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BS ISO 14229-1:2013



BSI Standards Publication

Road vehicles — Unified diagnostic services (UDS)

Part 1: Specification and requirements

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Road vehicles — Unified diagnostic services (UDS) —

Part 1: Specification and requirements

*Véhicules routiers — Services de diagnostic unifiés (SDU) —
Partie 1: Spécification et exigences*



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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 14229-1 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 3, *Electrical and electronic equipment*.

This second edition cancels and replaces the first edition (ISO 14229-1:2006), which has been technically revised.

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

- *Part 1: Specification and requirements*
- *Part 2: Session layer services*
- *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 Interconnect Network implementation (UDSonLIN)*

The titles of future parts will be drafted as follows:

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

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Introduction

ISO 14229 has been established in order to define common requirements for diagnostic systems, whatever the serial data link is.

To achieve this, ISO 14229 is based on the Open Systems Interconnection (OSI) Basic Reference Model in accordance with ISO 7498-1 and ISO/IEC 10731, which structures communication systems into seven layers. When mapped on this model, the services used by a diagnostic tester (client) and an Electronic Control Unit (ECU, server) are broken into the following layers in accordance with Table 1:

- Application layer (layer 7), unified diagnostic services specified in ISO 14229-1, ISO 14229-3 UDSONCAN, ISO 14229-4 UDSONFR, ISO 14229-5 UDSONIP, ISO 14229-6 UDSONK-Line, ISO 14229-7 UDSONLIN, further standards and ISO 27145-3 WWH-OBD.
- Presentation layer (layer 6), vehicle manufacturer specific, ISO 27145-2 WWH-OBD.
- Session layer services (layer 5) specified in ISO 14229-2.
- Transport layer services (layer 4), specified in ISO 15765-2 DoCAN, ISO 10681-2 Communication on FlexRay, ISO 13400-2 DoIP, ISO 17987-2 LIN, ISO 27145-4 WWH-OBD.
- Network layer services (layer 3), specified in ISO 15765-2 DoCAN, ISO 10681-2 Communication on FlexRay, ISO 13400-2 DoIP, ISO 17987-2 LIN, ISO 27145-4 WWH-OBD.
- Data link layer (layer 2), specified in ISO 11898-1, ISO 11898-2, ISO 17458-2, ISO 13400-3, IEEE 802.3, ISO 14230-2, ISO 17987-3 LIN and further standards, ISO 27145-4 WWH-OBD.
- Physical layer (layer 1), specified in ISO 11898-1, ISO 11898-2, ISO 17458-4, ISO 13400-3, IEEE 802.3, ISO 14230-1, ISO 17987-4 LIN and further standards, ISO 27145-4 WWH-OBD.

NOTE The diagnostic services in this standard are implemented in various applications e.g. Road vehicles – Tachograph systems, Road vehicles – Interchange of digital information on electrical connections between towing and towed vehicles, Road vehicles – Diagnostic systems, etc. It is required that future modifications to this standard provide long-term backward compatibility with the implementation standards as described above.

Table 1 — Example of diagnostic/programming specifications applicable to the OSI layers

Applicability	OSI seven layer	Enhanced diagnostics services						WWH-OBD
Seven layer according to ISO/IEC 7498-1 and ISO/IEC 10731	Application (layer 7)	ISO 14229-1, ISO 14229-3 UDSONCAN, ISO 14229-4 UDSONFR, ISO 14229-5 UDSONIP, ISO 14229-6 UDSONK-Line, ISO 14229-7 UDSONLIN, further standards						ISO 27145-3
	Presentation (layer 6)	vehicle manufacturer specific						ISO 27145-2
	Session (layer 5)	ISO 14229-2						
	Transport (layer 4)	ISO 15765-2	ISO 10681-2	ISO 13400-2	Not applicable	ISO 17987-2	further standards	ISO 27145-4
	Network (layer 3)						further standards	
	Data link (layer 2)	ISO 11898-1, ISO 11898-2	ISO 17458-2	ISO 13400-3, IEEE 802.3	ISO 14230-2	ISO 17987-3	further standards	
	Physical (layer 1)		ISO 17458-4		ISO 14230-1	ISO 17987-4	further standards	

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Road vehicles — Unified diagnostic services (UDS) —

Part 1: Specifications and requirements

1 Scope

This part of ISO 14229 specifies data link independent requirements of diagnostic services, which allow a diagnostic tester (client) to control diagnostic functions in an on-vehicle Electronic Control Unit (ECU, server) such as an electronic fuel injection, automatic gear box, anti-lock braking system, etc. connected to a serial data link embedded in a road vehicle.

It specifies generic services, which allow the diagnostic tester (client) to stop or to resume non-diagnostic message transmission on the data link.

This part of ISO 14229 does not apply to non-diagnostic message transmission on the vehicle's communication data link between two Electronic Control Units. However, this part of ISO 14229 does not restrict an in-vehicle on-board tester (client) implementation in an ECU in order to utilize the diagnostic services on the vehicle's communication data link to perform bidirectional diagnostic data exchange.

This part of ISO 14229 does not specify any implementation requirements.

2 Normative references

The following referenced documents are indispensable for the application 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 14229-2, *Road vehicles — Unified diagnostic services (UDS) — Part 2: Session layer services*

3 Terms, definitions, symbols and abbreviated terms

3.1 Terms and definitions

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

3.1.1

boot manager

part of the boot software that executes immediately after an ECU power on or reset whose primary purpose is to check whether a valid application is available to execute as compared to transferring control to the reprogramming software

NOTE The boot manager may also take into account other conditions for transitioning control to the reprogramming software.

3.1.2

boot memory partition

area of the server memory in which the boot software is located