SLOVENSKI STANDARD
SIST EN 50491-6-1:2014

01-marec-2014

Splošne zahteve za stanovanjske in stavbne elektronske sisteme (HBES) in sisteme za avtomatizacijo in regulacijo stavb (BACS) - 6-1. del: Inštalacije HBES - Inštalacije in načrtovanje

General requirements for Home and Building Electronic Systems (HBES) and Building Automation and Control Systems (BACS) - Part 6-1: HBES installations - Installation and planning

Allgemeine Anforderungen an die Elektrische Systemtechnik für Heim und Gebäude (ESHG) und an Systeme der Gebäudeautomation (GA) - Teil 6-1: ESHG-Installationen - Installation und Planung

Ta slovenski standard je istoveten z: **EN 50491-6-1:2014**

ICS:

97.120	Avtomatske krmilne naprave za dom	Automatic controls for household use

SIST EN 50491-6-1:2014 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 50491-6-1

January 2014

ICS 97.120

English version

General requirements for Home and Building Electronic Systems (HBES) and Building Automation and Control Systems (BACS) - Part 6-1: HBES installations - Installation and planning

Exigences générales pour systèmes électroniques pour les foyers domestiques et les bâtiments (HBES) et pour systèmes de gestion technique du bâtiment (SGTB) - Partie 6-1 : Installations des HBES - Planification et installation

Allgemeine Anforderungen an die Elektrische Systemtechnik für Heim und Gebäude (ESHG) und an Systeme der Gebäudeautomation (GA) - Teil 6-1: ESHG-Installationen - Installation und Planung

This European Standard was approved by CENELEC on 2013-11-25. 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.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists 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, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

CENELEC

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

CEN-CENELEC Management Centre: Avenue Marnix 17, B - 1000 Brussels

Ref. No. EN 50491-6-1:2014 E

Contents

Figures

Tables

Foreword

This document (EN 50491-6-1:2014) has been prepared by CLC/TC 205 "Home and Building Electronic Systems (HBES)".

The following dates are fixed:

• latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2014-11-25
• latest date by which the national standards conflicting with this document have to be withdrawn	(dow)	2016-11-25

This European Standard covers the Principle Elements of the Safety Objectives for Electrical Equipment Designed for Use within Certain Voltage Limits (LVD - 2006/95/EC).

This European Standard is complementary to EN 50174-2, “Information technology – Cabling installation – Part 2: Installation planning and practices inside buildings” – Clause 10 “Homes”. The couple of standards constitute the reference for the installation requirements of the home network which includes the telecommunications service distribution and the HBES.

This European Standard specifies the specific HBES installation requirements. EN 50174-2 gives the specific ICT and BCT cabling installation and planning requirements.

1 Scope

This European Standard specifies the additional specific HBES requirements for the common rules for the planning and the installation of HBES home cabling systems. The structure is in accordance with EN 50174-2.

This European Standard focuses on requirements for HBES cabling systems in homes. Requirements for backbones cabling in buildings are also considered.

HBES radio frequency (RF) systems are considered as extensions or as alternative to cabled systems.

RF connections may have an impact on the infrastructure. Different infrastructure models are presented for the use of RF connections instead of wired ones (e.g. fewer installation spaces IS6).

Optical fibre HBES installation guidelines may be considered in future.

Power line systems are outside the scope of this European Standard.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 50090 (all parts), *Home and Building Electronic Systems (HBES)*

EN 50090-5-3, *Home and Building Electronic Systems (HBES) – Part 5-3: Media and media dependent layers – Radio frequency*

CLC/TR 50090-9-2, *Home and Building Electronic Systems (HBES) – Part 9-2: Installation requirements – Inspection and testing of HBES installation*

EN 50131-5-3 *Alarm systems – Intrusion systems – Part 5-3: Requirements for interconnections equipment using radio frequency techniques*

EN 50173-4, *Information technology – Generic cabling systems – Part 4: Homes*

EN 50174 (all parts), *Information technology – Cabling installation*

EN 50174-2:2009, *Information technology – Cabling installation – Part 2: Installation planning and practices inside buildings*

EN 50491-2, *General requirements for Home and Building Electronic Systems (HBES) and Building Automation and Control Systems (BACS) – Part 2: Environmental conditions*

EN 50491-3, *General requirements for Home and Building Electronic Systems (HBES) and Building Automation and Control Systems (BACS) – Part 3: Electrical safety requirements*

EN 50491-4-1, *General requirements for Home and Building Electronic Systems (HBES) and Building Automation and Control Systems (BACS) – Part 4-1: General functional safety requirements for products intended to be integrated in Building Electronic Systems (HBES) and Building Automation and Control Systems (BACS)*

EN 50491-5-1, *General requirements for Home and Building Electronic Systems (HBES) and Building Automation and Control Systems (BACS) – Part 5-1: EMC requirements, conditions and test set-up*

EN 50491-5-2, *General requirements for Home and Building Electronic Systems (HBES) and Building Automation and Control Systems (BACS) – Part 5-2: EMC requirements for HBES/BACS used in residential, commercial and light industry environment*

EN 50491-5-3, *General requirements for Home and Building Electronic Systems (HBES) and Building Automation and Control Systems (BACS) – Part 5-3: EMC requirements for HBES/BACS used in industry environment*

CLC/TR 50491-6-3, *General requirements for Home and Building Electronic Systems (HBES) and Building Automation and Control Systems (BACS) – Part 6-3: HBES installations – Assessment and definition of levels*

EN 60670 series, *Boxes and enclosures for electrical accessories for household and similar fixed electrical installations* (IEC 60670 series)

ETSI EN 300 220, *Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Radio equipment to be used in the 25 MHz to 1 000 MHz frequency range with power levels ranging up to 500 mW*

ETSI EN 301 489, *Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services*

ETSI EN 302 208-1, *Electromagnetic compatibility and Radio spectrum Matters (ERM); Radio Frequency Identification Equipment operating in the band 865 MHz to 868 MHz with power levels up to 2 W; Part 1: Technical requirements and methods of measurement*

ETSI EN 302 208-2, *Electromagnetic compatibility and Radio spectrum Matters (ERM); Radio Frequency Identification Equipment operating in the band 865 MHz to 868 MHz with power levels up to 2 W; Part 2: Harmonized EN covering essential requirements of article 3.2 of the R&TTE Directive*

HD 60364 (all parts), *Low-voltage electrical installations* (IEC 60364)

HD 60364-4-41, *Low-voltage electrical installations – Part 4-41: Protection for safety – Protection against electric shock* (IEC 60364-4-41)

HD 60364-4-444 *Low-voltage electrical installations – Part 4-444: Protection for safety – Protection against voltage disturbances and electromagnetic disturbances* (IEC 60364-4-44)

HD 60364-5-52, *Low-voltage electrical installations – Part 5-52: Selection and erection of electrical equipment – Wiring systems* (IEC 60364-5-52)

HD 60364-5-54, *Low-voltage electrical installations – Part 5-54: Selection and erection of electrical equipment – Earthing arrangements, protective conductors* (IEC 60364-5-54)

IEEE 802.15.4, *IEEE Standard for Information technology – Telecommunications and information exchange between systems-Local and metropolitan area networks – Specific requirements – Part 15.4: Wireless Medium Access Control (MAC) and Physical Layer (PHY) Specifications for Low-Rate Wireless Personal Area Networks (WPANs)*

IEEE 802.11, *IEEE Standard for Information Technology – Telecommunications and information exchange between systems-Local and Metropolitan networks – Specific requirements – Part II: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) specifications*

3 Terms, definitions and abbreviations

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1.1
Broadcast and Communication Technologies (BCT) cabling
cabling system designed to support applications using the HF band (3 MHz … 30 MHz), the VHF band (30 MHz … 300 MHz) and the UHF band (300 MHz … 3 000 MHz) for transmission of sound radio, TV and two-way data services, as well as fro in-home inter-networking

3.1.2
Control, Commands and Communication in Buildings (CCCB) cabling
cabling system designed to support applications related to commands, controls and communications in buildings

3.1.3
HBES application
single automated action performed by the systems

Note 1 to entry: Applications are normally integrated to perform higher-level actions.

3.1.4
HBES/BACS
any combinations of HBES/BACS products (including their separate connected/detachable devices) linked together via one or more HBES/BACS networks

Note 1 to entry: Other names to describe types of HBES/BACS systems:

– home control network;
– home control systems;
– home and building electronics systems;
– building systems;
– building automation systems;
– home automation system.

3.1.5
HBES cluster
group of HBES applications operated to release a common scope desired by the user (automation, security)

3.1.6
home network
network for digital and analogue information transport for a home or a business premises of similar complexity, providing defined access points and using one or more media in any topology

3.1.7
Information and Communication Technologies (ICT) cabling
cabling system designed to support applications using information and communication technologies

3.1.8
service
user need released by HBES functions (single or integrated)

3.2 Abbreviations

For the purposes of this document, the following abbreviations apply.

ACP Area Connection Point

BE Building Entrance

BO Broadcasting Outlet

CO Control Outlet

HD Home Distributor

MATO Multi-Application Telecommunication Outlet.

SHD Secondary Home Distributor

TO Telecommunications Outlet

4 Aspect of system and cabling

The home cabling system ensures the distribution of telecommunication services and HBES functions in accordance with EN 50491 and/or EN 50090 either as a specific HBES or in conjunction with generic cabling designed in accordance with EN 50173-4.

The set up of the home network goes through the following steps:

– design;

– planning;

– installation.

Planning and installation of a general telecommunication cabling are given in EN 50174. Additional requirements for HBES are given in this European Standard.

HBES services may be distributed across all three cabling subsystem (ICT, BCT and CCCB, see 5.1).

Wireless extension to a cabled system may be considered when the infrastructure cannot be entirely planned and/or to give the user mobility.

5 Home network model and general requirements

5.1 Home cabling

The proper design of home cabling shall take into account factors like size, infrastructure, telecommunication services and HBES functions required by the user, whether the home is placed in a new or existing building (see Annex A).

Cabling subsystems may have different topologies (see Figure 1). Star topology is commonly used for ICT, BCT cabling subsystems, even if some “non-star” topologies may also be required to implement some HBES functions. CCCB cabling has normally free topology (bus, tree, loop, star and/or combinations thereof).

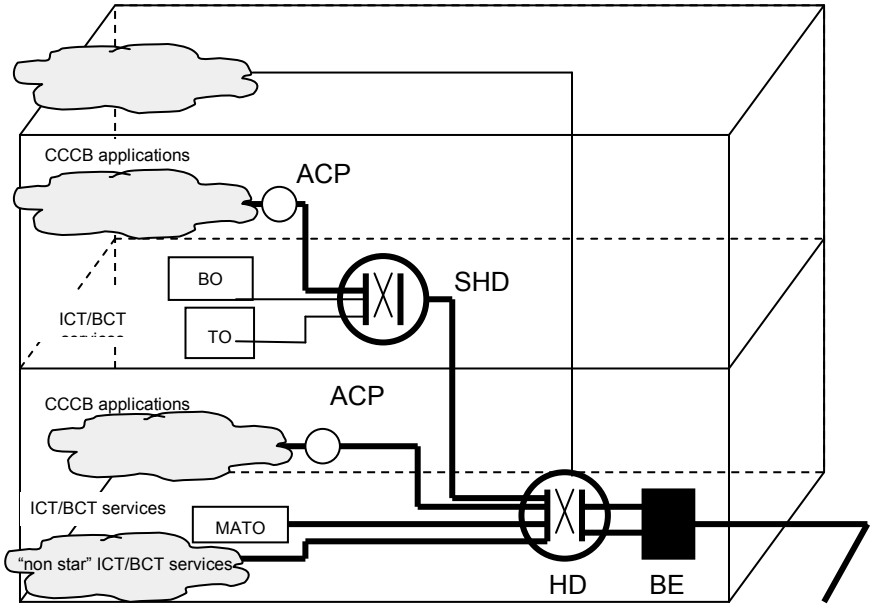


**Figure 1 – General topology of home cabling –
ICT, BCT, CCCB cabling subsystems are indicated**

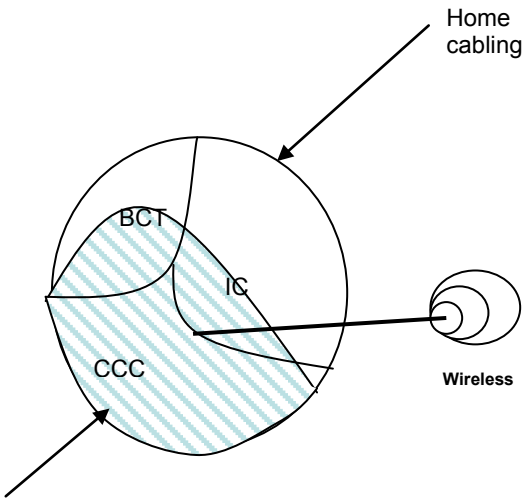
According to EN 50173, IC or BCT cabling subsystems are conceived mainly to distribute telecommunication services. CCCB cabling subsystems are reserved for control, command and wide band HBES functions such as video door phony and surveillance, audio distribution, etc.

NOTE 1 CCCB channel performances are under revision in CLC/TC 215 to support HBES wide band functions.

To support all the HBES functions, ICT, BCT, CCCB cabling subsystems are needed (see Table 1).

HBES cabling may be extended by wireless.

Figure 2 shows the cabling needed to deliver HBES functions as a part of the complete home cabling.



Cabling needed to deliver HBES functions

HBES cabling systems are part of the home cabling system thereby making use of all four subsystems and a possible wireless extension.

Figure 2 – Cabling needed to deliver HBES function

An HBES cabling system covers both indoor and outdoor locations.

EXAMPLES Outdoor locations are e.g. front doors, garages, shafts, etc.

NOTE 2 Requirements for outdoor HBES installation, foreseen to be included in 6.4, are for further study.

HBES devices are usually fixed to the home cabling system (e.g. ceiling lighting point, a window shutter or HVAC fixture) and have thus a fixed position. Nevertheless, it may be necessary to connect moveable appliances.

Many modifications may however occur during the building life (e.g. change of devices, the addition or removal of walls). Flexibility is therefore required for both the home cabling system and for the mains network.

Table 1 lists telecommunication services and HBES functions and states the physical medium normally used.

Table 1 – Non exhaustive list of telecommunications services, HBES clusters/applications, corresponding cabling subsystem and reference standards

Cluster	Applications covered by HBES / BACS / telecommunications services	Cabling subsystem	Bandwidth / transmission rate requirements
Automation	Lighting control	CCCB	Up to 80 kbs
	Shutters control	CCCB	Up to 80 kbs
	Portal and door control	CCCB	Up to 80 kbs
HVAC	Heating control	CCCB	Up to 80 kbs
	Air conditioning control	CCCB	Up to 80 kbs
	Ventilation	CCCB	Up to 80 kbs
	Smart energy metering	CCCB	Up to 80 kbs
Security	Gas detection	CCCB	Up to 80 kbs
	Smoke detection	CCCB	Up to 80 kbs
	Fire detection and alarm	CCCB	Up to 80 kbs
	Flood detection	CCCB	Up to 80 kbs
	Intrusion detection	CCCB	
	Video surveillance	CCCB	40 MHz
	Access control	CCCB	40 MHz
Communications	Audio/video door systems	CCCB	40 MHz
	Social alarm	CCCB	Up to 20 kbs
	Indoor voice communication	CCCB	40 MHz
	Outdoor voice communication	CCCB, ICT	4-8 MHz
AV	Music distribution	CCCB	40 MHz
	Video distribution	CCCB	40 MHz
	TV broadcast distribution	BCT	47 MHz – 2 150 MHz
IT	PC and other peripheral device sharing	ICT	10 Mbs – 10 000 Mbs / 10 MHz … 1 000 MHz
	Internet access	ICT	10 Mbs – 10 000 Mbs / 10 MHz … 1 000 MHz
	Network storage	ICT	10 Mbs – 10 000 Mbs / 10 MHz … 1 000 MHz
General	Home supervision	ICT	10 Mbs – 10 000 Mbs / 10 MHz … 1 000 MHz
NOTE ICT and BCT applications are listed in EN 50173.			

HBES installations are classified according to their complexity in CLC/TR 50491-6-3.

5.2 Wireless telecommunication services and HBES applications

HBES functions may alternatively be supplied via radio links.

References to relevant ETSI and IEEE standards to which an RF system shall comply are listed in Table 2.