

INTERNATIONAL STANDARD

ISO/IEC 24702

First edition
2006-10

**Information technology –
Generic cabling –
Industrial premises**

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ISO/IEC 24702:2006

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International Electrotechnical Commission, 3, rue de Varembé, PO Box 131, CH-1211 Geneva 20, Switzerland
Telephone: +41 22 919 02 11 Telefax: +41 22 919 03 00 E-mail: inmail@iec.ch Web: www.iec.ch



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INFORMATION TECHNOLOGY – GENERIC CABLING – INDUSTRIAL 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. Their preparation is entrusted to technical committees; any ISO and IEC member body interested in the subject dealt with may participate in this preparatory work. International governmental and non-governmental organizations liaising with ISO and IEC also participate in this preparation.
- 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) 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 and ISO member bodies.
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- 9) 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.
- 10) 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 24702 was prepared by subcommittee 25: Interconnection of information technology equipment, of ISO/IEC joint technical committee 1: Information technology.

ISO/IEC 24702 should be read in conjunction with International Standard ISO/IEC 11801.

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 title page.

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

INTRODUCTION

Within premises, the importance of the information technology 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 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 organization's effectiveness.

Historically, the cabling within premises comprised both application-specific and multipurpose networks. The subsequent growth of generic cabling designed in accordance with ISO/IEC 11801 has supported the development of high-data-rate applications based upon a defined cabling model.

This International Standard recognizes the benefit of generic cabling to interconnect several pieces of apparatus within industrial premises or industrial areas within other types of premises (within and between structures and buildings) and should be read in conjunction with ISO/IEC 11801.

This International Standard provides, for industrial premises:

- a) users with an application-independent generic cabling system and an open market for cabling components;
- b) requirements for infrastructures that support critical automation, process control and monitoring applications in a range of industrial environments;
- c) users with a flexible cabling scheme such that modifications are both easy and economical;
- d) building professionals, production and control engineers with guidance allowing the accommodation of cabling:
 - before specific requirements are known; i.e. in the initial planning either for construction or refurbishment;
 - by further deployment as the requirements of specific industrial areas are defined;
- e) industry and standardisation bodies with a cabling system which supports current products and provides a basis for future product development and applications standardisation.

This International Standard specifies multi-vendor cabling, and is related to

- the associated standard for generic cabling within commercial premises (ISO/IEC 11801),
- standards for cabling components developed by Technical Committees of ISO and IEC,
- standards for the quality assurance and installation of information technology cabling (series ISO/IEC 14763 and IEC 61918) and testing of installed cabling (IEC 61935-1),
- applications developed by the technical committees of IEC, subcommittees of ISO/IEC JTC 1 and study groups of ITU-T (for example Fieldbus, LANs and ISDN).

Within this International standard the cabling, defined between the interfaces shown in Figure 1, contains passive components only.

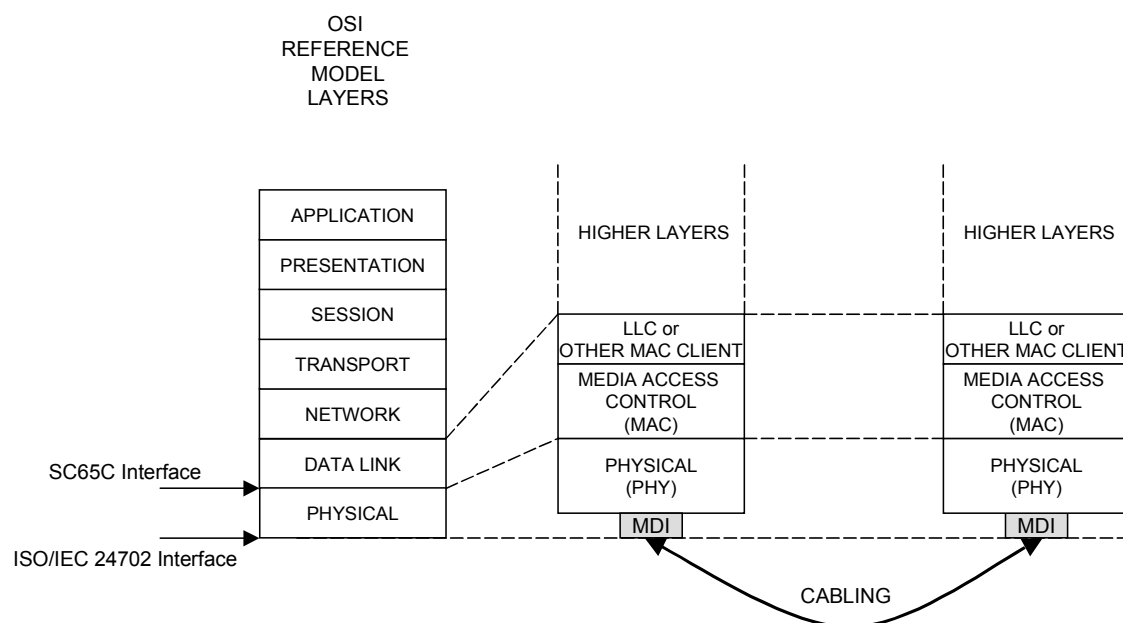


Figure 1 – Cabling specified by ISO/IEC 24702 and its relationship to OSI reference model layers

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

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INFORMATION TECHNOLOGY

GENERIC CABLING – INDUSTRIAL PREMISES

1 Scope

This International Standard specifies generic cabling that supports a wide range of communications services including automation, process control and monitoring applications for use within industrial premises or industrial areas within other types of premises, comprising single or multiple buildings on a campus. It covers balanced cabling and optical fibre cabling.

This standard is based upon and references the requirements of ISO/IEC 11801. It contains additional requirements that are appropriate to industrial premises in which the maximum distance over which communications services have to be distributed is 10 000 m. The principles of this International Standard may also be applied to installations that do not fall within this range.

In addition to the requirements of ISO/IEC 11801, this International Standard specifies

- a) a modified structure and configuration for generic cabling within industrial premises in which information technology applications are used to support process monitoring and control functions,
- b) implementation options,
- c) additional requirements that reflect the range of operating environments within industrial premises.

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 regulations. However, information given in this document may be of assistance in meeting these standards and regulations.

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 60512-4-1, *Connectors for electronic equipment – Tests and measurements – Part 4-1: Voltage stress tests – Test 4a: Voltage proof*

IEC 60512-4-2, *Connectors for electronic equipment – Tests and measurements – Part 4-2: Voltage stress tests – Test 4b: Partial discharge*

IEC 60512-6-2, *Connectors for electronic equipment – Tests and measurements – Part 6-2: Dynamic stress tests – Test 6b: Bump*

IEC 60512-6-3, *Connectors for electronic equipment – Tests and measurements – Part 6-3: Dynamic stress tests – Test 6c: Shock*

IEC 60512-6-4, *Connectors for electronic equipment – Tests and measurements – Part 6-4: Dynamic stress tests – Test 6d: Vibration (sinusoidal)*

IEC 60512-8, *Electromechanical components for electronic equipment; basic testing procedures and measuring methods – Part 8: Connector tests (mechanical) and mechanical tests on contacts and terminations*

IEC 60512-9, *Electromechanical components for electronic equipment; basic testing procedures and measuring methods – Part 9: Miscellaneous tests*

IEC 60512-11-4, *Connectors for electronic equipment – Tests and measurements – Part 11-4: Climatic tests – Test 11d: Rapid change of temperature*

IEC 60512-11-7, *Connectors for electronic equipment – Tests and measurements – Part 11-7: Climatic tests – Test 11g: Flowing mixed gas corrosion test*

IEC 60512-11-9, *Connectors for electronic equipment – Tests and measurements – Part 11-9: Climatic tests – Test 11i: Dry heat*

IEC 60512-11-10, *Connectors for electronic equipment – Tests and measurements – Part 11-10: Climatic tests – Test 11j: Cold*

IEC 60512-11-12, *Connectors for electronic equipment – Tests and measurements – Part 11-12: Climatic tests – Test 11m: Damp heat, cyclic*

IEC 60512-19-3, *Electromechanical components for electronic equipment – Basic testing procedures and measuring methods – Part 19: Chemical resistance tests – Section 3: Test 19c – Fluid resistance*

IEC 60512-23-3, *Electromechanical components for electronic equipment – Basic testing procedures and measuring methods – Part 23-3: Test 23c: Shielding effectiveness of connectors and accessories*

IEC 60529, *Degrees of protection provided by enclosures (IP Code)*

IEC 60603-7, *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 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 60793-2-30, *Optical fibres – Part 2-30: Product specifications – Sectional specification for category A3 multimode fibres*

IEC 60793-2-40, *Optical fibres – Part 2-40: Product specifications – Sectional specification for category A4 multimode fibres*

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

IEC 60794-1-2, *Optical fibre cables – Part 1-2: Generic specification – Basic optical cable test procedures*

IEC 60794-2, *Optical fibre cables – Part 2: Indoor cables – Sectional specification*

IEC 60794-3, *Optical fibre cables – Part 3: Sectional specification – Outdoor cables*

IEC 61076-2-101, *Connectors for electronic equipment – Part 2-101: Circular connectors – Detail specification for circular connectors M8 with screw- or snap-locking, M12 with screw-locking for low voltage applications*

IEC 61076-3-106, *Connectors for electronic equipment – Product requirements – Part 3-106: Rectangular connectors – Detail specification for protective housings for use with 8-way shielded and unshielded connectors for industrial environments incorporating the IEC 60603-7 series interface*

IEC 61131-2, *Programmable controllers – Part 2: Equipment requirements and tests*

IEC 61156 (all parts), *Multicore and symmetrical pair/quad cables for digital communications – Measurement of coupling attenuation of balances cabling in laboratory conditions*

IEC 61156-5-1 (all parts), *Multicore and symmetrical pair/quad cables for digital communications*

IEC 61156-5-1, *Multicore and symmetrical pair/quad cables for digital communications – Part 5-1: Symmetrical pair/quad cables with transmission characteristics up to 600 MHz – Horizontal floor wiring - Blank detail specification*

IEC 61156-6-1, *Multicore and symmetrical pair/quad cables for digital communications – Part 6-1: Symmetrical pair/quad cables with transmission characteristics up to 600 MHz – Work area wiring – Blank detail specification*

IEC 61300-2-1, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 2-1: Tests – Vibration (sinusoidal)*

IEC 61300-2-4, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 2-4: Tests – Fibre (cable) retention*

IEC 61300-2-5, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 2-5: Tests – Torsion/twist*

IEC 61300-2-9, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 2-9: Tests – Shock*

IEC 61300-2-18, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 2-18: Tests – Dry heat – High temperature endurance*

IEC 61300-2-22, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 2-22: Tests – Change of temperature*

IEC 61300-2-30, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 2-30: Tests – Solar radiation*

IEC 61300-2-34, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 2-34: Tests – Resistance to solvents and contaminating fluids*

IEC 61300-2-44, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 2-44: Tests – Flexing of the strain relief of fibre optic devices*

IEC 61300-2-46, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 2-46: Tests – Damp heat, cyclic*

IEC 61300-3-34, *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 (all parts), *Fibre optic interconnecting devices and passive components performance standard – Specification for the testing of optical fibre communication cabling in accordance with ISO/IEC 24702 – Cords – Blank detail specification*

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

IEC 61918, *Digital data communications for measurement and control – Installation of communication networks in industrial control systems*

IEC 61935-1, *Testing of balanced communication cabling in accordance with ISO/IEC 11801 – Part 1: Installed cabling*

IEC 61935-2, *Testing of balanced communication cabling in accordance with ISO/IEC 11801 – Part 2: Patch cords and work area cords*

IEC 62012-1, *Multicore and symmetrical pair/quad cables for digital communications to be used in harsh environments – Part 1: Generic specification*

ISO/IEC 11801:2002, *Information technology – Generic cabling for customer premises*

ISO/IEC 11801, *Information technology – Generic cabling for customer premises*

NOTE Refer to the second edition of ISO/IEC 11801, published in 2002, where this date has been specified. For undated references, use the latest edition of ISO/IEC 11801.

ISO/IEC 14763 (all parts), *Information technology – Implementation and operation of customer premises cabling*

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

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

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

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

3 Definitions and abbreviations

3.1 Definitions

For the purposes of this International Standard the following definitions apply in addition to those of ISO/IEC 11801.

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