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Road vehicles — Vehicle to grid communication interface —

Part 8: Physical layer and data link layer requirements for wireless communication

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

*Partie 8: Exigences relatives à la couche physique et à la couche de
liaison entre les données pour la communication sans fil*



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Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Abbreviated terms	2
5 Conventions	3
5.1 Definition of OSI based services.....	3
5.2 Requirement structure.....	3
6 System architecture	3
7 Wireless communication requirements	4
7.1 Overview.....	4
7.2 SECC requirements.....	5
7.2.1 General.....	5
7.2.2 WLAN technology.....	5
7.2.3 WLAN frequency and channel.....	6
7.2.4 SECC channel scanning and selection.....	8
7.2.5 Quality of service.....	9
7.2.6 Association support.....	10
7.2.7 Layer 2 interfaces.....	13
7.2.8 Pairing.....	14
7.3 EVCC requirements.....	14
7.3.1 General.....	14
7.3.2 WLAN technology.....	14
7.3.3 WLAN frequency and channel.....	15
7.3.4 Quality of service.....	15
7.3.5 Association support.....	15
7.3.6 Layer 2 interfaces.....	17
7.4 Security.....	18
Annex A (informative) Mounting location of wireless communication module and antenna	19
Annex B (informative) Interference scan and auto channel selection example	23
Annex C (informative) Introduction of service available area	26
Annex D (informative) National regulations in usage of U-NII bands	28
Bibliography	33

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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 ISO documents 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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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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.

This document was prepared jointly by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 31, *Data communication*, and Technical Committee IEC/TC 69, *Electric road vehicles and electric industrial trucks* in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 301, *Road vehicles*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 15118-8:2018) of which it constitutes a minor revision. The changes compared to the previous edition are as follows:

- DFS and/or TPC are now used instead of only DFS, see [7.2.3](#) and [7.3.3](#);
- correction of requirement V2G8-034;
- editorial corrections.

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

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

The pending energy crisis and necessity to reduce greenhouse gas emissions has led the vehicle manufacturers to a very significant effort to reduce the energy consumption of their vehicles. They are presently developing vehicles partly or completely propelled by electric energy. Those vehicles will reduce the dependency on oil, improve the global energy efficiency and reduce the total CO₂ emissions for road transportation if the electricity is produced from renewable sources. To charge the batteries of such vehicles, a specific charging infrastructure is required.

Much of the standardization work on dimensional and electrical specifications of the charging infrastructure and the vehicle interface is already treated in the relevant ISO or IEC groups. However, the question of information transfer between the EV and the EVSE has not been treated sufficiently.

Such communication is necessary for the optimization of energy resources and energy production systems so that vehicles can recharge in the most economic or most energy efficient way. It is also required to develop efficient and convenient billing systems in order to cover the resulting micro-payments. The necessary communication channel may serve in the future to contribute to the stabilization of the electrical grid, as well as to support additional information services required to operate electric vehicles efficiently and economically.

In ISO 15118-3, the messages exchanged between the vehicle and the infrastructure are transported by the cable used for power transfer. With the inception of wireless power transfer technologies and the tremendous development of wireless communication in our societies, the need for a wireless communication between vehicle and charging infrastructure becomes imperative. This is the main focus of this document. The relevant information on use-case definitions and network and application protocol requirements can be found in ISO 15118-1 and ISO 15118-2, respectively.

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Road vehicles — Vehicle to grid communication interface —

Part 8: Physical layer and data link layer requirements for wireless communication

1 Scope

This document specifies the requirements of the physical and data link layer of a wireless High Level Communication (HLC) between Electric Vehicles (EV) and the Electric Vehicle Supply Equipment (EVSE). The wireless communication technology is used as an alternative to the wired communication technology as defined in ISO 15118-3.

It covers the overall information exchange between all actors involved in the electrical energy exchange. ISO 15118 (all parts) are applicable for conductive charging as well as Wireless Power Transfer (WPT).

For conductive charging, only EVSEs compliant with “IEC 61851-1 modes 3 and 4” and supporting HLC are covered by this document. For WPT, charging sites according to IEC 61980 (all parts) and vehicles according to ISO 19363 are covered by this document.

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 15118-2:2014, *Road vehicles — Vehicle-to-Grid Communication Interface — Part 2: Network and application protocol requirements*

ISO 15118-3:2015, *Road vehicles — Vehicle to grid communication interface — Part 3: Physical and data link layer requirements*

ISO 19363, *Electrically propelled road vehicles — Magnetic field wireless power transfer — Safety and interoperability requirements*

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*