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Vervangt CR 205-009:1996

Nederlandse norm

# **NEN-EN 50090-5-2 (en)**

Home and Building Electronic Systems (HBES)  
- Part 5-2: Media and media dependent layers -  
Network based on HBES Class 1, Twisted Pair

ICS 97.120  
maart 2004

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VOORBEELD  
Preview

Normcommissie 381 025 "Telematica Installaties"

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EN 50090-3-2:2004	NEN-EN 50090-3-2:2004	Gebouwbeheersystemen (HBES) - Deel 3-2: Toepassingsaspecten - Gebruikersproces voor HBES klasse 1 (en)
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EN 50090-9-1:2004	-	-
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HD 22.2 S2	-	-
IEC 60189-2	-	-
IEC 60332-1	-	-
IEC 60754-2	-	-



EUROPEAN STANDARD

**EN 50090-5-2**

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EUROPÄISCHE NORM

February 2004

ICS 97.120

Supersedes R205-009:1996

English version

**Home and Building Electronic Systems (HBES)  
Part 5-2: Media and media dependent layers -  
Network based on HBES Class 1, Twisted Pair**

Systèmes électroniques pour les foyers  
domestiques et les bâtiments (HBES)  
Partie 5-2: Médias et couches  
dépendantes des médias -  
Réseau basé sur HBES Classe 1,  
Paire Torsadée

Elektrische Systemtechnik für Heim  
und Gebäude (ESHG)  
Teil 5-2: Medien und medienabhängige  
Schichten -  
Netzwerk basierend auf ESHG Klasse 1,  
Twisted Pair

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

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

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## Foreword

This European Standard was prepared by the Technical Committee CENELEC TC 205, Home and Building Electronic Systems (HBES) with the help of CENELEC co-operation partner Konnex Association (formerly EHBESA).

The text of the draft was submitted to the Unique Acceptance Procedure and was approved by CENELEC as EN 50090-5-2 on 2003-12-02.

This European Standard supersedes R205-009:1996.

CENELEC takes no position concerning the evidence, validity and scope of patent rights.

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The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2004-12-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2006-12-01

EN 50090-5-2 is part of the EN 50090 series of European Standards, which will comprise the following parts:

- Part 1: Standardisation structure
- Part 2: System overview
- Part 3: Aspects of application
- Part 4: Media independent layers
- Part 5: Media and media dependent layers
- Part 6: Interfaces
- Part 7: System management
- Part 8: Conformity assessment of products
- Part 9: Installation requirements

## Introduction

According to OSI Physical Layers consist of the medium, the cable, the connectors, the transmission technology etc. which refers to their hardware requirements. In this European Standard however, the status of the Physical Layer as a “communication medium” is emphasized.

## 1 Scope

This European Standard defines the mandatory and optional requirements for the medium specific physical and data link layer for HBES Class 1 Twisted Pair in its two variations called TP0 and TP1.

Data link layer interface and general definitions, which are media independent, are given in EN 50090-4-2.

## 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.

EN 50090-1 <sup>1)</sup>	<i>Home and Building Electronic Systems (HBES) – Part 1: Standardisation structure</i>
EN 50090-2-2	<i>Home and Building Electronic Systems (HBES) – Part 2-2: System overview – General technical requirements</i>
EN 50090-3-2:2004	<i>Home and Building Electronic Systems (HBES) – Part 3-2: Aspects of application – User process for HBES Class 1</i>
EN 50090-4-2:2004	<i>Home and Building Electronic Systems (HBES) – Part 4-2: Media independent layers – Transport layer, network layer and general parts of data link layer for HBES Class 1</i>
EN 50090-7-1:2004	<i>Home and Building Electronic Systems (HBES) – Part 7-1: System Management – Management procedures</i>
EN 50090-9-1:2004	<i>Home and Building Electronic Systems (HBES) – Part 9-1: Installation requirements – Generic cabling for HBES Class 1 Twisted Pair</i>
EN 50290 series	<i>Communication cables</i>
EN 61000-4-5	<i>Electromagnetic compatibility (EMC) – Part 4-5: Testing and measurement techniques – Surge immunity test (IEC 61000-4-5)</i>
EN 61000-6-1	<i>Electromagnetic compatibility (EMC) – Part 6-1: Generic standards – Immunity for residential, commercial and light-industrial environments (IEC 61000-6-1, mod.)</i>
EN 61000-6-2	<i>Electromagnetic compatibility (EMC) – Part 6-2: Generic standards - Immunity for industrial environments (IEC 61000-6-2, mod.)</i>
HD 21.2 S2	<i>Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V – Part 2: Test methods (IEC 60227-2, mod.)</i>

<sup>1)</sup> At draft stage.

HD 22.2 S2	<i>Rubber insulated cables of rated voltages up to and including 450/750 V – Part 2: Test methods (IEC 60245-2, mod.)</i>
IEC 60189-2	<i>Low-frequency cables and wires with PVC insulation and PVC sheath – Part 2: Cables in pairs, triples, quads and quintuples for inside installations</i>
IEC 60332-1	<i>Tests on electric cables under fire conditions – Part 1: Test on a single vertical insulated wire or cable</i>
IEC 60754-2	<i>Test on gases evolved during combustion of electric cables – Part 2: Determination of degree of acidity of gases evolved during the combustion of materials taken from electric cables by measuring pH and conductivity</i>

### 3 Terms, definitions and abbreviations

#### 3.1 Terms and definitions

For the purposes of this part the terms and definitions given in EN 50090-1 and the following apply.

##### 3.1.1

##### **HBES Class 1 Twisted Pair Type 0**

the Twisted Pair medium Twisted Pair Type 0 (TP0) is a physical layer specification for data and power transmission on a single twisted pair, allowing asynchronous character-oriented data transfer in a half duplex bi-directional communication mode, using a specifically unbalanced/unsymmetrical base-band signal coding with collision avoidance under SELV conditions

##### 3.1.2

##### **HBES Class 1 Twisted Pair Type 1**

the Twisted Pair medium Twisted Pair Type 1 (TP1) is a physical layer specification for data and power transmission on a single twisted pair, allowing asynchronous character-oriented data transfer in a half duplex bi-directional communication mode, using a specifically balanced/symmetrical base-band signal coding with collision avoidance under SELV conditions

##### 3.1.3

##### **distributed power supply**

the bus is powered in a distributed way by a number of the devices connected to the line (compared to a centralized power supply)

##### 3.1.4

##### **Logical Tag Extended HEE**

usage of the L\_Data\_Extended frame dedicated to extended group addressing

##### 3.1.5

##### **Remote Powered Devices**

remote Powered Bus Devices (RPD) do not extract their energy for the application circuit and the bus controller from the bus but from another independent source of energy, e.g. mains. Owing to the reduced DC power consumption of RPD, a bus line equipped with such devices requires less power from the installed Power Supply Unit (PSU). The connection of bus-controller and application to the same electrical potential reduces the effort of galvanic separation in RPD

##### 3.1.6

##### **TP0 C Factor**

to simplify system engineering, the supply current of a TP0 device (both power supply and bus device) is expressed by a factor "C", defined as

$$C = \frac{\text{Actual current}}{\text{Reference device supply current}}$$

The actual current can either be the one provided by a power supply or used by a device

**3.1.7****TP0 Character**

11 bit set including 8 data bits, 1 check bit (odd parity bit) and two synchronisation bits (start and stop bits)

**3.1.8****TP0 Distortion**

percentage ratio of the deviation time between the instant a transition occurs and the ideal transition instant, and the bit duration (~208 µs); the distortion is measured for each bit of a character, starting with the start bit

**3.1.9****TP0 Inter-Frame Time**

time between the end of a frame (end of stop bit for the last character) and the beginning of the next frame (beginning of the start bit of the first character)

**3.1.10****TP0 Line Load**

percentage ratio representing the proportion of actual character transmission during a specified integration time interval

**3.1.11****TP0 Odd parity bit**

check bit whose value is such that there is an odd number of logic "0" within the data and parity fields

**3.1.12****TP0 Repeater**

connects a primary segment to a secondary segment

**3.1.13****TP1 Backbone Couplers**

15 backbone couplers can be used to couple up to 16 zones to a full sized TP1 network

**3.1.14****TP1 Backbone Line**

the main line of the inner zone is called backbone line

**3.1.15****TP1 Bridge**

four TP1-64 physical segments can be combined to a line by using bridges. To such a line 256 devices can then be connected

**3.1.16****TP1 Line**

a TP1 line consists of a maximum of 256 devices, either directly connected in case of TP1-256 or separated over 4 physical segments in case of TP1-64, each with 64 devices

**3.1.17****TP1 Line Couplers**

routers that combine lines to a zone are called line couplers

**3.1.18****TP1 Logical Unit**

converts the serial bit stream to octets and octets to the serial bit stream, which is a serial stream of characters

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