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Edition 1.0 2017-11

INTERNATIONAL STANDARD

Information technology – Generic cabling for customer premises
Part 3: Industrial premises



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Information technology – Generic cabling for customer premises
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CONTENTS

FOREWORD 5
INTRODUCTION 7
1 Scope 10
2 Normative references 10
3 Terms, definitions, abbreviated terms and symbols 11
3.1 Terms and definitions 11
3.2 Abbreviated terms 12
3.3 Symbols 12
4 Conformance 12
5 Structure of the generic cabling system 13
5.1 General 13
5.2 Functional elements 13
5.3 Cabling subsystem 14
5.3.1 General structure 14
5.3.2 Campus and building backbone cabling subsystem 15
5.3.3 Floor cabling subsystem 15
5.3.4 Intermediate cabling subsystem 15
5.3.5 Centralized cabling architecture 16
5.3.6 Design objectives 16
5.4 Interconnection of subsystems 16
5.5 Accommodation of functional elements 18
5.6 Interfaces 19
5.6.1 Equipment interfaces and test interfaces 19
5.6.2 Channels and permanent links 19
5.7 Dimensioning and configuring 19
5.7.1 General 19
5.7.2 Distributors 19
5.7.3 Connecting hardware 20
5.7.4 Apparatus attachment and equipment cords 20
5.7.5 Patch cords and jumpers 20
5.7.6 Telecommunications outlet 20
5.7.7 Telecommunications rooms and equipment rooms 21
5.7.8 Industrial enclosures 21
6 Channel performance requirements 21
6.1 General 21
6.2 Environmental performance 22
6.3 Transmission performance 22
6.3.1 General 22
6.3.2 Balanced cabling 22
6.3.3 Optical fibre cabling 23
7 Link performance requirements 23
7.1 General 23
7.2 Balanced cabling 23
7.3 Optical fibre cabling 23
8 Reference implementations 23
8.1 General 23

8.2 Balanced cabling 23
8.2.1 General 23
8.2.2 Intermediate cabling subsystem 24
8.2.3 Floor cabling subsystem 26
8.2.4 Campus and building backbone cabling subsystem 28
8.3 Optical fibre cabling 28
9 Cable requirements 28
9.1 General 28
9.2 Balanced cables 28
9.3 Optical fibre cables 29
10 Connecting hardware requirements 29
10.1 General requirements 29
10.2 Connecting hardware for balanced cabling 29
10.2.1 General requirements 29
10.2.2 Electrical, mechanical and environmental performance 29
10.3 Connecting hardware for optical fibre cabling 30
10.3.1 General requirements 30
10.3.2 Optical, mechanical and environmental performance 30
11 Cords 30
11.1 Jumpers 30
11.2 Balanced cords 30
11.2.1 General 30
11.2.2 Additional requirements for apparatus attachment cords 30
11.3 Optical fibre cords 30
Annex A (normative) Industrial cabling system 31
A.1 General 31
A.2 Industrial intermediate cabling subsystem 31
Annex B (normative) Additional reference implementations 33
B.1 General 33
B.2 Channel configurations 33
B.2.1 General 33
B.2.2 Channels with no connections 33
B.2.3 Channels with inter-connections 34
B.2.4 End-to-end link (E2E link) 35
B.3 Channels using balanced cabling bulkhead connections 36
Annex C (informative) Other implementations 38
C.1 General 38
C.2 Channels using balanced cabling bulkhead connections with additional connections 38
Bibliography 41

Figure 1 – Relationships between the generic cabling documents produced by ISO/IEC JTC 1/SC 25 7
Figure 2 – Relationships between the ISO/IEC and IEC cabling documents that apply to industrial premises 8
Figure 3 – Configuration of apparatus-based functional elements within industrial premises 14
Figure 4 – Structure of generic cabling for industrial environment 14

Figure 5 – Centralized structure of generic cabling for industrial premises 16
Figure 6 – Hierarchical structure of generic cabling for industrial premises 17
Figure 7 – Inter-relationship of functional elements in an installation with diversity for protection against failure (CPs optional between IDs and TOs) 17
Figure 8 – Accommodation of functional elements (CPs optional between IDs and TOs) 18
Figure 9 – Equipment and test interfaces 19
Figure 10 – Transmission performance of a channel 21
Figure 11 – Example of a system showing the location of cabling interfaces and extent of associated channels 22
Figure 12 – Intermediate cabling models 25
Figure 13 – Floor cabling model 27
Figure A.1 – Industrial cabling system supporting several AIs via an IID 31
Figure A.2 – Combined structure of generic and industrial cabling system using an IID 32
Figure B.1 – Channel configurations without intermediate connections 34
Figure B.2 – Channel configurations with inter-connections 35
Figure B.3 – Channel configurations with bulkhead connections 36
Figure C.1 – Channel configurations with bulkhead and additional connections 39

Table 1 – Maximum channel lengths 20
Table 2 – Length assumptions used in the mathematical modelling of balanced intermediate cabling 25
Table 3 – Intermediate link length equations 26
Table 4 – Floor link length equations 28
Table B.1 – Channel length equations for balanced cabling with inter-connections 35
Table B.2 – Channel length equations with bulkhead connections 37
Table C.1 – Channel equations with bulkhead and additional connections 40

INFORMATION TECHNOLOGY – GENERIC CABLING FOR CUSTOMER PREMISES

Part 3: Industrial 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.

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International Standard ISO/IEC 11801-3 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 24702:2006 and Amendment 1:2009. 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 industrial premises;

b) support of critical process control, monitoring and automation (PCMA) services between automation islands by adding new Annex A (normative) “Industrial cabling system”;

c) support of specific requirements for industrial cabling the end-to-end link (E2E) has been introduced and delivers additional channel configuration covered in Annex B (normative);

d) silica optical fibre cabling has been removed from this International Standard.

ISO/IEC 11801-3 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.

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, which is critical for providing robust services to the automation islands in industrial premises, or industrial spaces within other types of building.

Additionally those premises can include

- office spaces for which generic cabling is specified in ISO/IEC 11801-2,
- data centre spaces for which generic cabling is specified in ISO/IEC 11801-5.

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

This document has taken into account the correlation between all parts of the ISO/IEC 11801 series and the IEC 61918 and IEC 61784-5 series.

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.

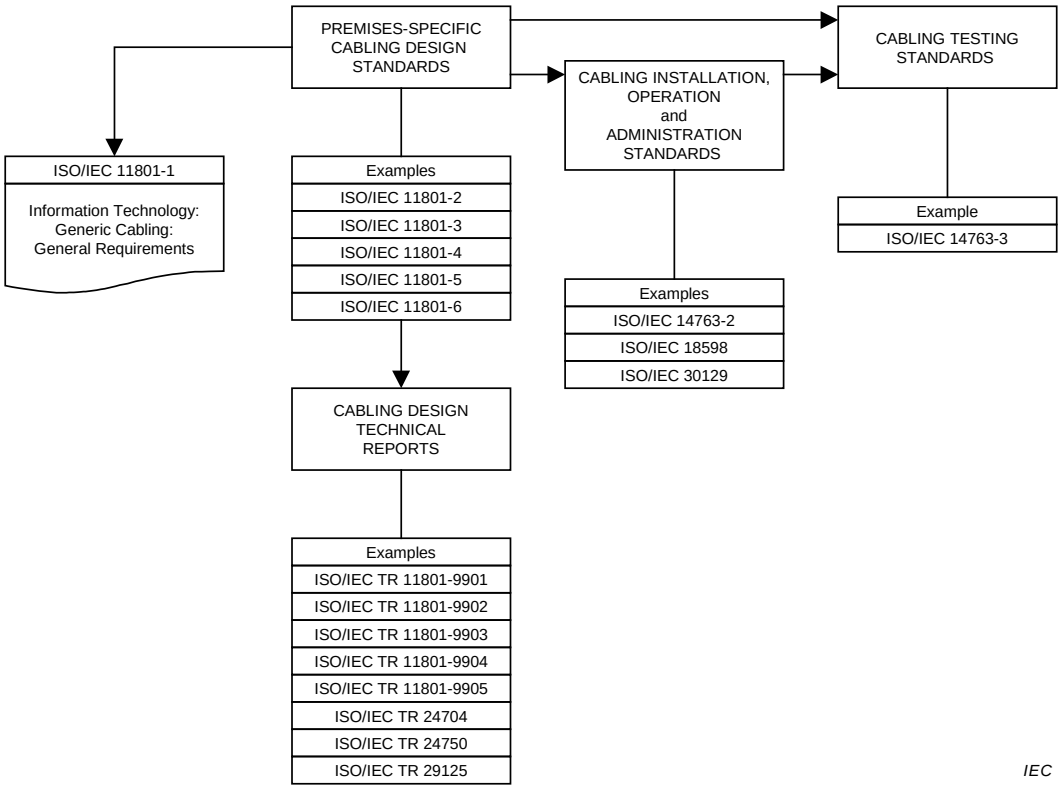


Figure 1 – Relationships between the generic cabling documents produced by ISO/IEC JTC 1/SC 25

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), including critical industrial process control and monitoring applications and study groups of ITU-T.

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 D, E, E_A, F and F_A, specified in ISO/IEC 11801-1,

3) 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.

Figure 2 shows the relationship between all the documents (the generic cabling standards produced by ISO/IEC JTC 1/SC 25 and the application-specific standards produced by IEC SC 65C) that apply to industrial premises.

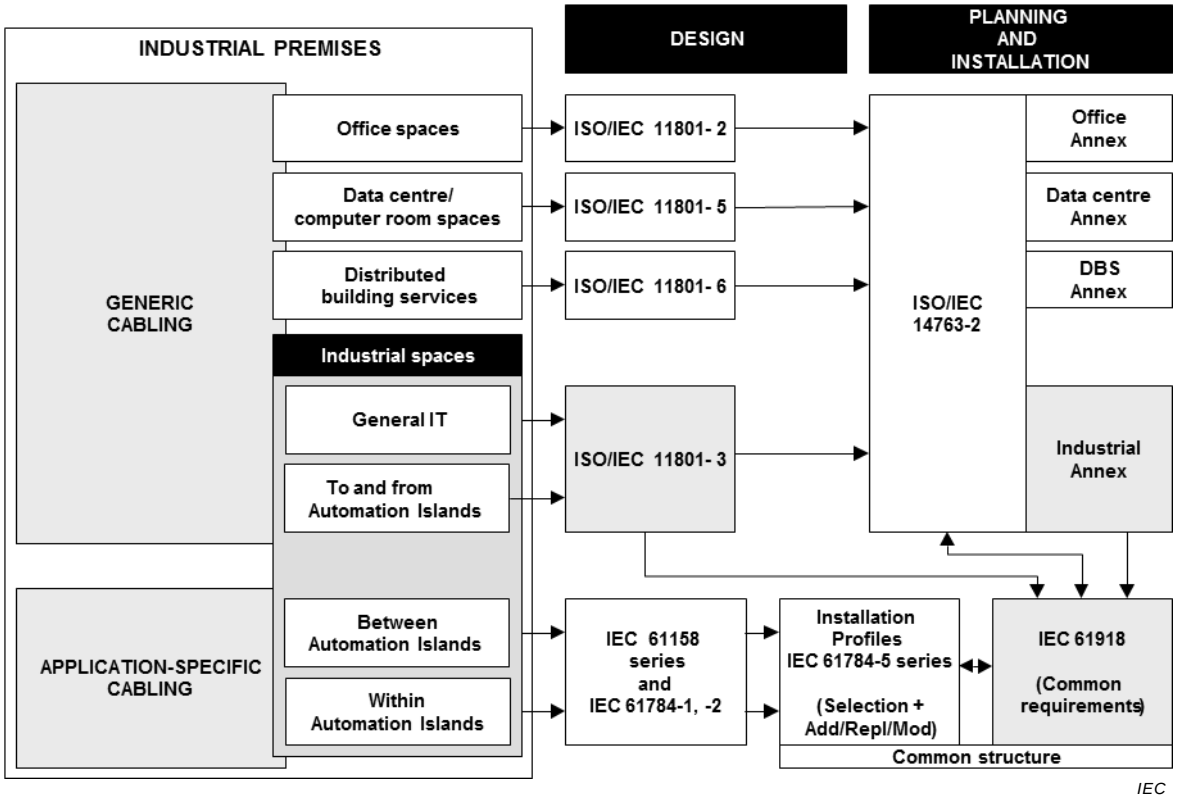


Figure 2 – Relationships between the ISO/IEC and IEC cabling documents that apply to industrial premises

It is anticipated that the generic cabling system meeting the minimum requirements of this document will have a life expectancy consistent with other infrastructures within industrial premises.

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 3: Industrial premises

1 Scope

This part of ISO/IEC 11801 specifies generic cabling for use within industrial premises, or industrial areas within other types of 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 10 000 m. The principles of this document can be applied to larger installations.

Cabling defined by this document supports a wide range of services, including automation, process control, and monitoring applications. 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 industrial 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.

The cabling providing critical automation, process control and monitoring applications within the automation islands is not addressed by this document. Information for this application-specific cabling is provided in the IEC 61784-5 series (design) and in IEC 61918 (installation).

Safety (electrical safety and protection, fire, etc.) 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 61918, *Industrial communication networks – Installation of communication networks in industrial premises*

IEC 61754-20, *Fibre optic interconnecting devices and passive components – Fibre optic connector interfaces – Part 20: Type LC connector family*

IEC 61784-5 (all parts), *Industrial communication networks – Profiles – Part 5: Installation of fieldbuses – Installation profiles for CPF*

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

ISO/IEC 11801-2, *Information technology – Generic cabling for customer premises – Part 2: Office premises*

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

ISO/IEC 14763-4, *Information technology – Implementation and operation of customer premises cabling – Part 4: Measurement of end-to-end (E2E) links*[1]

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

3 Terms, definitions, abbreviated terms and symbols

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
apparatus
one or more pieces of equipment having specific and defined overall functions within industrial premises served by one or more network interfaces

3.1.2
apparatus attachment cord
cord used to connect a telecommunications outlet to a network interface

3.1.3
automation island
premises and areas where a combination of systems that control, monitor and protect process(es) of a plant are installed

3.1.4
automation outlet
fixed connecting hardware which provides an interface to the automation island (AI)

3.1.5
bulkhead
wall or barrier which maintains the ingress and climatic environmental classifications applicable on either side

3.1.6
equipment room
room dedicated to housing distributors and application-specific equipment

3.1.7
floor cable
cable connecting the floor distributor to the intermediate distributor

3.1.8
floor distributor
distributor used to make connections between the floor cable, other cabling subsystems and active equipment

3.1.9
intermediate cable
cable connecting the intermediate distributor to the telecommunications outlet

———————

[1] Under preparation. Stage at time of publication: ISO/IEC CDV 14763-4:2017.

3.1.10
intermediate distributor
distributor used to make connections between the intermediate cable, other cabling subsystems and active equipment

3.1.11
industrial intermediate distributor
intermediate distributor used to make connections between several automation islands and transmit critical process control, monitoring and automation data (PCMA) between them

3.1.12
network interface
interface between the apparatus attachment cabling and the apparatus network

3.1.13
telecommunications room
enclosed space for housing telecommunications equipment, cable terminations, interconnect and cross-connect

3.2 Abbreviated terms

AI	automation island
AO	automation outlet
CPL	CP link
E2E link	end-to-end link
FD	floor distributor
ID	intermediate distributor
IID	industrial intermediate distributor
NI	network interface
PCMA	process control, monitoring and automation (data)

3.3 Symbols

Symbols used in this document are defined at the place where they occur.

Symbols used identically in different parts of ISO/IEC 11801 are defined in ISO/IEC 11801-1:2017, 3.3.

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