IEC 63380-3

Edition 1.0 2025-07

INTERNATIONAL STANDARD

Standard interface for connecting charging stations to local energy management systems –
Part 3: Communication protocol and cybersecurity specific aspects

ICS 29.240.99; 43.120

ISBN 978-2-8327-0508-7

IEC 63380-3:2025-07(en)

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FOREWORD

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IEC 63380-3 has been prepared by 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
69/1051/FDIS	69/1060/RVD

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/publications.

In this document, all text record fields are written in lowercase Courier font, since they belong to protocol information/binary data exchange.

A list of all parts in the IEC 63380 series, published under the general title *Standard interface for connecting charging stations to local energy management systems*, can be found on the IEC website.

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- withdrawn, or
- revised.

INTRODUCTION

The expansion of renewable energy and the simultaneous reduction in conventional generation of electricity 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 and heat pumps. 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 of energy efficiency 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, it is important to make a fundamental distinction between the terms "power management" 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. The maximum load at the grid connection point can therefore be reduced. Accordingly, it is important to give priority to local power management over, for example, optimization of operations and tariffs or desired charging plans.

Furthermore, the tariff-optimized operation can be pursued within the limits specified by the grid infrastructure – controlled by the energy management system. As a consequence, 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 demands. Effective coordination becomes essential if generating systems 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; this aspect needs to be considered during the development of a standardized interface for local power and energy management.

The aim of the IEC 63380 series is to define a standard interface for connecting charging stations to local energy management systems and the information exchange.

The 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.

The IEC 63380 series covers scenarios where the charging infrastructure is managed by the entity that operates the private electrical network, and local energy management systems are used for local load management.

The IEC 63380 series addresses the energy management in installations with forward and bidirectional charging whereby the overall energy management is ensured by the customer energy manager.

The 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;

- IEC 63380-1[1]: General requirements, use cases and abstract messages;
- IEC 63380-2: Specific data model mapping;
- IEC 63380-3: Communication protocol and cybersecurity specific aspects;
- IEC 63380-4[2]: Test specifications.

1 Under preparation: Stage at the time of publication: IEC/CFDIS 63380-1:2025.

2 Under preparation. Stage at the time of publication: IEC/ACD 63380-4:2021.

1 Scope

This part of IEC 63380 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 document 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.

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

IEC 63380-2, *Standard interface for connecting charging stations to local energy management systems – Part 2: Specific data model mapping*

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*

IETF RFC 793:1981, *Transmission Control Protocol*

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

IETF RFC 6455:2011, *The WebSocket Protocol*

IETF RFC 6763, *DNS-Based Service Discovery*

IETF RFC 5246, *The Transport Layer Security (TLS) Protocol* Version 1.2

IETF RFC 5289, *TLS Elliptic Curve Cipher Suites with SHA-256/384 and AES Galois Counter Mode (GCM)*

IETF RFC 8422, *Elliptic Curve Cryptography (ECC) Cipher Suites for Transport Layer Security (TLS) Versions 1.2 and earlier*