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Protocol for management of electric vehicles charging and discharging infrastructures – Part 1: Basic definitions, use cases and architectures

Protocole de gestion des infrastructures de charge et de décharge des véhicules électriques – Partie 1: Définitions de base, cas d'utilisation et architectures

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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PROTOCOL FOR MANAGEMENT OF ELECTRIC VEHICLES CHARGING AND DISCHARGING INFRASTRUCTURES –

Part 1: Basic definitions, use cases and architectures

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IEC 63110-1 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
69/837/FDIS	69/843/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/standardsdev/publications.

A list of all parts in the IEC 63110 series, published under the general title *Protocol for management of electric vehicles charging and discharging infrastructures*, 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

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INTRODUCTION

In recent years, the necessity of reducing greenhouse gas emissions has led the automotive industry to develop vehicles propelled by electric energy. Among them, the success of vehicles with electric rechargeable batteries has marked the beginning of the deployment of electric charging infrastructures.

During the first years, solutions for management of charging infrastructures were based on industry alliance specifications or proprietary protocols. They greatly contributed to education and involvement of early EV adopters. However, with the coming mass development of e-mobility required by the latest energy policies in most countries, it is necessary to standardize the communication protocol between charging infrastructures and charging stations operators in order to establish an international, safe, secure, interoperable and grid friendly e-mobility eco-system.

This standardized protocol is beneficial to all actors belonging to the e-mobility environment such as EV manufacturers, charging station manufacturers and operators, e-mobility service providers, grid network operators, distribution system operators (DSO) and transmission system operators (TSO), flexibility operators (FO), balance responsible parties and of course the EV users.

Special attention is paid to the security and traceability of the transactions with respect to identification and payment, but also to privacy regulations in force in many countries in order to avoid malicious or criminal use of the charging station.

The general requirements and definitions of this document form the basic framework for all use case descriptions and related documents in IEC 63110 (all parts). This document is the result of a large consensus among all the actors of e-mobility and should be considered as a guideline for implementers of IEC 63110 (all parts).

Technical specifications and requirements of the IEC 63110 protocol will be defined in a future part of IEC 63110.

PROTOCOL FOR MANAGEMENT OF ELECTRIC VEHICLES CHARGING AND DISCHARGING INFRASTRUCTURES –

Part 1: Basic definitions, use cases and architectures

1 Scope

This part of IEC 63110, as a basis for the other parts of IEC 63110, covers the definitions, use cases and architecture for the management of electric vehicle charging and discharging infrastructures.

It addresses the general requirements for the establishment of an e-mobility eco-system, therefore covering the communication flows between different e-mobility actors as well as data flows with the electric power system.

This document covers the following features:

– management of energy transfer (e.g., charging session), reporting, including information exchanges related to the required energy, grid usage, contractual data, and metering data;

– asset management of EVSE, including controlling, monitoring, maintaining, provisioning, firmware update and configuration (profiles) of EVSE;

– authentication/authorization/payment of charging and discharging sessions, including roaming, pricing, and metering information;

– the provision of other e-mobility services;

– cybersecurity.

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 15118 (all parts), *Road vehicles – Vehicle to grid communication interface*

INTERNET ENGINEERING TASK FORCE (IETF). RFC 6960: *X.509 Internet Public Key Infrastructure Online Certificate Status Protocol – OCSP* [online]. S. Santesson et al. June 2013 [viewed 2022-01-26]. Available at: https://www.ietf.org/rfc/rfc6960.txt