



BSI Standards Publication

Information technology — Home Electronic System (HES) architecture

Part 4-301: Application protocols for home air conditioners and controllers

National foreword

This British Standard is the UK implementation of ISO/IEC 14543-4-301:2020.

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INTERNATIONAL STANDARD



**Information technology – Home Electronic System (HES) architecture –
Part 4-301: Application protocols for home air conditioners and controllers**



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IEC Central Office
3, rue de Varembe
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

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INFORMATION TECHNOLOGY – HOME ELECTRONIC SYSTEM (HES) ARCHITECTURE –

Part 4-301: Application protocols for home air conditioners and controllers

FOREWORD

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International Standard ISO/IEC 14543-4-301 has been prepared by subcommittee 25: Interconnection of information technology equipment, of ISO/IEC joint technical committee 1: Information technology.

The list of all currently available parts of the ISO/IEC 14543 series, under the general title *Information technology – Home Electronic System (HES) architecture*, can be found on the IEC and ISO websites.

The text of this document is based on the following documents:

CDV	Report on voting
JTC1-SC25/2929/CDV	JTC1-SC25/2952/RVC

Full information on the voting for the approval of this document can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

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INTRODUCTION

This document specifies the message structure, sequences and protocol of the application layer for networked enhanced control devices used in the Home Electronic System. Some services are targeted for communications between devices. Other services are exclusively reserved for management purposes. Some services can be used for both management and run-time communications. This document is applicable for energy management services, mobile access, remote appliance maintenance services, home healthcare services, home security services and comfort control.

This document specifies the detailed procedures and behaviours of both home air conditioners and controllers at the application level communication based on ISO/IEC 14543-4-3.

Figure 1 shows the relationship between IEC 62394, ISO/IEC 14543-4-3 and ISO/IEC 14543-4-301. The existing ISO/IEC 14543-4-3 specifies the message structure, sequences and protocol for a general-purpose communication for use in network enhanced control devices of the Home Electronic System (HES) Class 1. ISO/IEC 14543-4-3 provides the common interfaces for the use-level process and the services such as energy management, remote maintenance, and other services for easily building a system consisting of multi-vendor devices and equipment. The existing IEC 62394 specifies the detailed lists of control commands on NECD objects. Annex A shows terms and NECD frame format on ISO/IEC 14543-4-3 and IEC 62394.

Since ISO/IEC 14543-4-3 is a general-purpose communication specification that applies to a variety of devices, it does not focus on the detailed procedures and behaviours for each device such as a home air conditioner.

In order to enhance interoperability, it is necessary to specify how to implement ISO/IEC 14543-4-3 for each device or controller at the application level: command sequences, timeout requirements, required combinations of acceptable commands, etc.

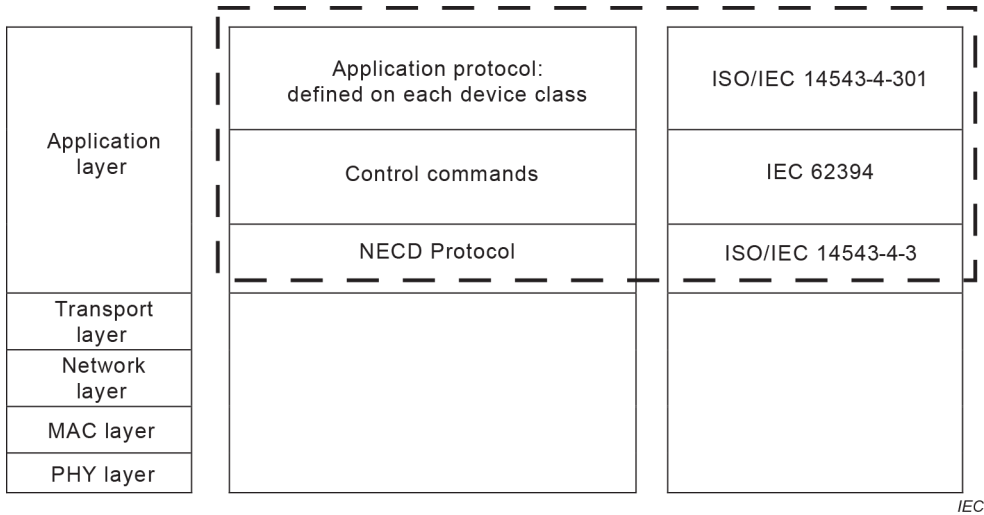


Figure 1 – Relationship between IEC 62394, ISO/IEC 14543-4-3 and ISO/IEC 14543-4-301

INFORMATION TECHNOLOGY – HOME ELECTRONIC SYSTEM (HES) ARCHITECTURE –

Part 4-301: Application protocols for home air conditioners and controllers

1 Scope

This part of ISO/IEC 14543 specifies an application-layer protocol necessary for ensuring interoperability among the products of various manufacturers regarding communications between home air conditioners and controllers, using a protocol called network enhanced communications device (NECD) as specified in ISO/IEC 14543-4-3. This protocol is based on user datagram protocol (UDP) using IPv4 or IPv6 (TCP is optional).

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 14543-2-1, *Information technology – Home Electronic System (HES) architecture – Part 2-1: Introduction and device modularity*

ISO/IEC 14543-4-3, *Information technology – Home Electronic System (HES) architecture – Part 4-3: Application layer interface to lower communications layers for network enhanced control devices of HES Class 1*

IEC 62394, *Service diagnostic interface for consumer electronics products and networks – Implementation for ECHONET*

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 14543-2-1 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1.1

controller

function embedded on unspecified devices for controlling home air conditioners

3.1.2

device object

NECD object other than node profile object

Note 1 to entry: In this document, it refers to home air conditioner object only.

3.1.3**home air conditioner**

air conditioning device for home use including a communications interface that supports the NECD protocol

Note 1 to entry: As used in this document, this term means the home air conditioner includes a communications interface that supports the NECD protocol.

3.1.4**NECD communication middleware**

middleware between the lower communication layers and the application layer that performs communications processing according to the protocol specified in this document

3.1.5**NECD communication processing block**

processing block for the communication middleware

Note 1 to entry: This block performs communications protocol processing to facilitate remote device control and monitoring processing for application software, stores information for the above and controls various data on the device as well as the status of other devices.

3.1.6**NECD data****NDA**

data region for a message exchanged by NECD communication middleware

3.1.7**NECD header****NHD**

data containing the protocol type and message format for the NDA section

3.1.8**NECD object****NOJ**

model of information to be disclosed to the network from information owned by the NECD communication processing block, or an access procedure model

Note 1 to entry: The information or control target owned by each device is specified as a property and the operating method (setting, browsing) for this is specified as a service.

3.1.9**NECD property code****NPC**

code value related to the NECD property

3.1.10**NECD protocol**

communication protocol used in NECD communication specified in ISO/IEC 14543-4-3

3.1.11**NECD service****NSV**

code value related to the NECD service

3.1.12**NECD frame**

frame composed of NHD1, NHD2, TID and NDA