SLOVENSKI STANDARD
oSIST prEN 50325-1:2019

01-junij-2019

Industrijski komunikacijski podsistemi, ki temeljijo na ISO 11898 (CAN), za vmesnike krmilnikov - 1. del: Splošne zahteve

Industrial communications subsystem based on ISO 11898 (CAN) for controller-device interfaces - Part 1: General requirements

Industrielles Kommunikationssubsystem basierend auf ISO 11898 (CAN) - Teil 1: Allgemeine Anforderungen

Sous-système de communications industriel basé sur l'ISO 11898 (CAN) pour les interfaces des dispositifs de commande - Partie 1: Prescriptions générales

Ta slovenski standard je istoveten z: **prEN 50325-1:2019**

ICS:

35.240.50	Uporabniške rešitve IT v industriji	IT applications in industry
43.040.15	Avtomobilska informatika. Vgrajeni računalniški sistemi	Car informatics. On board computer systems

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EUROPEAN STANDARD

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English Version

Industrial communications subsystem based on ISO 11898 (CAN) for controller-device interfaces - Part 1: General requirements

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This draft European Standard is submitted to CENELEC members for enquiry.
Deadline for CENELEC: 2019-06-21.

It has been drawn up by CLC/TC 65X.

If this draft becomes a European Standard, CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

This draft European Standard was established by CENELEC in three official versions (English, French, German).
A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

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.

Warning : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

This document (prEN 50325-1:2019) has been prepared by the CLC/TC 65CX, Fieldbus.

This document is currently submitted to the Enquiry.

The following dates are proposed:

• latest date by which the existence of this document has to be announced at national level	(doa)	dor + 6 months
• latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	dor + 12 months
• latest date by which the national standards conflicting with this document have to be withdrawn	(dow)	dor + 36 months (to be confirmed or modified when voting)

This document will supersede EN 50325-1:2002.

This European standard is divided into five parts:

Part 1 General requirements

Part 2 withdrawn

Part 3 withdrawn

Part 4 CANopen

Part 5 Functional safety communication based on EN 50325-4

The specifications for CANopen and Functional safety communication based on EN 50325-4 are based on ISO 11898 *Controller area network (CAN) for high-speed communication*, a broadcast-oriented communications protocol. However, ISO 11898 specifies only part of a complete communication system, and additional specifications are needed for other layers to ensure precise data exchange functionality and support of inter-operating devices. The DeviceNet and SDS specifications build on ISO 11898 to describe a complete industrial communication system.

Attention is drawn to the possibility that some of the elements of this European Standard may be the subject of patent rights other than those identified above. CENELEC shall not be held responsible for identifying any or all such patent rights.

Further attention is drawn to the Standard EN 50325-4 (CANopen) and the possibility that some of the elements of those European Standards may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights

If during the application of those Standards Intellectual Property Rights may appear and will not be made available on reasonable and non discriminatory terms and conditions to anyone wishing to obtain such a license, applying the rules of CEN/CENELEC Memorandum 8, this fact shall be brought to the attention of CENELEC Central Secretariat for further action.

Information on conformance testing services are offered by the following companies/institutions:

EN 50325-4:

CAN in Automation (CiA) GmbH

Am Weichselgarten 26,

D-91058 Erlangen, Germany

www.can-cia.org.

Introduction

The controller-device interfaces described in this standard utilize a common base protocol to provide solutions to users in industrial environments who have a need for simple communications and diagnostics. The application layer of each network has been created to meet specific performance and market requirements.

The objective of the interface user is a gain in productivity that may be realized through reduced wiring, reduced start up time, improved quality of output and reduced down time. The interfaces described provide low-cost connectivity between low-voltage switchgear, controlgear, control circuit devices, switching elements and controlling devices (e.g. programmable controllers, personal computers, etc.) and eliminate expensive hardwiring. The direct connectivity provides improved communication between devices as well as important device-level diagnostics not easily accessible or available through hardwired I/O interfaces.

The interfaces described are based on a broadcast-oriented communications protocol - Controller Area Network (CAN). The CAN protocol was originally developed by Robert Bosch GmbH for the European automotive market for replacing expensive, wire harnesses with low cost network cable on vehicles. As a result, the CAN protocol has fast response and high reliability and the protocol has been standardized as ISO 11898. Chips are available in a variety of packages with temperature and noise immunity ratings well suited to the industrial automation market. Demand for CAN is the key driver in the “low price with high performance” characteristic of CAN chips.

As a result of the common use of CAN, the interfaces described provide a common set of capabilities that are ideally targeted to applications which include simple devices, limited distance and limited amount of data per transmission.

1 Scope

This document applies to controller-device interfaces that provide defined interfaces between low-voltage switchgear, controlgear, control circuit devices, switching elements and controlling devices (e.g. programmable controllers, personal computers, etc.). It may also be applied for the interfacing of other devices and elements to a controller-device interface.

This document specifies requirements for controllers and devices utilizing these interfaces, including not only the communication protocol specification, but also associated relevant electrical and mechanical characteristics. It also specifies the electrical and EMC tests required to verify the performance of each controller-device interface when connected to the appropriate controllers and devices.

This document establishes a consistent terminology and format for the subsequent interfaces. It also harmonises requirements of a general nature in order to reduce the need for testing to different standards, increase understanding and facilitate comparisons of controller-device interface standards. Those requirements of the various controller-device interface standards that can be considered as general have therefore been gathered in this document.

In addition to meeting the specific requirements stated in this document, the controller-device interfaces included in this standard

- are documented in the English language in accordance with the requirements specified in this part 1,
- are already in use in commercial products and running in industrial plants,
- are available in quantity and at low price,
- are available from several sources and commercialised openly,
- to satisfy the tests specified, amongst others, in EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, and EN 61000-4-6 against the test levels specified in EN 50082-2,
- have appropriate mechanisms for transmission error detection,
- are open, widely accepted, well documented, stable and support inter-operability,
- are complete and describe the necessary interfaces in sufficient detail to enable error-free implementation,
- are free of any restriction related to testing the implementation.

For each controller-device interface only two documents are necessary to determine all requirements and tests:

- the general requirements of this standard, referred to as “part 1” in the relevant parts covering the various types of controller-device interfaces;
- the relevant controller-device interface standard hereinafter referred to as the “relevant controller-device interface standard” or “controller-device interface standard”.

The solutions described in this standard have been used for many years by industry to solve application requirements involving low-voltage switchgear and controlgear. They are characterized by:

- their ability to power connected devices directly from the network;
- their ability to operate in harsh environments typified by those encountered at the machine level by controls in industrial applications;
- usage of the sophisticated medium access rules of CAN which allows both organization of traffic based on user-assigned priorities and efficient resolution of occasional access conflict;

- a wide range of exchange services allowing precise tailoring of data exchange to the actual application needs as well as simultaneous distribution of data to a selected set of connected devices;

- their capability to simultaneously support data acquisition, diagnostics, messaging and programming/configuration as required, amongst others, for systems interfacing controllers to low-voltage switchgear and controlgear in industrial applications.

NOTE The controller-device interface standards currently part of this series are:

- EN 50325-4: CANopen

- EN 50325-5 : Functional safety communication based on EN 50325-4

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.

EN 60529:1991, *Degrees of protection provided by enclosures (IP Code)*

EN 60947-1:1999, *Low-voltage switchgear and controlgear – Part 1: General rules (IEC 60947-1:1999, modified)*

EN 60947-5-2:1998, *Low-voltage switchgear and controlgear – Part 5-2: Control circuit devices and switching elements - Proximity switches (IEC 60947-5-2:1997, modified)*

ISO/IEC 7498-1:1994, *Information technology — Open Systems Interconnection — Basic Reference Model: The Basic Model — Part 1*

ISO 11898:1993, *Road vehicles - Interchange of digital information - Controller area network (CAN) for high-speed communication*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply. ISO and IEC maintain terminological databases for use in standardization at the following addresses:

• IEC Electropedia: available at http://www.electropedia.org/

• ISO Online browsing platform: available at http://www.iso.org/obp

NOTE The relevant controller-device interface standards include in their definitions clause those necessary terms and definitions that are not included in this part of the standard.

3.1
CAN (Controller Area Network)
definition of a generic physical layer and data link medium access procedure based on non-destructive bit-wise arbitration. (See ISO 11898-1)

3.2
controller
network element such as a PLC, PC, or equivalent computing hardware in which the control application or process software runs