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Road vehicles - Vehicle to grid communication interface - Part 9: Physical and data link layer conformance test for wireless communication (ISO 15118-9:2022)

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

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English Version

Road vehicles - Vehicle to grid communication interface - Part 9: Physical and data link layer conformance test for wireless communication (ISO 15118-9:2022)

Véhicules routiers - Interface de communication entre véhicule et réseau électrique - Partie 9: Essai de conformité relatif à la couche physique et à la couche liaison de données pour la communication sans-fil (ISO 15118-9:2022)

Straßenfahrzeuge - Kommunikationsschnittstelle zwischen Fahrzeug und Ladestation - Teil 9: Konformitätsprüfungen der Bitübertragungs- und Sicherungsschicht für die drahtlose Kommunikation (ISO 15118-9:2022)

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CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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Contents

Page

European foreword

The text of ISO 15118-9:2022 has been prepared by Technical Committee ISO/TC 22 "Road vehicles" of the International Organization for Standardization (ISO) and has been taken over as EN ISO 15118-9:2023 by Technical Committee CEN/TC 301 "Road vehicles" the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by April 2024, and conflicting national standards shall be withdrawn at the latest by April 2024.

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

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Endorsement notice

The text of ISO 15118-9:2022 has been approved by CEN as EN ISO 15118-9:2023 without any modification.

INTERNATIONAL STANDARD

ISO 15118-9

First edition
2022-11

Road vehicles — Vehicle to grid communication interface —

Part 9: Physical and data link layer conformance test for wireless communication

Véhicules routiers — Interface de communication entre véhicule et réseau électrique —

Partie 9: Essai de conformité relatif à la couche physique et à la couche liaison de données pour la communication sans-fil

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Contents

Page

Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives or www.iec.ch/members_experts/refdocs).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html. In the IEC, see www.iec.ch/understanding-standards.

This document was prepared jointly by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 31, *Data communication*, and Technical Committee IEC/TC 69, *Electrical power/energy transfer systems for electrically propelled road vehicles and industrial trucks*.

A list of all parts in the ISO 15118 series can be found on the ISO website.

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Introduction

Resulting from the wireless physical and data link layer requirements defined in ISO 15118-8, a corresponding set of abstract test cases is necessary to verify the conformance of implementations. This document, therefore, defines a conformance test suite for the wireless physical and data link layer protocols in order to derive a common and agreed basis for conformance tests. The resulting test suite is a prerequisite for downstream interoperability tests. Since interoperability furthermore involves the actual application logic of an implementation, those tests are beyond the scope of this document. Hence, this document focuses on the interface aspects and the corresponding requirements given in ISO 15118-8 only.

INTERNATIONAL STANDARD **ISO 15118-9:2022(E)**

Road vehicles — Vehicle to grid communication interface —

Part 9: Physical and data link layer conformance test for wireless communication

1 Scope

This document specifies conformance tests in the form of an abstract test suite (ATS) for a system under test (SUT) implementing an electric-vehicle or supply-equipment communication controller (EVCC or SECC) with support for WLAN-based high-level communication (HLC) according to ISO 15118-8 and against the background of ISO 15118-1. These conformance tests specify the testing of capabilities and behaviours of an SUT, as well as checking what is observed against the conformance requirements specified in ISO 15118-8 and against what the implementer states the SUT implementation's capabilities are.

The capability tests within the ATS check that the observable capabilities of the SUT are in accordance with the static conformance requirements defined in ISO 15118-8. The behaviour tests of the ATS examine an implementation as thoroughly as practical over the full range of dynamic conformance requirements defined in ISO 15118-8 and within the capabilities of the SUT (see NOTE below).

A test architecture is described in correspondence to the ATS. The abstract test cases in this document are described leveraging this test architecture and are specified in descriptive tabular format for the ISO/OSI physical and data link layers (layers 1 and 2).

In terms of coverage, this document only covers normative sections and requirements in ISO 15118-8. This document can additionally refer to specific tests for requirements on referenced standards (e.g. IEEE, or industry consortia standards, like WiFi Alliance) as long as they are relevant in terms of conformance for implementations according to ISO 15118-8. However, it is explicitly not intended to widen the scope of this conformance specification to such external standards, if it is not technically necessary for the purpose of conformance testing for ISO 15118-8. Furthermore, the conformance tests specified in this document do not include the assessment of performance nor robustness or reliability of an implementation. They cannot provide judgments on the physical realization of abstract service primitives, how a system is implemented, how it provides any requested service, nor the environment of the protocol implementation. Furthermore, the abstract test cases defined in this document only consider the communication protocol and the system's behaviour defined ISO 15118-8. The power flow between the EVSE and the EV is not considered.

NOTE Practical limitations make it impossible to define an exhaustive test suite, and economic considerations can restrict testing even further. Hence, the purpose of this document is to increase the probability that different implementations are able to interwork. This is achieved by verifying them by means of a protocol test suite, thereby increasing the confidence that each implementation conforms to the protocol specification. However, the specified protocol test suite cannot guarantee conformance to the specification since it detects errors rather than their absence. Thus, conformance to a test suite alone cannot guarantee interworking. Instead, it gives confidence that an implementation has the required capabilities and that its behaviour conforms consistently in representative instances of communication.

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 15118-1, *Road vehicles — Vehicle to grid communication interface — Part 1: General information and use-case definition*

ISO 15118-2, *Road vehicles — Vehicle-to-Grid Communication Interface — Part 2: Network and application protocol requirements*

ISO 15118-8:2020, *Road vehicles — Vehicle to grid communication interface — Part 8: Physical layer and data link layer requirements for wireless communication*

ISO 15118-20, *Road vehicles — Vehicle to grid communication interface — Part 20: 2nd generation network layer and application layer requirements*

ETSI ES 201 873-5 V4.9.1[1)], *Methods for Testing and Specification (MTS) — The Testing and Test Control Notation version 3 — Part 5: TTCN-3 Runtime Interface (TRI) (April 2022)*

ETSI ES 201 873-6 V4.13.1[2)], *Methods for Testing and Specification (MTS) — The Testing and Test Control Notation version 3 — Part 6: TTCN-3 Control Interface (TCI) (April 2022)*

IEEE 802.11-2012, *IEEE Standard for Information technology — Telecommunications and information exchange between systems — Local and metropolitan area networks — specific requirements: Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications*

1) Available at https://www.etsi.org/deliver/etsi_es/201800_201899/20187305/04.09.01_60/es_20187305v040901p.pdf.

2) Available at https://www.etsi.org/deliver/etsi_es/201800_201899/20187306/04.13.01_60/es_20187306v041301p.pdf.