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Residential Controls—ClimateTalk 2.1 CT-485 Physical Specification

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Foreword

ClimateTalk is a universal language for innovative, cost-effective solutions that optimize performance, efficiency, and home comfort. The ClimateTalk Open Standards define a set of messages and commands to enable interoperability, enhanced user interface, and machine-to-machine control independent of the physical layer connecting the devices.

This document defines the Serial Hardware requirements for CT-485. Corresponding to OSI Layer 1, the Physical specification defines the electrical transmission requirements for implementing ClimateTalk over CT-485.

These standards are periodically reviewed by the Residential Controls Section of NEMA for any revisions necessary to keep them up to date with advancing technology. Proposed or recommended revisions should be submitted to:

NEMA Technical Operations Department
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Apcom Inc.	Franklin, TN
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Emerson Automation Solutions	Rosemont, IL
Johnson Controls	Goode, VA
Resideo Technologies, Inc.	Golden Valley, MN
White-Rodgers/Copeland	St. Louis, MO

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History of Standards

The Residential Controls Section of NEMA was formed in 1940 to promote the standardization of products within the scope of the section. NEMA standards are voluntary and are designed to eliminate misunderstandings between the purchaser and the manufacturer.

This publication is one of a series sponsored by the Residential Controls Section. Other publications in this series are identified as Pub. No. NEMA BS XX (followed by the year of issue).

The present publication, NEMA BS 31015-2023, is published in accordance with NEMA's policy of periodic review and revision to keep NEMA standards contemporary with industry needs and technological advancement.

Section 1
General

1.1 Scope

ClimateTalk is a universal language for innovative, cost-effective solutions that optimize performance, efficiency, and home comfort. The ClimateTalk Open Standards define a set of messages and commands to enable interoperability, enhanced user interface, and machine-to-machine control independent of the physical layer connecting the devices.

The messages and commands defined by the ClimateTalk Information Model are the presentation and application layers as defined by the OSI Model.[1] ClimateTalk Applications are fully defined at Layer 7 of the OSI Model by a combination of a Device Specific Application Profile, an Application Specification, and the Command Reference.

Below the application layer, ClimateTalk messages can be carried over any physical medium following the OSI Model. CT-485 and CT-LWP are wired serial physical and network layers designed to support the formation of ClimateTalk networks and transport ClimateTalk messages, but other OSI-based protocols—including wireless transports—can be used as well.

CT-485 is a Physical, Data Link, and Networking set of specifications that define one of the physical media over which ClimateTalk messages are sent. CT-485 is a variant of EIA/TIA-485 standards with provisions against incorrect wiring and grounding requirements that meet the needs of residential systems.

This document defines the Serial Hardware requirements for CT-485, which corresponds to OSI Layer 1. The Physical Specification defines the electrical transmission requirements for implementing ClimateTalk over CT-485. All hardware is defined in this specification and all devices must meet the requirements in this document to be certified as CT-485 devices. See Figure 1 for a diagram of relevant standards.

[1] http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=20269.