ANSI/CEA Standard

Fiber-Optic Channel Specification

ANSI/CEA-709.4

February 2013

[Note: This standard is the same as EIA-709.4, later renamed CEA-709.4, which was approved as an EIA standard in November 1999, and as an ANSI standard in August 2000. ANSI administratively withdrew it in 2010 due to lack of five year review. CEA re-approved it and resubmitted it to ANSI in 2012.]

Approved American National Standard

ANSI

CEA

Consumer Electronics Association

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(Formulated under the cognizance of the CEA **R7 Home Networks Committee**.)

Foreword

This standard was developed under the auspices of the Consumer Electronics Association (CEA, formerly CEMA) Technology & Standards R7.1 HCS1 Subcommittee.

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1 Introduction
This document, in conjunction with ANSI/EIA-709.1-A Control Network Protocol Specification, defines a complete 7-layer protocol stack for communications on an EIA-709.4 single-fiber (half-duplex) fiber-optic channel. This channel supports communication at 1250 kbps between multiple nodes, each of which consists of a fiber-optic transceiver, a protocol processor, an application processor, a power supply, and application electronics. The single-fiber channel implemented as specified herein allows two nodes to communicate bidirectionally across a single piece of fiber cable -- thus minimizing complexity of the fiber interconnect.

1.1 Scope
This document specifies the physical layer (OSI Layer 1) requirements for the EIA -709.4 fiber-optic channel which encompasses the interface to the Media Access Control (MAC) layer and the interface to the medium. Parameters that are controlled by other layers but control the operation of the physical layer are also specified.

1.2 Relation of Specification to the EIA-709 model
The EIA-709 model is based on the OSI Reference Model. It is a 7-layer model. There are also important extensions to the OSI Reference Model.

Figure 1 shows the scope of this specification in reference to the entire EIA-709 model. In this document, only the parts of the model relevant to the fiber-optic media are specified. Anything outside that boundary is covered in other parts of the standard. Similar specifications exist for the other EIA-709 media.

2 Normative References
The following references contain provisions, which, through reference in this text, constitute normative provisions of this standard. At the time of publication, the edition indicated was valid normative. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below.

2.1 Normative Reference List
- ANSI/EIA-709.1-A Control Network Protocol Specification
- ANSI\TIA\EIA 492AAAA-A Detail Specification for 62.5-μm Core Diameter/125-μm Cladding Diameter Class 1a Graded-Index Multimode Optical Fibers

2.2 Normative Reference Acquisition
ANSI/TIA/EIA Standards:
- Global Engineering Documents, World Headquarters, 15 Inverness Way East, Englewood, CO USA 80112-5776; Phone 800-854-7179; Fax 303-397-2740; Internet http://global.ihs.com; Email global@ihs.com

3 Network Overview
The EIA-709.4 channel is specified to support a ring topology but will accommodate a bus topology with loss of redundancy. The total network length and number of nodes may be extended by use of ANSI/EIA-709.1-A compliant routers equipped with EIA-709.4 transceivers. The transmit signal is obtained by amplitude modulating the carrier frequency with a Differential Manchester signal, which is polarity insensitive.