



**International
Standard**

ISO 23150-13

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

**Part 13:
Camera specific interfaces**

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

Partie 13: Interfaces spécifiques de caméra

**First edition
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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 23150-13, together with ISO 23150-1 [1], ISO 23150-2 [2], ISO 23150-11 [3], ISO 23150-12 [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 technology specific interfaces for camera;
- revise of the logical interfaces;
- new logical interfaces for camera advanced detections.

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.

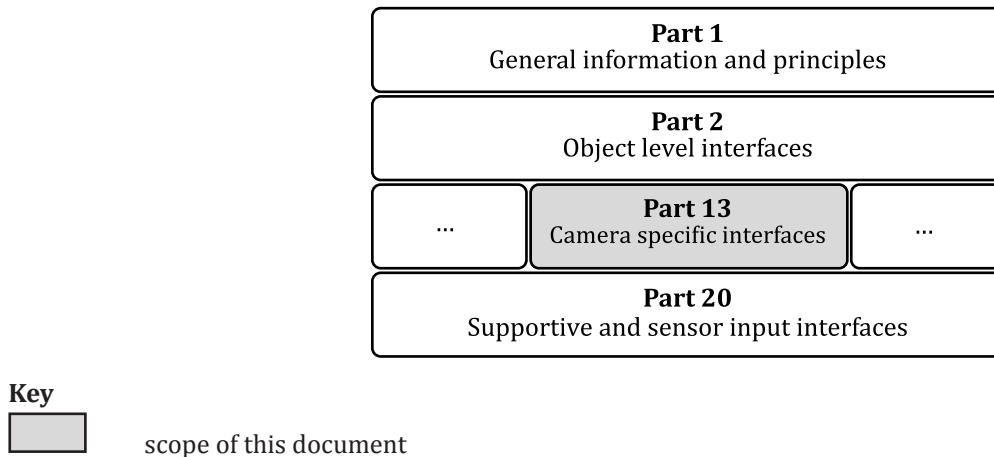


Figure 1 — Relationship of the ISO 23150 series

This document specifies technology-specific interfaces for camera sensors as well as sensor clusters. The interfaces are based on the generic specifications of the interfaces in ISO 23150-1 [\[1\]](#). This document references the generic specifications of signals for the interface header, the generic interface levels and the profiles.

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

- on object level (see ISO 23150-2 [\[2\]](#));
- 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 sensor cluster feature interface;
- generic sensor advanced detection interface;
- generic sensor detection interface;
- general level-independent profiles.

ISO 23150-13:2026(en)

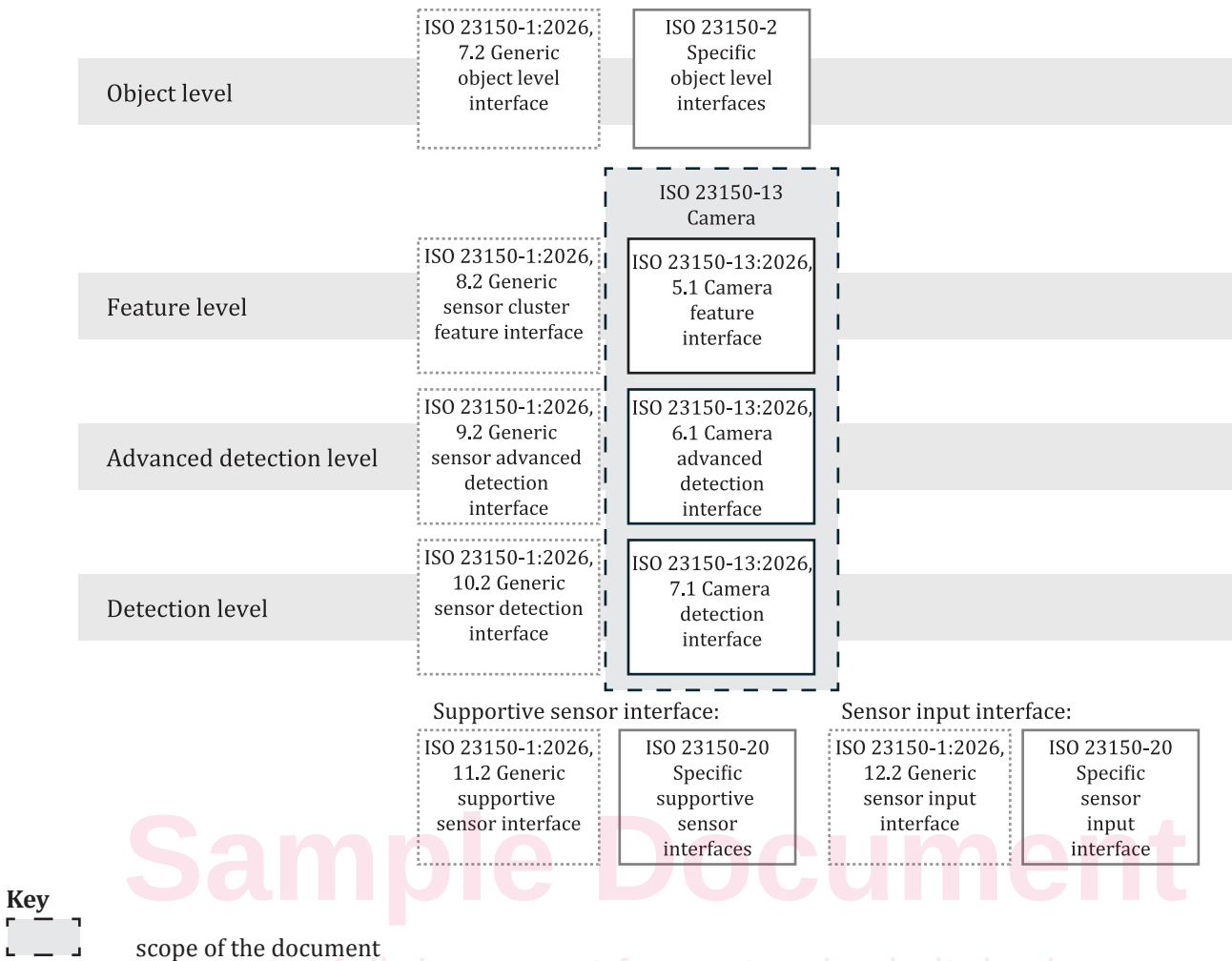


Figure 2 — Interfaces in the scope of this document and the related interfaces of the ISO 23150 series

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

Part 13: Camera specific interfaces

1 Scope

This document is applicable to road vehicles with automated driving functions and specifies the technology-specific logical interfaces for camera sensors or sensor clusters, such as:

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

ISO 23150-1, *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
CADI	camera advanced detection interface
CDI	camera detection interface
CFI	camera feature interface
D	dimensional
DE	default enumerators
DLI	detection level interface
ECU	electronic control unit
EES	extended enumeration signal
EM	error model
FLI	feature level 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
RL	requirement level
SII	sensor input interface
SSI	supportive sensor interface
UTL	unrolling tuple list
VRO	value representation optimisation

5 Feature level

5.1 Camera feature interface

The generic specification of the feature interfaces is defined in ISO 23150-1:2026 [8], Clause 8. The camera feature interface shall base on the generic sensor cluster feature interface as specified in ISO 23150-1:2026, 8.2. [Table 1](#) provides the logical structure of the [CFI](#).

Table 1 — Camera feature interface structure

Structure	Multiplicity	Option
Camera feature header (5.2)	1	
Features	Multiple	Size type: dynamic/fixed

The logical structure of the [CFI](#) 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 [5.4](#) and in ISO 23150-1 as well as the signal options defined in ISO 23150-1:2026, Annex B shall also be considered.

Table 2 — Camera feature 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 [8], A.1.2)	M	Profile: Uniqueness of interface versioning (ISO 23150-1:2026 [8], 6.5.1)
		Interface ID (ISO 23150-1:2026 [8], A.1.3)	O	Profile: Uniqueness of interface versioning (ISO 23150-1:2026 [8], 6.5.1)
		Number of valid serving sensors (ISO 23150-1:2026 [8], A.1.4)	M	Profile: Uniqueness of interface versioning (ISO 23150-1:2026 [8], 6.5.1) Optimise LL (ISO 23150-1:2026 [8], B.1.2) Alternative UTL (ISO 23150-1:2026 [8], B.1.7) Key: Sensor ID (ISO 23150-1:2026 [8], A.1.5)
		Size type: dynamic/fixed Size #: Number of valid serving sensors (ISO 23150-1:2026 [8], A.1.4)		
		Sensor ID (ISO 23150-1:2026 [8], A.1.5)	M	Profile: Uniqueness of interface versioning (ISO 23150-1:2026 [8], 6.5.1) Alternative VRO (ISO 23150-1:2026 [8], B.1.4)
		Time stamp – prediction (ISO 23150-1:2026 [8], A.1.6.1)	M	

^a Features may not be tracked continuously. The same feature may be tracked as a new entity multiple times. Therefore, the profile does not provide the signal "Age" (ISO 23150-1:2026 [8], A.2.22) on FLI.

^b For polyline interpolation, a linear interpolation between two sequential vertex points is assumed. Therefore, the signal "Polyline interpolation method" (ISO 23150-1:2026 [8], A.2.29) always has the mandatory enumeration "PIM_Linear". The profile does not provide the signal "Polyline interpolation method" (ISO 23150-1:2026 [8], A.2.29) explicitly. Camera features are described by zero, one or two dimensional shapes. Therefore, the signal "Shape type" (ISO 23150-1:2026 [8], A.2.30) has the mandatory enumeration "ST_Point", "ST_Line" or "ST_2DSurface". For the definition of a "ST_2DSurface", only the exemplary enumeration "ST_2DSurface_Segment" is not used.

Table 2 (continued)

LSG	RL LSG M/C/O	Signal	RL signal M/C/O	Option
		Cycle counter (ISO 23150-1:2026 [8], A.1.7.1)	O	Redundancy (ISO 23150-1:2026 [8], B.1.3) Signal: Time stamp – prediction (ISO 23150-1:2026 [8], A.1.6.1)
		Interface cycle time (ISO 23150-1:2026 [8], A.1.8)	O	
		Interface cycle time – variation (ISO 23150-1:2026 [8], A.1.9)	O	
		Data qualifier (ISO 23150-1:2026 [8], A.1.10)	M	Optimise DE (ISO 23150-1:2026 [8], B.1.8) Optimise EES (ISO 23150-1:2026 [8], B.1.9)
		Colour model type (ISO 23150-1:2026 [8], A.1.14)	M	Profile: Colour model (ISO 23150-1:2026 [8], 6.5.2) Alternative VRO (ISO 23150-1:2026 [8], B.1.4) Use enumeration to define colours by defining colour values and the applied colour model for each enumerator. Optimise DE (ISO 23150-1:2026 [8], B.1.8) Optimise EES (ISO 23150-1:2026 [8], B.1.9)
Features				
Features information	M	Recognised features – capability (ISO 23150-1:2026 [8], A.1.11.2)	O	
		Recognised features – status (ISO 23150-1:2026 [8], A.1.12.2)	O	Redundancy (ISO 23150-1:2026 [8], B.1.3) Signal: Recognised features – capability (ISO 23150-1:2026 [8], A.1.11.2) Optimise DE (ISO 23150-1:2026 [8], B.1.8) Optimise EES (ISO 23150-1:2026 [8], B.1.9)
		Number of valid features (ISO 23150-1:2026 [8], A.1.13.2)	M	Optimise LL (ISO 23150-1:2026 [8], B.1.2) Optimize AER (ISO 23150-1:2026 [8], B.1.5)
		Size type: dynamic/fixed Size #: Number of valid features (ISO 23150-1:2026 [8], A.1.13.2)		
^a Features may not be tracked continuously. The same feature may be tracked as a new entity multiple times. Therefore, the profile does not provide the signal "Age" (ISO 23150-1:2026 [8], A.2.22) on FLI.				
^b For polyline interpolation, a linear interpolation between two sequential vertex points is assumed. Therefore, the signal "Polyline interpolation method" (ISO 23150-1:2026 [8], A.2.29) always has the mandatory enumeration "PIM_Linear". The profile does not provide the signal "Polyline interpolation method" (ISO 23150-1:2026 [8], A.2.29) explicitly. Camera features are described by zero, one or two dimensional shapes. Therefore, the signal "Shape type" (ISO 23150-1:2026 [8], A.2.30) has the mandatory enumeration "ST_Point", "ST_Line" or "ST_2DSurface". For the definition of a "ST_2DSurface", only the exemplary enumeration "ST_2DSurface_Segment" is not used.				

Table 2 (continued)

LSG	RL LSG M/C/O	Signal	RL signal M/C/O	Option
↔ Status	M	Existence probability – feature level (ISO 23150-1:2026 [8], A.4.2)	M	
		Feature ID (ISO 23150-1:2026 [8], A.4.3)	C (ISO 23150-1:2026 [8], B.3.2) Exist: DLI	Alternative A2I (ISO 23150-1:2026 [8], B.3.3)
		Feature grouping ID (A.2.2)	O	
		Object ID reference (ISO 23150-1:2026 [8], A.2.69)	C (ISO 23150-1:2026 [8], B.3.2) Exist: OLI	Alternative A2I (ISO 23150-1:2026 [8], B.3.3)
		Time stamp difference – feature level (ISO 23150-1:2026 [8], A.4.4)	M	Optimise IV (ISO 23150-1:2026 [8], B.1.6)
		Number of valid observations (ISO 23150-1:2026 [8], A.2.23)	O	Profile: Observations (ISO 23150-1:2026 [8], 6.5.8) ^a Optimise LL (ISO 23150-1:2026 [8], B.1.2) Alternative UTL (ISO 23150-1:2026 [8], B.1.7) Key: Time stamp reference (ISO 23150-1:2026 [8], A.2.24)
		Size type: dynamic/fixed Size #: Number of valid observations (ISO 23150-1:2026 [8], A.2.23)		
		Time stamp reference (ISO 23150-1:2026 [8], A.2.24)	M	Profile: Observations (ISO 23150-1:2026 [8], 6.5.8) ^a Alternative VRO (ISO 23150-1:2026 [8], B.1.4)
		Observation status (ISO 23150-1:2026 [8], A.2.25)	M	Profile: Observations (ISO 23150-1:2026 [8], 6.5.8) ^a Redundancy (ISO 23150-1:2026 [8], B.1.3) Signal: Feature ID (ISO 23150-1:2026 [8], A.4.3) (if unique over time), Time stamp – prediction (ISO 23150-1:2026 [8], A.1.6.1) Optimise DE (ISO 23150-1:2026 [8], B.1.8) Optimise EES (ISO 23150-1:2026 [8], B.1.9)

^a Features may not be tracked continuously. The same feature may be tracked as a new entity multiple times. Therefore, the profile does not provide the signal "Age" (ISO 23150-1:2026 [8], A.2.22) on FLI.

^b For polyline interpolation, a linear interpolation between two sequential vertex points is assumed. Therefore, the signal "Polyline interpolation method" (ISO 23150-1:2026 [8], A.2.29) always has the mandatory enumeration "PIM_Linear". The profile does not provide the signal "Polyline interpolation method" (ISO 23150-1:2026 [8], A.2.29) explicitly. Camera features are described by zero, one or two dimensional shapes. Therefore, the signal "Shape type" (ISO 23150-1:2026 [8], A.2.30) has the mandatory enumeration "ST_Point", "ST_Line" or "ST_2DSurface". For the definition of a "ST_2DSurface", only the exemplary enumeration "ST_2DSurface_Segment" is not used.

Table 2 (continued)

LSG	RL LSG M/C/O	Signal	RL signal M/C/O	Option
↔ Shape information	M	Number of valid shape classifications (ISO 23150-1:2026 [8], A.2.26)	M	Profile: Shape classification (ISO 23150-1:2026 [8], 6.5.9) Optimise LL (ISO 23150-1:2026 [8], B.1.2) Alternative UTL (ISO 23150-1:2026 [8], B.1.7) Key: Shape classification type (ISO 23150-1:2026 [8], A.2.27)
		Size type: dynamic/fixed Size #: Number of valid shape classifications (ISO 23150-1:2026 [8], A.2.26)		
		Shape classification type (ISO 23150-1:2026 [8], A.2.27)	M	Profile: Shape classification (ISO 23150-1:2026 [8], 6.5.9) Alternative VRO (ISO 23150-1:2026 [8], B.1.4) Optimise DE (ISO 23150-1:2026 [8], B.1.8) Optimise EES (ISO 23150-1:2026 [8], B.1.9)
		Shape classification type – confidence (ISO 23150-1:2026 [8], A.2.28)	M	Profile: Shape classification (ISO 23150-1:2026 [8], 6.5.9) Alternative VRO (ISO 23150-1:2026 [8], B.1.4) Optimise DE (ISO 23150-1:2026 [8], B.1.8) Optimise EES (ISO 23150-1:2026 [8], B.1.9)
↔ Shape colour tone	M	Size type: dynamic/fixed Size # * Implicit list length – Optimise LL (ISO 23150-1:2026 [8], B.1.2): depends on Colour model type (ISO 23150-1:2026 [8], A.1.14)		
		Colour value (ISO 23150-1:2026 [8], A.2.18)	M	Profile: Colour model (ISO 23150-1:2026 [8], 6.5.2)
		Colour tone – confidence (ISO 23150-1:2026 [8], A.2.19)	O	Profile: Colour model (ISO 23150-1:2026 [8], 6.5.2)
↔ Shape points	M	Shape type (ISO 23150-1:2026 [8], A.2.30)	M	Profile: Shape type {x, y, z} (ISO 23150-1:2026 [8], 6.5.10.2) ^b Optimise DE (ISO 23150-1:2026 [8], B.1.8) Optimise EES (ISO 23150-1:2026 [8], B.1.9)
		Number of valid vertices (ISO 23150-1:2026 [8], A.2.31)	M	Profile: Shape type {x, y, z} (ISO 23150-1:2026 [8], 6.5.10.2) ^b Optimise LL (ISO 23150-1:2026 [8], B.1.2)

^a Features may not be tracked continuously. The same feature may be tracked as a new entity multiple times. Therefore, the profile does not provide the signal "Age" (ISO 23150-1:2026 [8], A.2.22) on FLI.

^b For polyline interpolation, a linear interpolation between two sequential vertex points is assumed. Therefore, the signal "Polyline interpolation method" (ISO 23150-1:2026 [8], A.2.29) always has the mandatory enumeration "PIM_Linear". The profile does not provide the signal "Polyline interpolation method" (ISO 23150-1:2026 [8], A.2.29) explicitly. Camera features are described by zero, one or two dimensional shapes. Therefore, the signal "Shape type" (ISO 23150-1:2026 [8], A.2.30) has the mandatory enumeration "ST_Point", "ST_Line" or "ST_2DSurface". For the definition of a "ST_2DSurface", only the exemplary enumeration "ST_2DSurface_Segment" is not used.