INTERNATIONAL STANDARD

ISO 11898-1

Second edition
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Road vehicles — Controller area network (CAN) —

Part 1: Data link layer and physical signalling

Véhicules routiers — Gestionnaire de réseau de communication (CAN) —

Partie 1: Couche liaison de données et signalisation physique

Reference number
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Foreword

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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).

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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 second edition cancels and replaces the first edition (ISO 11898-1:2003), which has been technically revised. It also incorporates the Corrigendum ISO 11898-1:2003/Cor 1:2006.

ISO 11898 consists of the following parts, under the general title *Road vehicles — Controller area network (CAN)*:

— *Part 1: Data link layer and physical signalling*

— *Part 2: High-speed medium access unit* [1)]

— *Part 3: Low-speed, fault-tolerant, medium-dependent interface*

— *Part 4: Time-triggered communication*

— *Part 5: High-speed medium access unit with low-power mode* [1)]

— *Part 6: High-speed medium access unit with selective wake-up functionality* [1)]

1) Parts 2, 5, and 6 are being revised. They will be merged under a new edition of Part 2.

Introduction

ISO 11898 was first published as one document in 1993. It covered the CAN data link layer, as well as the high-speed physical layer.

In the reviewed and restructured ISO 11898 series:

— Part 1 defines the data link layer including the logical link control (LLC) sub-layer and the medium access control (MAC) sub-layer, as well as the physical signalling (PHS) sub-layer;

— Part 2 defines the high-speed physical medium attachment (PMA);

— Part 3 defines the low-speed fault-tolerant physical medium attachment (PMA);

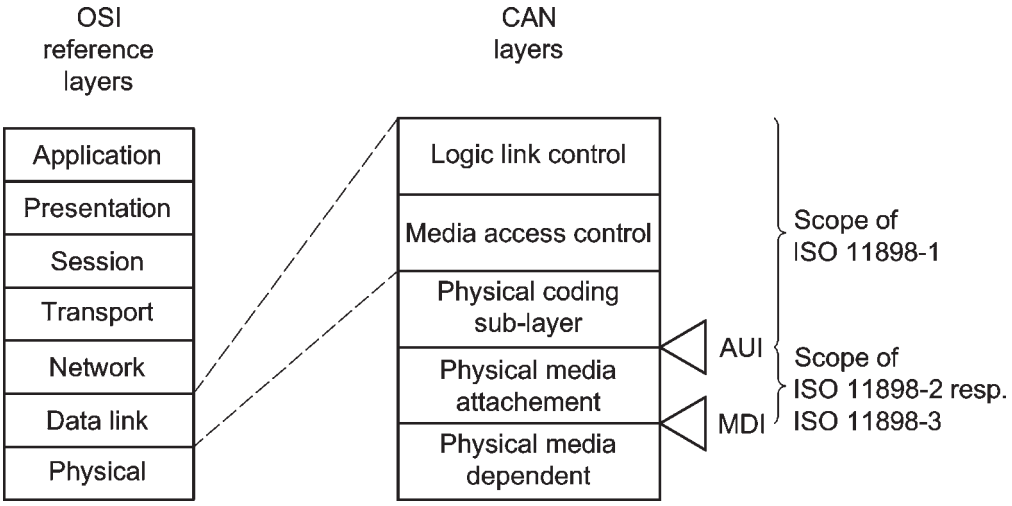
— Part 4 defines the time-triggered communication;

— Part 5 defines the power modes of the high-speed physical medium attachment (PMA);

— Part 6 defines the selective wake-up functionality of the high-speed physical medium attachment (PMA).

NOTE ISO 11898-2 is updated in parallel to the update of this part of ISO 11898 to combine the functions described in ISO 11898-2, ISO 11898-5 and ISO 11898-6. (The future edition of ISO 11898-2 will cancel and replace the current ISO 11898-2:2003, ISO 11898-5:2007 and ISO 11898-6:2013)

Figure 1 shows the relations between the OSI reference layers and the parts of the ISO 11898 series.



NOTE ISO 11898-2 refers to the future edition that will cancel and replace the current ISO 11898-2:2003, ISO 11898-5:2007 and ISO 11898-6:2013.

Figure 1 — CAN data link and physical sub-layers relation to the OSI model

Road vehicles — Controller area network (CAN) —

Part 1:
Data link layer and physical signalling

1 Scope

This part of ISO 11898 specifies the characteristics of setting up an interchange of digital information between modules implementing the CAN data link layer. Controller area network is a serial communication protocol, which supports distributed real-time control and multiplexing for use within road vehicles and other control applications.

This part of ISO 11898 specifies the Classical CAN frame format and the newly introduced CAN Flexible Data Rate Frame format. The Classical CAN frame format allows bit rates up to 1 Mbit/s and payloads up to 8 byte per frame. The Flexible Data Rate frame format allows bit rates higher than 1 Mbit/s and payloads longer than 8 byte per frame.

This part of ISO 11898 describes the general architecture of CAN in terms of hierarchical layers according to the ISO reference model for open systems interconnection (OSI) according to ISO/IEC 7498-1. The CAN data link layer is specified according to ISO/IEC 8802-2 and ISO/IEC 8802-3.

This part of ISO 11898 contains detailed specifications of the following (see Figure 2):

— logical link control sub-layer;

— medium access control sub-layer;

— physical coding sub-layer.

There are three implementation options. They are the following:

— support of the Classical CAN frame format only, not tolerating the Flexible Data Rate frame format;

— support of the Classical CAN frame format and tolerating the Flexible Data Rate frame format;

— support of the Classical CAN frame format and the Flexible Data Rate frame format.

The last option is recommended to be implemented for new designs.

NOTE Implementations of the first option can communicate with implementations of the third option only as long as the Flexible Data Rate frame format is not used; otherwise, Error Frames are generated. There are opportunities to run implementations of the first option also in CAN networks using the Flexible Data Rate frame format, but these are not in the scope of this part of ISO 11898.

2 Conformance

The data link layer conformance test plan is not in the scope of this part of ISO 11898. For an implementation to be compliant with this part of ISO 11898, the logical link control sub-layer and the medium access control sub-layer shall comply with all mandatory specifications and values given in this part of ISO 11898. If optional specifications and values are implemented, they shall comply, too.