

Overview of Structured Cabling Standards and Related Documents

Introduction

Over the past few years standards for structured cabling systems have been developed from the original ANSI/TIA/EIA 568, and following the requirement from higher bandwidth applications for enhanced performance structured cabling. Today there are a plethora of standards from various organisations which cover the design and implementation of structured cabling - typically optical fibre and Category 5 copper - in commercial buildings.

These documents, with which the end user, installer, system designer/planner and system manufacturer need to be familiar, are listed below. Also identified (*in italics*) are draft standards and documents from these organisations which, in due course, and after ratification, can be expected to become published. As with the draft issues of TIA/EIA 568-A and ISO/IEC 11801, many of these have become *de facto* standards even before publication.

ANSI/TIA/EIA

- TIA/EIA 568-A : Commercial Building Telecommunications Cabling Standard.

This standard is planned be up-issued to 568-B, and sectionalsised, by 1998, to incorporate TSBs 67, 72 and 75, together with other planned publications currently in draft.

- TIA/EIA TSB 67 : Link Performance Transmission Specifications for Field Testing of Unshielded Twisted Pair Cabling Systems.
- TIA/EIA TSB 72 : Centralised Optical Fibre Cabling Guidelines.
- TIA/EIA TSB 75 : Additional Horizontal Cabling Practices.
- *TIA PN 3772 : Propagation Delay and Delay Skew Specifications for 100 Ohm 4-Pair Cabling.*
- *TIA PN 2948 : Transmission Specifications for Unshielded Twisted Pair Modular Plug Cords.*
- *TIA PN 3193 : Technical Specifications for 100 Ohm Screened Twisted Pair Cabling.*
- TIA/EIA 569-A : Commercial Building Standard for Telecommunications Pathways and Spaces.
- TIA/EIA 570 : Residential and Light Commercial Telecommunications Wiring Standard.

This standard is planned be up-issued to 570-B in 1998/9.

- TIA/EIA 606 : Administration Standard for the Telecommunications Infrastructure of Commercial Buildings.
- TIA/EIA 607 : Commercial Building Grounding and Bonding Requirements for Telecommunications.

ISO/IEC

- ISO/IEC 11801 : Information technology - Generic Cabling for Customer Premises.
- IEC 603-7 : 8-Way RJ Connectors for Frequencies below 3MHz .

This standard is subject to planned amendments in 1998/9 to reflect the requirement for standardisation for plugs and sockets that are (a) shielded and (b) characterised to 100MHz.

- *ISO/IEC CD 14673 : Information Technology - Implementation and Operation of Customer Premises Cabling : Part 1 - Administration.*
Part 2 - Planning and Installation.
Part 3 - Testing of Optical Fibre Cabling.
Part 4 - Testing of Balanced Copper Cabling in the Horizontal Sub-system.

CENELEC

- EN 50173 : Information Technology - Generic Cabling Systems.
- *prEN 50174 : Information Technology - Planning and Installation of Cabling*
Part 1 - General.
Part 2 - Internal Cabling.
Part 3 - External Cabling.
- EN 50167 : Horizontal Floor Wiring Cables with a Common Overall Screen for Use in Digital Communication.
- EN 50168 : Work Area Wiring Cables with a Common Overall Screen for Use in Digital Communication.
- EN 50169 : Backbone Cables, Riser and Campus, with a Common Overall Screen for Use in Digital Communication.
- EN 60603-7 : 8-Way RJ Connectors for Frequencies below 3MHz.

This standard is subject to planned amendments in 1998/9 to reflect the requirement for standardisation for plugs and sockets that are (a) shielded and (b) characterised to 100MHz.

BSI

- DISC PD 1001 : A Guide to Electromagnetic Compatibility and Structured Cabling.

TIA

- An Overview of the European Standard BS EN 50173 : 1996 for Generic Cabling Systems, and the differences with ANSI/TIA/EIA 568-A and ISO/IEC 11801.

For further information on these and related standards, and how they may affect your future plans to implement and use structured cabling, please contact KRONE's Technical Department.

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Comparative Overview of International Structured Cabling Standards

There is a misconception that the three main international structured cabling standards are interchangeable. Unfortunately, there are some top-line differences between them, and these are identified below. Additionally, there are other more technically specific differences e.g. return loss measurement for a link, which are too numerous to list, but about which KRONE can advise upon request.

	TIA/EIA 568-A (+ TSBs 67,72,75)	ISO/IEC 11801	EN 50173
100Ω horizontal	² UTP recommended @ TO	UTP/FTP recommended @ TO	¹ UTP/FTP recommended @ TO
120Ω horizontal	Not supported	³ UTP/FTP supported	³ UTP/FTP supported
150Ω horizontal	Supported	Supported	Supported
Fibre horizontal	⁵ 62.5/125 MM	⁴ 50/125 & 62.5/125 MM	⁴ 50/125 & 62.5/125 MM
100Ω backbone	Supported	Supported	Supported
120Ω backbone	Not supported	Supported	Supported
150Ω backbone	Supported	Supported	Not supported
Fibre backbone	SM & 62.5/125 MM	SM, ⁴ 50/125 & 62.5/125 MM	SM, ⁴ 50/125 & 62.5/125 MM
Horizontal bend radius	> 4x cable O.D. @ termination point	> 4x cable O.D. @ termination point	> 4x cable O.D. @ termination point
Backbone bend radius	> 10x cable O.D. @ termination point	> 6x cable O.D. @ termination point	> 6x cable O.D. @ termination point
Bend radius during pulling	Not specified	> 8x cable O.D.	> 8x cable O.D.
Cabling components	⁷ Category 3,4 & 5	⁷ Category 3,4 & 5	⁶ Category 3 & 5
Link/channel performance	Cat. 3 to 16MHz Cat. 4 to 20MHz Cat. 5 to 100MHz	Class C to 16MHz Cat. 3 to 16MHz Cat. 4 to 20MHz Class D to 100MHz Cat. 5 to 100MHz Class E (optical) above 100MHz	Class C to 16MHz Cat. 3 to 16MHz Class D to 100MHz Cat. 5 to 100MHz Class E (optical) above 100MHz
Basic link performance	Supported	Not supported	Not supported
Link performance	Not supported	Supported	Supported
Channel performance	Supported	⁸ Not supported	⁸ Not supported
RJ45 configuration	4 pairs only	2 or 4 pairs	2 or 4 pairs
TO cabling configuration	Wire-pin T568A/T568B	¹⁰ Pairs-pins only	¹⁰ Pairs-pins only
⁹Patch cable attenuation	<120% of horizontal cable	<150% of horizontal cable	<150% of horizontal cable
Application mapping	No reference	¹¹ Comprehensive tables	¹¹ Grouped by link class

Notes

1. The standard recommends 100 Ohm balanced cabling, which can be unscreened or screened. There is no difference between "screened" and "shielded" cabling.
2. The USA market has been predominately UTP and this is reflected in the standard.
3. This is predominately a French market requirement, and is non-preferred.
4. Both EN50173 and ISO/IEC 11801 recommend 62.5/125, but allow the use of 50/125 fibre.
5. TIA/EIA 568-A does not support the use of 50/125 fibre.
6. EN50173 recommends at least two TOs / work area, one Category 5 100 Ohm and one Category 5, 150 Ohm or fibre.
7. ISO/IEC 11801 and TIA/EIA 568-A recommend Category 3 or higher for the first TO, and Category 5, 150 Ohm or fibre for the second TO.
8. End to end performance is not specified in either EN50173 or ISO/IEC 11801, and is beyond the scope of the standards. However, the channel performance can be derived by allowing for the equipment cord performance with the link performance.
9. There is no patch cord assembly standard available yet.
10. EN50173 and ISO/IEC 11801 do not recognise any colour code scheme, and allow the user to decide the code to be used provided that it is consistent throughout the generic cabling system.
11. EN50173 and ISO/IEC 11801 recognise supported applications which will run on each class / Category.

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