INTERNATIONAL STANDARD

ISO 11898-5

First edition
2007-06-15

Road vehicles — Controller area network (CAN) —

Part 5: High-speed medium access unit with low-power mode

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

Partie 5: Unité d'accès au médium haute vitesse avec mode de puissance réduite



Reference number
ISO 11898-5:2007(E)

© ISO 2007

PDF disclaimer

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.



COPYRIGHT PROTECTED DOCUMENT

© ISO 2007

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

 © ISO 2007 – All rights reserved

Contents

Page

Foreword ... iv

Introduction ... v

1 Scope ... 1

2 Normative references ... 1

3 Terms and definitions ... 1

4 Symbols and abbreviated terms ... 2

5 Functional description of medium access unit (MAU) with low-power mode ... 2
5.1 General ... 2
5.2 Physical medium attachment sub layer specification ... 2

6 Conformance tests ... 5
6.1 General ... 5
6.2 V_{Split} output function ... 5
6.3 Output voltage during low-power mode ... 6
6.4 Internal resistance during low-power mode ... 6
6.5 Propagation delay during normal mode ... 7
6.6 Wake-up filter time during low-power mode ... 7
6.7 Bus driver symmetry during normal mode ... 7
6.8 Input leakage current, unpowered device ... 8

7 Electrical specification of high-speed medium access unit (HS-MAU) ... 8
7.1 Physical medium attachment sub layer specification ... 8
7.2 CAN node ... 10
7.3 Medium dependent interface (MDI) specification, connector parameters ... 18
7.4 Physical medium specification ... 18

Bibliography ... 20

© ISO 2007 – All rights reserved

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 11898-5 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 3, *Electrical and electronic equipment*.

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*

— *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*

 © ISO 2007 – All rights reserved

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 describes 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 (PLS) sub layer;

— Part 2 defines the high-speed medium access unit (MAU);

— Part 3 defines the low-speed fault-tolerant medium access unit (MAU);

— Part 4 defines the time-triggered communication;

— Part 5 defines the power modes of the high-speed medium access unit (MAU).

ISO 11898-1 and ISO 11898-2 have been cancelled and replaced ISO 11898:1993.

© ISO 2007 – All rights reserved

Road vehicles — Controller area network (CAN) —

Part 5:
High-speed medium access unit with low-power mode

1 Scope

This part of ISO 11898 specifies the CAN physical layer for transmission rates up to 1 Mbit/s for use within road vehicles. It describes the medium access unit functions as well as some medium dependent interface features according to ISO/IEC 8802-2.

This part of ISO 11898 represents an extension of ISO 11898-2, dealing with new functionality for systems requiring low-power consumption features while there is no active bus communication.

Physical layer implementations according to this part of ISO 11898 are compliant with all parameters of ISO 11898-2, but are defined differently within this part of ISO 11898. Implementations according to this part of ISO 11898 and ISO 11898-2 are interoperable and can be used at the same time within one network.

2 Normative references

The following referenced documents are indispensable for the application 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 7637-3, *Road vehicles — Electrical disturbances from conduction and coupling — Part 3: Electrical transient transmission by capacitive and inductive coupling via lines other than supply lines*

ISO 11898-2:2003, *Road vehicles — Controller area network (CAN) — Part 2: High-speed medium access unit*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 11898-2 and the following apply.

3.1
VCC
⟨CAN node⟩ supply voltage of the physical layer used for the bus receiver, transmitter and optional split termination voltage V_{Split} during normal mode

NOTE Typical voltage of VCC is 5 V.

3.2
split termination voltage
V_{Split}
⟨CAN node⟩ output voltage of split termination support output relative to ground signal of the module (GND)

© ISO 2007 – All rights reserved

3.3
propagation time
t_{Prop}
⟨CAN node⟩ signal propagation time measured from an edge at transmit data (TXD) input to the corresponding edge on receive data (RXD) output of the MAU

3.4
wake-up filter time
t_{Wake}
⟨CAN node⟩ duration of a dominant signal on the bus lines CAN_H and CAN_L for forcing a wake-up to the CAN NODE

3.5
wake-up pattern
⟨CAN node⟩ one or multiple consecutive dominant bus levels for at least t_{Wake}, each separated by a recessive bus level

NOTE Figures within this part of ISO 11898 are using arrows as following: voltages + → –; currents flowing from the positive to the negative pole.

4 Symbols and abbreviated terms

For the purposes of this document, the symbols and abbreviated terms given in ISO 11898-2 apply.

5 Functional description of medium access unit (MAU) with low-power mode

5.1 General

The following description is valid for a two-wire differential bus. The values of the voltage levels, the resistances and the capacitances as well as the termination network are described in Clause 7.

5.2 Physical medium attachment sub layer specification

5.2.1 General

As shown in Figure 1 the bus line is terminated by termination network A and termination network B. These terminations are intended to suppress reflections.

Besides this reflection-optimized termination structure, centralized single terminations are possible at limited bit rates and topologies.

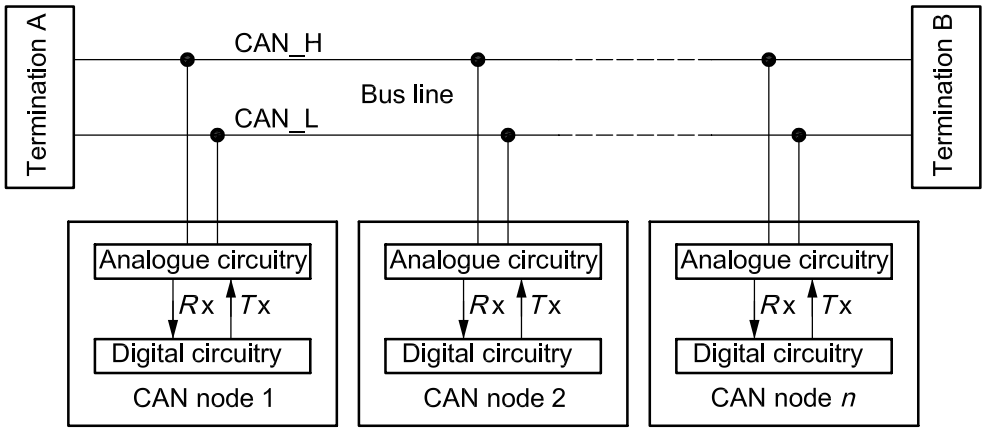


Figure 1 — Suggested electrical interconnection

© ISO 2007 – All rights reserved