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Second edition
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Road vehicles — Standardized access to automotive repair and maintenance information (RMI) —

Part 2: Technical requirements

Véhicules routiers — Normalisation de l'accès aux informations relatives à la réparation et à la maintenance pour l'automobile (RMI) —

Partie 2: Exigences techniques

Reference number
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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 by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 31, *Data communication,* 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 18541-2:2014), which has been technically revised.

The main changes compared to the previous edition are as follows:

— security-related RMI according to SERMI scheme moved to Annex A;

— previous Annex A "PC specification" has been removed; the corresponding subclauses 9.2 and 9.3 were updated accordingly;

— Figures 2, 3 and 4 were updated (security-related RMI has been deleted);

— correction of errors and improvement of formulations in the entire document.

A list of all parts in the ISO 18541 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 ISO 18541 series includes the requirements to be fulfilled by repair and maintenance information (RMI) systems as applied by the European Commission — Enterprise and Industry Directorate-General, Consumer goods — Automotive industry EC mandate M/421,[6] dated Brussels, 21 January 2008.

This mandate relates to the EC type-approval system for vehicles falling into the scopes of Directives 70/156/EEC (replaced by 2007/46/EC [9]), 2002/24/EC [replaced by (EU) 168/2013 [7]] and 2003/37/EC [replaced by (EU) 167/2013 [8]] and, in particular, to requirements for access to vehicle repair and maintenance information by independent operators.

The purpose of the EC Mandate M/421 is to develop a standard or set of standards which specify the requirements to provide standardized access to automotive repair and maintenance information (RMI) for independent operators.

The ISO 18541 series only covers access to automotive repair and maintenance information for light passenger and commercial vehicles [see (EC) No 715/2007 [15], (EC) No 692/2008 [14] and (EU) No 566/2011 [11]] and heavy-duty vehicles [see (EC) No 595/2009 [13], (EU) No 582/2011 [12] and (EU) No 64/2012 [10]] based on Directive 2007/46/EC [9] and for two-or three-wheel vehicles and quadricycles based on regulation (EU) 168/2013 [7].

The information included in the ISO 18541 series derives from the legislative requirements on European level in the field of RMI and related security requirements and can be referenced by legislation in other countries.

Road vehicles — Standardized access to automotive repair and maintenance information (RMI) —

Part 2: Technical requirements

1 Scope

This document includes technical requirements which are related to automotive repair and maintenance information (RMI) systems in order to standardize access to RMI for independent operators.

This document specifies the minimum set of technical requirements related to a vehicle manufacturer's RMI system. These requirements will reflect the deriving needs from the use cases as specified in ISO 18541-1.

Furthermore, this document defines requirements for granting access to security-related RMI in Annex A following the SERMI scheme.

This document is applicable to light passenger and commercial vehicles as defined in regulation (EC) 715/2007 Article 2 [15].

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 18541-1, *Road vehicles — Standardized access to automotive RMI — Part 1: General information and use case definition*

ISO 18541-3, *Road vehicles — Standardized access to automotive repair and maintenance information (RMI) — Part 3: Functional user interface requirements*

ISO 22900-2, *Road vehicles — Modular vehicle communication interface (MVCI) — Part 2: Diagnostic protocol data unit application programming interface (D-PDU API)*

SAE J2534-1, *Recommended Practice for Pass-Thru Vehicle Programming*

SAE J2534-2, *Optional Pass-Thru Features*

SERMI scheme[1)] — *Scheme for accreditation, approval and authorization to access security-related repair and maintenance information*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 18541-1 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 http://www.electropedia.org/

1) Available at https://www.vehiclesermi.eu/.

4 Abbreviated terms

API	application programming interface
CSP	certificate status protocol
DB	database
DLC	data link cable
DLL	dynamic link library
D-PDU	diagnostic – protocol data unit
DVD	optical disc storage media format
ECU	electronic control unit
FAQ	frequently asked questions
IO	independent operator
IT	information technology
LAN	local area network
MVCI	modular vehicle communication interface
NAT	network address translation
OBD	on-board diagnostics
OCSP	online certificate status protocol
PC	personal computer
PKCS	public key certificate status
RMI	repair and maintenance information
SERMI	forum for access to security-related vehicle repair and maintenance information
TREQ-	technical requirement
TC	trust centre
USB	universal serial bus
VAT No.	value added tax number
VM	vehicle manufacturer
WWH-OBD	World-wide harmonized on-board diagnostics

5 Requirements overview and principles

5.1 Basic principles for requirements definition

Basic principles have been established as a guideline to define the requirements.

— BP1: the requirements stated in this document shall not specify any implementation details.

— BP2: requirements shall be expressed in terms of performance rather than design or descriptive characteristics. This approach leaves maximum freedom to technical development.

— BP3: a requirement is identified by a TREQ-xx, where 'xx' is the requirement number. Each requirement consists of a "Main title", "Requirement definition", "Requirement description", "Explanatory/example" and "Classification".

— BP4: The requirements in clusters 4 and 5 in this document have been formulated with the aim of minimizing the number of IO clients (PC, laptop, etc.) required to access different VM RMI systems.

5.2 Requirements clustering

Figure 1 illustrates the technical requirements clusters. Figure 1 shall provide an overview about all technical requirements clusters and the specific technical requirements. Each technical requirement is identified by the mnemonic "TREQ-" and an alpha-numeric number. The name of the technical requirement is descriptive for the area.

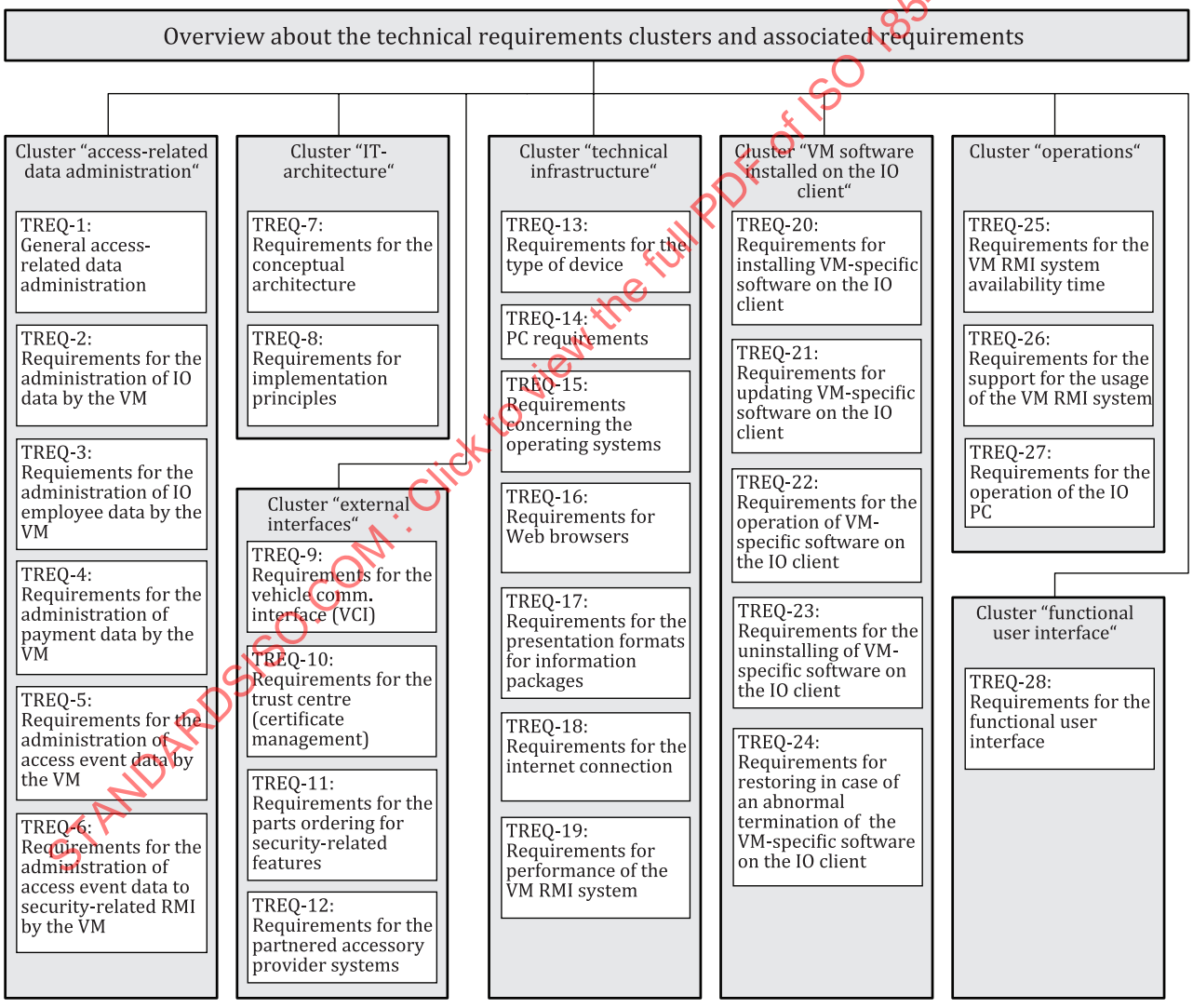


Figure 1 — Overview about the technical requirements clusters

Table 1 provides an overview of the main categories of standardized access to automotive RMI requirements. A requirement category shall have at least one requirement.

Table 1 — Main requirements clusters

# - Main title of cluster	Brief description	Technical requirements [TREQ] reference
1 – Access-related data administration	Describes the main data types to be administered by the VM RMI system and the requirements for the appropriate management procedures in order to comply with the standardized access to RMI. RMI requirements related to cluster access-related data administration are: — requirements for the administration of IO data by the VM; — requirements for the administration IO employee data by the VM; — requirements for the administration of payment data by the VM; — requirements for the administration of access event data by the VM; — requirements for the administration of access event data to security-related RMI by the VM.	[TREQ-1] General access-related data administration [TREQ-2] Administration of IO data by the VM [TREQ-3] Administration of IO employee data by the VM [TREQ-4] Administration of payment data by the VM [TREQ-5] Administration of access event data by the VM [TREQ-6] Administration of access event data to security-related RMI by the VM
2 – IT architecture	Describes requirements for the main IT components and interfaces at the different IT architectural levels. RMI requirements related to cluster IT architecture are: — requirements for the conceptual architecture; — requirements for the implementation principles.	[TREQ-7] Conceptual architecture [TREQ-8] Implementation principles
3 – External interfaces	Describes the requirements for communication interfaces other than the user interface. RMI requirements related to cluster external interfaces are: — requirements for the vehicle communication interface (VCI); — requirements for the trust centre (certificate management); — requirements for the parts ordering for security-related features; — requirements for the partnered accessory provider systems.	[TREQ-9] Vehicle communication interface (VCI) [TREQ-10] Trust centre (certificate management) [TREQ-11] Parts ordering for security-related features [TREQ-12] Partnered accessory provider systems

Table 1 *(continued)*

# - Main title of cluster	Brief description	Technical requirements [TREQ] reference
4 – Technical infrastructure	Compatibility conditions, minimum requirements for components and Internet connection parameters to give an acceptable performance. This cluster intends to define minimal development guiding rules that shall be followed by the VM in order to ensure compatibility between VM RMI systems. Compatibility issues that may occur shall be managed by the Forum SERMI. This requirements cluster specifies the technical infrastructure recommendations which are: — requirements related to type of device; — requirements related to PC requirements; — requirements related to operating systems, runtime languages, libraries; — requirements related to Web browsers; — requirements related to presentation formats for information packages; — requirements related to Internet connection; — requirements related to performance of the VM RMI system.	[TREQ-13] Type of device [TREQ-14] PC requirements [TREQ-15] Operating systems [TREQ-16] Web browsers [TREQ-17] Presentation formats for information packages [TREQ-18] Internet connection [TREQ-19] Performance of the VM RMI system
5 – Coexistence of VM software on IO client	This requirements cluster specifies the coexistence of VM software on the IO client: — requirements for installing VM-specific software on the IO client; — requirements for updating VM-specific software on the IO client; — requirements for the operation of VM-specific software on the IO client; — requirements for the uninstalling of VM-specific software on the IO client; — requirements for restoring in case of an abnormal termination of the VM-specific software on the IO client. The VM software shall be developed according to acknowledged quality criteria for the coexistence of VM applications installed on the client side.	[TREQ-20] Requirements for installing VM-specific software on the IO client [TREQ-21] Requirements for updating of installed VM data and applications on the IO client [TREQ-22] Requirements for the operation of VM-specific software on the IO client [TREQ-23] Requirements for the uninstalling of VM-specific software on the IO client [TREQ-24] Requirements for restoring in case of an abnormal termination of the VM-specific software on the IO client
6 – Operations	This requirements cluster specifies the RMI requirements related to the cluster operations which are: — requirements related to the VM RMI system availability time; — requirements related to the support for the usage of the VM RMI system; — requirements related to the operation of the IO PC.	[TREQ-25] VM RMI system availability time [TREQ-26] Support for the usage of the VM RMI system [TREQ-27] Operation of the IO PC
7 – Functional user interface	This requirement cluster includes the reference to the ISO 18541-3 functional user interface of the VM RMI system.	[TREQ-28] Requirements cluster 7 – Functional user interface

6 Requirements cluster 1 — Access-related data administration

6.1 [TREQ-1] General access-related data administration

Table 2 defines the requirements for the general access-related data administration.

Table 2 — [TREQ-1] General access-related data administration

REQ #	TREQ-1
Main title	General access-related data administration
Requirement definition	The VM allows access to the RMI system depending on the storage of some data: — for user registration; — agreement to terms and conditions; — any other data required by local legislation; — for user login and access data recovery; — for invoicing; — for physical delivery of material if needed; — for logging of any access to security-related RMI; — for logging of any access to ECU replacing/update (in case of liability issues); — to be able to disable a user, see ISO 18541-1 use case UC 1.5 "request to delete the registration of an IO employee".
Brief description	The VM shall administer data on users, on payment, on access events to security-related RMI and on access events to general RMI content. It is important to be aware of any data or privacy protection legislation when administering this data.
Classification	Mandatory

6.2 [TREQ-2], [TREQ-3] Administration of IO and IO employee data by the VM

6.2.1 [TREQ-2] Administration of IO data by the VM

Table 3 defines the requirements for the administration of IO data by the VM.

Table 3 — [TREQ-2] Administration of IO data by the VM

REQ #	TREQ-2
Main title	Requirements for the administration of IO data by the VM
Requirement definition	IO data shall be administered by the VM to enable user access, access data reset and to facilitate written communication with the IO.
Brief description	The following list of IO data shall be administered by the VM: — IO name; — IO postal address; — country; — postal address for invoicing if different from IO postal address; — inter-community VAT No.; — first name, family name of the IO legal representative; — e-mail address for communication with the IO legal representative in all aspects of the VM RMI system usage; — preferred language; — user ID and password of the IO legal representative (the user ID must be unique in the VM system).
Classification	Mandatory

6.2.2 [TREQ-3] Administration of IO employee data by the VM

Table 4 defines the requirements for the administration of IO employee data by the VM.

Table 4 — [TREQ-3] Administration of IO employee data by the VM

REQ #	TREQ-3
Main title	Requirements for the administration of IO employee data by the VM
Requirement definition	IO employee data shall be administered by the VM to enable user access, access data reset and to facilitate written communication with the IO employee.
Brief description	The following list of user data shall be administered by the VM: — IO name; — e-mail address for communication with the employee in all aspects of the VM RMI system usage; — preferred language; — user ID and password of the IO employee (the user ID must be unique in the VM system); — optionally credentials requested by the VM if the IO employee wants to request access to security-related RMI; — optionally the access level granted for security-related RMI.
Classification	Mandatory

6.3 [TREQ-4] Administration of payment data by the VM

Table 5 defines the requirements for the administration of payment data by the VM.

Table 5 — [TREQ-4] Administration of payment data by the VM

REQ #	TREQ-4
Main title	Requirements for the administration of payment data by the VM
Requirement definition	User data shall be administered by the VM to allow the VM to invoice the user.
Brief description	The following user data shall be administered by the VM for the purposes of invoicing for use of the VM RMI system: — type of subscription; — method of payment; — subscription period; — invoicing address; — inter-community VAT No.
Classification	Mandatory

6.4 [TREQ-5] Administration of access event data by the VM

Table 6 defines the requirements for the administration of access event data by the VM.

Table 6 — [TREQ-5] Administration of access event data by the VM

REQ #	TREQ-5
Main title	Requirements for the administration of access event data by the VM
Requirement definition	Access event data shall be administered by the VM to monitor use of the VM RMI system and take appropriate action if necessary.
Brief description	The following access event data shall be administered by the VM: — user ID; — log on and off times; — period of non-use.
Classification	Mandatory

6.5 [TREQ-6] Administration of access event data to security-related RMI by the VM

Table 7 defines the requirements for the administration of access event data to security-related RMI by the VM.

Table 7 — [TREQ-6] Administration of access event data to security-related RMI by the VM

REQ #	TREQ-6
Main title	Requirements for the administration of access event data to security-related RMI by the VM
Requirement definition	Access event data to security-related RMI shall be administered by the VM to support enquiries in case of liability issues.
Brief description	The following access event data shall be administered by the VM: — user ID; — log on and off times; — type of security-related RMI accessed; — VIN of the related vehicle; — affected ECU (if possible).

Table 7 *(continued)*

REQ #	TREQ-6
Classification	Mandatory

7 Requirements cluster 2 — IT architecture

7.1 [TREQ-7] Conceptual architecture

Table 8 defines the requirements for the conceptual architecture.

Table 8 — [TREQ-7] Conceptual architecture

REQ #	TREQ-7
Main title	Requirements for the conceptual architecture
Requirement definition	The implementation of the RMI system shall be according to a standardized conceptual architecture.
Brief description	The standardized conceptual architecture is described in Figure 2. The IO is responsible for the provision of client hardware (PC, laptop, etc.) and a VCI according to the detailed requirements in Clause 8. The VM is responsible for the availability of the RMI system and the authorized/purchased software and data components. The VM shall facilitate the successful download to the IO client, once the IO has registered, logged-in and prompted the download.
Classification	Mandatory

Figure 2 shows all IT systems potentially involved in the execution of the repair and maintenance use cases defined in ISO 18541-1.

— The RMI applications will be implemented as distributed software on a client device at the location of the independent operator (independent operator system) and a server in the VM premises (vehicle manufacturer/RMI system). The software distribution may follow different patterns depending on the overall design decision taken by the application builders to achieve an optimum performance (see 7.2).

— Client and server communicate via Internet.

— The RMI application may communicate with other applications for the execution of single use cases.

— The user is offered access to repair and maintenance information via the client device with standard navigation, communication and display facilities.

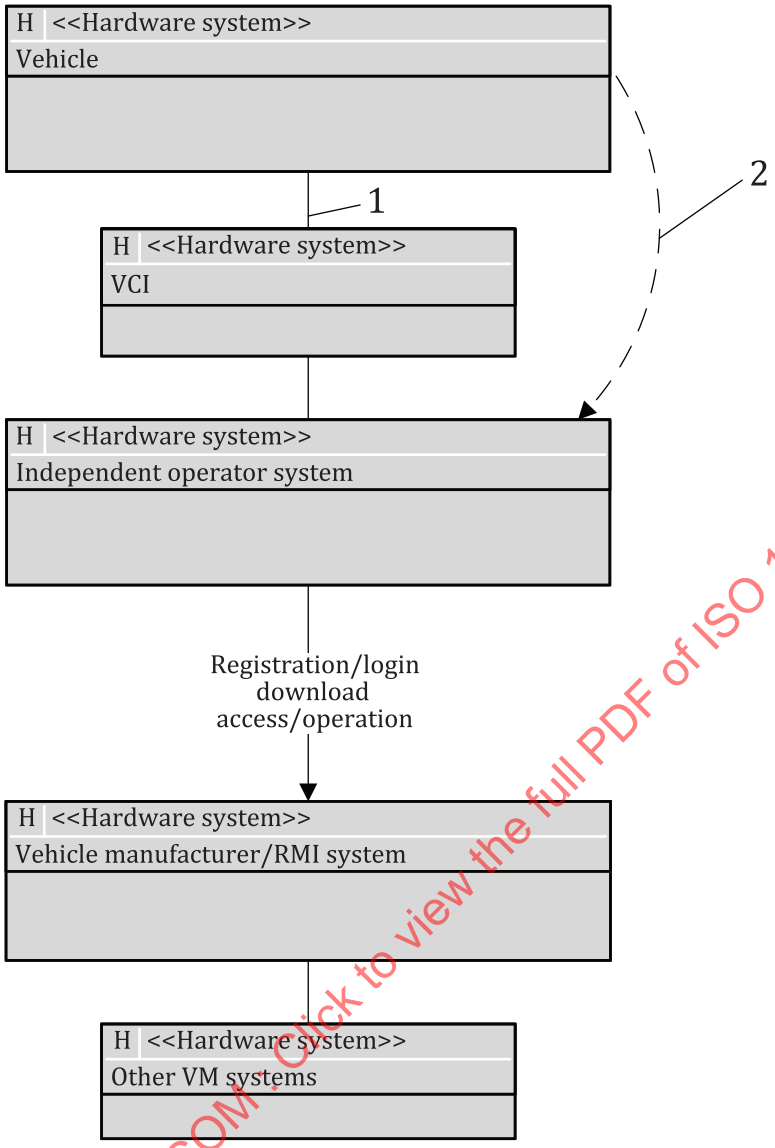
— The vehicle acts as an IT system communicating with the other systems for use cases like updating and replacing modules or integrated diagnostics.

— For the communication with the VM RMI applications, for the purposes of diagnostics and reprogramming, two alternatives are possible:

  — alternative '1': the vehicle is connected via a pluggable, standardized, non-proprietary vehicle communication interface;

  — alternative '2': the vehicle is connected via an in-build wireless, standardized, non-proprietary vehicle communication interface;

  — both alternatives shall either support ISO 22900-2 or the SAE J2534 series (or all three) standards.



Key

1 wired/wireless connection between “vehicle” and “independent operator system” with VCI protocol module

2 alternative means of connection as defined in TREQ-8 between “vehicle” and “independent operator system” without VCI protocol module

Figure 2 — Conceptual architecture for access to vehicle RMI

7.2 [TREQ-8] Implementation principles

Table 9 defines the requirements for the implementation principles.

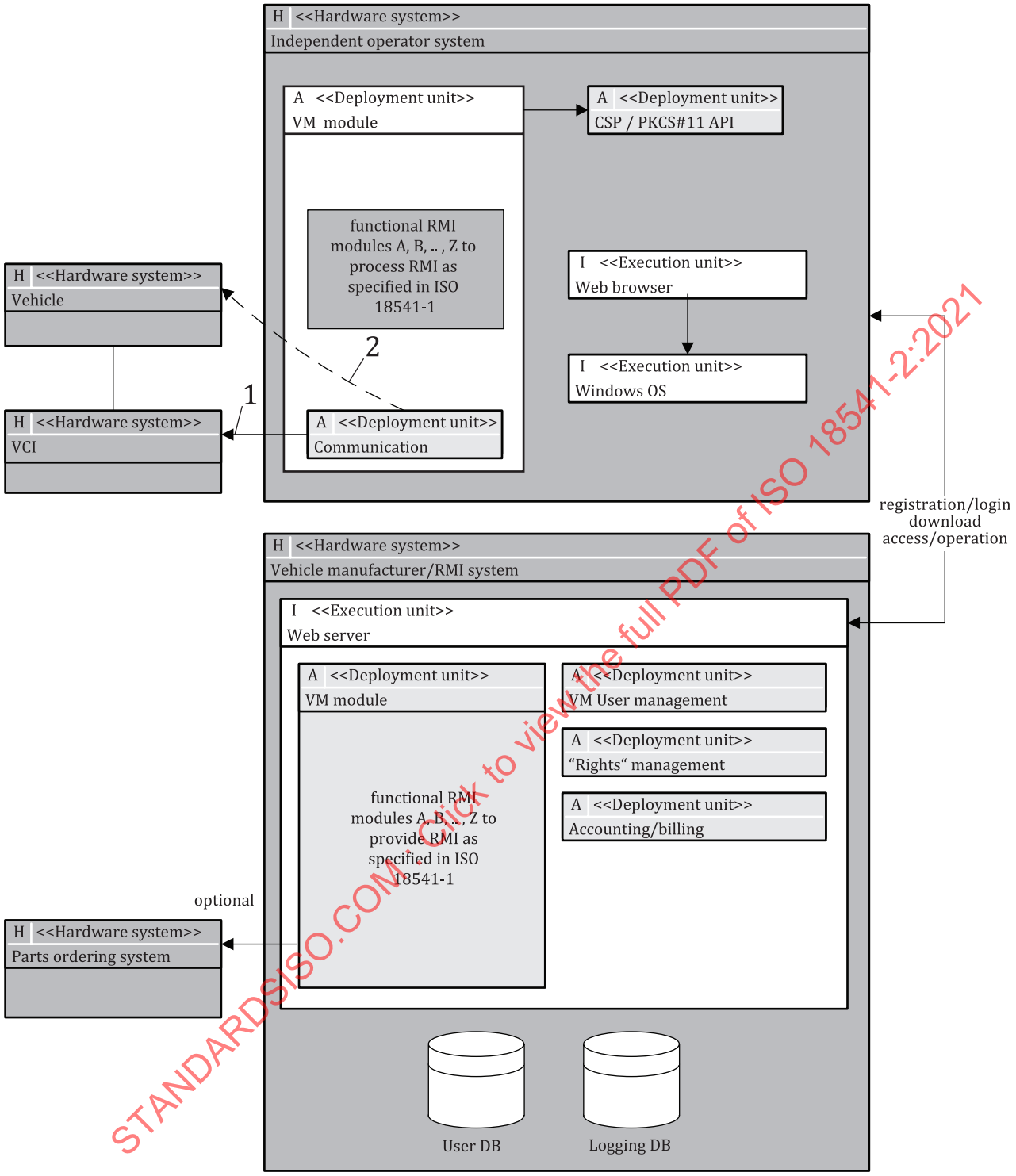
Table 9 — [TREQ-8] Implementation principles

REQ #	TREQ-8
Main title	Requirements for implementation principles
Requirement definition	The implementation of the VM RMI architecture may vary as long as it remains within the conceptual architecture.

Table 9 *(continued)*

REQ #	TREQ-8
Brief description	The VM will decide on the option for implementation to follow: — 'thin' client; — 'thick' client, or — any other implementation strategies following state-of-the-art software technology. There are minimum requirements for the software infrastructure to be supported by the implemented application. See the requirements of cluster 4 in Clause 9 for a detailed specification. Figure 3 shows an example for 'thick' client architecture. Figure 4 shows an example for 'thin' client architecture.
Classification	Mandatory

Figure 3 illustrates an example for the implementation of a VM RMI application following a so-called “thick client” software distribution pattern. Substantial parts of the application software are downloaded to the client system and executed there. Some use cases are executed completely in the client system; others are executed in cooperation between the client and the server application software parts.



Key

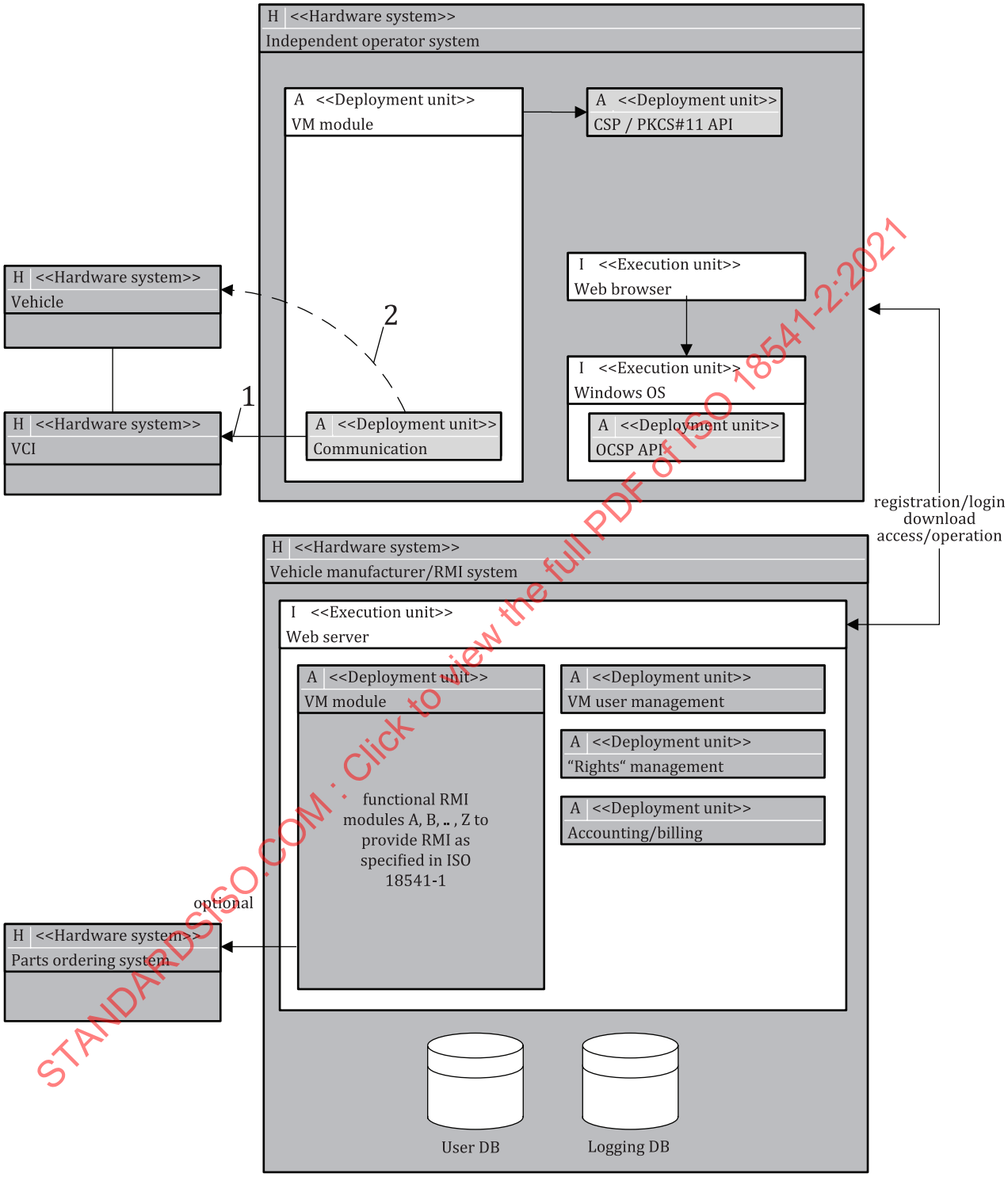
1 wired/wireless connection between “vehicle” and “independent operator system” with VCI protocol module

2 alternative means of connection as defined in TREQ-8 between “vehicle” and “independent operator system” without VCI protocol module

Figure 3 — Example for thick client architecture

Figure 4 illustrates an example for the implementation of a VM RMI application following a so-called “thin client” software distribution pattern. The application software resides only on the server and is not downloaded to the client. In the client system only modules for web-based navigation, display

and communication with the server, the vehicle, the certificate hardware and the trust centre are implemented. All use cases are executed using the server application software.



Key

1 wired/wireless connection between “vehicle” and “independent operator system” with VCI protocol module

2 alternative means of connection as defined in TREQ-8 between “vehicle” and “independent operator system” without VCI protocol module

Figure 4 — Example for thin client architecture

8 Requirements cluster 3 — External interfaces

8.1 [TREQ-9] Vehicle communication interface (VCI)

Table 10 defines the requirements for the vehicle communication interface.

Table 10 — [TREQ-9] Vehicle communication interface (VCI)

REQ #	TREQ-9
Main title	Requirements for the vehicle communication interface (VCI)
Requirement definition	The vehicle shall be connected to the diagnostics or programming application via a vehicle communication interface (VCI) either compliant to the modular vehicle communication interface (MVCI) according to ISO 22900-2 (D-PDU API), or SAE J2534 pass-thru according to SAE J2534–1 and SAE J2534–2 for diagnosis according to use case 6.3 and updating and replacing modules according to use cases in cluster 7 of ISO 18541-1:2021. The diagnostic and programming application may be integrated in the RMI system or run separately.
Brief description	The VM RMI website shall inform the user about the VCI standards supported under the relevant use cases. When the VM RMI system supports ISO 22900-2 then the VM RMI system will support the D-PDU API as specified in ISO 22900-2 (D-PDU API), so that different MVCI providers can communicate via this API with the VM RMI system application for updating and replacing modules and integrated diagnostics. A software driver for the specific MVCI shall be provided by the MVCI tool manufacturer and shall be installed in the IO PC in addition to the VM RMI system software. Figure 5 illustrates the ISO 22900-2 structure, components and interfaces. When the VM RMI system supports the SAE J2534 series of pass-thru standards then the VM RMI system will support the pass-thru API as specified in the SAE J2534–1 and SAE J2534–2 recommended practice, so that different pass-thru VCI providers can communicate via this API with the VM RMI system application for updating and replacing modules and integrated diagnostics. A software driver for the specific SAE J2534 series pass-thru VCI shall be provided by the pass-thru device tool manufacturer and shall be installed in the IO PC in addition to the VM RMI system software. Figure 6 illustrates the SAE J2534 series structure, components and interfaces. There may be many MVCI/pass-thru VCI providers for the vehicles and RMI system of one VM. It is up to the IO to make a provider choice. NOTE It is the VCI tool manufacturer's decision which vehicle communication protocols are implemented in the VCI. In addition to the above interfaces Ethernet, serial cable or LAN interface and alternative media like CD, DVD or memory stick may also be used for infotainment systems (e.g. navigation systems, telephone) but on the condition that no proprietary communication software (e.g. drivers or plugins) and hardware is required.
Classification	Mandatory

Figure 5 illustrates the ECU programming/diagnostic runtime system as part of the VM's RMI system with support for the ISO 22900-2 MVCI D-PDU API-compatible VCI.

The ECU programming/diagnostic runtime system consists of:

— at least one application, e.g. ECU programming;

— an ISO 22900-2 MVCI D-PDU API compatible Microsoft Windows™ 2) DLL provided by the VCI tool manufacturer;

2) Microsoft Windows is the trademark of a product supplied by Microsoft. This information is given for the convenience of users of this document and does not constitute an endorsement by ISO of the product named. Equivalent products may be used if they can be shown to lead to the same results.

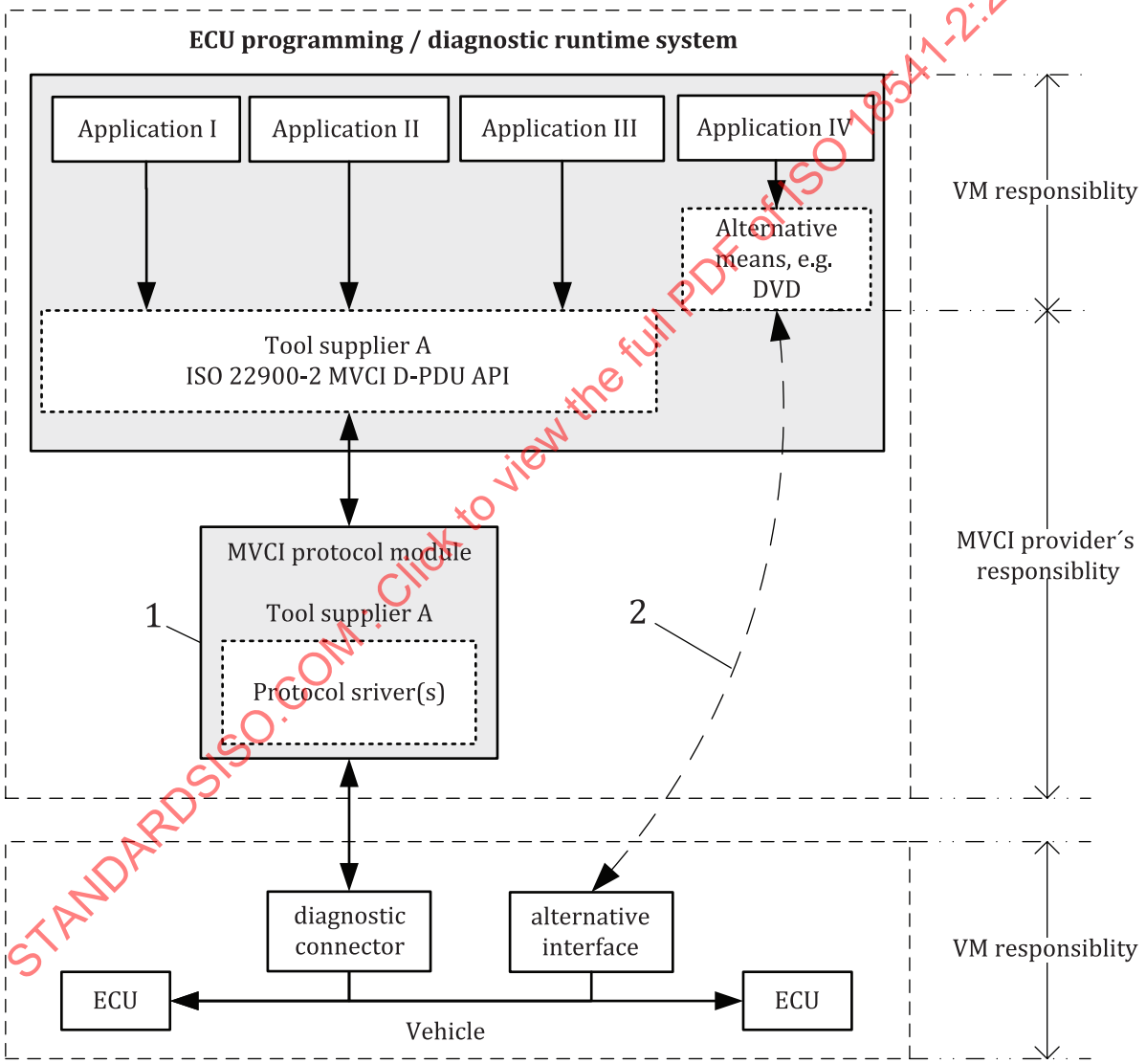
— alternative '1':

  — an MVCI protocol module with vehicle communication protocols (see NOTE in Table 10) provided by the VCI tool manufacturer;

  — an MVCI protocol module with a standardized diagnostic connector to connect to the vehicle. It is important to be aware of possible region-specific legislation regarding the standardized diagnostic connector, e.g. the ISO 15031-3 compatible diagnostic connector as used for light passenger cars.

— alternative '2':

  — alternative means of connection as defined in TREQ-8 between “vehicle” and “independent operator system” without VCI protocol module.



Key

1 wired/wireless connection between “vehicle” and “independent operator system” with VCI protocol module

2 alternative means of connection as defined in TREQ-8 between “vehicle” and “independent operator system” without VCI protocol module

Figure 5 — ISO 22900-2 MVCI D-PDU API-compatible VCI

Figure 6 illustrates the ECU programming/diagnostic runtime system as part of the VM's RMI system with support for the SAE J2534 series pass-thru API-compatible VCI.

The ECU programming/diagnostic runtime system shall consist of:

— at least one application, e.g. ECU programming;

— an SAE J2534-1 and SAE J2534-2 pass-thru API compatible Microsoft Windows™ DLL provided by the VCI tool manufacturer;

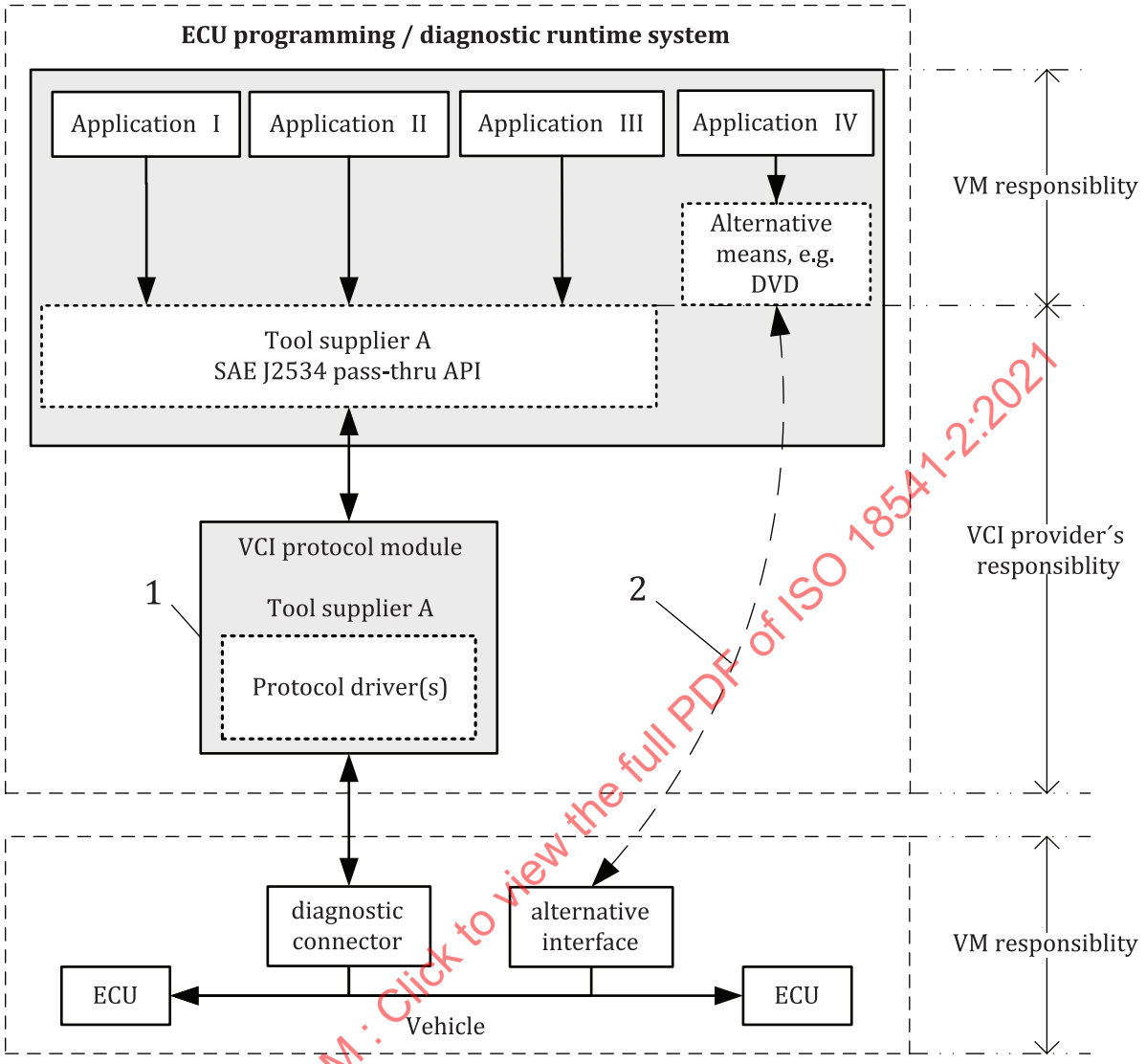
— alternative '1':

  — a pass-thru protocol module with vehicle communication protocols (see NOTE in Table 10) provided by the VCI tool manufacturer;

  — an SAE J2534 series pass-thru API-compatible VCI with a standardized diagnostic connector to connect to the vehicle. The standardized diagnostic connector shall be according to the requirements specified in the country-specific legislation, e.g. the ISO 15031-3 compatible diagnostic connector as used for light passenger cars.

— alternative '2':

  — alternative means of connection as defined in TREQ-8 between "vehicle" and "independent operator system" without pass-thru protocol module.



Key

1 wired/wireless connection between “vehicle” and “independent operator system” with VCI protocol module

2 alternative means of connection as defined in TREQ-8 between “vehicle” and “independent operator system” without VCI protocol module

Figure 6 — SAE J2534 series pass-thru API-compatible VCI

8.2 [TREQ-10] Trust centre (certificate management)

In case access to security-related RMI is provided following the SERMI scheme, the technical requirements defined in Annex A shall apply.

8.3 [TREQ-11] Parts ordering for security-related features

Table 11 defines the requirements for the parts ordering for security-related features.

Table 11 — [TREQ-11] Parts ordering for security-related features

REQ #	**TREQ-11**
Main title	Requirements for the parts ordering for security-related features

Table 11 *(continued)*

REQ #	TREQ-11
Requirement definition	In cases where ordering of security-related parts is needed, this ordering shall be facilitated either online or offline where appropriate.
Brief description	If and only if security-related parts (pre-programmed or programmable parts, e.g. keys or ECUs) can be ordered online, then an interface from the VM RMI system shall be provided to facilitate the ordering. This interface shall only be accessible for an IO with an appropriate access level granted by the VM. The ordering process to be followed will be VM-specific. Some VMs may provide access to an online parts ordering system, other VMs may require this ordering process to be conducted via the authorized repair network. There are different ways and concepts for the implementation of security-related features so that the repair doesn't require the ordering of pre-programmed or programmable parts, e.g. keys and ECUs.
Classification	Mandatory

8.4 [TREQ-12] Partnered accessory provider systems

Table 12 defines the requirements for the partnered accessory provider systems.

Table 12 — [TREQ-12] Partnered accessory provider systems

REQ #	TREQ-12
Main title	Requirements for the partnered accessory provider systems
Requirement definition	The VM RMI system shall support an interface or offer a link to a system of the accessory provider for RMI for the accessories.
Brief description	For the purposes of meeting the requirement a minimum interface would be a relevant URL.
Classification	Mandatory if the information is not contained in the VM RMI system.

9 Requirements cluster 4 — Technical infrastructure

9.1 [TREQ-13] Type of device

Table 13 defines the requirements for the type of device.

Table 13 — [TREQ-13] Type of device

REQ #	TREQ-13
Main title	Requirements for the type of device
Requirement definition	The VM RMI system shall support IO PCs and laptops which fulfil TREQ-13, TREQ-14 and TREQ-15 as client interfaces that are connected to the Internet.
Brief description	The devices shall be able to communicate via Internet. Other types of devices may be considered in the future depending on the overall technological evolution.
Classification	Mandatory

9.2 [TREQ-14] PC requirements

Table 14 defines the requirements for the PC.

Table 14 — [TREQ-14] PC requirements

REQ #	TREQ-14
Main title	Requirements for the PC
Requirement definition	The VM RMI system shall support a “fit for purpose” and commercially available PC.
Brief description	A “fit-for-purpose” and commercially available PC, laptop, etc. installed with an operating system that is currently supported by the operating system supplier is considered to be used by the IOs. Refer to VM-RMI website for "fit-for-purpose" requirements.
Classification	Mandatory

9.3 [TREQ-15] Operating systems

Table 15 defines the requirements for the operating systems.

Table 15 — [TREQ-15] Operating systems

REQ #	TREQ-15
Main title	Requirements concerning operating systems
Requirement definition	The VM shall ensure that the VM applications running on the IO client are able to run on a fit-for-purpose commercially available PC as specified in 9.2.
Brief description	See brief description in 9.2.
Classification	Mandatory

9.4 [TREQ-16] Web browsers

Table 16 defines the requirements for the web browsers.

Table 16 — [TREQ-16] Web browsers

REQ #	TREQ-16
Main title	Requirements for Web browsers
Requirement definition	The VM RMI system shall support at least one web browser which can run on a fit-for-purpose commercially available PC as specified in 9.2.
Brief description	A usage level is considered sufficient when the browser is Microsoft-Windows based and listed under the top 5 according to the acknowledged publisher of statistical usage data, e.g. “StatCounter Global Stats”, “W3Counter”. The supported web browser version shall be freely available and downloadable from the web browser supplier site.
Classification	Mandatory

9.5 [TREQ-17] Presentation formats for information packages

Table 17 defines the requirements for the presentation formats for information packages.

Table 17 — [TREQ-17] Presentation formats for information packages

REQ #	TREQ-17
Main title	Requirements for the presentation formats for information packages
Requirement definition	The information packages shall be presented using open text and graphic formats or formats that can be viewed and printed using only standard software plug-ins that are freely available, easy to install, and that run under computer operating systems, as listed in Table 15.

Table 17 *(continued)*

REQ #	TREQ-17
Brief description	PDF, HTML, JPG, PNG are examples of open text and open graphic formats as implied by the requirements.
Classification	Mandatory

9.6 [TREQ-18] Internet connection

Table 18 defines the requirements for the Internet connection.

Table 18 — [TREQ-18] Internet connection

REQ #	TREQ-18
Main title	Requirements for the Internet connection
Requirement definition	VM recommendations for Internet connection parameters shall be published by each VM. The VM application shall use known standard communication ports for any standard external protocols used within the application, e.g. http (80), https (443), ftp (21), for reference see ports up to 1023 in the standard ports list (RFC 1700). For internal communication local to the IO Client any port above 1023 can be used. VM software shall work with NAT (Network Address Translation) if the IO uses NAT.
Brief description	See requirement definition.
Classification	Mandatory

9.7 [TREQ-19] Performance of the VM RMI system

Table 19 defines the requirements for the performance of the VM RMI system.

Table 19 — [TREQ-19] Performance of the VM RMI system

REQ #	TREQ-19
Main title	Requirements for the performance of the VM RMI system
Requirement definition	The performance of the VM RMI system for an IO shall be equivalent to the performance for an AR considering the performance implications of using the Internet connection and the specification for the PC.
Brief description	See requirement definition.
Classification	Mandatory

10 Requirements cluster 5 — Co-existence of VM software on IO client

10.1 [TREQ-20] Requirements for installing VM-specific software on the IO client

Table 20 defines the requirements for installing VM-specific software on the IO client.

Table 20 — [TREQ-20] Requirements for installing VM-specific software on the IO client

REQ #	TREQ-20
Main title	Requirements for installing VM-specific software on the IO client

Table 20 *(continued)*

REQ #	TREQ-20
Requirement definition	If any VM-specific software is to be installed on the IO client it shall act in such a way that the functionality of the IO PC/laptop is unaffected when the VM software is not running, except for VM installed software files. In cases where the VM software installations on the IO client side cannot be performed without IO cooperation, the IO shall take the necessary steps to facilitate the installation following the instructions from the VM.
Brief description	The VM shall check at least the following properties for the support of their software (if there is no specific VM software to be installed, VM has only to check for support of a standard operating software as listed). — If connected devices (card reader, MVCI, pass-thru VCI, etc.) are used, they shall be applied with the tool manufacturer's driver unit. — If runtime-languages/script languages are used, which can be installed in different versions in parallel, these different runtime-languages versions can be installed. Configurations shall be made per application. Global configurations shall not be overwritten. — If runtime-languages/script languages are used, which cannot be installed in all version levels at the same time, the minimum version shall be used. Configurations shall be made per application. Global configurations shall not be overwritten; — If additional standard software packages are installed which need general PC resources (e.g. operating system services, Apache web server), they shall be set up in order to be used by several applications (e.g. the task scheduler: existing configurations shall not be overwritten but adjusted). — No system libraries/runtime environment modified, except for the update to a newer version. — No system initialization files modified. — No autorun entries added without user's confirmation. — The installation shall be contained either in a single folder named uniquely or follow the platform recommendation (e.g. Microsoft, Java). — If the VM application requires registry keys´ modifications, these shall be done either in the local user section or follow the platform recommendation (e.g. Microsoft, .NET).
Classification	Mandatory

10.2 [TREQ-21] Requirements for updating of installed VM data and applications on the IO client

Table 21 defines the requirements for updating VM-specific software on the IO client.

Table 21 — [TREQ-21] Requirements for updating of installed VM data and applications on the IO client

REQ #	TREQ-21
Main title	Requirements for updating VM-specific software on the IO client
Requirement definition	Installed VM data and applications on the IO client shall be maintained by checking the validity of the data and application when the application is running, and, where necessary, providing updates to the application but only with user consent. In addition to the actual VM applications web browser plugins or further base software components might be updated by the VM. Updates of the VM-specific software on the IO client shall follow the same requirements as installation of software onto the IO PC as set out in TREQ-20.

Table 21 *(continued)*

REQ #	TREQ-21
Brief description	The following installed VM data and applications and optionally also plugins and other base software components at the IO site shall be administered by the VM based on: — installed application version at the IO site; — current version information available; — downloaded data validity. In cases where the VM software installations and updates on the client side cannot be performed without IO cooperation, the IO shall take the necessary steps to facilitate the installation or update following the instructions from the VM.
Classification	Mandatory

10.3 [TREQ-22] Requirements for the operation of VM-specific software on the IO client

Table 22 defines the requirements for the operation of VM-specific software on the IO client.

Table 22 — [TREQ-22] Requirements for the operation of VM-specific software on the IO client

REQ #	TREQ-22
Main title	Requirements for the operation of VM-specific software on the IO client
Requirement definition	Any VM-specific software on the IO client shall be responsible for resetting the PC/laptop system configuration to the same state as it was before it started, excepting the VM-specific software configuration and general-purpose services and processes.
Brief description	If changes are made to the configuration of the IO PC/laptop, these changes shall be reset at the end of the execution of the VM-specific software, e.g. screen resolution, disabling of browser functions. Used resources shall be released when the VM-specific software completes execution and are closed wherever possible unless the user agreed otherwise during the application installation or via user specific configuration (e.g. connection to VCI device, communication port, use of libraries): — VM application specific processes and services shall not be running once the actual VM application's execution is terminated; — the VM application shall not terminate generic processes and services in the IO client (e.g. TOMCAT, Apache, antivirus); — TCP/UDP ports for VM specific processes and services shall not be in use once the VM application is terminated; — no system libraries/runtime environment modified, except for the update to a newer version; — no system initialization files modified.
Classification	Mandatory

10.4 [TREQ-23] Requirements for the uninstalling of VM-specific software on the IO client

Table 23 defines the requirements for the uninstalling of VM-specific software on the IO client.

Table 23 — [TREQ-23] Requirements for the uninstalling of VM-specific software on the IO client

REQ #	TREQ-23
Main title	Requirements for the uninstalling of VM-specific software on the IO client
Requirement definition	The VM-specific software is responsible for removing VM installed software files, data, registry entries and folders when the user requests to uninstall the VM software.
Brief description	The VM-specific software shall include a procedure for a complete removing of VM installed software files, data, registry entries and folders when the user requests to uninstall. User specific data shall only be removed if confirmed by the user except VM RMI-specific adjustments or preferences of the VM RMI-specific software. If additional standard software packages were installed which need general PC resources (e.g. operating system services, Apache web server), they shall not be removed if required by other applications.
Classification	Mandatory

10.5 [TREQ-24] Requirements for restoring in case of an abnormal termination of the VM-specific software on the IO client

Table 24 defines the requirements for restoring in case of an abnormal termination of the VM-specific software on the IO client.

Table 24 — [TREQ-24] Requirements for restoring in case of an abnormal termination of the VM-specific software on the IO client

REQ #	TREQ-24
Main title	Requirements for restoring in case of an abnormal termination of the VM-specific software on the IO client
Requirement definition	In case of an abnormal termination the VM specific software shall make best endeavours to restore the PC/laptop system configuration to the same state as after a normal termination, at the next invocation/call of the VM-specific software.
Brief description	At the start of VM-specific software it shall be possible to recognize there has been an abnormal termination in order to attempt to restore a consistent configuration state with regards to VM-specific installed software services and configuration files. The user will be informed about the actions put in place to this aim.
Classification	Mandatory

11 Requirements cluster 6 — Operations

11.1 [TREQ-25] VM RMI system availability time

Table 25 defines the requirements related to the VM RMI system availability time.

Table 25 — [TREQ-25] VM RMI system availability time

REQ #	TREQ-25
Main title	Requirements for the VM RMI system availability time
Requirement definition	The system shall be available except for scheduled maintenance downtime for the system or part of the system.

Table 25 *(continued)*

REQ #	TREQ-25
Brief description	The system shall be available 24 hours, 7 days a week except for scheduled maintenance downtime for the system or part of the system. The scheduled maintenance downtime notification period for the VM RMI system shall be the same for both an AR and an IO. IOs accessing the system during this time period should get the notification that some operations like re-programming may be interrupted by the maintenance downtime. The period of maintenance will depend on the type being carried out but will also form part of the notification, e.g. 'Maintenance on June 21st, 2011 for 2 h starting at 22:00 (CET)'. Date, time and time zone shall be indicated. Where possible this maintenance should be carried out outside of normal working hours. Emergency maintenance or failure of the VM RMI system shall be notified 'normal service will be resumed as soon as possible' or text with a similar meaning. It is the user's responsibility to continue to try and connect to the service as it is not possible to notify in this instance.
Classification	Mandatory

11.2 [TREQ-26] Support for the usage of the VM RMI system

Table 26 defines the requirements for the support for the usage of the VM RMI system.

Table 26 — [TREQ-26] Support for the usage of the VM RMI system

REQ #	TREQ-26
Main title	Requirements for the support for the usage of the VM RMI system
Requirement definition	The VM shall offer a support to assist the users in the usage of his RMI system.
Brief description	A "user manual" shall be made available online or for download from the VM RMI website homepage. Alternatively, the VM can provide a context sensitive online help. Online support in the form of a FAQ shall be available to assist the user. This shall be accessible from the VM RMI website. Email contact shall be available for registered users for issues not covered or understood within the FAQ. Additional support, e.g. user help desk, only if provided to authorized repairers and to the same level and conditions.
Classification	Mandatory with one optional part

11.3 [TREQ-27] Operation of the IO PC

Table 27 defines the requirements for the operation of the IO PC.

Table 27 — [TREQ-27] Operation of the IO PC

REQ #	TREQ-27
Main title	Requirements for the operation of the IO PC
Requirement definition	The IO shall keep the PC or laptop in an adequate state to allow the proper execution of the RMI functionality.

Table 27 *(continued)*

REQ #	TREQ-27
Brief description	The following are the recommendations for the operation of the IO PC. — The IO PC shall be connected to the Internet and be dedicated to operations required for the servicing and maintenance of vehicles. This is to avoid security threats, application conflicts and performance loss. — An IT security protection system shall be installed and shall be kept up to date. — The system firewall shall be activated, and the IO shall ensure that any firewall settings shall not interfere with the installation process and are in accordance with the technical settings for the firewall access issued by each VM. — The IO PC operating system and other relevant software infrastructure shall be kept up to date by the IO, i.e. migrating to the requirements in TREQ-13 – TREQ-17. During data transfer operations the computer shall be dedicated to this task as there is a danger of an interruption in communication resulting in a failed operation. IO shall comply with VM-specific requirements for the administration of downloaded VM data at the IO location e.g. as documented in the VM's terms and conditions.
Classification	Mandatory

12 Requirements cluster 7 — [TREQ-28] Functional user interface

Table 28 includes the reference to ISO 18541-3 functional user interface requirements.

Table 28 — [TREQ-28] Requirements cluster 7 — Functional user interface

REQ #	TREQ-28
Main title	Requirements for the functional user interface
Requirement definition	This requirements cluster includes the reference to the ISO 18541-3 functional user interface of the VM RMI system.
Brief description	See requirement definition.
Classification	Mandatory

Annex A
(normative)

Requirements for access to security-related RMI according to SERMI scheme

A.1 General

This annex specifies requirements for granting access to security-related RMI according to the SERMI scheme.

If the SERMI scheme is applied, the following modified requirements shall be considered. The modifications are marked in italics.

A.2 [TREQ-1] General access-related data administration

Table A.1 defines the requirements for the general access-related data administration.

Table A.1 — General access-related data administration

REQ #	TREQ-1
Main title	General access-related data administration
Requirement definition	The VM allows access to the RMI system depending on the storage of some data: — for user registration; — agreement to terms and conditions; — any other data required by local legislation; — for user login and access data recovery; — for invoicing; — for physical delivery of material if needed; — for logging of any access to security-related RMI, see SERMI; — for logging of any access to ECU replacing/update (in case of liability issues); — to be able to disable a user, see ISO 18541-1 use case UC 1.5 "request to delete the registration of an IO employee";
Brief description	The VM shall administer data on users, on payment, on access events to security-related RMI and on access events to general RMI content. It is important to be aware of any data or privacy protection legislation when administering this data.
Classification	Mandatory

A.3 [TREQ-3] Administration of IO employee data by the VM

Table A.2 defines the requirements for the administration of IO employee data by the VM.