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Information technology –
Fibre channel –

Part 116:
10 Gigabit Fibre Channel (10GFC)

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FOREWORD

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International Standard ISO/IEC 14165-116 was prepared by subcommittee 25: Interconnection of information technology equipment, of ISO/IEC joint technical committee 1: Information technology.

INTRODUCTION

The Fibre Channel signalling and physical requirements described in this document cover

- link architecture including retiming (see clause 5)
- physical layer specifications(see clause 6)
- connector performance specifications (see clause 7)
- link and cable plant management specifications (see clause 8)
- FC-1 data path interface (see clause 9)
- optional interconnect interfaces (see clauses 10, 11 and 14)
- transmission coding (see clauses 12 and 13)
- management interface and register set (see clause 15).

INFORMATION TECHNOLOGY – FIBRE CHANNEL – Part 116: 10 Gigabit Fibre Channel (10GFC)

1 Scope

This part of ISO/IEC 14165 describes the signalling and physical requirements that may be utilized by Fibre Channel-2 (FC-2) level transport data at a rate in excess of 10 Gbit/s.

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

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

IEC 60793-2, *Optical fibres – Part 2: Product specifications – General*

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

IEC 60825-1:1993, *Safety of laser products – Part 1: Equipment classification, requirements and user's guide, including Amendment 1 (1997) and Amendment 2 (2001)*

IEC 60950-1, *Information technology equipment – Safety – Part 1: General requirements*

IEC 61280-4-1, *Fibre-optic communication subsystem test procedures – Part 4-1: Cable plant and links – Multimode fibre-optic cable plant attenuation measurement*

IEC 61280-4-2, *Fibre-optic communication subsystem basic test procedures – Part 4-2: Fibre optic cable plant – Single-mode fibre optic cable plant attenuation*

IEC 61300-3-3, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-3: Examinations and measurements – Active monitoring of changes in attenuation and return loss*

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

IEC 61753-021-2, *Fibre optic interconnecting devices and passive component performance standard – Part 021-2: Fibre optic connectors terminated on single-mode fibre for category C – Controlled environment*

IEC 61753-022-2, *Fibre optic interconnecting devices and passive components performance standard – Part 022-2: Fibre optic connectors terminated on multimode fibre for category C – Controlled environmen*t

IEC 61754-7, *Fibre optic connector interfaces – Part 7: Type MPO connector family*

ISO/IEC 8802-3:2000, *Information technology – Telecommunications and information exchange between systems – Local and metropolitan area networks – Specific requirements – Part 3: Carrier sense multiple access with collision detection (CSMA/CD) access method and physical layer specifications (also referred to as 10GbE)*[1]

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1 Including forthcoming ISO/IEC 8802-3, Amendment 1, *Media Access Control (MAC) Parameters, Physical Layers and Management Parameters for 10 Gbit/s Operation*.

ITU-T Recommendation G.707, *Network node interface for the synchronous digital hierarchy (SDH).*

ITU-T Recommendation G.709, *Interfaces to the Optical Transport Network (OTN).*

3 Definitions and conventions

3.1 Definitions

For the purpose of this International Standard the following definiton applies:

3.1.1 compliance point
external connector for transmitters and receivers

3.2 Editorial conventions

3.2.1 General

In FC-PI, a number of conditions, mechanisms, sequences, parameters, events, states, or similar terms are printed with the first letter of each word in uppercase and the rest lowercase (e.g., Exchange, Class). Any lowercase uses of these words have the normal technical English meanings.

Numbered items do not represent any priority. Any priority is explicitly indicated.

The ISO convention of numbering is used (i.e., the thousands and higher multiples are separated by a space and a comma is used as the decimal point). A comparison of the American and ISO conventions is shown in table 1.

Table 1 – ISO and American conventions

ISO	American
0,6	0.6
1 000	1,000
1 323 462,9	1,323,462.9

In case of any conflict between figure, table and text, the text, then tables, and finally figures take precedence. Exceptions to this convention are indicated in the appropriate subclauses.

In all of the figures, tables, and text of this document, the most significant bit of a binary quantity is shown on the left side. Exceptions to this convention are indicated in the appropriate subclauses.

The term “shall” is used to indicate a mandatory rule. If such a rule is not followed, the results are unpredictable unless indicated otherwise.

If a field or a control bit in a frame is specified as not meaningful, the entity which receives the frame shall not check that field or control bit.

3.2.2 Hexadecimal notation

Hexadecimal notation is used to represent fields. For example, a four-byte Process_Associator field containing a binary value of 00000000 11111111 10011000 11111010 is shown in hexadecimal format as hex ‘00 FF 98 FA’.

3.2.3 Transmission rate abbreviations

The exact transmission rates are used in the tables and the abbreviated forms are used in text. Note that 3,187 5 gigabaud (GBd) is the preferred ISO method and is used instead of 3 187,5 megabaud (MBd) where it makes sense to do so.

Table 2 – Data rate abbreviations

Notation	Notation *(FC-FS style)*	True signalling rate
3,187 5 GBd	3 187,5 MBd	3 187,5 MBd

Table 2

Notation	Notation (FC-FS style)	True signalling rate
10,2 Gb/s	10 200 Mb/s	10 200 Mb/s
10,518 75 GBd	10 518,75 MBd	10 518,75 MBd
12,75 GBd	12 750 MBd	12 750 MBd