

ANSI/CEA Standard

Control Network Power Line (PL) Channel Specification

ANSI/CEA-709.2-A R-2006

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(Formulated under the cognizance of the CEA's **R7.1 Home Control Systems Subcommittee**.)

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CONTROL NETWORK POWER LINE (PL) CHANNEL SPECIFICATION

1 Introduction

This document specifies the EIA-709 Control Network Power Line (PL) Channel and serves as a companion document to EIA-709.1-A [1]. Its purpose is to present the information necessary for the development of a PL physical network and nodes to communicate and share information over that network. This is one of a series of documents covering the various media that comprise the EIA-709 standard.

This document covers the complete physical layer (OSI layer 1) including the interface to the Medium Access Control (MAC) Layer and the interface to the medium. It includes parameters specific to the EIA-709.2 PL channel type, even though the parameters may be controlled at an OSI layer other than layer 1. The document also provides a set of guideline physical and electrical specifications for the power line environment as an aid in developing products for that environment.

1.1 Safety Preamble

This preamble sets forth several recommendations related to safety concerns with respect to EIA-709.2.

This discussion is not complete, nor does it address all possible safety issues. The designer is urged to consult, among other things, the relevant local and national electrical codes for the country of intended use. Local codes usually supplement national electrical codes and impose additional safety related requirements.

Products conforming to EIA-709.2 are to be designed, constructed, assembled, tested and installed following recognized safety provisions appropriate to products covered by the standard.

EIA-709.2 power line network cables are subject to at least five direct electrical safety hazards during their use:

- High-energy transients coupled into the power line network from external environmental sources.
- Possible differences between safety grounds to which network components are connected.
- Possible high voltages on neutral or ground wiring.
- Possible open safety grounds.
- High short-circuit current levels available at interface.

These electrical safety hazards should be alleviated for the network to perform properly. In addition to provisions for properly handling these faults in an operational system, special measures should be taken to maintain the intended safety features during changes of an existing network.

All wire and wiring to which EIA-709.2 nodes connect should conform to wiring standards of the National Electrical Code for U.S. nodes or the appropriate national code for the country of intended use and should have been inspected to comply with that code.

All EIA-709.2 nodes should obtain UL listing (or equivalent listing from an appropriate nationally or internationally recognized testing organization) for the node. Additional testing/listing may be required by local electrical and/or fire codes and applicable testing for sales in countries other than the U.S. may be required.

1.2 Scope

This specification contains all the information necessary to facilitate the exchange of data and control information over the power line medium within a home. The document is divided into five sections (1 - 5):

1. An introduction to the specification.
2. A general description of the power line network that is likely to exist in home environments.
3. The specifications of the allowed topology and configuration rules for constructing EIA-709.2 compliant networks in homes.
4. A specification of the EIA-709.2 physical medium. This section covers frequency allocation, physical and electrical specification of the medium, connectors, environmental requirements, and installation considerations.