

**INTERNATIONAL  
STANDARD**

**ISO/IEC  
11801**

Second edition  
2002-09

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**Information technology –  
Generic cabling for customer premises**



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# INTERNATIONAL STANDARD

# ISO/IEC 11801

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2002-09

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## Information technology – Generic cabling for customer premises

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## CONTENTS

FOREWORD .....	10
INTRODUCTION .....	11
1 Scope .....	13
2 Normative references.....	13
3 Definitions, abbreviations and symbols .....	17
3.1 Definitions .....	17
3.2 Abbreviations.....	23
3.3 Symbols .....	24
3.3.1 Variables .....	24
3.3.2 Indices.....	25
4 Conformance .....	25
5 Structure of the generic cabling system .....	26
5.1 General .....	26
5.2 Functional elements.....	26
5.3 Cabling subsystems.....	27
5.3.1 General.....	27
5.3.2 Campus backbone cabling subsystem.....	27
5.3.3 Building backbone cabling subsystem .....	28
5.3.4 Horizontal cabling subsystem.....	28
5.3.5 Design objectives.....	28
5.4 Interconnection of subsystems.....	29
5.4.1 General.....	29
5.4.2 Centralised cabling architecture.....	30
5.5 Accommodation of functional elements .....	30
5.6 Interfaces .....	30
5.6.1 Equipment interfaces and test interfaces.....	30
5.6.2 Channel and permanent link .....	32
5.6.3 External network interface.....	32
5.7 Dimensioning and configuring.....	32
5.7.1 Distributors .....	32
5.7.2 Cables .....	34
5.7.3 Work area cords and equipment cords .....	34
5.7.4 Patch cords and jumpers .....	34
5.7.5 Telecommunications outlet (TO) .....	35
5.7.6 Consolidation point .....	36
5.7.7 Telecommunications rooms and equipment rooms .....	36
5.7.8 Building entrance facilities .....	36
5.7.9 External services cabling .....	36
6 Performance of balanced cabling.....	37
6.1 General .....	37
6.2 Layout .....	38
6.3 Classification of balanced cabling.....	39
6.4 Balanced cabling performance.....	39
6.4.1 General.....	39

6.4.2	Return loss .....	39
6.4.3	Insertion loss/attenuation .....	40
6.4.4	NEXT .....	41
6.4.5	Attenuation to crosstalk ratio (ACR) .....	44
6.4.6	ELFEXT .....	45
6.4.7	Direct current (d.c.) loop resistance .....	47
6.4.8	Direct current (d.c.) resistance unbalance .....	48
6.4.9	Current carrying capacity .....	48
6.4.10	Operating voltage .....	48
6.4.11	Power capacity .....	48
6.4.12	Propagation delay .....	48
6.4.13	Delay skew .....	49
6.4.14	Unbalance attenuation .....	49
6.4.15	Coupling attenuation .....	50
7	Reference implementations for balanced cabling .....	50
7.1	General .....	50
7.2	Balanced cabling .....	50
7.2.1	General .....	50
7.2.2	Horizontal cabling .....	50
7.2.3	Backbone cabling .....	54
8	Performance of optical fibre cabling .....	55
8.1	General .....	55
8.2	Component choice .....	55
8.3	Channel attenuation .....	56
8.4	Channel topology .....	56
8.5	Propagation delay .....	58
9	Cable requirements .....	58
9.1	General .....	58
9.2	Balanced cables .....	58
9.2.1	Basic performance requirements .....	58
9.2.2	Additional requirements .....	59
9.2.3	Additional performance requirements for flexible cables .....	60
9.3	Additional crosstalk considerations for cable sharing in balanced cables .....	60
9.3.1	General .....	60
9.3.2	Power summation in backbone cables .....	60
9.3.3	Hybrid, multi-unit and cables connected to more than one TO .....	60
9.4	Optical fibre cables .....	61
9.4.1	Optical fibre types .....	61
9.4.2	Generic performance requirements .....	61
9.4.3	Multimode optical fibre cable .....	61
9.4.4	Single-mode optical fibre cables .....	62
10	Connecting hardware requirements .....	62
10.1	General requirements .....	62
10.1.1	Applicability .....	62
10.1.2	Location .....	63
10.1.3	Design .....	63
10.1.4	Operating environment .....	63
10.1.5	Mounting .....	63

10.1.6	Installation practices .....	63
10.1.7	Marking and colour coding .....	64
10.2	Connecting hardware for balanced cabling .....	64
10.2.1	General requirements .....	64
10.2.2	Performance marking .....	64
10.2.3	Mechanical characteristics .....	64
10.2.4	Electrical characteristics .....	66
10.2.5	Telecommunications outlet requirements .....	72
10.2.6	Design considerations for installation .....	73
10.3	Optical fibre connecting hardware .....	74
10.3.1	General requirements .....	74
10.3.2	Marking and colour coding .....	74
10.3.3	Mechanical and optical characteristics .....	74
10.3.4	Telecommunications outlet requirements .....	75
10.3.5	Connection schemes for optical fibre cabling .....	75
11	Screening practices .....	77
11.1	General .....	77
11.2	Electromagnetic performance .....	77
11.3	Earthing .....	78
12	Administration .....	78
13	Balanced cords .....	78
13.1	Introduction .....	78
13.2	Insertion loss .....	78
13.3	Return loss .....	79
13.4	NEXT .....	79
Annex A	(normative) Balanced permanent link and CP link performance .....	82
A.1	General .....	82
A.2	Performance .....	82
A.2.1	General .....	82
A.2.2	Return loss .....	83
A.2.3	Insertion loss/attenuation .....	84
A.2.4	NEXT .....	85
A.2.5	Attenuation to crosstalk ratio (ACR) .....	88
A.2.6	ELFEXT .....	89
A.2.7	Direct current (d.c.) loop resistance .....	92
A.2.8	Direct current (d.c.) resistance unbalance .....	93
A.2.9	Propagation delay .....	93
A.2.10	Delay skew .....	94
Annex B	(normative) Test procedures .....	96
B.1	General .....	96
B.2	Channel and link performance testing .....	96
B.2.1	Testing balanced cabling channels, permanent links and CP links .....	96
B.2.2	Testing optical fibre cabling channels .....	96
B.2.3	Channel and link test schedules .....	96
B.3	Transmission testing of cords for balanced cabling .....	97
B.4	Transmission testing of components for cabling .....	98
B.4.1	Transmission testing of copper cables for balanced cabling .....	98

B.4.2	Transmission testing of connecting hardware for balanced cabling .....	98
B.4.3	Transmission testing of cables for optical cabling.....	98
B.4.4	Transmission testing of connectors for optical cabling.....	98
Annex C (normative)	Mechanical and environmental performance testing of connecting hardware for balanced cabling .....	99
C.1	Introduction.....	99
C.2	Test requirements.....	99
C.2.1	General.....	99
C.2.2	Initial test measurements .....	99
C.2.3	Environmental and mechanical performance .....	100
Annex D (informative)	Electromagnetic characteristics .....	104
Annex E (informative)	Acronyms for balanced cables .....	105
Annex F (informative)	Supported applications .....	107
F.1	Supported applications for balanced cabling .....	107
F.2	Supported applications for optical fibre cabling .....	109
Annex G (informative)	Channel and permanent link models for balanced cabling .....	113
G.1	General .....	113
G.2	Insertion loss .....	113
G.2.1	Insertion loss of the channel configuration .....	113
G.2.2	Insertion loss of the permanent link configurations .....	114
G.2.3	Assumptions for insertion loss .....	114
G.3	NEXT .....	115
G.3.1	NEXT of the channel configuration .....	115
G.3.2	NEXT of the permanent link configurations .....	115
G.3.3	Assumptions for NEXT .....	116
G.4	ELFEXT .....	119
G.4.1	ELFEXT of the channel configuration .....	119
G.4.2	ELFEXT for the permanent link configurations .....	119
G.4.3	Assumptions for ELFEXT .....	120
G.5	Return loss .....	120
G.5.1	Return loss of the channel and permanent link configurations .....	120
G.5.2	Assumptions for the return loss circuit analysis method .....	121
Annex H (informative)	Class F channel and permanent link with two connections.....	124
Annex I (informative)	Significant changes to balanced cabling requirements with respect to earlier editions of this International Standard.....	125
I.1	General .....	125
I.2	References .....	125
I.3	Structural elements.....	125
I.4	Product designation .....	125
I.5	Component requirements.....	125
I.6	Installed cabling requirements .....	126
Bibliography	.....	132

Figure 1 – Structure of generic cabling .....	27
Figure 2 – Hierarchical structure of generic cabling .....	29
Figure 3 – Structures for centralised generic cabling .....	29
Figure 4 – Accommodation of functional elements .....	30
Figure 5 – Interconnect models .....	31
Figure 6 – Cross-connect models .....	31
Figure 7 – Equipment and test interfaces .....	31
Figure 8 – Example of a generic cabling system with combined BD and FD.....	33
Figure 9 – Inter-relationship of functional elements in an installation with redundancy.....	34
Figure 10 – Channel, permanent link and CP link of a balanced cabling .....	37
Figure 11 – Example of a system showing the location of cabling interfaces and extent of associated channels .....	38
Figure 12 – Horizontal cabling models.....	52
Figure 13 – Backbone cabling model.....	54
Figure 14 – Combined backbone/horizontal channels.....	57
Figure 15 – Eight-position outlet pin and pair grouping assignments (front view of connector).....	73
Figure 16 – Duplex SC connectivity configuration.....	76
Figure 17 – Optical fibre patch cord .....	77
Figure A.1 – Link options .....	82
Figure E.1 – Cable naming schema.....	105
Figure E.2 – Cable types.....	106
Figure G.1 – Example of computation of NEXT with higher precision.....	116
Figure H.1 – Two connection channel and permanent link .....	124
Figure I.1 – Horizontal cabling model .....	127
Figure I.2 – Backbone cabling model.....	127

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Table 1 – Maximum channel lengths .....	32
Table 2 – Return loss for channel.....	40
Table 3 – Informative return loss values for channel at key frequencies .....	40
Table 4 – Insertion loss for channel.....	41
Table 5 – Informative insertion loss values for channel at key frequencies .....	41
Table 6 – NEXT for channel .....	42
Table 7 – Informative NEXT values for channel at key frequencies.....	42
Table 8 – PS NEXT for channel.....	43
Table 9 – Informative PS NEXT values for channel at key frequencies .....	43
Table 10 – Informative ACR values for channel at key frequencies.....	44
Table 11 – Informative PS ACR values for channel at key frequencies .....	45
Table 12 – ELFEXT for channel.....	46
Table 13 – Informative ELFEXT values for channel at key frequencies.....	46
Table 14 – PS ELFEXT for channel.....	47
Table 15 – Informative PS ELFEXT values for channel at key frequencies .....	47
Table 16 – Direct current (d.c.) loop resistance for channel.....	47
Table 17 – Propagation delay for channel .....	48
Table 18 – Informative propagation delay values for channel at key frequencies .....	49
Table 19 – Delay skew for channel.....	49
Table 20 – Unbalance attenuation for channel.....	50
Table 21 – Horizontal link length equations .....	53
Table 22 – Backbone link length equations .....	55
Table 23 – Channel attenuation.....	56
Table 24 – Basic requirements of balanced cables .....	58
Table 25 – Mechanical characteristics of balanced cables .....	59
Table 26 – Optical fibre cable attenuation .....	61
Table 27 – Multimode optical fibre modal bandwidth.....	62
Table 28 – Mechanical characteristics of connecting hardware for use with balanced cabling .....	65
Table 29 – Electrical characteristics of telecommunications outlets intended for use with balanced cabling .....	67
Table 30 – Return loss .....	68
Table 31 – Insertion loss .....	68
Table 32 – Near end crosstalk (NEXT) .....	68
Table 33 – Power sum near end crosstalk (PS NEXT) .....	69
Table 34 – Far end crosstalk (FEXT).....	69
Table 35 – Power sum far end crosstalk (PS FEXT) .....	70
Table 36 – Input to output resistance .....	70
Table 37 – Input to output resistance unbalance .....	70
Table 38 – Current carrying capacity.....	71
Table 39 – Propagation delay.....	71
Table 40 – Delay skew .....	71

Table 41 – Transverse conversion loss (TCL) f.f.s.....	71
Table 42 – Transfer impedance (screened connectors only).....	72
Table 43 – Insulation resistance.....	72
Table 44 – Voltage proof.....	72
Table 45 – Matrix of backward compatible mated modular connector performance.....	73
Table 46 – Mechanical and optical characteristics of optical fibre connecting hardware.....	75
Table 47 – Minimum return loss for balanced cords.....	79
Table 48 – Informative values of return loss at key frequencies for Category 5, 6 and 7 cords.....	79
Table 49 – Informative values of NEXT at key frequencies for Category 5, 6 and 7 cords.....	81
Table A.1 – Return loss for permanent link or CP link.....	83
Table A.2 – Informative return loss values for permanent link with maximum implementation at key frequencies.....	83
Table A.3 – Insertion loss for permanent link or CP link.....	84
Table A.4 – Informative insertion loss values for permanent link with maximum implementation at key frequencies.....	85
Table A.5 – NEXT for permanent link or CP link.....	86
Table A.6 – Informative NEXT values for permanent link with maximum implementation at key frequencies.....	86
Table A.7 – PS NEXT for permanent link or CP link.....	87
Table A.8 – Informative PS NEXT values for permanent link with maximum implementation at key frequencies.....	88
Table A.9 – Informative ACR values for permanent link with maximum implementation at key frequencies.....	89
Table A.10 – Informative PS ACR values for permanent link with maximum implementation at key frequencies.....	89
Table A.11 – ELFEXT for permanent link or CP link.....	90
Table A.12 – Informative ELFEXT values for permanent link with maximum implementation at key frequencies.....	91
Table A.13 – PS ELFEXT for permanent link or CP link.....	92
Table A.14 – Informative PS ELFEXT values for permanent link with maximum implementation at key frequencies.....	92
Table A.15 – Direct current (d.c.) loop resistance for permanent link or CP link.....	93
Table A.16 – Informative d.c. loop resistance for permanent link with maximum implementation.....	93
Table A.17 – Propagation delay for permanent link or CP link.....	94
Table A.18 – Informative propagation delay values for permanent link with maximum implementation at key frequencies.....	94
Table A.19 – Delay skew for permanent link or CP link.....	95
Table A.20 – Informative delay skew for permanent link with maximum implementation.....	95
Table B.1 – Cabling characteristics of copper and optical fibre cabling for acceptance, compliance and reference testing.....	97
Table C.1 – Group P.....	100
Table C.2 – Group A.....	101
Table C.3 – Group B.....	102
Table C.4 – Group C.....	103

Table C.5 – Group D .....	103
Table F.1 – Applications using balanced cabling .....	108
Table F.2 – Modular connector pin assignment for applications .....	109
Table F.3 – Supported applications using optical fibre cabling .....	110
Table F.4 – Maximum channel lengths supported by optical fibre applications for multimode fibre .....	111
Table F.5 – Maximum channel length supported by optical fibre applications for single-mode fibres .....	112
Table G.1 – Insertion loss deviation .....	114
Table H.1 – ACR and PS ACR values for 2 connection class F channels and permanent links at key frequencies .....	124
Table I.1 – Principal transmission performance requirements of 150 $\Omega$ connecting hardware .....	126
Table I.2 – Minimum return loss limits for links, permanent links and channels for the different cabling classes .....	128
Table I.3 – Maximum attenuation limits for links, permanent links and channels for the different cabling classes .....	128
Table I.4 – Minimum NEXT limits for links, permanent links and channels for the different cabling classes .....	129
Table I.5 – Minimum ACR limits for links, permanent links and channels for the different cabling classes .....	129
Table I.6 – Maximum propagation delay limits for links, permanent links and channels for the different cabling classes .....	130
Table I.7 – Maximum d.c. loop resistance limits for links, permanent links and channels for the different cabling classes .....	130
Table I.8 – Minimum unbalance attenuation (LCL/L <sub>o</sub> TL) limits for links, permanent links and channels for the different cabling classes .....	130
Table I.9 – Minimum PS NEXT, PS ACR, ELFEXT and PS ELFEXT limits for permanent links and channels for the different cabling classes .....	131
Table I.10 – Maximum delay skew limits for permanent links and channels for the different cabling classes .....	131

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## INFORMATION TECHNOLOGY – GENERIC CABLING FOR CUSTOMER PREMISES

### FOREWORD

- 1) ISO (International Organization for Standardization) and IEC (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.
- 2) In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.
- 3) Attention is drawn to the possibility that some of the elements of this International Standard 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 was prepared by subcommittee 25: Interconnection of information technology equipment, of ISO/IEC joint technical committee 1: Information technology.

This second edition cancels and replaces the first edition published in 1995 and its amendments 1 (1999) and 2 (1999), and constitutes a technical revision. The significant changes with respect to the first edition and its amendments are listed in Annex I.

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

This International Standard has taken into account requirements specified in application standards listed in Annex F. It refers to International Standards for components and test methods whenever appropriate International Standards are available.

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## INTRODUCTION

Within customer premises, the importance of the cabling infrastructure is similar to that of other fundamental building utilities such as heating, lighting and mains power. As with other utilities, interruptions to service can have a serious impact. Poor quality of service due to lack of design foresight, use of inappropriate components, incorrect installation, poor administration or inadequate support can threaten an organisation's effectiveness.

Historically, the cabling within premises comprised both application specific and multipurpose networks. The original edition of this standard enabled a controlled migration to generic cabling and the reduction in the use of application-specific cabling.

The subsequent growth of generic cabling designed in accordance with ISO/IEC 11801 has

- a) contributed to the economy and growth of Information and Communications Technology (ICT),
- b) supported the development of high data rate applications based upon a defined cabling model, and
- c) initiated development of cabling with a performance surpassing the performance classes specified in ISO/IEC 11801:1995 and ISO/IEC 11801 Ed1.2:2000.

NOTE ISO/IEC 11801, edition 1.2 consists of edition 1.0 (1995) and its amendments 1 (1999) and 2 (1999).

This second edition of ISO/IEC 11801 has been developed to reflect these increased demands and opportunities.

This International Standard provides:

- a) users with an application independent generic cabling system capable of supporting a wide range of applications;
- b) users with a flexible cabling scheme such that modifications are both easy and economical;
- c) building professionals (for example, architects) with guidance allowing the accommodation of cabling before specific requirements are known; that is, in the initial planning either for construction or refurbishment;
- d) industry and applications standardization bodies with a cabling system which supports current products and provides a basis for future product development.

This International Standard specifies a multi-vendor cabling system which may be implemented with material from single and multiple sources, and is related to:

- a) international standards for cabling components developed by committees of the IEC, for example copper cables and connectors as well as optical fibre cables and connectors (see Clause 2 and bibliography);
- b) standards for the installation and operation of information technology cabling as well as for the testing of installed cabling (see Clause 2 and bibliography);
- c) applications developed by technical committees of the IEC, by subcommittees of ISO/IEC JTC 1 and by study groups of ITU-T, for example for LANs and ISDN;
- d) planning and installation guides which take into account the needs of specific applications for the configuration and the use of cabling systems on customer premises (ISO/IEC 14709 series).

Physical layer requirements for the applications listed in Annex F have been analysed to determine their compatibility with cabling classes specified in this standard. These application requirements, together with statistics concerning the topology of premises and the model described in 7.2, have been used to develop the requirements for Classes A to D and the optical class cabling systems. New Classes E and F have been developed in anticipation of future network technologies.

As a result, generic cabling defined within this International Standard

- a) specifies a cabling structure supporting a wide variety of applications,
- b) specifies channel and link Classes A, B, C, D and E meeting the requirements of standardised applications,
- c) specifies channel and link Classes E and F based on higher performance components to support the development and implementation of future applications,
- d) specifies optical channel and link Classes OF-300, OF-500, and OF-2000 meeting the requirements of standardised applications and exploiting component capabilities to ease the implementation of applications developed in the future,
- e) invokes component requirements and specifies cabling implementations that ensure performance of permanent links and of channels that meet or exceed the requirements for cabling classes,
- f) is targeted at, but not limited to, the general office environment.

This International Standard specifies a generic cabling system that is anticipated to have a usable life in excess of 10 years.

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## INFORMATION TECHNOLOGY – GENERIC CABLING FOR CUSTOMER PREMISES

### 1 Scope

ISO/IEC 11801 specifies generic cabling for use within premises, which may comprise single or multiple buildings on a campus. It covers balanced cabling and optical fibre cabling.

ISO/IEC 11801 is optimised for premises in which the maximum distance over which telecommunications services can be distributed is 2 000 m. The principles of this International Standard may be applied to larger installations.

Cabling defined by this standard supports a wide range of services, including voice, data, text, image and video.

This International Standard specifies directly or via reference the:

- a) structure and minimum configuration for generic cabling,
- b) interfaces at the telecommunications outlet (TO),
- c) performance requirements for individual cabling links and channels,
- d) implementation requirements and options,
- e) performance requirements for cabling components required for the maximum distances specified in this standard,
- f) conformance requirements and verification procedures.

Safety (electrical safety and protection, fire, etc.) and Electromagnetic Compatibility (EMC) requirements are outside the scope of this International Standard, and are covered by other standards and by regulations. However, information given by this standard may be of assistance.

ISO/IEC 11801 has taken into account requirements specified in application standards listed in Annex F. It refers to available International Standards for components and test methods where appropriate.

### 2 Normative references

The following referenced documents are indispensable for the application 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 60027 (all parts), *Letter symbols to be used in electrical technology*

IEC 60068-1, *Environmental testing – Part 1: General and guidance*

IEC 60068-2-14, *Environmental testing – Part 2: Tests – Test N: Change of temperature*

IEC 60068-2-38, *Environmental testing – Part 2: Tests – Test Z/AD: Composite temperature/humidity cyclic test*

IEC 60352-3, *Solderless connections – Part 3: Solderless accessible insulation displacement connections – General requirements, test methods and practical guidance*

IEC 60352-4, *Solderless connections – Part 4: Solderless non-accessible insulation displacement connections – General requirements, test methods and practical guidance*

IEC 60352-6, *Solderless connections – Part 6: Insulation piercing connections – General requirements, test methods and practical guidance*

IEC 60364-1, *Electrical installations of buildings – Part 1: Fundamental principles, assessment of general characteristics, definitions*

IEC 60512-2:1995, *Electromechanical components for electronic equipment; basic testing procedures and measuring methods – Part 2: General examination, electrical continuity and contact resistance tests, insulation tests and voltage stress tests*  
Amendment 1 (1999)

IEC 60512-25-1, *Connectors for electronic equipment – Tests and measurements – Part 25-1: Test 25a – Crosstalk ratio*

IEC 60512-25-2:2002, *Connectors for electronic equipment – Tests and measurements – Part 25-2: Test 25b – Attenuation (insertion loss)*

IEC 60512-25-4:2001, *Connectors for electronic equipment – Tests and measurements – Part 25-4: Test 25d – Propagation delay*

IEC 60512-25-5, – *Connectors for electronic equipment – Basic tests and measurements – Part 25-5: Test 25e – Return loss<sup>1</sup>*

IEC 60603-7:1996, *Connectors for frequencies below 3 MHz for use with printed boards – Part 7: Detail specification for connectors, 8-way, including fixed and free connectors with common mating features, with assessed quality*

IEC 60603-7-1:2002, *Connectors for electronic equipment – Part 7-1: Detail specification for 8-way, shielded free and fixed connectors, with common mating features, with assessed quality*

IEC 60603-7-7:2002, *Connectors for electronic equipment – Part 7-7: Detail specification for 8-way, shielded, free and fixed connectors, for data transmission with frequencies up to 600 MHz (category 7, shielded)*

IEC 60793-1-40, *Optical fibres – Part 1-40: Measurement methods and test procedures – Attenuation*

IEC 60793-1-41, *Optical fibres – Part 1-41: Measurement methods and test procedures – Bandwidth*

IEC 60793-1-44, *Optical fibres – Part 1-44: Measurement methods and test procedures – Cut-off wavelength*

IEC/PAS 60793-1-49:2002, *Optical fibres – Part 1-49: Measurement methods and test procedures – Differential mode delay*

IEC 60793-2 (all parts), *Optical fibres – Part 2: Product specifications*

IEC 60793-2-10, *Optical fibres – Part 2-10: Product specifications – Sectional specification for category A1 multimode fibres*

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<sup>1</sup> To be published.

IEC 60793-2-50, *Optical fibres – Part 2-50: Product specifications – Sectional specification for class B single-mode fibres*

IEC 60794-2:1989, *Optical fibre cables – Part 2: Product specification (indoor cable)*<sup>2</sup>  
Amendment 1 (1998)

IEC 60794-3 (all parts), *Optical fibre cables – Part 3: Sectional specification – Outdoor cables*

IEC 60825 (all parts), *Safety of laser products*

IEC 60874-1:1999, *Connectors for optical fibres and cables – Part 1: Generic specification*

IEC 60874-14 (all parts), *Connectors for optical fibres and cables – Part 14: Sectional specification for fibre optic connector – Type SC*

IEC 60874-19 (all parts), *Connectors for optical fibres and cables – Part 19: Sectional specification for fibre optic connector – Type SCD(uplex)*

IEC 60874-19-1:1999, *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 60874-19-2:1999, *Connectors for optical fibres and cables – Part 19-2: Fibre optic adaptor (duplex) type SC for single-mode fibre connectors – Detail specification*

IEC 60874-19-3:1999, *Connectors for optical fibres and cables – Part 19-3: Fibre optic adaptor (duplex) type SC for multimode fibre connectors – Detail specification*

IEC 61073-1, *Mechanical splices and fusion splice protectors for optical fibres and cables – Part 1: Generic specification*

IEC/PAS 61076-3-104:2002, *Connectors for electronic equipment – Part 3-104: Detail specification for 8-way, shielded free and fixed connectors, for data transmissions with frequencies up to 600 MHz*

IEC 61156 (all parts), *Multicore and symmetrical pair/quad cables for digital communications*

IEC 61156-1:1994, *Multicore and symmetrical pair/quad cables for digital communications – Part 1: Generic specification*<sup>3</sup>

Amendment 1:1999

Amendment 2:2001

IEC 61156-2:1995, *Multicore and symmetrical pair/quad cables for digital communications – Part 2: Horizontal floor wiring – Sectional specification*<sup>4</sup>

Amendment 1:1999

Amendment 2:2001

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<sup>2</sup> There exists a consolidated edition 4.1 (1998) of IEC 60794-2 that includes edition 4.0 (1989) and its amendment 1 (1998).

<sup>3</sup> There exists a consolidated edition 1.2 (2001) of IEC 61156-1 that includes edition 1.0 (1994) and its amendments 1 (1999) and 2 (2001).

<sup>4</sup> There exists a consolidated edition 1.2 (2001) of IEC 61156-2 that includes edition 1.0 (1995) and its amendments 1 (1999) and 2 (2001).

IEC 61156-3:1995, *Multicore and symmetrical pair/quad cables for digital communications – Part 3: Multicore and symmetrical pair/quad cables for digital communications – Part 3: Work area wiring – Sectional specification*<sup>5</sup>

Amendment 1:1999  
Amendment 2:2001

IEC 61156-4:1995, *Multicore and symmetrical pair/quad cables for digital communications – Part 4: Riser cables – Sectional specification*<sup>6</sup>

Amendment 1:1999  
Amendment 2:2001

IEC 61156-5:2002, *Multicore and symmetrical pair/quad cables for digital communications – Part 5: Symmetrical pair/quad cables with transmission characteristics up to 600 MHz – Horizontal floor wiring – Sectional specification*

IEC 61156-6:2002, *Multicore and symmetrical pair/quad cables for digital communications – Part 6: Symmetrical pair/quad cables with transmission characteristics up to 600 MHz – Work area wiring – Sectional specification*

IEC 61300-2-2:1995, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 2-2: Tests – Mating durability*

IEC 61300-3-6:1997, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-6: Examinations and measurements – Return loss*<sup>7</sup>

Amendment 1:1998  
Amendment 2:1999

IEC 61300-3-34:2001, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-34: Examinations and measurements – Attenuation of random mated connectors*

IEC 61753-1-1:2000, *Fibre optic interconnecting devices and passive components performance standard – Part 1-1: General and guidance – Interconnecting devices (connectors)*

IEC 61935-1:2000, *Generic cabling systems – Specifications for the testing of balanced communication cabling in accordance with ISO/IEC 11801 – Part 1: Installed cabling*  
Amendment 1 (under consideration)

IEC 61935-2, – *Generic cabling systems – Specification for the testing of balanced communication cabling in accordance with ISO/IEC 11801 – Part 2: Patchcords and work area cords*<sup>8</sup>

ISO/IEC TR 14763-1, *Information technology – Implementation and operation of customer premises cabling – Part 1: Administration*

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<sup>5</sup> There exists a consolidated edition 1.2 (2001) of IEC 61156-3 that includes edition 1.0 (1995) and its amendments 1 (1999) and 2 (2001).

<sup>6</sup> There exists a consolidated edition 1.2 (2001) of IEC 61156-4 that includes edition 1.0 (1995) and its amendments 1 (1999) and 2 (2001).

<sup>7</sup> There exists a consolidated edition 1.2 (1999) of IEC 61300-3-6 that includes edition 1.0 (1997) and its amendments 1 (1999) and 2 (1999).

<sup>8</sup> To be published.

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

ISO/IEC TR 14763-3, *Information technology – Implementation and operation of customer premises cabling – Part 3: Testing of optical fibre cabling*

ISO/IEC 18010:2002, *Information technology – Pathways and spaces for customer premises cabling*

ITU-T Rec. G.652:1993, *Characteristics of a single-mode optical fibre cable*

### 3 Definitions, abbreviations and symbols

#### 3.1 Definitions

For the purposes of this International Standard, the following definitions apply.

NOTE The abbreviation “lg” in the equations signifies “ $\log_{10}$ ”.

##### 3.1.1

###### **administration**

methodology defining the documentation requirements of a cabling system and its containment, the labelling of functional elements and the process by which moves, additions and changes are recorded

##### 3.1.2

###### **application**

system, including its associated transmission method, which is supported by telecommunications cabling

##### 3.1.3

###### **attenuation**

decrease in magnitude of power of a signal in transmission between points

NOTE Attenuation indicates the total losses on cable, expressed as the ratio of power output to power input.

##### 3.1.4

###### **balanced cable**

cable consisting of one or more metallic symmetrical cable elements (twisted pairs or quads)

##### 3.1.5

###### **building backbone cable**

cable that connects the building distributor to a floor distributor

NOTE Building backbone cables may also connect floor distributors in the same building.

##### 3.1.6

###### **building distributor**

distributor in which the building backbone cable(s) terminate(s) and at which connections to the campus backbone cable(s) may be made

##### 3.1.7

###### **building entrance facility**

facility that provides all necessary mechanical and electrical services and which complies with all relevant regulations, for the entry of telecommunications cables into a building