



ISO/IEC 11801-2

Edition 1.0 2017-11

INTERNATIONAL STANDARD

**Information technology – Generic cabling for customer premises –
Part 2: Office premises**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 35.200

ISBN 978-2-8322-5034-1

Warning! Make sure that you obtained this publication from an authorized distributor.

CONTENTS

FOREWORD.....	4
INTRODUCTION.....	6
1 Scope.....	8
2 Normative references	8
3 Terms, definitions and abbreviated terms	8
3.1 Terms and definitions.....	8
3.2 Abbreviated terms.....	9
4 Conformance.....	9
5 Structure of the generic cabling system	10
5.1 General.....	10
5.2 Functional elements.....	10
5.3 General structure and hierarchy.....	11
5.3.1 General	11
5.3.2 Campus and building backbone cabling subsystem.....	11
5.3.3 Horizontal cabling subsystem	11
5.3.4 Design objectives	11
5.4 Interconnection of subsystems.....	12
5.4.1 General	12
5.4.2 Centralized cabling architecture.....	12
5.5 Accommodation of functional elements	12
5.6 Dimensioning and configuring	13
5.6.1 Distributors.....	13
5.6.2 Connecting hardware.....	15
5.6.3 Work area cords and equipment cords.....	15
5.6.4 Patch cords and jumpers	15
5.6.5 Telecommunications outlet	15
5.6.6 Consolidation point.....	16
5.6.7 Telecommunications rooms and equipment rooms.....	17
5.6.8 External services cabling	17
6 Channel performance requirements	17
6.1 General.....	17
6.2 Environmental performance	18
6.3 Transmission performance	18
6.3.1 General	18
6.3.2 Balanced cabling	19
6.3.3 Optical fibre cabling.....	19
7 Link performance requirements	19
7.1 General.....	19
7.2 Balanced cabling	19
7.3 Optical fibre cabling	19
8 Reference implementations	20
8.1 General.....	20
8.2 Balanced cabling	20
8.2.1 General	20
8.2.2 Horizontal cabling	20
8.2.3 Campus and building backbone cabling system	23

- 8.3 Optical fibre cabling 23
 - 8.3.1 General 23
 - 8.3.2 Component selection 23
 - 8.3.3 Dimensions..... 23
- 9 Cable requirements 25
 - 9.1 General..... 25
 - 9.2 Balanced cables 26
 - 9.3 Optical fibre cables 26
- 10 Connecting hardware requirements 26
 - 10.1 General requirements 26
 - 10.2 Connecting hardware for balanced cabling..... 26
 - 10.2.1 General requirements 26
 - 10.2.2 Electrical, mechanical and environmental performance 26
 - 10.3 Connecting hardware for optical fibre cabling..... 27
 - 10.3.1 General requirements 27
 - 10.3.2 Optical, mechanical and environmental performance 27
- 11 Cord requirements 27
 - 11.1 Jumpers..... 27
 - 11.2 Balanced cords 27
 - 11.2.1 General 27
 - 11.2.2 Additional requirements for work area cords 27
 - 11.3 Optical fibre cords..... 27
- Bibliography..... 28

- Figure 1 – Relationships between the generic cabling documents produced by ISO/IEC JTC 1/SC 25 6
- Figure 2 – Structure of generic cabling 11
- Figure 3 – Hierarchical structure of generic cabling..... 12
- Figure 4 – Structures for centralized generic cabling..... 12
- Figure 5 – Accommodation of functional elements 13
- Figure 6 – Example of a generic cabling system with combined BD and FD 14
- Figure 7 – Inter-relationship of functional elements in an installation with redundancy 15
- Figure 8 –Channel, permanent link and CP link..... 18
- Figure 9 – Example of a system showing the location of cabling interfaces and extent of associated channels 18
- Figure 10 – Horizontal cabling models 21
- Figure 11 – Combined backbone/horizontal channels..... 25

- Table 1 – Maximum channel lengths 14
- Table 2 – Length assumptions used in the mathematical modelling of balanced horizontal cabling..... 22
- Table 3 – Horizontal link length equations..... 22

INFORMATION TECHNOLOGY – GENERIC CABLING FOR CUSTOMER PREMISES –

Part 2: Office premises

FOREWORD

- 1) ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.
- 2) The formal decisions or agreements of IEC and ISO on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees and ISO member bodies.
- 3) IEC, ISO and ISO/IEC publications have the form of recommendations for international use and are accepted by IEC National Committees and ISO member bodies in that sense. While all reasonable efforts are made to ensure that the technical content of IEC, ISO and ISO/IEC publications is accurate, IEC or ISO cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees and ISO member bodies undertake to apply IEC, ISO and ISO/IEC publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any ISO, IEC or ISO/IEC publication and the corresponding national or regional publication should be clearly indicated in the latter.
- 5) ISO and IEC do not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. ISO or IEC are not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or ISO or its directors, employees, servants or agents including individual experts and members of their technical committees and IEC National Committees or ISO member bodies for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication of, use of, or reliance upon, this ISO/IEC publication or any other IEC, ISO or ISO/IEC publications.
- 8) Attention is drawn to the normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this ISO/IEC publication may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

International Standard ISO/IEC 11801-2 was prepared by subcommittee 25: Interconnection of information technology equipment, of ISO/IEC joint technical committee 1: Information technology.

This first edition, together with ISO/IEC 11801-1, cancels and replaces ISO/IEC 11801:2002, Amendment 1:2008 and Amendment 2:2010. 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 offices,
- b) alignment of functional element designations with the generic terminology of ISO/IEC 11801-1,
- c) reference to the campus and building backbone cabling system specification of ISO/IEC 11801-1,
- d) reference to the channel and link specifications of ISO/IEC 11801-1.

ISO/IEC 11801-2 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 may 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.

The contents of the corrigendum of April 2018 have been included in this copy.

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.

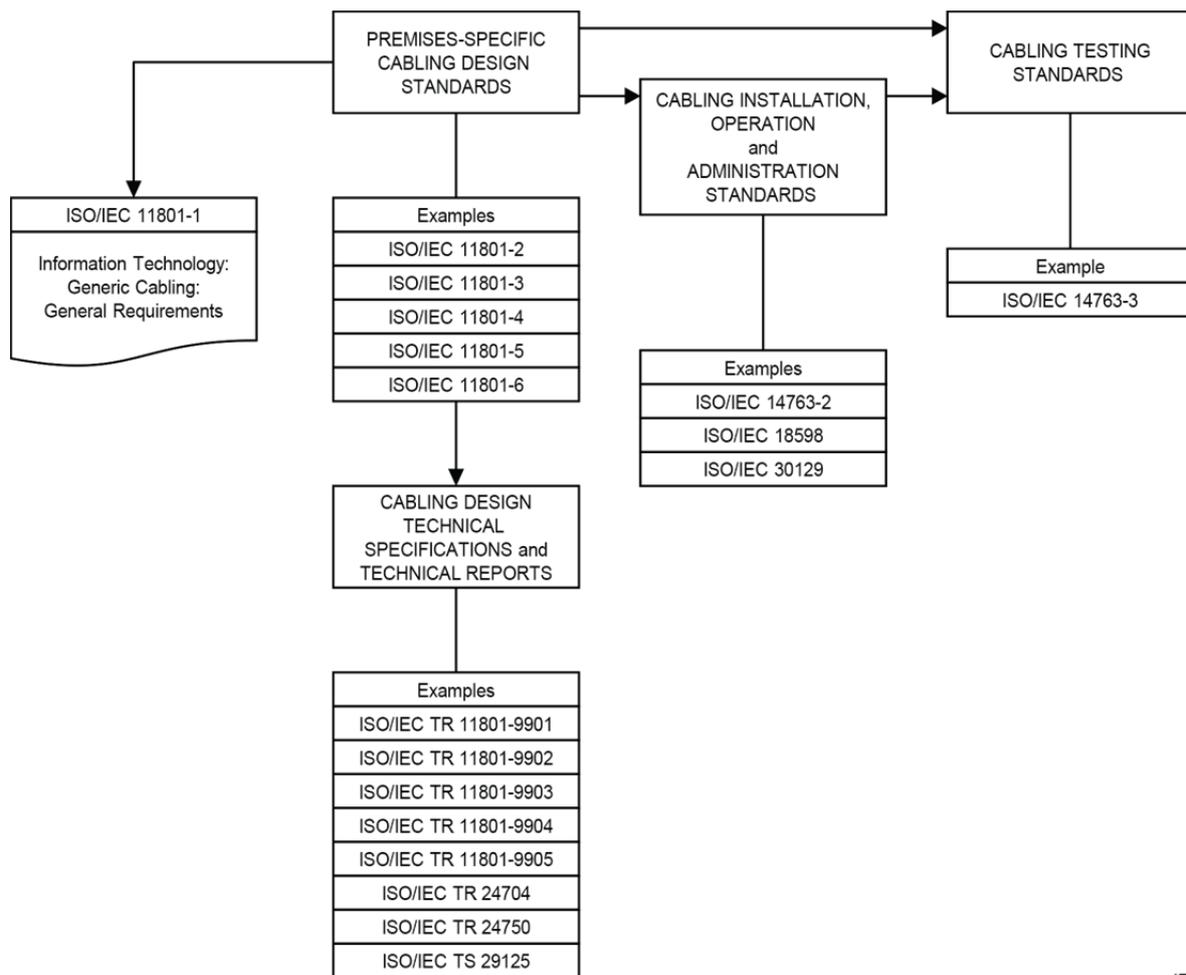
This document specifies generic cabling within and between the buildings of office premises, or office spaces within other types of building.

Additionally those premises can include

- industrial spaces for which generic cabling is specified in ISO/IEC 11801-3,
- data centre spaces for which generic cabling is specified in ISO/IEC 11801-5.

Generic cabling for distributed building services in office 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.



IEC

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.

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 document

- 1) specifies a structure for generic cabling supporting a wide variety of applications,
- 2) adopts balanced cabling channel and link Classes E, E_A, F, and F_A specified in ISO/IEC 11801-1,
- 3) adopts optical fibre cabling channel and link requirements specified in ISO/IEC 11801-1,
- 4) 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, supporting 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 2: Office premises

1 Scope

This part of ISO/IEC 11801 specifies generic cabling for use within office premises, which can comprise single or multiple buildings on a campus. 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 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 configuration for generic cabling within office premises,
- b) the interfaces at the telecommunications outlet (TO),
- 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 and 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 61754-20 (all parts), *Fibre optic interconnecting devices and passive components – Fibre optic connector interfaces – Part 20: Type LC connector family*

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*