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Edition 1.0 2017-11

INTERNATIONAL STANDARD

Information technology – Generic cabling for customer premises – Part 5: Data centres



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INTERNATIONAL STANDARD

Information technology – Generic cabling for customer premises – Part 5: Data centres

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INFORMATION TECHNOLOGY – GENERIC CABLING FOR CUSTOMER PREMISES –

Part 5: Data centres

FOREWORD

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International Standard ISO/IEC 11801-5 was prepared by subcommittee 25: Interconnection of information technology equipment, of ISO/IEC joint technical committee 1: Information technology.

This first edition cancels and replaces ISO/IEC 24764:2010 and Amendment 1:2014. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) standard re-structured to contain only those requirements that are specific for generic cabling systems installed in data centres;

b) addition of balanced cabling channels Class I and Class II;

c) addition of examples of structures in accordance with ISO/IEC 11801-5 in Annex C;

d) addition of examples of networking architectures in Annex D.

ISO/IEC 11801-5 is to be read in conjunction with ISO/IEC 11801-1.

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 within and to the computer room spaces of data centre premises, or computer room spaces within other types of building.

Additionally those premises can include

- office spaces for which generic cabling is specified in ISO/IEC 11801-2,
- industrial spaces for which generic cabling is specified in ISO/IEC 11801-3.

Generic cabling for distributed building services in data centre spaces is specified in ISO/IEC 11801-6, which addresses all of the above premises and spaces within them.

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.

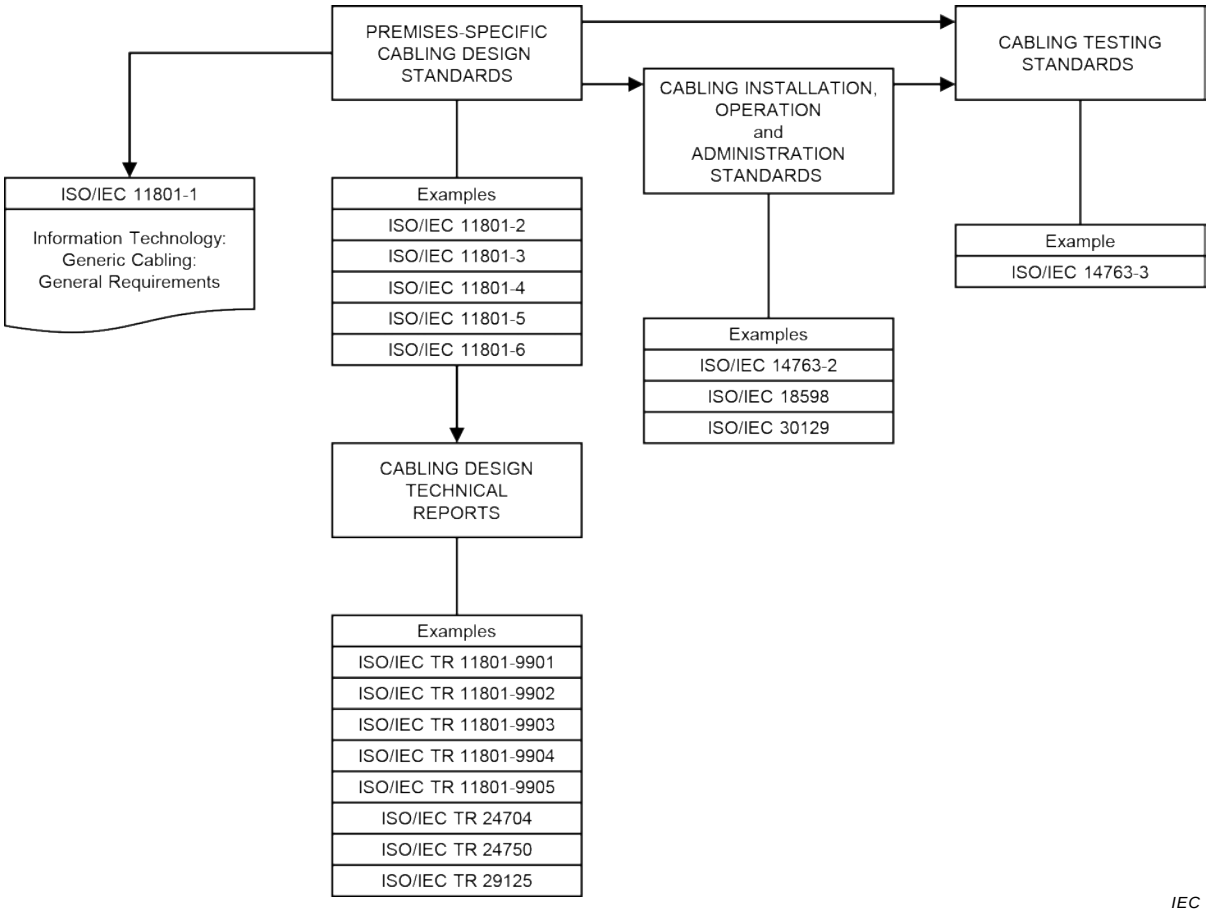


Figure 1 – Relationships between the generic cabling documents produced by ISO/IEC JTC 1/SC 25

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 those developed by the technical committees of IEC (including the subcommittees of ISO/IEC JTC 1) and study groups of ITU-T as used to support high data rate, mission-critical services within the densely connected environment of data centre spaces.

This document has taken into account requirements specified in application standards listed in Annex E of ISO/IEC 11801-1:2017.

This document should 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.

Physical layer requirements for the applications listed in Annex E of ISO/IEC 11801-1:2017 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 International Standard specifies a structure for generic cabling supporting a wide variety of applications, which

1) adopts balanced cabling channel and link Classes E_A, F, F_A, I and II specified in ISO/IEC 11801-1,

2) 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,

3) adopts optical fibre cabling channel and link requirements specified in ISO/IEC 11801-1.

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 5: Data centres

1 Scope

This part of ISO/IEC 11801 specifies generic cabling within and to the computer room spaces of data centre premises, or data centre spaces within other types of buildings. It covers balanced cabling and optical fibre cabling.

This document is optimized for premises in which the maximum distance over which telecommunications services can be distributed is 2 000 m. The principles of this document can also be applied to larger installations.

Cabling specified by this document supports a wide range of services including voice, data and video that can also incorporate the supply of power.

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

a) the structure and minimum configurations for generic cabling within data centres,

b) the interfaces at the equipment outlet (EO) and the external network interface (ENI),

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.

IEC 60603-7-7, *Connectors for electronic equipment – Part 7-7: Detail specification for 8-way, shielded, free and fixed connectors for data transmissions with frequencies up to 600 MHz*

IEC 60603-7-41, *Connectors for electronic equipment – Part 7-41: Detail specification for 8-way, unshielded, free and fixed connectors, for data transmissions with frequencies up to 500 MHz*

IEC 60603-7-51, *Connectors for electronic equipment – Part 7-51: Detail specification for 8-way, shielded, free and fixed connectors, for data transmissions with frequencies up to 500 MHz*

IEC 60603-7-71, *Connectors for electronic equipment – Part 7-71: Detail specification for 8-way, shielded, free and fixed connectors, for data transmission with frequencies up to 1 000 MHz*

IEC 60603-7-81, *Connectors for electronic equipment – Part 7-81: Detail specification for 8-way, shielded, free and fixed connectors, for data transmissions with frequencies up to 2 000 MHz*

IEC 60603-7-82, *Connectors for electronic equipment – Part 7-82: Detail specification for 8-way, 12 contacts, shielded, free and fixed connectors, for data transmissions with frequencies up to 2 000 MHz*

IEC 60874-19-1, *Fibre optic interconnecting devices and passive components – Connectors for optical fibres and cables – Part 19-1: Fibre optic patch cord connector type SC-PC (floating duplex) standard terminated on multimode fibre type A1a, A1b – Detail specification*

IEC 61754-7-1, *Fibre optic interconnecting devices and passive components – Fibre optic connector interfaces – Part 7-1: Type MPO connector family – One fibre row*

IEC 61754-7-2, *Fibre optic interconnecting devices and passive components – Fibre optic connector interfaces – Part 7-2: Type MPO connector family – Two fibre rows*

IEC 61754-20, *Fibre optic connector interfaces – Part 20: Type LC connector family*

IEC 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*

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 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
computer room
one or more spaces primarily dedicated to housing cabling and equipment used for electronics data storage, processing and networking

3.1.2
computer room space
area within the data centre that accommodates the data processing, data storage and telecommunications equipment that provides the primary function of the data centre

3.1.3
equipment outlet
fixed connecting device for terminating the zone distribution cabling and providing the interface to the equipment cord

3.1.4
fixed zone distribution cable
cable connecting the zone distributor to either the equipment outlet or, if present, the local distribution point

3.1.5
intermediate distribution cable
cable connecting the intermediate distributor to the zone distributor

3.1.6
intermediate distributor
distributor used to make connections between the main distribution cabling subsystem, intermediate distribution cabling subsystem, network access cabling subsystem and cabling subsystems specified in ISO/IEC 11801-1 and active equipment

3.1.7
local distribution point
connection point in the zone distribution cabling subsystem between a zone distributor and an equipment outlet

3.1.8
local distribution point cable
cable connecting a local distribution point to an equipment outlet

3.1.9
local distribution point link
transmission path between a local distribution point and the interface at the other end of the fixed zone distribution cable including the connecting hardware at each end

3.1.10
main distribution cable
cable connecting the main distributor to the intermediate distributor or the zone distributor

3.1.11
main distributor
distributor used to make connections between the main distribution cabling subsystem, network access cabling subsystem and cabling subsystems as specified in ISO/IEC 11801-1 and active equipment

3.1.12
network access cable
cable connecting the external network interface (or other distributors of the ISO/IEC 11801 series) to the main distributor, intermediate distributor or zone distributor

3.1.13
transition assembly
assembly of cabled optical fibres and connectors, with an MPO connector on one end and simplex or duplex connectors on the other end

3.1.14
zone distribution cable
cable connecting the zone distributor to the equipment outlet(s) or local distribution point(s), where present

3.1.15
zone distributor
distributor used to make connections between the main distribution cabling subsystem, intermediate distribution cabling subsystem, zone distribution cabling subsystem, network access cabling subsystem, cabling subsystems specified in ISO/IEC 11801-1 and active equipment

3.2 Abbreviated terms

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

CuC copper cabling
ENI external network interface
EO equipment outlet
ID intermediate distributor
LDP local distribution point
MD main distributor
OFC optical fibre cabling
SAN storage area network
ZD zone distributor

4 Conformance

For a cabling installation 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 CP 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 E1 environments, using the reference implementations of Clause 8 and compatible cabling components conforming to the requirements of Clauses 9, 10, and 11, that is based upon a statistical approach of performance modelling.

c) The interfaces to the cabling at the EO 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