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Edition 1.0 2017-11

# INTERNATIONAL STANDARD

## Information technology – Generic cabling for customer premises – Part 6: Distributed building services



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# INTERNATIONAL STANDARD

## Information technology – Generic cabling for customer premises – Part 6: Distributed building services

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# INFORMATION TECHNOLOGY – GENERIC CABLING FOR CUSTOMER PREMISES –

## Part 6: Distributed building services

## FOREWORD

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International Standard ISO/IEC 11801-6 was prepared by subcommittee 25: Interconnection of information technology equipment, of ISO/IEC joint technical committee 1: Information technology.

ISO/IEC 11801-6 is to be read in conjunction with ISO/IEC 11801-1, which was created to consolidate general requirements for generic cabling into a single standard which allows the other standards in the ISO/IEC 11801 series to have a common reference.

This International Standard has been approved by vote of the member bodies, and the voting results can be obtained from the address given on the second title page.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the ISO/IEC 11801 series, published under the general title *Information technology – Generic cabling for customer premises*, can be found on the IEC website.

# INTRODUCTION

The importance of cabling infrastructure is similar to that of other fundamental utilities such as water and energy supply and interruptions to the services provided over that infrastructure can have a serious impact. A lack of design foresight, the use of inappropriate components, incorrect installation, poor administration or inadequate support can threaten quality of service and have commercial consequence for all types of users.

This document specifies generic cabling for distributed building services and can be used alone or in conjunction with all the premises-specific standards of the ISO/IEC 11801 series.

It has been prepared to reflect the increasing use of generic cabling in support of non-user specific services and the sharing of information between such services, many of which require the use of remote powered devices. The distribution of these services is implemented either as a stand-alone structure and configuration or as an overlay provided to locations other than those specified by premises-specific standards in the ISO/IEC 11801 series.

This document is not intended to replace the application of other premises-specific standards in the ISO/IEC 11801 series but has been prepared in recognition of the fact that, although certain functional elements of distributed building services cabling can be co-located with those of other generic cabling infrastructures, they can be

a) specified, installed and operated by different entities than those responsible for other generic cabling infrastructures that are installed within the premises,
b) specified and installed at a different time than other generic cabling infrastructures that are installed within the premises.

Figure 1 shows the schematic and contextual relationships between the standards relating to information technology cabling produced by ISO/IEC JTC 1/SC 25, namely the ISO/IEC 11801 series of standards for generic cabling design, standards for the installation, operation and administration of generic cabling and for testing of installed generic cabling.

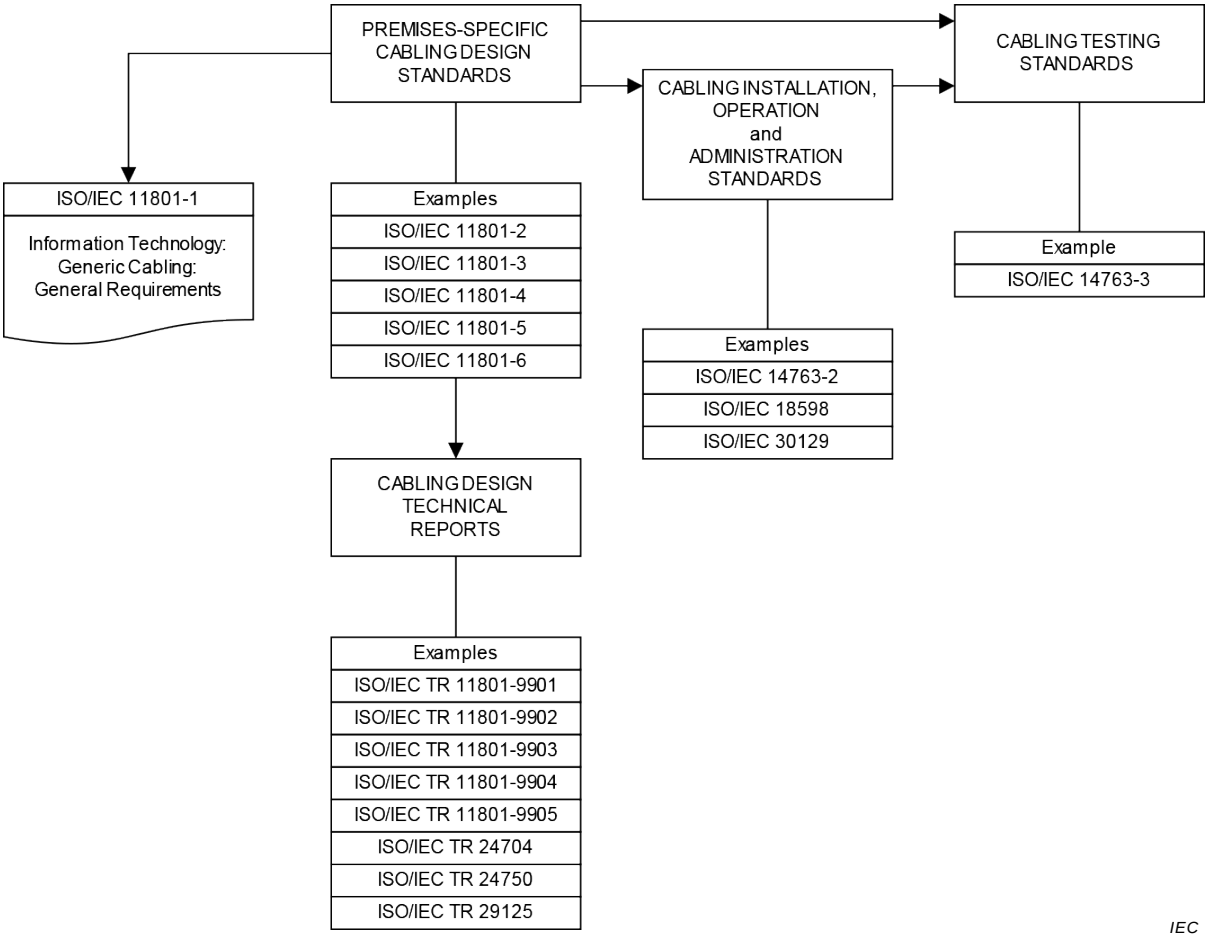



**Figure 1 – Relationships between the generic cabling documents produced by ISO/IEC JTC 1/SC 25**

The generic cabling specified by this document provides users with

a) an application independent system capable of supporting a wide range of applications in a range of installation and operating environments,

b) a flexible scheme such that modifications are both easy and economical,

c) a multi-vendor supply chain within an open market for cabling components.

In addition, this document provides

d) relevant industry professionals with guidance allowing the accommodation of cabling before specific requirements are known, i.e. in the initial planning either for construction or refurbishment and for further deployment as the requirements of areas are defined,

e) industry and standardization bodies with a cabling system which supports current products and provides a basis for future product development and applications standardization.

Applications addressed in this document include, but are not limited to those applications in ISO/IEC 11801:2017, Annex E, as used to support the following services:

1) telecommunications, e.g. wireless access points, distributed antenna systems;

2) energy management, e.g. lighting, power distribution, incoming utility metering;

3) environmental control, e.g. temperature, humidity;

4) personnel management, e.g. access control, cameras, passive infra-red (PIR) detectors, time and attendance monitoring, electronic signage, audio-visual projectors;

5) personal information and alarms, e.g. paging, patient monitoring, nurse call, infant security;

6) intelligent building systems;

7) communications between devices (i.e. “internet of things”).

Physical layer requirements for the applications listed in ISO/IEC 11801-1:2017, Annex E have been analysed to determine their compatibility with the cabling performance specified in this document and, together with statistics concerning premises geography from different countries and the models described in Clause 6, have been used to develop the requirements for cabling components and to stipulate their arrangement into cabling systems.

As a result, this document

- specifies a structure for generic cabling supporting a wide variety of applications including, but not restricted to, the applications in ISO/IEC 11801-1:2017, Annex E,
- adopts balanced cabling channel and link Classes $E_A$, F and $F_A$, specified in ISO/IEC 11801-1:2017,
- adopts optical fibre cabling channel and link requirements as specified in ISO/IEC 11801-1,
- adopts component requirements, specified in ISO/IEC 11801-1, and specifies cabling implementations that ensure performance of permanent links and of channels that meet or exceed the requirements of a specified group (e.g. Class) of applications.

Life expectancy of generic cabling systems can vary depending on environmental conditions, supported applications, aging of materials used in cables, and other factors such as access to pathways (campus pathways are more difficult to access than building pathways). With appropriate choice of components, generic cabling systems meeting the requirements of this document are expected to have a life expectancy of at least ten years.

This document has taken into account requirements specified in application standards listed in ISO/IEC 11801-1:2017, Annex E. It refers to International Standards for components and test methods whenever appropriate International Standards are available.

# INFORMATION TECHNOLOGY – GENERIC CABLING FOR CUSTOMER PREMISES –

# Part 6: Distributed building services

## 1 Scope

This part of ISO/IEC 11801 specifies generic cabling within premises that comprise single or multiple buildings on a campus. It covers balanced cabling and optical fibre cabling.

This document has been prepared to reflect the increasing use of generic cabling in support of non-user specific services and the sharing of information between such services that can also incorporate the supply of power, including

1) telecommunications, e.g. wireless access points, distributed antenna systems,
2) energy management, e.g. lighting, power distribution, incoming utility metering,
3) environmental control, e.g. temperature, humidity,
4) personnel management, e.g. access control, cameras, PIR detectors, time and attendance monitoring, electronic signage, audio-visual projectors,
5) personal information and alarms, e.g. paging, patient monitoring, nurse call, infant security,
6) intelligent building systems.

This document specifies directly or via reference to ISO/IEC 11801-1

a) the structure and configuration for generic cabling for distributed building services,
b) the interfaces at the service outlet (SO),
c) the performance requirements for cabling links and channels,
d) the implementation requirements and options,
e) the performance requirements for cabling components,
f) the conformance requirements and verification procedures.

Safety (e.g. electrical safety and protection, fire) and electromagnetic compatibility (EMC) requirements are outside the scope of this document, and are covered by other standards and by regulations. However, information given by this document can be of assistance.

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

ISO/IEC 11801-1:2017, *Information technology – Generic cabling for customer premises – Part 1: General requirements*

ISO/IEC 14763-2, *Information technology – Implementation and operation of customer premises cabling – Part 2: Planning and installation*

ISO/IEC 30129, *Information technology – Telecommunications bonding networks for buildings and other structures*

# 3 Terms, definitions and abbreviated terms

## 3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 11801-1, ISO/IEC 14763-2 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

**3.1.1**
**building service**
non-user specific service within premises including, but not restricted to, building automation, security, access control, building management, wireless access points, information displays and alarm systems

**3.1.2**
**distributed building service**
building service provided to locations additional to those specified in premises-specific standards in the ISO/IEC 11801 series

**3.1.3**
**network conversion interface**
passive or active device allowing the attachment of cabling of different network topologies to a service concentration point

**3.1.4**
**service area**
area in a room or facility where non-user specific equipment is placed and connected to the same service concentration point or groups of service outlets

**3.1.5**
**service area cord**
cord connecting the service outlet to the terminal equipment

**3.1.6**
**service concentration point**
**SCP**
connection point in the Type A generic cabling between a service distributor and a service outlet or a connection point offering connections to terminal equipment at the end of Type B generic cabling

**3.1.7**
**service concentration point cable**
cable between a service concentration point and a service outlet

**3.1.8**
**service distribution cable**
cable connecting the service distributor to the service outlet(s) of Type A cabling or service concentration point(s) of Type A or Type B cabling

**3.1.9**
**service outlet**
**SO**
fixed connecting device where the service distribution cabling terminates

**3.1.10**
**Type A generic cabling**
service distribution cabling between the service distributor and the service outlet

**3.1.11**
**Type B generic cabling**
service distribution cabling between the service distributor and the service concentration point when a service outlet is not used

### 3.2 Abbreviated terms

For the purposes of this document, the abbreviated terms given in ISO/IEC 11801-1 and the following apply.

| | |
|---|---|
| DAS | distributed antenna system |
| HVAC | heating, ventilation and air conditioning |
| MIMO | multiple input, multiple output |
| NFC | near field communication |
| OE EQP | opto-electronic equipment |
| PIR | passive infrared |
| PP | patch panel |
| RFID | radio-frequency identification |
| SCP | service concentration point |
| SD | service distributor |
| SO | service outlet |
| WAP | wireless access point |

## 4 Conformance

For a cabling system to conform to this document the following applies.

a) The configuration and structure shall conform to the requirements outlined in Clause 5.

b) Channels shall meet the requirements specified in Clause 6 when subjected to environment conditions, local to the channels (see NOTE below), as defined by the applicable environmental Class(es) of Clause 6.

   This shall be achieved by one of the following:

   1) a channel design and implementation ensuring that the prescribed channel performance of Clause 6 is met;

   2) attachment of appropriate components to a permanent link or service concentration point (SCP) link design meeting the prescribed performance class of Clause 7. Channel performance shall be ensured where a channel is created by adding more than one cord to either end of a link meeting the requirements of Clause 7;

   3) for $E_1$ environments, using the reference implementations of Clause 8 and compatible cabling components conforming to the requirements of Clauses 9, 10 and 11, this is based upon a statistical approach of performance modelling.

c) The interfaces to the cabling at the SO shall conform to the requirements of Clause 10 with respect to mating interfaces and performance when subjected to environment conditions, local to the connecting hardware (see NOTE below), as defined by the applicable environmental Class(es) of Clause 6.

d) Connecting hardware at other places in the cabling structure shall meet the performance requirements specified in Clause 10 when subjected to environment conditions, local to the connecting hardware (see NOTE below), as defined by the applicable environmental Class(es) of Clause 6,

e) The requirements of ISO/IEC 14763-2 and ISO/IEC 30129 shall be met.

This document does not specify which tests and sampling levels should be adopted. Test methods to assess conformance with the channel and link requirements of Clause 6 and Clause 7, respectively, are specified in ISO/IEC 11801-1. The test parameters to be measured, the sampling levels and the treatment of measured results to be applied for