

# ETSI TS 103 247 V1.2.1 (2018-11)



## Access, Terminals, Transmission and Multiplexing (ATTM); Singlemode Optical Fibre System Specifications for Home Cabling

*iTeh STANDARD PREVIEW*  
*(standards.iteh.ai)*  
*Full standard available at*  
*https://standards.iteh.ai/catalog/standards/sist/8a8b9187-47d6-4b2d-a75d-51e95ba1d359/etsi-ts-103-247-v1-2-1-2018-11*

---

**Reference**

RTS/ATTM-0244

---

**Keywords**

cable, fibre, network, optical

**ETSI**

650 Route des Lucioles  
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C  
Association à but non lucratif enregistrée à la  
Sous-Préfecture de Grasse (06) N° 7803/88

---

**Important notice**

The present document can be downloaded from:

<http://www.etsi.org/standards-search>

The present document may be made available in electronic versions and/or in print. The content of any electronic and/or print versions of the present document shall not be modified without the prior written authorization of ETSI. In case of any existing or perceived difference in contents between such versions and/or in print, the only prevailing document is the print of the Portable Document Format (PDF) version kept on a specific network drive within ETSI Secretariat.

Users of the present document should be aware that the document may be subject to revision or change of status. Information on the current status of this and other ETSI documents is available at

<https://portal.etsi.org/TB/ETSIDeliverableStatus.aspx>

If you find errors in the present document, please send your comment to one of the following services:

<https://portal.etsi.org/People/CommiteeSupportStaff.aspx>

---

**Copyright Notification**

No part may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm except as authorized by written permission of ETSI.

The content of the PDF version shall not be modified without the written authorization of ETSI.

The copyright and the foregoing restriction extend to reproduction in all media.

© ETSI 2018.

All rights reserved.

**DECT™**, **PLUGTESTS™**, **UMTS™** and the ETSI logo are trademarks of ETSI registered for the benefit of its Members.

**3GPP™** and **LTE™** are trademarks of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners.

**oneM2M™** logo is a trademark of ETSI registered for the benefit of its Members and of the oneM2M Partners.

**GSM®** and the GSM logo are trademarks registered and owned by the GSM Association.

# Contents

Intellectual Property Rights .....	5
Foreword.....	5
Modal verbs terminology.....	5
Introduction .....	5
1 Scope .....	7
2 References .....	7
2.1 Normative references .....	7
2.2 Informative references.....	9
3 Definition of terms and abbreviations .....	10
3.1 Terms.....	10
3.2 Abbreviations .....	11
4 HAN architecture evolution .....	12
4.1 Introduction .....	12
4.2 HAN architectures .....	14
4.2.1 Different architecture .....	14
4.2.2 Single format HAN .....	14
4.2.3 Multi format HAN .....	15
4.2.3.1 A mid-term architecture: the Multiformat Active Star.....	15
4.2.3.2 A longer-term architecture: the Multiformat Passive Star.....	16
5 HAN performances.....	19
5.1 HAN optical power budget.....	19
5.1.1 Introduction.....	19
5.1.2 Transmission system requirements .....	19
5.1.2.1 Assumptions .....	19
5.1.2.2 Active star architecture .....	20
5.1.2.3 CWDM passive star architecture.....	20
5.1.3 Attenuation requirements for passive optical network.....	22
5.1.4 Optical budget deterioration .....	23
5.1.4.1 Definitions of requirements.....	23
5.1.4.2 BOL (Begin-Of-Life) .....	24
5.1.4.3 EOL (End-Of-Life) .....	24
6 Home area network cabling .....	24
6.1 Introduction .....	24
6.2 Optical fibre.....	24
6.3 Cables .....	24
6.3.1 Generalities .....	24
6.3.2 Dimensional requirement.....	25
6.3.3 Mechanical requirements .....	25
6.3.4 Environmental requirements .....	25
6.4 Optical connector .....	25
6.5 Optical non-wavelength-selective splitter .....	26
6.6 Optical WDM (Wavelength-Division-Multiplexer) .....	26
7 Reliability .....	26
7.1 Reliability of active devices .....	26
7.2 Reliability of passive components.....	26
8 Installation.....	27
9 Energy efficiency .....	27
<b>Annex A (informative): Optical Telecommunication Outlet - wall socket .....</b>	<b>28</b>
A.1 Introduction .....	28

A.2	Connection type.....	28
A.3	Optical connections in wall outlet.....	28
A.4	Interfaces - External sockets.....	29
A.5	Interfaces - Internal sockets.....	29
A.6	Wall socket plugs versions.....	29
A.7	Sustainability requirements.....	30
A.8	Examples of optical fibre wall outlet.....	30
<b>Annex B (informative): Residential PON example.....</b>		<b>31</b>
B.1	Residential network evolution.....	31
B.2	Architecture 1 - centralized mode according to Recommendation ITU-T G.9960 (G.hn) - P2MP.....	31
B.3	Architecture 2 - peer to peer-mode according to Recommendation ITU-T G.9960 (G.hn) - MP2MP.....	33
B.4	Architecture 3 - G.hn with RF Video Overlay.....	34
B.5	Residential network performances.....	34
B.5.1	Optical power budget.....	34
B.5.2	Transmission system requirements.....	34
<b>Annex C (informative): Multiformat active star example.....</b>		<b>35</b>
C.1	Introduction.....	35
C.2	First option: electrical multiplex on an optical path.....	35
C.3	Second option: hybrid electrical/optical multiplex.....	40
<b>Annex D (informative): Multiformat passive star example.....</b>		<b>44</b>
D.1	Introduction.....	44
D.2	The demonstrated configuration.....	45
D.3	Implementing the applications.....	48
D.3.1	Residential PON ("PON-like") application.....	48
D.3.2	"LAN-like" application.....	48
D.3.3	RoF application.....	49
D.3.4	TV broadcast application.....	50
D.3.5	Point-to-point application.....	51
D.3.6	Simultaneous running applications.....	51
<b>Annex E (informative): Example of an optical fibre home cabling system.....</b>		<b>52</b>
E.1	Introduction.....	52
E.2	Installation of an optical fibre home cabling system.....	52
E.3	Connection of the optical TO to the end user equipment.....	53
	History.....	54

---

# Intellectual Property Rights

## Essential patents

IPRs essential or potentially essential to normative deliverables may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: "*Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards*", which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (<https://ipr.etsi.org/>).

Pursuant to the ETSI IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

## Trademarks

The present document may include trademarks and/or tradenames which are asserted and/or registered by their owners. ETSI claims no ownership of these except for any which are indicated as being the property of ETSI, and conveys no right to use or reproduce any trademark and/or tradename. Mention of those trademarks in the present document does not constitute an endorsement by ETSI of products, services or organizations associated with those trademarks.

---

# Foreword

This Technical Specification (TS) has been produced by ETSI Technical Committee Access, Terminals, Transmission and Multiplexing (ATTM).

---

# Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the [ETSI Drafting Rules](#) (Verbal forms for the expression of provisions).

"**must**" and "**must not**" are **NOT** allowed in ETSI deliverables except when used in direct citation.

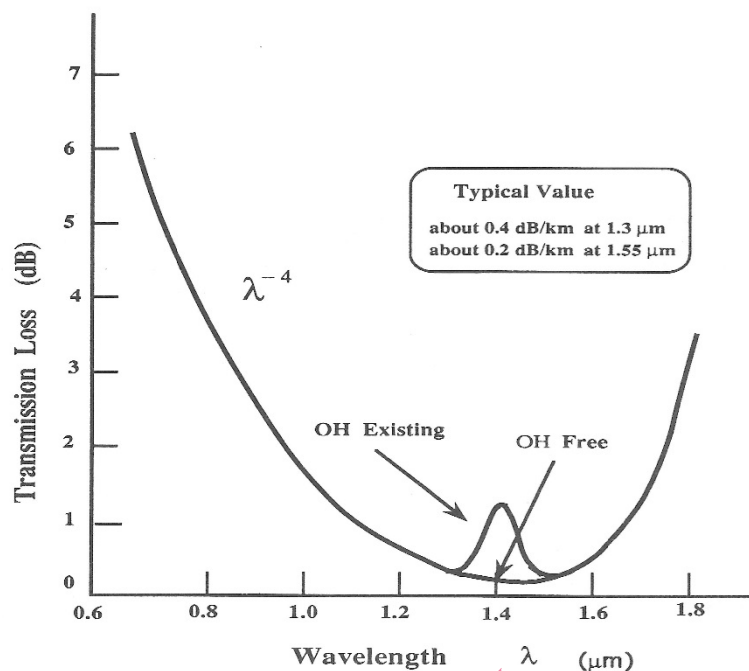
---

# Introduction

Singlemode non-dispersion shifted optical fibres with step-index according to CENELEC EN 60793-2-50 [5] with cladding diameter of 125 µm (referred to as SM in the present document) are mostly deployed in telecommunication networks. The rise of available transmission **bandwidth** per fiber is even significantly faster than e.g. the increase of storage capacity of electronic memory chips, or the increase of computation power of microprocessors. The main advantages of SM are:

- SM is the current communication wireline with the biggest bandwidth (up to 160 Gbit/s).
- SM is the current optical waveguide with the lowest optical losses (< 0,25 dB/km at 1 550 nm, see figure 1).
- SM is the waveguide with the best possibilities for wavelength multiplexing.
- SM optical connections have the best developed theory for optical interface with narrow uncertainties.
- There are reasonable compatibilities for connecting SM fibres of different types (considering losses).
- Complete immunity to ElectroMagnetic Interference (EMI).
- Compared with electrical cables, fiber-optic cables are very lightweight.

For all these reasons, SM is potentially the best and most sustainable solution for all telecommunication networks.



**Figure 1: Singlemode fibre attenuation versus wavelength**

The home network should not represent a bottleneck for the expected evolution for services such as the introduction of High Definition quality IPTV, multi-room/multi-vision configuration, using different channels seen in different rooms with up to 3 Set Top Boxes (STBs) and high quality video communication via the TV set. More in general, with the "Connected Home", several devices are connected together: the home network can be used, for example, to share multimedia contents not necessarily delivered in real time by access network, but with the paradigm of "download and play" this content can be stored in a device inside the house and use it afterwards. However, this residential network cabling as defined in CENELEC EN 50173-4 [47] should be easy, fast and cheap to deploy.

The home network should be able to manage multiformat and multiservice characteristics of the information delivered by different service providers.

# 1 Scope

The present document specifies the SM cabling system for multiformat and multiservices optical home area network (HAN) for interoperability among different suppliers. The system comprises of the active optical elements, the cables, connectors and wall plugs.

## 2 References

### 2.1 Normative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

Referenced documents which are not found to be publicly available in the expected location might be found at <http://docbox.etsi.org/Reference>.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

The following referenced documents are necessary for the application of the present document.

- [1] Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.
- [2] IEEE 802.3™: "LAN/MAN CSMA/CD (Ethernet) Access Method".
- [3] Void.
- [4] ETSI TS 101 791: "Transmission and Multiplexing (TM); Dense wavelength division multiplexing devices; Common requirements and conformance testing".
- [5] CENELEC EN 60793-2-50: "Optical fibres - Part 2-50: Product specifications - Sectional specification for category B single-mode fibres".
- [6] CENELEC EN 60825-1: "Safety of laser products - Part 1: Equipment classification and requirements".
- [7] CENELEC EN 60875-1: "Fibre optic interconnecting devices and passive components - Non-wavelength-selective fibre optic branching devices - Part 1: Generic specification".
- [8] CENELEC EN 61753-031-2/E-2: "Fibre optic interconnecting devices and passive components - Performance standard - Part 031-2: Non-connectorized single-mode 1×N and 2×N non-wavelength-selective branching devices for Category C - Controlled environment".
- [9] CENELEC EN 62074-1: "Fibre optic interconnecting devices and passive components - Fibre optic WDM devices - Part 1: Generic specification".
- [10] Void.
- [11] CENELEC EN 61755 series: "Fibre optic interconnecting devices and passive components - Connector optical interfaces".
- [12] EU Code of Conduct on Energy Consumption of Broad Band Equipment, version 6 2017.

NOTE: Available at [http://publications.jrc.ec.europa.eu/repository/bitstream/JRC106039/ictcoc-ecbe-v6\\_feb\\_2017\\_final.pdf](http://publications.jrc.ec.europa.eu/repository/bitstream/JRC106039/ictcoc-ecbe-v6_feb_2017_final.pdf).

- [13] IEC 60884-1: "Plugs and socket-outlets for household and similar purposes - Part 1: General requirements".

- [14] ISO/IEC 8802-3: "Information technology -- Telecommunications and information exchange between systems -- Local and metropolitan area networks -- Specific requirements -- Part 3: Standard for Ethernet".
- [15] CENELEC EN 60950-1: "Information technology equipment - Safety - Part 1: General requirements".
- [16] Recommendation ITU-T G.671: "Transmission characteristics of optical components and subsystems".
- [17] Recommendation ITU-T G.9960: "Unified high-speed wireline-based home networking transceivers - System architecture and physical layer specification".
- [18] Recommendation ITU-T K.21: "Resistibility of telecommunication equipment installed in customer premises to overvoltages and overcurrents".
- [19] ETSI EN 300 019-2-3: "Equipment Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment; Part 2-3: Specification of environmental tests; Stationary use at weatherprotected locations".
- [20] CENELEC EN 50173-1: "Information technology - Generic cabling systems - Part 1: General requirements".
- [21] CENELEC EN 61755-1: "Fibre optic interconnecting devices and passive components - Fibre optic connector optical interfaces - Part 1: Optical interfaces for single-mode non-dispersion shifted fibres - General and guidance".
- [22] CENELEC EN 60794-2 series: "Optical fibre cables - Part 2: Indoor optical fibre cables".
- [23] CENELEC EN 50575: "Power, control and communication cables - Cables for general applications in construction works subject to reaction to fire requirements".
- [24] CENELEC EN 60794-1-21: "Optical fibre cables - Part 1-21: Generic specification - Basic optical cable test procedures - Mechanical tests methods".
- [25] Void.
- [26] Void.
- [27] CENELEC EN 61754-20: "Fibre optic interconnecting devices and passive components - Fibre optic connector interfaces - Part 20: Type LC connector family".
- [28] CENELEC EN 61754-4: "Fibre optic interconnecting devices and passive components - Fibre optic connector interfaces - Part 4: Type SC connector family".
- [29] CENELEC EN 61754-29: "Fibre optic interconnecting devices and passive components - Fibre optic connector interfaces - Part 29: Type BLINK connector series".
- [30] CENELEC EN 61754-30: "Fibre optic interconnecting devices and passive components - Fibre optic connector interfaces - Part 30: Type CLIK connector series".
- [31] Void.
- [32] CENELEC EN 61755-2-1: "Fibre optic connector optical interfaces - Part 2-1: Optical interface standard single mode non-angled physically contacting fibres".
- [33] CENELEC EN 61755-2-2: "Fibre optic connector optical interfaces - Part 2-2: Optical interface standard single mode angled physically contacting fibres".
- [34] CENELEC EN 61755-3-1: "Fibre optic connector optical interfaces - Part 3-1: Optical interface, 2,5 mm and 1,25 mm diameter cylindrical full zirconia PC ferrule, single mode fibre".
- [35] CENELEC EN 61755-3-2: "Fibre optic connector optical interfaces - Part 3-2: Optical interface, 2,5 mm and 1,25 mm diameter cylindrical full zirconia ferrules for 8 degrees angled-PC single mode fibres".



- [36] CENELEC EN 61300-3-6: "Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 3-6: Examinations and measurements - Return loss".
- [37] CENELEC EN 61300-3-34: "Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 3-34: Examinations and measurements - Attenuation of random mated connectors".
- [38] CENELEC EN 61300-3-4: "Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 3-4: Examinations and measurements - Attenuation".
- [39] CENELEC EN 55022: " Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement".
- [40] CENELEC EN 55024: "Information technology equipment - Immunity characteristics - Limits and methods of measurement".
- [41] Void.
- [42] Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC Text with EEA relevance.
- [43] Void.
- [44] Recommendation ITU-T G.657: "Characteristics of a bending-loss insensitive single-mode optical fibre and cable".
- [45] Recommendation ITU G.652: "Characteristics of a single-mode optical fibre and cable".
- [46] CENELEC EN 60794-1-22: "Optical fibre cables - Part 1-22: Generic specification - Basic optical cable test procedures - Environmental test methods".
- [47] CENELEC EN 50173-4: "Information technology - Generic cabling systems - Part 4: Homes".
- [48] Regulation (EU) No 305/2011 of the European Parliament and of the Council of 9 March 2011 laying down harmonised conditions for the marketing of construction products and repealing Council Directive 89/106/EEC.

## 2.2 Informative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

- [i.1] IEEE 802.3u<sup>TM</sup>: "IEEE Standards for Local and Metropolitan Area Networks: Supplement - Media Access Control (MAC) Parameters, Physical Layer, Medium Attachment Units, and Repeater for 100Mb/s Operation, Type 100BASE-T (Clauses 21-30)".
- [i.2] IEEE 802.3x<sup>TM</sup>: "IEEE Standards for Local and Metropolitan Area Networks: Supplements to Carrier Sense Multiple Access With Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications - Specification for 802.3 Full Duplex Operation and Physical Layer Specification for 100 Mb/s Operation on Two Pairs of Category 3 Or Better Balanced Twisted Pair Cable (100BASE-T2)".
- [i.3] IEEE 802.1Q<sup>TM</sup>: "IEEE Standard for Local and metropolitan area networks -- Bridges and Bridged Networks".
- [i.4] IEEE 802.1p<sup>TM</sup>: "IEEE Standard for Local and metropolitan area networks -- Supplement to Media Access Control (MAC) Bridges: Traffic Class Expediting and Dynamic Multicast Filtering".

- [i.5] IEEE 802.1D™: "Standard for Local and Metropolitan Area Networks: Media Access Control (MAC) Bridges".

## 3 Definition of terms and abbreviations

### 3.1 Terms

For the purposes of the present document, the terms given in Recommendation ITU-T G.671 [16] and the following apply:

**distribution point:** point that allows the connection of the outdoor cable (feeder and/or drop) to the indoor (in-house or building) cable

**drop cable:** individual cable which links up the distribution point (or floor distributor) to the optical external network testing interface

**floor distributor:** distributor which, if it exists, is situated on one floor and distributes fibres or indoor cables on one or across the floor(s) to each customer/individual apartments

**global link:** transmission link between transmitter and receiver of two connected systems

**global link loss:** loss of the global link comprising loss of the permanent link and all additional optical elements losses

**home network extender:** access point located in each room and capable to give access to the multiformat services at the customer by multiplexing (uplink) and demultiplexing (down link)

**Home Area Network (HAN):** network of optical fibres in homes that considers convergence of communication multiformat services and extends an access from a carrier's central office, broadcast terrestrial, cable or satellite TV or other networks (ICT, BCT, CCCB, etc.)

**Home Distributor (HD):** distributor within a home where cables terminate

**multiformat:** different format of signal (Ethernet, broadcasted TV, Phone, etc.)

**multiformat link:** link capable to transport over a single medium multiformat signals from the multiformat switch to the extender

**multiformat switch:** active equipment able to multiplex multiformat signals

**multipoint-to-multipoint link:** link from several physical points to several physical points

**multiservice:** several services like telephone, TV, Internet, etc.

**optical External Network Testing Interface (ENTI):** physical point at which a subscriber is provided with access to an optical communications network; point in or near the customer premises accessible to the network operator for testing purposes

**permanent link:** part of the transmission link comprising fixed cabling (fibre and permanent optical elements) with one connector at each end

**permanent link loss:** loss of the permanent link comprising fibre and permanent optical elements losses

**point-to-multipoint link:** link from one physical point to several physical points

**point-to-point link:** direct link from one physical point to another physical point

**subscribers entrance facilities:** facility that provides all necessary mechanical and electrical services for the entry of cables into a subscribers space

**triple play services:** triple-play service scenario is one in which voice, video and data are all provided in a single access subscription

## 3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

APC	Angled Physical Contact
BCT	Broadcast and Communications Technology
BIDI	BIDirectional
BO	Broadcast Outlet
BOL	Begin-Of-Life
CATV	CABle TV
CCCB	Commands, Controls and Communications in Buildings
CPE	Customer Premises Equipment
CWDM	Coarse Wavelength Division Multiplexing
DFB	Distributed FeedBack
DIY	Do It Yourself
DVB	Digital Video Broadcasting
DVB-S	Digital Video Broadcasting - Satellite
DVB-T	Digital Video Broadcasting - Terrestrial
DWDM	Dense Wavelength Division Multiplexing
EMI	Electro Magnetic Interference
ENTI	External Network Testing Interface
EOL	End-Of-Life
Ext	Extender
FMT	Fibre Management Tray
FSAN	Full Service Access Network
FTTH	Fiber To The Home
GL	Global Link
GTW	GaTeWay
HAN	Home Area Network
HD	Home Distributor
HDMI	High Definition Multimedia Interface
HG	Home Gateway
ICT	Information and Communications Technology
IoT	Internet of Things
IP	Internet Protocol
IPTV	Internet Protocol Television
LAN	Local Area Network
LC	Lucent Connector
LD	Laser Diode
LNB	Low Noise Block
MAC	Media Access Control
MC	MediaConverters
MS	Multiformat Switch
MTBF	Mean Time Between Failures
OFE	Optical FrontEnd
ONT	Optical Network termination
OTO	Optical Telecommunication Outlet
P2P	Point-to-Point
PC	Physical Contact
PCI	Peripheral Component Interconnect
PD	Photo Diode
PF	PerFluorinated
PIN	Positive Intrinsic Negative
PL	Permanent Link
POF	Plastic Optical Fibre
PON	Passive Optical Network
PVC	PolyVinyl Chloride
QoS	Quality of Service
RF	Radio Frequency
RL	Return Loss
RoF	Radio over Fibre

RoHS	Restriction of the Use of Certain Hazardous Substances
RX	Receiver
SC	Subscriber Connector
SEF	Subscriber Entrance Facilities
SFP	Small Form-factor Pluggable
SM	Single Mode
STB	Set Top Box
TDMA	Time division multiple access
TO	Telecommunications Outlet
TOS	Type Of Service
TV	TeleVision
TX	Tranceiver
UHF	Ultra High Frequency
USB	Universal Serial Bus
UTP5	Unshielded Twisted Pair (Category 5)
UWB	Ultra-Wide Band
VCSEL	Vertical Cavity Surface Emitting Laser
VLAN	Virtual Local Area Network
WDM	Wavelength Division Multiplexing

---

## 4 HAN architecture evolution

### 4.1 Introduction

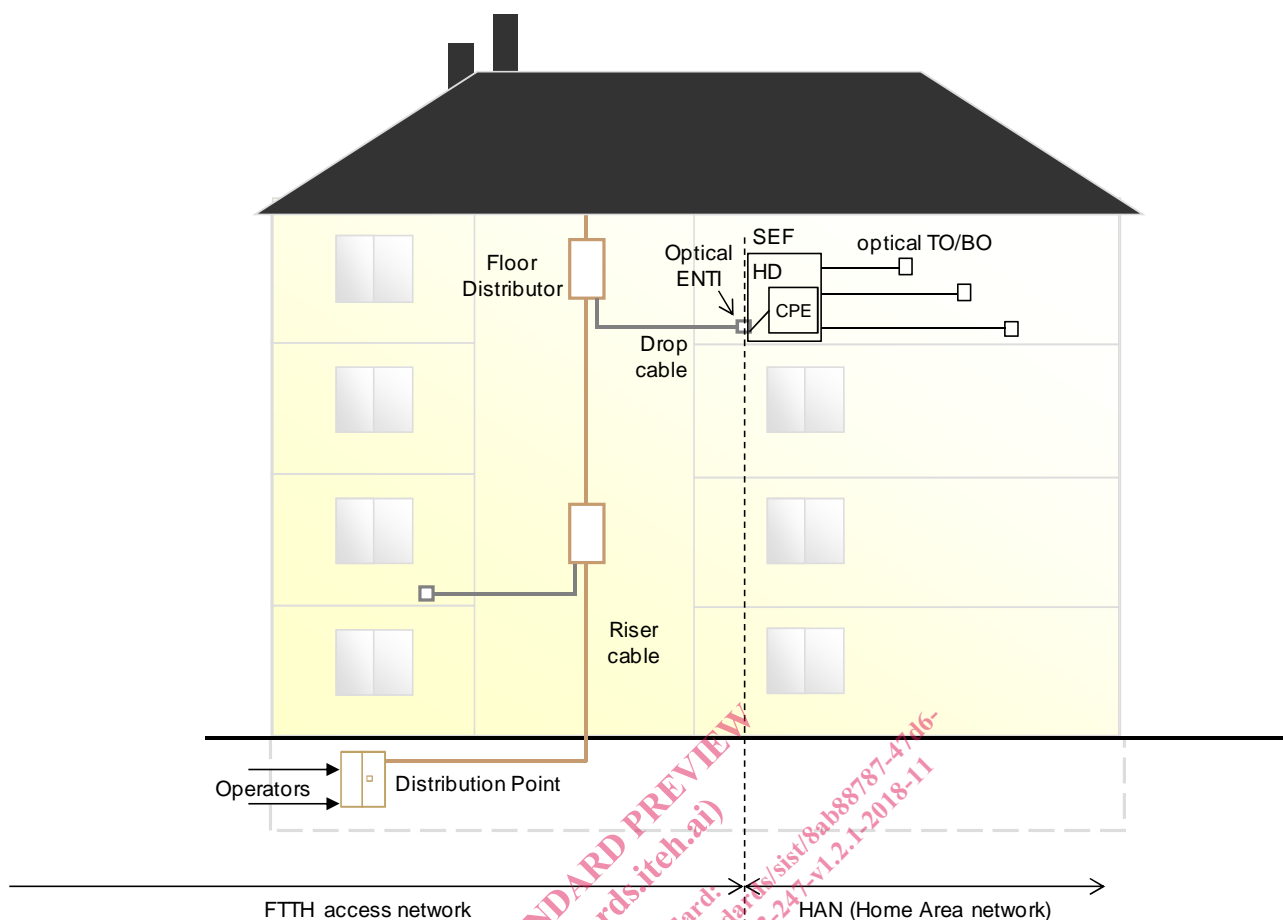
HAN includes active and passive networks deployed at the customer's site (apartment or building) between the Home Distributor (HD) and the end-user devices (TV set, STB, PC, IP phone, IP video camera, IoT end-point, Wireless points, etc.).

The HAN cabling system is defined according to CENELEC EN 50173-4 [47].

The Home Distributor is located at the SEF (Subscribers Entrance Facilities) and includes the optical ENTI (External Network Testing Interface) and active equipment's (CPE as Customer Premises Equipment) like Home Gateway (HG), Multiformat Switch (MS), etc.

The HD is connected with optical links to optical TO/BO (Telecommunications Outlet/Broadcast Outlet) where the end-user devices are connected via converters or extenders if needed.

The inputs to STB from terrestrial TV and satellite TV should be copper or fibre cables.



**Figure 2: FTTH and HAN cabling system scope**

Increasing the bit rate to meet the requirements related to the richness of the contents and high interactivity, and taking into account the heterogeneity of the signals to be delivered are the two major challenges which drive the HAN evolutions.

Data exchanges (traffic) have drastically increased in the Home Area Network (HAN) these last years and this expansion is expected to indubitably go on for a long time. First, because significant progress has been accomplished during the last years in the access networks: with continuously increasing bit rate on copper networks thanks to xDSL technologies, or as well with the Fiber-To-The-Home (FTTH) deployments, it is now possible to deliver rich contents up to the user's door. The second reason is the steadily increasing number of interconnected devices inside the home, implementing multi-Gigabit interfaces such as USB-3 (4,8 Gbit/s) or Thunderbolt (10 Gbit/s).

However, besides the need for high capacity, another major challenge lies in the great heterogeneity of signals to be delivered in the home. Actually, the HAN is the convergence point of many competing worlds, as computer, telecommunication, consumer electronics and several types of signals have to be considered: IP data for triple play services, Radio Frequency (RF) signals for broadcast TV (terrestrial, satellite or cable TV), specific formats as High Definition Multimedia Interface (HDMI) signals or related to various very high bit rate interfaces for example. Today, separate network segments are used in the home, each carrying one type of service (Ethernet cables for IP data, coaxial cable for broadcasted terrestrial or satellite TV, HDMI cables for high definition digital video). This situation is expected to be soon unacceptable by the customer, and the only solution is a structured home network able to carry all these signals on a unique convergent infrastructure. In addition, to guarantee effectiveness, safety and comfort in use, the medium used to realize the HAN is expected to be integrated inside the walls of the home: singlemode optical fiber then appears as a very good candidate to implement such a multifunctional and future-proof network, as its performances allows facing further evolutions of HAN requirements.