SLOVENSKI STANDARD
oSIST prEN IEC 63380-3:2024

01-julij-2024

Sistemi za upravljanje lokalnih polnilnih postaj in lokalni sistemi za upravljanje z energijo za povezovanje v omrežje in izmenjavo informacij - 3. del: Posebni vidiki komunikacijskih protokolov in kibernetske varnosti

Local charging station management systems and local energy management systems network connectivity and information exchange - Part 3: Communication protocol and cybersecurity specific aspects

Ta slovenski standard je istoveten z: prEN IEC 63380-3:2024

ICS:

29.240.99	Druga oprema v zvezi z omrežji za prenos in distribucijo električne energije	Other equipment related to power transmission and distribution networks
43.120	Električna cestna vozila	Electric road vehicles

oSIST prEN IEC 63380-3:2024 en

69/953/CDV

COMMITTEE DRAFT FOR VOTE (CDV)

PROJECT NUMBER:

IEC 63380-3 ED1

DATE OF CIRCULATION:	CLOSING DATE FOR VOTING:
2024-05-10	**2024-08-02**

SUPERSEDES DOCUMENTS:

69/878/CD, 69/950/CC

IEC TC 69 : ELECTRICAL POWER/ENERGY TRANSFER SYSTEMS FOR ELECTRICALLY PROPELLED ROAD VEHICLES AND INDUSTRIAL TRUCKS

SECRETARIAT: Belgium	SECRETARY: Mr Peter Van den Bossche
OF INTEREST TO THE FOLLOWING COMMITTEES:	PROPOSED HORIZONTAL STANDARD: ☒ Other TC/SCs are requested to indicate their interest, if any, in this CDV to the secretary.

FUNCTIONS CONCERNED:

☐ EMC ☐ ENVIRONMENT ☐ QUALITY ASSURANCE ☐ SAFETY

☒ SUBMITTED FOR CENELEC PARALLEL VOTING	☐ NOT SUBMITTED FOR CENELEC PARALLEL VOTING

Attention IEC-CENELEC parallel voting

The attention of IEC National Committees, members of CENELEC, is drawn to the fact that this Committee Draft for Vote (CDV) is submitted for parallel voting.

The CENELEC members are invited to vote through the CENELEC online voting system.

This document is still under study and subject to change. It should not be used for reference purposes.

Recipients of this document are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Recipients of this document are invited to submit, with their comments, notification of any relevant "In Some Countries" clauses to be included should this proposal proceed. Recipients are reminded that the CDV stage is the final stage for submitting ISC clauses. (SEE AC/22/2007 OR NEW GUIDANCE DOC).

TITLE:

<p>Local Charging station management systems and Local Energy Management Systems network connectivity and information exchange - Part 3 Communication Protocol and Cybersecurity Specific Aspects</p>

PROPOSED STABILITY DATE: 2027

NOTE FROM TC/SC OFFICERS:

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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STANDARD INTERFACE FOR CONNECTING CHARGING POINTS AND/OR CHARGING STATIONS TO LOCAL ENERGY MANAGEMENT SYSTEMS

Part 3: Communication Protocol and Cybersecurity Specific Aspects

For rules on the drafting of the title, refer to the ISO/IEC Directives, Part 2:2021, Clause 11.

The foreword is a mandatory element of the text.

For rules on the drafting of the foreword, refer to the ISO/IEC Directives, Part 2:2021, Clause 12.

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IEC 63380 has been prepared by subcommittee PT63380: Local Charging station management systems, of IEC technical committee 69: Electrical power/energy transfer systems for electrically propelled road vehicles and industrial trucks. It is an International Standard.

The text of this International Standard is based on the following documents:

Draft	Report on voting

69/878/CD	CC_69_878_CD

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

INTRODUCTION

The expansion of renewable energy and the simultaneous reduction in conventional generation result in new power flows and loads on the equipment in the grid and at the house connection point. At the same time, electrical consumers with high power consumption are increasingly being installed in low-voltage systems in private customer systems. These include charging systems for electric vehicles. These two developments can temporarily lead to peak loads and bottlenecks in the network. An expansion of the distribution grids for the comparatively few hours of high simultaneous power consumption is not considered economically sensible. The legislator has therefore introduced the concept of "network-friendly control of controllable consumer devices".

It is crucial to define a standardized interface for the connected consumers and generating facilities, which also includes the charging infrastructure for electric vehicles. When developing a local, standardized interface, a fundamental distinction shall be made between the terms power and energy management.

In order to avoid an overload and the associated emergency shutdown due to specified power limits in the property while all consumers are drawing electricity at the same time - especially heating and air conditioning technology as well as charging infrastructure - power management is of great urgency. This could allow the maximum load at the grid connection point to be reduced. Accordingly, priority shall be given to local power management over, for example, optimization of operations and tariffs or desired charging plans.

In addition to the above-described goal of power management, the further goal of procurement- or tariff-optimized operation can be pursued within the performance limits specified by the infrastructure – controlled by the energy management system. Accordingly, a charging infrastructure will be able to transmit information about procurement and tariff-optimized operation from the local energy management of the property to the electric vehicle so that it can coordinate its charging plan according to local requirements. Effective coordination becomes essential if generating systems (e.g. solar system, combined heat and power plant) are used within the property in order to achieve the highest possible self-consumption of electricity.

The long-term goal is to buffer power and energy bottlenecks within a property using the energy stored in the vehicle, which also brings the topic of energy recovery into focus and this aspect needs to be considered during the development of a standardized interface for local power and energy management.

The aim of this document is to define a standard interface for connecting charging points and/or charging stations to local energy management systems.

STANDARD INTERFACE FOR CONNECTING CHARGING POINTS AND/OR CHARGING STATIONS TO LOCAL ENERGY MANAGEMENT SYSTEMS

Part 3: Communication Protocol and Cybersecurity Specific Aspects

1 Scope

This IEC 63380 series defines the secure information exchange between local energy management systems and electric vehicle charging stations. The local energy management systems communicate to the charging station controllers via the resource manager.

This IEC 63380 series specifies use cases, the sequences of information exchange, the data models as well as the communication protocols to be used and includes all aspects of local energy management of charging stations.

This IEC 63380 series covers scenarios where the charging infrastructure is managed by the operator of the private electrical network, and local energy management systems are used for local load management.

This IEC 63380 series does not cover the secure information exchange between the charging station and the IT backend system(s), such as the management of energy transfer of the charge session, contractual and billing data, provided by the IT backend.

The IEC 63380 series consists of the following structure, describing the interface between charging stations and local energy management systems.

- Part -1 General Requirements, Use Cases and abstract Messages
- Part -2 Specific Data Model Mapping
- Part -3 Communication Protocol and Cybersecurity Specific Aspects
- Part -4 Test Specifications

This part of IEC 63380 specifies the application of relevant transport protocols; in this case, SPINE (Smart Premises Interoperable Neutral-Message Exchange), SHIP (Smart Home IP), and ECHONET Lite. Other communication protocols can be defined in future editions.

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, Transmission Control Protocol

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

IETF RFC 6455, The WebSocket Protocol

IETF RFC 6763, DNS-Based Service Discovery

ISO/IEC 14543-4-3:2015 Information technology, Home Electronic Systems (HES) architecture — Part 4-3: Application layer interface to lower communications layers for network enhanced control devices of HES Class 1

IEC 62394:2022, Service diagnostic interface for consumer electronics products and networks - Implementation for ECHONET

IEC 63380-2 CDV: Local Charging station management systems and Local Energy Management Systems network connectivity and information exchange - Part 2: Specific Data Model Mapping

3 Terms, definitions, and abbreviated terms

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

- IEC Electropedia: available at http://www.electropedia.org/

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

3.1 Terms and definitions

3.1.1
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”.

3.1.2
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

3.1.3
DNS
Domain Name System,

[Source: IETF RFC 1035]

3.1.4
DNS host name
fully qualified domain name used within DNS as host name to get the IP address of the corresponding internet host.

3.1.5
DNS-SD
Domain Name System – Service discovery

[Source: IETF RFC 6763]

3.1.6
Factory Default
setting that allows the user to reset the SHIP node to the as-new condition; this means that all data that has been provided and stored by the SHIP node during its operation time shall be deleted

3.1.7
IANA
Internet Assigned Numbers Authority

3.1.8
IETF
Internet Engineering Task Force

3.1.9
IP
Internet Protocol

3.1.10
mDNS, multicast DNS host name
fully qualified domain name used within mDNS as host name to get the IP address of the corresponding local SHIP node

3.1.11
M/O/NV/C
abbreviations which refer to:

1. M = mandatory
2. O = optional
3. NV = not valid
4. C = choice, i.e., a presence or support depends also on the selection from multiple possibilities

and which are primarily used within specific definition tables describing certain specialized data model definitions

3.1.12
Numerical representation
written system for expressing numbers. For example, 0xab represents a decimal value of 171

3.1.13
PIN
Personal Identification Number
specification which makes use of a PIN as secret for SHIP specific verification procedures

3.1.14
PKI
Public Key Infrastructure

3.1.15
Push Button
switching mechanism to control some aspect of a machine or a process

Note 1 to entry: A push button event does not necessarily mean that a real physical button has to be used to trigger this event. A push button event may also be generated by other means, e.g., via a smart phone application or a web-interface (secure connection to SHIP node required). A push button shall provide a simple mechanism for a user to bring the device to a certain state or start a certain process.

3.1.16
QR Code
the term "QR Code" is a registered trademark of DENSO WAVE INCORPORATED; "QR Code" is the short form for "Quick Response Code" and used for efficient encoding of data into a small graphic