



**International
Standard**

ISO 23150-2

**Road vehicles — Logical interface
between sensors and data fusion
unit for automated driving
functions —**

**Part 2:
Object level interfaces**

*Véhicules routiers — Interface logique entre capteurs et unité de
fusion de données pour les fonctions de conduite automatisée —*

Partie 2: Interfaces de niveau objet

**First edition
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Sample Document

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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 document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see <http://www.iso.org/directives>).

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This document was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 31, *Data communication*.

This first edition of ISO 23150-2, together with ISO 23150-1 [\[1\]](#), ISO 23150-11 [\[2\]](#), ISO 23150-12 [\[3\]](#), ISO 23150-13 [\[4\]](#), ISO 23150-14 [\[5\]](#), ISO 23150-15 [\[6\]](#) and ISO 23150-20 [\[7\]](#), cancels and replaces ISO 23150:2023, which has been technically revised.

The main changes are as follows:

- reorganisation of the document structure; use of generic interfaces, generic signals, generic profiles and terms and definitions defined in ISO 23150-1 [\[1\]](#) as a basis for this document;
- specific collection of interfaces in separated documents; in this document specific collection of all interfaces on object level.

A list of all parts in the ISO 23150 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

Vehicle environmental perception sensors (single sensor or sensor cluster) provide logical interfaces according to the ISO 23150 series to the fusion unit or automated driving functions. The fusion unit generates a surround model and interprets the scene around the vehicle based on the sensor data. Interfaces are defined on different levels and described in a modular and semantic representation. The interfaces on feature level, advanced detection level and detection level are technology specific and differ by each technology.

[Figure 1](#) shows the schematic and contextual relationships between the documents relating to logical interfaces of the ISO 23150 series.

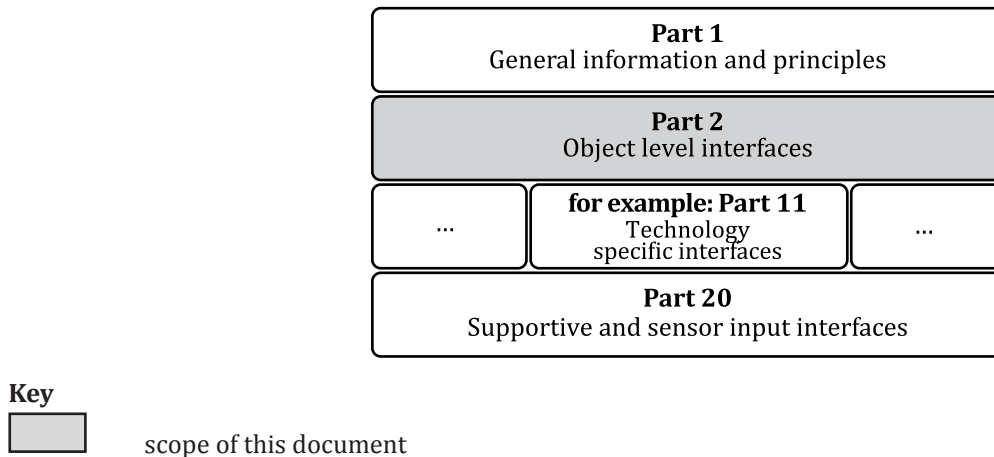


Figure 1 — Relationship of the ISO 23150 series

This document specifies the object level interfaces. Object interfaces such as the "potentially -moving -object interface" ([5.2.1](#)), the "road object interface" ([5.3.1](#)), the "static object interface" ([5.4.1](#)) and the "free-space object interface" ([5.5.1](#)) are part of the object level. These interfaces are based on the generic specifications of the object level interface in the ISO 23150-1 [\[1\]](#), which are supplied by single sensors or sensor clusters. This document references generic specifications of signals of the header and the generic interface levels.

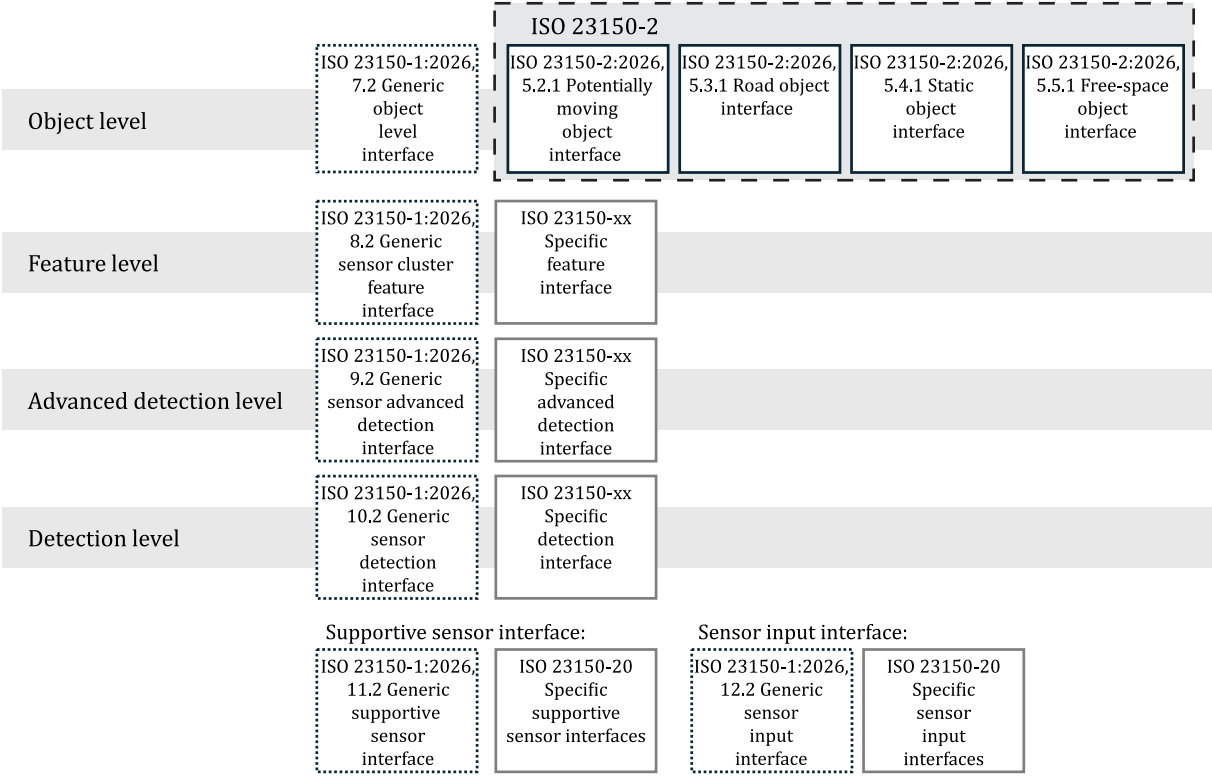
A sensor or sensor cluster may also implement (provide or receive) logical interfaces:

- on feature, advanced detection or detection level (see technology specific parts of the ISO 23150 series);
- for additional interfaces as supportive sensor interfaces and sensor input information interfaces (see ISO 23150-20 [\[7\]](#)).

This document is not intended to replace the logical interface specifications of other documents in the ISO 23150 series.

This document is based on the generic specifications in ISO 23150-1 [\[1\]](#) as shown in [Figure 2](#):

- generic object level interface;
- general level-independent profiles.



Key



scope of this document

Figure 2 — Interfaces in the scope of this document and the related interfaces of the ISO 23150 series

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Road vehicles — Logical interface between sensors and data fusion unit for automated driving functions —

Part 2: Object level interfaces

1 Scope

This document is applicable to road vehicles with automated driving functions and specifies the interfaces at the object level:

- potentially moving object interface;
- road object interface;
- static object interface;
- free-space object interface.

This document does not provide electrical and mechanical interface specifications. Raw data interfaces are also excluded.

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 23150-1, *Road vehicles — Logical interface between sensors and data fusion unit for automated driving functions — Part 1: General information and principles*

ISO 23150-1:2026, *Road vehicles — Logical interface between sensors and data fusion unit for automated driving functions — Part 1: General information and principles*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 23150-1 apply.

ISO and IEC maintain terminology 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/>

4 Abbreviated terms

A2I	assign to interface
AD	automated driving
ADLI	advanced detection level interface
AER	alternative entity representation
C	conditional
D	dimensional
DE	default enumerators
DLI	detection level interface
ECU	electronic control unit
EES	extended enumeration signal
EM	error model
FLI	feature level interface
FSOI	free-space object interface
ID	identifier
IQR	interquartile range
IR	infrared
IRI	international roughness index
IV	implicit value
LL	list length
LSG	logical signal group
M	mandatory
O	optional
OLI	object level interface
PMOI	potentially moving object interface
RDOI	road object interface
RL	requirement level
SII	sensor input interface
SOI	static object interface
SSI	supportive sensor interface
UTL	unrolling tuple list

VRO value representation optimisation

5 Object level

5.1 General

The generic specification of the object level interfaces is defined in ISO 23150-1:2026, Clause 7. The object level interfaces shall be based on the generic object level interface as specified in ISO 23150-1:2026, 7.2.

On object level the following interfaces are available:

- potentially moving object interface ([5.2.1](#));
- road object interface ([5.3.1](#));
- static object interface ([5.4.1](#));
- free-space object interface ([5.5.1](#)).

5.2 Potentially moving object

5.2.1 Potentially moving object interface

The potentially moving object interface ([PMOI](#)) contains the list of objects that could potentially move and are relevant for driving situations. This includes all objects that currently move, have moved (see [Figure 3](#)) and that are not definitely static three-dimensional structures. [Table 1](#) defines the general structure of the potentially moving object interface.

Table 1 — Potentially moving object interface structure

Structure	Multiplicity	Option
Potentially moving object header (5.2.2)	1	
Potentially moving objects	Multiple	Size type: dynamic/fixed

The logical structure of the [PMOI](#) shall be implemented in accordance with the interface definition specified in [Table 2](#), the signals as defined in [Annex A](#) and ISO 23150-1:2026, Annex A. Furthermore, the generic profiles as defined in [5.2.4](#) and in ISO 23150-1:2026 as well as the signal options defined in ISO 23150-1:2026, Annex B shall also be considered. The object interface defines sets of signals for more detailed potentially moving object types (for example, lights, persons).

ISO 23150-2:2026(en)

Table 2 — Potentially moving object interface

LSG	RL LSG M/C/O	Signal	RL signal M/C/O	Option
Information: interface	M	Interface version ID {major, minor, patch} (ISO 23150-1:2026, A.1.2)	M	Profile: Uniqueness of interface versioning (ISO 23150-1:2026, 6.5.1)
		Interface ID (ISO 23150-1:2026, A.1.3)	O	Profile: Uniqueness of interface versioning (ISO 23150-1:2026, 6.5.1)
		Number of valid serving sensors (ISO 23150-1:2026, A.1.4)	M	Profile: Uniqueness of interface versioning (ISO 23150-1:2026, 6.5.1) Optimise LL (ISO 23150-1:2026, B.1.2) Alternative UTL (ISO 23150-1:2026, B.1.7) Key: Sensor ID (ISO 23150-1:2026, A.1.5)
		Size type: dynamic/fixed Size #: Number of valid serving sensors (ISO 23150-1:2026, A.1.4)		
		Sensor ID (ISO 23150-1:2026, A.1.5)	M	Profile: Uniqueness of interface versioning (ISO 23150-1:2026, 6.5.1) Alternative VRO (ISO 23150-1:2026, B.1.4)
		Time stamp – prediction (ISO 23150-1:2026, A.1.6.1)	M	
		Cycle counter (ISO 23150-1:2026, A.1.7.1)	O	Redundancy (ISO 23150-1:2026, B.1.3) Signal: Time stamp – prediction (ISO 23150-1:2026, A.1.6.1)
		Interface cycle time (ISO 23150-1:2026, A.1.8)	O	
		Interface cycle time – variation (ISO 23150-1:2026, A.1.9)	O	
		Data qualifier (ISO 23150-1:2026, A.1.10)	M	Optimise DE (ISO 23150-1:2026, B.1.8) Optimise EES (ISO 23150-1:2026, B.1.9)
		Motion type (A.1.2)	M	Profile: Motion type (5.2.4.1) Optimise DE (ISO 23150-1:2026, B.1.8) Optimise EES (ISO 23150-1:2026, B.1.9)
Potentially moving objects				

Table 2 (continued)

LSG	RL LSG M/C/O	Signal	RL signal M/C/O	Option
Potentially moving objects information	M	Recognised objects – capability – potentially moving objects (A.1.3.1)	O	
		Recognised objects – status – potentially moving objects (A.1.4.1)	O	Redundancy (ISO 23150-1:2026, B.1.3) Signal: Recognised objects – capability – potentially moving objects (A.1.3.1) Optimise DE (ISO 23150-1:2026, B.1.8) Optimise EES (ISO 23150-1:2026, B.1.9)
		Number of valid objects – potentially moving objects (A.1.5.1)	M	Optimise LL (ISO 23150-1:2026, B.1.2)
		Size type: dynamic/fixed Size #: Number of valid objects – potentially moving objects (A.1.5.1)		
↔ Potentially moving object status	M	Existence probability – object level (ISO 23150-1:2026, A.3.2)	M	
		Object ID (ISO 23150-1:2026, A.3.3)	M	Alternative A2I (ISO 23150-1:2026, B.3.3)
		Object grouping ID (ISO 23150-1:2026, A.3.4)	O	
		Age (ISO 23150-1:2026, A.2.22)	M	Profile: Observations (ISO 23150-1:2026, 6.5.8)
		Number of valid observations (ISO 23150-1:2026, A.2.23)	O	Profile: Observations (ISO 23150-1:2026, 6.5.8) Optimise LL (ISO 23150-1:2026, B.1.2) Alternative UTL (ISO 23150-1:2026, B.1.7) Key: Time stamp reference (ISO 23150-1:2026, A.2.24)
		Size type: dynamic/fixed Size #: Number of valid observations (ISO 23150-1:2026, A.2.23)		
		Time stamp reference (ISO 23150-1:2026, A.2.24)	M	Profile: Observations (ISO 23150-1:2026, 6.5.8) Alternative VRO (ISO 23150-1:2026, B.1.4)

ISO 23150-2:2026(en)

Table 2 (continued)

LSG	RL LSG M/C/O	Signal		RL signal M/C/O	Option
			Observation status (ISO 23150-1:2026, A.2.25)	M	Profile: Observations (ISO 23150-1:2026, 6.5.8) Redundancy (ISO 23150-1:2026, B.1.3) Signal: Object ID (ISO 23150-1:2026, A.3.3), Time stamp – prediction (ISO 23150-1:2026, A.1.6.1) Optimise DE (ISO 23150-1:2026, B.1.8) Optimise EES (ISO 23150-1:2026, B.1.9)
			Track quality (ISO 23150-1:2026, A.3.5)	O	
			Measurement status (ISO 23150-1:2026, A.2.68)	M	Profile: Measurement status (ISO 23150-1:2026, 6.5.18) Optimise DE (ISO 23150-1:2026, B.1.8) Optimise EES (ISO 23150-1:2026, B.1.9)
↔ Potentially moving object information	M		Tracking motion model (A.2.2)	O	Optimise DE (ISO 23150-1:2026, B.1.8) Optimise EES (ISO 23150-1:2026, B.1.9)
			Number of valid recognition classifications (ISO 23150-1:2026, A.2.61)	M	Profile: Recognition classification type (ISO 23150-1:2026, 6.5.15) Optimise LL (ISO 23150-1:2026, B.1.2) Alternative UTL (ISO 23150-1:2026, B.1.7) Key: Recognition classification type (ISO 23150-1:2026, A.2.62)
		Size type: dynamic/fixed Size #: Number of valid recognition classifications (ISO 23150-1:2026, A.2.61)			
			Recognition classification type (ISO 23150-1:2026, A.2.62)	M	Profile: Recognition classification type (ISO 23150-1:2026, 6.5.15) Alternative VRO (ISO 23150-1:2026, B.1.4) Optimise DE (ISO 23150-1:2026, B.1.8) Optimise EES (ISO 23150-1:2026, B.1.9)
			Recognition classification type – confidence (ISO 23150-1:2026, A.2.63)	M	Profile: Recognition classification type (ISO 23150-1:2026, 6.5.15)

ISO 23150-2:2026(en)

Table 2 (continued)

LSG	RL LSG M/C/O	Signal	RL signal M/C/O	Option
		Road level (A.2.3)	0	Redundancy (ISO 23150-1:2026, B.1.3) Signal: {z} of Position {x, y, z} (ISO 23150-1:2026, A.2.43) Optimise DE (ISO 23150-1:2026, B.1.8) Optimise EES (ISO 23150-1:2026, B.1.9)
↔ Potentially moving object position	M	Position {x, y, z} (ISO 23150-1:2026, A.2.43)	{M, M, O}	Profile: Object pose (ISO 23150-1:2026, 7.5.3) Profile: Motion state vector (5.2.4.2)
		Position {x, y, z} – error (ISO 23150-1:2026, A.2.44)	C Analog: Position {x, y, z} (ISO 23150-1:2026, A.2.43)	Profile: Object pose (ISO 23150-1:2026, 7.5.3) Profile: Motion state vector (5.2.4.2) Implementation EM (ISO 23150-1:2026, B.4.2)
		Orientation {yaw, pitch, roll} (ISO 23150-1:2026, A.3.22)	{C (ISO 23150-1:2026, B.2.2) Relevant: camera, O, O}	Profile: Object pose (ISO 23150-1:2026, 7.5.3) Profile: Motion state vector (5.2.4.2)
		Orientation {yaw, pitch, roll} – error (ISO 23150-1:2026, A.3.23)	0	Profile: Object pose (ISO 23150-1:2026, 7.5.3) Profile: Motion state vector (5.2.4.2) Implementation EM (ISO 23150-1:2026, B.4.2)
		Reference point {x, y, z} (ISO 23150-1:2026, A.3.24)	0	Profile: Object pose (ISO 23150-1:2026, 7.5.3) Optimise DE (ISO 23150-1:2026, B.1.8) Optimise EES (ISO 23150-1:2026, B.1.9)
↔ Potentially moving object bounding box	C (ISO 23150-1:2026, B.2.2) Relevant: camera	Bounding box extent {length, width, height} (ISO 23150-1:2026, A.3.25)	C Analog: Position {x, y, z} (ISO 23150-1:2026, A.2.43)	Profile: Object pose (ISO 23150-1:2026, 7.5.3)
		Bounding box extent {length, width, height} – error (ISO 23150-1:2026, A.3.26)	0	Profile: Object pose (ISO 23150-1:2026, 7.5.3) Implementation EM (ISO 23150-1:2026, B.4.2)
		Clearance of the object {height} (A.2.4)	0	

Table 2 (continued)

LSG	RL LSG M/C/O	Signal	RL signal M/C/O	Option
		Included geometric structures (A.2.5)	0	Optimise DE (ISO 23150-1:2026, B.1.8) Optimise EES (ISO 23150-1:2026, B.1.9)
↔ Potentially moving object dynamics	M	Velocity {x, y, z} (A.2.6)	C Analog: Position {x, y, z} (ISO 23150-1:2026, A.2.43)	Profile: Motion type (5.2.4.1) Profile: Motion state vector (5.2.4.2)
		Velocity {x, y, z} – error (A.2.7)	0	Profile: Motion type (5.2.4.1) Profile: Motion state vector (5.2.4.2) Implementation EM (ISO 23150-1:2026, B.4.2)
		Acceleration {x, y, z} (A.2.8)	0	Profile: Motion type (5.2.4.1)
		Acceleration {x, y, z} – error (A.2.9)	0	Profile: Motion type (5.2.4.1) Implementation EM (ISO 23150-1:2026, B.4.2)
		Instantaneous centre of rotation {x, y} (A.2.10)	C (ISO 23150-1:2026, B.2.3) Signal: Rotation rate at instantaneous centre of rotation {yaw} (A.2.12)	
		Instantaneous centre of rotation {x, y} – error (A.2.11)	0	Implementation EM (ISO 23150-1:2026, B.4.2)
		Rotation rate at instantaneous centre of rotation {yaw} (A.2.12)	0	Profile: Motion type (5.2.4.1) Profile: Motion state vector (5.2.4.2)
		Rotation rate at instantaneous centre of rotation {yaw} – error (A.2.13)	0	Profile: Motion type (5.2.4.1) Profile: Motion state vector (5.2.4.2) Implementation EM (ISO 23150-1:2026, B.4.2)
		Movement status (A.2.14)	0	Optimise DE (ISO 23150-1:2026, B.1.8) Optimise EES (ISO 23150-1:2026, B.1.9)

Table 2 (continued)

LSG	RL LSG M/C/O	Signal	RL signal M/C/O	Option
↔ Potentially moving object's lights	C (ISO 23150-1:2026, B.2.2) Relevant: camera	Number of valid lights (A.2.15)	M	Optimise LL (ISO 23150-1:2026, B.1.2) Alternative UTL (ISO 23150-1:2026, B.1.7) Key: Light type (A.2.16)
		Size type: dynamic/fixed Size #: Number of valid lights (A.2.15)		
		Light type (A.2.16)	M	Alternative VRO (ISO 23150-1:2026, B.1.4) Optimise DE (ISO 23150-1:2026, B.1.8) Optimise EES (ISO 23150-1:2026, B.1.9)
		Light status (A.2.17)	M	Optimise DE (ISO 23150-1:2026, B.1.8) Optimise EES (ISO 23150-1:2026, B.1.9)
↔ Potentially moving object: persons	O	Number of valid persons (A.2.18)	M	Optimise LL (ISO 23150-1:2026, B.1.2)
		Size type: dynamic/fixed Size #: Number of valid persons (A.2.18)		
		Number of valid person type roles (A.2.19)	M	Optimise LL (ISO 23150-1:2026, B.1.2) Alternative UTL (ISO 23150-1:2026, B.1.7) Key: Person type role (A.2.20)
		Size type: dynamic/fixed Size #: Number of valid person type roles (A.2.19)		
		Person type role (A.2.20)	M	Alternative VRO (ISO 23150-1:2026, B.1.4) Optimise DE (ISO 23150-1:2026, B.1.8) Optimise EES (ISO 23150-1:2026, B.1.9)
		Person type role – confidence (A.2.21)	M	
		Number of valid person gestures (A.2.22)	O	Optimise LL (ISO 23150-1:2026, B.1.2) Alternative UTL (ISO 23150-1:2026, B.1.7) Key: Person gesture indication type (A.2.23)