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Part 151: Fibre Channel BaseT (FC-BaseT)

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INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 35.200

ISBN 978-2-8322-5100-3

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Information Technology — Fibre Channel — Part 151: BaseT

Technologies de l'information — Fibre Channel — Partie 151 (FC-BaseT)

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INFORMATION TECHNOLOGY – FIBRE CHANNEL –

Part 151: Fibre Channel BaseT (FC-BaseT)

FOREWORD

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This International Standard has been approved by vote of the member bodies and the voting results may

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

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INTRODUCTION

This part of ISO/IEC 14165 describes extensions to the Fibre Channel signaling and physical layer requirements defined in ANSI INCITS 404-2005, Fibre Channel - Physical Interfaces 2, to transport Fibre Channel over the commonly available 4-pair balanced copper cabling specified in ISO/IEC 11801:2002 and TIA/EIA-568-B.2-2001. This document is one of the Fibre Channel family of standards.

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INFORMATION TECHNOLOGY — FIBRE CHANNEL —

Part 151: Fibre Channel BaseT (FC-BaseT)

1 Scope

This part of ISO/IEC 14165 describes extensions to the Fibre Channel signaling and physical layer requirements defined in ISO/IEC 14165-142, Fibre Channel - Physical Interfaces 2, to transport Fibre Channel over the commonly available 4-pair balanced copper cabling specified in ISO/IEC 11801:2002 and TIA/EIA-568-B.2-2001. This standard is one of the Fibre Channel family of standards.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 60603-7-2, *Connectors for electronic equipment – Part 7-2: Detail specification for 8-way, unshielded, free and fixed connectors, for data transmissions with frequencies up to 100 MHz*

IEC 60603-7-3, *Connectors for electronic equipment – Part 7-3: Detail specification for 8-way, shielded, free and fixed connectors, for data transmission with frequencies up to 100 MHz*

IEC 60603-7-4, *Connectors for electronic equipment – Part 7-4: Detail specification for 8-way, unshielded, free and fixed connectors, for data transmissions with frequencies up to 250 MHz*

IEC 60603-7-5, *Connectors for electronic equipment – Part 7-5: Detail specification for 8-way, shielded, free and fixed connectors, for data transmissions with frequencies up to 250 MHz*

ISO/IEC 14165-122, *Information technology - Fibre Channel - Part 122: Arbitrated Loop - 2 (FC-AL-2)* [ANSI INCITS 332-1999 including ANSI INCITS 332-1999/AM1-2003 and ANSI INCITS 332-1999/AM2-2006]

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

ISO/IEC 11801:2002/AMD1:2008

ISO/IEC 11801:2002/AMD2:2010

ISO/IEC TR 24750, *Information technology - Assessment and mitigation of installed balanced cabling channels in order to support 10GBASE-T*

ANSI INCITS 404-2006, *Information technology - Fibre Channel - Part 142: Physical Interfaces - 2 (FC-PI-2)*

ANSI INCITS 424-2007, *Information technology - Fibre Channel - Framing and Signaling - 2 (FC-FS-2)*

IEEE Std 802.3-2005, *Standard for 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*

IEEE Std 802.3an-2006, *Physical Layer and Management Parameters for 10 Gb/s Operation, Type 10GBASE-T*

3 Terms, definitions, abbreviations, symbols, and conventions

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1.1

10 Gigabit Media Independent Interface XGMII

interface defined in IEEE 802.3-2005 for 10 Gbit/s operations but used in this standard for lower speeds operations (see 4.4)

3.1.2

Auto-Negotiation

algorithm that allows two devices at either end of a link segment to negotiate common data service functions

3.1.3

balanced cable

cable consisting of one or more metallic symmetrical cable elements (e.g., twisted pairs)

3.1.4

bit error rate

BER

ratio of the number of bits received in error to the total number of bits received

3.1.5

dimension

component of the PHY that generates locally and recovers from the link partner a logical sequence of symbols

Note 1 to entry: A transmit or receive dimension is a logical reference for a wire pair, independent from the specific wire pair where symbols are sent or received.

Note 2 to entry: Dimensions A, B, C, and D are respectively associated with sequences A_n , B_n , C_n , and D_n (see 4.3).

3.1.6

jitter

variations of signal transitions from their ideal positions in time. Jitter may be characterized by its spectral properties and its distribution in time

3.1.7

link

transmission path between any two interfaces of generic cabling

3.1.8**link segment**

point-to-point full-duplex medium connection between two and only two Medium Dependent Interfaces (MDIs)

3.1.9**Master PHY**

PHY that uses an external clock for generating its clock signals to determine the timing of transmitter and receiver operations

Note 1 to entry: It also uses the Master transmit scrambler generator polynomial for side-stream scrambling.

3.1.10**Medium Dependent Interface****MDI**

mechanical and electrical interface between the transmission medium and the Physical Layer device

3.1.11**Ordered Set**

word composed of a special character in its first (left-most) position and data characters in its remaining positions (see FC-FS-2)

3.1.12**Physical Coding Sublayer****PCS**

portion of the Physical Layer that couples the XGMII and the Physical Medium Attachment (PMA)

Note 1 to entry: The PCS contains the functions to encode data bits for transmission via the PMA and to decode the received conditioned signal from the PMA.

3.1.13**Physical Layer device
PHY**

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portion of the Physical Layer between the Medium Dependent Interface (MDI) and the XGMII, consisting of the Physical Coding Sublayer (PCS) and the Physical Medium Attachment (PMA)

Note 1 to entry: The PHY contains the functions that transmit, receive, and manage the encoded signals that are impressed on and recovered from the physical medium.

3.1.14**Physical Medium Attachment sublayer****PMA sublayer**

portion of the Physical Layer that contains the functions for transmission, reception, clock recovery and skew alignment

3.1.15**Scrambler**

randomizing mechanism that is used to eliminate long strings of consecutive identical transmitted symbols and avoid the presence of spectral lines in the signal spectrum without changing the signaling rate

3.1.16**Side-stream scrambler**

scrambler in which the state of the scrambler is dependent only on the prior state of the scrambler and not on the transmitted data