

IEEE Standard for a Metric Equipment Practice for Microcomputers— Convection-Cooled with 2 mm Connectors

Sponsor

**Microprocessor and Microcomputer Standards Subcommittee
of the
IEEE Computer Society**

Approved June 27, 1991

IEEE Standards Board

Abstract: Requirements are presented for subracks, plug-in units, printed boards, and backplanes to be used in conjunction with IEEE Std 1301-1991 and with a 2 mm connector as defined in EIA IS-64 (1991). The general arrangement, dimensions, and environmental requirements are covered. This standard may be used with other P1301.x connector implementations in the same subrack.

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Foreword

(This Foreword is not a part of IEEE Std 1301.1-1991, IEEE Standard for a Metric Equipment Practice for Microcomputers—Convection-Cooled with 2 mm Connectors.)

This detail standard has been developed in conjunction with IEEE Std 1301-1991 and by the same people.

The Metric Equipment Practice Study Group and Working Group have been active since July of 1989. During this time, the computer industry has shown a remarkable interest in the development of this specification, and the participation by many experts has enabled it to be developed in a very short time. Around 200 people have participated in the creation of this specification. Although it is not possible to acknowledge everyone who contributed, several individuals deserve special mention for the contributions they made toward the development of this document:

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Contents

SECTION	PAGE
1. Introduction	9
1.1 Scope	9
1.2 Purpose.....	9
1.3 Dimensions	9
1.4 Coordination Dimensions.....	9
1.5 Environmental Requirements.....	9
1.6 Conformance.....	9
2. References.....	10
3. Special Word Usage, Definitions, and Abbreviations	11
3.1 Special Word Usage.....	11
3.2 Definitions	11
3.3 Abbreviations	12
4. Dimensional Nomenclature	12
4.1 Dimensional Location Nomenclature.....	12
4.2 Dimensional Nomenclature, Heights	12
4.3 Dimensional Nomenclature, Widths.....	14
4.4 Dimensional Nomenclature, Depths.....	15
4.5 Dimensional Nomenclature, Mounting Pitches.....	15
5. General Arrangement.....	16
6. Subracks.....	17
7. Backplane Design and Mounting Positions.....	17
7.1 Rigidity.....	17
7.2 Dimensions	17
8. Plug-in Units.....	23
FIGURES	
Fig 1 General Arrangement.....	16
Fig 2 6 SU Backplane Printed Board.....	19
Fig 3 Backplane Assembly.....	20
Fig 4 12 SU Backplane Printed Board.....	21
Fig 5 18 SU Backplane Printed Board.....	22
Fig 6 Diagram of 12 mm Connector Module Placement for Plug-in Unit Intermateability between 6 SU, 12 SU, and 18 SU Subracks	24
Fig 7 Plug-in Unit for a 6 SU Subrack	25
Fig 8 Plug-in Unit for a 12 SU Subrack	26
Fig 9 Plug-in Unit for an 18 SU Subrack.....	27

TABLES	PAGE
Table 1 Recommended Subrack Sizes	17
Table 2 Backplane Dimensions.....	18
Table 3 Plug-in Unit Depths	28
Table 4 Connector Locating Dimensions, H_{15} , for Connector Layout According to Fig 6	29
APPENDIX	
A Pin Length, Backplane Bow, and Pin Wipe	30
A1. Scope.....	30
A2. Definitions	30
A3. Relationships between Parameters.....	32
A3.1 Gap	32
A3.2 Allowance for Different Pin Lengths	32
A4. Plug-in Unit Tilt.....	33
A4.1 Cases to Be Considered When Estimating Tilt	34
A4.2 Assumptions	36
A4.3 Effect on Pin Wipe.....	36
A4.4 Effect on Sequencing.....	36
A4.5 Issue of 5 mm Pins	36
A4.6 Recommendations	37
APPENDIX FIGURES	
Fig A1 Gap.....	30
Fig A2 Pin Wipe.....	31
Fig A3 Pin Wipe and Allowance for Different Pin Lengths	32
Fig A4 Plug-in Unit Tilt.....	33
APPENDIX TABLE	
Table A1 Effect of Tilt on Pin Wipe	35

IEEE Standard for a Metric Equipment Practice for Microcomputers— Convection-Cooled with 2 mm Connectors

1. Introduction

1.1 Scope. This is a detail standard for subracks, plug-in units, printed boards, and backplanes to be used in conjunction with IEEE Std 1301-1991 [16]¹ and a 2 mm connector as defined in EIA IS-64 (1991) [2].

1.2 Purpose. This standard is an implementation of Std 1301-1991 [16]. This standard may be used with other P1301.x connector implementations in the same subrack.

1.3 Dimensions. All dimensions in this document are in millimeters as per ISO 1000 [20] and ISO 31-1 [18] unless otherwise specified.

First angle projection has been used throughout this document.

1.4 Coordination Dimensions. IEEE Std 1301-1991 [16] defines the actual dimensions of a 25 mm metric equipment practice. These actual dimensions are derived from coordination dimensions using the principle of boundary and axis references illustrated in IEEE Std 1301-1991 and IEC 917 (1988) [13].

Overall dimensions and internal subdivisions are determined by using different increments or mounting pitches ($mp_1 = 25$ mm, $mp_2 = 5$ mm, $mp_3 = 2.5$ mm, and $mp_4 = 0.5$ mm). These mounting pitches have been used to derive the key dimensions given in this standard. They are also used when extending this standard with additional dimensions (where such extensions are permitted) and when alternative positions of piece parts are described. (In such cases, it is obvious that the relationships between involved dimensions shall be maintained.)

The subscript "C" has been used in this document to indicate coordination dimensions.

1.5 Environmental Requirements. See P1301.2 [17]. Connector-specific requirements are found in EIA IS-64 (1991) [2].

1.6 Conformance. Conformance with this standard can be claimed provided that—

- (1) The recommended values are used, or
- (2) Allowed, but non-preferred, dimensions and options as indicated in this standard are implemented. The use of non-preferred dimensions shall be specified by other standard specifications or shall be agreed upon between supplier and user.

¹ The numbers in brackets correspond to those of the references in Section 2.

2. References

The following publications shall be used in conjunction with this standard:

- [1] CFR (Code of Federal Regulations), Title 47: Telecommunications, Part 15J, published by Office of the Federal Register (FCC Rules and Regulations are contained within this document).²
- [2] EIA IS-64 (1991), 2 mm Two-Part Connector for Use with Printed Boards and Backplanes.³
- [3] IEC 50, International Electrotechnical Vocabulary.⁴
- [4] IEC 68-2-1 (1990), Environmental Testing, Part 2: Tests—Tests A: Cold.
- [5] IEC 68-2-2 (1974), Environmental Testing, Part 2: Tests—Tests B: Dry Heat.
- [6] IEC 68-2-6 (1982), Environmental Testing, Part 2: Tests—Tests Fc and Guidance: Vibration (sinusoidal).
- [7] IEC 68-2-11 (1981), Environmental Testing, Part 2: Tests—Tests Ka: Salt mist.
- [8] IEC 68-2-27 (1987), Environmental Testing, Part 2: Tests—Test Ea and Guidance: Shock.
- [9] IEC 97 (1970), Grid system for printed circuits.
- [10] IEC 348 (1978), Safety requirements for electronic measuring apparatus.
- [11] IEC 707 (1981), Methods of test for the determination of the flammability of solid electrical insulating materials when exposed to an igniting source.
- [12] IEC 916 (1988), Mechanical structures for electronic equipment. Terminology.
- [13] IEC 917 (1988), Modular order for the development of mechanical structures for electronic equipment practices.
- [14] IEC 917-0 (1989), Modular order for the development of mechanical structures for electronic equipment practices, Part 0: Guide for the users of Publication 917.

² This document is available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

³ EIA publications are available from Global Engineering, 1990 M Street NW, Suite 400, Washington, DC 20036, USA.

⁴ IEC publications are available from IEC Sales Department, Case Postale 131, 3 rue de Varembe, CH-1211, Genève 20, Switzerland/Suisse. IEC publications are also available in the United States from the Sales Department, American National Standards Institute, 11 West 42nd Street, 13th Floor, New York, NY 10036, USA.

- [15] IEC 917-1 (to be published early 1992), Sectional standard on mechanical structures for electronic equipment, coordination dimensions for the 25 mm equipment practice.⁵
- [16] IEEE Std 1301-1991, IEEE Standard for a Metric Equipment Practice for Microcomputers—Coordination Document.⁶
- [17] P1301.2, Recommended Practices for the Implementation of a Metric Equipment Practice (IEEE Std 1301). D1.2, Sept 10, 1991.⁷
- [18] ISO 31-1:1978, Quantities and units of space and time.⁸
- [19] ISO 128:1982, Technical drawings—General principles of presentation.
- [20] ISO 1000:1981, SI units and recommendations for the use of their multiples and of certain other units.
- [21] ISO 1101:1983, Technical drawing—Geometric tolerancing—Tolerancing characteristics and symbols—Examples of indication and interpretation.

3. Special Word Usage, Definitions, and Abbreviations

3.1 Special Word Usage

may. A key word indicating flexibility of choice with no implied preference. The phrase *is optional* is used interchangeably with the key word *may*.

shall. A key word indicating a mandatory requirement. Designers shall implement such mandatory requirements to ensure interchangeability and to claim conformance with the specification. The phrase *is required* is used interchangeably with the key word *shall*.

should. A key word indicating flexibility of choice with a strongly preferred implementation. The phrase *is recommended* and the word *preferred* are used interchangeably with the key word *should*.

⁵ As this standard goes to press, IEC 917-1 is not yet published. Publication is anticipated in early 1992. Until that time, information about drafts can be obtained from the Chair of IEC 48D Working Group 2. Phone: +44 703 266 300. Fax: +44 703 268 610.

⁶ IEEE publications are available from the Institute of Electrical and Electronics Engineers, Service Center, 445 Hoes Lane, P.O. Box 1331, Piscataway, NJ 08855-1331, USA.

⁷ This IEEE-authorized standards project is available from the IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08855-1331.

⁸ ISO publications are available from ISO, Case Postale 56, 1 rue de Varembe, CH-1211, Genève 20, Switzerland/Suisse. ISO publications are also available in the United States from the Sales Department, American National Standards Institute, 11 West 42nd Street, 13th Floor, New York, NY 10036, USA.

3.2 Definitions

aperture dimension. The usable space between features.

coordination dimension. A reference dimension used to coordinate mechanical interfaces. This is not a manufacturing dimension with a tolerance.

mounting pitch (mp). The pitch used to arrange parts or assemblies in a given space.
n. Multiplier having integer values of 1, 2, 3, . . .

reference plane. A theoretical plane, not having thickness or tolerance, used to separate space. See IEEE Std 1301-1991 [16].

system unit (SU). The equipment reference increment mounting pitch, 1 SU = 25.0 mm, for height, width, and depth.

3.3 Abbreviations. The following abbreviations are used in this document:

D	depth nomenclature
Fig	figure
H	height nomenclature
I/O	input/output
mm	millimeter
mp	mounting pitch
Nom	nomenclature
SU	system unit
W	width nomenclature

4. Dimensional Nomenclature

4.1 Dimensional Location Nomenclature. The following location key is used to specify which document is responsible for assigning values to the defined dimensional parameters:

- ① **IEEE Std 1301 Specified Dimensions.** IEEE Std 1301-1991 [16] contains all the generic dimensions that are not connector-related.
- ② **IEEE Std 1301.1 Implementation Parameters.** These are connector-dependent dimensions for the printed board plug-in unit and backplane.
- ③ **Application-Specific Parameters.** Application-specific parameters are product-related and have not been assigned values by IEEE Std 1301-1991 [16] or by this standard. In order to make products, these parameters must be specified according to P1301.2 [17].