



SLOVENSKI STANDARD

SIST ENV 13149-4:2003

01-oktober-2003

Javni prevoz - Sistemi za časovno razporejanje in nadzor cestnih vozil – 4. del: Splošna aplikacijska pravila za prenosna vodila CANopen

Public transport - Road vehicle scheduling and control systems - Part 4: General application rules for CANopen transmission busses

Öffentlicher Verkehr - Steuerungssysteme für Straßenfahrzeuge - Teil 4: Allgemeine Anwendungsregeln für den CANopen Datenbus

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Ta slovenski standard je istoveten z: **ENV 13149-4:2002**

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ICS:

35.240.60	Uporabniške rešitve IT v transportu in trgovini	IT applications in transport and trade
43.040.15	Avtomobilska informatika. Vgrajeni računalniški sistemi	Car informatics. On board computer systems
43.080.20	Avtobusi	Buses

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EUROPEAN PRESTANDARD
PRÉNORME EUROPÉENNE
EUROPÄISCHE VORNORM

ENV 13149-4

May 2002

ICS 35.240.60; 43.080.20; 45.060.01

English version

**Public transport - Road vehicle scheduling and control systems -
Part 4: General application rules for CANopen transmission
busses**

This European Prestandard (ENV) was approved by CEN on 25 March 2002 as a prospective standard for provisional application.

The period of validity of this ENV is limited initially to three years. After two years the members of CEN will be requested to submit their comments, particularly on the question whether the ENV can be converted into a European Standard.

CEN members are required to announce the existence of this ENV in the same way as for an EN and to make the ENV available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force (in parallel to the ENV) until the final decision about the possible conversion of the ENV into an EN is reached.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

ENV 13149-4:2002 (E)

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Foreword

This document (ENV 13149-4:2002) has been prepared by Technical Committee CEN/TC 278 "Road transport and traffic telematics", the secretariat of which is held by NEN.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to announce this European Prestandard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

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ENV 13149-4:2002 (E)**Introduction**

This European Prestandard is part 4 of prEN 13149, which gives rules for on-board data transmission systems.

This part 4 together with part 5 and part 6 describes a complete solution independent from part 1, part 2 and part 3.

1 Scope

This European Prestandard specifies the choice and the general application's rules of an onboard data transmission bus between the different equipment for service operations and monitoring of the fleet. This applies to equipment installed onboard buses, trolleybuses and tramways only as part of a bus fleet operation. It excludes tramways when they are operated as part of a train, subway or metro operation. This equipment includes operation aid systems, automatic passenger information systems, fare collection systems, etc.

The equipment directly related to the safety-related functioning of the vehicle (propulsion management, brake systems, door opening systems, etc.) are excluded from the scope of the present standard and are dealt with in other standardisation bodies.

For the described application two bus systems are standardised. Part 1 to part 3 describe the WORLDFIP bus system and part 4 to part 6 describe the CANopen bus system. There is no ranking between the two bus systems.

This European Prestandard covers the link between equipments inside a single vehicle. Although it could be applied to multiple vehicles, this application is not explicitly covered by this standard.

Part 4 of this European Prestandard specifies the CANopen-based network. This specification describes the general architecture in terms of hierarchical layers according to the ISO reference model for Open Systems Interconnection (OSI) specified in ISO 7498.

Part 5 of this European Prestandard specifies in detail the connectors and the connector pin assignment and the cabling.

Part 6 of this European Prestandard specifies in detail the application profiles for the virtual devices in public transport.

2 Normative references

This European Prestandard incorporates by dated or undated references, provisions from other publications. These normative references are cited at the appropriate place in the text, and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Prestandard only when incorporated in it by amendment or revision (including amendments).

EN 50325-1: Industrial communications subsystem based on ISO 11898 (CAN) for controller-device interfaces - Part 1: General requirements.

prEN 50325-4 Industrial communications subsystem based on ISO 11898 (CAN) for controller-device interfaces - Part 4: CANopen.

3 Terms and definitions

For the purposes of this European Prestandard, in addition to the terms and definitions given in the referenced international and European Standards, the following terms and definitions apply:

3.1

CAN

Controller Area Network. Data link layer protocol for serial communication as specified in EN 50325-1

3.2

CANopen

application layer and the communication profile for CAN-based networks as specified in prEN 50325-4

3.3

ECU

Electronic Control Unit

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4 Basic concepts

4.1 General

The CANopen bus system was developed for different applications for automotive, industry and so on. For the application as defined in the scope, the valid particular standards (for example standards for temperature, vibration, EMC, etc.) for busses and tramways shall be taken into account.

4.2 Topology

The preferred wiring topology of the CANopen network is a single line structure with terminations on both sides of the network (see Figure 1). Detailed information on the network topology is given in EN 50325-1.

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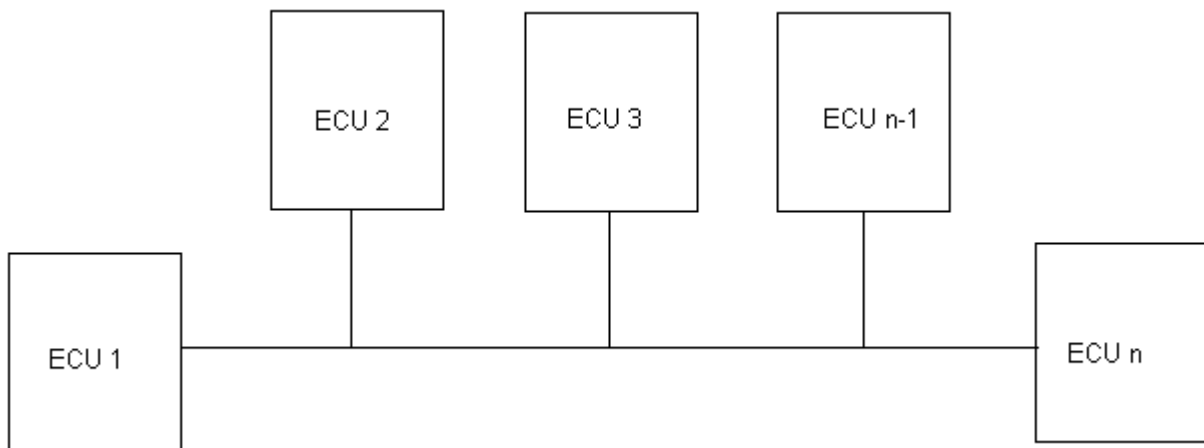


Figure 1 - Preferred CAN topology

4.3 CANopen performance

The CANopen-based network has the following properties:

- master/slave network management capability including boot-up message and node guarding or heartbeat;
- unconfirmed Process Data Object (PDO) transmission for real-time data;
- confirmed read/write access to all entries in the object dictionary by means of Service Data Objects (SDO);
- pre-defined master/slave identifier connection set;
- default PDO mapping for virtual devices.

4.4 CANopen – OSI reference

The relations between the OSI layer model, applied standards and the CANopen structure are shown in Figure 2.

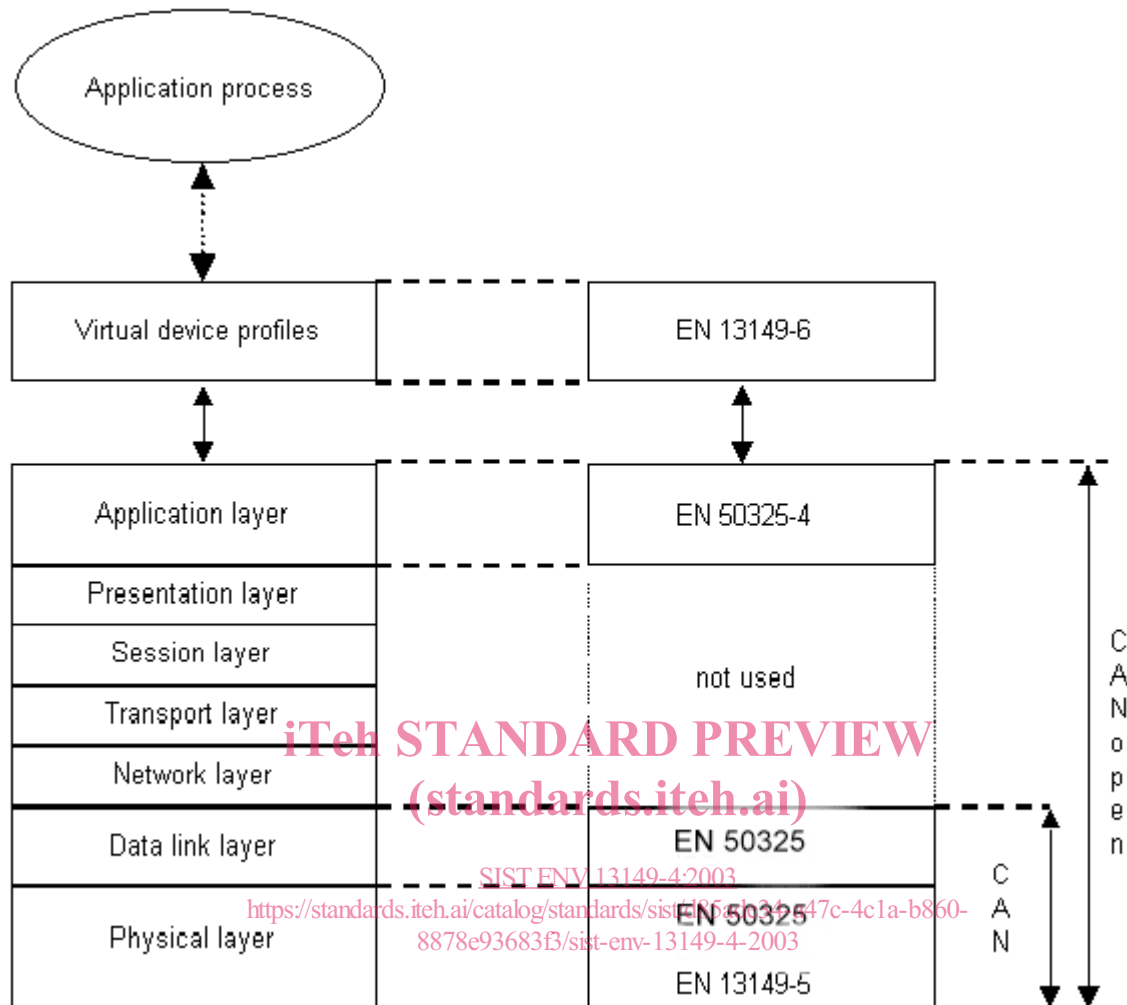


Figure 2- Structure of the CANOpen - ISO reference model

The used physical layer is compliant to EN 50325-1 describing the CAN high-speed transceiver, the bit timing as defined in prEN 50325-4 (CANOpen).

The data link layer is compliant to EN 50325-1.

Network, transport, session and presentation layers are not implemented (layer 3 through layer 6).

The application layer is specified in prEN 50325-4.