Household appliances network and grid connectivity - Part 4-1: Communication Protocol Specific Aspects: SPINE, SPINE-IoT and SHIP

EESTI STANDARDIMIS- JA AKREDITEERIMISKESKUS
ESTONIAN CENTRE FOR STANDARDISATION AND ACCREDITATION

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN IEC 63510-4-1:2026 sisaldab Euroopa standardi EN 50631-4-1:2023 ingliskeelset teksti.	This Estonian standard EVS-EN IEC 63510-4-1:2026 consists of the English text of the European standard EN 50631-4-1:2023.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation and Accreditation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 17.03.2023.	Date of Availability of the European standard is 17.03.2023.
Standard on kättesaadav Eesti Standardimis-ja Akrediteerimiskeskusest.	The standard is available from the Estonian Centre for Standardisation and Accreditation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

ICS 97.120

Corrigendum to EN 50631-4-1:2023

English version

By Technical Board decision D182/C041 the text of the International Standard IEC 63510-4-1:2025, which is identical with EN 50631-4-1:2023, was approved by CENELEC as EN IEC 63510-4-1 on 2005-12-17. As a consequence EN 50631-4-1:2023 is renumbered as EN IEC 63510-4-1:2026.

The following date was fixed:

- latest date by which the existence of EN IEC 63510-4-1 has to be announced at national level (doa) 2026-05-31

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EUROPEAN STANDARD

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English Version

Household appliances network and grid connectivity - Part 4-1: Communication Protocol Specific Aspects: SPINE, SPINE-IoT and SHIP

Appareils domestiques connectés au réseau et réseau intelligent - Partie 4-1: Aspects spécifiques des protocoles de communication: SPINE, SPINE-IoT et SHIP

Netzwerk- und Stromnetz-Konnektivität von Haushaltsgeräten - Teil 4-1: Spezifische Aspekte der Kommunikationsprotokolle: SPINE, SPINE-IoT und SHIP

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
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European foreword

This document (EN 50631-4-1:2023) has been prepared by WG 07 “Smart Household Appliances” of CLC/TC 59X “Performance of household and similar electrical appliances”.

The following dates are fixed:

• latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2024-02-13
• latest date by which the national standards conflicting with this document have to be withdrawn	(dow)	2026-02-13

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

Any feedback and questions on this document should be directed to the users’ national committee. A complete listing of these bodies can be found on the CENELEC website.

Introduction

Energy management systems will more and more become necessary due to change from fossil and nuclear to renewable production and the associated decentralization. Since an appropriate standard for a home and building management is in preparation this document specifies how sets of products from multiple manufacturers can exchange information with Home and Building / Customer Energy Management Systems, located in a home network or in the cloud.

This document focuses on interoperability of household appliances and describes the necessary control and monitoring. It defines a set of functions of household and similar electrical appliances. The functions in this document cover next to energy-management main remote-control and – monitoring use cases.

This document does not deal with safety and security requirements. Safety requirements have been set in the IEC/EN 60335 series [1].

EN 50631 will provide interoperability on information exchange among various appliances in the home. The EN 50631 series will be re-arranged regarding the further development and will be split into 6 parts:

— EN 50631-1, *Household appliances network and grid connectivity — Part 1: General Requirements, Generic Data Modelling and Neutral Messages*

— EN 50631-2, *Household appliances network and grid connectivity — Part 2: Product Specific mappings, details, requirements and deviations*

— EN 50631-**3-x**, *Household appliances network and grid connectivity — Part 3: Specific Data Model Mapping*

— EN 50631-**4-x**, *Household appliances network and grid connectivity — Part 4: Communication Protocol Specific Aspects*

— EN 50631-5, *Household appliances network and grid connectivity — Part 5: General Test-Requirements and - Specification*

— EN 50631-6, *Household appliances network and grid connectivity — Part 6: SPINE Data Model Toolbox*

Data communication heavily depends on the environment of appliances. Sometimes low bitrate or energy efficient communication puts strict requirements to selected communication technologies. Therefore, popular and de facto standards had been and will be developed by the industry to fulfil such requirements. To not influence common data modelling for appliances because of such restrictions, the standardized data models and neutral message structures need to be applied to communication technologies.

This standard series therefore is intended to separate data modelling and neutral message structure from the attached communication.

Part 1 defines general requirements, generic data modelling and generic neutral messages without relation to any specific communication technology or any product specific layout.

Part 2 lists and specifies product specific requirements and implementation guidance based on the generic data model and generic neutral messages.

Part 3 defines the mapping of neutral messages to examples of typical data models like SPINE, OCF, and so forth. These data models are neither mandatory nor to be seen as complete spectrum of data models.

Part 4 defines the mapping of neutral messages to examples of typical communication protocols. These communication protocols are neither mandatory, nor do they provide an exhaustive list of communication protocols.

Part 5 defines testing requirements and testing specifications. This part will be covered in the future by a New Work Item Proposal.

Part 6 provides the technical reference specification for the SPINE data model. This part will be covered in the future by a New Work Item Proposal.

1 Scope

This document specifies the application of relevant transport protocols for Home and Wide Area Networks as well as cloud connectivity; in this case, SPINE (Smart Premises Interoperable Neutral-Message Exchange), SPINE-IoT, and SHIP (Smart Home IP).

This document is part of the EN 50631 series, which defines the information exchange between Smart Appliances and management systems in homes and buildings including energy management.

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.

IETF RFC 793:1981, *Transmission Control Protocol*

IETF RFC 3280:2002, *Internet X.509 Public Key Infrastructure Certificate Revocation List (CRL) Profile*

IETF RFC 6455:2011, *The WebSocket Protocol*

IETF RFC 6763, *DNS-Based Service Discovery*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
CA
Certificate Authority
Certification Authority
entity which can provide a digital signature for certificates

Note 1 to entry: Other SHIP nodes can check this digital signature with the certificate from the CA itself, the “CA-certificate”.

3.2
Commissioning Tool
<SHIP> instrument to establish the trust between different devices in the smart home installation, e.g. distribute trustworthy credentials from some SHIP nodes to other SHIP nodes

Note 1 to entry: E.g. a smart phone, a web server or a dedicated device can embody the role of a commissioning tool. So far, the SHIP specification does not specify a commissioning tool; an interoperable protocol for commissioning can be used on the layer above SHIP.

Note 2 to entry: A manufacturer may also use their own solutions.

3.3
DNS
Domain Name System

[SOURCE: IETF RFC 1035]