# ISO 15118-20:2022-04 (E)

## Road vehicles - Vehicle to grid communication interface - Part 20: 2nd generation network layer and application layer requirements

## Contents

Page


Foreword ..... v

Introduction ..... vi

1 Scope ..... 1

2 Normative references ..... 1

3 Terms and definitions ..... 4

4 Abbreviated terms ..... 12

5 Conventions ..... 15
5.1 Definition of OSI based services ..... 15
5.2 Requirement structure ..... 15
5.3 Usage of references ..... 16
5.4 Notation used for XML schema diagrams ..... 16

6 Document overview ..... 16

7 Basic requirements for V2G communication ..... 17
7.1 General information ..... 17
7.2 Service primitive concept of OSI layered architecture ..... 18

Overview 18

Syntax of service primitives ..... 18
7.3 Security concept ..... 19

General ..... 19

Certificate and key management ..... 21

Number of root certificates and root validity ..... 35

Support and application of TLS ..... 37

Firewall 38

Protection of the cryptographic keys ..... 38

Random number generation ..... 40
7.4 V2G communication states and data link handling ..... 42
7.5 Data link layer ..... 46

Data link layer security for WLAN ..... 46
7.6 Network link layer ..... 51

General ..... 51

Applicable RFCs, limitations and protocol parameter settings ..... 51

IP addressing ..... 53
7.7 Transport layer ..... 54

Transmission control protocol (TCP) ..... 54

User datagram protocol (UDP) ..... 55

Transport layer security (TLS) ..... 56
7.8 V2G transfer protocol ..... 82

General information ..... 82

Supported ports ..... 83

Protocol data unit ..... 84
7.9 Presentation layer ..... 87

XML and efficient XML interchange (EXI) ..... 87

Message security ..... 90
7.10 Application layer ..... 115

SECC discovery protocol ..... 115

8 Application layer messages ..... 128
8.1 General information and definitions ..... 128
8.2 Protocol handshake definition ..... 129

Handshake sequence ..... 129

Message definition supportedAppProtocolReq and supportedAppProtocolRes ..... 131

Semantics description supportedAppProtocol messages ..... 132

Message examples ..... 133
8.3 V2G message definition ..... 134

Overview 134

General ..... 135

Header definition ..... 135

Request and response definitions ..... 138

Complex data types ..... 240
8.4 Service selection ..... 361

General ..... 361

General description of configuration parameters ..... 362

Selection of service and service parameters ..... 363
8.5 V2G communication timing ..... 373

Overview 373

Common ..... 373

DC service ..... 374

**Message sequence and communication session ..... 374**

**Session setup and ready to charge ..... 381**

**V2G message synchronization for AC and DC with IEC 61851-1 signalling ..... 387**
**V2G message synchronization with IEC 61980-2 signalling for WPT ..... 394**

**8.6 Message sequencing and error handling ..... 394**

**Overview 394**

**Basic definitions for error handling ..... 395**

**ResponseCode handling ..... 395**

**Request-response message sequence requirements ..... 406**

**Multiplexed communication ..... 434**

**Message sequence diagrams ..... 437**

**(normative) Schema definition ..... 442**

**(normative) Certificate profiles ..... 444**

**(normative) Specification of identifiers ..... 498**

**(informative) ACDP ..... 504**

**(informative) Basic PPD for interoperability ..... 506**

**(informative) Message sequencing for renegotiation ..... 509**

**(informative) Association of VAS client to V2G session ..... 511**

**(informative) Application of certificates ..... 512**

**(informative) Precision of measurements and tolerances ..... 547**

**(informative) Absolute pricing examples ..... 549**