2}$

The CAN bit timing values shall also comply with the following conditions:

— nominal bit rate: 250 kbit/s ±0,5 %;

— sample point: between 80 % and 88 % of nominal bit time of single data sampling mode.

Values for the bit timing shall be according to Table 2, which is based on time quanta, t_q.

Table 2 — CAN bit timing parameter values for 250 kbit/s for a given time quanta, t_q

Parameter		
t_q	t_{SJW}	t_{SEG2}
200 ns	600 ns	600 ns
250 ns	500 ns	750 ns
334 ns	668 ns	668 ns
400 ns	800 ns	800 ns

5.2.3 CAN bit timing requirements for 500 kbit/s

For a physical layer configured to 500 kbit/s, the parameter values given in Table 3 shall apply.

Table 3 — CAN bit timing parameter values for 500 kbit/s, single data sampling mode

Parameter	Timing setting		
	Min	Nominal	Max
t_B	1 980 ns	2 000 ns	2 020 ns
t_q	—	—	200 ns
t_{SEG1}	$t_{SEG1} = t_B - 1t_q - t_{SEG2}$	$t_{SEG1} = t_B - 1t_q - t_{SEG2}$	$t_{SEG1} = t_B - 1t_q - t_{SEG2}$

The CAN bit timing values shall also comply with the following conditions:

— nominal bit rate: 500 kbit/s ±1 %;

— clock tolerance: ±0,05 %;

— sample point: between 80 % and 88 % of nominal bit time of single data sampling mode.

Values for the bit timing shall be according to Table 4, which is based on time quanta, t_q.

Table 4 — CAN bit timing parameter values for 500 kbit/s for a given time quanta, t_q

Parameter values		
t_q	t_{SJW}	t_{SEG2}
100 ns	300 ns	400 ns
125 ns	375 ns	375 ns
167 ns	334 ns	334 ns
200 ns	400 ns	400 ns

6 Data link layer application requirements

6.1 Message frame format

6.1.1 General

For the data link layer, the application layer provides a string of information that is assimilated into a PDU. The PDU provides a framework for organizing the information, which shall be sent in the CAN data frame.

The 29-bit identifier shall be in accordance with ISO 11898-1.

The PDU shall consist of seven fields in addition to the specific CAN fields specified in Figure 3.

The PDU fields shall contain P, EDP, DP, PF, PS, which may be a DA or a GE, SA, and data field.

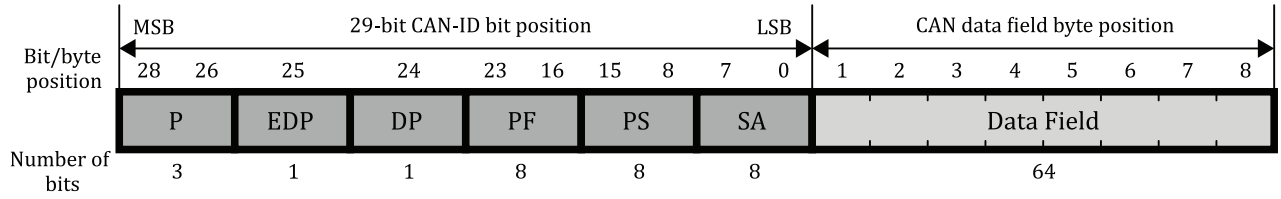


Figure 3 — Usage of 29 bit CAN identifier and data field

NOTE For compatibility with other definitions (e.g. ISO 11898-1, J1939), the bit positions of the identifier field start with index 0, and the bit/byte positions within the data field start with index 1.

6.1.2 Priority (P) bits

This 3-bit subfield shall be used to optimize PDU message latency for transmission onto the bus only and shall have no other specific meaning. It shall not be used for message validation on receiver side and should be globally masked off by the receiver (ignored). The priority of any PDU may be set from highest, 0_{10} (000_2), to lowest, 7_{10} (111_2) and will use the default values as given in the PGN specifications. Other values may be specified by the system integrator (vehicle manufacturer).

6.1.3 Extended data page (EDP) bit

This 1-bit subfield shall be used in conjunction with the DP subfield to select a range of PGNs. The definition of a PGN is given in 6.2.

6.1.4 Data page (DP) bit

This 1-bit subfield shall be used in conjunction with the EDP subfield to select a range of PGNs. The definition of a PGN is given in 6.2.

6.1.5 PDU format (PF) field

This 8-bit subfield shall determine the PDU format and the transmission method as specified in 6.2.

6.1.6 PDU specific (PS) field

6.1.6.1 General

This 8-bit subfield shall depend on the PDU format. For a PDU1 format, the PDU specific (PS) subfield is a destination address (DA); for a PDU2 format, the PS subfield is a group extension (GE).

6.1.6.2 Destination address (DA) field

The DA addresses the ECU intended to receive and act upon the message. In case of the global destination address (255_{10}/FF_{16}), all nodes shall process the PDU.

6.1.6.3 Group extension (GE) field

The GE field extends the four least significant bits of the PF field, and provides 4 096 PGNs. It indicates that the PS field is a group extension when the four most significant bits of PF field are set.

6.1.7 Source address (SA) field

The SA field shall be 8-bit long. There shall be only one device on the network with a given SA, i.e. the SA assures that the CAN identifiers are unique.

6.1.8 Data field

A single CAN frame shall provide a maximum of eight data bytes within the data field. If not specified in the message definition, all eight bytes shall be used, even if fewer are required. This provides means to easily add parameters while remaining compatible with previous revisions, which only specified part of the data field.

All unused data fields shall be set to the value “not available” [all bits set to one (1)].

6.2 PDU specification

6.2.1 Parameter group number (PGN)

This 24-bit number shall be used in all cases where a group of parameters (PG) assembled in the PDU data field need to be identified. A PGN is built from the CAN-ID subfields EDP, DP, PF, and PS as specified in Figure 4 and is used to identify or label a group of parameters. It is independent of the remaining fields of the CAN-ID.

The upper bits, 18 to 23, are reserved and shall always be set to zero (0). For a PDU1 message, i.e. if the PS field is a DA, the least significant byte (PS) of the PGN shall always be set to zero (0).

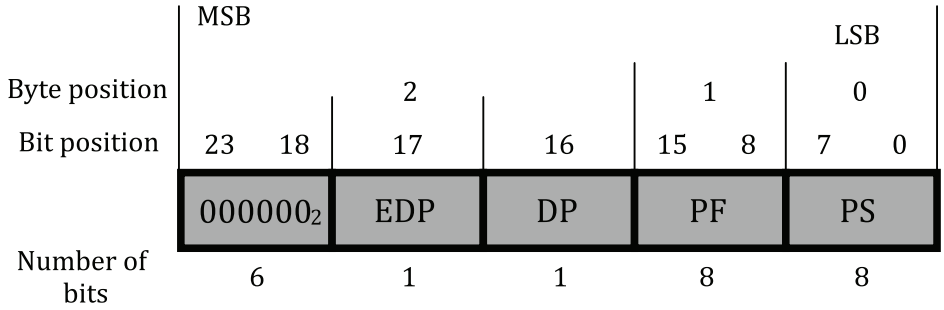


Figure 4 — Contents of the PGN

6.2.2 PDU format

The PDU format is either PDU1 or PDU2 and specifies the transmission method and the content of the PS field.

— If the value of the PDU format field is in the range of 0 to 239, the PDU format is of type PDU1 and the PS field contains a destination address. The PDU1 format is used for PGs to be sent to either a specific destination of broadcasted to global destination.

— If the value of the PDU format field is in the range of 240 to 255, then PDU format is of type PDU2 and the PDU-specific field contains a group extension. The PDU2 format is used to communicate global PGs.

6.3 Message types

6.3.1 General

The RU shall respond to a PGN request:

a) If the request is directly addressed to the RU with addresses as specified in Clause 9.

   1) If the RU supports the requested PGN, then the RU shall transmit the requested PGN.

2) If the RU doesn't support the requested PGN, then the RU shall respond with the NACK.

b) If the request is globally addressed with the address as specified in Clause 9.

1) If the RU supports the requested PGN, then the RU shall transmit the requested PGN.

2) If the RU doesn't support the requested PGN, then the RU shall not respond.

If the RU submits a response, a NACK or broadcast of the requested PGN, it shall transmit it within 200 ms after reception of the PGN request. The requesting device shall not issue another request within 1 250 ms from the first request in case of a response from the RU.

For each message, the attribute definition given in Table 5 shall apply.

Table 5 — Message attribute definition

Attribute	Definition
Transmission repetition time	The nominal time and tolerance between two subsequently transmitted messages.
Data length	The number of bytes of the message.
Extended data page	The value of parameter EDP as specified in 6.1.3.
Data page	The value of parameter DP as specified in 6.1.4.
PDU format	The value of parameter PF as specified in 6.1.5.
PDU specific	The value of parameter PS as specified in 6.1.6.
Default priority	The recommended value of parameter P as specified in 6.1.2.
PGN	The value of parameter PGN as specified in 6.2.
Byte pos	The byte position of the parameter in the PDU data field, starting with 1.
Bit pos	The bit position of the parameter within the data byte, starting with 1.
Parameter	The name of the parameter as specified in ISO 16844-7.
Remark	Attribute used for comments, if required.

6.3.2 RQST — Request

The request message, identified by the PGN, shall be used to request information from a specific device or globally. Only information that is not broadcast periodically shall be requested. Table 6 specifies the PG attributes. Table 7 specifies the PG content.

Table 6 — PGN 59904 — RQST attribute specification

Attribute	Value
Transmission repetition time	sent if sending of a PGN is required
Data length	3 byte
Extended data page	0
Data page	0
PDU format	234 (PDU1)
PDU specific	DA (global or specific)
Default priority	6
PGN	59904_{10}/$00EA00_{16}$

Table 7 — PGN 59904 — RQST parameter specification

Byte pos	Bit pos	Parameter	Remark
1 to 3		PGN being requested (byte 1 is LSB, byte 3 is MSB)	—

NOTE The data field of this message consists of 3 byte only as a deviation to the requirements given in 6.1.8.

6.3.3 ACKM — Acknowledgment message

Acknowledgement shall provide a handshake between transmitting and receiving devices. Table 8 specifies the PG attributes. Table 9 specifies the PG content.

Table 8 — PGN 59392 — ACKM attribute specification

Attribute	Value
Transmission repetition time	on request
Data length	8 byte
Extended data page	0
Data page	0
PDU format	232_{10} (PDU1)
PDU specific	DA = 255_{10} (Global)
Default priority	6
PGN	$59392_{10}/00E800_{16}$

Table 9 — PGN 59392 — ACKM parameter specification

Byte pos	Bit pos	Parameter	Remark
1		Control byte	See Table 10
2		Group function value	Not used (send 255_{10})
3 to 5		Reserved by document	—
6 to 8		PGN of requested information/PGN that required the acknowledgement (byte 6 is LSB, byte 8 is MSB)	—

Table 10 — Control byte specification

Control byte	Interpretation	Use
0	ACK	— When the local time adjustment was successful (see 8.9). — When the trip distance was reset (see 8.6).
1	NACK	— When a non-supported PGN was requested with a specific request. — When the local time adjustment was not successful (see 8.9).

7 Transport protocol

7.1 General

The transport protocol is invoked when PGs containing more than 8 byte are transmitted and shall be implemented according to SAE J1939-21.[6] The first frame to be transmitted shall be the BAM as

defined in 7.2, followed by required number of TP.DT containing the segmented data as defined in 7.3. The time between messages (interframe space) shall be in the range of 50 ms to 200 ms.

For each message, the attribute definition given in Table 5 shall apply.

7.2 BAM — Broadcast announce message

The BAM message parameters shall be used as defined in Table 11 and Table 12.

Table 11 — PGN 60416 — BAM attribute specification

Attribute	Value
Transmission repetition time	per PG to be transmitted
Data length	8 byte
Extended data page	0
Data page	0
PDU format	236 (PDU1)
PDU specific	255 (DA, Global)
Default priority	6
PGN	60416_{10}/$00EC00_{16}$

Table 12 — PGN 60416 — BAM parameter specification

Byte pos	Bit pos	Parameter	Remark
1		Control byte, fixed value 32_{10}	—
2 to 3		Total message size in number of bytes	9 to 1 785
4		Total number of packets	2 to 255
5		Reserved by document	—
6 to 8		PGN of packed message (byte 6 is LSB, byte 8 is MSB)	—

7.3 TP.DT — Transport protocol — Data transfer

TP.DT shall be used to transmit the segmented data of a PG. The TP.DT message is an individual packet of a multipacket transfer. Table 13 specifies the PG attributes. Table 14 specifies the PG content.

Table 13 — PGN 60160 — TP.DT attribute specification

Attribute	Value
Transmission repetition time	per PG to be transmitted
Data length	8 byte
Extended data page	0
Data page	0
PDU format	235 (PDU1)
PDU specific	DA = 255_{10} (Global)
Default priority	6
PGN	60160_{10}/$00EB00_{16}$

Table 14 — PGN 60160 — TP.DT parameter specification

Byte pos	Bit pos	Parameter	Remark
1		Sequence number	1 to 255
2 to 8		Packed data	—

Packed data format:

— The packed data bytes shall be sent with MSB first.

— If the last packet contains less than 8 defined data bytes, it shall then be padded with FF_{16} to fill 8 byte.

8 Application layer

8.1 General

Each parameter placed in the PG data field shall be implemented as specified in ISO 16844-7.

For each message, the attribute definition given in Table 5 shall apply.

For parameters with a length of more than one byte, the LSB shall be located on the lower byte position. ASCII data shall be transmitted with the first character first. Exceptions are noted where applicable.

NOTE The PGNs in this Clause can also be specified in SAE J1939[3] but are added here to provide an application specific baseline. Compatibility issues are addressed in the definition.

8.2 TD — Time/Date

The PG containing time and date shall be transmitted from the RU. All parameters shall be supported. Table 15 specifies the PG attributes. Table 16 specifies the PG content.

Table 15 — PGN 65254 — TD attribute specification

Attribute	Value
Transmission repetition time	1 s
Data length	8 byte
Extended data page	0
Data page	0
PDU format	254 (PDU2)
PDU specific	230 (GE)
Default priority	6
PGN	65254_{10}/$00FEE6_{16}$

Table 16 — PGN 65254 — TD parameter specification

Byte pos	Bit pos	Parameter	Remark
1		Seconds	UTC date/time
2		Minutes	UTC date/time
3		Hours	UTC date/time
4		Month	UTC date/time
5		Day	UTC date/time
6		Year	UTC date/time

Table 16 *(continued)*

Byte pos	Bit pos	Parameter	Remark
7		Local minute offset	local to UTC date/time offset
8		Local hour offset	local to UTC date/time offset

8.3 VI — Vehicle identification

Vehicle identification PG shall be transmitted by the RU on a specific or global request from any device on the network. Table 17 specifies the PG attributes. Table 18 specifies the PG content. The VIN data bytes shall be sent with MSB first.

Table 17 — PGN 65260 — VI attribute specification

Attribute	Value
Transmission repetition time	on request
Data length	18 byte
Extended data page	0
Data page	0
PDU format	254 (PDU2)
PDU specific	236 (GE)
Default priority	6
PGN	65260_{10}/$00FEEC_{16}$

Table 18 — PGN 65260 — VI parameter specification

Byte pos	Bit pos	Parameter	Remark
1 to 17		VIN[a]	—
18		Delimiter (ASCII "*")	—

a This PG is defined with variable length in SAE J1939.[3] For the use of ISO 16844, the length shall be fixed as defined in this Clause.

8.4 VDHR — High resolution vehicle distance

The high resolution vehicle distance PG shall be transmitted by the RU. All parameters shall be supported. It shall be used for trip and odometer in the visual instrument. Table 19 specifies the PG attributes. Table 20 specifies the PG content.

Table 19 — PGN 65217 — VDHR attribute specification

Attribute	Value
Transmission repetition time	1 s
Data length	8 byte
Extended data page	0
Data page	0
PDU format	254 (PDU2)
PDU specific	193 (GE)
Default priority	6
PGN	65217_{10}/$00FEC1_{16}$

Table 20 — PGN 65217 — VDHR parameter specification

Byte pos	Bit pos	Parameter	Remark
1 to 4		High resolution total vehicle distance	—
5 to 8		High resolution trip distance	—

8.5 SERV — Service information

Service parameters shall be transmitted with the service component identification that has the nearest time until the next service inspection. The RU shall transmit it on specific or global request from any device on the network. The service components that shall be supported are the tachograph (periodic inspection due) and the two driver cards (card expiring). Table 21 specifies the PG attributes. Table 22 specifies the PG content.

Table 21 — PGN 65216 — SERV attribute specification

Attribute	Value
Transmission repetition time	on request
Data length	8 byte
Extended data page	0
Data page	0
PDU format	254 (PDU2)
PDU specific	192 (GE)
Default priority	6
PGN	65216_{10}/$00FEC0_{16}$

Table 22 — PGN 65216 — SERV parameter specification

Byte pos	Bit pos	Parameter	Remark
1 to 3		Not used – send as “not available”	—
4		Service component identification	—
5		Service delay/calendar time based	—
6 to 8		Not used – send as “not available”	—

8.6 RESET — Reset

The RU shall accept reset from at least the visual instrument. The RU, upon reception of a correct reset message, shall reset the high resolution trip distance and then send an ACK. A correctly formatted reset PG shall contain in parameter “Trip group 1” a value of 01_2, and in parameter “Service component identification” a value of 252_{10}. All other bits shall be set to one (1). The tachograph may use the reset message as a heartbeat from the visual instrument. Messages that are only used as heartbeat, i.e. do not request a reset, shall contain FF_{16} in all data bytes. The heartbeat function of the reset message shall be EOL-programmable. Table 23 specifies the PG attributes. Table 24 specifies the PG content.

Table 23 — PGN 56832 — RESET attribute specification

Attribute	Value
Transmission repetition time	1 s
Data length	8 byte
Extended data page	0
Data page	0

Table 23 *(continued)*

Attribute	Value
PDU format	222 (PDU1)
PDU specific	DA
Default priority	7
PGN	56832_{10}/$00DE00_{16}$

Table 24 — PGN 56832 — RESET parameter specification

Byte pos	Bit pos	Parameter	Remark
1	1 to 2	Trip group 1	—
	3 to 4	Not used – send as “not available”	—
	5 to 8	Not used – send as “not available”	—
2		Service component identification	—
3 to 8		Not used – send as “not available”	—

8.7 TCO1 — Tachograph

The TCO1 PG shall be transmitted by the RU. All parameters except “Tachograph status — Direction indicator” are mandatory. Table 25 specifies the PG attributes. Table 26 specifies the PG content.

Table 25 — PGN 65132 — TCO1 attribute specification

Attribute	Value
Transmission repetition time	50 ms[a]
Data length	8 byte
Extended data page	0
Data page	0
PDU format	254 (PDU2)
PDU specific	108 (GE)
Default priority	3
PGN	65132_{10}/$00FE6C_{16}$
[a] Default value – re-programmable according to ISO 16844-7.	

Table 26 — PGN 65132 — TCO1 parameter specification

Byte pos	Bit pos	Parameter	Remark
1	1 to 3	Work states — Driver 1 working state	—
	4 to 6	Work states — Driver 2 working state	—
	7 to 8	Work states — Drive recognize	—
2	1 to 4	Driver 1 states — Driver 1 time related states	—
	5 to 6	Driver 1 states — Driver card, driver 1	—
	7 to 8	Driver 1 states — Over speed	—
3	1 to 4	Driver 2 states — Driver 2 time related states	—
	5 to 6	Driver 2 states — Driver card, driver 2	—
	7 to 8	reserved by document	—
4	1 to 2	Tachograph status — System event	—

Table 26 *(continued)*

Byte pos	Bit pos	Parameter	Remark
	3 to 4	Tachograph status — Handling information	—
	5 to 6	Tachograph status — Tachograph performance	—
	7 to 8	Tachograph status — Direction indicator	—
5 to 6		Tachograph output shaft speed	—
7 to 8		Tachograph vehicle speed	—

8.8 DI — Driver's identification

The RU shall transmit driver identification on specific or global request from any device on the network

a) if only driver card 1 is present, only the parameter driver 1 identification and two delimiters shall be transmitted,

b) if only driver card 2 is present, a delimiter followed by parameter driver 2 identification and the second delimiter shall be transmitted,

c) if both driver cards are present, the message is sent as stated below, and

d) if no driver cards are present, only the two delimiters shall be sent.

Table 27 specifies the PG attributes. Table 28 specifies the PG content. The driver 1 and driver 2 identification data bytes shall be sent with MSB first.

Table 27 — PGN 65131 — DI attribute specification

Attribute	Value
Transmission repetition time	on request
Data length	Variable
Extended data page	0
Data page	0
PDU format	254 (PDU2)
PDU specific	107 (GE)
Default priority	6
PGN	65131_{10}/$00FE6B_{16}$

Table 28 — PGN 65131 — DI parameter specification

Byte pos	Bit pos	Parameter	Remark
1 to 19		Driver 1 identification	—
20		Delimiter (ASCII "*")	—
21 to 39		Driver 2 identification	—
40		Delimiter (ASCII "*")	—

8.9 TDA — Time/Date adjust

The RU shall accept time/date adjust from any device on the network. Upon reception of the message, the RU shall respond as follows:

a) if the message was correct and the local offset time was adjusted correctly, the RU shall transmit an ACK;

b) if the message was not correct or the local offset time was not adjusted, the RU shall transmit a NACK.

A correctly formatted time/date adjust message shall contain values other than “not available” in byte 7 and byte 8 only. Byte 1 to byte 6 shall always be transmitted with a value of “not available”. All other message will be considered invalid. Table 29 specifies the PG attributes. Table 30 specifies the PG content.

Table 29 — PGN 54528 — TDA attribute specification

Attribute	Value
Transmission repetition time	when required
Data length	8 byte
Extended data page	0
Data page	0
PDU format	213 (PDU1)
PDU specific	DA
Default priority	6
PGN	54528_{10}/$00D500_{16}$

Table 30 — PGN 54528 — TDA parameter specification

Byte pos	Bit pos	Parameter	Remark
1		Adjust seconds	Not used[a]
2		Adjust minutes	Not used[a]
3		Adjust hours	Not used[a]
4		Adjust month	Not used[a]
5		Adjust day	Not used[a]
6		Adjust year	Not used[a]
7		Adjust local minute offset	—
8		Adjust local hour offset	—

[a] Shall always be transmitted as “not available (FF_{16}).

8.10 EEC1 — Electronic engine controller 1

The RU shall accept the EEC1 message when engine speed recording via CAN is implemented. Table 31 specifies the PG attributes. Table 32 specifies the PG content.

Table 31 — PGN 61444 — EEC1 attribute specification

Attribute	Value
Transmission repetition time	manufacturer specific
Data length	8 byte
Extended data page	0
Data page	0
PDU format	240 (PDU2)
PDU specific	4 (GE)
Default priority	3
PGN	61444_{10}/$00F004_{16}$

Table 32 — PGN 61444 — EEC1 parameter specification

Byte pos	Bit pos	Parameter	Remark
1 to 3		ignored	—
4 to 5		engine speed	—
6 to 8		ignored	—

8.11 CL — Cab illumination message

When cab illumination via CAN is implemented, the RU shall accept the message from any source address and with destination address of the RU or the global address. Table 33 specifies the PG attributes. Table 34 specifies the PG content.

Table 33 — PGN 53248 — CL attribute specification

Attribute	Value
Transmission repetition time	5 s and on change of state
Data length	8 byte
Extended data page	0
Data page	0
PDU format	208 (PDU1)
PDU specific	DA
Default priority	6
PGN	$53248_{10}/00D000_{16}$

Table 34 — PGN 53248 — CL parameter specification

Byte pos	Bit pos	Parameter	Remark
1		Illumination brightness percent	—
2		Switch backlight illumination brightness percent	—
3		Switch indication illumination brightness percent	—
4 to 8		Reserved by document	—

8.12 DRTD1 — Driver 1 driving rest times

The driving rest times of driver 1 PG shall be transmitted by the RU. All parameters are mandatory. It shall be used to transmit driver 1's driving times. Table 35 specifies the PG attributes. Table 36 specifies the PG content.

Table 35 — PGN 64597— DRTD1 attribute specification

Attribute	Value
Transmission repetition time	10 s
Data length	32 byte
Extended data page	0
Data page	0
PDU format	252 (PDU2)
PDU specific	85 (GE)
Default priority	6

Table 35 *(continued)*

Attribute	Value
PGN	64597_{10}/$00FC55_{16}$

Table 36 — PGN 64597— DRTD1 parameter specification

Byte pos	Bit pos	Parameter	Remark
1 to 2		Driver1RemainingCurrentDrivingTime	—
3 to 4		Driver1RemainingTimeUntilNextBreakOrRest	—
5 to 6		Driver1DurationOfNextBreakRest	—
7 to 8		Driver1RemainingTimeOfCurrentBreakRest	—
9 to 10		Driver1TimeLeftUntilNextDrivingPeriod	—
11 to 12		Driver1DurationOfNextDrivingPeriod	—
13 to 14		Driver1CurrentDailyDrivingTime	—
15 to 16		Driver1TimeLeftUntilNewDailyRestPeriod	—
17 to 18		Driver1MinimumDailyRest	—
19 to 20		Driver1RemainingDrivingTimeOfCurrentWeek	—
21 to 22		Driver1TimeLeftUntilNewWeeklyRestPeriod	—
23 to 24		Driver1MinimumWeeklyRest	—
25 to 26		Driver1OpenCompensationInTheLastWeek	—
27 to 28		Driver1OpenCompensationInWeekBeforeLast	—
29 to 30		Driver1OpenCompensationIn2ndWeekBeforeLast	—
31 to 32		Driver1AdditionalInformation	—

8.13 DRTD2 — Driver 2 driving rest times

The driving rest times of driver 2 PG shall be transmitted by the RU. All parameters are mandatory. It shall be used to transmit driver 2's driving times. Table 37 specifies the PG attributes. Table 38 specifies the PG content.

Table 37 — PGN 64596— DRTD2 attribute specification

Attribute	Value
Transmission repetition time	10 s
Data length	32 byte
Extended data page	0
Data page	0
PDU format	252 (PDU2)
PDU specific	84 (GE)
Default priority	6
PGN	64596_{10} / $00FC54_{16}$

Table 38 — PGN 64596 — DRTD2 parameter specification

Byte pos	Bit pos	Parameter	Remark
1 to 2		Driver2RemainingCurrentDrivingTime	—
3 to 4		Driver2RemainingTimeUntilNextBreakOrRest	—
5 to 6		Driver2DurationOfNextBreakRest	—
7 to 8		Driver2RemainingTimeOfCurrentBreakRest	—
9 to 10		Driver2TimeLeftUntilNextDrivingPeriod	—
11 to 12		Driver2DurationOfNextDrivingPeriod	—
13 to 14		Driver2CurrentDailyDrivingTime	—
15 to 16		Driver2TimeLeftUntilNewDailyRestPeriod	—
17 to 18		Driver2MinimumDailyRest	—
19 to 20		Driver2RemainingDrivingTimeOfCurrentWeek	—
21 to 22		Driver2TimeLeftUntilNewWeeklyRestPeriod	—
23 to 24		Driver2MinimumWeeklyRest	—
25 to 26		Driver2OpenCompensationInTheLastWeek	—
27 to 28		Driver2OpenCompensationInWeekBeforeLast	—
29 to 30		Driver2OpenCompensationIn2ndWeekBeforeLast	—
31 to 32		Driver2AdditionalInformation	—

9 Addresses

Listed ECUs shall use the addresses as defined in Table 39.

Table 39 — Address assignments for tachograph system

Device name	Address
Engine	$0_{10}/0_{16}$
Visual instrument	$23_{10}/17_{16}$
RU	$238_{10}/EE_{16}$
Global	$255_{10}/FF_{16}$

Bibliography

[1] Regulation (EC) No 561/2006 of the European Parliament and the Council of 15. March 2006 on the harmonisation of certain social legislation relating to the road transport and amending Council Regulations (EEC) No 3821/85 and (EC) No 2135/98 and repealing Council Regulation (EEC) No 3820/85

[2] Council Regulation (EEC) No. 3821/85 of 20 December 1985 on recording equipment in road transport

[3] SAE J1939, *Recommended Practice for a Serial Control and Communications Vehicle Network*

[4] SAE J1939-11, *Physical Layer, 250 kbit/s, Twisted Shielded Pair*

[5] SAE J1939-14, *Physical Layer, 500 kbit/s*

[6] SAE J1939-21, *Data Link Layer*

[7] ISO 16844-6, *Road vehicles — Tachograph systems — Part 6: Diagnostics*

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