
**Road vehicles — Vehicle domain
service (VDS) —**

**Part 1:
General information and use case
definitions**

*Véhicules routiers — Service du domaine du véhicule (SDV) —
Partie 1: Information générale et définitions des cas d'utilisation*



This document is a preview generated by EKO



COPYRIGHT PROTECTED DOCUMENT

© ISO 2021

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

Foreword	v
Introduction	vi
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
3.1 Basis of vehicle domain	1
3.2 Primary actors	2
3.3 Secondary actors	3
4 Abbreviated terms	3
5 Conventions	4
5.1 Documents overview on OSI based services	4
5.2 General policy structure	5
6 General information for vehicle domain service	6
6.1 General	6
6.2 Vehicle domain service	6
6.3 Vehicle domain dynamic map service	7
6.4 Variations of vehicle domain services	8
6.4.1 Basic functions of vehicle domain service	8
6.4.2 Vehicle domain registration service	9
6.4.3 Traffic explorer service	10
6.4.4 Traffic reporter service	11
6.4.5 Manoeuvre coordinator service	12
6.4.6 Scenario variations of vehicle domain service	13
6.5 Time synchronization in VDDMS	16
6.6 Other variations of vehicle domain services	16
6.6.1 Vehicle domain digital key service	16
6.7 System architecture of vehicle domain services	17
6.7.1 General	17
6.7.2 Basic system architecture of vehicle domain service	18
6.7.3 Typical system architecture variation of vehicle domain service	18
6.7.4 Vehicle domain service on vehicle multimedia service	19
6.8 Network operators related to VDS	20
6.9 VDS in smart traffic architecture model proposal	21
6.10 Information security in VDS	24
7 Business use cases for VDS	24
7.1 General	24
7.2 Business use case of vehicle domain registration	24
7.3 Business use case of traffic explorer	25
7.4 Business use case of traffic reporter	26
7.5 Business use case of manoeuvre coordinator	27
8 System sequences for VDS	27
8.1 General	27
8.2 Basic elements of general BUC	28
9 System use cases for VDS	29
9.1 General	29
9.2 System use case of VDS start	29
9.3 System use case of communication set up	29
9.4 System use case of security set up	30
9.5 System use case of VDS selection	31
9.6 System use case of VD data collection	31
9.7 System use case of VD status report	32

9.8	System use case of driving manoeuvre query.....	32
9.9	System use case of VDS stop.....	33
Annex A (informative) Scenario variations of vehicle domain dynamic map service.....		35
Annex B (informative) Typical examples of smart traffic architecture model.....		43
Annex C (informative) Reference model of vehicle domain service on vehicle multimedia system.....		51
Bibliography.....		54

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).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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*, in collaboration with ITU-T (as H.VDS-UC).

A list of all parts in the ISO 23239 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 connected vehicles are expected to expand and become even more popular in the markets of different countries. A variety of technologies are being developed and discussed for many applications.

Everyone who drives a car collects traffic information to determine the correct driving behaviour and accurately recognize the relevant traffic information and driving conditions without delay. Although the autonomous driving function takes over the driver's operation, there is the same value in a judgment of correct driving behaviour. While many independent autonomous driving cars and intelligent driver assistance functions provide information collected by various sensors, LIDAR and radar, their performance is limited and the inaccuracies increase with ambient conditions such as weather and blind spots.

In addition, the blinkers normally equipped with all vehicles only provide one-way fragmentary information, though. If the vehicle communicates with other neighbouring vehicles or traffic participants and exchanges various information, it will be able to go beyond the limits of its sensor capabilities and blind spots to provide a more accurate assessment of the traffic situation. It will also be possible to negotiate planned driving manoeuvres with neighbouring vehicles and to coordinate the sequence and timing of driving manoeuvres.

This ability to share information between vehicles defined in this document is provided only on a direct communication network between the vehicle and neighbouring traffic participants. It will be accomplished with on-board functionality without investing in a significant communication infrastructure on the road. This will enable vehicles to make more accurate and appropriate driving choices, which will provide a number of benefits such as reducing traffic accidents and congestion with improving traffic efficiency.

An important aspect of this documentation development is focusing on implementation points throughout the vehicle. Typical use cases are collected, from which distinctive aspects of the implementation specification are derived. And beyond simple information exchange, the resulting information is reviewed, evaluated, and then used to generate reliable information that can be applied to critical vehicle controls.

The ISO 23239 series is developed within a unique standard number, so that it will eliminate inconsistencies and redundancies within the documentation. As a result of these tasks, compatibility and interoperability will be confirmed, being added the economy and efficiency of implementation with global consistency. Furthermore, by providing a concrete path from existing simple and partial communication interface to trusted vehicle implementation, it is expected to support a smooth launch of brand-new vehicle application and accelerate the introduction of next generation communication technologies into the future vehicle market.

Road vehicles — Vehicle domain service (VDS) —

Part 1: General information and use case definitions

1 Scope

This document, as the first document in the ISO 23239 series, provides a basic definition of vehicle domain service and supplementary information on detailed concepts, as well as definitions of the typical and supplementary use cases being used to define the specification of applications.

Detailed specifications of communications and applications are provided in other documents in the ISO 23239 series, and they are not provided in this document.

NOTE The remote processes by the tools connected to the on-board diagnosis (OBD) connector in a vehicle, such as repair and maintenance, prognostics, monitoring, configuration and reprogramming of vehicle are out of the scope of this document.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1 Basis of vehicle domain

3.1.1

vehicle domain

VD

limited group of secure and reliable connections, provided by the *master vehicle* (3.2.2) and established on an existing network service by registering the *domain actor* (3.2.3)

Note 1 to entry: Vehicle domain is only related to network connection between master vehicle and domain actor. Physical or geometrical conditions are not included.

3.1.2

vehicle domain dynamic map

VDDM

dynamic map in the *vehicle domain* (3.1.1) generated by a *master vehicle* (3.2.2)

Note 1 to entry: VDDM consists of static high definition features, dynamic actors and other characteristics.