International

ISO 23150-20

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

Part 20: Supportive and sensor input interfaces

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

Partie 20: Interfaces d'entrée et de support de capteur

First edition
2026-06

Reference number
ISO 23150-20:2026(en)

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Published in Switzerland

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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 23150-20, together with ISO 23150-1 [1], ISO 23150-2 [2], ISO 23150-11 [3], ISO 23150-12 [4], ISO 23150-13 [5], ISO 23150-14 [6] and ISO 23150-15 [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 supportive and sensor input interfaces;

— revise of the logical interfaces;

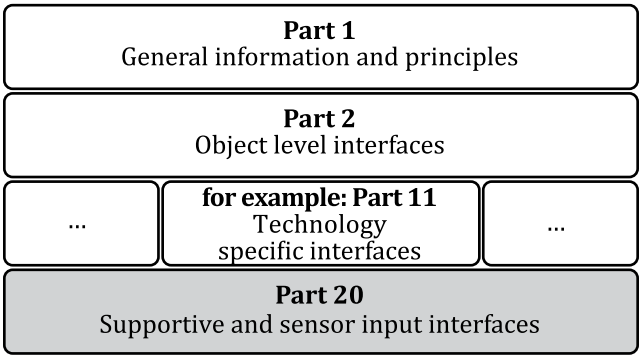
— new logical interfaces for sensor calibration.

A list of all parts in the ISO 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.

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 at the feature level, advanced detection level and detection level are technology specific and differ for each technology.

Figure 1 shows the schematic and contextual relationships between the documents relating to logical interfaces of the ISO 23150 series.



Key

scope of the document

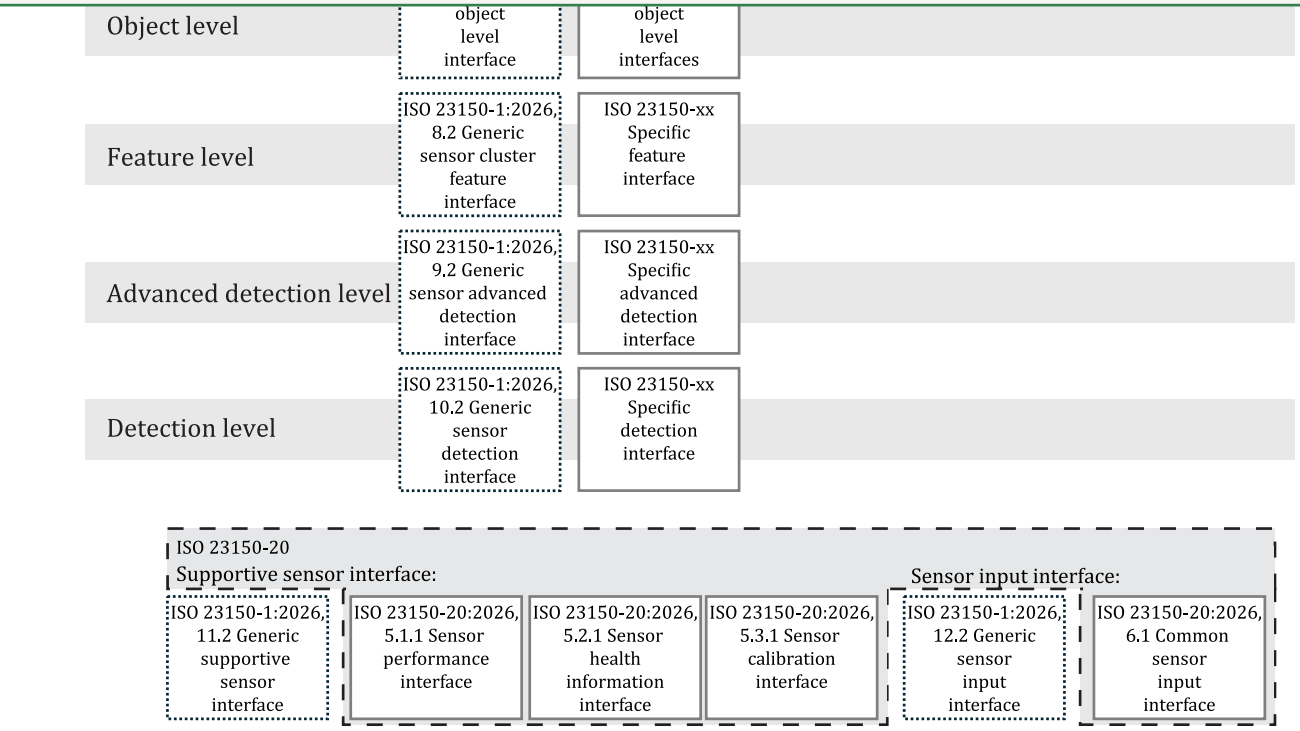
Figure 1 — Relationship of the ISO 23150 series

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

— generic supportive sensor interface;

— generic sensor input 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

This document specifies the additional interfaces for supportive sensor interfaces (SSI) and sensor input interfaces (SII). These include the supportive sensor interfaces "sensor performance interface" (5.1.1), "sensor health information interface" (5.2.1) and "sensor calibration interface" (5.3.1) as well as the sensor input interface "common sensor input interface" (6.1). These interfaces are based on the generic specifications of the supportive sensor interface and the sensor input interface in ISO 23150-1 [1]. They can be supplied by every sensor or sensor cluster. This document references to generic specifications of signals for the interface header, the generic interface levels and the profiles.

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

— on object level (see ISO 23150-2 [2]);

— on feature-, advanced detection- or detection level (see technology specific parts of the ISO 23150 series).

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

Table 1 provides an overview over the differences and boundaries between the SSIs.

Sensor performance		Sensor health information	Sensor calibration
Impairment on observed field	Impairment in sensor effect chain	Sensor internal	Sensor and vehicle
— rain, fog — snow — particles (air) — and so forth	— dirt, dust — condensation — scratch — and so forth	— operation — diagnosis — defects — cleaning — and so forth	— position — calibration — and so forth
Classification into several measurement ranges Relevant for safety concept		Global information for the complete sensor Relevant E/E information	Sensor pose in the vehicle Misalignment: hardware and software calibration

The data of SSI (see 5.1, 5.2, 5.3) can be required to correctly interpret information from object-, feature-, advanced detection- and detection level interfaces. Data consistency over the sensor's interfaces needs to be assured. Supportive sensor interfaces may have LSGs which the sensor provides. If an SSI is not provided, the SSI relevant LSGs will be provided by other interfaces as defined (ISO 23150-1:2026 [8], B.3.4).

The SII (see Clause 6) provides information and parametrisation for a sensor or a sensor cluster. The sensor receives the SIIs via the in-vehicle communication. Each SII can be sent to the sensor or sensor cluster by different ECUs. Also, several ECUs can provide complementary parts of the interface (for example, one ECU provides weather information, and a second ECU provides road information of the common sensor input interface). During the system design phase, each received SIIs of a sensor or a sensor cluster and the ECUs that originate these interfaces are defined. The information source and how the signals are provided are defined during the system design phase to meet the safety and system design requirements (for example, that the fusion unit may provide certain SIIs).