



DPC: 25/30495690 DC

BSI Group Headquarters

389 Chiswick High Road London W4 4AL

Tel: +44 (0)20 8996 9000

Fax: +44 (0)20 8996 7400

www.bsigroup.com

Date: 15 April 2025

Origin: International

Latest date for receipt of comments: 08 June 2025

Project No. 2024/01908

Responsible committee: AGE/6 Agricultural tractors and forestry machinery

Interested committees:

Title: BS ISO 11783-3 Draft Tractors and machinery for agriculture and forestry — Serial control and communications data network.
Part 3: Data link layer.

Please notify admin.start@bsigroup.com if you are aware of any keywords that might assist in clarifying or identifying the standard or of the content of this standard:

- i) has any issues related to 3rd party IPR, patent or copyright
- ii) affects other national standard(s)
- iii) requires additional national guidance or information

WARNING: THIS IS A DRAFT AND MUST NOT BE REGARDED OR USED AS A BRITISH STANDARD. THIS DRAFT IS NOT CURRENT BEYOND 08 June 2025

This draft is issued to allow comments from interested parties; all comments will be given consideration prior to publication. No acknowledgement will normally be sent. **See overleaf for information on the submission of comments.**

No copying is allowed, in any form, without prior written permission from BSI except as permitted under the Copyright, Designs and Patent Act 1988 or for circulation within a nominating organization for briefing purposes. Electronic circulation is limited to dissemination by e-mail within such an organization by committee members.

Further copies of this draft may be purchased from BSI Shop <http://shop.bsigroup.com> or from BSI Customer Services, Tel: +44(0) 20 8996 9001 or email cservices@bsigroup.com. British, International and foreign standards are also available from BSI Customer Services.

Information on the co-operating organizations represented on the committees referenced above may be obtained from <https://standardsdevelopment.bsigroup.com/>.

E-mail: admin.start@bsigroup.com

Introduction

This draft standard is based on national and international discussions. Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

For national standards, comments will be reviewed by the relevant UK national committee and the resulting standards published as a British Standard.

UK Vote

Please indicate whether you consider the UK should submit a negative (with supporting technical reasons) or positive vote on this draft. Please indicate if you are aware of any reason why this draft standard should not be published as a British Standard.

Submission of Comments

- **Annotated drafts are not acceptable and will be rejected.**
- All comments should be submitted online at <https://standardsdevelopment.bsigroup.com/>. You will need to register in order to comment.

Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
------------------	------------------------

1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/ Figure/Table/Note	Type of comment	Comment (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	



DRAFT International Standard

ISO/DIS 11783-3

Tractors and machinery for agriculture and forestry — Serial control and communications data network —

Part 3: Data link layer

*Tracteurs et matériels agricoles et forestiers — Réseaux de
commande et de communication de données en série —*

Partie 3: Couche liaison de données

ICS: 65.060.01; 35.240.99

ISO/TC 23/SC 19

Secretariat: DIN

Voting begins on:
2025-04-15

Voting terminates on:
2025-07-08

This document is circulated as received from the committee secretariat.

THIS DOCUMENT IS A DRAFT CIRCULATED FOR COMMENTS AND APPROVAL. IT IS THEREFORE SUBJECT TO CHANGE AND MAY NOT BE REFERRED TO AS AN INTERNATIONAL STANDARD UNTIL PUBLISHED AS SUCH.

IN ADDITION TO THEIR EVALUATION AS BEING ACCEPTABLE FOR INDUSTRIAL, TECHNOLOGICAL, COMMERCIAL AND USER PURPOSES, DRAFT INTERNATIONAL STANDARDS MAY ON OCCASION HAVE TO BE CONSIDERED IN THE LIGHT OF THEIR POTENTIAL TO BECOME STANDARDS TO WHICH REFERENCE MAY BE MADE IN NATIONAL REGULATIONS.

RECIPIENTS OF THIS DRAFT ARE INVITED TO SUBMIT, WITH THEIR COMMENTS, NOTIFICATION OF ANY RELEVANT PATENT RIGHTS OF WHICH THEY ARE AWARE AND TO PROVIDE SUPPORTING DOCUMENTATION.

Reference number
ISO/DIS 11783-3:2025(en)

© ISO 2025



Documents

Document Sharing Hub



COPYRIGHT PROTECTED DOCUMENT

© ISO 2025

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

Foreword	v
Introduction	vi
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Abbreviated terms	2
5 General description	2
6 Technical requirements	2
6.1 Mapping of messages to CAN data frames	2
6.1.1 General requirements and recommendations	2
6.1.2 Mapping of ISO 11783 messages to CAN data frames in CEFF	3
6.1.3 Parameter group numbers (PGN)	5
6.1.4 ISO 11783 support of ISO 11898-1 data frames in CBFF	6
6.2 Protocol data unit (PDU)	7
6.2.1 General	7
6.2.2 Priority (P)	7
6.2.3 Extended data page (EDP)	7
6.2.4 Data page (DP)	8
6.2.5 PDU format (PF)	8
6.2.6 PDU specific (PS)	8
6.2.7 Source address (SA)	9
6.2.8 Data field	9
6.3 Protocol data unit (PDU) formats	10
6.3.1 General	10
6.3.2 PDU1 format	10
6.3.3 PDU2 format	11
6.4 Message types	12
6.4.1 General	12
6.4.2 PG command	13
6.4.3 Request	13
6.4.4 Broadcast/response	17
6.4.5 Acknowledgement	17
6.4.6 Group functions	19
6.4.7 Transfer	21
6.5 Message priority	22
6.6 Bus access	23
6.7 Contention-based arbitration	23
6.8 Error detection	23
6.9 Assignment process for SA, PG and PGN	23
6.9.1 General	23
6.9.2 Address assignment criteria	24
6.9.3 Parameter group assignment criteria	24
6.9.4 Data field definition	25
6.10 Transport protocol functions	25
6.10.1 General	25
6.10.2 "Packetization" and reassembly	26
6.10.3 Transport protocol — connection management	27
6.10.4 Transport protocol — connection management messages (TP.CM)	29
6.10.5 Transport protocol — data transfer messages (TP.DT)	33
6.10.6 Transport protocol connection constraints	34
6.11 Extended transport protocol functions	35
6.11.1 Overview	35
6.11.2 General	35

6.11.3	Message size.....	35
6.11.4	Extended transport protocol — connection management.....	35
6.11.5	Extended transport protocol — connection management messages (ETP.CM)	37
6.11.6	Extended transport protocol — data transfer messages (ETP.DT)	40
6.11.7	Extended transport protocol — connection constraints.....	41
6.12	PDU processing requirements.....	41
6.13	Miscellaneous provisions.....	41
6.13.1	High data rates.....	41
6.13.2	Request scheduling.....	41
6.13.3	Controller response time and timeout defaults.....	42
6.13.4	Required responses.....	42
6.13.5	Transmission of PGs to specific or global destinations	42
6.13.6	CTS number of packet recommendation.....	43
Annex A (informative)	Transport protocol transfer sequences — examples of connection mode data transfer.....	44
Annex B (informative)	Communication mode examples.....	52
Annex C (informative)	Network bandwidth utilization.....	54
Bibliography		55

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 of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 23, *Tractors and machinery for agriculture and forestry*, Subcommittee SC 19, *Agricultural electronics*.

This fifth edition cancels and replaces the fourth edition (ISO 11783-3:2018), which has been technically revised. The main changes compared to the previous edition are as follows:

- replace default priority by assigned priority;
- improve transport protocol abort handling to close unambiguously a transport session;
- add Proprietary B PG to Data Page one;
- remove length limit for Proprietary A and Proprietary A2 PGs;
- limit usage of 11-bit CAN IDs;
- a control function may respond with a NACK when receiving unsupported PDU1 type messages

A list of all parts in the ISO 11783 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

ISO 11783 series specifies a communications system for agricultural equipment based on the ISO 11898-1 CAN protocol. SAE J1939 series¹⁾, on which parts of ISO 11783 series are based, were developed jointly for use in truck and bus applications and for construction and agriculture applications. Joint documents have been completed to allow electronic units that meet the truck and bus SAE J1939 specifications to be used by agricultural and forestry equipment with minimal changes. General information on the ISO 11783 series can be found in ISO 11783-1.

The purpose of ISO 11783 series is to provide an open, interconnected system for on-board electronic systems. It is intended to enable electronic control units (ECUs) to communicate with each other, providing a standardized system.

1) Society of automotive engineers.

Tractors and machinery for agriculture and forestry — Serial control and communications data network —

Part 3: Data link layer

1 Scope

This document specifies the application, the network layer protocols and the mapping to the controller area network (CAN) data link layer protocol as specified in ISO 11898-1. The application layer specifies protocol data units (PDU), which can be mapped to CAN CC data frames using the Classical Extended Frame Format (CEFF). For PDUs exceeding the length of the CEFF-formatted data frames, this document specifies transport layer protocols and the mapping to CEFF-formatted data frames.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 11783-1, *Tractors and machinery for agriculture and forestry — Serial control and communications data network — Part 1: General standard for mobile data communication*

ISO 11783-5, *Tractors and machinery for agriculture and forestry — Serial control and communications data network — Part 5: Network management*

ISO 11783-7, *Tractors and machinery for agriculture and forestry — Serial control and communications data network — Part 7: Implement messages application layer*

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

ISO 15765-2, *Road vehicles — Diagnostic communication over Controller Area Network (DoCAN) — Part 2: Transport protocol and network layer services*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 11783-1 and ISO 11898-1 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1

multi-packet message

message that does not fit into the data field of a single CAN data frame (i.e. messages with a data field greater than eight byte)

3.2

data transfer packet

packet that contains data that is part of a larger message communicated using either TP.DT or ETP.DT

3.3

request to send

RTS

message used to gain approval to send a block of data

3.4

clear to send

CTS

message used to grant approval to a sender of a block of data

3.5

group function value

GFV

An unsigned eight-bit number that identifies a unique parameter or sequence of parameters in a dedicated PG

Note 1 to entry: The values follow the recommendations for one-byte parameter given in ISO 11783-7.

3.6

extended group function value

EGFV

A one-, two- or three-byte number that identifies a unique parameter or sequence of parameters in a dedicated PG

Note 1 to entry: The interpretation of the values is proprietary and defined by the manufacturer.

4 Abbreviated terms

For the purposes of this document, the symbols and abbreviated terms given in ISO 11783-1 and the following apply. If the definition of the term in this document is different from the definition in ISO 11783-1, this definition applies.

GFI group function index

5 General description

The data link layer enables the reliable transfer of data across the physical link. This consists of sending the CAN CC data frame with the necessary synchronization, sequence control, error control and flow control. The flow control is accomplished through a consistent message and frame format.

6 Technical requirements

6.1 Mapping of messages to CAN data frames

6.1.1 General requirements and recommendations

The CAN specification referenced throughout this document is ISO 11898-1. When there are differences between the CAN specification and this document, this document is the governing document.

The mapping of messages specified in this document to CAN data frames as standardized in ISO 11898-1 is limited to CAN CC (classic) data frames. ISO 11898-1 specifies two CAN CC data frame formats: CBFF (classic base frame format) using an 11-bit ID field and CEFF (classic extended frame format) using a 29-bit identifier field. Messages compliant with this document shall be mapped to CAN data frames in CEFF format. CAN

remote frames as standardized in ISO 11898-1 shall not be transmitted. CAN FD data frames and CAN XL data frames shall not be transmitted.

NOTE The CAN data link layer entity sends CAN error frames and CAN overload frames as specified in ISO 11898-1. The PGN mapping to CAN data frames in CEFF is specified in [Table 1](#).

Proprietary messages are not in the scope of this document however if proprietary messages are used, see [6.1.4](#) for additional definitions.

6.1.2 Mapping of ISO 11783 messages to CAN data frames in CEFF

The CEFF message, illustrated by [Figure 1](#), encompasses a single protocol data unit (PDU). The PDU consists of seven predefined fields, assimilated from information provided by the application layer:

- Priority;
- Extended Data Page (EDP);
- Data Page (DP);
- PDU Format (PF),
- PDU Specific (PS), which can be Destination Address (DA), Group Extension (GE) or proprietary;
- Source Address (SA);
- Data.

See [6.2](#) for a detailed description of each field and [6.3](#) for PDU formats.

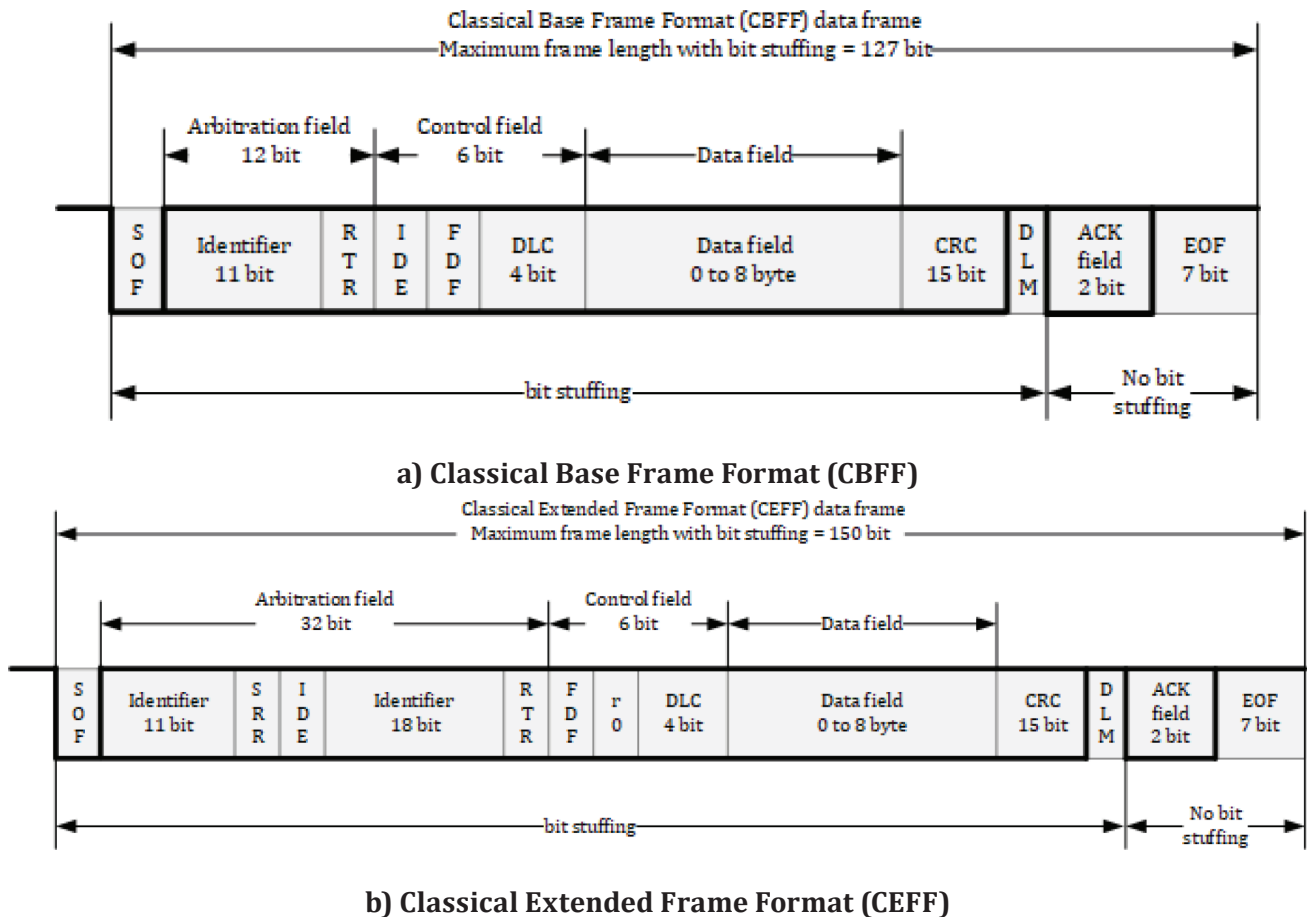


Figure 1 — CAN CC data frames

The fields are then packaged into one CAN CC data frame and sent over the physical media to other network controllers. The layers of the OSI model that ISO 11783 series supports are shown in [Figure 2](#). It is possible that some PG definitions require more than one CAN CC data frame in order to send their information.

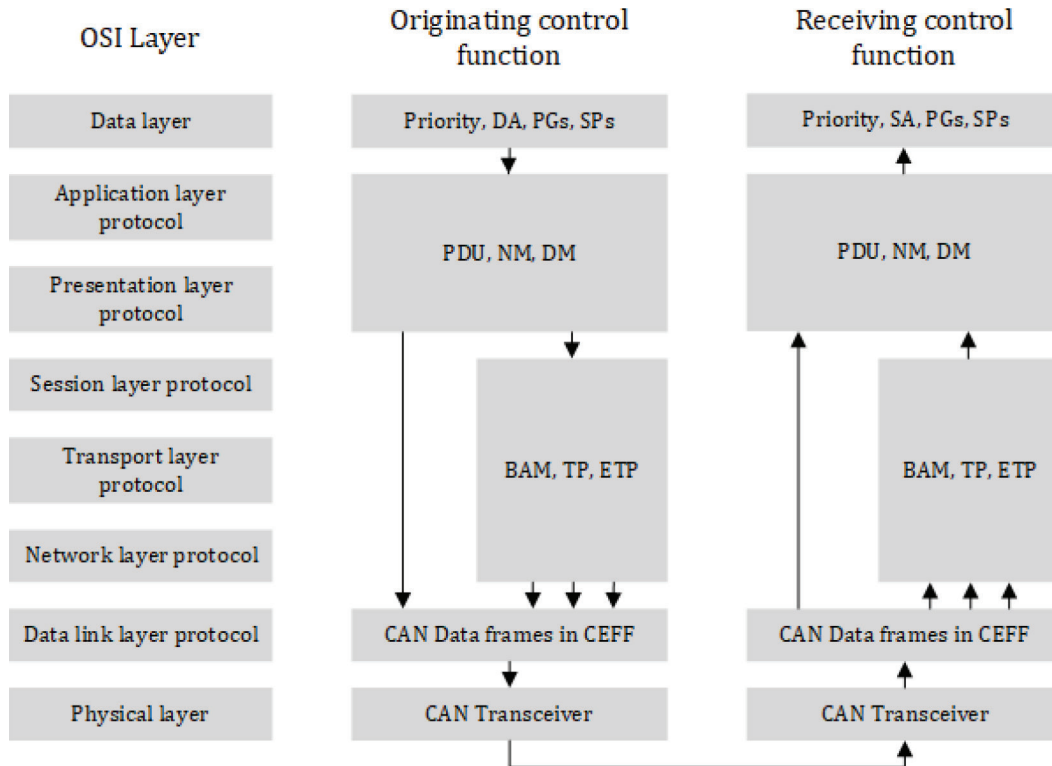


Figure 2 — Application of OSI model according to ISO 11783 series

[Table 1](#) shows the arbitration and control fields of the 29-bit identifier for CAN, 29-bit identifier for ISO 11783 series and 11-bit identifier for CAN, and the use of the 11-bit identifier on an ISO 11783 series defined network. A complete definition for each of the bit field assignments according to ISO 11783 series is given in 6.3. In ISO 11783 series, the CAN data frame data field is described as bytes one to eight. Byte one's most significant bit, bit eight, is the first bit sent closest to the data length code (DLC). Byte eight's least significant bit, bit one, is the last of the data bits to be sent and is closest to the cyclic redundancy check (CRC) field. See [Figure 3](#).

When the extended data page (EDP) is equal to one and the data page (DP) is equal to one, the CAN frame is identified as an ISO 15765-2 formatted frame. ISO 15765-2 specifies diagnostic communication over CAN (DoCAN). Therefore, the processing of this specific CAN frame format does not follow the definitions specified in ISO 11783 series and shall be in accordance with ISO 15765-2 (see [6.2.4](#)).

Table 1 — Mapping of ISO 11783 fields into CAN arbitration and control fields

29-bit CAN identifier		11-bit CAN identifier	
CAN	ISO 11783	CAN	ISO 11783
ID28	P3	ID28	P3
ID27	P2	ID27	P2
ID26	P1	ID26	P1
ID25	EDP	ID25	SA8
ID24	DP	ID24	SA7
ID23	PF8	ID23	SA6
ID22	PF7	ID22	SA5
ID21	PF6	ID21	SA4

Table 1 (continued)

29-bit CAN identifier		11-bit CAN identifier	
CAN	ISO 11783	CAN	ISO 11783
ID20	PF5	ID20	SA3
ID19	PF4	ID19	SA2
ID18	PF3	ID18	SA1
ID17	PF2		
ID16	PF1		
ID15	PS8		
ID14	PS7		
ID13	PS6		
ID12	PS5		
ID11	PS4		
ID10	PS3		
ID9	PS2		
ID8	PS1		
ID7	SA8		
ID6	SA7		
ID5	SA6		
ID4	SA5		
ID3	SA4		
ID2	SA3		
ID1	SA2		
ID0	SA1		
EDP Extended Data Page according to this document SA# Source Address bit number (#) according to this document DP Data Page according to this document PF# PDU Format bit number (#) according to this document PS# PDU Specific bit number (#) according to this document			

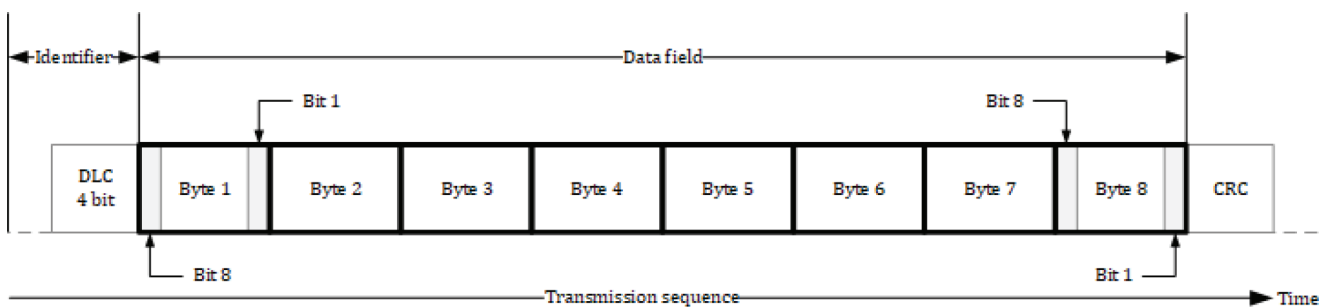


Figure 3 — CAN CC data field

6.1.3 Parameter group numbers (PGN)

Whenever it is necessary to identify a PG in the data field of a CAN CC data frame, this is expressed in 24 bit. The 24-bit value is sent the least significant byte (LSB) first (see [Table 2](#)), also according to which the most significant byte (MSB) is sent third and the middle byte second and the LSB first. The 24-bit PGN is determined from the following constituent components: six bit set to zero, Extended Data Page bit, Data Page bit, PDU Format field (eight bit), and PDU Specific field (eight bit).

The procedure for the bit fields to be converted to PGN is as follows. The six most significant bits of the PGN shall be set to zero. Then the Extended Data Page bit, Data Page bit and PDU Format field are copied into the next 10 bit. If the PF value is less than 240 ($F0_{16}$) then the LSB of the PGN is set to zero. Otherwise, it is set to the value of the PS field. See [Table 2](#) for an illustration of the PGN, their corresponding bits and their conversion to a decimal number.

NOTE Not all 131 072 combinations (2^{17}) are available to be assigned as PGN. Only a total of 8 672 combinations are available for assignment {calculated as: 2 pages $\times$ [240 + (16 $\times$ 256)] = 8 672}, using the conventions specified in this document. See ISO 11783-1 for the latest PGN assignments.

Table 2 — Parameter group number examples

PGN constituent components					PGN		Numbers of assignable PGs	Cumulative numbers of PGs	ISO- or manufacturer- assigned
PGN (MSB) Byte 1 sent third in CAN data frame			PGN Byte 2 sent second in CAN data frame	PGN (LSB) Byte 3 sent first in CAN data frame	(dec.)	(hex.)			
Bit 8 to 3	EDP	DP	PF	PS					
	Bit 2	Bit 1	Bit 8 to 1	Bit 8 to 1					
0	0	0	0	0	0	000000			ISO
							239	239	
0	0	0	238	0	60 928	00EE00			
0	0	0	239	0	61 184	00EF00	1	240	MF
0	0	0	240	0	61 440	00F000			ISO
							3 840		
0	0	0	254	255	65 279	00FEFF		4 080	
0	0	0	255	0	65 280	00FF00			
							256		MF
0	0	0	255	255	65 535	00FFFF		4 336	
0	0	1	0	0	65 536	010000			
0	0	1	238	0	126 464	01EE00	239		ISO
0	0	1	239	0	126 720	01EF00	240	4 576	MF
0	0	1	240	0	126 976	01F000			
							4 096		ISO
0	0	1	255	255	131 071	01FFFF		8 672	

6.1.4 ISO 11783 support of ISO 11898-1 data frames in CBFF

Controllers on the network, based on ISO 11783 series may support data frames in CBFF. Though these are not compatible with the ISO 11783 series message structure, to accommodate the co-existence of the two formats, a minimum level of definition is given. This minimum definition allows controllers that use this format to reduce the interference with other controllers. CBFF messages are defined as being proprietary. CBFF messages should not be transmitted, because of real-time and timing-behaviour impacts for the messages standardized in ISO 11783 series. In reference to [Table 1](#), the 11-bit CAN identifier field is parsed as follows: the three most significant bits are used as priority bits; the eight least significant bits identify the SA of the PDU. Priority bits are described in [6.2.2](#). The SA is described in [6.2.7](#).

Incorrect bus arbitration can occur when two messages, one base frame and one extended frame, access the bus at the same time. The SA is a higher relative priority in the base frame messages than in the extended frame messages. The message with an 11-bit CAN identifier (base frame) can have an SA indicating a higher priority than that of the Extended Data Page bit, Data Page bit and PDU Format of the 29-bit CAN identifier (extended frame) message. The three priority bits should be used to achieve the correct bus arbitration.

6.2 Protocol data unit (PDU)

6.2.1 General

The applications and/or network layer provide a string of information that is assimilated into a protocol data unit. The protocol data unit provides a framework for organizing the information that is essential to each CAN CC data frame sent. The protocol data unit (PDU) as specified in this document shall consist of the seven fields listed in [6.1.2](#) and specified below. These fields shall then be packaged into one or more CAN CC data frames and sent over the physical media to other network controllers. There is only one PDU per CAN CC data frame.

NOTE Some PG definitions require more than one CAN CC data frame for sending the corresponding data.

Certain bits of the CAN CC data frame fields are left out of the PDU definition because they are controlled entirely by the CAN specification and are invisible to all of the OSI layers above the data link layer. These include the SOF, SRR, IDE, RTR, FDF, CRC, ACK and EOF fields, and parts of the control field. They are defined by the CAN protocol definition and remain unmodified by ISO 11783 series.

The PDU fields (see [Figure 4](#)) are specified in [6.2.2](#) to [6.2.8](#).

	Priority	EDP	DP	PF	PS	SA	Data
No. of bits	3	1	1	8	8	8	64

Figure 4 — PDU fields

6.2.2 Priority (P)

6.2.2.1 Priority field

The three bits of the Priority field are mapped into the three highest priority CAN identifier bits (as shown in [Table 1](#)). On the receiving CAN nodes, the Priority field shall be ignored.

The Priority field can be set from 000_2 (highest priority) to 111_2 (lowest priority). Annex D recommends the assignment of priorities.

6.2.2.2 Assigned priority

Messages with an assigned priority shall use the assigned priority.

NOTE 1 The assigned priority is intended to achieve the application-required latency for messages.

NOTE 2 Transport protocol messages (see [6.10.4](#), [6.10.5](#), [6.11.5.2](#) and [6.11.6](#)) use their Assigned priority and the Assigned priority of the transported PG is not used.

6.2.2.3 Default priority

Messages with a default priority should be sent with the priority given in [Annex C](#). Messages with the default priority may be sent with the priority as specified for the message.

6.2.3 Extended data page (EDP)

The extended data page (EDP) bit is used in conjunction with the data page bit to determine the structure of the CAN identifier of the CAN CC data frame. All ISO 11783 series messages shall set the extended data page bit to zero on transmit. (See [Table 3](#) for the defined uses of the EDP and DP fields.) It is possible that future definitions will expand the PDU Format field, defining new PDU formats, expanding the priority field, or increasing the address space.

6.2.4 Data page (DP)

The data page (DP) bit is used in conjunction with the EDP bit to determine the structure of the CAN identifier of the CAN CC data frame. With the EDP bit set to zero, the DP bit selects between page zero and page one of the PG descriptions. See [Table 3](#).

Table 3 — Definition of extended data page (EDP) and data page (DP) use

EDP Bit 25	DP Bit 24	Description
CAN ID Bit 25	CAN ID Bit 24	
0	0	ISO 11783 page 0 PG
0	1	ISO 11783 page 1 PG
1	0	Reserved by document
1	1	ISO 15765-2 defined PG

NOTE The EDP and DP of the CAN 29-bit identifier being set to 11₂ identifies it as an ISO 15765-2 message. This means that the remaining bits of the CAN identifier is *not* set up as specified by this document; CAN frames following this format are not described in ISO 11783 series.

6.2.5 PDU format (PF)

PDU format (PF) is an 8-bit field that determines the PDU format and is one of the fields used to determine the PGN assigned to the CAN CC data field. PGN are used to identify or label commands, data, some requests, acknowledgements and negative acknowledgements, as well as for identifying or labelling information that requires one or more CAN CC data frames to communicate the information. If there is more information than can fit in eight data bytes, a multi-packet message is required to be sent. If there are eight or less data bytes, then a single CAN CC data frame is used. A PG can represent one or more parameters, where a parameter is a piece of data such as engine rotations per minute. Even though a PG label can be used for one parameter, multiple parameters should be grouped so that all eight byte of the data field are used.

The definition of two proprietary PGs allows both PDU1 and PDU2 formats to be used. The interpretation of the proprietary information varies between manufacturers.

EXAMPLE Even though two different engines can use a common set of standard PGs, it is probable that one manufacturer's proprietary communications will be different from another's.

6.2.6 PDU specific (PS)

The PDU specific (PS) field is an 8-bit field whose definition depends on its PDU format, which determines whether it will be a DA or GE field. See [Table 4](#).

Table 4 — Definition of PDU specific (PS) field

PDU format	PF	PS
PDU1	0 to 239	Destination Address (DA)
PDU2	240 to 255	Group Extension (GE)

The DA field defines the specific address to which the message is being sent. Any other controller should ignore this message. The global destination address (255) requires all controllers to listen and respond accordingly as message recipients.

The GE field, in conjunction with the four least significant bits of the PF field, provides for 4 096 PGs per data page. These are only available using the GE format PDU (PDU2).

NOTE When the four most significant bits of the PDU format field are set, it indicates that the PS field is a GE field.

In addition, 240 PGs are provided in each data page for use only in the destination-specific format PDU (PDU1 format). In total, 8 672 PGs are available to be defined using the two data pages currently available.

This total is calculated using [Formula \(1\)](#):

$$[240 + (16 \times 256)] \times 2 = 8\,672 \quad (1)$$

where

- 240 represents the number of PDU format field values available per data page (i.e. PDU1 format, PS field = DA);
- 16 is the number of PDU format values per GE value (i.e. PDU2 format only);
- 256 is the number of possible GE values (i.e. PDU2 format only);
- 2 is the number of data page states (both PDU formats).

See also [6.3](#).

6.2.7 Source address (SA)

The source address (SA) field is eight bit long. There shall only be one control function on the network with a given SA.

NOTE For address management and allocation, and procedures to prevent duplication of SA, see ISO 11783-5.

6.2.8 Data field

6.2.8.1 Parameter data with fixed length from zero byte to eight byte

When a PG needs eight or less data bytes for transporting parameters, then it can be mapped into a single CAN data frame in CEFF. PGs should allocate eight byte of the CAN data field independent of the size of the mapped parameters. This provides a means of adding parameters and avoiding incompatibility with previous revisions that only define part of the CAN data field. The remaining, not used, CAN data field bytes shall be defined as “not available” (see ISO 11783-7:2022, clause 3.3.4). When the number of parameter data bytes associated with a PG is specified, it cannot be changed. For example, the REQUEST PG (PGN 59 904), has a PG data length of three byte, so the CAN DLC is set to three.

Note A group function (see [6.4.6](#)), for example VT-commands (as specified in ISO 11783-6:2022, clause 5.2.6), uses the same data field length because the PG is the same.

6.2.8.2 Parameter data greater than eight byte

When a PG needs more than eight data bytes, then it is mapped to multiple CAN CC data frames representing packets respectively segments. The term multi-packet is used to describe this type of PG. A PG defined as being multi-packet capable, having less than nine data bytes to transfer in a specific instance, shall be sent in a single CAN CC data frame with the DLC set to eight. When a particular PG has nine or more data bytes to transfer, then one of the transport protocol functions are used. The transport function connection management capability is used to set up and close out the communication of the multi-packet PGs. The transport protocol data transfer capability is used to communicate the data itself in a series of packets mapped to single CAN CC data frames containing the “packetized” data. Additionally, the transport protocol function provides flow control and handshaking capabilities for destination-specific transfers (see [6.10](#)).

CAN CC data frames associated with a particular multi-packet response shall have a DLC of eight. All unused data bytes shall be set to “not available”. The number of bytes per packet is fixed; however, ISO 11783 series defines multi-packet messages that have a variable and or fixed number of packets. The PG for active diagnostic codes is an example of a multi-packet message that has a variable number of packets. PGs that are defined as multi-packet only use the transport protocol, when more than eight data bytes number are needed.

6.3 Protocol data unit (PDU) formats

6.3.1 General

The available PDU formats, illustrated in [Figure 5](#), are defined as PDU1 (PS = DA) and PDU2 (PS = GE). PDU1 allows for direction of the CAN CC data frame to a specific destination address (control function); PDU2 only communicates CAN CC data frames that are not destination specific. Two separate PDU formats are created to provide more possible PGN combinations while still providing for destination-specific communications. Proprietary PG definitions are assigned so that both PDU formats can be used for proprietary communications. A standardized method for proprietary communications is defined to prevent possible conflicts in identifier usage.

The definition of proprietary PGNs has been established allowing both PDU1 and PDU2 Formats to be used. The interpretation of the proprietary information varies by manufacturer.

	Priority	EDP	DP	PF	PS(DA)	SA	Data
No. of bits	3	1	1	8	8	8	64

a) PDU1

	Priority	EDP	DP	PF	PS(GE)	SA	Data
No. of bits	3	1	1	8	8	8	64

b) PDU2

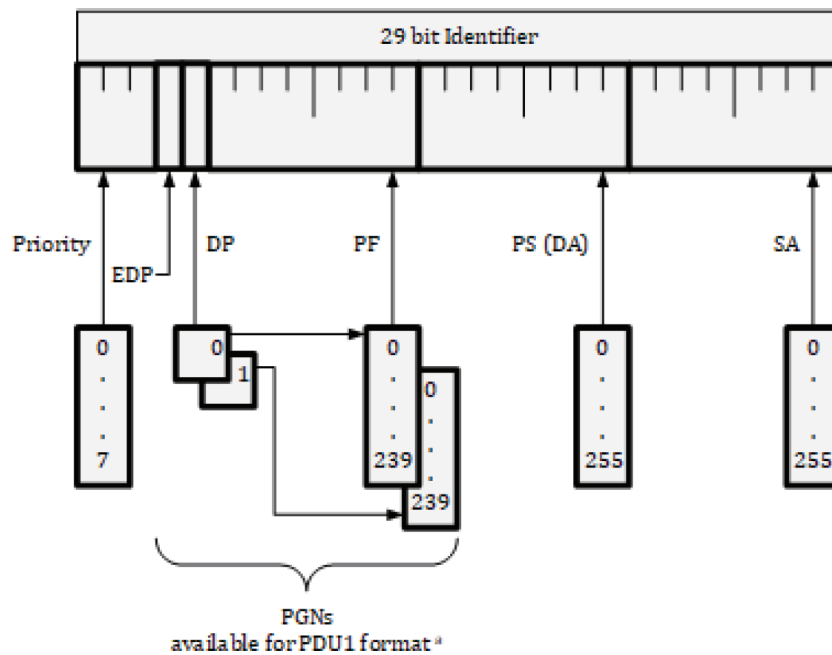
Figure 5 — Available PDU formats

6.3.2 PDU1 format

The PDU1 format makes it possible for applicable PGs to be sent to either a specific or global destination because the PS field contains the DA.

PDU1 format messages can be requested or sent as unsolicited messages.

PDU1 format messages are determined by the PF field. When the value of that field is 0 to 239, the message is in the PDU1 format. The format of the PDU1 message is illustrated by [Figure 5](#). See also [Figure 6](#).



^a Currently, $2 \times 240 = 480$.

Figure 6 — PDU1 format

PGs requiring a destination (PDU1) and minimal latency start at PF = 0 and increment towards 238. See [Table 12](#).

PGs requiring a destination where latency is not critical start at PF = 239 and decrement towards 0. See [Table 12](#).

A PF equal to 239 (Extended Data Page bit = 0 and Data Page bit = 0 or 1) is assigned for proprietary use. In this case the PS field is a destination address (see [6.4.6](#)). See [6.4.6.2](#) for Proprietary A and [6.4.6.3](#) for Proprietary A2 definition.

6.3.3 PDU2 format

The PDU2 format can be used to broadcast messages to the network for reception by any interested controller function, and therefore does not contain a DA. PDU2 format messages can be requested or sent as unsolicited messages. The PS field contains the GE.

NOTE Selection of the PDU2 format at the time a PG is defined prevents that PG from ever being able to be directed to a specific destination.

PDU2 format messages are defined as being those where the PF value is equal to 240 to 255. The format of the PDU2 message is illustrated by [Figure 5](#). Also see [Figure 7](#).