

INTERNATIONAL STANDARD

**Multicore and symmetrical pair/quad cables for digital communications –
Part 8: Symmetrical pair/quad cables with transmission characteristics up to
1 200 MHz – Work area wiring – Sectional specification**

IEC 61156-8:2009

<https://standards.iteh.ai/catalog/standards/sist/1514f07e-2504-46f9-89f1-9781406693aa/iec-61156-8-2009>



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INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

PRICE CODE



ICS 33.120.20

ISBN 978-2-88910-428-4

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**MULTICORE AND SYMMETRICAL PAIR/QUAD CABLES
FOR DIGITAL COMMUNICATIONS –**

**Part 8: Symmetrical pair/quad cables
with transmission characteristics up to 1 200 MHz –
Work area wiring – Sectional specification**

FOREWORD

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International Standard IEC 61156-8 has been prepared by subcommittee 46C: Wires and symmetric cables, of IEC technical committee 46: Cables, wires, waveguides, R.F. connectors, R.F. and microwave passive components and accessories.

The text of this standard is based on the following documents:

FDIS	Report on voting
46C/887/FDIS	46C/894/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

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

A list of all parts of the IEC 61156 series, under the general title: *Multicore and symmetrical pair/quad cables for digital communications*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

The contents of the corrigendum of July 2009 have been included in this copy.

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MULTICORE AND SYMMETRICAL PAIR/QUAD CABLES FOR DIGITAL COMMUNICATIONS –

Part 8: Symmetrical pair/quad cables with transmission characteristics up to 1 200 MHz – Work area wiring – Sectional specification

1 Scope

This sectional specification relates to IEC 61156-1 and IEC 61156-7. The cables described herein are specified up to 1 200 MHz and are specifically designed to build patch, equipment, and work area cables as defined in ISO/IEC 11801 and ISO/IEC 15018.

It covers a cable having four individually screened (STP) pairs. The cable may be provided with a common screen over the cable core. The transmission characteristics are specified for a frequency range 4 MHz to 1 200 MHz and at 20 °C.

These cables can be used for various communication channels which use as many as four pairs simultaneously. In this sense, this sectional specification provides the cable characteristics required by system developers to evaluate new systems.

The cables covered by this sectional specification are intended to operate with voltages and currents normally encountered in communication systems. These cables are not intended to be used in conjunction with low impedance sources, for example the electric power supplies of public utility mains.

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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 60304, *Standard colours for insulation for low-frequency cables and wires*

IEC 61156-1:2007, *Multicore and symmetrical pair/quad cables for digital communications – Part 1: Generic specification*

IEC 61156-7, *Multicore and symmetrical pair/quad cables for digital communications – Part 7: Symmetrical pair cables with transmission characteristics up to 1 200 MHz – Sectional specification for digital and analog communication cables*

3 Terms and definitions

For the purposes of this document, the terms and definitions defined in IEC 61156-1 apply.

4 Installation considerations

4.1 Installation conditions

Installation considerations are defined in Clause 4 of IEC 61156-1.

4.2 Climatic conditions

Under static conditions, the cables shall operate in the temperature range from -20 °C to $+60\text{ °C}$. The temperature dependence of the cables is specified, and should be taken into account for the design of an actual cabling system.

5 Materials and cable construction

5.1 General remarks

The choice of materials and cable construction shall be suitable for the intended application and installation of the cable. Particular care shall be taken to meet any special requirements for the fire performance (such as burning properties, smoke generation, evolution of halogen gas, etc.).

5.2 Cable construction

The cable construction shall be in accordance with the details and dimensions given in the relevant detail specification.

5.2.1 Conductor

The conductor shall be solid or stranded annealed copper conductor, in accordance with IEC 61156-1 and shall have a nominal diameter between 0,4 mm to 0,65 mm. The stranded conductor should have preferably seven strands. Higher conductor diameters may be used if compatible with the connecting hardware.

5.2.2 Insulation

The conductor shall be insulated with a suitable thermoplastic material. Examples of suitable materials are

- polyolefin;
- fluoropolymer;
- low-smoke zero-halogen thermoplastic material.

The insulation may be solid or cellular with or without a solid dielectric skin. The insulation shall be continuous and shall have a thickness such that the completed cable meets the specified requirements.

The insulation colour code is not specified but shall be indicated in the relevant detail specification. The colours shall be readily identifiable and shall correspond reasonably with the standard colours shown in IEC 60304.

NOTE It is acceptable to mark or stripe the "a" wire with the colour of the "b" wire to facilitate pair identification.

5.2.3 Cable element

The cable element shall be screened pair or quad adequately twisted.

The screen of the cable element shall be in accordance with 5.2.3.1 of IEC 61156-1.

5.2.4 Cable make-up

A spacer may be used to separate the cable elements. The cable elements, including spacers, shall be assembled to form the cable core.

The core of the cable may be wrapped with a protective layer of non-hygroscopic and not-wicking material.

5.2.5 Screening of cable core

When required by the relevant detail specification, a screen for the cable core shall be provided.

The screen shall be in accordance with 5.2.5 of IEC 61156-1.

5.2.6 Sheath

The sheath material shall consist of a suitable thermoplastic material.

Examples of suitable materials are

- polyolefin;
- PVC;
- fluoropolymer;
- low-smoke zero-halogen thermoplastic material.

The sheath shall be continuous, having a thickness as uniform as possible. A non-metallic ripcord may be provided. When provided, the ripcord shall be non-hygroscopic and not-wicking.

The colour of the sheath is not specified, but it shall be stated in the relevant detail specification.

5.2.7 Identification

Each length of cable shall be identified as to the manufacturer, and when required, the year of manufacture, using one of the following methods:

- a) appropriately coloured threads or tapes;
- b) with a printed tape;
- c) printing on the cable core wrapping;
- d) marking on the sheath.

Additional markings, such as length marking, etc., are permitted. If used, such markings shall refer to this specification.

5.2.8 Finished cable

The finished cable shall be adequately protected for storage and shipment.

6 Characteristics and requirements

6.1 General remarks

This clause lists the characteristics and minimum requirements of a cable complying with this sectional specification. Test methods shall be in accordance with Clause 6 of IEC 61156-1.

All the tests shall be carried out on a cable length of 100 m, unless otherwise specified.

6.2 Electrical characteristics

The tests shall be carried out on a cable length of not less than 100 m, unless otherwise specified.

6.2.1 Conductor resistance

The maximum resistance shall not exceed 14,5 Ω for 100 m of cable.

6.2.2 Resistance unbalance

6.2.2.1 Resistance unbalance within a pair

The resistance unbalance shall not exceed 1,5 %.

6.2.2.2 Resistance unbalance between pairs

The pair-to-pair resistance unbalance shall not exceed 4 %.

6.2.3 Dielectric strength

There shall be no failures when a test is performed on conductor/conductor and conductor/screen with 1,0 kV d.c. for 1 min or, alternately, with 2,5 kV d.c. for 2 s. An a.c. voltage may be used. The a.c. voltage levels in these cases shall be 0,7 kV a.c. for 1 min or, alternately, 1,7 kV a.c. for 2 s.

6.2.4 Insulation resistance

The test shall be performed on [standards.iteh.ai](https://standards.iteh.ai/catalog/standards/sist/1514f07e-2504-46f9-89f1-9781406693aa/iec-61156-8-2009)

- conductor/conductor;
- conductor/screen.

The minimum insulation resistance at 20 °C shall not be less than 5 000 M Ω ·m.

6.2.5 Mutual capacitance

The mutual capacitance is not specified but may be indicated in the relevant detail specification.

6.2.6 Capacitance unbalance

The maximum capacitance unbalance pair to ground shall not exceed 1 200 pF/km at a frequency of 1 kHz.

6.2.7 Transfer impedance

The transfer impedance shall not exceed the values shown in Table 1 at the discrete frequencies indicated.