



TECHNICAL SPECIFICATION



**Optical backplanes – Product specification –
Part 2-1: Optical backplane using optical fibre circuit boards and multi-core right
angle optical connectors**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

PRICE CODE

W

ICS 33.180.99

ISBN 978-2-8322-1039-0

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Part 2-1: Optical backplane using optical fibre circuit boards and multi-core right angle optical connectors

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Technical specifications are subject to review within three years of publication to decide whether they can be transformed into International Standards.

IEC 62661-2-1, which is a technical specification, has been prepared by IEC technical committee 86: Fibre optics.

The text of this technical specification is based on the following documents:

Enquiry draft	Report on voting
86/439/DTS	86/452/RVC

Full information on the voting for the approval of this technical specification 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.

The committee has decided that the contents of this publication will remain unchanged until the stability 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

- transformed into an International Standard,
- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

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

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OPTICAL BACKPLANES – PRODUCT SPECIFICATION –

Part 2-1: Optical backplane using optical fibre circuit boards and multi-core right angle optical connectors

1 Scope

1.1 General

This part of IEC 62661 gives guidelines for an optical backplane using optical fibre boards and multi-core right angle optical connectors with low bending loss multimode fibres (hereafter called low-loss RAO) to connect daughter boards to the optical backplane.

NOTE Low bending multimode fibres are currently under study.

1.2 Product definition

The structure of an optical backplane specified in this specification is as follows

- a) The optical backplane has the structure to fit to a sub-rack specified in IEC 60297-3-101 with a height of more than 3U (44,45 mm × 3).
- b) One optical backplane occupies a space of 100 mm (height) and 420 mm (width) in the optical backplane stated in item a).
- c) A multiple number of optical backplanes may be installed to a sub-rack specified in IEC 60297-3-101 if multiple spaces specified in item b) are available, that is, a height of 44,45 mm × N (N≥5).
- d) The backplane installs maximum of 14 front boards (daughter boards) with a pitch of 6HP (30,48 mm).
- e) New Type RAO connectors specified in Annex B are used in the optical backplane.
- f) Multimode optical fibres are used for optical wiring in the optical backplane. More specifically, the optical backplane is made of an optical fibre board specified in IEC 62496-3-1 using low bending loss optical fibres.

1.3 Connection arrangement

Connection arrangement for the optical backplane is as follows:

- a) The construction of optical connection specified in this document consists of using the compact right-angled optical board connectors specified in Annex B which are mounted on an optical backplane housed in a sub-rack specified in IEC 60297-3-101.
- b) The slots are assigned the following numerical designations in this specification: the slot on the left end is designated slot number 1, and the slot on the right end is designated slot number 14. The daughter board located at slot 7 or slot 8 is defined as daughter board B, while daughter boards located on any of the other slots are defined as daughter board A. This document specifies an optical dual star connection between daughter board A and daughter board B.

1.4 Classification of connections

Connections in this specification are classified as shown in Table 1.

Table 1 – Classification of ferrules

Class	Total number of optical cables in optical backplane	Optical connections in daughter board A	MT ferrule in the connector in slot of daughter board A	MT ferrule in the connector in slot of daughter board B
DS 192 optical backplane	$96 \times 2 = 192$ lines	$8 \times 2 = 16$ lines	8 core MT ferrule	12 core MT ferrule
DS 384 optical backplane	$192 \times 2 = 384$ lines	$16 \times 2 = 32$ lines	16 core MT ferrule	24 core MT ferrule

The 16 core MT ferrule and the 24 core MT ferrule used on DS 384 optical backplane are 125 µm pitch high-density MT ferrules defined by Figure B.5.

1.5 Operating environment

The operating environment is specified in Table A.1 of IEC 62496-3:2011, Category C (temperature range of -10 °C to $+60$ °C).

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60297-3-101, *Mechanical structures for electronic equipment – Dimensions of mechanical structures of the 482,6 mm (19 in) series – Part 3-101: Subracks and associated plug-in units*

IEC 60793-1-22, *Optical fibres – Part 1-22: Measurement methods and test procedures – Length measurement*

IEC 61300-1:2011, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 1: General and guidance*

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

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

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

IEC 61300-2-17, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 2-17: Tests – Cold*

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 61300-2-19, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 2-19: Tests – Damp heat (steady state)*

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

IEC 61300-3-4, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-4: Examinations and measurements – Attenuation*

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

IEC 61754-25, *Fibre optic connector interfaces - Part 25: Type RAO connector family*

IEC 62496-3:2011, *Optical circuit boards – Part 3: Performance standards – General and guidance*

IEC 62496-3-1, *Optical circuit boards – Part 3-1: Performance standards –Flexible optical circuit boards using unconnectorized optical glass fibres*