



SLOVENSKI STANDARD

SIST ENV 13149-2:2003

01-oktober-2003

**Javni prevoz - Sistemi za časovno razporejanje in kontrolo cestnih vozil – 2. del:
Specifikacije za okablenje sistema WORLDFIP**

Public transport - Road vehicle scheduling and control systems - Part 2: WORLDFIP
cabling specifications

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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 13149-2

April 2000

ICS 35.240.60; 43.080.20; 45.060.01

English version

**Public transport - Road vehicle scheduling and control systems -
Part 2: WORLDFIP cabling specifications**

This European Prestandard (ENV) was approved by CEN on 15 March 2000 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.

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

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

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Foreword

This European Prestandard has been prepared by Technical Committee CEN/TC 278 "Road transport and traffic telematics", the secretariat of which is held by NNI.

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, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Introduction

This European Prestandard was prepared by CEN/TC 278 *Road Transport and Traffic Telematics*.

1. Scope

This European Prestandard defines the cabling specifications for an onboard data transmission bus between the different parts of equipment for service operations and monitoring of the fleet.

This European Prestandard is applicable to equipment installed onboard buses, trolley buses and tramways only as part of a bus fleet operation. This equipment include operations aid systems, automatic passenger information systems, fare collection systems, etc.

Equipment directly related to the functioning of the vehicle (e.g. driver dashboard, engine management, brake systems, door opening systems) are excluded from the scope of this European Prestandard and are dealt with in other standardisation bodies.

This European Prestandard is not applicable to tramways operated as part of a train, subway or metro operation.

Two alternative transmission buses will be accepted. This European Prestandard refers to one of them (known as WORLFIP and specified in EN 50170-3). A second set of standards will be published for the other solution (so called CAN). The selected bus system, between the two standardised alternatives, shall be subject to an agreement between each transport operating organisation and its equipment providers.

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

This European Prestandard is the second part of a set of standards related to the onboard transmission bus, which will define the following aspects for each allowed transmission bus:

- choice of the bus and general application's rules
- cabling specifications
- messages' content specifications

2. Normative references

This European Prestandard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places 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. For undated references the latest edition of the publication referred to applies (including amendments)

EN 61158-2:1994	<i>Field bus standard for use in industrial control systems, Part 2: Physical layer specification and service definition</i>
EN 50170-3	<i>General purpose field communication system - volume 3: WorldFIP</i>

3. Cabling specifications

3.1 General remarks

The principles for the coupling of devices to the data transmission bus focus upon the longer term objectives which are to achieve the least necessary number of variants, rather than to allow for the profusion of interim and migratory solutions which may occur initially. This is specially important for public transport road vehicles which are generally equipped in different non-correlated stages (for example, first the fare collection system, then the radio and automatic location system some months or years later, etc.)

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It is important to understand that electrical connections onto the bus have some impact upon the network performance, and that the practice is dependant upon the principles relevant to transmission lines rather than simple electrical power circuits.

Since one of the main objectives is to provide the minimum amount of cabling on vehicles the basic power concepts are also covered with flexibility to suit different circumstances.

3.2 Characteristic impedance

The main trunk circuit shall be a single pair twisted and shielded cable of nominal characteristic impedance of 150 Ohms at 1Mhz with overall braided shield. This shall not be connected in the form of a ring.

3.3 Polarity

The polarity of the signal conductors shall be maintained throughout the trunk:

Pair 1	Wire 1 (White)	-	Data +
	Wire 2 (Black)	-	Data -

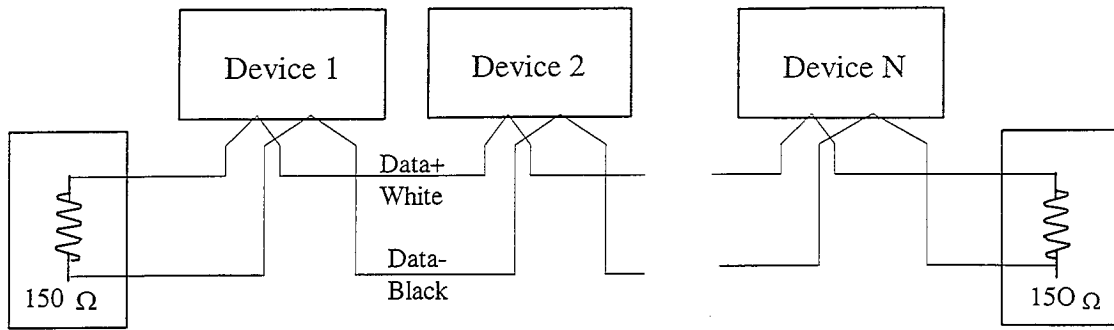
3.4 Signal conductors

The signal conductors shall not be used for powering any devices.

3.5 Connections between devices

The one pair cable can be run between devices in a daisy chain fashion but shall be terminated with a 150 Ω resistor at each end.

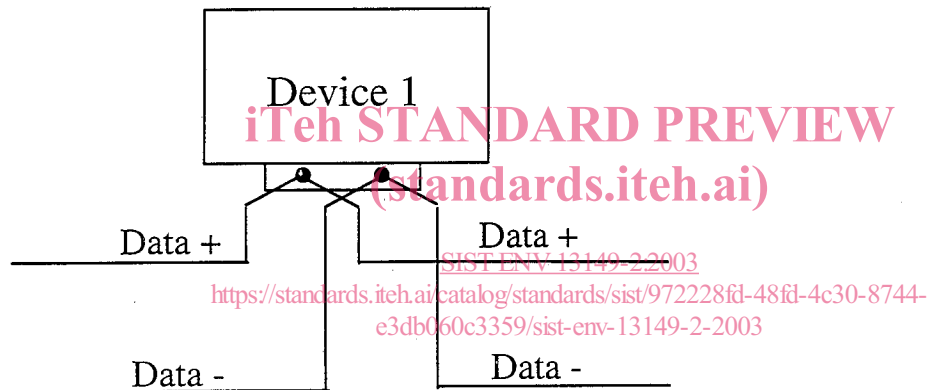
Figure 1



3.6 Connection/disconnection of a device

To avoid the disruption to the trunk continuity when a device is removed, the cable shall be joined on the trunk side of the device connector. This will allow removal of a device without causing a failure to the remaining network.

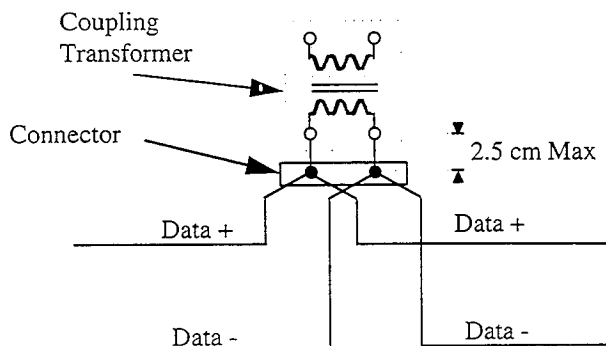
Figure 2



3.7 Spur length

To minimise the mismatch caused by a spur, the cable connection at the device shall be within 2,5 cm of the coupling transformer.

Figure 3



3.8 Connectors

Types of connectors are not mandatory but the following conventions are recommended:

Cable Side	-	Socket (receptacles)
Device Side	-	Plug (pins)

Four way connectors		Nine way connectors			
Terminal	1 a	Data +	Terminal	1	Screen
	2 b	Data -		2	
	3 c	DC + ve		3	
	4 d	DC - ve		4	
				5	
				6	Data +
				7	Data -
				8	DC +
				9	DC -

When a connection which breaks into the trunk circuit is required a tap connection can be provided. This could be provided using a two pair branch cable.

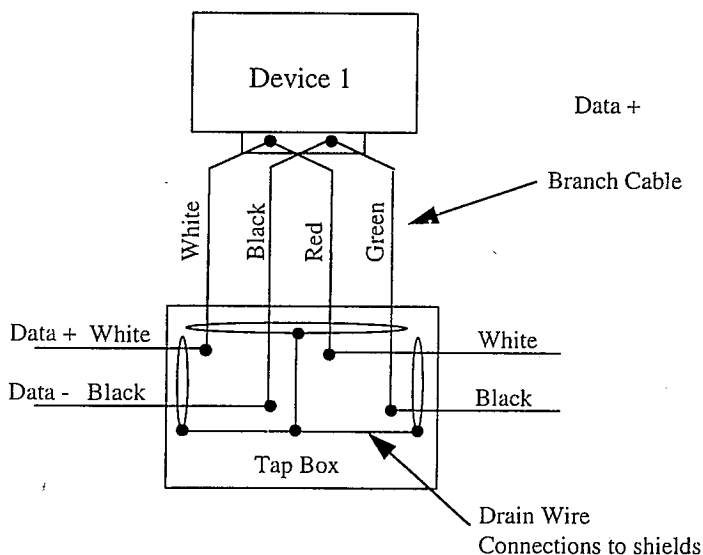
3.9 Branch cable polarity:

The polarity of the signal conductors shall be maintained.

Pair 1	Wire 1	White	Data +
	Wire 2	Black	Data -
Pair 2	Wire 1	Red	Data +
	Wire 2	Green	Data -

See additional tables in Annex A which refers to cables for up to six pairs for additional circuits.

Figure 4



3.10 Cable jointing

The wires shall be joined to maintain the data polarity. These shall be crimped and insulated to maintain the circuit integrity. The screen continuity shall be maintained by the drain wire. The cable sheath shall be clamped to provide strain relief.

1) Cable tap with branch cable

