
**Road vehicles — Diagnostic
communication over Controller Area
Network (DoCAN) —**

**Part 2:
Transport protocol and network layer
services**

*Véhicules routiers — Communication de diagnostic sur gestionnaire
de réseau de communication (DoCAN) —*

Partie 2: Protocole de transport et services de la couche réseau



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ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

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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](#)

The committee responsible for this document is ISO/TC 22, *Road vehicles*, Subcommittee SC 31, *Data communication*.

This third edition cancels and replaces the second edition (ISO 15765-2:2011), which has been technically revised.

ISO 15765 consists of the following parts, under the general title *Road vehicles — Diagnostic communication over Controller Area Network (DoCAN)*¹⁾:

- *Part 1: General information and use case definition*
- *Part 2: Transport protocol and network layer services*
- *Part 4: Requirements for emissions-related systems*

1) ISO 15765-3 Implementation of unified diagnostic services (UDS on CAN) has been withdrawn and replaced by ISO 14229-3 Road vehicles — Unified diagnostic services (UDS) — Part 3: Unified diagnostic services on CAN implementation (UDSonCAN)

Introduction

This part of ISO 15765 has been established in order to define common requirements for vehicle diagnostic systems implemented on a controller area network (CAN) communication link, as specified in ISO 11898-1. Although primarily intended for diagnostic systems, it also meets requirements from other CAN-based systems needing a network layer protocol.

To achieve this, it is based on the Open Systems Interconnection (OSI) Basic Reference Model in accordance with ISO/IEC 7498-1 and ISO/IEC 10731, which structures communication systems into seven layers as shown in [Table 1](#).

Table 1 — Enhanced and legislated on-board diagnostics specifications applicable to the OSI layers

OSI 7 layers ^a	Vehicle-manufacturer-enhanced diagnostics	Legislated OBD (on-board diagnostics)	Legislated WWH-OBDD (on-board diagnostics)
Application (layer 7)	ISO 14229-1, ISO 14229-3	ISO 15031-5	ISO 27145-3, ISO 14229-1
Presentation (layer 6)	Vehicle manufacturer specific	ISO 15031-2, ISO 15031-5, ISO 15031-6, SAE J1930-DA, SAE J1979-DA, SAE J2012-DA	ISO 27145-2, SAE 1930-DA, SAE J1979-DA, SAE J2012-DA, SAE J1939-DA (SPNs), SAE J1939-73 Appendix A (FMIs)
Session (layer 5)	ISO 14229-2		
Transport protocol (layer 4)	ISO 15765-2	ISO 15765-2	ISO 15765-4, ISO 15765-2
Network (layer 3)			
Data link (layer 2)	ISO 11898-1	ISO 11898-1	ISO 15765-4, ISO 11898-1
Physical (layer 1)	ISO 11898-1, ISO 11898-2, ISO 11898-3, or vehicle manufacturer specific	ISO 11898-1, ISO 11898-2	ISO 15765-4, ISO 11898-1, ISO 11898-2
ISO 27145-4			

^a 7 layers according to ISO/IEC 7498-1 and ISO/IEC 10731

The application layer services covered by ISO 14229-3 have been defined in compliance with diagnostic services established in ISO 14229-1 and ISO 15031-5 but are not limited to use only with them. ISO 14229-3 is also compatible with most diagnostic services defined in national standards or vehicle manufacturer's specifications.

For other application areas, ISO 15765 can be used with any CAN physical layer.

Road vehicles — Diagnostic communication over Controller Area Network (DoCAN) —

Part 2: Transport protocol and network layer services

1 Scope

This part of ISO 15765 specifies a transport protocol and network layer services tailored to meet the requirements of CAN-based vehicle network systems on controller area networks as specified in ISO 11898-1. It has been defined in accordance with the diagnostic services established in ISO 14229-1 and ISO 15031-5 but is not limited to use with them and is also compatible with most other communication needs for in-vehicle networks.

ISO 11898-1 specifies variable length CAN frames with a maximum payload size dependent on the protocol device used. A CLASSICAL CAN protocol device can transmit/receive frames with payload sizes ranging from 0 bytes to 8 bytes per frame. A CAN FD (flexible data rate) protocol device can transmit/receive frames with payload sizes from 0 bytes to 64 bytes. A CAN FD protocol device is also capable of transmitting/receiving CLASSICAL CAN frames.

The diagnostic communication over controller area network (DoCAN) protocol supports the standardized service primitive interface as specified in ISO 14229-2 (UDS).

This part of ISO 15765 provides the transport protocol and network layer services to support different application-layer implementations such as

- enhanced vehicle diagnostics (emissions-related system diagnostics beyond legislated functionality, non-emissions-related system diagnostics),
- emissions-related on-board diagnostics (OBD) as specified in ISO 15031,
- world-wide harmonized on-board diagnostics (WWH-OBD) as specified in ISO 27145, and
- end of life activation on on-board pyrotechnic devices (ISO 26021).

The transport protocol specifies an unconfirmed communication.

NOTE This part of ISO 15765 does not determine whether CLASSICAL CAN, CAN FD or both are recommended or required to be implemented by other standards referencing this part of ISO 15765.

2 Normative references

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/IEC 7498-1, *Information technology — Open Systems Interconnection — Basic Reference Model: The Basic Model — Part 1*

ISO 11898-1:2015²⁾, *Road vehicles — Controller area network (CAN) — Part 1: Data link layer and physical signalling*

2) The dated reference is to the first version of ISO 11898-1 that includes the definition of CAN FD. Versions after the dated reference are also valid. Future dated references are valid for CAN FD.