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Environmentally Sealed CAT-5, IEEE 1394b-2002
Interconnect System

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1394 Trade Association Board of Directors

Abstract

This specification defines an environmentally sealed CAT-5e connector systems, which meets IEEE-1394b-2002 specifications, for use in demanding factory automation, medical, test equipment and industrial applications.

Keywords

IEEE 1394, Serial Bus, connector, CAT-5, industrial, environmentally sealed

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Contents

Foreword: ii

Revision history:..... iii

1 Scope and purpose..... 4

 1.1 Scope 4

 1.2 Purpose 4

2 Normative references..... 5

 2.1 Reference scope..... 5

 2.2 Approved references..... 5

 2.3 Reference acquisition 5

3 Connectors..... 6

 3.1 Plug..... 6

 3.2 Socket..... 7

 3.3 Plug and Socket Mated..... 9

4 Cable Construction (reference)..... 10

5 Performance Group A- IP67 Sealing..... 11

Tables

Table 5-1 Performance Group A..... 11

Table 5-2 Other Performance Criteria 11

Figures

Figure 3-1 Plug Front 6

Figure 3-2: Plug Section..... 7

Figure 3-3: Socket Front..... 7

Figure 3-4: Socket Section 8

Figure 3-5: Socket Lock Details..... 8

Figure 3-6: Plug and Socket Mated..... 9

Annexes

Annex A (Informative) Bibliography 12

Foreword:

Today, the IEEE 1394b-2002 specification defines a CAT-5 interface for use in typical commercial applications. Many applications, however, require a ruggedized version of this interface.

This specification will act as an additional approved 1394b interface for applications requiring additional ruggedness and the approved IEEE 1394b-2002 CAT 5e interface.

There is one annex, Annex A, in this specification, which is informative and is not considered part of this specification.

This specification was accepted by the Board of Directors of the 1394 Trade Association. Board of Directors acceptance of this specification does not necessarily imply that all board members voted for acceptance. At the time it accepted this specification, the 1394 Trade Association. Board of Directors had the following members:

Eric Anderson, Chair
Max Bassler, Vice-Chair
Dave Thompson, Secretary

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Molex	Max Bassler
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Oxford Semiconductor	Jalil Oraee
Samsung	Jong-Wook Park

The Cable & Connector Working Group, which developed and reviewed this specification, had the following members:

James Snider, Chair
Jim Koser, Temporary Secretary

Revision history:

- | | |
|---|--|
| 1. Revision 0.5 (March 16, 2004) | Initial Draft for Distribution |
| 2. Revision 0.6 (June 15, 2004) | Additional Product Drawings
and Editorial Changes |
| 3. Revision 0.65 (September 9, 2004) | Prepare ballot version |
| 4. Revision 1.0 (March 7, 2005) | Updated BRC version for BoD |

Environmentally Sealed CAT-5, IEEE 1394b-2002 Interconnect System

1 Scope and purpose

1.1 Scope

This specification defines an environmentally sealed CAT-5e connector systems, which meets IEEE-1394b-2002 performance specifications, for use in demanding factory automation, medical, test equipment and industrial applications. The core IEEE 1394b-2002 CAT-5e connector is surrounded by an external housing, which seals it from dust, water, oils and other external substances that can compromise signal integrity. The additional sealing requirements will be defined in the specification

1.2 Purpose

To offer a rugged solution that meets IEEE-1394b-2002 for use with CAT-5e UTP cabling. Doing so will enable 1394 to reach new customers in new markets and provide an interconnect solution tailored towards their unique needs. Factory networking may be one of the ways this interconnect can be used under the performance found in IEEE 1394b-2002 standard.

2 Normative references

2.1 Reference scope

The specifications and standards named in this section contain provisions, which, through reference in this text, constitute provisions of this 1394 Trade Association Specification. At the time of publication, the editions indicated were valid. All specifications and standards are subject to revision; parties to agreements based on this 1394 Trade Association Specification are encouraged to investigate the possibility of applying the most recent editions of the specifications and standards indicated below.

2.2 Approved references

The following approved specifications and standards may be obtained from the organizations that control them.

IEEE STD 1394b-2002, Standard for a High Performance Serial Bus—Amendment 2

CEI/IEC 60529, Edition 2.1, Degrees of Protection Provided by Enclosures (IP Codes)

VG 95234, Electrical Connectors with Bayonet Coupling, Pressure-Water Tight

Throughout this document, the term “IEEE 1394” shall be understood to refer to IEEE Std 1394-1995 as amended by IEEE-1394a-2000 and IEEE Std 1394b-2002.

2.3 Reference acquisition

The references cited may be obtained from the organizations that control them:

1394 Trade Association, 1560 Southlake BLVD, Southlake, TX 76092 USA; (817) 416-2200 (FAX) (817) 416-2256; <http://www.1394ta.org/>

American National Standards Institute (ANSI), 11 West 42nd Street, New York, NY 10036, USA; (212) 642-4900 / (212) 398-0023 (FAX); <http://www.ansi.org/>

Institute of Electrical and Electronic Engineers (IEEE), 445 Hoes Lane, PO Box 1331, Piscataway, NJ 08855-1331, USA; (732) 981-0060 / (732) 981-1721 (FAX); <http://www.ieee.org/>

International Electrotechnical Commission (IEC), 3, rue de Varembe', P.O. Box 131, CH- 1211 GENEVA 20, Switzerland; +41 22 919 0211/+41 22 919 0300(FAX) ; <http://www.iec.ch>

Deutsches Institut Fur Normung e.V. (DIN), Cologne Office, Kamekestrasse 8, 50672 Koln, Germany, 02 21 / 57 13 -0 ; www2.din.de

In addition, many of the documents controlled by the above organizations may also be ordered through a third party:

Global Engineering Documents, 15 Inverness Way, Englewood, CO 80112-5776; (800) 624-3974 / (303) 792-2192; <http://www.global.ihs.com/>

3 Connectors

This clause specifies all dimensions, tolerances and descriptions of features that affect the intermateability and interoperability of the environmentally sealed plugs and sockets. The features of the sealed plugs and sockets that do not affect the intermateability and interoperability are not specified and may vary at the option of the manufacturer.

3.1 Plug

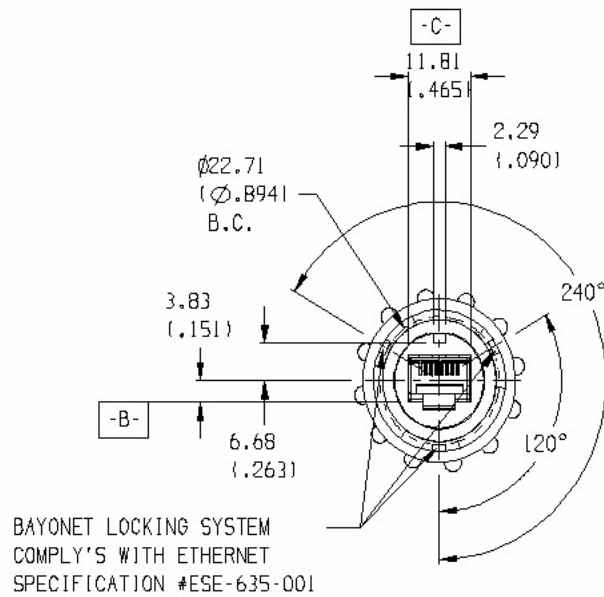


Figure 3-1 Plug Front

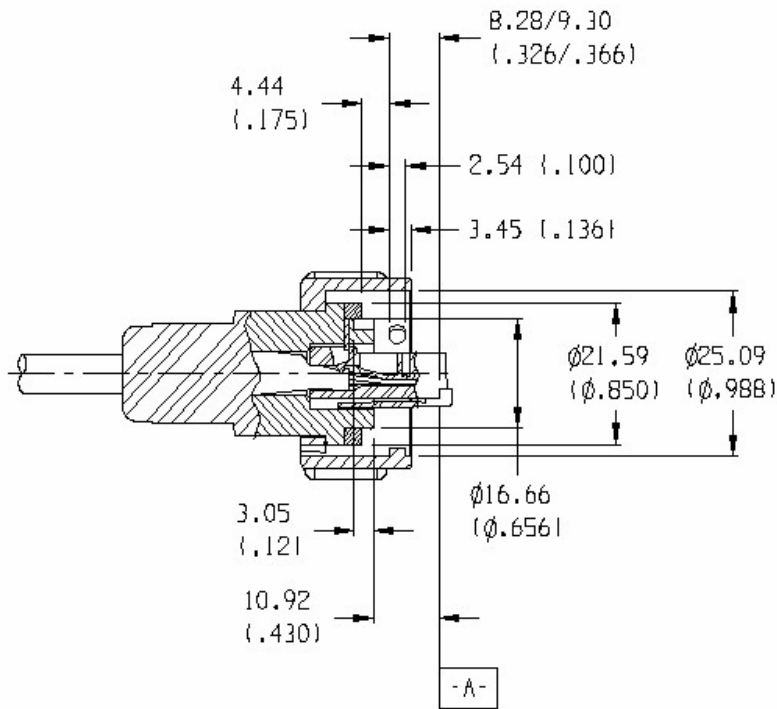


Figure 3-2: Plug Section

3.2 Socket

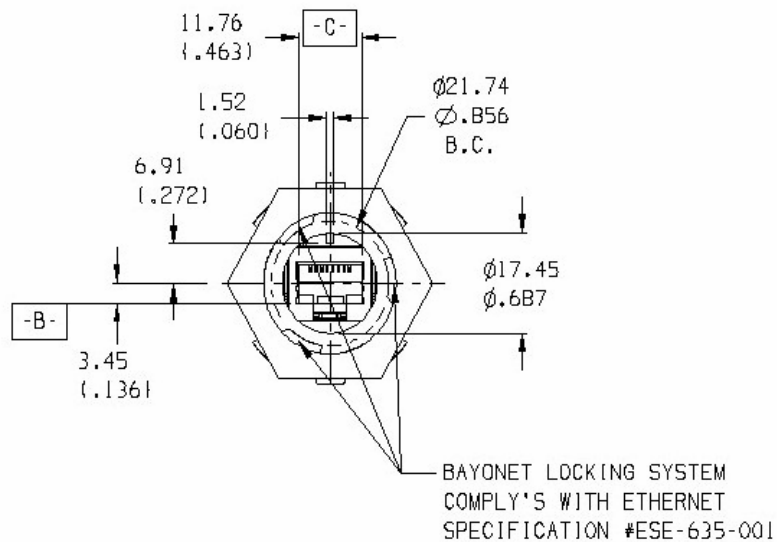


Figure 3-3: Socket Front

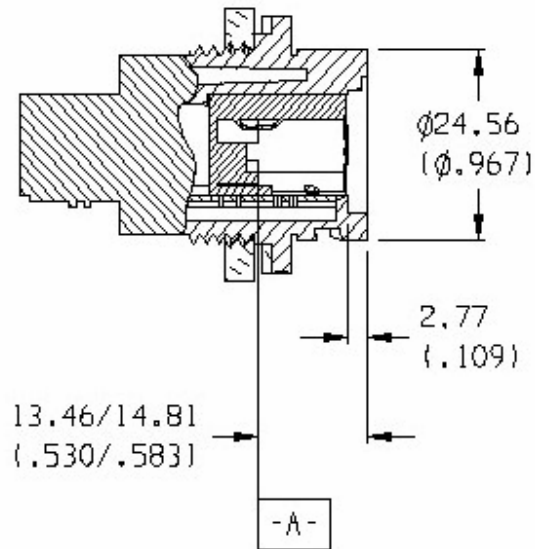


Figure 3-4: Socket Section

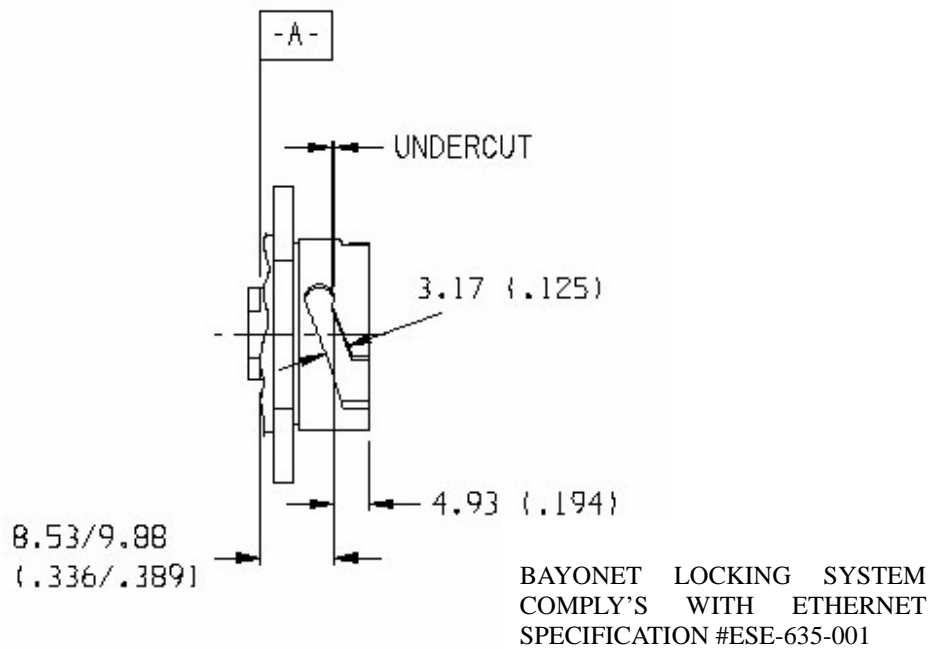


Figure 3-5: Socket Lock Details

3.3 Plug and Socket Mated

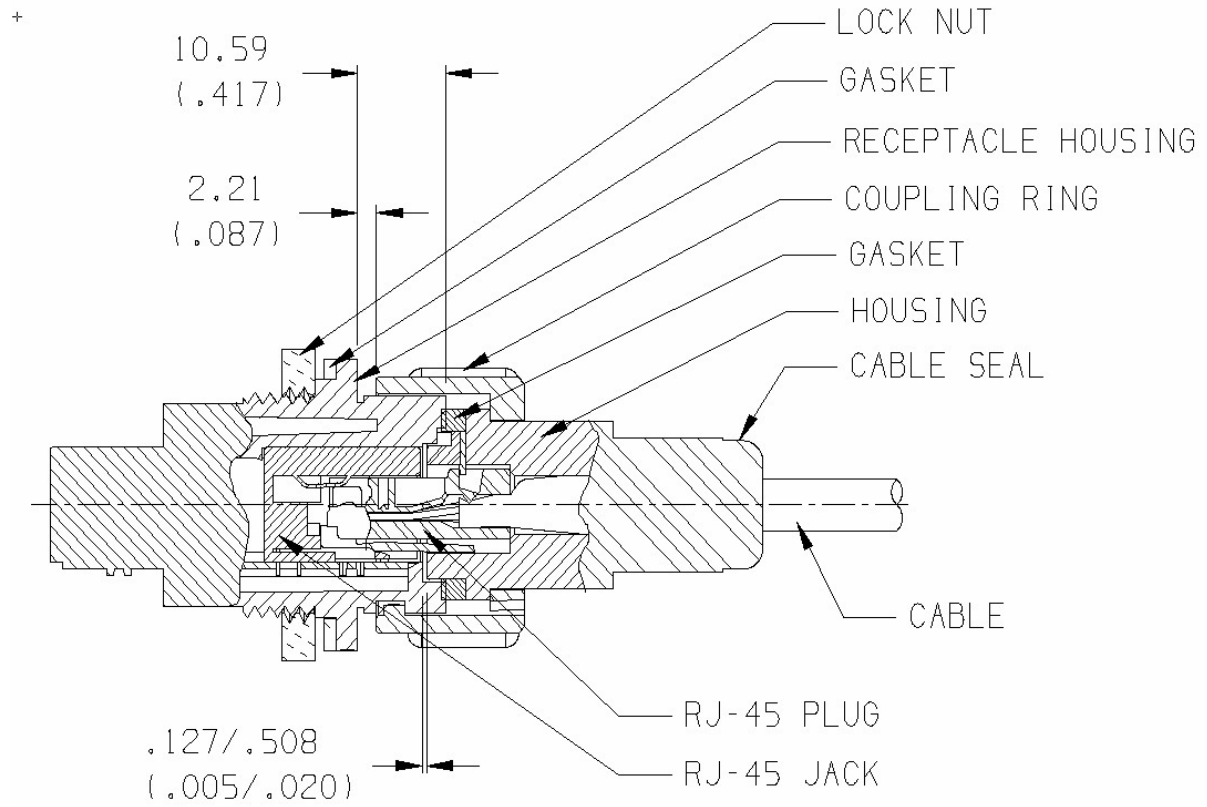
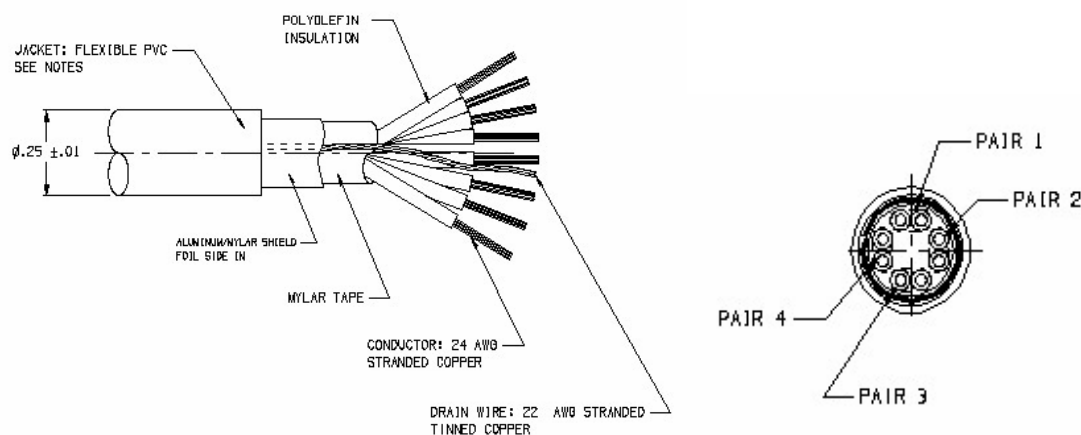


Figure 3-6: Plug and Socket Mated

4 Cable Construction (reference)



1. CABLE DESCRIPTION:
CAT 5E, 24 AWG, 4 PAIRS, SHIELDED, BLACK

2. CONSTRUCTION:

CONDUCTORS: 24 AWG, STRANDED COPPER

INSULATION: POLYOLEFIN

3. COLOR CODE:

PAIR 1: BLUE, WHITE/BLUE

PAIR 2: ORANGE, WHITE/ORANGE

PAIR 3: GREEN, WHITE/GREEN

PAIR 4: BROWN, WHITE/BROWN

4. SHIELD:

ALUMINUM-MYLAR TAPE (FOIL SIDE IN)
AND 22 AWG DRAIN WIRE

5. JACKET:

MATERIAL: PVC, .028 THK

COLOR: BLACK

OD: $.25 \pm .01$

6. STANDARDS:

UL444/CSA-C22.2 NO.214, TYPE CM

(50/IEC-11B01, PATCH CORD

5 Performance Group A- IP67 Sealing

Phase	Test			Measurements to be performed		Requirements
	Title	ID No.	Severity or conditions	Title	ID No.	Performance level
A1	Protection against ingress of dust (Level-6)	CEI/IEC 60529 (section 13)	Mount connector on Cat. 1 enclosure and place it in test chamber. Circulate talcum powder in Chamber for min. 2 hrs	Visual	CEI/IEC 60529 (Section 13.6.2)	No deposit of dust is observable inside the enclosure
A2	Protection against ingress of water	CEI/IEC 60529 (section 14.2.7)	Submerge enclosure between .15m to 1.0m in fresh water for 30 minutes	Visual	CEI/IEC 60529 (section 14.3)	No ingress of water is observable inside the enclosure

Table 5-1 Performance Group A

Note: Category 1 Enclosure- Enclosures where the normal working cycle of the equipment causes a reduction in the air pressure within the enclosure below that of the surrounding air, such as with thermal cycling.

Other Performance Criteria

Item	Characteristic	Rating
1	Durability	500 Cycles
2	Wire Range	24 AWG
3	Tightening Torque- Locking Ring	</= 10 in. lbs
4	Destructive Torque- Locking Ring	> 20 in. lbs
5	Tightening Torque-Strain Relief/Cable Seal (Field Serviceable Version)	> 25 in. lbs
6	Flammability Rating	UL 94V-0

Table 5-2 Other Performance Criteria

**Annex A
(Informative)**

Bibliography

- [B1] IEEE Std 1394-1995, Standard for a High Performance Serial Bus
- [B2] IEEE Std 1394a-2000, Standard for a High Performance Serial Bus—Amendment 1
- [B3] IEEE Std 1394b-2002, Standard for a High Performance Serial Bus—Amendment 2
- [B4] CEI/IEC 60529, Edition 2.1, Degrees of Protection Provided by Enclosures (IP Codes)
- [B5] VG 95234, Electrical Connectors with Bayonet Coupling, Pressure-Water Tight