SLOVENSKI STANDARD
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Home and building electronic systems (HBES) - Technical Report 10: Interfaces. Medium interface - Twisted pair - Class 1

Home and Building Electronic Systems (HBES) -- Technical Report 10: Interfaces - Medium interface, Twisted Pair, Class 1

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REPORT

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English version

Home and Building Electronic Systems (HBES)
Technical Report 10:
Interfaces - Medium Interface, Twisted Pair, Class 1

This CENELEC Report has been prepared by Technical Committee CENELEC TC 205, Home and Building Electronic Systems (HBES). It was approved by CENELEC on 1995-11-28.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Ref. No. R205-010:1996 E

Foreword

This Technical Report has been prepared by the Technical Committee CENELEC TC 205 (former TC 105), Home and Building Electronic Systems (HBES). It was decided to ask BT for publication during a voting plenary meeting on September 12 and October 18 and 19, 1995.

It was approved for publication as R205-010 by the CENELEC Technical Board on 1995-11-28.

The final intent of TC 205 is to develop a unique standard, with possible use of different media. The following structure of the series of standards *EN 50090 Home and Building Electronic Systems (HBES)* has been decided:

Part 1:	Standardization structure
Part 2:	System overview
Part 3:	Aspects of application
Part 4:	Transport Layer and Network Layer
Part 5:	Media and media dependent layers
Part 6:	Interfaces
Part 7:	Management

Nevertheless, due to historical and market reasons, a first step was taken that allows three different implementations for some parts of the standard, the other parts being common. It is expected that a future version of the HBES standard will only propose one unique implementation, including the existing common parts. For the time being, TC 205 had agreed that the existing different implementations are described in European Prestandards (ENVs).

The three implementations are:

- implementation 1: BatiBUS;
- implementation 2: EIB;
- implementation 3: EHS.

The use of one implementation in a specific ENV requires the use of the same implementation throughout the whole series.

As decided during the meeting of TC 205 held on March 28 and 29th 1995, in accordance with the TC 205 standardization structure as approved by the Technical Board, and in line with TC 205's approach initiated and exposed three years ago as laid down in the CENELEC IT Strategy Plan, the following documents - which were expected to become parts of the EN(V) 50090 series and which describe the protocols of the three proposed HBES implementations BatiBUS, EIB and EHS - had been submitted to vote at plenary meetings of TC 205, in accordance with subclause 7.2 of the CEN/CENELEC Internal Regulations Part 2:

prENV 50090-3-3	Aspects of application - Application Layer
prENV 50090-4	Transport Layer and Network Layer
prENV 50090-5-2	Media and media dependent layers - Network based on Twisted Pair, Class 1
prENV 50090-6-3	Interfaces - Media interfaces
prENV 50090-7	Management

The comments expressed by some National Committees during these meetings reflected the reluctance to the principle of endorsing three existing systems as a step to coming to a unique solution.

Despite the public commitment of the consortia supporting these systems to converge on a unique system, a commitment proven already by the acceptance of:

EN 50090-2-1	System overview - Architecture
EN 50090-2-2	System overview - General Technical requirements
EN 50090-3-1	Aspects of application - Introduction to the application structure
EN 50090-3-2	Aspects of application - User process
R205-001	Applications and requirements - Class 1
R205-002	Guidelines for the professional installation of Twisted Pair cables Class 1
R205-004	Applications and requirements - Class 2 and 3

as well as by the ongoing work in TC 205, none of the arguments put forward could change the opinion of these National Committee delegations.

A formal vote at the meetings showed that there was not sufficient consensus to have the prENVs approved. Therefore the Technical Board decided to publish these documents as CENELEC Reports:

R205-007	Aspects of application - Application Layer
R205-008	Transport Layer and Network Layer, Class 1
R205-009	Media and media dependent layers - Network based on Twisted Pair, Class 1
R205-010	Interfaces - Medium Interface, Twisted Pair, Class 1
R205-011	Management

This Technical Report contains clauses which may be subject to Intellectual Property Rights (IPR)[1].

In accordance with CEN/CENELEC Memorandum 8, the Central Secretariat received a declaration from the three consortia whose protocols are described in this Technical Report, i.e. BCi, EHSA and EIBA, the details of which have been made available to the CENELEC membership.

For full details or IPR conditions the three consortia can be contacted at the following addresses:

BatiBus club international (BCi)
11, rue Hamelin
F-75783 PARIS CEDEX 16

European Home System Association (EHSA)
Excelsiorlaan 11 - Bus 1
B-1930 ZAVENTEM

European Installation Bus Association (EIBA)
Avenue de la Tanche 5
B-1160 BRUSSELS

1) As defined in CEN/CENELEC Memorandum No 8.

Contents

1 Scope

This Technical Report specifies the Medium Interface Twisted Pair of the Home and Building Electronic System (HBES) including the mechanical, functional and electrical characteristics.

NOTE: Since no unique standard can be derived from the current available systems, the three European implementations BatiBUS, *EIB*, EHS, will be presented as three options in this Technical Report.

2 Normative references

This Technical Report 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 Technical Report only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 50090-1	Home Electronic System, HES - Part 1: Standardization Structure
EN 60068-2-1	Environmental testing - Part 2: Tests - Tests A: Cold (IEC 68-2-1:1990)
EN 60068-2-6	Environmental testing - Part 2: Tests -Test Fc: Vibration (sinusoidal) (IEC 68-2-6:1995 + corrigendum Mar. 1995)
EN 60603-7	Connectors for frequencies below 3 MHz for use with printed boards - Part 7: Detail specification for connectors, 8-way, including fixed and free connectors with common mating features (IEC 603-7:1990)
EN 60999	Connecting devices - Safety requirements for screw-type and screwless-type clamping units for electrical copper conductors (IEC 999:1990 modified)
HD 323.2.3 S2	Basic environmental testing procedures - Part 2: Tests - Test Ca: Damp heat, steady state (IEC 68-2-3:1969 + A1:1984)
HD 625.1	Insulation coordination for equipment within low-voltage systems - Part 1: Principles, requirements and tests (IEC 664-1:1992, modified)
IEC 512-2	Electromechanical components for electronic equipment; basic testing procedures and measuring methods - Part 2: General examination, electrical continuity and contact resistance tests, insulation tests and voltage stress tests
IEC 512-3	Electromechanical components for electronic equipment; basic testing procedures and measuring methods - Part 3: Current-carrying capacity tests
ISO/IEC 7498-1	Information technology - Open Systems Interconnection - Basic Reference Model: The Basic Model
R205-009	Home and Building Electronic System, HBES - Technical Report 9: Media and media dependent layers - Network based on Twisted Pair, Class 1

3 Definitions and abbreviations

3.1 Definitions

For the purpose of this prestandard, the definitions of ISO/IEC 7498-1 and of EN 50090-1[1)] apply, as well as the following definitions.

3.1.1 cable connector: the MI-TP connector on the medium cable side.

3.1.2 device connector: the MI-TP connector on the device side.

3.1.3 receiver: the receiving station.

3.1.4 transmitter: the transmitting station.

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1) At present draft

3.2 Abbreviations

AC	Alternate Current
EMC	Electromagnetic compatibility
MI	Medium Interface
MI-TP	Medium Interface Twisted Pair
n.a.	not applicable
Vpp.	Voltage, peak to peak

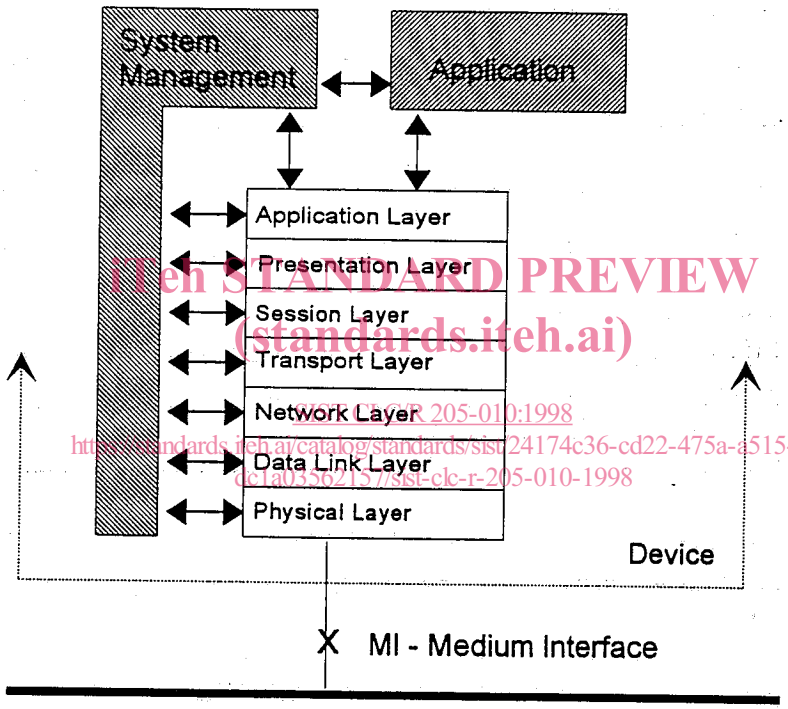
4 Basic principles of the Medium Interface

The MI offers a connection point to the network medium. It gives the user a connection point that is dependent on the three different implementations.

In principle, all kinds of devices that connect to the Medium Interface Twisted Pair (MI-TP) shall provide a Medium Interface.

The data are received and transmitted in a serial binary bit stream.

Figure 1 gives the position of the Medium Interface with respect to the overall structure of the HBES reference model.



NOTE: Layers between Data Link Layer and Application Layer may be null in some systems.

Figure 1: Position of the MI in the HBES reference model

5 Mechanical characteristics of the Medium Interface

5.1 General

This clause defines the mechanical characteristics of the Medium Interface Twisted Pair for the three implementations.

The three implementations satisfy the following common characteristics:

a) the female connector is mounted on the medium cable, also called cable connector;
b) the male connector is mounted on the device, also called device connector;
c) Disconnection of the device from the medium does not interrupt the network;
d) the connectors are not reversible in case of polarized Medium cable;
e) system requirements for safety, EMC, reliability.

5.2 Implementation 1

5.2.1 Recommended connector

The specifications of the recommended connector are illustrated in figure 2 and 3. It calls for a 5,08 mm pitch connector. The male connector shall be mounted on the device and the female connector shall be mounted on the cable.

Any other connector other than the one recommended here may be used also, as long as it fulfils the BatiBUS specifications of implementation 1.

Table 1 describes the characteristics of the recommended connector.

Table 1: Characteristics of the recommended connector

	Characteristic	Requirement	Test method for implementation 1
a)	**Electrical**		
	Voltage	250 V a.c.	HD 625.1
	Current	12 A	IEC 512-3
	Peak withstand	4 kV	HD 625.1
	[B] Conductor to contact pin resistance	3,1 mΩ to 3,7 mΩ	in new state after 100 plug cycles
	[A] Conductor - conductor resistance	n.a.	n.a.
	[C] Device pin to contact pin resistance	3,5 mΩ	
	Isolation resistance terminal to terminal	9 x 10^{12} Ω	DC 500 V IEC 512-2
b)	**Mechanical**		
	Conductor withdrawal force	50 N	2,5 mm^2 EN 60999
	Insertion force per contact pin per terminal	< 5 N	(8 N per security latch)
	Pull out force per contact pin per terminal	< 4 N	(6 N per security latch)
	Contact pin for device connection	1 mm^2 (NOTE 1)	
	Connectable conductor section per terminal	0,13 mm^2 to 2,5 mm^2	
	Conductor length, insulation removed	7 mm	
	Vibration resistance: frequency range amplitude sweep	 10 Hz to 57 Hz 0,15 mm 1 oct/min, 10 cycles	 constant EN 60068-2-6
	Vibration resistance frequency range acceleration sweep	 57 Hz to 150 Hz > 2 g 1 oct/min, 10 cycles	 constant EN 60068-2-6
c)	**Environmental**		
	Life cycles	> 100	
	Application class		
	Test requirements Dry Heat Steady Temperature Test Cold test Damp Heat Cycle Test	 HD 323.2.3 S2, 4 days, +70 °C, humidity < 50 % EN 60068-2-1, steady -25° C, 96 h HD 323.2.3 S2 cycle (25/55/25° C), Test D-B, 24 h	
NOTE 1: CuSn tin coated			