# INTERNATIONAL STANDARD

ISO 14229-6

First edition 2013-03-15

## Road vehicles — Unified diagnostic services (UDS) —

Part 6:

**Unified diagnostic services on K-Line implementation (UDSonK-Line)** 

iTeh STVéhicules routiers—Services de diagnostic unifiés (SDU) —
Partie 6: SDU sur l'implémentation de la ligne-K (SDUsurLigne-K)

ISO 14229-6:2013 https://standards.iteh.ai/catalog/standards/sist/dc6edacd-1e5d-4779-9aaa-663ad61eef04/iso-14229-6-2013



# iTeh STANDARD PREVIEW (standards.iteh.ai)

ISO 14229-6:2013 https://standards.iteh.ai/catalog/standards/sist/dc6edacd-1e5d-4779-9aaa-663ad61eef04/iso-14229-6-2013



### COPYRIGHT PROTECTED DOCUMENT

© ISO 2013

All rights reserved. Unless otherwise specified, 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
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents					
Fore	eword	iv			
Intr	oduction	v			
1	Scope	1			
2	Normative references	1			
3	Terms, definitions and abbreviated terms				
5	3.1 Terms and definitions				
	3.2 Abbreviated terms				
4	Conventions	2			
5	Document overview				
6	Unified diagnostic services implementation on K-Line	4			
	6.1 General	4			
	6.2 UDSonK-Line services overview	4			
	<ul><li>6.3 Diagnostic and communication control functional unit</li><li>6.4 Data transmission functional unit</li></ul>	t5			
7	Application layer requirements				
	7.1 Application layer services				
	7.3 Application layer timing Application layer				
8	Presentation layer requirements	L VV			
9	Presentation layer requirements Session layer requirements Session layer requirements				
10	Transport/network layer interface adaptation	7			
	10.1 General information and approximation of the first state of the f	4779-9433-			
	10.2 DoK-Line transport/network layer interface adaptation	on			
11	Data link layer diagnostic implementation requirements				
	11.1 General information				
	11.2 Data segmentation 11.3 Session handling				
	11.4 Timings				
	11.5 Protocol initialization, start and stop of communicatio				
	11.6 Error handling				
12	Non-volatile server memory programming process				
Bibliography					

### **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. 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. 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.

The committee responsible for this document is ISO/TC 22, Road vehicles, Subcommittee SC 3, Electrical and electronic equipment.

ISO 14229 consists of the following parts under the general title *Road vehicles* — *Unified diagnostic services (UDS)*:

- Part 1: Specification and requirements ISO 14229-6:2013
  - https://standards.iteh.ai/catalog/standards/sist/dc6edacd-1e5d-4779-9aaa-
- Part 2: Session layer services
- 663ad61eef04/iso-14229-6-2013
- Part 3: Unified diagnostic services on CAN implementation (UDSonCAN)
- Part 4: Unified diagnostic services on FlexRay implementation (UDSonFR)
- Part 5: Unified diagnostic services on Internet Protocol implementation (UDSonIP)
- Part 6: Unified diagnostic services on K-Line implementation (UDSonK-Line)

The following part is under preparation:

— Part 7: Unified diagnostic services on Local Interconnet Network implementation (UDSonLIN)

The titles of future parts will be drafted as follows:

— Part n: Unified diagnostic services on ... implementation (UDSon...)

### Introduction

This part of ISO 14229 has been established in order to enable the implementation of unified diagnostic services, as specified in ISO 14229-1, on K-Line (UART based) networks (UDSonK-Line).

To achieve this, it is based on the Open Systems Interconnection (OSI) Basic Reference Model specified in ISO/IEC 7498-1 and ISO/IEC 10731, which structures communication systems into seven layers. When mapped on this model, the services specified by ISO 14229 are divided into:

- Application layer (layer 7), specified in:
  - Vehicle manufacturer enhanced diagnostics: ISO 14229-1 / ISO 14229-6,
  - Legislated OBD: ISO°15031-5,
  - Legislated WWH-OBD: ISO 14229-1, ISO 27145-3;
- Presentation layer (layer 6), specified in:
  - Vehicle manufacturer enhanced diagnostics: not applicable,
  - Legislated OBD: SAE J1930-DA, SAE J1979-DA, SAE J2012-DA,
  - Legislated WWH-OBD: ISO 27145-2 with reference to SAE J1930-DA, SAE J1939 Companion Spreadsheet (SPNs), SAE J1939-73:2010, Appendix A (FMIs), SAE J1979-DA and SAE J2012-DA;
- Session layer services (layer 5), specified in: PREVIEW
  - Vehicle manufacturer en hanced diagnostics: 180 14229-2,
  - Legislated OBD: ISO 14229-2, <u>ISO 14229-6:2013</u>
  - Legislated WWH-0BD: iSO 1/422992/tandards/sist/dc6edacd-1e5d-4779-9aaa-663ad61eel04/iso-14229-6-2013
- Transport layer services (layer 4), specified in:
  - Vehicle manufacturer enhanced diagnostics: ISO 14230-2,
  - Legislated OBD: ISO 15765-2, ISO 15765-4,
  - Legislated WWH-OBD: ISO 27145-4;
- Network layer services (layer 3), specified in:
  - Vehicle manufacturer enhanced diagnostics: ISO 14230-2,
  - Legislated OBD: ISO 15765-2, ISO 15765-4,
  - Legislated WWH-OBD: ISO 27145-4;
- Data link layer (layer 2), specified in:
  - Vehicle manufacturer enhanced diagnostics: ISO 14230-2,
  - Legislated OBD: ISO 11898-1, ISO 11898-2, ISO 15765-4,
  - Legislated WWH-OBD: ISO 27145-4;
- Physical layer (layer 1), specified in:
  - Vehicle manufacturer enhanced diagnostics: ISO 14230-1,
  - Legislated OBD: ISO 11898-1, ISO 11898-2, ISO 15765-4,

### ISO 14229-6:2013(E)

Legislated WWH-OBD: ISO 27145-4;

in accordance with Table 1.

Table 1 — DoK-Line enhanced diagnostics, legislated OBD and WWH-OBD specification reference applicable to the OSI layers

Applicability	OSI 7 layers	Vehicle manufacturer enhanced diag- nostics	Legislated OBD	Legislated WWH-OBD		
	Application (layer 7)	ISO 14229-1 / ISO 14229-6	ISO 15031-5	ISO 14229-1 / ISO 27145-3		
	Presentation (layer 6)	Vehicle manufac- turer specific	SAE J1930-DA / SAE J1979-DA / SAE J2012-DA	ISO 27145-2, SAE J1930-DA, SAE J1939 Companion Spreadsheet (SPNs), SAE J1939- 73:2010, Appendix A (FMIs), SAE J1979-DA, SAE J2012-DA		
Seven layer according to ISO/IEC 7498-1	Session (layer 5)	ISO 14229-2				
and	Transport (layer 4)	er 4) vork ISO 14230-2	ISO 15765-2, ISO 15765-4	ISO 15765-2, ISO 15765-4	- ISO 27145-4	ISO 13400-2
ISO/IEC 10731	Network (layer 3)					
	Data link (layer 2)	iTso4230-TA	ISO 11898-1, ISO 11898-2,	ISO 11898-1, ISO 11898-2,	130 27 143-4	ISO 13400-3, IEEE 802.3
	Physical (layer 1)		ISO 15765-4. IND 15765-4.	ISO 11696-2, ISO 15765-4		

ISO 14229-6:2013

https://standards.iteh.ai/catalog/standards/sist/dc6edacd-1e5d-4779-9aaa-663ad61eef04/iso-14229-6-2013

### Road vehicles — Unified diagnostic services (UDS) —

### Part 6:

## Unified diagnostic services on K-Line implementation (UDSonK-Line)

### 1 Scope

This part of ISO 14229 specifies the implementation of a common set of unified diagnostic services (UDS) on K-Line (UART based) in road vehicles (UDSonK-Line).

UDSonK-Line references ISO 14229-1 and ISO 14229-2, and specifies implementation requirements of

- the diagnostic services to be used for diagnostic communication over K-Line,
- the server memory programming for all in-vehicle servers connected to a K-Line network with external test equipment.

NOTE UDSonK-Line does not specify any requirement for the in-vehicle K-Line bus architecture.

This part of ISO°14229 makes reference to information contained in ISO 14229-1, ISO 14229-2, ISO 14230-1, and ISO 14230-2. (standards.iteh.ai)

This part of ISO 14229 does not include any redundant information of the above-mentioned documents. It focuses on ISO 14229-6:2013

https://standards.iteh.ai/catalog/standards/sist/dc6edacd-1e5d-4779-9aaa-

- additional requirements specific to the implementation of UDSonK-Line network, and
- specific restrictions in the implementation of UDSonK-Line network.

### 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 14229-1, Road vehicles — Unified diagnostic services (UDS) — Part 1: Specification and requirements

ISO 14229-2, Road vehicles — Unified diagnostic services (UDS) — Part 2: Session layer services

ISO 14230-1, Road vehicles — Diagnostic communication over K-Line (DoK-Line) — Part 1: Physical layer

ISO 14230-2, Road vehicles — Diagnostic communication over K-Line (DoK-Line) — Part 2: Data link layer

ISO 14230-4, Road vehicles — Diagnostic systems — Keyword Protocol 2000 — Part 4: Requirements for emission-related systems

### 3 Terms, definitions and abbreviated terms

### 3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 14229-1, ISO 14229-2, ISO 14230-1 and ISO 14230-2 apply.

### ISO 14229-6:2013(E)

### 3.2 Abbreviated terms

Mtype message type

AE address extension

DA destination address

ID identifier

FB first byte

SA source address

TA target address

SFID subfunction identifier

### 4 Conventions

This part of ISO 14229 is based on the conventions discussed in the OSI Service Conventions (ISO/IEC 10731:1994) as they apply for diagnostic services.

### 5 Document overviewiTeh STANDARD PREVIEW

Figure 1 illustrates the document references from ISO 14229-1, ISO 14229-2, ISO 14230-1 and ISO 14230-2. This part of ISO 14229 uses only a subset of the diagnostic services defined in ISO 14229-1 (see Table 2).

ISO 14229-6:2013

https://standards.iteh.ai/catalog/standards/sist/dc6edacd-1e5d-4779-9aaa-663ad61eef04/iso-14229-6-2013

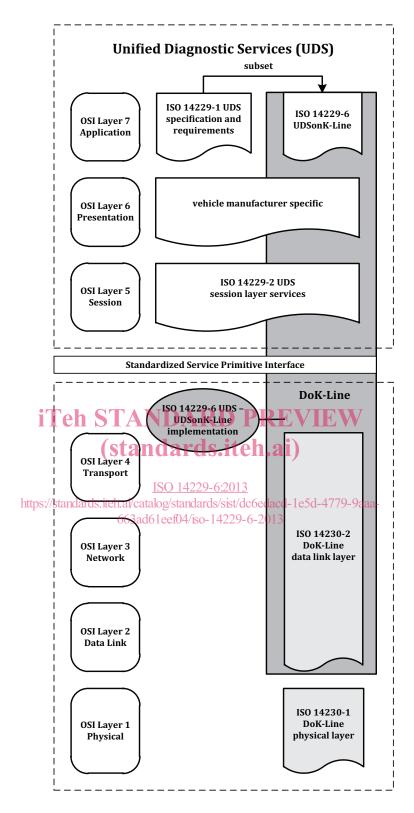


Figure 1 — UDSonK-Line document reference according to OSI model