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2022-11-24	R22-11	AUTOSAR Release Management	• Editorials clean up;
2021-11-25	R21-11	AUTOSAR Release Management	• Update the service interface according to ISO 23150:2021; • Add the reference to ISO 23150 :2021
2020-11-30	R20-11	AUTOSAR Release Management	• Initial release

Disclaimer

Contents

1 Introduction

This specification describes the functional description and interfaces of the function cluster Sensor Interfaces which belongs to AUTOSAR Adaptive Platform Services.The Sensor Interfaces has the responsibility of connecting sensors to AUTOSAR Adaptive computing unit via a service interface.

The Sensor Interfaces are based on the logical interface defined in [1]. The sensor types covered by the specification are the following:

- Camera Sensors
- Lidar Sensors
- Radar Sensors
- Ultrasonic Sensors

There are three levels for the sensor data reporting:

- Detection level
- Feature level
- Object level

Besides data reporting interfaces, the sensor supporing interfaces, i.e.sensor health and performance, are also defined.

The sensors as the AUTOSAR service provider and the AUTOSAR Adaptive applications are located in different ECUs. To allow the flexiblity usage of the Sensor Interfaces, it will expose its functionality via ara::com service interfaces, not direct APIs.

Further functional details are described in [2].

2 Acronyms and Abbreviations

The glossary below includes acronyms and abbreviations relevant to the Sensor Interfaces that are not included in AUTOSAR Glossary [3].

Abbreviation / Acronym:	Description:
AD	Automated Driving
ADI	Automated Driving Interfaces
AEB	Autonomous Emergency Braking
HiL	Hardware in the Loop
ISO	International Organization for Standardization
LIDAR	LIght Detection And Ranging
MiL	Model in the Loop
OEM	Original Equipment Manufacturer
OSI	Open Simulation Interface
RADAR	RAdio Detection And Ranging
SAE	Society of Automotive Engineers
USS	UltraSonic Sensor
XiL	... in the Loop

Table 2.1: Acronyms and abbreviations

Terms:	Description:
V2X	Vehicle-to-X-Communication is the generic term for various communication technologies in automotive, including vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) communication. The information is either transmitted directly between vehicles, between vehicle and roadside infrastructure or by using existing mobile networks.

Table 2.2: Terms

3 Related documentation

3.1 Input documents & related standards and norms

[1] ISO-23150 Road vehicles–Data communication between sensors and data fusion unit for automated driving functions–Logical interface

[2] Explanation of Sensor Interfaces
AUTOSAR_AP_EXP_SensorInterfaces

[3] Glossary
AUTOSAR_FO_TR_Glossary

[4] Specification of Adaptive Platform Core
AUTOSAR_AP_SWS_Core

[5] Specification of Communication Management
AUTOSAR_AP_SWS_CommunicationManagement

[6] Requirements on Automated Driving Interfaces
AUTOSAR_AP_RS_AutomatedDrivingInterfaces

3.2 Further applicable specification

AUTOSAR provides a core specification [4] which is also applicable for Automated Driving Interfaces. The chapter “General requirements for all FunctionalClusters” of this specification shall be considered as an additional and required specification for implementation of Automated Driving Interfaces.

4 Constraints and assumptions

Dedicated interfaces for particular sensors like radar, lidar, USS and camera are provided.

4.1 Limitations

4.1.1 ISO Optionals

All the ISO optionals are supported in the service defintiion, but the presence of an optional signal is decided during the design time. The optional signal presence is indicated by a capability vector. There is no change of optional presence during the run time.

4.1.2 Sensor Control Interfaces

Sensor control interfaces are not supported, e.g. actions like reset, initialization, and calibration.

4.1.3 Sensor Capabilities

The configuration of sensor capabilities is not supported, e.g. sensor opening angle and detection range.

4.2 Applicability to car domains

AUTOSAR Sensor Interfaces are used as service interfaces between dedicated sensors for enviroment precesion and the AUTOSAR Adaptive applications.

5 Dependencies to other modules

The Automated Driving Interfaces serve as common interfaces for the AUTOSAR Adaptive applications. The sensor information is provided by a non-platform service.The sensor interfaces are exposed to client applications via the ara::com middleware. Communication Management,[5] uses Identity and Access Management to validate the authorization of requests made to the specific service interfaces, i.e. the Communication Management shall check if the invoker is allowed to access the requested service interface of a specific sensor. The following Figure shows a radar and camera sensor instance which provide sensor information to a Data Fusion instance consuming sensor data.

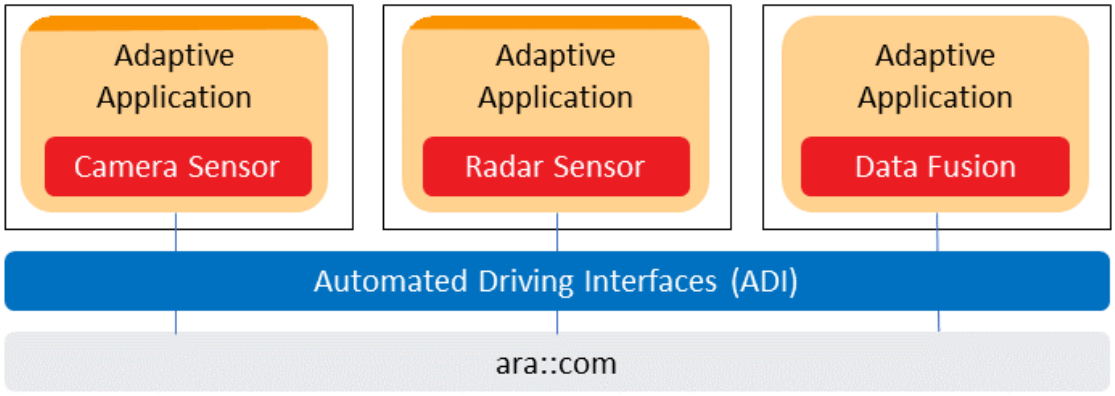

Figure 5.1: Sensor Interfaces dependencies to other AUTOSAR Adaptive Applications.

For each sensor type like radar, lidar, USS or camera, the ISO standard will contain lots of optional sensor data or signals in addition to the required signals, e.g. the classification of an object might be optional. During development of a driving function or data fusion system, a specific set of optional signals is selected by the function or data fusion developer according to the requirements of the driving function. To reduce development costs, especially in terms of functional safety, the set of optionals and thus the resulting logical sensor interface are required to be fixed during design-time, i.e. the specified sensor signals must not suddenly disappear from the interface of the sensor during runtime of the system so that a data fusion system can rely on the presence of the specified signals. Vice versa, a sensor interface must not add additional signals during runtime, e.g. not to risk an unintentional behavior change due to the increased bandwidth requirements.

6 Requirements Tracing

The following tables reference the requirements specified in [6] and links to the fulfillment of these. Please note that if column “Satisfied by” is empty for a specific requirement this means that this requirement is not fulfilled by this document.

Requirement	Description	Satisfied by
[RS_ADI_00001]	The ADI shall support the camera sensor technology for on-board sensors	[SWS_ADI_00001] [SWS_ADI_00100] [SWS_ADI_00101] [SWS_ADI_00102] [SWS_ADI_00103] [SWS_ADI_00104] [SWS_ADI_00105] [SWS_ADI_00106] [SWS_ADI_00107] [SWS_ADI_00108] [SWS_ADI_00113] [SWS_ADI_00114] [SWS_ADI_00115] [SWS_ADI_00116] [SWS_ADI_00117] [SWS_ADI_00118] [SWS_ADI_00119] [SWS_ADI_00120] [SWS_ADI_00121] [SWS_ADI_00122] [SWS_ADI_00123] [SWS_ADI_00124] [SWS_ADI_00125] [SWS_ADI_00126] [SWS_ADI_00127] [SWS_ADI_00128] [SWS_ADI_00129] [SWS_ADI_00130] [SWS_ADI_00200] [SWS_ADI_00201] [SWS_ADI_00202] [SWS_ADI_00203] [SWS_ADI_00204] [SWS_ADI_00205] [SWS_ADI_00206] [SWS_ADI_00207] [SWS_ADI_00208] [SWS_ADI_00209] [SWS_ADI_00210] [SWS_ADI_00211] [SWS_ADI_00212] [SWS_ADI_00213] [SWS_ADI_00214] [SWS_ADI_00215] [SWS_ADI_00216] [SWS_ADI_00217] [SWS_ADI_00218] [SWS_ADI_00219] [SWS_ADI_00220] [SWS_ADI_00221] [SWS_ADI_00222] [SWS_ADI_00223] [SWS_ADI_00224] [SWS_ADI_00225] [SWS_ADI_00226] [SWS_ADI_00227] [SWS_ADI_00228] [SWS_ADI_00229] [SWS_ADI_00230] [SWS_ADI_00231] [SWS_ADI_00232] [SWS_ADI_00233] [SWS_ADI_00234] [SWS_ADI_00235] [SWS_ADI_00236] [SWS_ADI_00239] [SWS_ADI_00300] [SWS_ADI_00301] [SWS_ADI_00302] [SWS_ADI_00303] [SWS_ADI_00304] [SWS_ADI_00305] [SWS_ADI_00306] [SWS_ADI_00307] [SWS_ADI_00308] [SWS_ADI_00309] [SWS_ADI_00310] [SWS_ADI_00311] [SWS_ADI_00312] [SWS_ADI_00313] [SWS_ADI_00314] [SWS_ADI_00315] [SWS_ADI_00316] [SWS_ADI_00317] [SWS_ADI_00318] [SWS_ADI_00319] [SWS_ADI_00320] [SWS_ADI_00321] [SWS_ADI_00322] [SWS_ADI_00323] [SWS_ADI_00324] [SWS_ADI_00325] [SWS_ADI_00326] [SWS_ADI_00327] [SWS_ADI_00328] [SWS_ADI_00329] [SWS_ADI_00330] [SWS_ADI_00331] [SWS_ADI_00332] [SWS_ADI_00333] [SWS_ADI_00334] [SWS_ADI_00335] [SWS_ADI_00336] [SWS_ADI_00337] [SWS_ADI_00338] [SWS_ADI_00339] [SWS_ADI_00340] [SWS_ADI_00341] [SWS_ADI_00342] [SWS_ADI_00343] ▽

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[RS_ADI_00002]	The ADI shall support the lidar sensor technology for on-board sensors	[SWS_ADI_00002] [SWS_ADI_00100] [SWS_ADI_00101] [SWS_ADI_00102] [SWS_ADI_00103] [SWS_ADI_00104] [SWS_ADI_00105] [SWS_ADI_00106] [SWS_ADI_00107] [SWS_ADI_00108] [SWS_ADI_00113] [SWS_ADI_00114] [SWS_ADI_00115] [SWS_ADI_00116] [SWS_ADI_00117] [SWS_ADI_00118] [SWS_ADI_00121] [SWS_ADI_00123] [SWS_ADI_00124] [SWS_ADI_00125] [SWS_ADI_00126] [SWS_ADI_00127] [SWS_ADI_00128] [SWS_ADI_00129] [SWS_ADI_00130] [SWS_ADI_00200] [SWS_ADI_00201] [SWS_ADI_00202] [SWS_ADI_00203] [SWS_ADI_00204] [SWS_ADI_00205] [SWS_ADI_00206] [SWS_ADI_00207] [SWS_ADI_00208] [SWS_ADI_00209] [SWS_ADI_00210] [SWS_ADI_00211] [SWS_ADI_00212] [SWS_ADI_00213] [SWS_ADI_00214] [SWS_ADI_00215] [SWS_ADI_00216] [SWS_ADI_00218] [SWS_ADI_00219] [SWS_ADI_00220] [SWS_ADI_00227] [SWS_ADI_00228] [SWS_ADI_00229] [SWS_ADI_00230] [SWS_ADI_00231] [SWS_ADI_00232] [SWS_ADI_00233] [SWS_ADI_00234] [SWS_ADI_00235] [SWS_ADI_00238] [SWS_ADI_00239] [SWS_ADI_00300] [SWS_ADI_00301] [SWS_ADI_00302] [SWS_ADI_00303] [SWS_ADI_00304] [SWS_ADI_00305] [SWS_ADI_00306] [SWS_ADI_00307] [SWS_ADI_00308] [SWS_ADI_00310] [SWS_ADI_00311] [SWS_ADI_00312] [SWS_ADI_00313] [SWS_ADI_00314] [SWS_ADI_00315] [SWS_ADI_00316] [SWS_ADI_00317] [SWS_ADI_00318] [SWS_ADI_00319] [SWS_ADI_00320] [SWS_ADI_00321] [SWS_ADI_00322] [SWS_ADI_00323] [SWS_ADI_00325] [SWS_ADI_00326] [SWS_ADI_00327] [SWS_ADI_00328] [SWS_ADI_00329] [SWS_ADI_00330] [SWS_ADI_00331] [SWS_ADI_00332] [SWS_ADI_00333] [SWS_ADI_00334] [SWS_ADI_00335] [SWS_ADI_00336] [SWS_ADI_00337] [SWS_ADI_00338] [SWS_ADI_00339] [SWS_ADI_00340] [SWS_ADI_00341] [SWS_ADI_00342] [SWS_ADI_00343] [SWS_ADI_00344] [SWS_ADI_00345] ▽

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Requirement	Description	Satisfied by
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Requirement	Description	Satisfied by
		△ [SWS_ADI_00430] [SWS_ADI_00431] [SWS_ADI_00432] [SWS_ADI_00433] [SWS_ADI_00434] [SWS_ADI_00438] [SWS_ADI_00439] [SWS_ADI_00440] [SWS_ADI_00441] [SWS_ADI_00442] [SWS_ADI_00443] [SWS_ADI_00444] [SWS_ADI_00445] [SWS_ADI_00446] [SWS_ADI_00447] [SWS_ADI_00448] [SWS_ADI_00449] [SWS_ADI_00450] [SWS_ADI_00451] [SWS_ADI_00452] [SWS_ADI_00453] [SWS_ADI_00454] [SWS_ADI_00501] [SWS_ADI_00502] [SWS_ADI_00503] [SWS_ADI_00504] [SWS_ADI_00506] [SWS_ADI_00507] [SWS_ADI_00508] [SWS_ADI_00509] [SWS_ADI_00510] [SWS_ADI_00511] [SWS_ADI_00512] [SWS_ADI_00513] [SWS_ADI_00514] [SWS_ADI_00515] [SWS_ADI_00516] [SWS_ADI_00517] [SWS_ADI_00518] [SWS_ADI_00519] [SWS_ADI_00520] [SWS_ADI_00521] [SWS_ADI_00523] [SWS_ADI_00524] [SWS_ADI_00525] [SWS_ADI_00526] [SWS_ADI_00527] [SWS_ADI_00528] [SWS_ADI_00529] [SWS_ADI_00530] [SWS_ADI_00531] [SWS_ADI_00532] [SWS_ADI_00533] [SWS_ADI_00534] [SWS_ADI_00535] [SWS_ADI_00536] [SWS_ADI_00537] [SWS_ADI_00538] [SWS_ADI_00539] [SWS_ADI_00540] [SWS_ADI_00541] [SWS_ADI_00542] [SWS_ADI_00543] [SWS_ADI_00544] [SWS_ADI_00545] [SWS_ADI_00546] [SWS_ADI_00547] [SWS_ADI_00548] [SWS_ADI_00549] [SWS_ADI_00550] [SWS_ADI_00551] [SWS_ADI_00701] [SWS_ADI_00702] [SWS_ADI_00703] [SWS_ADI_00704] [SWS_ADI_00706] [SWS_ADI_00707] [SWS_ADI_00708] [SWS_ADI_00709] [SWS_ADI_00710] [SWS_ADI_00711] [SWS_ADI_00712] [SWS_ADI_00713] [SWS_ADI_00714] [SWS_ADI_01000] [SWS_ADI_01001] [SWS_ADI_01002] [SWS_ADI_01003] [SWS_ADI_01006] [SWS_ADI_01010] [SWS_ADI_01011]
[RS_ADI_00004]	The ADI shall support the ultrasonic sensor technology for on-board sensors	[SWS_ADI_00004] [SWS_ADI_00100] [SWS_ADI_00101] [SWS_ADI_00102] [SWS_ADI_00103] [SWS_ADI_00104] [SWS_ADI_00105] [SWS_ADI_00106] [SWS_ADI_00107] [SWS_ADI_00108] [SWS_ADI_00113] [SWS_ADI_00114] [SWS_ADI_00115] [SWS_ADI_00116] [SWS_ADI_00117] [SWS_ADI_00118] [SWS_ADI_00121] [SWS_ADI_00123] [SWS_ADI_00124] [SWS_ADI_00125] [SWS_ADI_00126] [SWS_ADI_00127] [SWS_ADI_00128] [SWS_ADI_00129] [SWS_ADI_00130] [SWS_ADI_00200] [SWS_ADI_00201] [SWS_ADI_00202] [SWS_ADI_00203] [SWS_ADI_00204] [SWS_ADI_00205] [SWS_ADI_00206] ▽

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Requirement	Description	Satisfied by
		△ [SWS_ADI_00207] [SWS_ADI_00208] [SWS_ADI_00209] [SWS_ADI_00210] [SWS_ADI_00211] [SWS_ADI_00212] [SWS_ADI_00213] [SWS_ADI_00214] [SWS_ADI_00215] [SWS_ADI_00216] [SWS_ADI_00218] [SWS_ADI_00219] [SWS_ADI_00220] [SWS_ADI_00227] [SWS_ADI_00228] [SWS_ADI_00229] [SWS_ADI_00230] [SWS_ADI_00231] [SWS_ADI_00232] [SWS_ADI_00233] [SWS_ADI_00234] [SWS_ADI_00235] [SWS_ADI_00239] [SWS_ADI_00300] [SWS_ADI_00301] [SWS_ADI_00302] [SWS_ADI_00303] [SWS_ADI_00304] [SWS_ADI_00305] [SWS_ADI_00306] [SWS_ADI_00308] [SWS_ADI_00310] [SWS_ADI_00311] [SWS_ADI_00312] [SWS_ADI_00313] [SWS_ADI_00314] [SWS_ADI_00315] [SWS_ADI_00316] [SWS_ADI_00317] [SWS_ADI_00318] [SWS_ADI_00319] [SWS_ADI_00320] [SWS_ADI_00321] [SWS_ADI_00322] [SWS_ADI_00323] [SWS_ADI_00325] [SWS_ADI_00326] [SWS_ADI_00327] [SWS_ADI_00339] [SWS_ADI_00340] [SWS_ADI_00341] [SWS_ADI_00342] [SWS_ADI_00343] [SWS_ADI_00344] [SWS_ADI_00345] [SWS_ADI_00346] [SWS_ADI_00347] [SWS_ADI_00348] [SWS_ADI_00349] [SWS_ADI_00350] [SWS_ADI_00401] [SWS_ADI_00402] [SWS_ADI_00403] [SWS_ADI_00404] [SWS_ADI_00405] [SWS_ADI_00406] [SWS_ADI_00407] [SWS_ADI_00408] [SWS_ADI_00410] [SWS_ADI_00411] [SWS_ADI_00412] [SWS_ADI_00413] [SWS_ADI_00414] [SWS_ADI_00415] [SWS_ADI_00417] [SWS_ADI_00418] [SWS_ADI_00419] [SWS_ADI_00420] [SWS_ADI_00421] [SWS_ADI_00422] [SWS_ADI_00423] [SWS_ADI_00424] [SWS_ADI_00425] [SWS_ADI_00426] [SWS_ADI_00427] [SWS_ADI_00428] [SWS_ADI_00429] [SWS_ADI_00430] [SWS_ADI_00431] [SWS_ADI_00432] [SWS_ADI_00433] [SWS_ADI_00434] [SWS_ADI_00438] [SWS_ADI_00439] [SWS_ADI_00440] [SWS_ADI_00441] [SWS_ADI_00442] [SWS_ADI_00443] [SWS_ADI_00444] [SWS_ADI_00445] [SWS_ADI_00446] [SWS_ADI_00447] [SWS_ADI_00448] [SWS_ADI_00449] [SWS_ADI_00450] [SWS_ADI_00451] [SWS_ADI_00452] [SWS_ADI_00453] [SWS_ADI_00454] [SWS_ADI_00501] [SWS_ADI_00502] [SWS_ADI_00503] [SWS_ADI_00504] [SWS_ADI_00505] [SWS_ADI_00506] [SWS_ADI_00507] [SWS_ADI_00508] [SWS_ADI_00509] [SWS_ADI_00510] [SWS_ADI_00511] [SWS_ADI_00512] [SWS_ADI_00513] [SWS_ADI_00514] [SWS_ADI_00515] ▽

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Requirement	Description	Satisfied by
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[RS_ADI_00005]	The ADI shall be open for future extensions towards new sensor technologies	[SWS_ADI_00006]
[RS_ADI_00006]	The ADI shall provide interfaces which enable exchangeability of service compatible AUTOSAR Adaptive applications without changing the rest of the system.	[SWS_ADI_00010] [SWS_ADI_00012]
[RS_ADI_00007]	The ADI shall enable use cases with different resource limitations.	[SWS_ADI_00011]
[RS_ADI_00012]	The ADI shall support the ISO-23150 interfaces and ISO-23150 interface signals	[SWS_ADI_00006] [SWS_ADI_00007] [SWS_ADI_00100] [SWS_ADI_00101] [SWS_ADI_00102] [SWS_ADI_00103] [SWS_ADI_00104] [SWS_ADI_00105] [SWS_ADI_00106] [SWS_ADI_00107] [SWS_ADI_00108] [SWS_ADI_00109] [SWS_ADI_00110] [SWS_ADI_00111] [SWS_ADI_00112] [SWS_ADI_00113] [SWS_ADI_00114] [SWS_ADI_00115] [SWS_ADI_00116] [SWS_ADI_00117] [SWS_ADI_00118] [SWS_ADI_00119] [SWS_ADI_00120] [SWS_ADI_00121] [SWS_ADI_00122] [SWS_ADI_00123] [SWS_ADI_00124] [SWS_ADI_00125] [SWS_ADI_00126] [SWS_ADI_00127] [SWS_ADI_00128] [SWS_ADI_00129] [SWS_ADI_00130] [SWS_ADI_00200] [SWS_ADI_00201] [SWS_ADI_00202] ▽

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Requirement	Description	Satisfied by
		△ [SWS_ADI_00203] [SWS_ADI_00204] [SWS_ADI_00205] [SWS_ADI_00206] [SWS_ADI_00207] [SWS_ADI_00208] [SWS_ADI_00209] [SWS_ADI_00210] [SWS_ADI_00211] [SWS_ADI_00212] [SWS_ADI_00213] [SWS_ADI_00214] [SWS_ADI_00215] [SWS_ADI_00216] [SWS_ADI_00217] [SWS_ADI_00218] [SWS_ADI_00219] [SWS_ADI_00220] [SWS_ADI_00221] [SWS_ADI_00222] [SWS_ADI_00223] [SWS_ADI_00224] [SWS_ADI_00225] [SWS_ADI_00226] [SWS_ADI_00227] [SWS_ADI_00228] [SWS_ADI_00229] [SWS_ADI_00230] [SWS_ADI_00231] [SWS_ADI_00232] [SWS_ADI_00233] [SWS_ADI_00234] [SWS_ADI_00235] [SWS_ADI_00236] [SWS_ADI_00237] [SWS_ADI_00238] [SWS_ADI_00239] [SWS_ADI_00300] [SWS_ADI_00301] [SWS_ADI_00302] [SWS_ADI_00303] [SWS_ADI_00304] [SWS_ADI_00305] [SWS_ADI_00306] [SWS_ADI_00307] [SWS_ADI_00308] [SWS_ADI_00309] [SWS_ADI_00310] [SWS_ADI_00311] [SWS_ADI_00312] [SWS_ADI_00313] [SWS_ADI_00314] [SWS_ADI_00315] [SWS_ADI_00316] [SWS_ADI_00317] [SWS_ADI_00318] [SWS_ADI_00319] [SWS_ADI_00320] [SWS_ADI_00321] [SWS_ADI_00322] [SWS_ADI_00323] [SWS_ADI_00324] [SWS_ADI_00325] [SWS_ADI_00326] [SWS_ADI_00327] [SWS_ADI_00328] [SWS_ADI_00329] [SWS_ADI_00330] [SWS_ADI_00331] [SWS_ADI_00332] [SWS_ADI_00333] [SWS_ADI_00334] [SWS_ADI_00335] [SWS_ADI_00336] [SWS_ADI_00337] [SWS_ADI_00338] [SWS_ADI_00339] [SWS_ADI_00340] [SWS_ADI_00341] [SWS_ADI_00342] [SWS_ADI_00343] [SWS_ADI_00344] [SWS_ADI_00345] [SWS_ADI_00346] [SWS_ADI_00347] [SWS_ADI_00348] [SWS_ADI_00349] [SWS_ADI_00350] [SWS_ADI_00401] [SWS_ADI_00402] [SWS_ADI_00403] [SWS_ADI_00404] [SWS_ADI_00405] [SWS_ADI_00406] [SWS_ADI_00407] [SWS_ADI_00408] [SWS_ADI_00409] [SWS_ADI_00410] [SWS_ADI_00411] [SWS_ADI_00412] [SWS_ADI_00413] [SWS_ADI_00414] [SWS_ADI_00415] [SWS_ADI_00416] [SWS_ADI_00417] [SWS_ADI_00418] [SWS_ADI_00419] [SWS_ADI_00420] [SWS_ADI_00421] [SWS_ADI_00422] [SWS_ADI_00423] [SWS_ADI_00424] [SWS_ADI_00425] [SWS_ADI_00426] [SWS_ADI_00427] [SWS_ADI_00428] [SWS_ADI_00429] [SWS_ADI_00430] [SWS_ADI_00431] [SWS_ADI_00432] [SWS_ADI_00433] [SWS_ADI_00434] [SWS_ADI_00435] [SWS_ADI_00436] ▽

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Requirement	Description	Satisfied by
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Requirement	Description	Satisfied by
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[RS_ADI_00013]	The ADI shall interpret the ISO-23150 compliant to AUTOSAR	[SWS_ADI_00006] [SWS_ADI_00007] [SWS_ADI_00100] [SWS_ADI_00101] [SWS_ADI_00102] [SWS_ADI_00103] [SWS_ADI_00104] [SWS_ADI_00105] [SWS_ADI_00106] [SWS_ADI_00107] [SWS_ADI_00108] [SWS_ADI_00109] [SWS_ADI_00110] [SWS_ADI_00111] [SWS_ADI_00112] [SWS_ADI_00113] [SWS_ADI_00114] [SWS_ADI_00115] [SWS_ADI_00116] [SWS_ADI_00117] [SWS_ADI_00118] [SWS_ADI_00119] [SWS_ADI_00120] [SWS_ADI_00121] [SWS_ADI_00122] [SWS_ADI_00123] [SWS_ADI_00124] [SWS_ADI_00125] [SWS_ADI_00126] [SWS_ADI_00127] [SWS_ADI_00128] [SWS_ADI_00129] [SWS_ADI_00130] [SWS_ADI_00200] [SWS_ADI_00201] [SWS_ADI_00202] [SWS_ADI_00203] [SWS_ADI_00204] [SWS_ADI_00205] [SWS_ADI_00206] [SWS_ADI_00207] [SWS_ADI_00208] [SWS_ADI_00209] [SWS_ADI_00210] [SWS_ADI_00211] [SWS_ADI_00212] [SWS_ADI_00213] [SWS_ADI_00214] [SWS_ADI_00215] [SWS_ADI_00216] [SWS_ADI_00217] [SWS_ADI_00218] [SWS_ADI_00219] [SWS_ADI_00220] [SWS_ADI_00221] [SWS_ADI_00222] [SWS_ADI_00223] [SWS_ADI_00224] [SWS_ADI_00225] [SWS_ADI_00226] [SWS_ADI_00227] [SWS_ADI_00228] [SWS_ADI_00229] [SWS_ADI_00230] [SWS_ADI_00231] [SWS_ADI_00232] [SWS_ADI_00233] [SWS_ADI_00234] [SWS_ADI_00235] [SWS_ADI_00236] [SWS_ADI_00237] [SWS_ADI_00238] [SWS_ADI_00239] [SWS_ADI_00300] [SWS_ADI_00301] [SWS_ADI_00302] [SWS_ADI_00303] [SWS_ADI_00304] [SWS_ADI_00305] [SWS_ADI_00306] [SWS_ADI_00307] [SWS_ADI_00308] [SWS_ADI_00309] [SWS_ADI_00310] [SWS_ADI_00311] [SWS_ADI_00312] [SWS_ADI_00313] [SWS_ADI_00314] [SWS_ADI_00315] [SWS_ADI_00316] [SWS_ADI_00317] [SWS_ADI_00318] [SWS_ADI_00319] [SWS_ADI_00320] [SWS_ADI_00321] [SWS_ADI_00322] [SWS_ADI_00323] [SWS_ADI_00324] [SWS_ADI_00325] [SWS_ADI_00326] [SWS_ADI_00327] [SWS_ADI_00328] [SWS_ADI_00329] [SWS_ADI_00330] [SWS_ADI_00331] [SWS_ADI_00332] [SWS_ADI_00333] [SWS_ADI_00334] [SWS_ADI_00335] [SWS_ADI_00336] [SWS_ADI_00337] [SWS_ADI_00338] [SWS_ADI_00339] [SWS_ADI_00340] [SWS_ADI_00341] [SWS_ADI_00342] ▽

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Requirement	Description	Satisfied by
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[RS_ADI_00014]	The ADI shall be aligned with the semantics of the corresponding elements in the ISO-23150 .	[SWS_ADI_00006] [SWS_ADI_00007] [SWS_ADI_00100] [SWS_ADI_00101] [SWS_ADI_00102] [SWS_ADI_00103] [SWS_ADI_00104] [SWS_ADI_00105] [SWS_ADI_00106] [SWS_ADI_00107] [SWS_ADI_00108] [SWS_ADI_00109] [SWS_ADI_00110] [SWS_ADI_00111] [SWS_ADI_00112] [SWS_ADI_00113] [SWS_ADI_00114] [SWS_ADI_00115] [SWS_ADI_00116] [SWS_ADI_00117] [SWS_ADI_00118] [SWS_ADI_00119] [SWS_ADI_00120] [SWS_ADI_00121] [SWS_ADI_00122] [SWS_ADI_00123] [SWS_ADI_00124] [SWS_ADI_00125] [SWS_ADI_00126] [SWS_ADI_00127] [SWS_ADI_00128] [SWS_ADI_00129] [SWS_ADI_00130] [SWS_ADI_00200] [SWS_ADI_00201] [SWS_ADI_00202] [SWS_ADI_00203] [SWS_ADI_00204] [SWS_ADI_00205] [SWS_ADI_00206] [SWS_ADI_00207] [SWS_ADI_00208] [SWS_ADI_00209] [SWS_ADI_00210] [SWS_ADI_00211] [SWS_ADI_00212] [SWS_ADI_00213] [SWS_ADI_00214] [SWS_ADI_00215] [SWS_ADI_00216] [SWS_ADI_00217] [SWS_ADI_00218] [SWS_ADI_00219] [SWS_ADI_00220] [SWS_ADI_00221] [SWS_ADI_00222] [SWS_ADI_00223] [SWS_ADI_00224] [SWS_ADI_00225] [SWS_ADI_00226] [SWS_ADI_00227] [SWS_ADI_00228] [SWS_ADI_00229] [SWS_ADI_00230] [SWS_ADI_00231] [SWS_ADI_00232] [SWS_ADI_00233] [SWS_ADI_00234] [SWS_ADI_00235] [SWS_ADI_00236] [SWS_ADI_00237] [SWS_ADI_00238] ▽

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[RS_ADI_00015]	The ADI shall limit the transmission of unused data.	[SWS_ADI_00010] [SWS_ADI_00012]
[RS_ADI_00016]	The ADI specification shall support the replacement of a sensor by another one providing more profiles without recompilation of the client software.	[SWS_ADI_00010] [SWS_ADI_00012]
[RS_ADI_00017]	The ADI specification shall support the replacement of a sensor by another one providing less profiles without recompilation of the client software if the removed profiles are not used.	[SWS_ADI_00010] [SWS_ADI_00012]

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Requirement	Description	Satisfied by
[RS_ADI_00018]	The ADI specification shall enable AUTOSAR Adaptive applications to discard sensor data when newer sensor data is available.	[SWS_ADI_00005]
[RS_ADI_00019]	The ADI shall provide interface specifications that support an automatic translation of an interface specification to an implementable service interface.	[SWS_ADI_00006] [SWS_ADI_00007]

Table 6.1: RequirementsTracing

7 Functional Specification

7.1 Outline

7.1.1 Goals and scope

The specification is to provide well-defined sensor interfaces which is compliant to the sensor interface specification [1]. The ISO document covers just semantic definitions of interfaces whereas this specification aims to cover all aspects of the interfaces to make them fully compliant to the AUTOSAR Adaptive platform.

The specification shall enable the compatibility of sensors and data fusion algorithms independently of the supplier. To ensure the compatibility between sensors the interfaces are provided on implementation data type level.

The Automated Driving Interfaces serve as common interfaces for the AUTOSAR Adaptive applications. Consumers of the interfaces are AUTOSAR Adaptive applications containing functional elements as sensor data receivers, sensor data processors, data fusion applications, and automated driving functions. The sensor information is provided by a non-platform service. The non-platform service consumer is running in the adaptive platform as an AUTOSAR adaptive application, where the sensor could be deployed on different AUTOSAR platforms (Classic and Adaptive) as shown in the following figure.

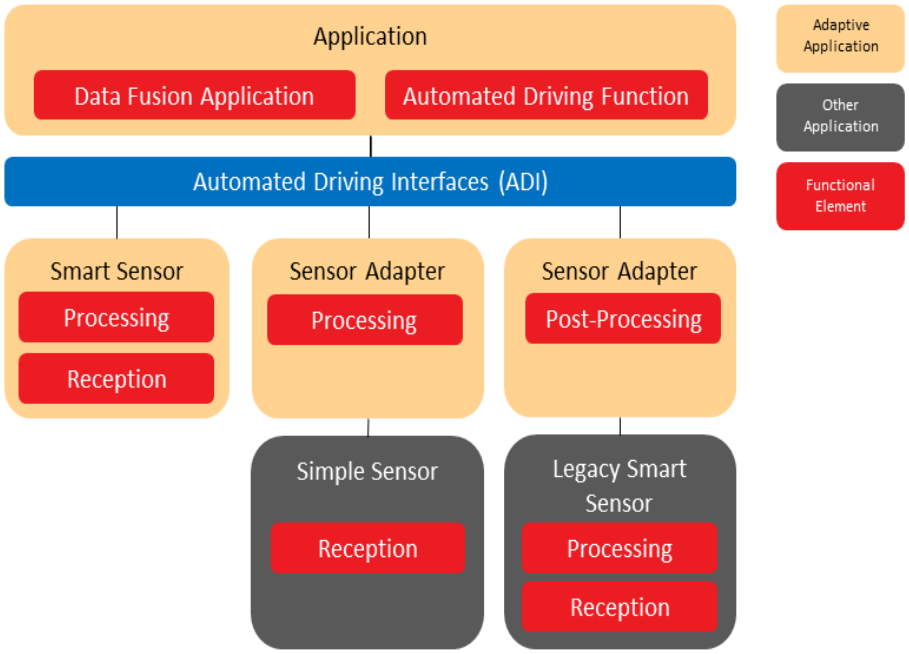

Figure 7.1: Functional elements communicating via ADI

Apart from the Automated Driving Interfaces (ADI), the other relevent elements are defined as follows :

- Sensor Data Reception: A functional element which receives or reads sensor data from a sensor. Such an element can provide raw sensor data. Raw sensor data means that it provides the actual data a sensor can measure. There is no processing of the sensor data. There are no data streams provided.
- Sensor Data Processing: This element which usually processes raw sensor data, provides pre-processed and post-processed sensor data. It provides data a sensor cannot directly measure but needs a processing stage for.
- Sensor Fusion Application: The data fusion algorithm is an application which collects sensor data and fuses it to provide a unified environmental model. Data fusion applications are typical consumers of sensor data. They provide their output to Automated Driving Functions.
- Automated Driving Function: Automated Driving Functions can also directly use the interfaces.

The Automated Driving interfaces can be used in following usages to enable the interoperability between different players and improve the efficiency for the development and validation of automated driving functions :

- Sensor Supplier Interface: The automated driving use case defines the requirements to the fusion algorithm and the used sensors. The OEM wants to rely on a standardized interface which provides well defined sensor information which are defined by the ISO-23150 and on an AUTOSAR standardized interface. The scope shall be the data format between a sensor and a computing unit running an AUTOSAR Adaptive application.
- Standardized Sensor API: Sensor developers need well described and standardized interfaces to provide an implementation which can be used by automated driving applications and data fusion algorithms. So, the same information is provided to all potential consumers of the data.
- Sensor Fusion Algorithm: To combine information from different sensors and to develop sensor fusion algorithms for automated driving a detailed description of all signals provided is needed.
- Sensor Fusion Integration: Sensor fusion algorithms shall be integrated on a high-performance computing platform within an Adaptive Application as the central unit of automated driving functions.
- Sensor Implementation Testing: Testing is performed at each stage of the development of the sensor system. To create a test specification for the system testable implementations are needed which are based on well-defined interfaces and descriptions.
- Sensor Simulation: By simulating the sensor fusion algorithms before actual target integration, it is possible to ensure smooth integration during the design, development, test and safeguarding steps. This ensures compatibility of algorithm integration into AUTOSAR Adaptive ECUs.

- Sensor Data Record and Replay: To be able to test and debug sensor fusion algorithms offline it is necessary to replay sensor data recorded in real world scenarios. This enables sensor fusion designers to reproduce failures and determine faults.

7.1.2 Relation to other standards

The currently ongoing standardization of the international standard ISO 23150 "Road vehicles - Data communication between sensors and data fusion unit for automated driving functions - Logical interface" will be applicable to road vehicles with automated driving functions. It specifies the logical interface between smart in-vehicle sensors that sense the environment (e.g. camera, lidar, radar, ultrasonic, etc.) and the vehicle fusion unit. The interface is described in a modular, semantic representation allowing different types of sensor technologies and fusion concepts. The "Open Simulation Interface" (OSI) is a generic software interface for the environmental perception of automated driving functions in virtual scenarios (https://github.com/OpenSimulationInterface/open-simulation-interface). OSI ensures modularity, integrability and interchangeability of the individual components. These can be environment simulation models, sensor models, logical models for the detected environment or sensor fusion and models for automated driving functions. Additional informations can be found on https://opensimulationinterface.github.io/open-simulation-interface/.

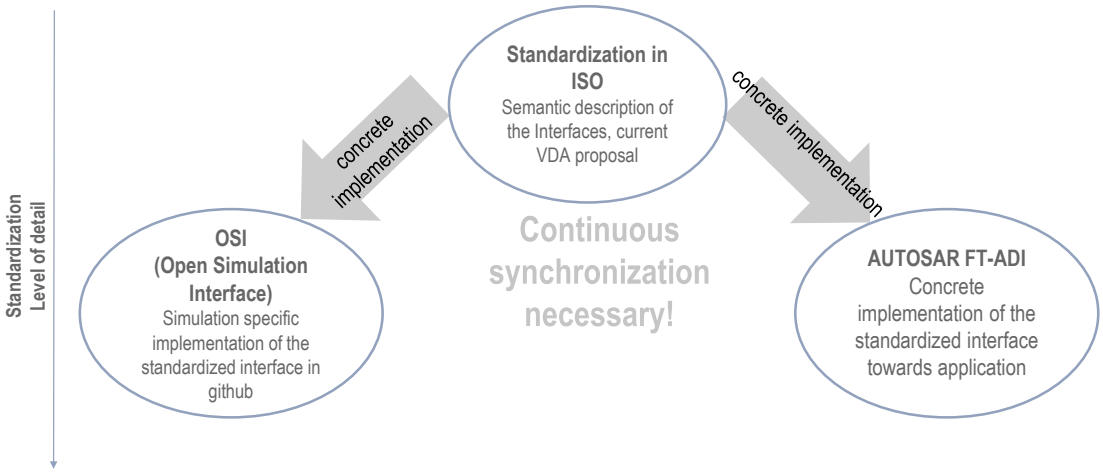

Figure 7.2: Scope of Standardization

The Open Simulation Interface and the Autosar ADI will support the ISO 23150.

7.2 AD Sensor Service Design

7.2.1 ISO mapping to Sensor Services

7.2.1.1 Sensor Types

To comply with the ISO 23150, the specific service is defined with different sensor types. Currently, Camera, Lidar, Radar, and Ultrasonic sercives are supported in the specification. The new service will be introduced along with the evolution of [1].

[SWS_ADI_00001]{DRAFT} **The Camera Sensor Data periodical Transmission** ⌈A Camera senor with Automated Driving interfaces shall provide the camera sensor data periodically to the Adaptive Applications⌋*(RS_ADI_00001)*

[SWS_ADI_00002]{DRAFT} **The Lidar Sensor Data periodical Transmission** ⌈A Lidar sensor with Automated Driving interfaces shall provide the lidar sensor data periodically to the Adaptive Applications⌋*(RS_ADI_00002)*

[SWS_ADI_00003]{DRAFT} **The Radar Sensor Data periodical Transmission** ⌈A radar sensor with Automated Driving interfaces shall be able to provide the radar sensor data periodically to the Adaptive Applications⌋*(RS_ADI_00003)*

[SWS_ADI_00004]{DRAFT} **The Ultrasonic Sensor Data periodical Transmission** ⌈A ultrasonic sensor with Automated Driving interfaces shall be able to provide the ultrasonic sensor data periodically to the Adaptive Applications⌋*(RS_ADI_00004)*

[SWS_ADI_00005]{DRAFT} **Receving periodical sensor data** ⌈The Adaptive Applications as the sevice consumer shall process the sensor data according to the timestamp in the package, not the package arrival time. The most recent data is always the highest priority for processing.⌋*(RS_ADI_00018)*

7.2.1.2 Sensor Data level

In ISO 23150, there are three ISO logic interface levels to support different levels of fusion: object level, feature level and detection level:

- Object level interface: Potentially moving object interface, Road object interface and Static object interface;
- Feature level interface: Camera feature interface and USS feature interface;
- Detection level interface: Radar detection interface,Lidar detection interface, Camera detection interface and USS detection interface.

A sensor could provide several ISO logical interfaces, and shall provide at least one ISO interface either on object, feature, or detection level.

[SWS_ADI_00006]{DRAFT} **Sensor specific services for different level ISO interfaces** ⌈To allow the flexibility of service providing by a sensor, each ISO interface shall

be mapped to a propriate ara::com means like events. The service interface shall support the defintions of ISO signals.The services for new types of sensors shall be added along with the evolution of [1]. The follwing AP services are defined in this specification:

- Camera,Lidar,Radar,Ultrasonic: Potentially moving object service, road object service, static object service
- Camera: Camera features service, camera detections service;
- Lidar: Lidar detections service;
- Radar: Radar detections service;
- Ultrasonic: Ultrasonic features service, Ultrasonic detection service.

⌋(*RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*, *RS_ADI_00019*, *RS_ADI_00005*)

7.2.1.3 Supportive Sensor interfaces

In ISO, there are two supportive senor interfaces for the Adaptive Applications process the reliability of the used measurement method or data, which are also used to the implementation of safety concept. The two supportive sensor interfaces are sensor technology indepedent, i.e. common to camera, lidar, radar and ultrasonic sensor, but with sensor technology specific data.

[SWS_ADI_00007]{DRAFT} **Sensor independent supportive services** ⌈The supportive interfaces shall be mapped to two sensor indpendent AP services and support the defintions of ISO signals.The follwing services are defined in this specification:

- Sensor Performance service;
- Sensor Health information service.

⌋(*RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*, *RS_ADI_00019*)

7.2.2 Service Optional Elements

An individual Sensor Service design faces the challenge that each ISO interface contains a lot of optional elements. The optional elements are known and fixed at design time by service providers and service users. The present of optional elements shall not be changed during run time.

[SWS_ADI_00010]{DRAFT} **Capability Vector** ⌈A service capability vector indicates which optional element is provided by the Service provider. The optional elements indicated by the capability vector shall be always sent during the runtime of the service. The service consumer should check the vector at the initialization time and subcribe the service if it includes all the optional elements that the consumer requires.The consumer may ignore the optional elements, if these elements are not required.⌋(*RS_ADI_00006*, *RS_ADI_00015*, *RS_ADI_00016*, *RS_ADI_00017*)

[SWS_ADI_00011]{DRAFT} **Service Profiles** ⌈In different use cases, there are different requirements on the sensor data i.e.for different data Types, behavior, content, performance, resolution, etc. Different Service Profiles for a Sensor Type enables the flexiblity of the corresponding sensor service for different use cases. In this release, only one profile is supported and more profiles should be considered in future releases.⌋*(RS_ADI_00007)*

[SWS_ADI_00012]{DRAFT} **Service Versioning** ⌈Service Versioning covers different configurations, i.e. optionals, additional data representation, etc. The same services with different service versioning, but with the same profile, shall be backward compatible.⌋*(RS_ADI_00006, RS_ADI_00015, RS_ADI_00016, RS_ADI_00017)*

8 API specification

There are no APIs defined in this release.

9 Service Interfaces

9.1 Type definitions

This chapter lists all types provided by the ADI.

9.1.1 General Header Definition

This section lists all the data types used in the header of the service interfaces.

9.1.1.1 CapabilityVector

[SWS_ADI_00100]{DRAFT} **Definition of ImplementationDataType CapabilityVector** ⌈

Name	CapabilityVector
Namespace	ara::adi::sensoritf
Kind	VECTOR <bool>
Derived from	-
Description	To identify presence of optional signal. The exact bit reference is denfined in the specification. For each service, there is exact one capabilityVector table, which is deifined in chapter 10.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.1.2 InterfaceVersionID

[SWS_ADI_00101]{DRAFT} **Definition of ImplementationDataType InterfaceVersionID** ⌈

Name	InterfaceVersionID
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	InterfaceVersionIDMajor uint32_t InterfaceVersionIDMinor uint32_t InterfaceVersionIDPatch uint32_t
Derived from	-
Description	Represents the version of the service.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.1.3 InterfaceCycleTimeVariation

[SWS_ADI_00102]{DRAFT} **Definition of ImplementationDataType InterfaceCycleTimeVariation** ⌈

Name	InterfaceCycleTimeVariation
Namespace	ara::adi::sensoritf
Kind	TYPE_REFERENCE
Derived from	`uint8_t`
Description	To indicate the cycle time variation. It represents a linear value between 0% and 100%.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.1.4 InterfaceID

[SWS_ADI_00103]{DRAFT} **Definition of ImplementationDataType InterfaceID** ⌈

Name	InterfaceID	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	`uint8_t`	
Description	Uniquely identify the interface.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	The interface ID is unknown.
kOther	0x01	Other interface.
kStaticObject	0x02	The Static Object interface.
kCameraFeature	0x03	The Camera Feature interface.
kUltrasonicFeature	0x04	The Ultrasonic Feature interface.
kRadarDetection	0x05	The Radar Detection interface.
kLidarDetection	0x06	The Lidar Detection interface.
kCameraDetection	0x07	The Camera Detection interface.
kUltrasonicDetection	0x08	The Ultrasonic Detection interface.
kSensorPerformance	0x09	The Sensor Performance interface.
kSensorHealthInformation	0x0A	The Sensor Health interface.
kPotentialMovingObject	0x0B	The Potential Moving Object interface.
kRoadObject	0x0C	The Road Object interface.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.1.5 DataQualifier

[SWS_ADI_00104]{DRAFT} **Definition of ImplementationDataType DataQualifier** ⌈

Name	DataQualifier	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	`uint8_t`	
Description	To identify the data quality of the transmitted data.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	Information of data quality is unknown.
kOther	0x01	Information of data quality is otherwise specified.
kNormal	0x02	Information can be used without restriction.
kReducedInViewAnd Performance	0x03	Reported data are from the sensor in a restricted view and performance.
kNotAvailable	0x04	Information from the sensor is not available.
kReducedInView	0x05	Reported data are from the sensor in a restricted view.
kTemporaryAvailable	0x06	Information is only temporary available.
kInvalid	0x07	Mesaurement cycle was invalid and no valid objects will be reported.
kReducedInPerformance	0x08	Reported data are from the sensor in a restricted performance.
kTestMode	0x09	Reported data are from the sensor in a test mode.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.1.6 RecognizedStatus

[SWS_ADI_00105]{DRAFT} **Definition of ImplementationDataType Recognized Status** ⌈

Name	RecognizedStatus	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	`uint8_t`	
Description	To indicate the recognition process status of the sensor due to resource limitations.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	The performance status of the sensor is unknown.
kOther	0x01	The performance status of the sensor is otherwise specified.
kNormal	0x02	The performance of the sensor is enough to process all recognized entities. If additional entities would have been in the environment the sensor would have processed additional entities.
kPreLimits	0x03	The performance of the sensor is close to the limits to process all recognized entities.
kLimited	0x04	The performance of the sensor is not enough to process all recognized entities.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.1.7 TrackingMotionModel

[SWS_ADI_00106]{DRAFT} **Definition of ImplementationDataType TrackingMotionModel** ⌈

Name	TrackingMotionModel	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	`uint8_t`	
Description	The motion model for tracking moving objects.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	The motion model is unknown.
kOther	0x01	The motion model is otherwise specified.
kConstantVelocity	0x02	Motion model uses constant velocity.
kConstantAcceleration	0x03	Motion model uses constant acceleration.
kConstantTurnRate	0x04	Motion model uses constant turn rate.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.1.8 MotionType

[SWS_ADI_00107]{DRAFT} **Definition of ImplementationDataType MotionType** ⌈

Name	MotionType	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	`uint8_t`	
Description	To identify the applied motion type in the message, i.e. absolute or relative motion values.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	The motion tpye is unknown.
kOther	0x01	The motion type is otherwise specified.
kRelativeValues	0x02	Relative motion values are used.
kAbsoluteValues	0x03	Absolute motion values are used.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.1.9 ColourModelType

[SWS_ADI_00108]{DRAFT} **Definition of ImplementationDataType ColourModel Type** ⌈

Name	ColourModelType	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	`uint8_t`	
Description	To identify the applied colour model in the service.	
Range / Symbol	***Limit***	***Description***
kGrey	0x00	Grey scale - 1 colour value is used for grey value.
kRGB	0x01	Red, green, blue - 3 colour values are used for the values for red, green, blue.
kRGBIR	0x02	Red, green, blue and IR - 4 colour values are used for the values for red, green, blue, and infrared.
kHSV	0x03	Hue, saturation, value - 3 colour values are used for the values for hue, saturation, value.
kLUV	0x04	Luminance and colour coordinates U, V - 3 colour values are used for the values for luminance and coordinates.
kCMYK	0x05	Cyan, magenta, yellow and key(black) values - 4 colour values are used for the values for cyan, maganeta, yellow and key
kColourList	0x06	Each value reference a pre-defined colour - 1 colour value.

⌋*(RS_ADI_00001, RS_ADI_00002, RS_ADI_00003, RS_ADI_00004, RS_ADI_00012, RS_ADI_00013, RS_ADI_00014)*

9.1.1.10 RadialVelocityAmbiguityDomain

[SWS_ADI_00109]{DRAFT} **Definition of ImplementationDataType RadialVelocity AmbiguityDomain** ⌈

Name	RadialVelocityAmbiguityDomain
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	Begin `float` End `float`
Derived from	-
Description	The Doppler ambiguity caused by under sampling. m/s

⌋*(RS_ADI_00003, RS_ADI_00012, RS_ADI_00013, RS_ADI_00014)*

9.1.1.11 RangeAmbiguityDomain

[SWS_ADI_00110]{DRAFT} **Definition of ImplementationDataType RangeAmbiguityDomain** ⌈

Name	RangeAmbiguityDomain
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	Begin `float` End `float`
Derived from	-
Description	The range of the ambiguity domain. m

⌋(*RS_ADI_00003*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.1.12 AngleAzimuthAmbiguityDomain

[SWS_ADI_00111]{DRAFT} **Definition of ImplementationDataType AngleAzimuthAmbiguityDomain** ⌈

Name	AngleAzimuthAmbiguityDomain
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	Begin `float` End `float`
Derived from	-
Description	The azimuth angle of the ambiguity domain is defined by {begin} and {end}. The unit is {rad,rad}

⌋(*RS_ADI_00003*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.1.13 AngleElevationAmbiguityDomain

[SWS_ADI_00112]{DRAFT} **Definition of ImplementationDataType AngleElevationAmbiguityDomain** ⌈

Name	AngleElevationAmbiguityDomain
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	Begin `float` End `float`
Derived from	-
Description	The elevation angle of the ambiguity domain is defined by {begin} and {end}.The unit is {rad,rad}.

⌋(*RS_ADI_00003*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.1.14 InterfaceApplicability

[SWS_ADI_00113]{DRAFT} **Definition of ImplementationDataType InterfaceApplicability** ⌈

Name	InterfaceApplicability	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	`uint8_t`	
Description	To identify the related interface of the service.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	Unknown interfaces.
kOther	0x01	Otherwise specified interfaces.
kObjectLevelInterfaces	0x02	Object level interfaces.
kFeatureLevelInterface	0x03	Feature level interface.
kDetectionLevelInterface	0x04	Detection level interface.
kFLIandDLI	0x05	Feature level and detection level interfaces.
kPMOI	0x06	Potential Moving Objects Interface.
kRDOI	0x07	Road Objects Interface.
kSOI	0x08	Static Objects Interface.
kAll	0x09	All interfaces.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.1.15 VehicleCoordinateSystemType

[SWS_ADI_00114]{DRAFT} **Definition of ImplementationDataType VehicleCoordinateSystemType** ⌈

Name	VehicleCoordinateSystemType	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	`uint8_t`	
Description	Defines the reference vehicle coordinate system for the interfaces of the sensor.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	Unknown coordinate system.
kOther	0x01	Otherwise specified coordinate system.
kRearAxle	0x02	Use vehicle rear axle coordinate system.
kRoadLevel	0x03	Use vehicle road level coordinate system.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.1.16 Point3D

[SWS_ADI_00115]{DRAFT} **Definition of ImplementationDataType Point3D** ⌈

Name	Point3D
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	x `float` y `float` z `float` (optional)
Derived from	-
Description	Represents a 3 dimension vector, the unit will be vary according to the refering data type.

⌋*(RS_ADI_00001, RS_ADI_00002, RS_ADI_00003, RS_ADI_00004, RS_ADI_00012, RS_ADI_00013, RS_ADI_00014)*

9.1.1.17 Point3DError

[SWS_ADI_00116]{DRAFT} **Definition of ImplementationDataType Point3DError** ⌈

Name	Point3DError
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	xError `float` yError `float` zError `float` (optional)
Derived from	-
Description	Represents Error value in 3 dimension vector, the unit will be vary according to the refering data type.

⌋*(RS_ADI_00001, RS_ADI_00002, RS_ADI_00003, RS_ADI_00004, RS_ADI_00012, RS_ADI_00013, RS_ADI_00014)*

9.1.1.18 Orientation3D

[SWS_ADI_00117]{DRAFT} **Definition of ImplementationDataType Orientation3D** ⌈

Name	Orientation3D
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	Yaw `float` Pitch `float` Roll `float`
Derived from	-
Description	Represents a 3 dimension vector {yaw, pitch,roll}, the unit will be vary according to the refering data type.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.1.19 Orientation3DError

[SWS_ADI_00118]{DRAFT} **Definition of ImplementationDataType Orientation3DError** ⌈

Name	Orientation3DError
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	YawError `float` PitchError `float` RollError `float`
Derived from	-
Description	Represents Error value in 3 dimension vector {yaw, pitch, roll}, the unit will be vary according to the refering data type.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.1.20 Point3DErrorVector

[SWS_ADI_00129]{DRAFT} **Definition of ImplementationDataType Point3DErrorVector** ⌈

Name	Point3DErrorVector
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	xxError `float` (optional) xyError `float` (optional) xzError `float` (optional) yxError `float` (optional) yyError `float` (optional) yzError `float` (optional) zxError `float` (optional) zyError `float` (optional) zzError `float` (optional)
Derived from	-
Description	Represents the Error value in 3 dimension vector, the unit will be vary according to the refering data type.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.1.21 Orientation3DErrorVector

[SWS_ADI_00130]{DRAFT} **Definition of ImplementationDataType Orientation3DErrorVector** ⌈

Name	Orientation3DErrorVector
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	yawyawError `float` (optional) yawpitchError `float` (optional) yawrollError `float` (optional) pitchyawError `float` (optional) pitchpitchError `float` (optional) pitchrollError `float` (optional) rollyawError `float` (optional) rollpitchError `float` (optional) rollrollError `float` (optional)
Derived from	-
Description	Represents the Error value in 3 dimension vector {yaw, pitch, roll}, the unit will be vary according to the refering data type.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.1.22 VanishingPoint

[SWS_ADI_00119]{DRAFT} **Definition of ImplementationDataType VanishingPoint** ⌈

Name	VanishingPoint
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	Azimuth `float` Elevation `float`
Derived from	-
Description	A set of lines in the image plane that corresponds to a set of parallel surface lines in the 3D world space converges to a common point in the image space known as the Vanishing point {azimuth, elevation}.The unit is {rad,rad}.

⌋(*RS_ADI_00001*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.1.23 VanishingPointError

[SWS_ADI_00120]{DRAFT} **Definition of ImplementationDataType VanishingPoint Error** ⌈

Name	VanishingPointError
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	Azimuth `float` Elevation `float`
Derived from	-
Description	Uncertainty of the Vanishing point {azimuth, elevation},using Error value.The unit is {rad,rad}.

⌋(*RS_ADI_00001*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.1.24 InformationSensorPose

[SWS_ADI_00121]{DRAFT} **Definition of ImplementationDataType Information SensorPose** ⌈

Name	InformationSensorPose
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	SensorOriginPoint `Point3D` SensorOriginPointError `Point3DError` (optional) SensorOriginPointErrorVector `Point3DErrorVector` (optional) SensorOrientation `Orientation3D` SensorOrientationError `Orientation3DError` (optional) SensorOrientationErrorVector `Orientation3DErrorVector` (optional)
Derived from	-
Description	Represents the Sensor Pos info.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.1.25 InformationSensorSurrounding

[SWS_ADI_00122]{DRAFT} **Definition of ImplementationDataType Information SensorSurrounding** ⌈

Name	InformationSensorSurrounding
Namespace	ara::adi::sensoritf
Kind	STRUCTURE

▽

△

Sub-elements	VanishingPoint `VanishingPoint` VanishingPointError `VanishingPointError` (optional)
Derived from	-
Description	Represents the vanishing point info.

⌋(*RS_ADI_00001*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.1.26 InterfaceHeader

[SWS_ADI_00123]{DRAFT} **Definition of ImplementationDataType Interface Header** ⌈

Name	InterfaceHeader
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	InformationInterface `InformationInterface` VehicleCoordinateSystem `VehicleCoordinateSystemType` (optional) SensorPose `InformationSensorPose` (optional) SensorCalibration `Calibration` (optional) SensorClusterInformation `SensorCluster` (optional) InterfaceExtension `InformationInterfaceExtension` (optional) SensorSurrounding `InformationSensorSurrounding` (optional)
Derived from	-
Description	Represents the header of each message.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.1.27 SensorID

[SWS_ADI_00124]{DRAFT} **Definition of ImplementationDataType SensorID** ⌈

Name	SensorID
Namespace	ara::adi::sensoritf
Kind	TYPE_REFERENCE
Derived from	`uint8_t`
Description	To represent the sensor logical identity.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.1.28 SensorIDList

[SWS_ADI_00125]{DRAFT} **Definition of ImplementationDataType SensorIDList** ⌈

Name	SensorIDList
Namespace	ara::adi::sensoritf
Kind	VECTOR <SensorID>
Derived from	-
Description	Represents a list of Sensor ID.

⌋*(RS_ADI_00001, RS_ADI_00002, RS_ADI_00003, RS_ADI_00004, RS_ADI_00012, RS_ADI_00013, RS_ADI_00014)*

9.1.1.29 InformationInterface

[SWS_ADI_00126]{DRAFT} **Definition of ImplementationDataType InformationInterface** ⌈

Name	InformationInterface
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	VersionID `InterfaceVersionID` NumberOfValidServingSensors `uint8_t` ValidServingSensors `SensorIDList` InterfaceID `InterfaceID` (optional) TimeStamp `uint64_t` CycleCounter `uint64_t` (optional) InterfaceCycleTime `uint32_t` (optional) InterfaceCycleTimeVariation `InterfaceCycleTimeVariation` (optional) DataQualifier `DataQualifier`
Derived from	-
Description	Represents the basic info of the sensor service.

⌋*(RS_ADI_00001, RS_ADI_00002, RS_ADI_00003, RS_ADI_00004, RS_ADI_00012, RS_ADI_00013, RS_ADI_00014)*

9.1.1.30 InformationInterfaceExtension

[SWS_ADI_00127]{DRAFT} **Definition of ImplementationDataType InformationInterfaceExtension** ⌈

Name	InformationInterfaceExtension
Namespace	ara::adi::sensoritf
Kind	STRUCTURE

▽

△

Sub-elements	TrackingMotionModel `TrackingMotionModel` (optional) MotionType `MotionType` ColourModelType `ColourModelType` (optional) InformationAmbiguityDomain `InformationAmbiguityDomain` (optional) InterfaceApplicability `InterfaceApplicability` (optional)
Derived from	-
Description	Represents the additional info of the sensor service.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.1.31 ProbabilityPercentage

[SWS_ADI_00128]{DRAFT} **Definition of ImplementationDataType ProbabilityPercentage** ⌈

Name	ProbabilityPercentage
Namespace	ara::adi::sensoritf
Kind	TYPE_REFERENCE
Derived from	`float`
Description	Represet probability in percentage.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.1.32 SensorCalibratableComponent

[SWS_ADI_00539]{DRAFT} **Definition of ImplementationDataType SensorCalibratableComponent** ⌈

Name	SensorCalibratableComponent	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	`uint8_t`	
Description	Enumeration for the sensor component which may be calibrated.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	Unknown calibration.
kOther	0x01	Otherwise specified calibration.
kIntrinsic	0x02	Calibration status for the intrinsic parameters of the sensor.
kExtrinsic	0x03	Calibration status for the extrinsic parameters of the sensor.
kOnline	0x04	Calibration status for the online parameters of the sensor.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.1.33 SensorCalibrationStatus

[SWS_ADI_00540]{DRAFT} **Definition of ImplementationDataType SensorCalibrationStatus** ⌈

Name	SensorCalibrationStatus	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	`uint8_t`	
Description	Enumeration for the current calibration status of the Sensor calibratable component.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	The sensor Calibration status is unknown.
kOther	0x01	The sensor Calibration status is otherwise specified.
kCalibrated	0x02	Sensor calibration was successful and within nominal tolerance range.
kNotCalibrated	0x03	Calibration not done or calibration failed.
kDegraded	0x04	Sensor calibrated, however performance degraded due to limited correction accuracy.
kInitialCalibrationNotPerformed	0x05	Sensor initial calibration not performed yet.
kInitialCalibrationFailed	0x06	Sensor initial calibration process failed.
kRecalibrationNeededIntrinsic	0x07	Recalibration of sensor's intrinsic parameters required.
kRecalibrationNeededExtrinsic	0x08	Recalibration of sensor's extrinsic parameters required.
kRecalibrationNeededFull	0x09	Recalibration of the complete sensor's parameters required.

⌋*(RS_ADI_00001, RS_ADI_00002, RS_ADI_00003, RS_ADI_00004, RS_ADI_00012, RS_ADI_00013, RS_ADI_00014)*

9.1.1.34 CaliComponentInfo

[SWS_ADI_00544]{DRAFT} **Definition of ImplementationDataType CaliComponentInfo** ⌈

Name	CaliComponentInfo
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	CaliComponent `SensorCalibratableComponent` CaliStatus `SensorCalibrationStatus` CaliProcessStatus `CalibrationProcessState` (optional)
Derived from	-
Description	Represents the calibration component information.

⌋*(RS_ADI_00001, RS_ADI_00002, RS_ADI_00003, RS_ADI_00004, RS_ADI_00012, RS_ADI_00013, RS_ADI_00014)*

9.1.1.35 CaliComponentInfoVector

[SWS_ADI_00545]{DRAFT} **Definition of ImplementationDataType CaliComponentInfoVector** ⌈

Name	CaliComponentInfoVector
Namespace	ara::adi::sensoritf
Kind	VECTOR <CaliComponentInfo>
Derived from	-
Description	Represents a list of calibration component information.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.1.36 Calibration

[SWS_ADI_00546]{DRAFT} **Definition of ImplementationDataType Calibration** ⌈

Name	Calibration
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	NoValidSensorCalibratableComponents uint8_t ValidSensorCalibratableComponents CaliComponentInfoVector SensorOriginPointCorrection Point3D (optional) SensorOriginPointCorrectionError Point3DError (optional) SensorOriginTranslationCorrectionLimitRange SensorOriginTranslationCorrectionLimit (optional) CorrectionPosLimitMax Point3D (optional) SensorOrientationCorrection Orientation3D (optional) SensorOrientationCorrectionError Orientation3DError (optional) SensorPoseAngleCorrectionLimitRange SensorPoseAngleCorrectionLimit (optional)
Derived from	-
Description	Represents the sensor calibration related information.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.1.37 CalibrationProcessState

[SWS_ADI_00548]{DRAFT} **Definition of ImplementationDataType CalibrationProcessState** ⌈

Name	CalibrationProcessState	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	`uint8_t`	
Description	Provides an enumeration for the current state of the Sensor calibration component.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	The process state of the calibration is unknown.
kOther	0x01	The process state of the calibration is otherwise specified.
kInitialCalibrationPerformed	0x02	The sensor initial calibration has been performed.
kInitialCalibrationNotPerformed	0x03	The sensor initial calibration has not been performed yet.
kInitialCalibrationFailed	0x04	The sensor initial calibration process failed.
kRecalibrationNeededIntrinsic	0x05	The recalibration of sensor's intrinsic parameters is required.
kRecalibrationNeededExtrinsic	0x06	The recalibration of sensor's extrinsic parameters is required.
kRecalibrationNeededFull	0x07	The recalibration of the complete sensor's parameters is required.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.1.38 SensorOriginTranslationCorrectionLimit

[SWS_ADI_00549]{DRAFT} **Definition of ImplementationDataType SensorOriginTranslationCorrectionLimit** ⌈

Name	SensorOriginTranslationCorrectionLimit
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	xbegin `float` xend `float` ybegin `float` yend `float` zbegin `float` (optional) zend `float` (optional)
Derived from	-
Description	Provides the limits of independent position corrections. Begin (minimum) and end (maximum) positions could be defined for each axis {x, y, z} separately.(m, m, m, m, m, m)

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.1.39 SensorPoseAngleCorrectionLimit

[SWS_ADI_00550]{DRAFT} **Definition of ImplementationDataType SensorPoseAngleCorrectionLimit** ⌈

Name	SensorPoseAngleCorrectionLimit
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	Yawbegin `float` Yawend `float` Pitchbegin `float` Pitchend `float` Rollbegin `float` Rollend `float`
Derived from	-
Description	Provides the limits of independent angle corrections. Begin (minimum) and end (maximum) angles could be defined for each angle {yaw, pitch, roll} separately.(rad, rad, rad, rad, rad, rad)

⌋*(RS_ADI_00001, RS_ADI_00002, RS_ADI_00003, RS_ADI_00004, RS_ADI_00012, RS_ADI_00013, RS_ADI_00014)*

9.1.1.40 SensorCluster

[SWS_ADI_00551]{DRAFT} **Definition of ImplementationDataType SensorCluster** ⌈

Name	SensorCluster
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	NumberOfValidSensors `uint8_t` SensorIDReferenceList `SensorIDList`
Derived from	-
Description	Group of sensors of the same technology serving a common logical interface.

⌋*(RS_ADI_00001, RS_ADI_00002, RS_ADI_00003, RS_ADI_00004, RS_ADI_00012, RS_ADI_00013, RS_ADI_00014)*

9.1.1.41 Point2D

[SWS_ADI_00604]{DRAFT} **Definition of ImplementationDataType Point2D** ⌈

Name	Point2D
Namespace	ara::adi::sensoritf
Kind	STRUCTURE

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Sub-elements	x `float` y `float`
Derived from	-
Description	Position with respect to the vehicle origin.

⌋(*RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.1.42 Point2DError

[SWS_ADI_00605]{DRAFT} **Definition of ImplementationDataType Point2DError** ⌈

Name	Point2DError
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	xError `float` yError `float`
Derived from	-
Description	Error values for feature's 2D position {x, y}.

⌋(*RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.1.43 InformationAmbiguityDomain

[SWS_ADI_00713]{DRAFT} **Definition of ImplementationDataType InformationAmbiguityDomain** ⌈

Name	InformationAmbiguityDomain
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	VelocityAmbiguity `RadialVelocityAmbiguityDomain` (optional) RangeAmbiguity `RangeAmbiguityDomain` (optional) AzimuthAmbiguity `AngleAzimuthAmbiguityDomain` (optional) ElevationAmbiguity `AngleElevationAmbiguityDomain` (optional)
Derived from	-
Description	Radar Sensor Ambiguity Domain informaiton if the sensor has related capability.

⌋(*RS_ADI_00003*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.2 Potentially Moving Objects Interface Definition

This section lists all the data types used in Potentially moving object interface.

9.1.2.1 MeasurementStatus

[SWS_ADI_00200]{DRAFT} **Definition of ImplementationDataType Measurement Status** ⌈

Name	MeasurementStatus	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	`uint8_t`	
Description	Represent the measurement Status.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	The measurement status is unknown.
kOther	0x01	The measurement status is otherwise specified.
kMeasured	0x02	The tracked object is measured.
kPredicted	0x03	The result is by predicted.
kNew	0x04	The tracked object is new.
kPartiallyMeasured	0x05	The tracked object is partically measured.
kPredictedOccluded	0x06	Tracked object is temporarily occluded by another entity.
kInvalid	0x07	The measurement result is invalid.

⌋*(RS_ADI_00001, RS_ADI_00002, RS_ADI_00003, RS_ADI_00004, RS_ADI_00012, RS_ADI_00013, RS_ADI_00014)*

9.1.2.2 ReferencePoint

[SWS_ADI_00201]{DRAFT} **Definition of ImplementationDataType Reference Point** ⌈

Name	ReferencePoint	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	`uint8_t`	
Description	Represent outer edges of the recognized object's bounding box.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	Unknown reference point.
kOther	0x01	Otherwise specified reference point.
kFrontRightTop	0x02	Front Right Top.
kMidsideLeftTop	0x03	Midside Left Top.
kMidsideMidwidthTop	0x04	Midside Midwidth Top.
kMidside Right Top.	0x05	Midside Right Top.
kRearLeftTop	0x06	Rear Left Top.
kRearMidwidthTop	0x07	Rear Midwidth Top.
kRearRightTop	0x08	Rear Right Top.
kFrontLeftMidheight	0x09	Front Left Midheight.
kFrontMidwidthMidheight	0x0A	Front Midwidth Midheight.
kFrontRightMidheight	0x0B	Front Right Midheight.

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kMidsideLeftMidheight	0x0C	Midside Left Midheight.
kMidsideMidwidthMidheight	0x0D	Midside Midwidth Midheight.
kMidsideRightMidheight	0x0E	Midside Right Midheight.
kRearLeftMidheight	0x0F	Rear Left Midheight.
kRearMidwidthMidheight	0x10	Rear Midwidth Midheight.
kRearRightMidheight	0x11	Rear Right Midheight.
kFrontLeftBottom	0x12	Front Left Bottom.
kFrontMidwidthBottom	0x13	Front Midwidth Bottom.
kFrontRightBottom	0x14	Front Right Bottom.
kMidsideLeftBottom	0x15	Midside Left Bottom.
kMidsideMidwidthBottom	0x16	Midside Midwidth Bottom.
kMidsideRightBottom	0x17	Midside Right Bottom.
kRearLeftBottom	0x18	Rear Left Bottom.
kRearMidwidthBottom	0x19	Rear Midwidth Bottom.
kRearRightBottom	0x1A	Rear Right Bottom.
kFrontLeftTop	0x1B	Front Left Top.
kFrontMidwidthTop	0x1C	Front Midwidth Top.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.2.3 MovementStatus

[SWS_ADI_00202]{DRAFT} **Definition of ImplementationDataType MovementStatus** ⌈

Name	MovementStatus	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	`uint8_t`	
Description	Represent the relevance to ego vehicle road level.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	The status is unknown.
kOther	0x01	The status is otherwise specified.
kStoppedMoving	0x02	The object stopped moving.
kStationary	0x03	The object is stationary.
kMoving	0x04	The object is moving.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.2.4 RoadLevel

[SWS_ADI_00203]{DRAFT} **Definition of ImplementationDataType RoadLevel** ⌈

Name	RoadLevel	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	`uint8_t`	
Description	Represent the relevance to ego vehicle road level.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	The road level is unknown.
kOther	0x01	The road level is otherwise specified.
kEgoRoadLevel	0x02	The object is on the same road level of the ego vehicle.
kRoadLevelAbove	0x03	The object is above the road level of the ego vehicle .
kRoadLevelBelow	0x04	The object is below the road level of the ego vehicle .

⌋*(RS_ADI_00001, RS_ADI_00002, RS_ADI_00003, RS_ADI_00004, RS_ADI_00012, RS_ADI_00013, RS_ADI_00014)*

9.1.2.5 DimensionBox

[SWS_ADI_00204]{DRAFT} **Definition of ImplementationDataType DimensionBox** ⌈

Name	DimensionBox
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	Length `float` Width `float` Height `float` (optional)
Derived from	-
Description	Represents the dimension of the bounding box. The unit is {m,m,m}.

⌋*(RS_ADI_00001, RS_ADI_00002, RS_ADI_00003, RS_ADI_00004, RS_ADI_00012, RS_ADI_00013, RS_ADI_00014)*

9.1.2.6 DimensionBoxError

[SWS_ADI_00205]{DRAFT} **Definition of ImplementationDataType DimensionBox Error** ⌈

Name	DimensionBoxError
Namespace	ara::adi::sensoritf
Kind	STRUCTURE

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Sub-elements	Length `float` Width `float` Height `float` (optional)
Derived from	-
Description	Represents the Error value of the bounding box, the unit is {m,m,m}.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.2.7 IncludedGeometricStructures

[SWS_ADI_00206]{DRAFT} **Definition of ImplementationDataType IncludedGeometricStructures** ⌈

Name	IncludedGeometricStructures	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	`uint8_t`	
Description	Represent the geometrical structures that are taken into account in the bounding boxes.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	The geometric structures taken into account are unknown.
kOther	0x01	The geometric structures taken into account are otherwise specified.
kWithoutMirrors	0x01	Geometrical structures don't include the mirrors.
kWithMirrors	0x02	Geometrical structures include the Mirrors.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.2.8 PotentiallyMovingObjectClassificationType

[SWS_ADI_00207]{DRAFT} **Definition of ImplementationDataType PotentiallyMovingObjectClassificationType** ⌈

Name	PotentiallyMovingObjectClassificationType	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	`uint8_t`	
Description	Represents the potentially moving object classification probability type.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	The potentionally moving object type is unknown.
kOther	0x01	The potentially moving object type otherwise specified.
kSmallCar	0x02	Probability type small car.
kCompactCar	0x03	Probability type compact car.

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kMediumCar	0x04	Probability type medium car.
kLuxuryCar	0x05	Probability type luxury car.
kVan	0x06	Probability type van.
kHeavyTruck	0x07	Probability type heavy truck.
kSemitrailer	0x08	Probability type semitrailer.
kTrailer	0x09	Probability type trailer.
kMotorbike	0x0A	Probability type motorbike.
kBicycle	0x0B	Probability type bicycle.
kBus	0x0C	Probability type bus.
kTram	0x0D	Probability type tram.
kTrain	0x0E	Probability type train.
kWheelchair	0x0F	Probability type wheelchair.
kSemiTractor	0x10	Probability type semi tractor.
kTricycleMotorized	0x11	Probability type motorized tricycle.
kTricycleNonMotorized	0x12	Probability non motiorized tricycle.
kAnimal	0x13	Probability type animal.
kPedestrian	0x14	Probability type pedestrian.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.2.9 LightStatus

[SWS_ADI_00208]{DRAFT} **Definition of ImplementationDataType LightStatus** ⌈

Name	LightStatus	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	`uint8_t`	
Description	Represents the status of an object's light.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	Light status is unknown.
kOther	0x01	Light status is otherwise specified.
kOff	0x02	Light status is off.
kOn	0x03	Light status is on.
kFlash	0x04	Light status is cyclic flashing.
kBrake	0x05	Light status indicates braking.
kWarning	0x06	Light status indicates warning.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.2.10 LightType

[SWS_ADI_00209]{DRAFT} **Definition of ImplementationDataType LightType** ⌈

Name	LightType	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	`uint8_t`	
Description	Represents the light classification.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	The light type is unknown.
kOther	0x01	The light type is otherwise specified.
kHazardFlashLight	0x02	Vehicle's hazard flash light.
kLeftBrakeLight	0x03	Vehicle's left break light.
kRightBrakeLight	0x04	Vehicle's right break light.
kCentreBrakeLight	0x05	Vehicle's centre break light.
kLeftOtherLight	0x06	Vehicle's left light (no flash or break light).
kRightOtherLight	0x07	Vehicle's right light (no flash or break light).
kCentreOtherLight	0x08	Vehicle's light not on the left or right site (no flash or break light).
kLeftFlashLight	0x09	Vehicle's left flash light.
kRightFlashLight	0x0A	Vehicle's right flash light.

⌋*(RS_ADI_00001, RS_ADI_00002, RS_ADI_00003, RS_ADI_00004, RS_ADI_00012, RS_ADI_00013, RS_ADI_00014)*

9.1.2.11 PersonPoseType

[SWS_ADI_00210]{DRAFT} **Definition of ImplementationDataType PersonPose Type** ⌈

Name	PersonPoseType	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	`uint8_t`	
Description	Represents the person pose possibility type.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	The person pose is unknown.
kOther	0x01	The person pose is otherwise specified.
kLeftHand	0x02	Described angles are measured between the normal to the hand palm relative to the ego-vehicle axis system.
kRightHand	0x03	Described angles are measured between the normal to the hand palm relative to the ego-vehicle axis system.
kLeftLowerArm	0x04	Described angles are measured between long axis of the left lower arm relative to the ego-vehicle axis system.
kRightLowerArm	0x05	Described angles are measured between long axis of the right lower arm relative to the ego-vehicle axis system.

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kRightUpperLeg	0x06	Described angles are measured between long axis of the right upper leg relative to the ego-vehicle axis system.
kLeftLowerLeg	0x07	Described angles are measured between long axis of the left lower leg relative to the ego-vehicle axis system.
kRightLowerLeg	0x08	Described angles are measured between long axis of the right lower leg relative to the ego-vehicle axis system.
kLeftLowerLeg	0x09	Described angles are measured between long axis of the left lower leg relative to the ego-vehicle axis system.
kLeftFoot	0x0A	Described angles are measured between long axis of the left foot relative to the ego-vehicle axis system.
kRightFoot	0x0B	Described angles are measured between long axis of the right foot relative to the ego-vehicle axis system.
kHead	0x0C	The person head pose.
kUpperBody	0x0D	The person upper body pose.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.2.12 ObjectLaneAssociation

[SWS_ADI_00211]{DRAFT} **Definition of ImplementationDataType ObjectLaneAssociation** ⌈

Name	ObjectLaneAssociation	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	`uint8_t`	
Description	Represents an association of the object to neighbouring lanes	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	Lane of object is unknown.
kOther	0x01	Lane of object is otherwise specified.
kEgoLine	0x02	Object is in ego lane.
kLeftNeighbouringLane	0x03	Object is in left neighbouring lane.
kRightNeighbouringLane	0x04	Object is in right neighbouring lane.
kEgoRightLane	0x05	Object is located between ego and right neighbouring lane.
kEgoLeftLane	0x06	Object is located between ego and left neighbouring lane.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.2.13 AngleBetweenObjectEdgeAndLaneRightEdgeLeftLane

[SWS_ADI_00212]{DRAFT} **Definition of ImplementationDataType AngleBetweenObjectEdgeAndLaneRightEdgeLeftLane** ⌈

Name	AngleBetweenObjectEdgeAndLaneRightEdgeLeftLane
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	LeftEdgeRightLane `float` RightEdgeLeftLane `float`
Derived from	-
Description	Represents the Angles to object edge to lane. The unit is {rad,rad}.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.2.14 AngleBetweenObjectEdgeAndLaneRightEdgeLeftLaneError

[SWS_ADI_00213]{DRAFT} **Definition of ImplementationDataType AngleBetweenObjectEdgeAndLaneRightEdgeLeftLaneError** ⌈

Name	AngleBetweenObjectEdgeAndLaneRightEdgeLeftLaneError
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	LeftEdgeRightLane `float` RightEdgeLeftLane `float`
Derived from	-
Description	Represents the Error value of the angles to object edge to lane. The unit is {rad,rad}.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.2.15 PercentageSideLane

[SWS_ADI_00214]{DRAFT} **Definition of ImplementationDataType PercentageSideLane** ⌈

Name	PercentageSideLane
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	Left `uint16_t` Right `uint16_t`
Derived from	-
Description	Represents the percentage value of the object width in the corresponding {left, right} lane.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.2.16 PotentiallyMovingObjectsDynamics

[SWS_ADI_00215]{DRAFT} **Definition of ImplementationDataType PotentiallyMovingObjectsDynamics** ⌈

Name	PotentiallyMovingObjectsDynamics
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	VelocityObjectLevel `Point3D` VelocityObjectLevelError `Point3DError` (optional) Acceleration `Point3D` (optional) AccelerationError `Point3DError` (optional) InstantaneousCentreOfRotation `Point2D` (optional) InstantaneousCentreOfRotationError `Point2DError` (optional) RotationRateAtInstantaneousCentreOfRotationYaw `float` (optional) RotationRateAtInstantaneousCentreOfRotationYawError `float` (optional) MovementStatus `MovementStatus` (optional)
Derived from	-
Description	Represents the dynamics of the possible moving objects.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.2.17 ObjectStatus

[SWS_ADI_00216]{DRAFT} **Definition of ImplementationDataType ObjectStatus** ⌈

Name	ObjectStatus
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	ExistenceProbabilityObjectLevel `ProbabilityPercentage` ObjectID `uint16_t` GroupingObjectID `uint8_t` (optional) Age `uint64_t` NumberOfValidObservationsObjectLevel `uint32_t` (optional) ValidObservations `ValidObservationVector` (optional) TrackQuality `uint16_t` (optional) MeasurementStatusObjectLevel `MeasurementStatus`
Derived from	-
Description	Represents the dynamics of the objects.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.2.18 PotentiallyMovingObjectsBoundingBox

[SWS_ADI_00217]{DRAFT} **Definition of ImplementationDataType PotentiallyMovingObjectsBoundingBox** ⌈

Name	PotentiallyMovingObjectsBoundingBox
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	BoundingBoxExtent `DimensionBox` BoundingBoxExtentError `DimensionBoxError` (optional) BoundingBoxGroundClearance `float` (optional) IncludedGeometricStructures `IncludedGeometricStructures` (optional)
Derived from	-
Description	Represents the bounding box information of the possible moving objects.

⌋*(RS_ADI_00001, RS_ADI_00012, RS_ADI_00013, RS_ADI_00014)*

9.1.2.19 PotentiallyMovingObjectsInformation

[SWS_ADI_00218]{DRAFT} **Definition of ImplementationDataType PotentiallyMovingObjectsInformation** ⌈

Name	PotentiallyMovingObjectsInformation
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	NumberOfValidPotentiallyMovingObjectClassifications `uint8_t` PotentiallyMovingObjectClassifications `ValidPotentiallyMovingObjectClassificationVector`
Derived from	-
Description	Represents the certainty information regarding possible moving object types list.

⌋*(RS_ADI_00001, RS_ADI_00002, RS_ADI_00003, RS_ADI_00004, RS_ADI_00012, RS_ADI_00013, RS_ADI_00014)*

9.1.2.20 ValidPotentiallyMovingObjectClassification

[SWS_ADI_00219]{DRAFT} **Definition of ImplementationDataType ValidPotentiallyMovingObjectClassification** ⌈

Name	ValidPotentiallyMovingObjectClassification
Namespace	ara::adi::sensoritf
Kind	STRUCTURE

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Sub-elements	PotentiallyMovingObjectClassificationType `PotentiallyMovingObjectClassificationType` PotentiallyMovingObjectClassificationTypeConfidence `float`
Derived from	-
Description	Represents the certainty information regarding a possible moving object type.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.2.21 ValidPotentiallyMovingObjectClassificationVector

[SWS_ADI_00220]{DRAFT} **Definition of ImplementationDataType ValidPotentiallyMovingObjectClassificationVector** ⌈

Name	ValidPotentiallyMovingObjectClassificationVector
Namespace	ara::adi::sensoritf
Kind	VECTOR <`ValidPotentiallyMovingObjectClassification`>
Derived from	-
Description	Represents a list of PMOCertainty.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.2.22 PotentiallyMovingObjectsLight

[SWS_ADI_00221]{DRAFT} **Definition of ImplementationDataType PotentiallyMovingObjectsLight** ⌈

Name	PotentiallyMovingObjectsLight
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	PMOLightType `LightType` PMOLightStatus `LightStatus`
Derived from	-
Description	Represents the light information including light type and light status.

⌋(*RS_ADI_00001*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.2.23 PotentiallyMovingObjectsLightVector

[SWS_ADI_00222]{DRAFT} **Definition of ImplementationDataType PotentiallyMovingObjectsLightVector** ⌈

Name	PotentiallyMovingObjectsLightVector
Namespace	ara::adi::sensoritf
Kind	VECTOR <PotentiallyMovingObjectsLight>
Derived from	-
Description	Represents a list of light.

⌋(*RS_ADI_00001*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.2.24 PotentiallyMovingObjectsLights

[SWS_ADI_00223]{DRAFT} **Definition of ImplementationDataType PotentiallyMovingObjectsLights** ⌈

Name	PotentiallyMovingObjectsLights
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	NumberOfValidLights uint8_t PotentiallyMovingObjectsLightList PotentiallyMovingObjectsLightVector
Derived from	-
Description	Represents the lights information of the tracked object.

⌋(*RS_ADI_00001*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.2.25 ValidPersonPose

[SWS_ADI_00224]{DRAFT} **Definition of ImplementationDataType ValidPersonPose** ⌈

Name	ValidPersonPose
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	PoseType PersonPoseType PersonPoseInfo Orientation3D PersonPoseError Orientation3DError (optional)
Derived from	-
Description	Represents the Pose information including pose type and pose status.

⌋(*RS_ADI_00001*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.2.26 PersonPoseVector

[SWS_ADI_00225]{DRAFT} **Definition of ImplementationDataType PersonPose Vector** ⌈

Name	PersonPoseVector
Namespace	ara::adi::sensoritf
Kind	VECTOR <ValidPersonPose>
Derived from	-
Description	Represents a list of Pose.

⌋(*RS_ADI_00001*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.2.27 PotentiallyMovingObjectsPerson

[SWS_ADI_00226]{DRAFT} **Definition of ImplementationDataType Potentially MovingObjectsPerson** ⌈

Name	PotentiallyMovingObjectsPerson
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	NumberOfValidPersonSPoses `uint8_t` PersonPoselist `PersonPoseVector`
Derived from	-
Description	Represents the poses information of the tracked person.

⌋(*RS_ADI_00001*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.2.28 PotentiallyMovingObjectsLaneRelatedInformation

[SWS_ADI_00227]{DRAFT} **Definition of ImplementationDataType Potentially MovingObjectsLaneRelatedInformation** ⌈

Name	PotentiallyMovingObjectsLaneRelatedInformation
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	LaneAssociation `ObjectLaneAssociation` AngleBetweenObjectEdgeAndLane `AngleBetweenObjectEdgeAndLaneRightEdgeLeftLane` (optional) AngleBetweenObjectEdgeAndLaneError `AngleBetweenObjectEdgeAndLaneRightEdgeLeftLaneError` (optional) PercentageSideLane `PercentageSideLane` (optional)
Derived from	-
Description	Represents the lane related information.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.2.29 PotentiallyMovingObjectsMotionRelatedInformation

[SWS_ADI_00228]{DRAFT} **Definition of ImplementationDataType PotentiallyMovingObjectsMotionRelatedInformation** ⌈

Name	PotentiallyMovingObjectsMotionRelatedInformation
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	AngularPositionAzimuth `float` AngularVelocityAzimuth `float`
Derived from	-
Description	Represents the motion related information.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.2.30 ValidPotentiallyMovingObject

[SWS_ADI_00229]{DRAFT} **Definition of ImplementationDataType ValidPotentiallyMovingObject** ⌈

Name	ValidPotentiallyMovingObject
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	PotentiallyMovingObjectsStatus `ObjectStatus` PotentiallyMovingObjectsInformation `PotentiallyMovingObjectsInformation` PotentiallyMovingObjectsPosition `PotentiallyMovingObjectsPosition` PotentiallyMovingObjectsBoundingBox `PotentiallyMovingObjectsBoundingBox` (optional) PotentiallyMovingObjectsDynamics `PotentiallyMovingObjectsDynamics` PotentiallyMovingObjectsLights `PotentiallyMovingObjectsLights` (optional) PotentiallyMovingObjectsPerson `PotentiallyMovingObjectsPerson` (optional) PotentiallyMovingObjectsLaneRelatedInformation `PotentiallyMovingObjectsLaneRelatedInformation` (optional) PotentiallyMovingObjectsMotionInformation `PotentiallyMovingObjectsMotionRelatedInformation` (optional) CameraSensorSpecific `PotentiallyMovingObjectsCameraSensorTechnologySpecific` (optional) RadarSensorSpecific `PotentiallyMovingObjectsRadarSensorTechnologySpecific` (optional) LidarSensorSpecific `PotentiallyMovingObjectsLidarSensorTechnologySpecific` (optional)
Derived from	-
Description	Represents the possible moving objects tracked by a camera,radar, lidar or Ultrasonic.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.2.31 ValidPotentiallyMovingObjectVector

[SWS_ADI_00230]{DRAFT} **Definition of ImplementationDataType ValidPotentiallyMovingObjectVector** ⌈

Name	ValidPotentiallyMovingObjectVector
Namespace	ara::adi::sensoritf
Kind	VECTOR <ValidPotentiallyMovingObject>
Derived from	-
Description	Represents a list of PMO.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.2.32 PotentiallyMovingObjects

[SWS_ADI_00231]{DRAFT} **Definition of ImplementationDataType PotentiallyMovingObjects** ⌈

Name	PotentiallyMovingObjects
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	RecognizedPotentiallyMovingObjectsCapability uint16_t (optional) RecognizedPotentiallyMovingObjectsStatus RecognizedStatus (optional) NumberOfValidPotentiallyMovingObjects uint16_t ValidPotentiallyMovingObjects ValidPotentiallyMovingObjectVector
Derived from	-
Description	Represents the possible moving object informaiton provided by a camera,lidar, radar or Ultrasonic sensor.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.2.33 ValidObservation

[SWS_ADI_00232]{DRAFT} **Definition of ImplementationDataType ValidObservation** ⌈

Name	ValidObservation
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	TimeStampReferenceObjectLevel uint64_t ObservationStatusObjectLevel ObservationStatus
Derived from	-
Description	Represents the Observation status.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.2.34 ValidObservationVector

[SWS_ADI_00233]{DRAFT} **Definition of ImplementationDataType ValidObservationVector** ⌈

Name	ValidObservationVector
Namespace	ara::adi::sensoritf
Kind	VECTOR <ValidObservation>
Derived from	-
Description	Represents a list of Observation status..

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.2.35 ObservationStatus

[SWS_ADI_00234]{DRAFT} **Definition of ImplementationDataType ObservationStatus** ⌈

Name	ObservationStatus	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	uint8_t	
Description	Represent the observation status of the object, which was recognized in a previous cycle.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	The status is unknown.
kOther	0x01	The status is others.
kObservationTrue	0x00	The object was observed in the current cycle.
kObservationFalse	0x01	The object was not observed in the current cycle. It may be predicted in the cycle.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.2.36 PotentiallyMovingObjectsPosition

[SWS_ADI_00235]{DRAFT} **Definition of ImplementationDataType PotentiallyMovingObjectsPosition** ⌈

Name	PotentiallyMovingObjectsPosition
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	PositionObjectLevel `Point3D` PositionObjectLevelError `Point3DError` Orientation `Orientation3D` (optional) OrientationError `Orientation3DError` (optional) ReferencePoint `ReferencePoint` (optional) RoadLevel `RoadLevel` (optional)
Derived from	-
Description	Represents the position information fo a potentially moving object.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.2.37 PotentiallyMovingObjectsCameraSensorTechnologySpecific

[SWS_ADI_00236]{DRAFT} **Definition of ImplementationDataType PotentiallyMovingObjectsCameraSensorTechnologySpecific** ⌈

Name	PotentiallyMovingObjectsCameraSensorTechnologySpecific
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	ScaleChangeObjectLevel `float` (optional)
Derived from	-
Description	Represents the Camera Sensor Sepcific information.

⌋(*RS_ADI_00001*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.2.38 PotentiallyMovingObjectsRadarSensorTechnologySpecific

[SWS_ADI_00237]{DRAFT} **Definition of ImplementationDataType PotentiallyMovingObjectsRadarSensorTechnologySpecific** ⌈

Name	PotentiallyMovingObjectsRadarSensorTechnologySpecific
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	EntityRadarCrossSection `float` (optional)
Derived from	-
Description	Represents the Radar Sensor Sepcific information.

⌋(*RS_ADI_00003*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.2.39 PotentiallyMovingObjectsLidarSensorTechnologySpecific

[SWS_ADI_00238]{DRAFT} **Definition of ImplementationDataType PotentiallyMovingObjectsLidarSensorTechnologySpecific** ⌈

Name	PotentiallyMovingObjectsLidarSensorTechnologySpecific
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	EntityLidarReflectivity `float` (optional)
Derived from	-
Description	Represents the Lidar Sensor Sepcific information.

⌋(*RS_ADI_00002*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.2.40 PotentiallyMovingObjectInterface

[SWS_ADI_00239]{DRAFT} **Definition of ImplementationDataType PotentiallyMovingObjectInterface** ⌈

Name	PotentiallyMovingObjectInterface
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	PotentiallyMovingObjectInterfaceHeader `InterfaceHeader` PotentiallyMovingObjectList `PotentiallyMovingObjects`
Derived from	-
Description	Represents the possible moving object informaiton provided by a camera,lidar, radar or Ultrasonic sensor.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.3 Road Objects Interface Definition

This section lists all the data types used in road object interface.

9.1.3.1 RoadType

[SWS_ADI_00300]{DRAFT} **Definition of ImplementationDataType RoadType** ⌈

Name	RoadType	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	`uint8_t`	
Description	To identify the ego-vehicle relevant type of the road.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	The road type is unknown.
kOther	0x01	The road type is otherwise specified.
kHighway	0x02	Represents the highway.
kRural	0x03	Represents the rural road.
kCity	0x04	Represents the city road.
kOffRoad	0x05	Represents off the road.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.3.2 RoadSurfaceClassificationType

[SWS_ADI_00301]{DRAFT} **Definition of ImplementationDataType RoadSurface ClassificationType** ⌈

Name	RoadSurfaceClassificationType	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	`uint8_t`	
Description	To identify the ego-vehicle relevant type of the road surface.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	The road surface is unknown.
kOther	0x01	The road surface is otherwise specified.
kRomanRoad	0x02	Roman Road.
kOffRoad	0x03	Off the road.
kFlat	0x04	Flat surface.
kBumpy	0x05	Bumpy surface.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.3.3 RoadConditionClassificationType

[SWS_ADI_00302]{DRAFT} **Definition of ImplementationDataType RoadCondition ClassificationType** ⌈

Name	RoadConditionClassificationType	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	`uint8_t`	
Description	To identify the ego-vehicle relevant type of the road surface.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	The road condition is unknown.
kOther	0x01	The road condition is otherwise specified.
kDry	0x02	Dry Road.
kWet	0x03	Wet road.
kSnow	0x04	Snow road.
kIce	0x05	Ice Road.

⌋*(RS_ADI_00001, RS_ADI_00002, RS_ADI_00003, RS_ADI_00004, RS_ADI_00012, RS_ADI_00013, RS_ADI_00014)*

9.1.3.4 RoadMarkingType

[SWS_ADI_00303]{DRAFT} **Definition of ImplementationDataType RoadMarking Type** ⌈

Name	RoadMarkingType	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	`uint8_t`	
Description	To identify the ego-vehicle relevant type of the road surface.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	The road marking is unknown.
kOther	0x01	The road marking is otherwise specified.
kTrafficSignOnLane	0x02	The road marking is a traffic sign on the lane.
kAsamSymbolicTrafficSignOn Lane	0x03	The road marking is a symbolic traffic sign on the lane.
kAsamTextualTrafficSignOn Lane	0x04	The road marking is a textual traffic sign on the lane.
kGenericSymbol	0x05	The edge line road marking has more than two lines and the most inner line (w.r.t. the ego-vehicle) is dashed.
kGenericLine	0x06	The road marking is a generic line.
kAsamGenericText	0x07	The road marking is a generic text.
kSolid	0x08	The road marking is solid. It could also be a stop line.
kCentreLineDashedMarking	0x09	The centre line road marking is dashed.
kEdgeLineDashedMarking	0x0A	The edge line road marking is dashed.
kTriangular	0x0B	The road marking is a line of triangles.

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kDoubleLineSolid	0x0C	The road marking has two lines and the most inner line (w.r.t. the ego-vehicle) is solid.
kCentreLineDoubleLineDashed	0x0D	The centre line road marking has two lines and the most inner line (w.r.t. the ego-vehicle) is dashed.
kMultipleLineSolid	0x0E	The road marking has more than two lines and the most inner line (w.r.t. the ego-vehicle) is solid.
kCentreLineMultipleLine Dashed	0x0F	The centre line road marking has more than two lines and the most inner line (w.r.t. the ego-vehicle) is dashed.
kEdgeLineMultipleLineDashed	0x10	The edge line road marking has more than two lines and the most inner line (w.r.t. the ego-vehicle) is dashed.
kBottsDotsCatsEyes	0x11	The road marking consists of Botts' dots or cats' eyes.
kHatched	0x12	The edge line road marking is dashed.
kBox	0x13	The road marking of a junction.
kColouredArea	0x14	The road marking is a coloured area.
kArrow	0x15	The road marking is an arrow.
kZebraCrossing	0x16	The road marking is a zebra crossing / continental / ladder.
kAttentionMarker	0x17	The road marking is an attention marker e.g. US, China and Japan.
kParkingArea	0x18	The edge line road marking is dashed.
kTShapeMarkingBegin	0x19	The road marking is a parking T-shape beginning parking line.
kTShapeMarkingEnd	0x1A	The road marking is a parking T-shape ending parking line.
kIShapeMarkingBegin	0x1B	The road marking is a parking I-shape beginning parking line.
kIShapeMarkingEnd	0x1C	The road marking is a zebra crossing / continental / ladder.
kLShapeMarkingBegin	0x1D	The road marking is a parking L-shape beginning parking line.
kLShapeMarkingEnd	0x1E	The road marking is a parking L-shape ending parking line.
kNets	0x1F	The road marking is a net, i.e. a non-stopping area.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.3.5 ArrowDirection

[SWS_ADI_00304]{DRAFT} **Definition of ImplementationDataType ArrowDirection**
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Name	ArrowDirection	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	`uint8_t`	
Description	To identify estimated direction of the displayed arrow.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	The arrow direction is unknown.
kOther	0x01	The arrow direction is otherwise specified.
kRight	0x02	Arrow has an estimated direction of -pi/2 rad to -90.
kStraightLeft	0x03	Arrow is straight left and has an estimated direction of +pi/2 rad to +90.
kStraightRight	0x04	Arrow is straight right and has an estimated direction of -pi/2 rad to -90.
kTurningPointLeft	0x05	Arrow has an estimated direction of +pi/2 rad to +180.

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kTurningPointRight	0x06	Arrow has an estimated direction of -pi/2rad to -180.
k45DegLeft	0x07	Arrow has an estimated direction of +pi/4 rad to +45.
k45DegRight	0x08	Arrow has an estimated direction of -pi/4 rad to -45.
kNoArrow	0x09	No arrow is present.
kForeward	0x0A	Arrow has an estimated direction of 0 rad to 0.
kLeft	0x0B	Arrow has an estimated direction of +pi/2 rad to +90.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.3.6 SignClassificationType

[SWS_ADI_00305]{DRAFT} **Definition of ImplementationDataType SignClassificationType** ⌈

Name	SignClassificationType	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	`uint8_t`	
Description	To identify the type of the sign as main traffic sign or road marking.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	The main traffic sign is unknown.
kOther	0x01	The main traffic sign is otherwise specified.
kAsamDangerspot	0x02	Danger sign.
kAsamRightBeforeLeftNext Intersection	0x03	Traffic sign for right before left for the next intersection.
kAsamTurnLeft	0x04	Turn left sign.
kAsamTurnRight	0x05	Turn right sign.
kAsamDoubleturnLeft	0x06	Double turn left sign.
kAsamDoubleturnRight	0x07	Double turn right sign.
kAsamHillDownwards	0x08	Hill Downwards sign.
kAsamHillUpwards	0x09	Hill upwards sign.
kAsamRoadNarrowing	0x0A	Road narrowing sign.
kAsamRoadNarrowingLeft	0x0B	Road narrowing on the left sign.
kAsamRoadNarrowingRight	0x0C	Road narrowing on the right sign.
kAsamRoadworks	0x0D	Roadworks sign.
kAsamTwowayTraffic	0x0E	Two way traffic sign.
kAsamAttentionTrafficLight	0x0F	Attention for traffic light sign.
kAsamGiveWay	0x10	Give way sign.
kAsamStop	0x11	Stop sign.
kAsamPriorityToOpposite Direction	0x12	Priority to opposite direction sign.
kAsamPriorityToOpposite DirectionUpsideDown	0x13	Priority to opposite direction upside down sign.
kAsamPrescribedLeftTurn	0x14	Prescribed left turn sign.
kAsamPrescribedRightTurn	0x15	Prescribed right turn sign.

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kAsamPrescribedStraight	0x16	Prescribed straight sign.
kAsamPrescribedLeftWay	0x17	Prescribed left way sign.
kAsamPrescribedRightWay	0x18	Prescribed right way sign.
kAsamPrescribedLeftTurnAnd Straight	0x19	Prescribed left turn and straight sign.
kAsamPrescribedRightTurnAnd Straight	0x1A	Prescribed right turn and straight sign.
kAsamPrescribedLeftTurnAnd RightTurn	0x1B	Prescribed left turn and right turn sign.
kAsamPrescribedLeftTurnRight TurnAndStraight	0x1C	Prescribed left turn, right turn and straight sign.
kAsamRoundabout	0x1D	Roundabout sign.
kAsamOnewayLeft	0x1E	Oneway left sign.
kAsamOnewayRight	0x1F	Oneway right sign.
kAsamPassLeft	0x20	Pass left sign.
kAsamPassRight	0x21	Pass right sign.
kAsamBusLane	0x22	Bus lane sign.
kAsamBusLaneBegin	0x23	Bus lane begin sign.
kAsamBusLaneEnd	0x24	Bus lane end sign.
kAsamAllProhibited	0x25	All prohibited sign.
kAsamMotorizedMultitrack Prohibited	0x26	Motorized multitrack prohibited sign.
kAsamTrucksProhibited	0x27	Trucks prohibited sign.
kAsamBicyclesProhibited	0x28	Bicycles prohibited sign.
kAsamMotorcyclesProhibited	0x29	Motorcycles prohibited sign.
kAsamPedestriansProhibited	0x2A	Pedestrians prohibited sign.
kAsamMotorVehiclesProhibited	0x2B	Motor vehicle prohibited sign.
kAsamDoNotEnter	0x2C	Do not enter sign.
kAsamEnvironmentalZone Begin	0x2D	Environmentag zone begin sign.
kAsamEnvironmentalZoneEnd	0x2E	Environmental zone end sign.
kAsamNoUTurnLeft	0x2F	No left U-turn sign.
kAsamNoUTurnRight	0x30	No right U-turn sign.
kAsamPrescribedUTurnLeft	0x31	Prescribed left U-turn sign.
kAsamPrescribedUTurnRight	0x32	Prescribed right U-turn sign.
kAsamMinimumDistanceFor Trucks	0x33	Minimum distance for trucks sign.
kAsamSpeedLimitBegin	0x34	Speed limit begin sign.
kAsamSpeedLimitZoneBegin	0x35	Speed limit zone begin sign.
kAsamSpeedLimitZoneEnd	0x36	Speed limit zone end sign.
kAsamMinimumSpeedBegin	0x37	Minimum speed begin sign.
kAsamOvertakingBanBegin	0x38	Overtaking ban begin sign.
kAsamOvertakingBanFor TrucksBegin	0x39	Overtaking ban for trucks begin sign.
kAsamSpeedLimitEnd	0x3A	Speed limit end sign.
kAsamMinimumSpeedEnd	0x3B	Minimum speed end sign.
kAsamOvertakingBanEnd	0x3C	Overtaking ban end sign.

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kAsamOvertakingBanFor TrucksEnd	0x3D	Overtaking ban for trucks end sign.
kAsamAllRestrictionsEnd	0x3E	All restrictions end sign.
kAsamNoStopping	0x3F	No stopping sign.
kAsamNoParking	0x40	No parking sign.
kAsamNoParkingZoneBegin	0x41	No parking zone begin sign.
kAsamNoParkingZoneEnd	0x42	No parking zone end sign.
kAsamRightOfWayNext Intersection	0x43	Right of way next intersection sign.
kAsamRightOfWayBegin	0x44	Right of way begin sign.
kAsamRightOfWayEnd	0x45	Right of way end sign.
kAsamPriorityOverOpposite Direction	0x46	Priority over opposite direction sign.
kAsamPriorityOverOpposite DirectionUpsideDown	0x47	Priority over opposite direction upside down sign.
kAsamTownBegin	0x48	Town begin sign.
kAsamTownEnd	0x49	Town end sign.
kAsamCarParking	0x4A	Car parking sign.
kAsamCarParkingZoneBegin	0x4B	Car parking zone begin sign.
kAsamCarParkingZoneEnd	0x4C	Car parking zone end sign.
kAsamLivingStreetBegin	0x4D	Living street begin sign.
kAsamLivingStreetEnd	0x4E	Living street end sign.
kAsamTunnel	0x4F	Tunnel sign.
kAsamEmergencyStoppingLeft	0x50	Emergency stopping left sign.
kAsamEmergencyStopping Right	0x51	Emergency stopping right sign.
kAsamHighwayBegin	0x52	Highway begin sign.
kAsamHighwayEnd	0x53	Highway end sign.
kAsamExpresswayBegin	0x54	Expressway begin sign.
kAsamExpresswayEnd	0x55	Expressway end sign.
kAsamHighwayExit	0x56	Highway exit sign.
kAsamZebraCrossing	0x57	Zebra crossing sign.
kAsamPoleExit	0x58	Pole exit sign.
kAsamAnnounceLeftLaneEnd	0x59	Announce left lane end sign.
kAsamAnnounceRightLaneEnd	0x5A	Announce right lane end sign.
kAsamPoleWarning	0x5B	Pole warning sign.
kAsamTrafficLightGreenArrow	0x5C	Traffic light green arrow sign.
kAsamUnevenRoad	0x5D	Uneven road sign.
kAsamSnowOrIce	0x5E	Snow or ice sign.
kAsamRoadSlipperyWetOr Dirty	0x5F	Road slippery, wet or dirty sign.
kAsamFallingRocks	0x60	Falling rocks sign.
kAsamLooseGravel	0x61	Loose gravel sign.
kAsamSideWinds	0x62	Side winds sign.
kAsamParkingHazard	0x63	Parking hazard sign.
kAsamTrafficQueues	0x64	Traffic queues sign.
kAsamMovableBridge	0x65	Movable bridge sign.
kAsamWaterside	0x66	Waterside sign.

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kAsamPedestrians	0x67	Pedestrians sign.
kAsamGuidingPlate	0x68	Guiding plate.
kAsamGuidingPlateWedges	0x69	Guiding plate wedges.
kAsamChildrenCrossing	0x6A	Children crossing sign.
kAsamCycleRoute	0x6B	Cycle route sign.
kAsamDirectionToHighway Right	0x6C	Direction to highway sign.
kAsamDeerCrossing	0x6D	Deer crossing sign.
kAsamFlight	0x6E	Flight sign.
kAsamOptionalDetour	0x6F	Optional detour sign.
kAsamLevelCrossingMarker	0x70	Level crossing marker.
kAsamDirectionalBoard Warning	0x71	Directional board warning.
kAsamReflectorPost	0x72	Reflector post.
kAsamAnnounceRightLane Begin	0x73	Announce right lane begin sign.
kAsamAnnounceLeftLane Begin	0x74	Announce left lane begin sign.
kAsamAnnounceLane Consolidation	0x75	Announce lane consolidation sign.
kAsamConsolidatedDirections	0x76	Consolidated directions sign.
kAsamStreetName	0x77	Street name sign.
kAsamDirection Preannouncement	0x78	Direction preannouncement sign.
kAsamDirection PreannouncementLaneConfig	0x79	Preannouncement lane config sign.
kAsamDirection PreannouncementHighway Entries	0x7A	Direction preannouncement highway entries sign.
kAsamHighwayAnnouncement	0x7B	Highway announcement sign.
kAsamOtherRoad Announcement	0x7C	Other road announcement sign.
kAsamHighwayAnnouncement TruckStop	0x7D	Highway announcement truckstop sign.
kAsamHighway PreannouncementDirections	0x7E	Highway preannouncement direction sign.
kAsamDirectionToLocal DestinationLeft	0x7F	Direction to local destination left sign.
kAsamSideLaneOpenForTraffic	0x80	Side lane open for traffic sign.
kAsamSideLaneClosedFor Traffic	0x81	Side lane closed for traffic sign.
kAsamSideLaneClosingFor Traffic	0x82	Side lane closing for traffic sign.
kAsamNumberedDetour	0x83	Numbered detour sign.
kAsamDetourBegin	0x84	Detour begin sign.
kAsamDetourEnd	0x85	Detour end sign.
kAsamDetourRoutingBoard	0x86	Detour routing board sign.
kAsamRailwayTrafficPriority	0x87	Railway traffic priority sign.
kAsamDirectionToLocal DestinationRight	0x88	Direction to local destination right sign.
kAsamBusStop	0x89	Bus stop sign.

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kAsamTaxiStand	0x8A	Taxi stand sign.
kAsamMobileLaneClosure	0x8B	Mobile lane closure sign.
kAsamTrafficCone	0x8C	Traffic cone.
kAsamGate	0x8D	Gate sign.
kAsamDetourCityBlock	0x8E	Detour city block sign.
kAsamDirectionToHighwayLeft	0x8F	Direction to highway left sign.
kAsamUngatedLevelCrossing	0x90	Ungated level crossing sign.
kAsamBicyclesOnly	0x91	Bicycles only sign.
kAsamHorseRidersOnly	0x92	Horse riders only sign.
kAsamPedestriansOnly	0x93	Pedestrians only sign.
kAsamBicyclesPedestrians SharedOnly	0x94	Bicycles and pedestrians shared only sign.
kAsamBicyclesPedestrians SeparatedLeftOnly	0x95	Bicycles and pedestrians seperated left only sign.
kAsamBicyclesPedestrians SeparatedRightOnly	0x96	Bicycles and pedestrians seperated right only sign.
kAsamPedestrianZoneBegin	0x97	Pedestrian zone begin sign.
kAsamPedestrianZoneEnd	0x98	Pedestrian zone end sign.
kAsamBicycleRoadBegin	0x99	Bicycle road begin sign.
kAsamBicycleRoadEnd	0x9A	Bicycle road end sign.
kAsamMopedsProhibited	0x9B	Moped prohibited sign.
kAsamHorseRidersProhibited	0x9C	Horse riders prohibited sign.
kAsamHorseCarriages Prohibited	0x9D	Horse carriages prohibited sign.
kAsamCattleProhibited	0x9E	Cattle prohibited sign.
kAsamBusesProhibited	0x9F	Buses prohibited sign.
kAsamCarsProhibited	0xA0	Cars prohibited sign.
kAsamCarsTrailersProhibited	0xA1	Cars and trailers prohibited sign.
kAsamTrucksTrailersProhibited	0xA2	Trucks and trailers prohibited sign.
kAsamTractorsProhibited	0xA3	Tractors prohibited sign.
kAsamHazardousGoods VehiclesProhibited	0xA4	Hazardous goods vehicles prohibited sign.
kAsamOverWeightVehicles Prohibited	0xA5	Overweight vehicles prohibited sign.
kAsamVehiclesAxleOverWeight Prohibited	0xA6	Vehicle axle overweight prohibited sign.
kAsamVehiclesExcessWidth Prohibited	0xA7	Vehicles excess width prohibited sign.
kAsamVehiclesExcessHeight Prohibited	0xA8	Vehicles excess height prohibited sign.
kAsamVehiclesExcessLength Prohibited	0xA9	Vehicles excess length prohibited sign.
kAsamSnowChainsRequired	0xAA	Snow chains required sign.
kAsamWaterPollutantVehicles Prohibited	0xAB	Water pollutant vehicles prohibited sign.
kAsamSidewalkHalfParkingLeft	0xAC	Sidewalk half parking left sign.
kAsamSidewalkHalfParking Right	0xAD	Sidewalk half parking right sign.
kAsamSidewalkParkingLeft	0xAE	Sidewalk parking left sign.
kAsamSidewalkParkingRight	0xAF	Sidewalk parking right sign.

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kAsamSidewalkPerpendicularHalfParkingLeft	0xB0	Sidewalk perpendicular half parking left sign.
kAsamSidewalkPerpendicularHalfParkingRight	0xB1	Sidewalk perpendicular half parking right sign.
kAsamSidewalkPerpendicularParkingLeft	0xB2	Sidewalk perpendicular parking left sign.
kAsamSidewalkPerpendicularParkingRight	0xB3	Sidewalk perpendicular parking right sign.
kAsamHighwayDistanceBoard	0xB4	Highway distance board sign.
kAsamDetourLeft	0xB5	Detour left sign.
kAsamDetourRight	0xB6	Detour right sign.
kAsamNamedHighwayExit	0xB7	Names highway exit sign.
kAsamNamedExpresswayExit	0xB8	Named expressway exit sign.
kAsamNamedRoadExit	0xB9	Named road exit sign.
kAsamExpresswayExit	0xBA	Expressway exit sign.
kAsamOnewayStreet	0xBB	Oneway street sign.
kAsamAmphibians	0xBC	Amphibians sign.
kAsamCrossingGuards	0xBD	Crossing guards sign.
kAsamDeadend	0xBE	Deadend sign.
kAsamDeadendExcludingDesignatedActors	0xBF	Deadend excluding designated actors sign.
kAsamAnnounceLaneTransitionLeft	0xC0	Announce lane transition left sign.
kAsamAnnounceLaneTransitionRight	0xC1	Announce lane transition right sign.
kAsamFirstAidStation	0xC2	First aid station sign.
kAsamPoliceStation	0xC3	Police station sign.
kAsamTelephone	0xC4	Telephone sign.
kAsamHorseRiders	0xC5	Horse riders sign.
kAsamFillingStation	0xC6	Filling station sign.
kAsamOptionalDetourRouting	0xC7	Optional detour routing sign.
kAsamCattle	0xC8	Cattle sign.
kAsamHotel	0xC9	Hotel sign.
kAsamInn	0xCA	Inn sign.
kAsamKiosk	0xCB	Kiosk sign.
kAsamToilet	0xCC	Toilet sign.
kAsamChapel	0xCD	Chapel sign.
kAsamTouristInfo	0xCE	Tourist info sign.
kAsamRepairService	0xCF	Repair service sign.
kAsamPedestrianUnderpass	0xD0	Pedestrian underpass sign.
kAsamPedestrianBridge	0xD1	Pedestrian bridge sign.
kAsamClearance	0xD2	Clearance sign.
kAsamRouteRecommendation	0xD3	Route recommendation sign.
kAsamRouteRecommendationEnd	0xD4	Route recommendation end sign.
kAsamCamperPlace	0xD5	Camper place sign.
kAsamAdvisorySpeedLimitBegin	0xD6	Advisory speed limit begin sign.
kAsamAdvisorySpeedLimitEnd	0xD7	Advisory speed limit end sign.

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kAsamPlaceName	0xD8	Placename sign.
kAsamTouristAttraction	0xD9	Tourist attraction sign.
kAsamTouristRoute	0xDA	Tourist route sign.
kAsamTouristArea	0xDB	Tourist area sign.
kAsamShoulderNotPassable MotorVehicles	0xDC	Shoulde not passable motor vehicles sign.
kAsamShoulderUnsafeTrucks Tractors	0xDD	Shoulder unsafe trucks and tractors sign.
kAsamTollBegin	0xDE	Toll begin sign.
kAsamTollEnd	0xDF	Toll end sign.
kAsamTollRoad	0xE0	Toll road sign.
kAsamCustoms	0xE1	Customs sign.
kAsamInternationalBorderInfo	0xE2	International border info sign.
kAsamStreetlightRedBand	0xE3	Streetlight red band sign.
kAsamFederalHighwayRoute Number	0xE4	Federal highway route number sign.
kAsamHighwayRouteNumber	0xE5	Highway route number sign.
kAsamHighwayInterchange Number	0xE6	Highway interchange number sign.
kAsamEuropeanRouteNumber	0xE7	European route number sign.
kAsamFederalHighway DirectionLeft	0xE8	Federal highway direction left sign.
kAsamFederalHighway DirectionRight	0xE9	Federal highway direction right sign.
kAsamPrimaryRoadDirection Left	0xEA	Primary road direction left sign.
kAsamPrimaryRoadDirection Right	0xEB	Primary road direction right sign.
kAsamSecondaryRoad DirectionLeft	0xEC	Secondary road direction left sign.
kAsamSecondaryRoad DirectionRight	0xED	Secondary road direction right sign.
kAsamDirectionDesignated ActorsLeft	0xEE	Direction designated actors left sign.
kAsamDirectionDesignated ActorsRight	0xEF	Direction designated actors right sign.
kAsamRoutingDesignated Actors	0xF0	Routing designated actors sign.
kNoMainSign	0xF1	No main sign detected.
kEmptySign	0xF2	Empty sign.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.3.7 SignValueUnit

[SWS_ADI_00306]{DRAFT} **Definition of ImplementationDataType SignValueUnit** ⌈

Name	SignValueUnit	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	`uint8_t`	
Description	To identify the value unit of the linked sign.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	Unknown unit.
kOther	0x01	Other unit.
kMeter	0x02	Meter
kKilometre	0x03	Kilometre
kFeet	0x04	Feet
kMile	0x05	Mile
kMetricTon	0x06	Metric Ton
kShortTon	0x07	Short Ton
kLongTon	0x08	LongTon.
kMinute	0x09	Minute
kHour	0x0A	Hour
Day	0x0B	Day
kWeekday	0x0C	Weekday
kPercentage	0x0D	Percentage
kKilometrePerHour	0x0E	Kilometre per hour
kMilePerHour	0x0F	Mile per hour

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.3.8 ConnectionType

[SWS_ADI_00307]{DRAFT} **Definition of ImplementationDataType Connection Type** ⌈

Name	ConnectionType	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	`uint8_t`	
Description	To identify the type of connection of at least two road markings, polylines or polynomials.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	The connection of road markings is unknown.
kOther	0x01	The connection of road markings is otherwise specified.
kMerge	0x02	The connection of road markings is a merge of road markings.
kSplit	0x03	The connection of road markings is a split of road markings.

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kInterconnection	0x04	The connection of road markings is an interconnection of road markings.
kExtension	0x05	The connection of road markings is an extension of two road markings.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.3.9 PolynomialCoefficient

[SWS_ADI_00308]{DRAFT} **Definition of ImplementationDataType PolynomialCoefficient** ⌈

Name	PolynomialCoefficient
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	C0 `float` C1 `float` C2 `float` C3 `float`
Derived from	-
Description	Calculated coefficient. (m, 1, 1/m, 1/m2)

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.3.10 ColourTone

[SWS_ADI_00309]{DRAFT} **Definition of ImplementationDataType ColourTone** ⌈

Name	ColourTone
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	ValidColourModel `ColourValueVector` ColourToneConfidenceObjectLevel `ProbabilityPercentage` (optional)
Derived from	-
Description	Represents the colour Information.

⌋(*RS_ADI_00001*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.3.11 RoadObjectInterface

[SWS_ADI_00310]{DRAFT} **Definition of ImplementationDataType RoadObjectInterface** ⌈

Name	RoadObjectInterface
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	RoadObjectInterfaceHeader `InterfaceHeader` RoadSurfaceObjectList `RoadSurface` (optional) RoadMarkingObjectList `RoadMarkings` (optional) RoadBoundariesObjectList `RoadBoundaries` (optional)
Derived from	-
Description	Represents the road object informaiton provided by a camera,lidar, radar or Ultrasonic sensor.

⌋*(RS_ADI_00001, RS_ADI_00002, RS_ADI_00003, RS_ADI_00004, RS_ADI_00012, RS_ADI_00013, RS_ADI_00014)*

9.1.3.12 PolynomialRangeX

[SWS_ADI_00311]{DRAFT} **Definition of ImplementationDataType PolynomialRangeX** ⌈

Name	PolynomialRangeX
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	Start `float` End `float`
Derived from	-
Description	Valid range of the polynomial [x Start, x End].(m, m)

⌋*(RS_ADI_00001, RS_ADI_00002, RS_ADI_00003, RS_ADI_00004, RS_ADI_00012, RS_ADI_00013, RS_ADI_00014)*

9.1.3.13 SupportedDataRangeX

[SWS_ADI_00312]{DRAFT} **Definition of ImplementationDataType SupportedDataRangeX** ⌈

Name	SupportedDataRangeX
Namespace	ara::adi::sensoritf
Kind	STRUCTURE

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Sub-elements	Start `float` End `float`
Derived from	-
Description	Supported range of the polynomial [x Start, x End] covered with measured points.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.3.14 PolylineInterpolationMethod

[SWS_ADI_00313]{DRAFT} **Definition of ImplementationDataType PolylineInterpolationMethod** ⌈

Name	PolylineInterpolationMethod	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	`uint8_t`	
Description	To identify the type of connection of at least two road markings, polylines or polynomials.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	Unknown interpolation between two sequential points.
kOther	0x01	Other interpolation between two sequential points.
kLinear	0x02	Linear interpolation between two sequential points.
kSpline	0x03	Spline interpolation between two sequential points.
kCubic	0x04	Cubic interpolation between two sequential points.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.3.15 VertexPointConfidence

[SWS_ADI_00314]{DRAFT} **Definition of ImplementationDataType VertexPointConfidence** ⌈

Name	VertexPointConfidence
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	Vpcx `ProbabilityPercentage` Vpcy `ProbabilityPercentage` Vpcz `ProbabilityPercentage`
Derived from	-
Description	Measured longitudinal, lateral and vertical distance of the vertex confidence.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.3.16 RoadBoundaryType

[SWS_ADI_00315]{DRAFT} **Definition of ImplementationDataType RoadBoundaryType** ⌈

Name	RoadBoundaryType	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	`uint8_t`	
Description	Indicated the type of the road boundary.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	The road boundary type is unknown.
kOther	0x01	The road boundary type is otherwise specified.
kFence	0x02	The road boundary is a fence.
kWall	0x03	The road boundary is a wall, a building, etc.
kTensionCableSystem	0x04	The road boundary is a tension cable system.
kUnclassifiedElevated	0x05	The road boundary is an unclassified elevated structure.
kRoadEdge	0x06	The road boundary is a general road edge.
kAsamSnowEdge	0x07	The road boundary is a edge consisting of snow.
kAsamGrassEdge	0x08	The road boundary is a edge consisting of grass.
kAsamGravelEdge	0x09	The road boundary is a edge consisting of gravel.
kAsamSoilEdge	0x0A	The road boundary is a edge consisting of soil.
kGuardrail	0x0B	The road boundary is a guardrail.
kCurb	0x0C	The road boundary is a curb stone.
kStructure	0x0D	The road boundary is a structure.
kBarrier	0x0E	The road boundary is a barrier.
kSoundBarrier	0x0F	The road boundary is a sound barrier.

⌋*(RS_ADI_00001, RS_ADI_00002, RS_ADI_00003, RS_ADI_00004, RS_ADI_00012, RS_ADI_00013, RS_ADI_00014)*

9.1.3.17 RoadObjectLaneAssociation

[SWS_ADI_00316]{DRAFT} **Definition of ImplementationDataType RoadObjectLaneAssociation** ⌈

Name	RoadObjectLaneAssociation	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	`uint8_t`	
Description	To provides the association of a road marking or a road boundary to a lane with respect to the ego-vehicle lane.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	The association of the road marking is unknown.
kOther	0x01	The association of the road marking is otherwise specified.

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kEgoLane	0x02	The road marking is on the ego lane.
kEgoLeft1Lane	0x03	The road boundary separates the ego lane from 1st left neighbouring lane.The road marking is associated to the ego lane and the 1st left neighbouring lane.
kEgoRight1Lane	0x04	The road boundary separates the ego lane from 1st right neighbouring lane.The road marking is associated to the ego lane and the 1st right neighbouring lane.
kLeft1Lane	0x05	The road marking is on the 1st left neighbouring lane.
kRight1Lane	0x06	The road marking is on the 1st right neighbouring lane.
kLeft1Left2Lane	0x07	The road boundary separates the 1st left lane from the 2nd left neighbouring lane.The road marking is associated to the 1st lane and the 2nd left neighbouring lane.
kRight1Right2Lane	0x08	The road boundary separates the 1st right lane from the 2nd right neighbouring lane.The road marking is associated to the 1st lane and the 2nd right neighbouring lane.
kLeft2Lane	0x09	The road marking is on the 2nd left neighbouring lane.
kRight2Lane	0x0A	The road marking is on the 2nd right neighbouring lane.
kLeftRoadEdge	0x0B	The road boundary limits at the outer edge of the leftmost lane.
kRightRoadEdge	0x0C	The road boundary limits at the outer edge of the rightmost lane.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.3.18 RoadBoundaries

[SWS_ADI_00317]{DRAFT} **Definition of ImplementationDataType RoadBoundaries** ⌈

Name	RoadBoundaries
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	RecognizedRoadBoundariesCapability `uint16_t` (optional) RecognizedRoadBoundariesStatus `RecognizedStatus` (optional) NumberOfValidRoadBoundaries `uint16_t` RoadBoundaryList `RoadBoundaryVector`
Derived from	-
Description	Represents the road boundaries Information.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.3.19 RoadSurfaceClassification

[SWS_ADI_00318]{DRAFT} **Definition of ImplementationDataType RoadSurface Classification** ⌈

Name	RoadSurfaceClassification
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	SurfaceType `RoadSurfaceClassificationType` RoadSurfaceClassificationTypeConfidence `ProbabilityPercentage`
Derived from	-
Description	Represents the road suface type and probability.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.3.20 SignState

[SWS_ADI_00319]{DRAFT} **Definition of ImplementationDataType SignState** ⌈

Name	SignState	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	`uint8_t`	
Description	To provides the state of the sign.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	The message sign is unknown.
kOther	0x01	The message sign is otherwise specified.
kStatic	0x02	The message sign is not a variable message sign.
kVariable	0x03	The message sign is a variable message sign.
kSwitchedOff	0x04	The message sign is a variable message sign which is switched off.
kFullOutOfService	0x05	The message sign is full out of service.
kPartlyOutOfService	0x06	Part of the message sign is out of service.
kOutOfView	0x07	The message sign has rotated.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.3.21 RoadSurfaceClassificationsVector

[SWS_ADI_00320]{DRAFT} **Definition of ImplementationDataType RoadSurface ClassificationsVector** ⌈

Name	RoadSurfaceClassificationsVector
Namespace	ara::adi::sensoritf
Kind	VECTOR <RoadSurfaceClassification>
Derived from	-
Description	Represents a list of Road Surface.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.3.22 RoadSurfaceConditionClassification

[SWS_ADI_00321]{DRAFT} **Definition of ImplementationDataType RoadSurface ConditionClassification** ⌈

Name	RoadSurfaceConditionClassification
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	RoadConditionType RoadConditionClassificationType RoadSurfaceConditionClassificationTypeConfidence ProbabilityPercentage
Derived from	-
Description	Represents the road suface condition and probability.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.3.23 RoadSurfaceConditionClassificationsVector

[SWS_ADI_00322]{DRAFT} **Definition of ImplementationDataType RoadSurface ConditionClassificationsVector** ⌈

Name	RoadSurfaceConditionClassificationsVector
Namespace	ara::adi::sensoritf
Kind	VECTOR <RoadSurfaceConditionClassification>
Derived from	-
Description	Represents a list of Road Surface condition.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.3.24 RoadSurface

[SWS_ADI_00323]{DRAFT} **Definition of ImplementationDataType RoadSurface** ⌈

Name	RoadSurface
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	RoadType `RoadType` NumberOfValidRoadSurfaceClassifications `uint8_t` ValidRoadSurfaceClassifications `RoadSurfaceClassificationsVector` RoadSurfaceRoughness `float` (optional) NumberOfValidRoadSurfaceConditionClassifications `uint8_t` (optional) ValidRoadSurfaceConditionClassifications `RoadSurfaceConditionClassificationsVector` TrackQuality `uint16_t` (optional) PMOMeasurementStatusObjectLevel `MeasurementStatus` (optional)
Derived from	-
Description	Represents the road suface Information.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.3.25 ColourValueVector

[SWS_ADI_00324]{DRAFT} **Definition of ImplementationDataType ColourValue Vector** ⌈

Name	ColourValueVector
Namespace	ara::adi::sensoritf
Kind	VECTOR <`float`>
Derived from	-
Description	Represents a list of Colour Value.

⌋(*RS_ADI_00001*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.3.26 RoadMarkingClassification

[SWS_ADI_00325]{DRAFT} **Definition of ImplementationDataType RoadMarking Classification** ⌈

Name	RoadMarkingClassification
Namespace	ara::adi::sensoritf
Kind	STRUCTURE

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Sub-elements	RoadMarkingType `RoadMarkingType` RoadMarkingTypeConfidence `ProbabilityPercentage` RoadObjectLaneAssociation `RoadObjectLaneAssociation` (optional) RoadObjectLaneAssociationConfidence `ProbabilityPercentage` (optional) ArrowOrientation `float` (optional) ArrowDirect `ArrowDirection` (optional) NumberOfValidSignClassifications `uint8_t` (optional) ValidSignClassificationsList `ValidSignClassificationVector` (optional) ColourTone `ColourTone` (optional)
Derived from	-
Description	Represents the road marking type Information.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.3.27 RoadMarkingClassificationVector

[SWS_ADI_00326]{DRAFT} **Definition of ImplementationDataType RoadMarking ClassificationVector** ⌈

Name	RoadMarkingClassificationVector
Namespace	ara::adi::sensoritf
Kind	VECTOR <`RoadMarkingClassification`>
Derived from	-
Description	Represents a list of Road Marking type.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.3.28 RoadMarkingsInformation

[SWS_ADI_00327]{DRAFT} **Definition of ImplementationDataType RoadMarkings Information** ⌈

Name	RoadMarkingsInformation
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	NumberOfValidRoadMarkingClassifications `uint8_t` ValidRoadMarkingClassificationsList `RoadMarkingClassificationVector`
Derived from	-
Description	Represents the road marking type Information.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.3.29 ValidConnection

[SWS_ADI_00328]{DRAFT} **Definition of ImplementationDataType ValidConnection** ⌈

Name	ValidConnection
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	Type `ConnectionType` ConnectionID `uint8_t`
Derived from	-
Description	Represents the road marking connection information.

⌋*(RS_ADI_00001, RS_ADI_00002, RS_ADI_00012, RS_ADI_00013, RS_ADI_00014)*

9.1.3.30 ValidConnectionVector

[SWS_ADI_00329]{DRAFT} **Definition of ImplementationDataType ValidConnectionVector** ⌈

Name	ValidConnectionVector
Namespace	ara::adi::sensoritf
Kind	VECTOR <`ValidConnection`>
Derived from	-
Description	Represents a list of Road marking connection information.

⌋*(RS_ADI_00001, RS_ADI_00002, RS_ADI_00012, RS_ADI_00013, RS_ADI_00014)*

9.1.3.31 ValidPolynomial

[SWS_ADI_00330]{DRAFT} **Definition of ImplementationDataType ValidPolynomial** ⌈

Name	ValidPolynomial
Namespace	ara::adi::sensoritf
Kind	STRUCTURE

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Sub-elements	PolynomialCoefficientY `PolynomialCoefficient` PolynomialCoefficientZ `PolynomialCoefficient` PolynomialYError `float` (optional) PolynomialZError `float` (optional) PolynomialRange `PolynomialRangeX` WidthPolynomial `float` (optional) WidthPolynomialError `float` (optional) WidthPolynomialConfidence `ProbabilityPercentage` (optional) HeightPolynomial `float` (optional) HeightPolynomialError `float` (optional) HeightPolynomialConfidence `ProbabilityPercentage` (optional) NumberOfValidDataRanges `uint8_t` (optional) DataRangeList `SupportedDataRangeVector` (optional)
Derived from	-
Description	Represents the Polynomial Information.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.3.32 SupportedDataRangeVector

[SWS_ADI_00331]{DRAFT} **Definition of ImplementationDataType SupportedDataRangeVector** ⌈

Name	SupportedDataRangeVector
Namespace	ara::adi::sensoritf
Kind	VECTOR <`SupportedDataRange`>
Derived from	-
Description	Represents a list of supported data range information.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.3.33 ValidPolynomialVector

[SWS_ADI_00332]{DRAFT} **Definition of ImplementationDataType ValidPolynomialVector** ⌈

Name	ValidPolynomialVector
Namespace	ara::adi::sensoritf
Kind	VECTOR <`ValidPolynomial`>
Derived from	-
Description	Represents a list of polynomials information.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_-00014*)

9.1.3.34 Polynomials

[SWS_ADI_00333]{DRAFT} **Definition of ImplementationDataType Polynomials** ⌈

Name	Polynomials
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	NumberOfValidConnections `uint8_t` ValidConnectionList `ValidConnectionVector` NumberOfValidPolynomials `uint8_t` ValidPolynomialsList `ValidPolynomialVector`
Derived from	-
Description	Represents the Polynomials related Information.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_-00014*)

9.1.3.35 ValidVertice

[SWS_ADI_00334]{DRAFT} **Definition of ImplementationDataType ValidVertice** ⌈

Name	ValidVertice
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	VertexPoint `Point3D` VertexPointError `Point3DError` VertexPointConfidence `VertexPointConfidence` (optional) WidthVertex `float` (optional) WidthVertexError `float` (optional) WidthVertexConfidence `ProbabilityPercentage` (optional) HeightVertex `float` (optional) HeightVertexError `float` (optional) HeightVertexConfidence `ProbabilityPercentage` (optional)
Derived from	-
Description	Represents the vertex point Information.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_-00014*)

9.1.3.36 ValidVerticeVector

[SWS_ADI_00335]{DRAFT} **Definition of ImplementationDataType ValidVertice Vector** ⌈

Name	ValidVerticeVector
Namespace	ara::adi::sensoritf
Kind	VECTOR <ValidVertice>
Derived from	-
Description	Represents a list of vertex points information.

⌋*(RS_ADI_00001, RS_ADI_00002, RS_ADI_00012, RS_ADI_00013, RS_ADI_00014)*

9.1.3.37 ValidPolyline

[SWS_ADI_00336]{DRAFT} **Definition of ImplementationDataType ValidPolyline** ⌈

Name	ValidPolyline
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	NumberOfValidVertices `uint8_t` ValidVerticesList `ValidVerticeVector`
Derived from	-
Description	Represents the Polyline related Information.

⌋*(RS_ADI_00001, RS_ADI_00002, RS_ADI_00003, RS_ADI_00012, RS_ADI_00013, RS_ADI_00014)*

9.1.3.38 ValidPolylineVector

[SWS_ADI_00337]{DRAFT} **Definition of ImplementationDataType ValidPolyline Vector** ⌈

Name	ValidPolylineVector
Namespace	ara::adi::sensoritf
Kind	VECTOR <ValidPolyline>
Derived from	-
Description	Represents a list of Polyline information.

⌋*(RS_ADI_00001, RS_ADI_00002, RS_ADI_00012, RS_ADI_00013, RS_ADI_00014)*

9.1.3.39 Polylines

[SWS_ADI_00338]{DRAFT} **Definition of ImplementationDataType Polylines** ⌈

Name	Polylines
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	NumberOfValidConnections `uint8_t` ValidConnectionList `ValidConnectionVector` InterpolationMethod `PolylineInterpolationMethod` NumberOfValidPolylines `uint8_t` ValidPolylinesList `ValidPolylineVector`
Derived from	-
Description	Represents the Polylines Information.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.3.40 RoadMarking

[SWS_ADI_00339]{DRAFT} **Definition of ImplementationDataType RoadMarking** ⌈

Name	RoadMarking
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	RoadMarkingsStatus `ObjectStatus` RoadMarkingsInformation `RoadMarkingsInformation` RoadMarkingsPolynomials `Polynomials` (optional) RoadMarkingsPolylines `Polylines` (optional)
Derived from	-
Description	Represents the road marking Information.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.3.41 RoadMarkingVector

[SWS_ADI_00340]{DRAFT} **Definition of ImplementationDataType RoadMarking Vector** ⌈

Name	RoadMarkingVector
Namespace	ara::adi::sensoritf
Kind	VECTOR <`RoadMarking`>
Derived from	-
Description	Represents a list of road marking object information.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.3.42 RoadMarkings

[SWS_ADI_00341]{DRAFT} **Definition of ImplementationDataType RoadMarkings** ⌈

Name	RoadMarkings
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	RecognizedRoadMarkingsCapability `uint8_t` (optional) RecognizedRoadMarkingsStatus `RecognizedStatus` (optional) NumberOfValidRoadMarkings `uint16_t` ValidRoadMarkings `RoadMarkingVector`
Derived from	-
Description	Represents the road marking Information.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.3.43 ValidRoadBoundaryClassification

[SWS_ADI_00342]{DRAFT} **Definition of ImplementationDataType ValidRoad BoundaryClassification** ⌈

Name	ValidRoadBoundaryClassification
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	RoadBoundaryType `RoadBoundaryType` RoadBoundaryTypeConfidence `ProbabilityPercentage` RoadObjectLaneAssociation `RoadObjectLaneAssociation` RoadObjectLaneAssociationConfidence `ProbabilityPercentage` ColourTone `ColourTone` (optional)
Derived from	-
Description	Represents the road boundary type Information.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.3.44 ValidRoadBoundaryClassificationVector

[SWS_ADI_00343]{DRAFT} **Definition of ImplementationDataType ValidRoadBoundaryClassificationVector** ⌈

Name	ValidRoadBoundaryClassificationVector
Namespace	ara::adi::sensoritf
Kind	VECTOR <ValidRoadBoundaryClassification>
Derived from	-
Description	Represents a list of road boundary type object information.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.3.45 RoadBoundariesInformation

[SWS_ADI_00344]{DRAFT} **Definition of ImplementationDataType RoadBoundariesInformation** ⌈

Name	RoadBoundariesInformation
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	NumberOfValidRoadBoundaryClassifications uint8_t ValidRoadBoundaryClassificationsList ValidRoadBoundaryClassificationVector
Derived from	-
Description	Represents the road boundary type Information.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.3.46 ValidRoadBoundary

[SWS_ADI_00345]{DRAFT} **Definition of ImplementationDataType ValidRoadBoundary** ⌈

Name	ValidRoadBoundary
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	RoadBoundariesStatus ObjectStatus RoadBoundariesInformation RoadBoundariesInformation RoadBoundariesPolynomials Polynomials (optional) RoadBoundariesPolylines Polylines (optional)
Derived from	-
Description	Represents the road boundary Information.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.3.47 RoadBoundaryVector

[SWS_ADI_00346]{DRAFT} **Definition of ImplementationDataType RoadBoundary Vector** ⌈

Name	RoadBoundaryVector
Namespace	ara::adi::sensoritf
Kind	VECTOR <ValidRoadBoundary>
Derived from	-
Description	Represents a list of road boundary object information.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.3.48 SupportedAxis

[SWS_ADI_00347]{DRAFT} **Definition of ImplementationDataType SupportedAxis** ⌈

Name	SupportedAxis	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	uint8_t	
Description	To provide the information of the polynomial axis for Supported data range x {begin, end}.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	Unknown.
kOther	0x01	Other.
kY	0x02	The signal Supported data range x {begin, end} corresponds to Y-axis polynomial line of Polynomial coefficient y {c0, c1, c2, c3}.
kZ	0x03	The signal Supported data range x {begin, end} corresponds to Z-axis polynomial line of Polynomial coefficient z {c0, c1, c2, c3}.
kYAndZ	0x04	The signal Supported data range x {begin, end} corresponds to both Y-axis polynomial line of Polynomial coefficient z {c0, c1, c2, c3} and Z-axis polynomial line of Polynomial coefficient z {c0, c1, c2, c3}.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.3.49 SignClassification

[SWS_ADI_00348]{DRAFT} **Definition of ImplementationDataType SignClassification** ⌈

Name	SignClassification
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	SignClassificationType `SignClassificationType` (optional) SignClassificationTypeConfidence `ProbabilityPercentage` (optional) SignValue `float` (optional) SignValueUnit `SignValueUnit` (optional) SignState `SignState` (optional)
Derived from	-
Description	Represents the sign Classification Information.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.3.50 ValidSignClassificationVector

[SWS_ADI_00349]{DRAFT} **Definition of ImplementationDataType ValidSignClassificationVector** ⌈

Name	ValidSignClassificationVector
Namespace	ara::adi::sensoritf
Kind	VECTOR <`SignClassification`>
Derived from	-
Description	Represents a list of Sign Classification.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.3.51 SupportedDataRange

[SWS_ADI_00350]{DRAFT} **Definition of ImplementationDataType SupportedDataRange** ⌈

Name	SupportedDataRange
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	SupportedDataRangeX `SupportedDataRangeX` SupportedAxis `SupportedAxis`
Derived from	-
Description	Supported data range info.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.4 Static Objects Interface Definition

This section lists all the data types used in Static object interface.

9.1.4.1 GeneralLandmarkClassificationType

[SWS_ADI_00401]{DRAFT} **Definition of ImplementationDataType GeneralLandmarkClassificationType** ⌈

Name	GeneralLandmarkClassificationType	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	`uint8_t`	
Description	Classification of the general landmark.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	Unknown general landmark.
kOther	0x01	Otherwise specified general landmark.
kBridge	0x02	Bridge as general landmark.
kAsamBuilding	0x03	Building as general landmark.
kCone	0x04	Cone as general landmark.
kAsamPylon	0x05	Pylon as general landmark.
kAsamDelineator	0x06	Delineator as general landmark.
kAsamTree	0x07	Tree as general landmark.
kAsamBarrier	0x08	Barrier as general landmark.
kAsamVegetation	0x09	Vegetation as general landmark.
kAsamCurbstone	0x0A	Curbstone as general landmark.
kAsamWall	0x0B	Wall as general landmark.
kAsamVerticalStructure	0x0C	Vertical structure as general landmark.
kAsamRectangularStructure	0x0D	Rectangular structure as general landmark.
kAsamOverheadStructure	0x0E	Overhead structure as general landmark.
kAsamReflectiveStructure	0x0F	Reflective structure as general landmark.
kAsamConstructionSite Element	0x10	Construction site element as general landmark.
kAsamSpeedBump	0x11	Speed bump as general landmark.
kAsamEmittingStructure	0x12	Emitting structure as general landmark.
kBeacon	0x13	Beacon as general landmark.
kBarrel	0x14	Barrel as general landmark.
kGuidePost	0x15	Guide post as general landmark.
kLampPost	0x16	Lamp post as general landmark.
kVerticalStructure	0x17	Vertical structure as general landmark.
kOverheadObject	0x18	Overhead object as general landmark.
kRectangularStructure	0x19	Rectangular structure as general landmark.

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kTunnel	0x1A	Tunnel as general landmark.
kReflector	0x1B	Reflector as general landmark.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.4.2 SignGeometry

[SWS_ADI_00402]{DRAFT} **Definition of ImplementationDataType SignGeometry** ⌈

Name	SignGeometry	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	`uint8_t`	
Description	The shape of the sign.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	The sign geometry is unknown.
kOther	0x01	The sign geometry is otherwise specified.
kCircle	0x02	Circle shape as sign geometry.
kTriangleTop	0x03	Triangle with tip pointing downwards as sign geometry.
kTriangleDown	0x04	Triangle with tip pointing upwards as sign geometry.
kSquare	0x05	Square shape as sign geometry.
kPole	0x06	Pole shape as sign geometry.
kRectangle	0x07	Rectangle shape as sign geometry.
kPlate	0x08	Plate with multiple traffic information.
kDiamond	0x09	Diamond shape as sign geometry.
kArrowLeft	0x0A	Arrow left five edge shape as sign geometry.
kArrowRight	0x0B	Arrow right five edge shape as sign geometry.
kOctagon	0x0C	Octagon shape as sign geometry.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.4.3 TrafficSignsInformation

[SWS_ADI_00403]{DRAFT} **Definition of ImplementationDataType TrafficSignsInformation** ⌈

Name	TrafficSignsInformation
Namespace	ara::adi::sensoritf
Kind	STRUCTURE

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Sub-elements	NumberOfValidSignClassifications `uint8_t` ValidMainSignClassificationsList `ValidMainSignClassificationVector` NumberOfValidLaneRelevanceClassifications `uint8_t` ValidLaneRelevanceClassificationList `ValidLaneRelevanceClassificationVector`
Derived from	-
Description	Represents the traffic sign Information.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.4.4 TrafficLightsInformation

[SWS_ADI_00404]{DRAFT} **Definition of ImplementationDataType TrafficLightsInformation** ⌈

Name	TrafficLightsInformation
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	NumberOfValidStructureLightClassifications `uint8_t` ValidStructureLightClassificationsList `ValidStructureLightClassificationsVector`
Derived from	-
Description	Represents the traffic light Information.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.4.5 LaneRelevanceClassificationType

[SWS_ADI_00405]{DRAFT} **Definition of ImplementationDataType LaneRelevanceClassificationType** ⌈

Name	LaneRelevanceClassificationType	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	`uint8_t`	
Description	Information if the sign is relevant for the ego-vehicle's lane, the nearest lane to the ego-vehicle or other relevant lanes.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	The lane relevance is unknown.
kOther	0x01	The lane relevance is otherwise specified.
kOnTrack	0x02	Relevant on track of ego-vehicle.
kNextLaneLeft	0x03	Relevant for the next lane to the ego-vehicle on the left site.
kNextLaneRight	0x04	Relevant for the next lane to the ego-vehicle on the right site.

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kNextNextLaneLeft	0x05	Relevant for the second next lane to the ego-vehicle on the left site.
kNextNextLaneRight	0x06	Relevant for the second next lane to the ego-vehicle on the right site.
kOnTrackAndNextLaneLeft	0x07	Relevant on track of ego-vehicle and the next left lane.
kOnTrackAndNextLaneRight	0x08	Relevant on track of ego-vehicle and the next right lane.
kMostLeftLane	0x09	Relevant for the leftest lane.
kMostRightLane	0x0A	Relevant for the rightest lane.
kAllLanes	0x0B	Relevant for all lanes, lane to the right and left site and on track.
kOtherLane	0x0C	Relevant for another far lane.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.4.6 SupplementarySignClassificationType

[SWS_ADI_00406]{DRAFT} **Definition of ImplementationDataType SupplementarySignClassificationType** ⌈

Name	SupplementarySignClassificationType	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	`uint8_t`	
Description	The type of the sign.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	Unknown supplementary info for sign.
kOther	0x01	Other supplementary info for sign.
kAsamNoSign	0x02	No sign.
kAsamValidForDistance	0x03	Valid for distance.
kAsamValidInDistance	0x04	Valid in distance.
kAsamTimeRange	0x05	Time range.
kAsamWeight	0x06	Weight.
kAsamRain	0x07	Rain.
kAsamFog	0x08	Fog.
kAsamSnow	0x09	Snow.
kAsamSnowRain	0x0A	Snow and rain.
kAsamLeftArrow	0x0B	Left arrow.
kAsamRightArrow	0x0C	Right arrow.
kAsamLeftBendArrow	0x0D	Left bend arrow.
kAsamRightBendArrow	0x0E	Right bend arrow.
kAsamTruck	0x0F	Truck.
kAsamTractorsMayBePassed	0x10	Tractors may be passed.
kAsamHazardous	0x11	Hazardous.
kAsamTrailer	0x12	Trailer.
kAsamNight	0x13	Night.
kAsamZone	0x14	Zone.
kAsamStop_4Way	0x15	Stop four way.
kAsamMotorcycle	0x16	Motorcycle.

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kAsamMotorcycleAllowed	0x17	Motorcycle allowed.
kAsamCar	0x18	Car.
kAsamStopIn	0x19	Stop in.
kAsamTime	0x1A	Time.
kAsamPriorityRoadBottomLeft FourWay	0x1B	Priority road bottom left four way.
kAsamPriorityRoadTopLeftFour Way	0x1C	Priority road top left four way.
kAsamPriorityRoadBottom RightFourWay	0x1D	Priority road bottom right four way.
kAsamArrow	0x1E	Arrow.
kAsamPriorityRoadTopRight FourWay	0x1F	Priority road top right four way.
kAsamPriorityRoadBottomLeft ThreeWayStraight	0x20	Priority road bottom left three way straight.
kAsamPriorityRoadBottomLeft ThreeWaySideways	0x21	Priority road bottom left three way sideways.
kAsamPriorityRoadTopLeft ThreeWayStraight	0x22	Priority road top left three way straight.
kAsamPriorityRoadBottom RightThreeWayStraight	0x23	Priority road bottom right three way straight.
kAsamPriorityRoadBottom RightThreeWaySideway	0x24	Priority road bottom right three way sideway.
kAsamPriorityRoadTopRight ThreeWayStraight	0x25	Priority road top right three way straight.
kAsamNoWaitingSideStripes	0x26	No waiting sidestripes.
kAsamSpace	0x27	Space.
kAsamAccident	0x28	Accident.
kAsamText	0x29	Text.
kAsamParkingConstraint	0x2A	Parking contstraint.
kAsamParkingDiscTime Restriction	0x2B	Parking disc time restriction.
kAsamWet	0x2C	Wet.
kAsamExcept	0x2D	Except.
kAsamConstrainedTo	0x2E	Contrained to.
kAsamServices	0x2F	Services.
kAsamRollingHighway Information	0x30	Rolling highway information.
kValidInformationBegin	0x31	Valid information begin.
kValidInformationEnd	0x32	Valid information end.
kLimitation	0x33	Limitation.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.4.7 RelativePosition

[SWS_ADI_00407]{DRAFT} **Definition of ImplementationDataType RelativePosition** ⌈

Name	RelativePosition	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	`uint8_t`	
Description	The relative position of the supplemental sign w.r.t. its main sign.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	Relative position is unknown.
kOther	0x01	Relative position is otherwise specified.
kAbove	0x02	Supplementary sign is above the main sign.
kLeft	0x03	Message sign is full out of service.
kBelow	0x04	Supplementary sign is below the main sign.
kRight	0x05	Supplementary sign is right of the main sign.

⌋*(RS_ADI_00001, RS_ADI_00002, RS_ADI_00003, RS_ADI_00004, RS_ADI_00012, RS_ADI_00013, RS_ADI_00014)*

9.1.4.8 StructureLightClassificationType

[SWS_ADI_00408]{DRAFT} **Definition of ImplementationDataType StructureLightClassificationType** ⌈

Name	StructureLightClassificationType	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	`uint8_t`	
Description	The traffic light can have different shapes.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	Structure of traffic light is unknown.
kOther	0x01	Structure of traffic light is otherwise specified.
kVertical3	0x02	Three light sources vertical.
kHorizontal3	0x03	Three light sources horizontal.
kDogHouse	0x04	Multi light sources.

⌋*(RS_ADI_00001, RS_ADI_00002, RS_ADI_00003, RS_ADI_00004, RS_ADI_00012, RS_ADI_00013, RS_ADI_00014)*

9.1.4.9 ColourClassificationType

[SWS_ADI_00409]{DRAFT} **Definition of ImplementationDataType ColourClassificationType** ⌈

Name	ColourClassificationType	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	`uint8_t`	
Description	Colour of light spot.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	The spot colour is unknown.
kOther	0x01	The spot colour is otherwise specified.
kRed	0x02	The spot colour is red.
kYellow	0x03	The spot colour is yellow.
kGreen	0x04	The spot colour is green.
kBlue	0x05	The spot colour is blue.
kWhite	0x06	The spot colour is white.

⌋(*RS_ADI_00001*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.4.10 GeneralLandmarksInformation

[SWS_ADI_00414]{DRAFT} **Definition of ImplementationDataType GeneralLandmarksInformation** ⌈

Name	GeneralLandmarksInformation
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	NumberOfValidGeneralLandmarkClassifications `uint8_t` LandmarkTypelist `ValidGeneralLandmarkClassificationVector`
Derived from	-
Description	Represents the ladmark type certainty Information.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.4.11 LightShapeClassificationType

[SWS_ADI_00411]{DRAFT} **Definition of ImplementationDataType LightShapeClassificationType** ⌈

Name	LightShapeClassificationType	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	`uint8_t`	
Description	The light's shape.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	The light shape is unknown.
kOther	0x01	The light shape is otherwise specified.
kArrowLeft	0x02	Arrow left shape.
kArrowDiagLeft	0x03	Arrow diagonal left shape.
kArrowStraightAheadLeft	0x04	Arrow straight ahead and arrow left shape.
kArrowRight	0x05	Arrow right shape.
kArrowDiagRight	0x06	Arrow diagonal right shape.
kArrowStraightAheadRight	0x07	Arrow straight ahead and arrow right shape.
kArrowLeftRight	0x08	Arrow left and arrow right shape.
kArrowDown	0x09	Arrow down shape.
kArrowDownLeft	0x0A	Arrow U-turn left shape.
kArrowDownRight	0x0B	Arrow U-turn right shape.
kCross	0x0C	Cross figure.
kPedestrian	0x0D	Pedestrian figure.
kWalk	0x0E	Text walk figure.
kDontWalk	0x0F	Text don't walk figure.
kBicycle	0x10	Bicycle figure.
kPedestrianAndBicycle	0x11	Pedestrian and bicycle figure.
kCountdownSecond	0x12	Countdown in seconds figure.Signal Light shape value contains the value in s.
kCountdownPercent	0x13	Countdown in percent figure. Signal Light shape value contains the value in %.
kTram	0x14	Tram figure.
kBus	0x15	Bus figure.
kBusAndTram	0x16	Bus and Tram figure.
kNoShape	0x17	No additional shape.
kArrowStraightAhead	0x18	Arrow straight ahead shape.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.4.12 LightModeClassificationType

[SWS_ADI_00410]{DRAFT} **Definition of ImplementationDataType LightMode ClassificationType** ⌈

Name	LightModeClassificationType	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	`uint8_t`	
Description	The light's mode.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	Light mode type is unknown.
kOther	0x01	Light mode type is otherwise.
kContinuous	0x02	Light source is continuous on.
kBlinking	0x03	One light source is blinking
kTurnedOff	0x04	Light source is turned off.
kCounting	0x05	Light source with counting.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.4.13 ValidGeneralLandmarkClassificationVector

[SWS_ADI_00413]{DRAFT} **Definition of ImplementationDataType ValidGeneral LandmarkClassificationVector** ⌈

Name	ValidGeneralLandmarkClassificationVector
Namespace	ara::adi::sensoritf
Kind	VECTOR <`GeneralLandmarkClassification`>
Derived from	-
Description	Represents a list of Landmark type.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.4.14 GeneralLandmarkClassification

[SWS_ADI_00412]{DRAFT} **Definition of ImplementationDataType GeneralLandmarkClassification** ⌈

Name	GeneralLandmarkClassification
Namespace	ara::adi::sensoritf
Kind	STRUCTURE

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Sub-elements	GeneralLandMarkType `GeneralLandmarkClassificationType` LandmarkClassProbability `ProbabilityPercentage`
Derived from	-
Description	Represents the general landmark type and probability.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.4.15 GeneralLandmarksPosition

[SWS_ADI_00415]{DRAFT} **Definition of ImplementationDataType GeneralLandmarksPosition** ⌈

Name	GeneralLandmarksPosition
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	Position `Point3D` PositionError `Point3DError` Orientation `Orientation3D` (optional) OrientationError `Orientation3DError` (optional) ReferencePoint `ReferencePoint` (optional)
Derived from	-
Description	Represents the landmark position.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.4.16 BoundingBox

[SWS_ADI_00416]{DRAFT} **Definition of ImplementationDataType BoundingBox** ⌈

Name	BoundingBox
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	BoxDimension `DimensionBox` BoxError `DimensionBoxError` (optional)
Derived from	-
Description	Represents the bounding box information of the static objects. This is only for camera

⌋(*RS_ADI_00001*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.4.17 GeneralLandmark

[SWS_ADI_00417]{DRAFT} **Definition of ImplementationDataType GeneralLandmark** ⌈

Name	GeneralLandmark
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	GeneralLandmarksStatus `ObjectStatus` GeneralLandmarksInformation `GeneralLandmarksInformation` GeneralLandmarksPos `GeneralLandmarksPosition` GeneralLandmarksBoundingBox `BoundingBox` (optional)
Derived from	-
Description	Represents the landmark Information.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.4.18 GeneralLandmarkVector

[SWS_ADI_00418]{DRAFT} **Definition of ImplementationDataType GeneralLandmarkVector** ⌈

Name	GeneralLandmarkVector
Namespace	ara::adi::sensoritf
Kind	VECTOR <`GeneralLandmark`>
Derived from	-
Description	Represents a list of Landmark.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.4.19 GeneralLandmarks

[SWS_ADI_00419]{DRAFT} **Definition of ImplementationDataType GeneralLandmarks** ⌈

Name	GeneralLandmarks
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	RecognizedGeneralLandmarksCapability `uint16_t` (optional) RecognizedGeneralLandmarksStatus `RecognizedStatus` (optional) NumberOfValidGeneralLandmarks `uint16_t` GeneralLandmarksList `GeneralLandmarkVector`

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Derived from	-
Description	Represents the general landmarks Information.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.4.20 LaneRelevanceClassification

[SWS_ADI_00420]{DRAFT} **Definition of ImplementationDataType LaneRelevanceClassification** ⌈

Name	LaneRelevanceClassification
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	LaneRelevanceClassificationType `LaneRelevanceClassificationType` LaneRelevanceClassificationTypeConfidence `ProbabilityPercentage`
Derived from	-
Description	Represents the main sign lane relevance classification Information.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.4.21 MainSignClassification

[SWS_ADI_00421]{DRAFT} **Definition of ImplementationDataType MainSignClassification** ⌈

Name	MainSignClassification
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	MainSignClassificationType `SignClassificationType` SignClassificationTypeConfidence `ProbabilityPercentage` SignValue `float` MSignUnit `SignValueUnit` SignState `SignState` MSignGeometry `SignGeometry` (optional)
Derived from	-
Description	Represents the main sign Information.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.4.22 TrafficSignsPosition

[SWS_ADI_00422]{DRAFT} **Definition of ImplementationDataType TrafficSignsPosition** ⌈

Name	TrafficSignsPosition
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	Position `Point3D` PositionError `Point3DError`
Derived from	-
Description	Represents the main sign position.

⌋*(RS_ADI_00001, RS_ADI_00002, RS_ADI_00003, RS_ADI_00004, RS_ADI_00012, RS_ADI_00013, RS_ADI_00014)*

9.1.4.23 SubObjectStatus

[SWS_ADI_00423]{DRAFT} **Definition of ImplementationDataType SubObjectStatus** ⌈

Name	SubObjectStatus
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	ExistenceProbabilityObjectLevel `ProbabilityPercentage` Age `uint64_t` NumberOfValidObservationsObjectLevel `uint32_t` (optional) ValidObservations `ValidObservationVector` (optional) TrackQuality `uint16_t` (optional) MeasurementStatusObjectLevel `MeasurementStatus`
Derived from	-
Description	Represents the dynamics of the static object.

⌋*(RS_ADI_00001, RS_ADI_00002, RS_ADI_00003, RS_ADI_00004, RS_ADI_00012, RS_ADI_00013, RS_ADI_00014)*

9.1.4.24 TrafficSignsSupplementarySignsInformation

[SWS_ADI_00424]{DRAFT} **Definition of ImplementationDataType TrafficSignsSupplementarySignsInformation** ⌈

Name	TrafficSignsSupplementarySignsInformation
Namespace	ara::adi::sensoritf
Kind	STRUCTURE

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Sub-elements	NumberOfValidSupplementarySignClassifications `uint8_t` ValidSupplementarySignClassifications `ValidSupplementarySignClassificationVector`
Derived from	-
Description	Represents the Supplementary sign type Information.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.4.25 SupplementarySignClassification

[SWS_ADI_00425]{DRAFT} **Definition of ImplementationDataType SupplementarySignClassification** ⌈

Name	SupplementarySignClassification
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	SupplementarySignClassificationType `SupplementarySignClassificationType` SupplementarySignClassificationTypeConfidence `ProbabilityPercentage` SSignValue `float` SSignUnit `SignValueUnit` SignState `SignState`
Derived from	-
Description	Represents the Supplementary sign Information.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.4.26 TrafficSignsSupplementarySignsPosition

[SWS_ADI_00426]{DRAFT} **Definition of ImplementationDataType TrafficSigns SupplementarySignsPosition** ⌈

Name	TrafficSignsSupplementarySignsPosition
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	SSRelativePosition `RelativePosition` RelativePosOrder `uint8_t`
Derived from	-
Description	Represents the Supplementary sign position Information.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.4.27 TrafficSignsSupplementarySign

[SWS_ADI_00427]{DRAFT} **Definition of ImplementationDataType TrafficSignsSupplementarySign** ⌈

Name	TrafficSignsSupplementarySign
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	TrafficSignsSupplementarySignsStatus `SubObjectStatus` TrafficSignsSupplementarySignsInformation `TrafficSignsSupplementarySignsInformation` TrafficSignsSupplementarySignsColourTone `ColourTone` TrafficSignsSupplementarySignsPos `TrafficSignsSupplementarySignsPosition`
Derived from	-
Description	Represents the Supplementary sign Information.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.4.28 TrafficSignsSupplementarySignVector

[SWS_ADI_00428]{DRAFT} **Definition of ImplementationDataType TrafficSignsSupplementarySignVector** ⌈

Name	TrafficSignsSupplementarySignVector
Namespace	ara::adi::sensoritf
Kind	VECTOR <`TrafficSignsSupplementarySign`>
Derived from	-
Description	Represents a list of Supplementary sign.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.4.29 TrafficSignsSupplementarySigns

[SWS_ADI_00429]{DRAFT} **Definition of ImplementationDataType TrafficSignsSupplementarySigns** ⌈

Name	TrafficSignsSupplementarySigns
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	NumberOfValidTrafficSupplementarySigns `uint8_t` SSignList `TrafficSignsSupplementarySignVector`
Derived from	-
Description	Represents the Supplementary signs Information.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.4.30 TrafficSign

[SWS_ADI_00430]{DRAFT} **Definition of ImplementationDataType TrafficSign** ⌈

Name	TrafficSign
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	TrafficSignsStatus `ObjectStatus` TrafficSignsInformation `TrafficSignsInformation` ColourTone `ColourTone` TrafficSignsPosition `TrafficSignsPosition` TrafficSignsSupplementarySigns `TrafficSignsSupplementarySigns`
Derived from	-
Description	Represents the traffic sign Information.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.4.31 ValidTrafficSignVector

[SWS_ADI_00431]{DRAFT} **Definition of ImplementationDataType ValidTrafficSignVector** ⌈

Name	ValidTrafficSignVector
Namespace	ara::adi::sensoritf
Kind	VECTOR <`TrafficSign`>
Derived from	-
Description	Represents a list of traffic sign.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.4.32 TrafficSigns

[SWS_ADI_00432]{DRAFT} **Definition of ImplementationDataType TrafficSigns** ⌈

Name	TrafficSigns
Namespace	ara::adi::sensoritf
Kind	STRUCTURE

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Sub-elements	RecognizedTrafficSignsCapability `uint16_t` (optional) RecognizedTrafficSignsStatus `RecognizedStatus` (optional) NumberOfValidTrafficSigns `uint16_t` TrafficSignsList `ValidTrafficSignVector`
Derived from	-
Description	Represents the traffic sings Information.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.4.33 StructureLightClassification

[SWS_ADI_00433]{DRAFT} **Definition of ImplementationDataType StructureLight Classification** ⌈

Name	StructureLightClassification
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	StructureLightClassificationType `StructureLightClassificationType` StructureLightClassificationTypeConfidence `ProbabilityPercentage`
Derived from	-
Description	Represents the traffic light type certainty Information.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.4.34 TrafficLightsPosition

[SWS_ADI_00434]{DRAFT} **Definition of ImplementationDataType TrafficLights Position** ⌈

Name	TrafficLightsPosition
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	PositionObjectLevel `Point3D` PositionObjectLevelError `Point3DError` Orientation `Orientation3D` (optional) OrientationError `Orientation3DError` (optional) ReferencePoint `ReferencePoint` (optional) MinimumVisibilityDistance `uint16_t`
Derived from	-
Description	Represents the traffic light position.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.4.35 ColourClassification

[SWS_ADI_00435]{DRAFT} **Definition of ImplementationDataType ColourClassification** ⌈

Name	ColourClassification
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	ColourClassificationType `ColourClassificationType` ColourClassificationTypeConfidence `ProbabilityPercentage`
Derived from	-
Description	Represents the colour type and probability.

⌋(*RS_ADI_00001*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.4.36 ColourClassificationVector

[SWS_ADI_00436]{DRAFT} **Definition of ImplementationDataType ColourClassificationVector** ⌈

Name	ColourClassificationVector
Namespace	ara::adi::sensoritf
Kind	VECTOR <`ColourClassification`>
Derived from	-
Description	Represents a list of colour type.

⌋(*RS_ADI_00001*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.4.37 TrafficLightsSpotsColour

[SWS_ADI_00437]{DRAFT} **Definition of ImplementationDataType TrafficLightsSpotsColour** ⌈

Name	TrafficLightsSpotsColour
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	NumberOfValidColourClassifications `uint8_t` ValidColourClassificationVectorList `ColourClassificationVector` NumberOfValidLightModeClassifications `uint8_t` ValidLightModeClassificationVectorList `LightModeClassificationVector`
Derived from	-
Description	Represents the trafic light colour type certainty Information.

⌋(*RS_ADI_00001*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.4.38 LightModeClassification

[SWS_ADI_00438]{DRAFT} **Definition of ImplementationDataType LightMode Classification** ⌈

Name	LightModeClassification
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	LightModeClassificationType `LightModeClassificationType` LightModeClassificationTypeConfidence `ProbabilityPercentage`
Derived from	-
Description	Represents the traffic light mode type and probability.

⌋*(RS_ADI_00001, RS_ADI_00002, RS_ADI_00003, RS_ADI_00004, RS_ADI_00012, RS_ADI_00013, RS_ADI_00014)*

9.1.4.39 LightModeClassificationVector

[SWS_ADI_00439]{DRAFT} **Definition of ImplementationDataType LightMode ClassificationVector** ⌈

Name	LightModeClassificationVector
Namespace	ara::adi::sensoritf
Kind	VECTOR <`LightModeClassification`>
Derived from	-
Description	Represents a list of traffic light mode type.

⌋*(RS_ADI_00001, RS_ADI_00002, RS_ADI_00003, RS_ADI_00004, RS_ADI_00012, RS_ADI_00013, RS_ADI_00014)*

9.1.4.40 LightShapeClassification

[SWS_ADI_00440]{DRAFT} **Definition of ImplementationDataType LightShape Classification** ⌈

Name	LightShapeClassification
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	LightShapeClassificationType `LightShapeClassificationType` LightShapeClassificationTypeConfidence `ProbabilityPercentage` LightShapeValue `uint8_t` (optional)
Derived from	-
Description	Represents the trafic light shape Information.

⌋*(RS_ADI_00001, RS_ADI_00002, RS_ADI_00003, RS_ADI_00004, RS_ADI_00012, RS_ADI_00013, RS_ADI_00014)*

9.1.4.41 TrafficLightsSpotsInformation

[SWS_ADI_00441]{DRAFT} **Definition of ImplementationDataType TrafficLights SpotsInformation** ⌈

Name	TrafficLightsSpotsInformation
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	NumberOfValidLightShapeClassifications `uint8_t` ValidLightShapeClassificationList `LightShapeClassificationVector`
Derived from	-
Description	Represents the trafic light spot shape Information.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.4.42 TrafficLightsSpotsPosition

[SWS_ADI_00442]{DRAFT} **Definition of ImplementationDataType TrafficLights SpotsPosition** ⌈

Name	TrafficLightsSpotsPosition
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	PositionObjectLevel `Point3D` PositionObjectLevelError `Point3DError` (optional) NumberOfValidLaneRelevanceClassifications `uint8_t` ValidLaneRelevanceClassificationList `ValidLaneRelevanceClassificationVector`
Derived from	-
Description	Represents the Traffic Light Spot position.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.4.43 TrafficLightSpot

[SWS_ADI_00443]{DRAFT} **Definition of ImplementationDataType TrafficLight Spot** ⌈

Name	TrafficLightSpot
Namespace	ara::adi::sensoritf
Kind	STRUCTURE

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Sub-elements	TrafficLightsSpotsStatus `SubObjectStatus` TrafficLightsSpotsInformation `TrafficLightsSpotsInformation` TrafficLightsSpotsColour `TrafficLightsSpotsColour` TrafficLightsSpotsPosition `TrafficLightsSpotsPosition`
Derived from	-
Description	Represents the traffic light sopt Information.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.4.44 TrafficLightSpotVector

[SWS_ADI_00444]{DRAFT} **Definition of ImplementationDataType TrafficLightSpotVector** ⌈

Name	TrafficLightSpotVector
Namespace	ara::adi::sensoritf
Kind	VECTOR <`TrafficLightSpot`>
Derived from	-
Description	Represents a list of traffic light spot.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.4.45 TrafficLightSpots

[SWS_ADI_00445]{DRAFT} **Definition of ImplementationDataType TrafficLightSpots** ⌈

Name	TrafficLightSpots
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	TotalNumberOfTrafficLightSpots `uint8_t` (optional) TotalNumberOfTrafficLightSpotsConfidence `ProbabilityPercentage` (optional) NumberOfValidTrafficLightSpots `uint8_t` ValidTrafficLightSpotList `TrafficLightSpotVector`
Derived from	-
Description	Represents the trafic light spots Information.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.4.46 TrafficLight

[SWS_ADI_00446]{DRAFT} **Definition of ImplementationDataType TrafficLight** ⌈

Name	TrafficLight
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	TrafficLightsStatus `ObjectStatus` StructureLightsInformation `TrafficLightsInformation` TrafficLightsPosition `TrafficLightsPosition` TrafficLightsBoundingBox `BoundingBox` (optional) TrafficLightsSpots `TrafficLightSpots`
Derived from	-
Description	Represents the traffic light Information.

⌋*(RS_ADI_00001, RS_ADI_00002, RS_ADI_00003, RS_ADI_00004, RS_ADI_00012, RS_ADI_00013, RS_ADI_00014)*

9.1.4.47 ValidTrafficLightVector

[SWS_ADI_00447]{DRAFT} **Definition of ImplementationDataType ValidTrafficLightVector** ⌈

Name	ValidTrafficLightVector
Namespace	ara::adi::sensoritf
Kind	VECTOR <`TrafficLight`>
Derived from	-
Description	Represents a list of traffic light.

⌋*(RS_ADI_00001, RS_ADI_00002, RS_ADI_00003, RS_ADI_00004, RS_ADI_00012, RS_ADI_00013, RS_ADI_00014)*

9.1.4.48 TrafficLights

[SWS_ADI_00448]{DRAFT} **Definition of ImplementationDataType TrafficLights** ⌈

Name	TrafficLights
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	RecognizedTrafficLightsCapability `uint16_t` (optional) RecognizedTrafficLightsStatus `RecognizedStatus` (optional) NumberOfValidTrafficLights `uint8_t` TrafficLightList `ValidTrafficLightVector`
Derived from	-
Description	Represents the traffic lights Information.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.4.49 StaticObjectInterface

[SWS_ADI_00449]{DRAFT} **Definition of ImplementationDataType StaticObjectInterface** ⌈

Name	StaticObjectInterface
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	StaticObjectInterfaceHeader `InterfaceHeader` StaticObjectGeneralLandmarks `GeneralLandmarks` (optional) StaticObjectTrafficSigns `TrafficSigns` (optional) StaticObjectTrafficLights `TrafficLights` (optional)
Derived from	-
Description	Represents the static object informaiton provided by a camera,lidar, radar or Ultrasonic sensor.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.4.50 ValidSupplementarySignClassificationVector

[SWS_ADI_00450]{DRAFT} **Definition of ImplementationDataType ValidSupplementarySignClassificationVector** ⌈

Name	ValidSupplementarySignClassificationVector
Namespace	ara::adi::sensoritf
Kind	VECTOR <`SupplementarySignClassification`>
Derived from	-
Description	Represents a list of Supplementary sign classification.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.4.51 ValidMainSignClassificationVector

[SWS_ADI_00451]{DRAFT} **Definition of ImplementationDataType ValidMainSign ClassificationVector** ⌈

Name	ValidMainSignClassificationVector
Namespace	ara::adi::sensoritf
Kind	VECTOR <MainSignClassification>
Derived from	-
Description	Represents a list of sign classification.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.4.52 ValidLaneRelevanceClassificationVector

[SWS_ADI_00452]{DRAFT} **Definition of ImplementationDataType ValidLaneRelevanceClassificationVector** ⌈

Name	ValidLaneRelevanceClassificationVector
Namespace	ara::adi::sensoritf
Kind	VECTOR <LaneRelevanceClassification>
Derived from	-
Description	Represents a list of lane Revelance classification.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.4.53 LightShapeClassificationVector

[SWS_ADI_00453]{DRAFT} **Definition of ImplementationDataType LightShape ClassificationVector** ⌈

Name	LightShapeClassificationVector
Namespace	ara::adi::sensoritf
Kind	VECTOR <LightShapeClassification>
Derived from	-
Description	Represents the list of light shape classification

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.4.54 ValidStructureLightClassificationsVector

[SWS_ADI_00454]{DRAFT} **Definition of ImplementationDataType ValidStructure LightClassificationsVector** ⌈

Name	ValidStructureLightClassificationsVector
Namespace	ara::adi::sensoritf
Kind	VECTOR <StructureLightClassification>
Derived from	-
Description	Represents the list of valid structure light classification

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.5 Feature Level Interface Definition

This section lists all the data types used in Camera feature and Ultrasonic feature interfaces.

9.1.5.1 ShapeType

[SWS_ADI_00601]{DRAFT} **Definition of ImplementationDataType ShapeType** ⌈

Name	ShapeType	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	uint8_t	
Description	Classification of the general landmark.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	Shape type is unknown.
kOther	0x01	Shape type is otherwise specified.
kPoint	0x02	Shape is a point.
kBox	0x03	Shape is a box (2 or 3 points).
kEllipse	0x04	Shape is an ellipse (2 or 3 points).
kPolygon	0x05	Shape is a polygon (3 or more points).
kPolyline	0x06	Shape is a polyline (2 or more points).
kPointCloud	0x07	Shape is a point cloud (2 or more points).

⌋(*RS_ADI_00001*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.5.2 ShapeClassificationType

[SWS_ADI_00602]{DRAFT} **Definition of ImplementationDataType ShapeClassificationType** ⌈

Name	ShapeClassificationType	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	`uint8_t`	
Description	The classification type for the shape.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	Shape class type is unknown.
kOther	0x01	Shape class type is otherwise specified.
kBackground	0x02	Shape is classified as background entity.
kForeground	0x03	Shape is classified as foreground entity.
kFlat	0x04	Shape is classified as flat entity.
kUpright	0x05	Shape is classified as upright entity.
kGround	0x06	Shape is classified as ground entity.
kBuilding	0x07	Shape is classified as building entity.
kVegetation	0x08	Shape is classified as vegetation entity.
kRoad	0x09	Shape is classified as road entity.
kNonRoad	0x0A	Shape is classified as non-road entity.
kSidewalk	0x0B	Shape is classified as sidewalk entity.
kPedestrian	0x0C	Shape is classified as pedestrian entity.
kVehicle	0x0D	Shape is classified as vehicle entity.
kTrafficSign	0x0E	Shape is classified as traffic sign entity.
kPedestrianFront	0x0F	Shape is classified as pedestrian front-view entity.
kPedestrianSide	0x10	Shape is classified as pedestrian side-view entity.
kPedestrianRear	0x11	Shape is classified as pedestrian rear-view entity.

⌋(*RS_ADI_00001*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.5.3 UltrasonicFeatureClassificationType

[SWS_ADI_00603]{DRAFT} **Definition of ImplementationDataType UltrasonicFeatureClassificationType** ⌈

Name	UltrasonicFeatureClassificationType	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	`uint8_t`	
Description	Ultrasonic feature type contains information about the current measurement of this feature.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	The Ultrasonic feature type is unknown.

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kOther	0x01	The Ultrasonic feature type is otherwise specified.
kPoint	0x02	Defined by one point.
kLineSegment	0x03	Defined by two or more points.

⌋(*RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.5.4 TrilaterationStatus

[SWS_ADI_00606]{DRAFT} **Definition of ImplementationDataType Trilateration Status** ⌈

Name	TrilaterationStatus	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	`uint8_t`	
Description	Information if feature is trilaterated with multiple signal ways or is not trilaterated.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	The trilateration status is unknown.
kOther	0x01	The trilateration status is otherwise specified.
kNormal	0x02	The 2D position {x, y} measurement is based on at least three points.
kNotTrilaterated	0x03	The 2D position {x, y} measurement is based on less than three points.

⌋(*RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.5.5 MeasurementStatusFeature

[SWS_ADI_00607]{DRAFT} **Definition of ImplementationDataType Measurement StatusFeature** ⌈

Name	MeasurementStatusFeature	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	`uint8_t`	
Description	Information about the measurement status of the feature.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	The measurement status is unknown.
kOther	0x01	The measurement status is otherwise specified.
kInitialization	0x02	No information available.
kTracked	0x03	Not measured in this cycle.
kMeasured	0x04	Current position of this feature was measured.
kDelete	0x05	Tracking will be deleted in the next cycle.
kNew	0x06	Shape is a polyline (2 or more points).

⌋(*RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.5.6 ShapeClassification

[SWS_ADI_00608]{DRAFT} **Definition of ImplementationDataType ShapeClassification** ⌈

Name	ShapeClassification
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	ShapeClassificationType `ShapeClassificationType` ShapeClassificationTypeConfidence `ProbabilityPercentage`
Derived from	-
Description	Represents the shape class type information.

⌋(*RS_ADI_00001*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.5.7 ValidShapeClassificationsVector

[SWS_ADI_00609]{DRAFT} **Definition of ImplementationDataType ValidShapeClassificationsVector** ⌈

Name	ValidShapeClassificationsVector
Namespace	ara::adi::sensoritf
Kind	VECTOR <`ShapeClassification`>
Derived from	-
Description	Represents a list of shape class type information.

⌋(*RS_ADI_00001*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.5.8 CameraFeaturesShapeInformation

[SWS_ADI_00610]{DRAFT} **Definition of ImplementationDataType CameraFeaturesShapeInformation** ⌈

Name	CameraFeaturesShapeInformation
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	NumberOfValidShapeClassificationsFeatureLevel `uint8_t` ValidShapeClassificationsList `ValidShapeClassificationsVector`
Derived from	-
Description	Represents the shape related information.

⌋(*RS_ADI_00001*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.5.9 ShapePoint

[SWS_ADI_00611]{DRAFT} **Definition of ImplementationDataType ShapePoint** ⌈

Name	ShapePoint
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	PointExistenceProbability `ProbabilityPercentage` Position `Point3D` PositionError `Point3DError`
Derived from	-
Description	Represents the Shape points information.

⌋(*RS_ADI_00001*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.5.10 ValidShapePointVector

[SWS_ADI_00612]{DRAFT} **Definition of ImplementationDataType ValidShapePointVector** ⌈

Name	ValidShapePointVector
Namespace	ara::adi::sensoritf
Kind	VECTOR <`ShapePoint`>
Derived from	-
Description	Represents a list of shape point information.

⌋(*RS_ADI_00001*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.5.11 ShapePoints

[SWS_ADI_00613]{DRAFT} **Definition of ImplementationDataType ShapePoints** ⌈

Name	ShapePoints
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	ShapeType `ShapeType` NumberOfValidShapePoints `uint16_t` ValidShapePointsList `ValidShapePointVector`
Derived from	-
Description	Represents the Shape points related information.

⌋(*RS_ADI_00001*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.5.12 ShapeReferencePoint

[SWS_ADI_00614]{DRAFT} **Definition of ImplementationDataType ShapeReferencePoint** ⌈

Name	ShapeReferencePoint
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	PointExistenceProbability `ProbabilityPercentage` Position `Point3D` PositionError `Point3DError` ShapeSurfaceNormal `Point3D` (optional) ShapeSurfaceNormalError `Point3DError` (optional) TranslationRate `Point3D` (optional) TranslationRateError `Point3DError` (optional) RotationRate `Orientation3D` (optional) RotationRateError `Orientation3DError` (optional) ScaleChange `float` (optional) ScaleChangeError `float` (optional)
Derived from	-
Description	Represents the Shape reference points information.

⌋*(RS_ADI_00001, RS_ADI_00012, RS_ADI_00013, RS_ADI_00014)*

9.1.5.13 ValidShapeReferencePointVector

[SWS_ADI_00615]{DRAFT} **Definition of ImplementationDataType ValidShapeReferencePointVector** ⌈

Name	ValidShapeReferencePointVector
Namespace	ara::adi::sensoritf
Kind	VECTOR <`ShapeReferencePoint`>
Derived from	-
Description	Represents a list of shape Reference point information.

⌋*(RS_ADI_00001, RS_ADI_00012, RS_ADI_00013, RS_ADI_00014)*

9.1.5.14 ShapeReferencePoints

[SWS_ADI_00616]{DRAFT} **Definition of ImplementationDataType ShapeReferencePoints** ⌈

Name	ShapeReferencePoints
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	NumberOfValidShapeReferencePointsFeatureLevel `uint8_t` ShapeReferencePointsList `ValidShapeReferencePointVector`
Derived from	-
Description	Represents the Shape Reference points related information.

⌋(*RS_ADI_00001*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.5.15 FeatureStatus

[SWS_ADI_00617]{DRAFT} **Definition of ImplementationDataType FeatureStatus** ⌈

Name	FeatureStatus
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	ExistenceProbabilityFeatureLevel `ProbabilityPercentage` FeatureID `uint16_t` (optional) FeatureGroupingID `uint16_t` (optional) ObjectIDReferenceFeatureLevel `uint16_t` (optional) TimeStampDifferenceFeatureLevel `uint64_t` NumberOfValidObservationsFeatureLevel `uint8_t` (optional) ValidObservations `ValidObservationVector` (optional)
Derived from	-
Description	Represents the dynamics of the features.

⌋(*RS_ADI_00001*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.5.16 CameraFeature

[SWS_ADI_00618]{DRAFT} **Definition of ImplementationDataType CameraFeature** ⌈

Name	CameraFeature
Namespace	ara::adi::sensoritf
Kind	STRUCTURE

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Sub-elements	CameraFeaturesStatus `FeatureStatus` CameraFeaturesShapeInformation `CameraFeaturesShapeInformation` CameraFeaturesShapeColourTone `ColourTone` CameraFeaturesShapePoints `ShapePoints` CameraFeaturesShapeReferencePoints `ShapeReferencePoints` (optional)
Derived from	-
Description	Represents the Camera feature information.

⌋(*RS_ADI_00001*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.5.17 ValidCameraFeatureVector

[SWS_ADI_00619]{DRAFT} **Definition of ImplementationDataType ValidCamera FeatureVector** ⌈

Name	ValidCameraFeatureVector
Namespace	ara::adi::sensoritf
Kind	VECTOR <`CameraFeature`>
Derived from	-
Description	Represents a list of camerqa feature information.

⌋(*RS_ADI_00001*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.5.18 CameraFeatureInterface

[SWS_ADI_00620]{DRAFT} **Definition of ImplementationDataType CameraFeatureInterface** ⌈

Name	CameraFeatureInterface
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	CameraFeatureInterfaceHeader `InterfaceHeader` RecognizedFeaturesCapability `uint32_t` (optional) RecognizedFeaturesStatus `RecognizedStatus` (optional) NumberOfValidFeatures `uint32_t` ValidCameraFeaturesList `ValidCameraFeatureVector`
Derived from	-
Description	Represents the camera feature interface information.

⌋(*RS_ADI_00001*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.5.19 UltrasonicSegmentInformation

[SWS_ADI_00621]{DRAFT} **Definition of ImplementationDataType UltrasonicSegmentInformation** ⌈

Name	UltrasonicSegmentInformation
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	NumberOfValidUltrasonicFeatureClassifications `uint8_t` ValidUltrasonicFeatureClassificationsList `ValidUltrasonicFeatureClassificationVector`
Derived from	-
Description	Represents the segment information.

⌋(*RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.5.20 UltrasonicFeatureClassification

[SWS_ADI_00622]{DRAFT} **Definition of ImplementationDataType UltrasonicFeatureClassification** ⌈

Name	UltrasonicFeatureClassification
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	UltrasonicFeatureClassificationType `UltrasonicFeatureClassificationType` UltrasonicFeatureClassificationTypeConfidence `ProbabilityPercentage`
Derived from	-
Description	Represents the Ultrasonic segmengt type information.

⌋(*RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.5.21 SegmentPoint

[SWS_ADI_00623]{DRAFT} **Definition of ImplementationDataType SegmentPoint** ⌈

Name	SegmentPoint
Namespace	ara::adi::sensoritf
Kind	STRUCTURE

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Sub-elements	Position `Point3D` PositionError `Point3DError` OrientationPitch `float` (optional) OrientationPitchError `float` (optional) Height `float` (optional) HeightError `float` (optional) VelocityUltrasonic `Point2D` (optional) VelocityUltrasonicError `Point2DError` (optional) TrilaterationStatus `TrilaterationStatus` MeasurementStatusFeatureLevel `MeasurementStatusFeature` (optional)
Derived from	-
Description	Represents the valid segment point information.

⌋(*RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.5.22 ValidSegmentPointVector

[SWS_ADI_00624]{DRAFT} **Definition of ImplementationDataType ValidSegmentPointVector** ⌈

Name	ValidSegmentPointVector
Namespace	ara::adi::sensoritf
Kind	VECTOR <`SegmentPoint`>
Derived from	-
Description	Represents a list of segment points information.

⌋(*RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.5.23 UltrasonicSegmentPoints

[SWS_ADI_00625]{DRAFT} **Definition of ImplementationDataType UltrasonicSegmentPoints** ⌈

Name	UltrasonicSegmentPoints
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	NumberOfValidPoints `uint16_t` ValidSegmentPointsList `ValidSegmentPointVector`
Derived from	-
Description	Represents the segment points information.

⌋(*RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.5.24 UltrasonicFeature

[SWS_ADI_00626]{DRAFT} **Definition of ImplementationDataType UltrasonicFeature** ⌈

Name	UltrasonicFeature
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	UltrasonicFeaturesStatus `FeatureStatus` UltrasonicFeaturesSegmentInformation `UltrasonicSegmentInformation` UltrasonicFeaturesSegmentPoints `UltrasonicSegmentPoints`
Derived from	-
Description	Represents the Ultrasonic feature information.

⌋(*RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.5.25 ValidUltrasonicFeatureVector

[SWS_ADI_00627]{DRAFT} **Definition of ImplementationDataType ValidUltrasonicFeatureVector** ⌈

Name	ValidUltrasonicFeatureVector
Namespace	ara::adi::sensoritf
Kind	VECTOR <`UltrasonicFeature`>
Derived from	-
Description	Represents a list of Ultrasonic feature information.

⌋(*RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.5.26 UltrasonicFeatureInterface

[SWS_ADI_00628]{DRAFT} **Definition of ImplementationDataType UltrasonicFeatureInterface** ⌈

Name	UltrasonicFeatureInterface
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	UltrasonicFeatureInterfaceHeader `InterfaceHeader` RecognizedFeaturesCapability `uint32_t` (optional) RecognizedFeaturesStatus `RecognizedStatus` (optional) NumberOfValidFeatures `uint32_t` ValidUltrasonicFeaturesList `ValidUltrasonicFeatureVector`
Derived from	-
Description	Represents the Ultrasonic feature interface information.

⌋(*RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.5.27 ValidUltrasonicFeatureClassificationVector

[SWS_ADI_00629]{DRAFT} **Definition of ImplementationDataType ValidUltrasonicFeatureClassificationVector** ⌈

Name	ValidUltrasonicFeatureClassificationVector
Namespace	ara::adi::sensoritf
Kind	VECTOR <UltrasonicFeatureClassification>
Derived from	-
Description	Represents a list of Ultrasonic feature classification information.

⌋*(RS_ADI_00004, RS_ADI_00012, RS_ADI_00013, RS_ADI_00014)*

9.1.6 Detection Level Interface Definition

This section lists all the data types used in Lidar, Radar, Camera , and Ultrasonic Detection interfaces.

9.1.6.1 Position3DSpheric

[SWS_ADI_00701]{DRAFT} **Definition of ImplementationDataType Position3DSpheric** ⌈

Name	Position3DSpheric
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	elevation `float` azimuth `float` distance `float` (optional)
Derived from	-
Description	Represents a 3 dimension vector, the unit will be vary according to the refering data type.

⌋*(RS_ADI_00001, RS_ADI_00002, RS_ADI_00003, RS_ADI_00004, RS_ADI_00012, RS_ADI_00013, RS_ADI_00014)*

9.1.6.2 Position3DSphericError

[SWS_ADI_00702]{DRAFT} **Definition of ImplementationDataType Position3DSphericError** ⌈

Name	Position3DSphericError
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	elevation `float` azimuth `float` distance `float` (optional)
Derived from	-
Description	Error values of the {Azimuth, Elevation, Distance} to the Position {Azimuth, Elevation, Distance}.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.6.3 DetectionClassificationType

[SWS_ADI_00703]{DRAFT} **Definition of ImplementationDataType DetectionClassificationType** ⌈

Name	DetectionClassificationType	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	`uint8_t`	
Description	The classification type for the shape.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	The detection type is unknown.
kOther	0x01	Detection entity is otherwise specified.
kInvalid	0x02	The detection type is invalid. It should not be used for object tracking.
kNoise	0x03	Detection entity is noise, e.g. rain or fog.
kOverdrivable	0x04	Detection entity is overdrivable for vehicle.
kUnderdriveable	0x05	Detection entity is underdrivable for vehicle.
kNearest	0x06	Detection entity is the nearest detection of a measurement.
kStrongest	0x07	Detection entity has the strongest signal of a measurement.
kObstacle	0x08	Detection entity is an obstacle for vehicle.

⌋(*RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.6.4 DetectionsPosition

[SWS_ADI_00704]{DRAFT} **Definition of ImplementationDataType DetectionsPosition** ⌈

Name	DetectionsPosition
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	DetectionPosition `Position3DSpheric` DetectionPositionError `Position3DSphericError`
Derived from	-
Description	Represents the position of the detections.

⌋(*RS_ADI_00003*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.6.5 UltrasonicDetectionsPosition

[SWS_ADI_00705]{DRAFT} **Definition of ImplementationDataType UltrasonicDetectionsPosition** ⌈

Name	UltrasonicDetectionsPosition
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	Distance `float` DistanceError `float` HeightUltrasonic `float` (optional) HeightUltrasonicError `float` (optional)
Derived from	-
Description	Represents the position of the detections.

⌋(*RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.6.6 DetectionStatus

[SWS_ADI_00706]{DRAFT} **Definition of ImplementationDataType DetectionStatus** ⌈

Name	DetectionStatus
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	ExistenceProbabilityDetectionLevel `ProbabilityPercentage` ObjectID `uint16_t` (optional) FeatureID `uint16_t` (optional) TimeStampDifferenceDetectionLevel `uint64_t`

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Derived from	-
Description	Represents the dynamics of the detections.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.6.7 DetectionClassification

[SWS_ADI_00707]{DRAFT} **Definition of ImplementationDataType DetectionClassification** ⌈

Name	DetectionClassification
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	DetectionClassificationType `DetectionClassificationType` (optional) DetectionClassificationTypeConfidence `ProbabilityPercentage` (optional)
Derived from	-
Description	Represents the detection class type information.

⌋(*RS_ADI_00003*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.6.8 ValidDetectionClassificationVector

[SWS_ADI_00708]{DRAFT} **Definition of ImplementationDataType ValidDetectionClassificationVector** ⌈

Name	ValidDetectionClassificationVector
Namespace	ara::adi::sensoritf
Kind	VECTOR <`DetectionClassification`>
Derived from	-
Description	Represents a list of detection class type information.

⌋(*RS_ADI_00003*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.6.9 RadarDetectionsInformation

[SWS_ADI_00709]{DRAFT} **Definition of ImplementationDataType RadarDetectionsInformation** ⌈

Name	RadarDetectionsInformation
Namespace	ara::adi::sensoritf
Kind	STRUCTURE

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Sub-elements	RadarCrossSection `float` RadarCrossSectionError `float` (optional) SignalToNoiseRatioDetectionLevel `float` SignalToNoiseRatioDetectionLevelError `float` (optional) MultiTargetProbability `ProbabilityPercentage` (optional) AmbiguityID `uint16_t` (optional) DetectionAmbiguityProbability `ProbabilityPercentage` (optional) FreeSpaceProbability `ProbabilityPercentage` (optional) NumberOfValidDetectionClassifications `uint8_t` (optional) ValidDetectionClassificationList `ValidDetectionClassificationVector` (optional)
Derived from	-
Description	Represents the radar detection information.

⌋(*RS_ADI_00003*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.6.10 RadarDetection

[SWS_ADI_00710]{DRAFT} **Definition of ImplementationDataType RadarDetection** ⌈

Name	RadarDetection
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	RadarDetectionsStatus `DetectionStatus` RadarDetectionsInformation `RadarDetectionsInformation` RadarDetectionsPosition `DetectionsPosition` RadarDetectionsDynamics `DetectionsDynamics`
Derived from	-
Description	Represents the Radar detection information.

⌋(*RS_ADI_00003*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.6.11 ValidRadarDetectionVector

[SWS_ADI_00711]{DRAFT} **Definition of ImplementationDataType ValidRadarDetectionVector** ⌈

Name	ValidRadarDetectionVector
Namespace	ara::adi::sensoritf
Kind	VECTOR <`RadarDetection`>
Derived from	-
Description	Represents a list of radar detection information.

⌋(*RS_ADI_00003*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.6.12 DetectionsDynamics

[SWS_ADI_00712]{DRAFT} **Definition of ImplementationDataType DetectionsDynamics** ⌈

Name	DetectionsDynamics
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	RelativeVelocityRadialDistance `float` RelativeVelocityRadialDistanceError `float` (optional)
Derived from	-
Description	Represents the dynamics of the detections.

⌋*(RS_ADI_00002, RS_ADI_00003, RS_ADI_00012, RS_ADI_00013, RS_ADI_00014)*

9.1.6.13 RadarDetectionsInterface

[SWS_ADI_00714]{DRAFT} **Definition of ImplementationDataType RadarDetectionsInterface** ⌈

Name	RadarDetectionsInterface
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	RadarDetectionInterfaceHeader `InterfaceHeader` RecognizedDetectionsCapability `uint32_t` (optional) RecognizedDetectionsStatus `RecognizedStatus` (optional) NumberOfValidDetections `uint32_t` ValidRadarDetectionsList `ValidRadarDetectionVector`
Derived from	-
Description	Represents the radar detection interface information.

⌋*(RS_ADI_00003, RS_ADI_00012, RS_ADI_00013, RS_ADI_00014)*

9.1.6.14 LidarDetectionsInformation

[SWS_ADI_00715]{DRAFT} **Definition of ImplementationDataType LidarDetectionsInformation** ⌈

Name	LidarDetectionsInformation
Namespace	ara::adi::sensoritf
Kind	STRUCTURE

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Sub-elements	Reflectivity `float` ReflectivityError `float` (optional) FreeSpaceProbability `ProbabilityPercentage` (optional) NumberOfValidDetectionClassifications `uint8_t` (optional) ValidDetectionClassificationList `ValidDetectionClassificationVector` (optional)
Derived from	-
Description	Represents the lidar detection information.

⌋(*RS_ADI_00002*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.6.15 LidarDetection

[SWS_ADI_00716]{DRAFT} **Definition of ImplementationDataType LidarDetection** ⌈

Name	LidarDetection
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	LidarDetectionStatus `DetectionStatus` LidarDetectionsInformation `LidarDetectionsInformation` LidarDetectionsPosition `LidarDetectionsPosition` LidarDetectionsDynamics `DetectionsDynamics`
Derived from	-
Description	Represents the lidar detection information.

⌋(*RS_ADI_00002*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.6.16 ValidLidarDetectionVector

[SWS_ADI_00717]{DRAFT} **Definition of ImplementationDataType ValidLidarDetectionVector** ⌈

Name	ValidLidarDetectionVector
Namespace	ara::adi::sensoritf
Kind	VECTOR <`LidarDetection`>
Derived from	-
Description	Represents a list of lidar detection information.

⌋(*RS_ADI_00002*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.6.17 LidarDetectionsPosition

[SWS_ADI_00718]{DRAFT} **Definition of ImplementationDataType LidarDetectionsPosition** ⌈

Name	LidarDetectionsPosition
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	DetectionPosition `Position3DSpheric` DetectionPositionError `Position3DSphericError` HeightLidar `float` (optional) HeightLidarError `float` (optional)
Derived from	-
Description	Represents the position of the detections.

⌋(*RS_ADI_00002*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.6.18 LidarDetectionsInterface

[SWS_ADI_00719]{DRAFT} **Definition of ImplementationDataType LidarDetectionsInterface** ⌈

Name	LidarDetectionsInterface
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	LidarDetectionInterfaceHeader `InterfaceHeader` RecognizedDetectionsCapability `uint32_t` (optional) RecognizedDetectionsStatus `RecognizedStatus` (optional) NumberOfValidLidarDetections `uint32_t` ValidLidarDetectionsList `ValidLidarDetectionVector` (optional)
Derived from	-
Description	Represents the lidar detection interface information.

⌋(*RS_ADI_00002*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.6.19 DetectionShapeClassification

[SWS_ADI_00720]{DRAFT} **Definition of ImplementationDataType DetectionShapeClassification** ⌈

Name	DetectionShapeClassification
Namespace	ara::adi::sensoritf
Kind	STRUCTURE

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Sub-elements	ShapeClassificationTypeDetectionLevel `ShapeClassificationType` ShapeClassificationTypeConfidenceDetectionLevel `ProbabilityPercentage`
Derived from	-
Description	Represents the shape classification type information.

⌋(*RS_ADI_00001*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.6.20 ValidDetectionShapeClassificationVector

[SWS_ADI_00721]{DRAFT} **Definition of ImplementationDataType ValidDetection ShapeClassificationVector** ⌈

Name	ValidDetectionShapeClassificationVector
Namespace	ara::adi::sensoritf
Kind	VECTOR <`DetectionShapeClassification`>
Derived from	-
Description	Represents a list of shape class type information.

⌋(*RS_ADI_00001*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.6.21 CameraShapesShapeInformation

[SWS_ADI_00722]{DRAFT} **Definition of ImplementationDataType CameraShapes ShapeInformation** ⌈

Name	CameraShapesShapeInformation
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	FreeSpaceProbability `ProbabilityPercentage` (optional) NumberOfValidShapeClassificationsDetectionLevel `uint8_t` ValidShapeClassificationsList `ValidDetectionShapeClassificationVector` ShapeAmbiguityID `uint16_t` (optional)
Derived from	-
Description	Represents the Camera detection related information.

⌋(*RS_ADI_00001*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.6.22 ShapePointDetectionLevel

[SWS_ADI_00723]{DRAFT} **Definition of ImplementationDataType ShapePointDetectionLevel** ⌈

Name	ShapePointDetectionLevel
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	PointExistenceProbabilityDetectionLevel `ProbabilityPercentage` Position `Position3DSpheric` PositionError `Position3DSphericError`
Derived from	-
Description	Represents the Shape point information.

⌋(*RS_ADI_00001*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.6.23 ValidShapePointDetectionLevelVector

[SWS_ADI_00724]{DRAFT} **Definition of ImplementationDataType ValidShapePointDetectionLevelVector** ⌈

Name	ValidShapePointDetectionLevelVector
Namespace	ara::adi::sensoritf
Kind	VECTOR <`ShapePointDetectionLevel`>
Derived from	-
Description	Represents a list of shape point information.

⌋(*RS_ADI_00001*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.6.24 CameraShapesShapePoints

[SWS_ADI_00725]{DRAFT} **Definition of ImplementationDataType CameraShapesShapePoints** ⌈

Name	CameraShapesShapePoints
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	ShapeTypeDetectionLevel `ShapeType` NumberOfValidShapePointsDetectionLevel `uint16_t` ValidShapePointsDetectionLevelList `ValidShapePointDetectionLevelVector`
Derived from	-
Description	Represents the Shape points related information.

⌋(*RS_ADI_00001*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.6.25 CameraShape

[SWS_ADI_00726]{DRAFT} **Definition of ImplementationDataType CameraShape** ⌈

Name	CameraShape
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	CameraShapesStatus `DetectionStatus` CameraShapeInformation `CameraShapesShapeInformation` CameraShapesShapeColourTone `ColourTone` CameraShapePoints `CameraShapesShapePoints` CameraShapeReferencePoints `CameraShapesShapeReferencePoints` (optional)
Derived from	-
Description	Represents the Camera detection information.

⌋(*RS_ADI_00001*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.6.26 ValidCameraShapeVector

[SWS_ADI_00727]{DRAFT} **Definition of ImplementationDataType ValidCameraShapeVector** ⌈

Name	ValidCameraShapeVector
Namespace	ara::adi::sensoritf
Kind	VECTOR <`CameraShape`>
Derived from	-
Description	Represents a list of Camera detection information.

⌋(*RS_ADI_00001*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.6.27 ShapeReferencePointDetectionLevel

[SWS_ADI_00728]{DRAFT} **Definition of ImplementationDataType ShapeReferencePointDetectionLevel** ⌈

Name	ShapeReferencePointDetectionLevel
Namespace	ara::adi::sensoritf
Kind	STRUCTURE

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Sub-elements	PointExistenceProbabilityDetectionLevel `ProbabilityPercentage` Position `Position3DSpheric` PositionError `Position3DSphericError` TranslationRate `Point3D` (optional) TranslationRateError `Point3DError` (optional)
Derived from	-
Description	Represents the Shape reference point information.

⌋(*RS_ADI_00001*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.6.28 ValidShapeReferencePointDetectionLevelVector

[SWS_ADI_00729]{DRAFT} **Definition of ImplementationDataType ValidShapeReferencePointDetectionLevelVector** ⌈

Name	ValidShapeReferencePointDetectionLevelVector
Namespace	ara::adi::sensoritf
Kind	VECTOR <`ShapeReferencePointDetectionLevel`>
Derived from	-
Description	Represents a list of shape reference point information.

⌋(*RS_ADI_00001*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.6.29 CameraShapesShapeReferencePoints

[SWS_ADI_00730]{DRAFT} **Definition of ImplementationDataType CameraShapesShapeReferencePoints** ⌈

Name	CameraShapesShapeReferencePoints
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	NumberOfValidShapeReferencePointsDetectionLevel `uint16_t` ValidShapeReferencePointsPointsDetectionLevelList `ValidShapeReferencePointDetectionLevelVector`
Derived from	-
Description	Represents the Shape reference points related information.

⌋(*RS_ADI_00001*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.6.30 CameraDetectionsInterface

[SWS_ADI_00731]{DRAFT} **Definition of ImplementationDataType CameraDetectionsInterface** ⌈

Name	CameraDetectionsInterface
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	CameraDetectionInterfaceHeader `InterfaceHeader` RecognizedDetectionsCap `uint32_t` (optional) RecognizedDetectionsStatus `RecognizedStatus` (optional) NumberOfValidShapes `uint32_t` ValidCameraDetectionList `ValidCameraShapeVector`
Derived from	-
Description	Represents the Camera detection interface information.

⌋(*RS_ADI_00001*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.6.31 UltrasonicDetectionsInformation

[SWS_ADI_00732]{DRAFT} **Definition of ImplementationDataType UltrasonicDetectionsInformation** ⌈

Name	UltrasonicDetectionsInformation
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	SecondSensorIDReference `float` (optional) Reflectivity `float` (optional)
Derived from	-
Description	Represents the Ultrasonic detection information.

⌋(*RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.6.32 UltrasonicDetection

[SWS_ADI_00733]{DRAFT} **Definition of ImplementationDataType UltrasonicDetection** ⌈

Name	UltrasonicDetection
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	UltrasonicDetectionStatus `DetectionStatus` UltrasonicDetectionsInformation `UltrasonicDetectionsInformation` UltrasonicDetectionsPositionInformation `UltrasonicDetectionsPosition`

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Derived from	-
Description	Represents the Ultrasonic detection information.

⌋(*RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.6.33 ValidUltrasonicDetectionVector

[SWS_ADI_00734]{DRAFT} **Definition of ImplementationDataType ValidUltrasonicDetectionVector** ⌈

Name	ValidUltrasonicDetectionVector
Namespace	ara::adi::sensoritf
Kind	VECTOR <`UltrasonicDetection`>
Derived from	-
Description	Represents a list of Ultrasonic detection information.

⌋(*RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.6.34 UltrasonicDetectionsInterface

[SWS_ADI_00735]{DRAFT} **Definition of ImplementationDataType UltrasonicDetectionsInterface** ⌈

Name	UltrasonicDetectionsInterface
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	UltrasonicDetectionsInterfaceHeader `InterfaceHeader` RecognizedDetectionsCap `uint8_t` (optional) RecognizedDetectionsStatus `RecognizedStatus` (optional) NoValidDetections `uint32_t` ValidUltrasonicDetectionList `ValidUltrasonicDetectionVector`
Derived from	-
Description	Represents the Ultrasonic detection interface information.

⌋(*RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.7 Supportive Sensor Interfaces Definition

This section lists all the data types used in Supportive Sensor interfaces.

9.1.7.1 SegmentAzimuth

[SWS_ADI_00501]{DRAFT} **Definition of ImplementationDataType SegmentAzimuth** ⌈

Name	SegmentAzimuth
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	Begin `float` End `float`
Derived from	-
Description	FOV defined by opening angles in sensor XY-plane. (rad, rad)

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.7.2 SegmentElevation

[SWS_ADI_00502]{DRAFT} **Definition of ImplementationDataType SegmentElevation** ⌈

Name	SegmentElevation
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	Begin `float` End `float`
Derived from	-
Description	FOV defined by opening angles in sensor XZ-plane. (rad, rad)

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.7.3 AnglePoint3D

[SWS_ADI_00503]{DRAFT} **Definition of ImplementationDataType AnglePoint3D** ⌈

Name	AnglePoint3D
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	RadialDistance `float` Azimuth `float` Elevation `float`
Derived from	-
Description	The angle point, and the units are depending on the specific use cases.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.7.4 BeamDivergence

[SWS_ADI_00504]{DRAFT} **Definition of ImplementationDataType BeamDivergence** ⌈

Name	BeamDivergence
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	Azimuth `float` Elevation `float`
Derived from	-
Description	The Beam divergence {azimuth, elevation} of the sensor within the specified segment is the full width at half maximum (FWHM) of the beam (given as the angle in rad).(rad, rad)

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.7.5 SegmentsStatus

[SWS_ADI_00505]{DRAFT} **Definition of ImplementationDataType SegmentsStatus** ⌈

Name	SegmentsStatus
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	SegmentAzimuthInformation `SegmentAzimuth` SegmentElevationInformation `SegmentElevation` MeasurementGridResolutionInformation `AnglePoint3D` (optional) BeamDivergence `BeamDivergence` (optional) RangeGain `ProbabilityPercentage` (optional) Blockage `BlockageStatus`
Derived from	-
Description	Represents the sensor performance information.

⌋(*RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.7.6 BlockageStatus

[SWS_ADI_00506]{DRAFT} **Definition of ImplementationDataType BlockageStatus** ⌈

Name	BlockageStatus	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	`uint8_t`	
Description	Defines the overall blockage of the FOV segment.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	The blockage status is unknown.
kOther	0x01	The blockage status is otherwise specified.
kFullBlockage	0x02	The sensor is completely blocked, no more feature and functionality working due to blockage condition.
kPartialBlockageHighImpact	0x03	The sensor has detected a blockage condition which has a significant impact on sensor performance (e.g. range).
kPartialBlockageMediumImpact	0x04	The sensor has detected a blockage condition which already has impact on sensor performance (e.g. range).
kPartialBlockageLowImpact	0x05	The sensor detects that a blockage condition is present or is increasing, but the degree of blockage has not yet had a significant impact on sensor performance and functionality.
kDefect	0x06	The full specified range is blocked, due to e.g. a pixel defect. This segment may overlap with other segments.
kNone	0x07	Normal mode.

⌋*(RS_ADI_00001, RS_ADI_00002, RS_ADI_00003, RS_ADI_00004, RS_ADI_00012, RS_ADI_00013, RS_ADI_00014)*

9.1.7.7 FieldOfViewReduction

[SWS_ADI_00507]{DRAFT} **Definition of ImplementationDataType FieldOfView Reduction** ⌈

Name	FieldOfViewReduction
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	NumberOfValidFieldOfViewReductionReasons `uint8_t` ValidFieldOfViewReductionReasonsList `ValidFieldOfViewReductionReasonsVector`
Derived from	-
Description	Represents the FOV reduction related information.

⌋*(RS_ADI_00001, RS_ADI_00002, RS_ADI_00003, RS_ADI_00004, RS_ADI_00012, RS_ADI_00013, RS_ADI_00014)*

9.1.7.8 FieldOfViewReductionReasonType

[SWS_ADI_00508]{DRAFT} **Definition of ImplementationDataType FieldOfView ReductionReasonType** ⌈

Name	FieldOfViewReductionReasonType	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	`uint8_t`	
Description	Defines the overall blockage of the FOV segment.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	FOV reduction type is unknown.
kOther	0x01	FOV reduction type is otherwise specified.
kSnow	0x02	Range reduction due to snow.
kRain	0x03	Range reduction due to rain.
kClutter	0x04	Range reduction due to clutter.
kFlyingLeaves	0x05	Range reduction due to flying leaves.
kNightAndLights	0x06	Range reduction due to night and lights.
kShades	0x07	Range reduction due to shades.
kContrastIssues	0x08	Range reduction due to contrast issues.
kJamming	0x09	Range reduction, e.g. electromagnetic compatibility.
kDeviceInterference	0x0A	Range reduction, e.g. electromagnetic compatibility.
kSand	0x0B	Range reduction due to sand.
kWetRoads	0x0C	Range reduction due to wet roads.
kGhosts	0x0D	Range reduction due to ghosts.
kSnowOnSensorSurface	0x0E	Near range blockage due to snow on the sensor surface.
kWaterOnSensorSurface	0x0F	Near range blockage due to water on the sensor surface.
kSoilOnSensorSurface	0x10	Near range blockage due to soil on the sensor surface.
kScratchesOnSensorSurface	0x11	Near range blockage due to scratches on the sensor surface.

⌋*(RS_ADI_00001, RS_ADI_00002, RS_ADI_00003, RS_ADI_00004, RS_ADI_00012, RS_ADI_00013, RS_ADI_00014)*

9.1.7.9 ValidFieldOfViewReductionReasonsVector

[SWS_ADI_00509]{DRAFT} **Definition of ImplementationDataType ValidFieldOf ViewReductionReasonsVector** ⌈

Name	ValidFieldOfViewReductionReasonsVector
Namespace	ara::adi::sensoritf
Kind	VECTOR <`FieldOfViewReductionReasons`>
Derived from	-
Description	Represents a list of FOV reduction reason type information.

⌋*(RS_ADI_00001, RS_ADI_00002, RS_ADI_00003, RS_ADI_00004, RS_ADI_00012, RS_ADI_00013, RS_ADI_00014)*

9.1.7.10 FieldOfViewReductionReasons

[SWS_ADI_00510]{DRAFT} **Definition of ImplementationDataType FieldOfView ReductionReasons** ⌈

Name	FieldOfViewReductionReasons
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	FOVReductionReasonType `FieldOfViewReductionReasonType` FieldOfViewReductionReasonTypeConfidence `ProbabilityPercentage`
Derived from	-
Description	Represents the FOV Reduction type information.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.7.11 RecognizedObjectType

[SWS_ADI_00511]{DRAFT} **Definition of ImplementationDataType Recognized ObjectType** ⌈

Name	RecognizedObjectType	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	`uint8_t`	
Description	Defines the overall blockage of the FOV segment.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	The recognized object type is unknown.
kOther	0x01	The recognized object type is otherwise specified.
kCar	0x02	Recognized entity is a car.
kTruck	0x03	Recognized entity is a truck.
kMotorBike	0x04	Recognized entity is a motor bike.
kBicycle	0x05	Recognized entity is a bicycle.
kPedestrian	0x06	Recognized entity is a pedestrian.
kMovingObject	0x07	Recognized entity is an unknown moving object.
kRoadBoundary	0x08	Recognized entity is a road boundary.
kRoadMarking	0x09	Recognized entity is a road marking.
kStaticObject	0x0A	Recognized entity is a static object.
kTrafficSign	0x0B	Recognized entity is a traffic sign.
kTrafficLight	0x0C	Recognized entity is a traffic light.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.7.12 DetectionRange

[SWS_ADI_00512]{DRAFT} **Definition of ImplementationDataType DetectionRange** ⌈

Name	DetectionRange
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	Min `float` Max `float`
Derived from	-
Description	Sensor detection range for one object type with Minimum classification rate this object type and Maximum false positive rate for this object type. (m, m)

⌋*(RS_ADI_00001, RS_ADI_00002, RS_ADI_00003, RS_ADI_00004, RS_ADI_00012, RS_ADI_00013, RS_ADI_00014)*

9.1.7.13 RecognizableObjectTypes

[SWS_ADI_00513]{DRAFT} **Definition of ImplementationDataType RecognizableObjectTypes** ⌈

Name	RecognizableObjectTypes
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	RecognizedObjectType `RecognizedObjectType` DetectionRangeInformation `DetectionRange` TruePositiveRate `ProbabilityPercentage` (optional) FalsePositiveRate `ProbabilityPercentage` (optional) PositivePredictiveValue `ProbabilityPercentage` (optional)
Derived from	-
Description	Represents the Object Detection Rate information.

⌋*(RS_ADI_00001, RS_ADI_00002, RS_ADI_00003, RS_ADI_00004, RS_ADI_00012, RS_ADI_00013, RS_ADI_00014)*

9.1.7.14 ValidRecognizableObjectTypesVector

[SWS_ADI_00514]{DRAFT} **Definition of ImplementationDataType ValidRecognizableObjectTypesVector** ⌈

Name	ValidRecognizableObjectTypesVector
Namespace	ara::adi::sensoritf
Kind	VECTOR <`RecognizableObjectTypes`>

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Derived from	-
Description	Represents a list of Object Detection Rate information.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.7.15 RealWorldObjectRecognitionCapabilities

[SWS_ADI_00515]{DRAFT} **Definition of ImplementationDataType RealWorldObjectRecognitionCapabilities** ⌈

Name	RealWorldObjectRecognitionCapabilities
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	NumberOfValidRecognizableObjectTypes `uint8_t` ValidRecognizableObjectTypesList `ValidRecognizableObjectTypesVector`
Derived from	-
Description	Represents the Object Detection Rate related information.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.7.16 ReferenceTargetType

[SWS_ADI_00516]{DRAFT} **Definition of ImplementationDataType ReferenceTargetType** ⌈

Name	ReferenceTargetType	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	`uint8_t`	
Description	Provides the classification of the sensor's recognition capabilities for defined reference targets.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	The reference target type is unknown.
kOther	0x01	The reference target type is otherwise specified.
kPatternA	0x02	The recognized entity is a defined pattern A.
kPatternB	0x03	The recognized entity is a defined pattern B.
kPatternC	0x04	The recognized entity is a defined pattern C.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.7.17 ReferenceTargetTypes

[SWS_ADI_00517]{DRAFT} **Definition of ImplementationDataType ReferenceTargetTypes** ⌈

Name	ReferenceTargetTypes
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	ReferenceTargetType `ReferenceTargetType` (optional) RadarCrossSectionReferenceTarget `float` (optional) ReflectivityReferenceTarget `float` (optional) DetectionRangeInformation `DetectionRange` TruePositiveRate `ProbabilityPercentage` (optional) RelativeRadialVelocityRange `RelativeRadialVelocityRange` (optional) SignalToNoiseRatioSupportiveLevel `float` SpatialSeparability `AnglePoint3D` (optional) VelocitySeparability `AnglePoint3D` (optional)
Derived from	-
Description	Represents the Reference Target Rate information.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.7.18 ValidReferenceTargetTypesVector

[SWS_ADI_00518]{DRAFT} **Definition of ImplementationDataType ValidReferenceTargetTypesVector** ⌈

Name	ValidReferenceTargetTypesVector
Namespace	ara::adi::sensoritf
Kind	VECTOR <`ReferenceTargetTypes`>
Derived from	-
Description	Represents a list of Reference Target Rate information.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.7.19 ReferenceTargetRecognitionCapabilities

[SWS_ADI_00519]{DRAFT} **Definition of ImplementationDataType ReferenceTargetRecognitionCapabilities** ⌈

Name	ReferenceTargetRecognitionCapabilities
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	NumberOfValidReferenceTargetTypes `uint8_t` ValidReferenceTargetTypesList `ValidReferenceTargetTypesVector`
Derived from	-
Description	Represents the Reference Target Rate related information.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.7.20 RelativeRadialVelocityRange

[SWS_ADI_00520]{DRAFT} **Definition of ImplementationDataType RelativeRadialVelocityRange** ⌈

Name	RelativeRadialVelocityRange
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	Begin `float` End `float`
Derived from	-
Description	Describes the relative radial speed range in the sensor coordinate system.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.7.21 PeformanceSegment

[SWS_ADI_00521]{DRAFT} **Definition of ImplementationDataType Peformance Segment** ⌈

Name	PeformanceSegment
Namespace	ara::adi::sensoritf
Kind	STRUCTURE

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Sub-elements	SegmentsStatus `SegmentsStatus` FieldOfViewReductionInformation `FieldOfViewReduction` RealWorldObjectRecognitionCapabilitiesInformation `RealWorldObjectRecognitionCapabilities` (optional) ReferenceTargetRecognitionCapabilitiesInforamtion `ReferenceTargetRecognitionCapabilities` (optional)
Derived from	-
Description	Represents the Performance sgement information.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.7.22 SensorOperationMode

[SWS_ADI_00523]{DRAFT} **Definition of ImplementationDataType SensorOperationMode** ⌈

Name	SensorOperationMode	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	`uint8_t`	
Description	Status information of the sensor.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	The sensor operation mode is unknown.
kOther	0x01	The sensor operation mode is other.
kSensorMeasuringActive	0x02	Sensor is active and performs measurements.
kSensorMeasuringDisabled	0x03	Sensor is disabled and performs no measurement at the moment.
kSensorMeasuringTestmode	0x04	Sensor is in active measurement mode, however in test mode.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.7.23 SensorDefectDetected

[SWS_ADI_00524]{DRAFT} **Definition of ImplementationDataType SensorDefectDetected** ⌈

Name	SensorDefectDetected	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	`uint8_t`	
Description	Signal for a sensor defect is detected.	
Range / Symbol	***Limit***	***Description***

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kUnknown	0x00	The sensor defect detected is unknown.
kOther	0x01	The sensor defect detected is another defect.
kSensorFullyFunctional	0x02	Sensor has no defects detected.
kNotFullyFunctionalDueTo Defect	0x03	Sensor has detected defects. Sensor can measure with limited performance.
kOutOfOrder	0x04	Sensor has detected defects and cannot perform measurements anymore.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.7.24 SensorDefectReason

[SWS_ADI_00525]{DRAFT} **Definition of ImplementationDataType SensorDefect Reason** ⌈

Name	SensorDefectReason	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	`uint8_t`	
Description	Signal for detailed information why the signal Sensor defect detected is notifying a sensor problem.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	The sensor defect reason is unknown.
kOther	0x01	The sensor defect reason is something other.
kNoDefectDetected	0x02	No defects detected by the sensor.
kInternalMemoryError	0x03	Sensor has detected an internal memory error.
kElectronicDefect	0x04	The sensor has detected an electronic defect.
kThermalDefect	0x05	Sensor has detected a thermal problem error.
kSurgeDefect	0x06	Sensor has detected a surge defect.
kCalibrationError	0x07	Sensor has detected a calibration error.
kImplausibleSensor Parametrisation	0x08	Sensor has detected an implausible parametrisation.
kMechanicalDefect	0x09	Sensor has detected a mechanical defect.
kSoftwareDefect	0x0A	Sensor has detected a software defect.
kComputingPowerNotSufficient	0x0B	Sensor has detected a to low power supply.
kOutOfTimeSyncronisation	0x0C	Sensor has detected an out of time synchronisation.
kSensorExternalDisturbed	0x0D	Sensor has detected an external disturbance.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.7.25 ValidSensorOperationModeVector

[SWS_ADI_00526]{DRAFT} **Definition of ImplementationDataType ValidSensorOperationModeVector** ⌈

Name	ValidSensorOperationModeVector
Namespace	ara::adi::sensoritf
Kind	VECTOR <SensorOperationMode>
Derived from	-
Description	Represents a list of input singal information.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.7.26 StatusSupplyVoltage

[SWS_ADI_00527]{DRAFT} **Definition of ImplementationDataType StatusSupplyVoltage** ⌈

Name	StatusSupplyVoltage	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	uint8_t	
Description	Signal for the current Status supply voltage status.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	The sensor supply voltage status is unknown.
kOther	0x01	The sensor supply voltage status is otherwise specified.
kWithinLimits	0x02	Supply voltage is optimal.
kLow	0x03	Supply voltage is out of valid range. Supply voltage is too low.
kPreLow	0x04	Supply voltage still in the valid range, but close to the limit and expected to leave the valid range soon.
kPreHigh	0x05	Supply voltage still in the valid range, but close to the limit and expected to leave the valid range soon.
kHigh	0x06	Supply voltage is out of valid range. Supply voltage is too high.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.7.27 SensorTemperatureStatus

[SWS_ADI_00528]{DRAFT} **Definition of ImplementationDataType SensorTemperatureStatus** ⌈

Name	SensorTemperatureStatus	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	`uint8_t`	
Description	Signal for the current Sensor temperature status status.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	The sensor temperature status is unknown.
kOther	0x01	The sensor temperature status is otherwise specified.
kTemperatureInLimits	0x02	Normal mode.
kPreOverTemperature	0x03	Close before over temperature.
kOverTemperature	0x04	No measurement updates available.
kUnderTemperature	0x05	No measurement updates available.
kPreUnderTemperature	0x06	Close before under temperature.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.7.28 ValidPeformanceSegmentVector

[SWS_ADI_00529]{DRAFT} **Definition of ImplementationDataType ValidPeformanceSegmentVector** ⌈

Name	ValidPeformanceSegmentVector
Namespace	ara::adi::sensoritf
Kind	VECTOR <`PeformanceSegment`>
Derived from	-
Description	Represents a list of performance segment information.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.7.29 SensorInputSignalType

[SWS_ADI_00530]{DRAFT} **Definition of ImplementationDataType SensorInputSignalType** ⌈

Name	SensorInputSignalType
Namespace	ara::adi::sensoritf
Kind	TYPE_REFERENCE

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Derived from	`uint8_t`	
Description	Classification of the Sensor input signal - type , which defines a group of sensor input signals received by the sensor.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	Sensor input signal type is unknown.
kOther	0x01	Sensor input signal type is otherwise specified.
kDynamicMotionControl	0x02	Dynamic motion control sensor input signals.
kVehicleDynamic	0x03	Vehicle dynamic sensor input signals.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.7.30 SensorInputSignalStatus

[SWS_ADI_00531]{DRAFT} **Definition of ImplementationDataType SensorInputSignalStatus** ⌈

Name	SensorInputSignalStatus	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	`uint8_t`	
Description	Enumeration if valid input signals for Sensor input signal - type are received by the sensor.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	The sensor input signal status is unknown.
kOther	0x01	The sensor input signal status is otherwise specified.
kValid	0x02	Normal mode.
kImplausible	0x03	Signal in context of sensor signals is not plausible compared with other signals or internal calculations.
kMissing	0x04	Signal was never received.
kOufOfRange	0x05	Signal violated the signal range.
kTimeout	0x06	Signal was received, however not in time period as expected.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.7.31 SensorExternalDisturbed

[SWS_ADI_00532]{DRAFT} **Definition of ImplementationDataType SensorExternalDisturbed** ⌈

Name	SensorExternalDisturbed
Namespace	ara::adi::sensoritf
Kind	TYPE_REFERENCE

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Derived from	`uint8_t`	
Description	Signal about the disturbance of the sensor by an external source.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	The sensor external disturbed status is unknown.
kOther	0x01	The sensor external disturbed status is otherwise specified.
kFullDisturbance	0x02	The sensor is completely disturbed, no more feature and functionality working due to external disturbance.
kDisturbanceHighImpact	0x03	The sensor has detected an external disturbance which has a significant impact on sensor performance.
kDisturbanceMediumImpact	0x04	The sensor has detected an external disturbance which already has impact on sensor performance.
kDisturbanceLowImpact	0x05	The sensor detects that an external disturbance is present or is increasing, but the degree of disturbance has not yet had a significant impact on sensor performance and functionality.
kNone	0x06	Normal mode.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.7.32 SensorTransmitPowerReduced

[SWS_ADI_00533]{DRAFT} **Definition of ImplementationDataType SensorTransmitPowerReduced** ⌈

Name	SensorTransmitPowerReduced	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	`uint8_t`	
Description	Enumeration if the sensor works with full output power.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	Sensor Transmit Power status is unknown.
kOther	0x01	Sensor Transmit Power status is otherwise specified.
kNormalOperation	0x02	Transmit output power normal.
kOutputPowerLimited	0x03	Transmit output power reduced.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.7.33 StatusSensorHeating

[SWS_ADI_00534]{DRAFT} **Definition of ImplementationDataType StatusSensorHeating** ⌈

Name	StatusSensorHeating	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	`uint8_t`	
Description	Status of the sensor heating.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	The sensor heating status is unknown.
kOther	0x01	The sensor heating status is otherwise specified.
kHeatingOff	0x02	No heating active.
kHeatingLevel	0x03	Sensor heating active.
kHeatingError	0x04	Sensor heating is defect.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.7.34 StatusSensorCleaning

[SWS_ADI_00535]{DRAFT} **Definition of ImplementationDataType StatusSensorCleaning** ⌈

Name	StatusSensorCleaning	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	`uint8_t`	
Description	Status of the sensor cleaning.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	The sensor cleaning status is unknown.
kOther	0x01	The sensor cleaning status is otherwise specified.
kCleaningIdle	0x02	Sensor cleaning is not active.
kCleaningActive	0x03	Sensor cleaning is active
kCleaningNeeded	0x04	Sensor cleaning should be performed.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.7.35 SensorTimeSync

[SWS_ADI_00536]{DRAFT} **Definition of ImplementationDataType SensorTimeSync** ⌈

Name	SensorTimeSync	
Namespace	ara::adi::sensoritf	
Kind	TYPE_REFERENCE	
Derived from	`uint8_t`	
Description	Status of the sensor time synchronisation.	
Range / Symbol	***Limit***	***Description***
kUnknown	0x00	The time synchronization status is unknown.
kOther	0x01	The time synchronization status is otherwise specified.
kWithinLimits	0x02	Time synchronization inside limits.
kOutOfLimits	0x03	Time synchronization time accuracy limits violated.
kTimeout	0x04	Time synchronization timeout elapsed (no valid time synchronization cycle within timeout interval).
kOffset	0x05	Time offset value. Requires: Sensor time sync offset value

⌋*(RS_ADI_00001, RS_ADI_00002, RS_ADI_00003, RS_ADI_00004, RS_ADI_00012, RS_ADI_00013, RS_ADI_00014)*

9.1.7.36 SensorPerformanceSegments

[SWS_ADI_00537]{DRAFT} **Definition of ImplementationDataType SensorPerformanceSegments** ⌈

Name	SensorPerformanceSegments
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	NumberOfValidFieldOfViewSegments `uint8_t` ValidPeformanceSegmentsList `ValidPeformanceSegmentVector`
Derived from	-
Description	Represents the performance segments related information.

⌋*(RS_ADI_00001, RS_ADI_00002, RS_ADI_00003, RS_ADI_00004, RS_ADI_00012, RS_ADI_00013, RS_ADI_00014)*

9.1.7.37 SensorPerformanceInterface

[SWS_ADI_00538]{DRAFT} **Definition of ImplementationDataType SensorPerformanceInterface** ⌈

Name	SensorPerformanceInterface
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	SensorPerformanceInterfaceHeader `InterfaceHeader` SensorPerformanceSegmentsInformation `SensorPerformanceSegments`
Derived from	-
Description	Represents the sensor performance interface information.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.7.38 InputSignalStatus

[SWS_ADI_00541]{DRAFT} **Definition of ImplementationDataType InputSignalStatus** ⌈

Name	InputSignalStatus
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	InputSignalType `SensorInputSignalType` InputSingalStatus `SensorInputSignalStatus`
Derived from	-
Description	Represents the input signal information.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.7.39 ValidInputSignalStatusVector

[SWS_ADI_00542]{DRAFT} **Definition of ImplementationDataType ValidInputSignalStatusVector** ⌈

Name	ValidInputSignalStatusVector
Namespace	ara::adi::sensoritf
Kind	VECTOR <`InputSignalStatus`>
Derived from	-
Description	Represents a list of input singal information.

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*, *RS_ADI_00012*, *RS_ADI_00013*, *RS_ADI_00014*)

9.1.7.40 SensorHealthStatus

[SWS_ADI_00543]{DRAFT} **Definition of ImplementationDataType SensorHealthStatus** ⌈

Name	SensorHealthStatus
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	NumberOfValidSensorOperationModes `uint8_t` ValidSensorOperationModesList `ValidSensorOperationModeVector` SensorDefectDetectedInformation `SensorDefectDetected` SensorDefectReasonInformation `SensorDefectReason` SupplyVoltageStatus `StatusSupplyVoltage` SensorTemperatureStatus `SensorTemperatureStatus` NumberOfValidSensorInputSignalStatuses `uint8_t` ValidSenorInputSignalStatusList `ValidInputSignalStatusVector` SensorExternalDisturbed `SensorExternalDisturbed` (optional) SensorTransmitPowerReduced `SensorTransmitPowerReduced` (optional) SensorHeatingStatus `StatusSensorHeating` (optional) SensorCleaningStatus `StatusSensorCleaning` (optional) SensorTimeSync `SensorTimeSync` (optional) SensorTimeSyncOffsetValue `float` (optional)
Derived from	-
Description	Represents the sensor health related information.

⌋*(RS_ADI_00001, RS_ADI_00002, RS_ADI_00003, RS_ADI_00004, RS_ADI_00012, RS_ADI_00013, RS_ADI_00014)*

9.1.7.41 SensorHealthInformationInterface

[SWS_ADI_00547]{DRAFT} **Definition of ImplementationDataType SensorHealthInformationInterface** ⌈

Name	SensorHealthInformationInterface
Namespace	ara::adi::sensoritf
Kind	STRUCTURE
Sub-elements	SensorHealthInformationInterfaceHeader `InterfaceHeader` SensorHealthStatusInformation `SensorHealthStatus` (optional) CalibrationInformation `Calibration` (optional) SensorCluster `SensorCluster` (optional)
Derived from	-
Description	Represents the sensor Health interface information.

⌋*(RS_ADI_00001, RS_ADI_00002, RS_ADI_00003, RS_ADI_00004, RS_ADI_00012, RS_ADI_00013, RS_ADI_00014)*

9.2 Service Interfaces

This chapter lists all provided service interfaces of the ADI.

9.2.1 Sensor Interfaces Port

[SWS_ADI_01000]{DRAFT} **Definition of Port SensorInterface provided by functional cluster ADI** ⌈

Name	SensorInterface		
Kind	ProvidedPort	***Interface***	SensorInterface
Description			
Variation			

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*)

9.2.2 Object level Interfaces

[SWS_ADI_01001]{DRAFT} **Definition of ServiceInterface PotentiallyMovingObjectsService** ⌈

Name	PotentiallyMovingObjectsService
Namespace	ara::adi::sensoritf

Method	Capability	
Description	Get the capability vector of the service.	
FireAndForget	false	
Parameter	CapVector	
	Description	The capability vector of the service indicates the presence of the optional signals of the event.
	Type	CapabilityVector
	Variation	
	Direction	OUT

Event	PotentiallyMovingObjectInterfaceEvent
Description	The potentially moving object list is reported by a sensor in a measurement cycle.
Type	PotentiallyMovingObjectInterface

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*)

[SWS_ADI_01002]{DRAFT} **Definition of ServiceInterface RoadObjectsService** ⌈

Name	RoadObjectsService
Namespace	ara::adi::sensoritf

Method	Capability	
Description	Get the capability vector of the service.	
FireAndForget	false	
Parameter	capVector	
	Description	The capability vector of the servie indicates the presence of the optional signals of the event.
	Type	`CapabilityVector`
	Variation	
	Direction	OUT

Event	RoadObjectInterfaceEvent
Description	The road object list is reported by a sensor in a measurement cycle.
Type	`RoadObjectInterface`

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*)

[SWS_ADI_01003]{DRAFT} **Definition of ServiceInterface StaticObjectsService** ⌈

Name	StaticObjectsService
Namespace	ara::adi::sensoritf

Method	Capability	
Description	Get the capability vector of the service.	
FireAndForget	false	
Parameter	capVector	
	Description	The capability vector of the servie indicates the presence of the optional signals of the event.
	Type	`CapabilityVector`
	Variation	
	Direction	OUT

Event	StaticObjectInterfaceEvent
Description	The static object list is reported by a sensor in a measurement cycle.
Type	`StaticObjectInterface`

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*)

9.2.3 Feature level Interfaces

[SWS_ADI_01004]{DRAFT} **Definition of ServiceInterface CameraFeaturesService** ⌈

Name	CameraFeaturesService
Namespace	ara::adi::sensoritf

Method	Capability	
Description	Get the capability vector of the service.	
FireAndForget	false	
Parameter	capVector	
	Description	The capability vector of the servie indicates the presence of the optional signals of the event.
	Type	`CapabilityVector`
	Variation	
	Direction	OUT

Event	CameraFeatureInterfaceEvent
Description	The camera feature list is reported by a sensor during one measurement cycle.
Type	`CameraFeatureInterface`

⌋(*RS_ADI_00001*)

[SWS_ADI_01005]{DRAFT} **Definition of ServiceInterface UltrasonicFeaturesService** ⌈

Name	UltrasonicFeaturesService
Namespace	ara::adi::sensoritf

Method	Capability	
Description	Get the capability vector of the service.	
FireAndForget	false	
Parameter	capVector	
	Description	The capability vector of the servie indicates the presence of the optional signals of the event.
	Type	`CapabilityVector`
	Variation	
	Direction	OUT

Event	UltrasonicFeatureInterfaceEvent
Description	The Ultrasonic Feature list is reported by a sensor in a measurement cycle.
Type	`UltrasonicFeatureInterface`

⌋(*RS_ADI_00004*)

9.2.4 Detection level Interfaces

[SWS_ADI_01006]{DRAFT} **Definition of ServiceInterface RadarDetectionsService** ⌈

Name	RadarDetectionsService
Namespace	ara::adi::sensoritf

Method	Capability	
Description	Get the capability vector of the service.	
FireAndForget	false	
Parameter	capVector	
	Description	The capability vector of the servie indicates the presence of the optional signals of the event.
	Type	`CapabilityVector`
	Variation	
	Direction	OUT

Event	RadarDetectionsInterfaceEvent
Description	The radar detection list is reported by a sensor in a measurement cycle.
Type	`RadarDetectionsInterface`

⌋(*RS_ADI_00003*)

[SWS_ADI_01007]{DRAFT} **Definition of ServiceInterface LidarDetectionsService** ⌈

Name	LidarDetectionsService
Namespace	ara::adi::sensoritf

Method	Capability	
Description	Get the capability vector of the service.	
FireAndForget	false	
Parameter	capVector	
	Description	The capability vector of the servie indicates the presence of the optional signals of the event.
	Type	`CapabilityVector`
	Variation	
	Direction	OUT

Event	LidarDetectionsInterfaceEvent
Description	The Lidar detection list is reported by a sensor in a measurement cycle.
Type	`LidarDetectionsInterface`

⌋(*RS_ADI_00002*)

[SWS_ADI_01008]{DRAFT} **Definition of ServiceInterface CameraDetectionsService** ⌈

Name	CameraDetectionsService
Namespace	ara::adi::sensoritf

Method	Capability
Description	Get the capability vector of the service.
FireAndForget	false

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Parameter	capVector	
	Description	The capability vector of the servie indicates the presence of the optional signals of the event.
	Type	`CapabilityVector`
	Variation	
	Direction	OUT

Event	CameraDetectionsInterfaceEvent
Description	The camera detection list is reported by a sensor in a measurement cycle.
Type	`CameraDetectionsInterface`

⌋(*RS_ADI_00001*)

[SWS_ADI_01009]{DRAFT} **Definition of ServiceInterface UltrasonicDetections Service** ⌈

Name	UltrasonicDetectionsService
Namespace	ara::adi::sensoritf

Method	Capability	
Description	Get the capability vector of the service.	
FireAndForget	false	
Parameter	capVector	
	Description	The capability vector of the servie indicates the presence of the optional signals of the event.
	Type	`CapabilityVector`
	Variation	
	Direction	OUT

Event	UltrasonicDetectionsInterfaceEvent
Description	The Ultrasonic Detection list is reported by a sensor in a measurement cycle.
Type	`UltrasonicDetectionsInterface`

⌋(*RS_ADI_00004*)

9.2.5 Supportive Interfaces

[SWS_ADI_01010]{DRAFT} **Definition of ServiceInterface SensorPerformance Service** ⌈

Name	SensorPerformanceService
Namespace	ara::adi::sensoritf

Method	Capability	
Description	Get the capability vector of the service.	
FireAndForget	false	
Parameter	capVector	
	Description	The capability vector of the servie indicates the presence of the optional signals of the event.
	Type	`CapabilityVector`
	Variation	
	Direction	OUT

Event	SensorPerformanceInterfaceEvent
Description	The sensor performance information is reported by a sensor.
Type	`SensorPerformanceInterface`

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*)

[SWS_ADI_01011]{DRAFT} **Definition of ServiceInterface SensorHealthInformationService** ⌈

Name	SensorHealthInformationService
Namespace	ara::adi::sensoritf

Method	Capability	
Description	Get the capability vector of the service.	
FireAndForget	false	
Parameter	capVector	
	Description	The capability vector of the servie indicates the presence of the optional signals of the event.
	Type	`CapabilityVector`
	Variation	
	Direction	OUT

Event	SensorHealthInformationInterfaceEvent
Description	The sensor health information is reported by a sensor.
Type	`SensorHealthInformationInterface`

⌋(*RS_ADI_00001*, *RS_ADI_00002*, *RS_ADI_00003*, *RS_ADI_00004*)

10 Capability Configuration

10.1 Object Level Service

10.1.1 PMObjectsService Capability Vector

The table below includes the capability bit setting for the optional elements for PMObjectsService, which also refers to ISO 23150.The Bit setting to 1 means the presence of the optional element, while 0 means absent.

Bit	Reference Singal in ISO23150	Reference Element in PMObjectService	Option
1	Interface ID(A.1.4)	InterfaceID	Autosar Service
2	Cycle Counter(A.1.6.1)	CycleCounter	ara com
3	Interface cycle time(A.1.7)	InterfaceCycleTime	ara com
4	Interface cycle time variation(A.1.8)	InterfaceCycleTimeVariation	ara com
5	Information vehicle coordinate system(Table 46)	InformationVehicleCoordinateSystem	0
6	Information sensor pose(Table 46)	InformationSensorPose	0
7	Sensor origin point x(A.1.22)	SensorOriginPointX	ara com
8	Sensor origin point y(A.1.22)	SensorOriginPointY	ara com
9	Sensor origin point z(A.1.22)	SensorOriginPointZ	ara com
10	Sensor origin point x error(A.1.23)	SensorOriginPointXError	ara com
11	Sensor origin point y error(A.1.23)	SensorOriginPointYError	ara com
12	Sensor origin point z error(A.1.23)	SensorOriginPointZError	ara com
13	Sensor origin point x x error (A.1.23)	SensorOriginPointXXError	ara com
14	Sensor origin point x y error(A.1.23)	SensorOriginPointXYError	ara com
15	Sensor origin point x z error(A.1.23)	SensorOriginPointXZError	ara com
16	Sensor origin point y x error(A.1.23)	SensorOriginPointYXError	ara com
17	Sensor origin point y y error A.1.23)	SensorOriginPointYYError	ara com
18	Sensor origin point y z error (A.1.23)	SensorOriginPointYZError	ara com
19	Sensor origin point z x error(A.1.23)	SensorOriginPointZXError	ara com
20	Sensor origin point z y error (A.1.23)	SensorOriginPointZYError	ara com
21	Sensor origin point z z error (A.1.23)	SensorOriginPointZZError	ara com
22	Sensor orientation yaw(A.1.24)	SensorOrientationYaw	ara com
23	Sensor orientation pitch(A.1.24)	SensorOrientationPitch	ara com
24	Sensor orientation roll(A.1.24)	SensorOrientationRoll	ara com
25	Sensor orientation yaw error(A.1.25)	SensorOrientationYawError	ara com
26	Sensor orientation pitch error(A.1.25)	SensorOrientationPitchError	ara com
27	Sensor orientation roll error(A.1.25)	SensorOrientationRollError	ara com
28	Sensor orientation yaw yaw error (A.1.25)	SensorOrientationYawYawError	ara com
29	Sensor orientation yaw pitch error (A.1.25)	SensorOrientationYawPitchError	ara com
30	Sensor orientation yaw roll error (A.1.25)	SensorOrientationYawRollError	ara com
31	Sensor orientation pitch yaw error (A.1.25)	SensorOrientationPitchYawError	ara com
32	Sensor orientation pitch pitch error (A.1.25)	SensorOrientationPitchPitchError	ara com
33	Sensor orientation pitch roll error (A.1.25)	SensorOrientationPitchRollError	ara com
34	Sensor orientation roll yaw error (A.1.25)	SensorOrientationRollYawError	ara com

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Bit	Reference Singal in ISO23150	Reference Element in PMObjectService	Option
35	Sensor orientation roll pitch error (A.1.25)	SensorOrientationRollPitchError	ara com
36	Sensor orientation roll roll error (A.1.25)	SensorOrientationRollRollError	ara com
37	Calibration(Table 48)	Calibration	0
38	Calibration process state(A.5.42)	CalibrationProcessState	ara com
39	Sensor origin point correction x(A.5.43)	SensorOriginPointCorrectionX	ara com
40	Sensor origin point correction y(A.5.43)	SensorOriginPointCorrectionY	ara com
41	Sensor origin point correction z(A.5.43)	SensorOriginPointCorrectionZ	ara com
42	Sensor origin point correction x error(A.5.44)	SensorOriginPointCorrectionXError	ara com
43	Sensor origin point correction y error(A.5.44)	SensorOriginPointCorrectionYError	ara com
44	Sensor origin point correction z error(A.5.44)	SensorOriginPointCorrectionZError	ara com
45	Sensor origin translation correction limit xbegin(A.5.45)	SensorOriginTranslationCorrectionLimitXbegin	ara com
46	Sensor origin translation correction limit xend(A.5.45)	SensorOriginTranslationCorrectionLimitXend	ara com
47	Sensor origin translation correction limit ybegin(A.5.45)	SensorOriginTranslationCorrectionLimitYbegin	ara com
48	Sensor origin translation correction limit yend(A.5.45)	SensorOriginTranslationCorrectionLimitYend	ara com
49	Sensor origin translation correction limit zbegin(A.5.45)	SensorOriginTranslationCorrectionLimitZbegin	ara com
50	Sensor origin translation correction limit zend(A.5.45)	SensorOriginTranslationCorrectionLimitZend	ara com
51	Sensor orientation correction yaw(A.5.46)	SensorOrientationCorrectionYaw	ara com
52	Sensor orientation correction pitch(A.5.46)	SensorOrientationCorrectionPitch	ara com
53	Sensor orientation correction roll(A.5.46)	SensorOrientationCorrectionRoll	ara com
54	Sensor orientation correction yaw error(A.5.47)	SensorOrientationCorrectionYawError	ara com
55	Sensor orientation correction pitch error(A.5.47)	SensorOrientationCorrectionPitchError	ara com
56	Sensor orientation correction roll error(A.5.47)	SensorOrientationCorrectionRollError	ara com
57	Sensor pose angle correction limit yawbegin(A.5.48)	SensorPoseAngleCorrectionLimitYawbegin	ara com
58	Sensor pose angle correction limit yawend(A.5.48)	SensorPoseAngleCorrectionLimitYawend	ara com
59	Sensor pose angle correction limit pitchbegin(A.5.48)	SensorPoseAngleCorrectionLimitPitchbegin	ara com
60	Sensor pose angle correction limit pitchend(A.5.48)	SensorPoseAngleCorrectionLimitPitchend	ara com
61	Sensor pose angle correction limit rollbegin(A.5.48)	SensorPoseAngleCorrectionLimitRollbegin	ara com
62	Sensor pose angle correction limit rollend(A.5.48)	SensorPoseAngleCorrectionLimitRollend	ara com
63	Sensor cluster(Table 48)	SensorCluster	0
64	Tracking motion model(A.1.13)	TrackingMotionModel	ara com
65	Colour model type(A.1.15)	ColourModelType	ara com
66	Information ambiguity domain(Table 30)	InformationAmbiguityDomain	0
67	Radial velocity ambiguity domain begin(A.1.16)	RadialVelocityAmbiguityDomainBegin	ara com
68	Radial velocity ambiguity domain end(A.1.16)	RadialVelocityAmbiguityDomainEnd	ara com
69	Range ambiguity domain begin(A.1.17)	RangeAmbiguityDomainBegin	ara com
70	Range ambiguity domain end(A.1.17)	RangeAmbiguityDomainEnd	ara com

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Bit	Reference Singal in ISO23150	Reference Element in PMObjectService	Option
71	Angle azimuth ambiguity domain begin(A.1.18)	AngleAzimuthAmbiguityDomainBegin	ara com
72	Angle azimuth ambiguity domain end(A.1.18)	AngleAzimuthAmbiguityDomainEnd	ara com
73	Angle elevation ambiguity domain begin(A.1.19)	AngleElevationAmbiguityDomainBegin	ara com
74	Angle elevation ambiguity domain end(A.1.19)	AngleElevationAmbiguityDomainEnd	ara com
75	Interface applicability(A.1.20)	InterfaceApplicability	ara com
76	Recognised potentially moving objects capability(A.1.10.1)	RecognisedPotentiallyMovingObjectsCapability	ara com
77	Recognised potentially moving objects status(A.1.11.1)	RecognisedPotentiallyMovingObjectsStatus	ara com
78	Object grouping ID(A.2.3)	ObjectGroupingID	ara com
79	Number of valid observations object level(A.2.5)	NumberOfValidObservationsObjectLevel	Autosar vector
80	Time stamp reference object level(A.2.6)	TimeStampReferenceObjectLevel	ara com
81	Observation status object level(A.2.7)	ObservationStatusObjectLevel	ara com
82	Track quality(A.2.8)	TrackQuality	ara com
83	Position object level z(A.2.13)	PositionObjectLevelZ	ara com
84	Position object level z error(A.2.14)	PositionObjectLevelZError	ara com
85	Orientation yaw(A.2.15)	OrientationYaw	ara com
86	Orientation pitch(A.2.15)	OrientationPitch	ara com
87	Orientation roll(A.2.15)	OrientationRoll	ara com
88	Orientation yaw error(A.2.16)	OrientationYawError	ara com
89	Orientation pitch error(A.2.16)	OrientationPitchError	ara com
90	Orientation roll error(A.2.16)	OrientationRollError	ara com
91	Reference point(A.2.17)	ReferencePoint	ara com
92	Road level(A.2.18)	RoadLevel	ara com
93	Bounding box(Table 9)	PotentiallyMovingObjectsBoundingBox	0
94	Bounding box extent height(A.2.19)	BoundingBoxExtentHeight	ara com
95	Bounding box extent length error(A.2.20)	BoundingBoxExtentLengthError	ara com
96	Bounding box extent width error(A.2.20)	BoundingBoxExtentWidthError	ara com
97	Bounding box extent height error(A.2.20)	BoundingBoxExtentHeightError	ara com
98	Bounding box ground clearance(A.2.21)	BoundingBoxGroundClearance	ara com
99	Included geometric structures(A.2.22)	IncludedGeometricStructures	ara com
100	Velocity x object level(A.2.23)	VelocityXObjectLevel	ara com
101	Velocity y object level(A.2.23)	VelocityYObjectLevel	ara com
102	Velocity z object level(A.2.23)	VelocityZObjectLevel	ara com
103	Velocity x object level error(A.2.24)	VelocityXObjectLevelError	ara com
104	Velocity y object level error(A.2.24)	VelocityYObjectLevelError	ara com
105	Velocity z object level error(A.2.24)	VelocityZObjectLevelError	ara com
106	Acceleration x(A.2.25)	AccelerationX	ara com
107	Acceleration y(A.2.25)	AccelerationY	ara com
108	Acceleration z(A.2.25)	AccelerationZ	ara com
109	Acceleration x error(A.2.26)	AccelerationXError	ara com
110	Acceleration y error(A.2.26)	AccelerationYError	ara com
111	Acceleration z error(A.2.26)	AccelerationZError	ara com
112	Instantaneous centre of rotation x(A.2.27)	InstantaneousCentreOfRotationX	ara com
113	Instantaneous centre of rotation y(A.2.27)	InstantaneousCentreOfRotationY	ara com

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Bit	Reference Singal in ISO23150	Reference Element in PMObjectService	Option
114	Instantaneous centre of rotation x error(A.2.28)	InstantaneousCentreOfRotationXError	ara com
115	Instantaneous centre of rotation y error(A.2.28)	InstantaneousCentreOfRotationYError	ara com
116	Rotation rate at instantaneous centre of rotation yaw(A.2.29)	RotationRateAtInstantaneousCentreOfRotationYaw	ara com
117	Rotation rate at instantaneous centre of rotation yaw error(A.2.30)	RotationRateAtInstantaneousCentreOfRotationYawError	ara com
118	Movement status(A.2.31)	MovementStatus	ara com
119	Lights(Table 9)	PotentiallyMovingObjectsLights	0
120	Person(Table 9)	PotentiallyMovingObjectsPerson	0
121	Person pose yaw error(A.2.38)	PersonPoseYawError	ara com
122	Person pose pitch error(A.2.38)	PersonPosePitchError	ara com
123	Person pose roll error(A.2.38)	PersonPoseRollError	ara com
124	Lane related information(Table 9)	PotentiallyMovingObjectsLaneRelatedInformation	0
125	Angle between object edge and lane left edge right lane(A.2.40)	AngleBetweenObjectEdgeAndLaneLeftEdgeRightLane	ara com
126	Angle between object edge and lane right edge left lane(A.2.40)	AngleBetweenObjectEdgeAndLaneRightEdgeLeftLane	ara com
127	Angle between object edge and lane left edge right lane error(A.2.41)	AngleBetweenObjectEdgeAndLaneLeftEdgeRightLaneError	ara com
128	Angle between object edge and lane right edge left lane error(A.2.41)	AngleBetweenObjectEdgeAndLaneRightEdgeLeftLaneError	ara com
129	Percentage side lane left(A.2.42)	PercentageSideLaneLeft	ara com
130	Percentage side lane right(A.2.42)	PercentageSideLaneRight	ara com
131	Motion related information(Table 9)	PotentiallyMovingObjectsMotionRelatedInformation	0
132	Camera sensor technology specific(Table 9)	PotentiallyMovingObjectsCameraSensorTechnologySpecific	0
133	Radar sensor technology specific(Table 9)	PotentiallyMovingObjectsRadarSensorTechnologySpecific	0
134	Lidar sensor technology specific(Table 9)	PotentiallyMovingObjectsLidarSensorTechnologySpecific	0

Table 10.1: Capability Vector of PMObjectService

10.1.2 RObjectsService Capability Vector

The table below includes the capability bit setting for the optional elements for RObjectService, which also refers to ISO 23150.The Bit setting to 1 means the presence of the optional element, while 0 means absent.

Bit	Reference Singal in ISO23150	Reference Element in RObjectsService	Option
1	Interface ID(A.1.4)	InterfaceID	Autosar Service
2	Cycle counter(A.1.6.1)	CycleCounter	ara com
3	Interface cycle time(A.1.7)	InterfaceCycleTime	ara com

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Bit	Reference Singal in ISO23150	Reference Element in RObjectsService	Option
4	Interface cycle time variation(A.1.8)	InterfaceCycleTimeVariation	ara com
5	Information vehicle coordinate system(Table 46)	InformationVehicleCoordinateSystem	0
6	Information sensor pose(Table 46)	InformationSensorPose	0
7	Sensor origin point x(A.1.22)	SensorOriginPointX	ara com
8	Sensor origin point y(A.1.22)	SensorOriginPointY	ara com
9	Sensor origin point z(A.1.22)	SensorOriginPointZ	ara com
10	Sensor origin point x error(A.1.23)	SensorOriginPointXError	ara com
11	Sensor origin point y error(A.1.23)	SensorOriginPointYError	ara com
12	Sensor origin point z error(A.1.23)	SensorOriginPointZError	ara com
13	Sensor origin point x x error (A.1.23)	SensorOriginPointXXError	ara com
14	Sensor origin point x y error (A.1.23)	SensorOriginPointXYError	ara com
15	Sensor origin point x z error (A.1.23)	SensorOriginPointXZError	ara com
16	Sensor origin point y x error (A.1.23)	SensorOriginPointYXError	ara com
17	Sensor origin point y y error (A.1.23)	SensorOriginPointYYError	ara com
18	Sensor origin point y z error (A.1.23)	SensorOriginPointYZError	ara com
19	Sensor origin point z x error (A.1.23)	SensorOriginPointZXError	ara com
20	Sensor origin point z y error (A.1.23)	SensorOriginPointZYError	ara com
21	Sensor origin point z z error (A.1.23)	SensorOriginPointZZError	ara com
22	Sensor orientation yaw(A.1.24)	SensorOrientationYaw	ara com
23	Sensor orientation pitch(A.1.24)	SensorOrientationPitch	ara com
24	Sensor orientation roll(A.1.24)	SensorOrientationRoll	ara com
25	Sensor orientation yaw error(A.1.25)	SensorOrientationYawError	ara com
26	Sensor orientation pitch error(A.1.25)	SensorOrientationPitchError	ara com
27	Sensor orientation roll error(A.1.25)	SensorOrientationRollError	ara com
28	Sensor orientation yaw yaw error (A.1.25)	SensorOrientationYawYawError	ara com
29	Sensor orientation yaw pitch error (A.1.25)	SensorOrientationYawPitchError	ara com
30	Sensor orientation yaw roll error (A.1.25)	SensorOrientationYawRollError	ara com
31	Sensor orientation pitch yaw error (A.1.25)	SensorOrientationPitchYawError	ara com
32	Sensor orientation pitch pitch error (A.1.25)	SensorOrientationPitchPitchError	ara com
33	Sensor orientation pitch roll error (A.1.25)	SensorOrientationPitchRollError	ara com
34	Sensor orientation roll yaw error (A.1.25)	SensorOrientationRollYawError	ara com
35	Sensor orientation roll pitch error (A.1.25)	SensorOrientationRollPitchError	ara com
36	Sensor orientation roll roll error (A.1.25)	SensorOrientationRollRollError	ara com
37	Calibration(Table 48)	Calibration	0
38	Calibration process state(A.5.42)	CalibrationProcessState	ara com
39	Sensor origin point correction x(A.5.43)	SensorOriginPointCorrectionX	ara com
40	Sensor origin point correction y(A.5.43)	SensorOriginPointCorrectionY	ara com
41	Sensor origin point correction z(A.5.43)	SensorOriginPointCorrectionZ	ara com
42	Sensor origin point correction x error(A.5.44)	SensorOriginPointCorrectionXError	ara com
43	Sensor origin point correction y error(A.5.44)	SensorOriginPointCorrectionYError	ara com
44	Sensor origin point correction z error(A.5.44)	SensorOriginPointCorrectionZError	ara com
45	Sensor origin translation correction limit xbegin(A.5.45)	SensorOriginTranslationCorrectionLimitXbegin	ara com
46	Sensor origin translation correction limit xend(A.5.45)	SensorOriginTranslationCorrectionLimitXend	ara com

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Bit	Reference Singal in ISO23150	Reference Element in RObjectsService	Option
47	Sensor origin translation correction limit ybegin(A.5.45)	SensorOriginTranslationCorrectionLimitYbegin	ara com
48	Sensor origin translation correction limit yend(A.5.45)	SensorOriginTranslationCorrectionLimitYend	ara com
49	Sensor origin translation correction limit zbegin(A.5.45)	SensorOriginTranslationCorrectionLimitZbegin	ara com
50	Sensor origin translation correction limit zend(A.5.45)	SensorOriginTranslationCorrectionLimitZend	ara com
51	Sensor orientation correction yaw(A.5.46)	SensorOrientationCorrectionYaw	ara com
52	Sensor orientation correction pitch(A.5.46)	SensorOrientationCorrectionPitch	ara com
53	Sensor orientation correction roll(A.5.46)	SensorOrientationCorrectionRoll	ara com
54	Sensor orientation correction yaw error(A.5.47)	SensorOrientationCorrectionYawError	ara com
55	Sensor orientation correction pitch error(A.5.47)	SensorOrientationCorrectionPitchError	ara com
56	Sensor orientation correction roll error(A.5.47)	SensorOrientationCorrectionRollError	ara com
57	Sensor pose angle correction limit yawbegin(A.5.48)	SensorPoseAngleCorrectionLimitYawbegin	ara com
58	Sensor pose angle correction limit yawend(A.5.48)	SensorPoseAngleCorrectionLimitYawend	ara com
59	Sensor pose angle correction limit pitchbegin(A.5.48)	SensorPoseAngleCorrectionLimitPitchbegin	ara com
60	Sensor pose angle correction limit pitchend(A.5.48)	SensorPoseAngleCorrectionLimitPitchend	ara com
61	Sensor pose angle correction limit rollbegin(A.5.48)	SensorPoseAngleCorrectionLimitRollbegin	ara com
62	Sensor pose angle correction limit rollend(A.5.48)	SensorPoseAngleCorrectionLimitRollend	ara com
63	Sensor cluster(Table 48)	SensorCluster	0
64	Tracking motion model(A.1.13)	TrackingMotionModel	ara com
65	Motion type(A.1.14)	MotionType	ara com
66	Colour model type(A.1.15)	ColourModelType	ara com
67	Information ambiguity domain(Table 30)	InformationAmbiguityDomain	0
68	Radial velocity ambiguity domain begin(A.1.16)	RadialVelocityAmbiguityDomainBegin	ara com
69	Radial velocity ambiguity domain end(A.1.16)	RadialVelocityAmbiguityDomainEnd	ara com
70	Range ambiguity domain begin(A.1.17)	RangeAmbiguityDomainBegin	ara com
71	Range ambiguity domain end(A.1.17)	RangeAmbiguityDomainEnd	ara com
72	Angle azimuth ambiguity domain begin(A.1.18)	AngleAzimuthAmbiguityDomainBegin	ara com
73	Angle azimuth ambiguity domain end(A.1.18)	AngleAzimuthAmbiguityDomainEnd	ara com
74	Angle elevation ambiguity domain begin(A.1.19)	AngleElevationAmbiguityDomainBegin	ara com
75	Angle elevation ambiguity domain end(A.1.19)	AngleElevationAmbiguityDomainEnd	ara com
76	Interface applicability(A.1.20)	InterfaceApplicability	ara com
77	Road surface(Table 12)	RoadSurface	0
78	Road surface roughness(A.2.52)	RoadSurfaceRoughness	ara com
79	Number of valid road surface condition classifications(A.2.53)	NumberOfValidRoadSurfaceConditionClassifications	Autosar vector
80	Road surface condition classification type(A.2.54)	RoadSurfaceConditionClassificationType	ara com
81	Road surface condition classification type confidence(A.2.55)	RoadSurfaceConditionClassificationTypeConfidence	ara com

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Bit	Reference Singal in ISO23150	Reference Element in RObjectsService	Option
82	Track quality(A.2.8)	TrackQuality	ara com
83	Measurement status object level(A.2.9)	MeasurementStatusObjectLevel	ara com
84	Road markings(Table 12)	RoadMarkings	0
85	Recognized road markings capability(A.1.10.2)	RecognizedRoadMarkingsCapability	ara com
86	Recognized road markings status(A.1.11.2)	RecognizedRoadMarkingsStatus	ara com
87	Object grouping ID(A.2.3)	ObjectGroupingID	ara com
88	Number of valid observations object level(A.2.5)	NumberOfValidObservationsObjectLevel	Autosar vector
89	Time stamp reference object level(A.2.6)	TimeStampReferenceObjectLevel	ara com
90	Observation status object level(A.2.7)	ObservationStatusObjectLevel	ara com
91	Track quality(A.2.8)	TrackQuality	ara com
92	Road object lane association(A.2.59)	RoadObjectLaneAssociation	ara com
93	Road object lane association confidence(A.2.60)	RoadObjectLaneAssociationConfidence	ara com
94	Arrow orientation(A.2.61)	ArrowOrientation	ara com
95	Arrow direction(A.2.62)	ArrowDirection	ara com
96	Number of valid sign classifications(A.2.63)	NumberOfValidSignClassifications	Autosar vector
97	Sign classification type(A.2.64)	SignClassificationType	ara com
98	Sign classification type confidence(A.2.65)	SignClassificationTypeConfidence	ara com
99	Sign value(A.2.66)	SignValue	ara com
100	Sign value unit(A.2.67)	SignValueUnit	ara com
101	Sign state(A.2.68)	SignState	ara com
102	Colour tone(Table xxx)	ColourTone	0
103	Colour tone confidence object level(A.2.70)	ColourToneConfidenceObjectLevel	ara com
104	Polynomials(Table 12)	RoadMarkingsPolynomials	0
105	Polynomial coefficient z c0(A.2.76)	PolynomialCoefficientZC0	ara com
106	Polynomial coefficient z c1(A.2.76)	PolynomialCoefficientZC1	ara com
107	Polynomial coefficient z c2(A.2.76)	PolynomialCoefficientZC2	ara com
108	Polynomial coefficient z c3(A.2.76)	PolynomialCoefficientZC3	ara com
109	Polynomial y error(A.2.77)	PolynomialYError	ara com
110	Polynomial z error(A.2.78)	PolynomialZError	V1 ara com (optimizeable API)
111	Width polynomial(A.2.80)	WidthPolynomial	ara com
112	Width polynomial error(A.2.81)	WidthPolynomialError	ara com
113	Width polynomial confidence(A.2.82)	WidthPolynomialConfidence	ara com
114	Height polynomial(A.2.83)	HeightPolynomial	ara com
115	Height polynomial error(A.2.84)	HeightPolynomialError	ara com
116	Height polynomial confidence(A.2.85)	HeightPolynomialConfidence	ara com
117	Number of valid data ranges(A.2.86)	NumberOfValidDataRanges	Autosar vector
118	Supported data range x begin(A.2.87)	SupportedDataRangeXBegin	ara com
119	Supported data range x end(A.2.87)	SupportedDataRangeXEnd	ara com
120	Supported axis(A.2.88)	SupportedAxis	ara com
121	Polylines(Table 12)	RoadMarkingsPolylines	0
122	Vertex point z(A.2.92)	VertexPointZ	ara com
123	Vertex point z error(A.2.93)	VertexPointZError	ara com
124	Vertex point confidence x(A.2.94)	VertexPointConfidenceX	ara com

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Bit	Reference Singal in ISO23150	Reference Element in RObjectsService	Option
125	Vertex point confidence y(A.2.94)	VertexPointConfidenceY	ara com
126	Vertex point confidence z(A.2.94)	VertexPointConfidenceZ	ara com
127	Width vertex(A.2.95)	WidthVertex	ara com
128	Width vertex error(A.2.96)	WidthVertexError	ara com
129	Width vertex confidence(A.2.97)	WidthVertexConfidence	ara com
130	Height vertex(A.2.98)	HeightVertex	ara com
131	Height vertex error(A.2.99)	HeightVertexError	ara com
132	Height vertex confidence(A.2.100)	HeightVertexConfidence	ara com
133	Road boundaries(Table 12)	RoadBoundaries	0
134	Recognised road boundaries capability (A.1.10.3)	RecognisedRoadBoundariesCapability	ara com
135	Recognised road boundaries status(A.1.11.3)	RecognisedRoadBoundariesStatus	ara com
136	Object grouping ID(A.2.3)	ObjectGroupingID	ara com
137	Number of valid observations object level(A.2.5)	NumberOfValidObservationsObjectLevel	Autosar vector
138	Time stamp reference object level(A.2.6)	TimeStampReferenceObjectLevel	ara com
139	Observation status object level(A.2.7)	ObservationStatusObjectLevel	ara com
140	Track quality(A.2.8)	TrackQuality	ara com
141	Road object lane association(A.2.59)	RoadObjectLaneAssociation	ara com
142	Road object lane association confidence(A.2.60)	RoadObjectLaneAssociationConfidence	ara com
143	Colour tone(Table xxx)	ColourTone	0
144	Colour tone confidence object level(A.2.70)	ColourToneConfidenceObjectLevel	ara com
145	Polynomials(Table 12)	RoadBoundariesPolynomials	0
146	Polynomial coefficient z c0(A.2.76)	PolynomialCoefficientZC0	ara com
147	Polynomial coefficient z c1(A.2.76)	PolynomialCoefficientZC1	ara com
148	Polynomial coefficient z c2(A.2.76)	PolynomialCoefficientZC2	ara com
149	Polynomial coefficient z c3(A.2.76)	PolynomialCoefficientZC3	ara com
150	Polynomial y error(A.2.77)	PolynomialYError	ara com
151	Polynomial z error(A.2.78)	PolynomialZError	V1 ara com (optimizeable API)
152	Width polynomial(A.2.80)	WidthPolynomial	ara com
153	Width polynomial error(A.2.81)	WidthPolynomialError	ara com
154	Width polynomial confidence(A.2.82)	WidthPolynomialConfidence	ara com
155	Height polynomial(A.2.83)	HeightPolynomial	ara com
156	Height polynomial error(A.2.84)	HeightPolynomialError	ara com
157	Height polynomial confidence(A.2.85)	HeightPolynomialConfidence	ara com
158	Number of valid data ranges(A.2.86)	NumberOfValidDataRanges	Autosar vector
159	Supported data range x begin(A.2.87)	SupportedDataRangeXBegin	ara com
160	Supported data range x end(A.2.87)	SupportedDataRangeXEnd	ara com
161	Supported axis(A.2.88)	SupportedAxis	ara com
162	Polylines(Table 12)	RoadBoundariesPolylines	0
163	Vertex point z(A.2.92)	VertexPointZ	ara com
164	Vertex point z error(A.2.93)	VertexPointZError	ara com
165	Vertex point confidence x(A.2.94)	VertexPointConfidenceX	ara com
166	Vertex point confidence y(A.2.94)	VertexPointConfidenceY	ara com
167	Vertex point confidence z(A.2.94)	VertexPointConfidenceZ	ara com

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Bit	Reference Singal in ISO23150	Reference Element in RObjectsService	Option
168	Width vertex(A.2.95)	WidthVertex	ara com
169	Width vertex error(A.2.96)	WidthVertexError	ara com
170	Width vertex confidence(A.2.97)	WidthVertexConfidence	ara com
171	Height vertex(A.2.98)	HeightVertex	ara com
172	Height vertex error(A.2.99)	HeightVertexError	ara com
173	Height vertex confidence(A.2.100)	HeightVertexConfidence	ara com

Table 10.2: Capability Vector of RObjectsService

10.1.3 SObjectsService Capability Vector

The table below includes the capability bit setting for the optional elements for SObjectsService, which also refers to ISO 23150.The Bit setting to 1 means the presence of the optional element, while 0 means absent.

Bit	Reference Singal in ISO23150	Reference Element in SObjectsService	Option
1	Interface ID(A.1.4)	InterfaceID	Autosar Service
2	Cycle counter(A.1.6.1)	CycleCounter	ara com
3	Interface cycle time(A.1.7)	InterfaceCycleTime	ara com
4	Interface cycle time variation(A.1.8)	InterfaceCycleTimeVariation	ara com
5	Information vehicle coordinate system(Table 46)	InformationVehicleCoordinateSystem	0
6	Information sensor pose(Table 46)	InformationSensorPose	0
7	Sensor origin point x(A.1.22)	SensorOriginPointX	ara com
8	Sensor origin point y(A.1.22)	SensorOriginPointY	ara com
9	Sensor origin point z(A.1.22)	SensorOriginPointZ	ara com
10	Sensor origin point x error(A.1.23)	SensorOriginPointXError	ara com
11	Sensor origin point y error(A.1.23)	SensorOriginPointYError	ara com
12	Sensor origin point z error(A.1.23)	SensorOriginPointZError	ara com
13	Sensor origin point x x error (A.1.23)	SensorOriginPointXXError	ara com
14	Sensor origin point x y error (A.1.23)	SensorOriginPointXYError	ara com
15	Sensor origin point x z error (A.1.23)	SensorOriginPointXZError	ara com
16	Sensor origin point y x error (A.1.23)	SensorOriginPointYXError	ara com
17	Sensor origin point y y error (A.1.23)	SensorOriginPointYYError	ara com
18	Sensor origin point y z error (A.1.23)	SensorOriginPointYZError	ara com
19	Sensor origin point z x error (A.1.23)	SensorOriginPointZXError	ara com
20	Sensor origin point z y error (A.1.23)	SensorOriginPointZYError	ara com
21	Sensor origin point z z error (A.1.23)	SensorOriginPointZZError	ara com
22	Sensor orientation yaw(A.1.24)	SensorOrientationYaw	ara com
23	Sensor orientation pitch(A.1.24)	SensorOrientationPitch	ara com
24	Sensor orientation roll(A.1.24)	SensorOrientationRoll	ara com
25	Sensor orientation yaw error(A.1.25)	SensorOrientationYawError	ara com
26	Sensor orientation pitch error(A.1.25)	SensorOrientationPitchError	ara com

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Bit	Reference Singal in ISO23150	Reference Element in SObjectsService	Option
27	Sensor orientation roll error(A.1.25)	SensorOrientationRollError	ara com
28	Sensor orientation yaw yaw error (A.1.25)	SensorOrientationYawYawError	ara com
29	Sensor orientation yaw pitch error (A.1.25)	SensorOrientationYawPitchError	ara com
30	Sensor orientation yaw roll error (A.1.25)	SensorOrientationYawRollError	ara com
31	Sensor orientation pitch yaw error (A.1.25)	SensorOrientationPitchYawError	ara com
32	Sensor orientation pitch pitch error (A.1.25)	SensorOrientationPitchPitchError	ara com
33	Sensor orientation pitch roll error (A.1.25)	SensorOrientationPitchRollError	ara com
34	Sensor orientation roll yaw error (A.1.25)	SensorOrientationRollYawError	ara com
35	Sensor orientation roll pitch error (A.1.25)	SensorOrientationRollPitchError	ara com
36	Sensor orientation roll roll error (A.1.25)	SensorOrientationRollRollError	ara com
37	Calibration(Table 48)	Calibration	0
38	Calibration process state(A.5.42)	CalibrationProcessState	ara com
39	Sensor origin point correction x(A.5.43)	SensorOriginPointCorrectionX	ara com
40	Sensor origin point correction y(A.5.43)	SensorOriginPointCorrectionY	ara com
41	Sensor origin point correction z(A.5.43)	SensorOriginPointCorrectionZ	ara com
42	Sensor origin point correction x error(A.5.44)	SensorOriginPointCorrectionXError	ara com
43	Sensor origin point correction y error(A.5.44)	SensorOriginPointCorrectionYError	ara com
44	Sensor origin point correction z error(A.5.44)	SensorOriginPointCorrectionZError	ara com
45	Sensor origin translation correction limit xbegin(A.5.45)	SensorOriginTranslationCorrectionLimitXbegin	ara com
46	Sensor origin translation correction limit xend(A.5.45)	SensorOriginTranslationCorrectionLimitXend	ara com
47	Sensor origin translation correction limit ybegin(A.5.45)	SensorOriginTranslationCorrectionLimitYbegin	ara com
48	Sensor origin translation correction limit yend(A.5.45)	SensorOriginTranslationCorrectionLimitYend	ara com
49	Sensor origin translation correction limit zbegin(A.5.45)	SensorOriginTranslationCorrectionLimitZbegin	ara com
50	Sensor origin translation correction limit zend(A.5.45)	SensorOriginTranslationCorrectionLimitZend	ara com
51	Sensor orientation correction yaw(A.5.46)	SensorOrientationCorrectionYaw	ara com
52	Sensor orientation correction pitch(A.5.46)	SensorOrientationCorrectionPitch	ara com
53	Sensor orientation correction roll(A.5.46)	SensorOrientationCorrectionRoll	ara com
54	Sensor orientation correction yaw error(A.5.47)	SensorOrientationCorrectionYawError	ara com
55	Sensor orientation correction pitch error(A.5.47)	SensorOrientationCorrectionPitchError	ara com
56	Sensor orientation correction roll error(A.5.47)	SensorOrientationCorrectionRollError	ara com
57	Sensor pose angle correction limit yawbegin(A.5.48)	SensorPoseAngleCorrectionLimitYawbegin	ara com
58	Sensor pose angle correction limit yawend(A.5.48)	SensorPoseAngleCorrectionLimitYawend	ara com
59	Sensor pose angle correction limit pitchbegin(A.5.48)	SensorPoseAngleCorrectionLimitPitchbegin	ara com
60	Sensor pose angle correction limit pitchend(A.5.48)	SensorPoseAngleCorrectionLimitPitchend	ara com
61	Sensor pose angle correction limit rollbegin(A.5.48)	SensorPoseAngleCorrectionLimitRollbegin	ara com

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Bit	Reference Singal in ISO23150	Reference Element in SObjectsService	Option
62	Sensor pose angle correction limit rollend(A.5.48)	SensorPoseAngleCorrectionLimitRollend	ara com
63	Sensor cluster(Table 48)	SensorCluster	0
64	Tracking motion model(A.1.13)	TrackingMotionModel	ara com
65	Motion type(A.1.14)	MotionType	ara com
66	Colour model type(A.1.15)	ColourModelType	ara com
67	Information ambiguity domain(Table 30)	InformationAmbiguityDomain	0
68	Radial velocity ambiguity domain begin(A.1.16)	RadialVelocityAmbiguityDomainBegin	ara com
69	Radial velocity ambiguity domain end(A.1.16)	RadialVelocityAmbiguityDomainEnd	ara com
70	Range ambiguity domain begin(A.1.17)	RangeAmbiguityDomainBegin	ara com
71	Range ambiguity domain end(A.1.17)	RangeAmbiguityDomainEnd	ara com
72	Angle azimuth ambiguity domain begin(A.1.18)	AngleAzimuthAmbiguityDomainBegin	ara com
73	Angle azimuth ambiguity domain end(A.1.18)	AngleAzimuthAmbiguityDomainEnd	ara com
74	Angle elevation ambiguity domain begin(A.1.19)	AngleElevationAmbiguityDomainBegin	ara com
75	Angle elevation ambiguity domain end(A.1.19)	AngleElevationAmbiguityDomainEnd	ara com
76	Interface applicability(A.1.20)	InterfaceApplicability	ara com
77	General landmarks(Table 12)	GeneralLandmarks	0
78	Recognised general landmarks capability(A.2.48)	RecognisedGeneralLandmarksCapability	ara com
79	Recognised general landmarks status(A.2.49)	RecognisedGeneralLandmarksStatus	ara com
80	Object grouping ID(A.2.53)	ObjectGroupingID	ara com
81	Number of valid observations object level(A.2.54)	NumberOfValidObservationsObjectLevel	Autosar vector
82	Time stamp reference object level()	TimeStampReferenceObjectLevel	ara com
83	Observation status object level(A.2.8)	ObservationStatusObjectLevel	ara com
84	Track quality()	TrackQuality	ara com
85	Position object level z(A.2.6)	PositionObjectLevelZ	ara com
86	Position object level z error(A.2.8)	PositionObjectLevelZError	ara com
87	Orientation yaw(A.2.9)	OrientationYaw	ara com
88	Orientation pitch()	OrientationPitch	ara com
89	Orientation roll(Table 12)	OrientationRoll	ara com
90	Orientation yaw error(A.2.56)	OrientationYawError	ara com
91	Orientation pitch error()	OrientationPitchError	ara com
92	Orientation roll error(A.2.57)	OrientationRollError	ara com
93	Reference point(A.2.58)	ReferencePoint	ara com
94	Bounding box(A.2.60)	GeneralLandmarksBoundingBox	0
95	Bounding box extent height(A.2.63)	BoundingBoxExtentHeight	ara com
96	Bounding box extent length error()	BoundingBoxExtentLengthError	ara com
97	Bounding box extent width error(A.2.64)	BoundingBoxExtentWidthError	ara com
98	Bounding box extent height error(A.2.65)	BoundingBoxExtentHeightError	ara com
99	Traffic signs()	TrafficSigns	0
100	Recognised traffic signs capability(Table xxx)	RecognisedTrafficSignsCapability	ara com
101	Recognised traffic signs status()	RecognisedTrafficSignsStatus	ara com
102	Object grouping ID()	ObjectGroupingID	ara com

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Bit	Reference Singal in ISO23150	Reference Element in SObjectsService	Option
103	Number of valid observations object level(A.2.71)	NumberOfValidObservationsObjectLevel	Autosar vector
104	Time stamp reference object level(A.2.72)	TimeStampReferenceObjectLevel	ara com
105	Observation status object level(A.2.73)	ObservationStatusObjectLevel	ara com
106	Track quality(A.2.74)	TrackQuality	ara com
107	Sign geometry(A.2.78)	SignGeometry	ara com
108	Number of valid lane relevance classifications(A.2.79)	NumberOfValidLaneRelevanceClassifications	Autosar vector
109	Lane relevance classification type(A.2.81)	LaneRelevanceClassificationType	ara com
110	Lane relevance classification type confidence(A.2.82)	LaneRelevanceClassificationTypeConfidence	ara com
111	Colour tone(A.2.85)	TrafficSignsColourTone	global struct
112	ColourToneConfidenceObjectLevel	ColourToneConfidenceObjectLevel	ara com
113	Position object level z(Table 12)	PositionObjectLevelZ	ara com
114	Position object level z error(A.2.72)	PositionObjectLevelZError	ara com
115	Number of valid observations object level(A.2.92)	NumberOfValidObservationsObjectLevel	Autosar vector
116	Time stamp reference object level(A.2.92)	TimeStampReferenceObjectLevel	ara com
117	Observation status object level(A.2.93)	ObservationStatusObjectLevel	ara com
118	Track quality(A.2.93)	TrackQuality	ara com
119	Colour tone()	TrafficSignsSupplementarySignsColourTone	global struct
120	Colour tone confidence object level(A.1.11.3)	ColourToneConfidenceObjectLevel	ara com
121	Traffic lights(A.2.6)	TrafficLights	0
122	Recognised traffic lights capability(A.2.7)	RecognisedTrafficLightsCapability	ara com
123	Recognised traffic lights status()	RecognisedTrafficLightsStatus	ara com
124	Object grouping ID()	ObjectGroupingID	ara com
125	Number of valid observations object level(A.2.103)	NumberOfValidObservationsObjectLevel	Autosar vector
126	Time stamp reference object level(A.2.60)	TimeStampReferenceObjectLevel	ara com
127	Observation status object level(Table xxx)	ObservationStatusObjectLevel	ara com
128	Track quality(A.2.69)	TrackQuality	ara com
129	Position object level z(A.2.76)	PositionObjectLevelZ	ara com
130	Position object level z error(A.2.76)	PositionObjectLevelZError	ara com
131	Orientation yaw(A.2.77)	OrientationYaw	ara com
132	Orientation pitch(A.2.78)	OrientationPitch	ara com
133	Orientation roll(A.2.79)	OrientationRoll	ara com
134	Orientation yaw error(A.2.79)	OrientationYawError	ara com
135	Orientation pitch error(A.2.80)	OrientationPitchError	ara com
136	Orientation roll error(A.2.81)	OrientationRollError	ara com
137	Reference point(A.2.82)	ReferencePoint	ara com
138	Bounding box(A.2.85)	TrafficLightsBoundingBox	0
139	Bounding box extent length(A.2.86)	BoundingBoxExtentLength	ara com
140	Bounding box extent length error(A.2.87)	BoundingBoxExtentLengthError	ara com
141	Bounding box extent width error(A.2.88)	BoundingBoxExtentWidthError	ara com
142	Bounding box extent height error()	BoundingBoxExtentHeightError	ara com

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Bit	Reference Singal in ISO23150	Reference Element in SObjectsService	Option
143	Total number of traffic light spots(Table 12)	TotalNumberOfTrafficLightSpots	Autosar vector
144	Total number of traffic light spots confidence(A.2.89)	TotalNumberOfTrafficLightSpotsConfidence	Autosar vector
145	Number of valid observations object level(A.2.92)	NumberOfValidObservationsObjectLevel	Autosar vector
146	Time stamp reference object level(A.2.93)	TimeStampReferenceObjectLevel	ara com
147	Observation status object level(A.2.93)	ObservationStatusObjectLevel	ara com
148	Track quality(A.2.94)	TrackQuality	ara com
149	Light shape value(A.2.100)	LightShapeValue	ara com
150	Colour()	TrafficLightsSpotsColour	0
151	Position object level z()	PositionObjectLevelZ	ara com
152	Position object level z error()	PositionObjectLevelZError	ara com
153	Number of valid lane relevance classifications()	NumberOfValidLaneRelevanceClassifications	Autosar vector
154	Lane relevance classification type()	LaneRelevanceClassificationType	ara com
155	Lane relevance classification type confidence()	LaneRelevanceClassificationTypeConfidence	ara com

Table 10.3: Capability Vector of SObjectsService

10.2 Feature Level Service

10.2.1 CameraFeatureService Capability Vector

The table below includes the capability bit setting for the optional elements for CameraFeatureService, which also refers to ISO 23150.The Bit setting to 1 means the presence of the optional element, while 0 means absent.

Bit	Reference Singal in ISO23150	Reference Element in CameraFeatureService	Option
1	Interface ID(A.1.4)	InterfaceID	Autosar Service
2	Cycle counter(A.1.6.1)	CycleCounter	ara com
3	Interface cycle time(A.1.7)	InterfaceCycleTime	ara com
4	Interface cycle time variation(A.1.8)	InterfaceCycleTimeVariation	ara com
5	Information vehicle coordinate system(Table 46)	InformationVehicleCoordinateSystem	0
6	Information sensor pose(Table 46)	InformationSensorPose	0
7	Sensor origin point x(A.1.22)	SensorOriginPointX	ara com
8	Sensor origin point y(A.1.22)	SensorOriginPointY	ara com
9	Sensor origin point z(A.1.22)	SensorOriginPointZ	ara com
10	Sensor origin point x error(A.1.23)	SensorOriginPointXError	ara com
11	Sensor origin point y error(A.1.23)	SensorOriginPointYError	ara com
12	Sensor origin point z error(A.1.23)	SensorOriginPointZError	ara com
13	Sensor origin point x x error (A.1.23)	SensorOriginPointXXError	ara com
14	Sensor origin point x y error (A.1.23)	SensorOriginPointXYError	ara com
15	Sensor origin point x z error (A.1.23)	SensorOriginPointXZError	ara com

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Bit	Reference Singal in ISO23150	Reference Element in CameraFeatureService	Option
16	Sensor origin point y x error (A.1.23)	SensorOriginPointYXError	ara com
17	Sensor origin point y y error (A.1.23)	SensorOriginPointYYError	ara com
18	Sensor origin point y z error (A.1.23)	SensorOriginPointYZError	ara com
19	Sensor origin point z x error (A.1.23)	SensorOriginPointZXError	ara com
20	Sensor origin point z y error (A.1.23)	SensorOriginPointZYError	ara com
21	Sensor origin point z z error (A.1.23)	SensorOriginPointZZError	ara com
22	Sensor orientation yaw(A.1.24)	SensorOrientationYaw	ara com
23	Sensor orientation pitch(A.1.24)	SensorOrientationPitch	ara com
24	Sensor orientation roll(A.1.24)	SensorOrientationRoll	ara com
25	Sensor orientation yaw error(A.1.25)	SensorOrientationYawError	ara com
26	Sensor orientation pitch error(A.1.25)	SensorOrientationPitchError	ara com
27	Sensor orientation roll error(A.1.25)	SensorOrientationRollError	ara com
28	Sensor orientation yaw yaw error (A.1.25)	SensorOrientationYawYawError	ara com
29	Sensor orientation yaw pitch error (A.1.25)	SensorOrientationYawPitchError	ara com
30	Sensor orientation yaw roll error (A.1.25)	SensorOrientationYawRollError	ara com
31	Sensor orientation pitch yaw error (A.1.25)	SensorOrientationPitchYawError	ara com
32	Sensor orientation pitch pitch error (A.1.25)	SensorOrientationPitchPitchError	ara com
33	Sensor orientation pitch roll error (A.1.25)	SensorOrientationPitchRollError	ara com
34	Sensor orientation roll yaw error (A.1.25)	SensorOrientationRollYawError	ara com
35	Sensor orientation roll pitch error (A.1.25)	SensorOrientationRollPitchError	ara com
36	Sensor orientation roll roll error (A.1.25)	SensorOrientationRollRollError	ara com
37	Calibration(Table 48)	Calibration	0
38	Calibration process state(A.5.42)	CalibrationProcessState	ara com
39	Sensor origin point correction x(A.5.43)	SensorOriginPointCorrectionX	ara com
40	Sensor origin point correction y(A.5.43)	SensorOriginPointCorrectionY	ara com
41	Sensor origin point correction z(A.5.43)	SensorOriginPointCorrectionZ	ara com
42	Sensor origin point correction x error(A.5.44)	SensorOriginPointCorrectionXError	ara com
43	Sensor origin point correction y error(A.5.44)	SensorOriginPointCorrectionYError	ara com
44	Sensor origin point correction z error(A.5.44)	SensorOriginPointCorrectionZError	ara com
45	Sensor origin translation correction limit xbegin(A.5.45)	SensorOriginTranslationCorrectionLimitXbegin	ara com
46	Sensor origin translation correction limit xend(A.5.45)	SensorOriginTranslationCorrectionLimitXend	ara com
47	Sensor origin translation correction limit ybegin(A.5.45)	SensorOriginTranslationCorrectionLimitYbegin	ara com
48	Sensor origin translation correction limit yend(A.5.45)	SensorOriginTranslationCorrectionLimitYend	ara com
49	Sensor origin translation correction limit zbegin(A.5.45)	SensorOriginTranslationCorrectionLimitZbegin	ara com
50	Sensor origin translation correction limit zend(A.5.45)	SensorOriginTranslationCorrectionLimitZend	ara com
51	Sensor orientation correction yaw(A.5.46)	SensorOrientationCorrectionYaw	ara com
52	Sensor orientation correction pitch(A.5.46)	SensorOrientationCorrectionPitch	ara com
53	Sensor orientation correction roll(A.5.46)	SensorOrientationCorrectionRoll	ara com
54	Sensor orientation correction yaw error(A.5.47)	SensorOrientationCorrectionYawError	ara com
55	Sensor orientation correction pitch error(A.5.47)	SensorOrientationCorrectionPitchError	ara com

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Bit	Reference Singal in ISO23150	Reference Element in CameraFeatureService	Option
56	Sensor orientation correction roll error(A.5.47)	SensorOrientationCorrectionRollError	ara com
57	Sensor pose angle correction limit yawbegin(A.5.48)	SensorPoseAngleCorrectionLimitYawbegin	ara com
58	Sensor pose angle correction limit yawend(A.5.48)	SensorPoseAngleCorrectionLimitYawend	ara com
59	Sensor pose angle correction limit pitchbegin(A.5.48)	SensorPoseAngleCorrectionLimitPitchbegin	ara com
60	Sensor pose angle correction limit pitchend(A.5.48)	SensorPoseAngleCorrectionLimitPitchend	ara com
61	Sensor pose angle correction limit rollbegin(A.5.48)	SensorPoseAngleCorrectionLimitRollbegin	ara com
62	Sensor pose angle correction limit rollend(A.5.48)	SensorPoseAngleCorrectionLimitRollend	ara com
63	Sensor cluster(Table 48)	SensorCluster	0
64	Tracking motion model(A.1.13)	TrackingMotionModel	ara com
65	Motion type(A.1.14)	MotionType	ara com
66	Information ambiguity domain(Table 30)	InformationAmbiguityDomain	0
67	Radial velocity ambiguity domain begin(A.1.16)	RadialVelocityAmbiguityDomainBegin	ara com
68	Radial velocity ambiguity domain end(A.1.16)	RadialVelocityAmbiguityDomainEnd	ara com
69	Range ambiguity domain begin(A.1.17)	RangeAmbiguityDomainBegin	ara com
70	Range ambiguity domain end(A.1.17)	RangeAmbiguityDomainEnd	ara com
71	Angle azimuth ambiguity domain begin(A.1.18)	AngleAzimuthAmbiguityDomainBegin	ara com
72	Angle azimuth ambiguity domain end(A.1.18)	AngleAzimuthAmbiguityDomainEnd	ara com
73	Angle elevation ambiguity domain begin(A.1.19)	AngleElevationAmbiguityDomainBegin	ara com
74	Angle elevation ambiguity domain end(A.1.19)	AngleElevationAmbiguityDomainEnd	ara com
75	Interface applicability(A.1.20)	InterfaceApplicability	ara com
76	Camera features(Table 12)	CameraFeatures	0
77	Recognised features capability(A.2.48)	RecognisedFeaturesCapability	ara com
78	Recognised features status(A.2.49)	RecognisedFeaturesStatus	ara com
79	Feature ID(A.2.52)	FeatureID	ara com
80	Feature grouping ID(A.2.53)	FeatureGroupingID	ara com
81	Object ID reference feature level()	ObjectIDReferenceFeatureLevel	ara com
82	Number of valid observations feature level(A.2.55)	NumberOfValidObservationsFeatureLevel	Autosar vector
83	Time stamp reference feature level(A.2.8)	TimeStampReferenceFeatureLevel	ara com
84	Observation status feature level(A.2.9)	ObservationStatusFeatureLevel	ara com
85	Colour tone confidence feature level(A.2.6)	ColourToneConfidenceFeatureLevel	ara com
86	Shape reference points(A.2.63)	CameraFeaturesShapeReferencePoints	0
87	Shape surface normal x(A.2.69)	ShapeSurfaceNormalX	ara com
88	Shape surface normal y()	ShapeSurfaceNormalY	ara com
89	Shape surface normal z(A.2.70)	ShapeSurfaceNormalZ	ara com
90	Shape surface normal x error()	ShapeSurfaceNormalXError	ara com
91	Shape surface normal y error()	ShapeSurfaceNormalYError	ara com
92	Shape surface normal z error()	ShapeSurfaceNormalZError	ara com
93	Translation rate x feature level(Table 12)	TranslationRateXFeatureLevel	ara com
94	Translation rate y feature level(A.2.71)	TranslationRateYFeatureLevel	ara com

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Bit	Reference Singal in ISO23150	Reference Element in CameraFeatureService	Option
95	Translation rate z feature level()	TranslationRateZFeatureLevel	ara com
96	Translation rate x feature level error(A.2.72)	TranslationRateXFeatureLevelError	ara com
97	Translation rate y feature level error(A.2.73)	TranslationRateYFeatureLevelError	ara com
98	Translation rate z feature level error()	TranslationRateZFeatureLevelError	ara com
99	Rotation rate yaw(A.2.74)	RotationRateYaw	ara com
100	Rotation rate pitch()	RotationRatePitch	ara com
101	Rotation rate roll(A.2.75)	RotationRateRoll	ara com
102	Rotation rate yaw error(A.2.75)	RotationRateYawError	ara com
103	Rotation rate pitch error(A.2.75)	RotationRatePitchError	ara com
104	Rotation rate roll error(A.2.75)	RotationRateRollError	ara com
105	Scale change feature level(A.2.76)	ScaleChangeFeatureLevel	ara com
106	Scale change feature level error(A.2.76)	ScaleChangeFeatureLevelError	ara com

Table 10.4: Capability Vector of CameraFeatureService

10.2.2 USSFeatureService Capability Vector

The table below includes the capability bit setting for the optional elements for USSFeatureService, which also refers to ISO 23150.The Bit setting to 1 means the presence of the optional element, while 0 means absent.

Bit	Reference Singal in ISO23150	Reference Element in USSFeatureService	Option
1	Interface ID(A.1.4)	InterfaceID	Autosar Service
2	Cycle counter(A.1.6.1)	CycleCounter	ara com
3	Interface cycle time(A.1.7)	InterfaceCycleTime	ara com
4	Interface cycle time variation(A.1.8)	InterfaceCycleTimeVariation	ara com
5	Information vehicle coordinate system(Table 46)	InformationVehicleCoordinateSystem	0
6	Information sensor pose(Table 46)	InformationSensorPose	0
7	Sensor origin point x(A.1.22)	SensorOriginPointX	ara com
8	Sensor origin point y(A.1.22)	SensorOriginPointY	ara com
9	Sensor origin point z(A.1.22)	SensorOriginPointZ	ara com
10	Sensor origin point x error(A.1.23)	SensorOriginPointXError	ara com
11	Sensor origin point y error(A.1.23)	SensorOriginPointYError	ara com
12	Sensor origin point z error(A.1.23)	SensorOriginPointZError	ara com
13	Sensor origin point x x error (A.1.23)	SensorOriginPointXXError	ara com
14	Sensor origin point x y error (A.1.23)	SensorOriginPointXYError	ara com
15	Sensor origin point x z error (A.1.23)	SensorOriginPointXZError	ara com
16	Sensor origin point y x error (A.1.23)	SensorOriginPointYXError	ara com
17	Sensor origin point y y error (A.1.23)	SensorOriginPointYYError	ara com
18	Sensor origin point y z error (A.1.23)	SensorOriginPointYZError	ara com
19	Sensor origin point z x error (A.1.23)	SensorOriginPointZXError	ara com
20	Sensor origin point z y error (A.1.23)	SensorOriginPointZYError	ara com

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Bit	Reference Singal in ISO23150	Reference Element in USSFeatureService	Option
21	Sensor origin point z z error (A.1.23)	SensorOriginPointZZError	ara com
22	Sensor orientation yaw(A.1.24)	SensorOrientationYaw	ara com
23	Sensor orientation pitch(A.1.24)	SensorOrientationPitch	ara com
24	Sensor orientation roll(A.1.24)	SensorOrientationRoll	ara com
25	Sensor orientation yaw error(A.1.25)	SensorOrientationYawError	ara com
26	Sensor orientation pitch error(A.1.25)	SensorOrientationPitchError	ara com
27	Sensor orientation roll error(A.1.25)	SensorOrientationRollError	ara com
28	Sensor orientation yaw yaw error (A.1.25)	SensorOrientationYawYawError	ara com
29	Sensor orientation yaw pitch error (A.1.25)	SensorOrientationYawPitchError	ara com
30	Sensor orientation yaw roll error (A.1.25)	SensorOrientationYawRollError	ara com
31	Sensor orientation pitch yaw error (A.1.25)	SensorOrientationPitchYawError	ara com
32	Sensor orientation pitch pitch error (A.1.25)	SensorOrientationPitchPitchError	ara com
33	Sensor orientation pitch roll error (A.1.25)	SensorOrientationPitchRollError	ara com
34	Sensor orientation roll yaw error (A.1.25)	SensorOrientationRollYawError	ara com
35	Sensor orientation roll pitch error (A.1.25)	SensorOrientationRollPitchError	ara com
36	Sensor orientation roll roll error (A.1.25)	SensorOrientationRollRollError	ara com
37	Calibration(Table 48)	Calibration	0
38	Calibration process state(A.5.42)	CalibrationProcessState	ara com
39	Sensor origin point correction x(A.5.43)	SensorOriginPointCorrectionX	ara com
40	Sensor origin point correction y(A.5.43)	SensorOriginPointCorrectionY	ara com
41	Sensor origin point correction z(A.5.43)	SensorOriginPointCorrectionZ	ara com
42	Sensor origin point correction x error(A.5.44)	SensorOriginPointCorrectionXError	ara com
43	Sensor origin point correction y error(A.5.44)	SensorOriginPointCorrectionYError	ara com
44	Sensor origin point correction z error(A.5.44)	SensorOriginPointCorrectionZError	ara com
45	Sensor origin translation correction limit xbegin(A.5.45)	SensorOriginTranslationCorrectionLimitXbegin	ara com
46	Sensor origin translation correction limit xend(A.5.45)	SensorOriginTranslationCorrectionLimitXend	ara com
47	Sensor origin translation correction limit ybegin(A.5.45)	SensorOriginTranslationCorrectionLimitYbegin	ara com
48	Sensor origin translation correction limit yend(A.5.45)	SensorOriginTranslationCorrectionLimitYend	ara com
49	Sensor origin translation correction limit zbegin(A.5.45)	SensorOriginTranslationCorrectionLimitZbegin	ara com
50	Sensor origin translation correction limit zend(A.5.45)	SensorOriginTranslationCorrectionLimitZend	ara com
51	Sensor orientation correction yaw(A.5.46)	SensorOrientationCorrectionYaw	ara com
52	Sensor orientation correction pitch(A.5.46)	SensorOrientationCorrectionPitch	ara com
53	Sensor orientation correction roll(A.5.46)	SensorOrientationCorrectionRoll	ara com
54	Sensor orientation correction yaw error(A.5.47)	SensorOrientationCorrectionYawError	ara com
55	Sensor orientation correction pitch error(A.5.47)	SensorOrientationCorrectionPitchError	ara com
56	Sensor orientation correction roll error(A.5.47)	SensorOrientationCorrectionRollError	ara com
57	Sensor pose angle correction limit yawbegin(A.5.48)	SensorPoseAngleCorrectionLimitYawbegin	ara com
58	Sensor pose angle correction limit yawend(A.5.48)	SensorPoseAngleCorrectionLimitYawend	ara com

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Bit	Reference Singal in ISO23150	Reference Element in USSFeatureService	Option
59	Sensor pose angle correction limit pitchbegin(A.5.48)	SensorPoseAngleCorrectionLimitPitchbegin	ara com
60	Sensor pose angle correction limit pitchend(A.5.48)	SensorPoseAngleCorrectionLimitPitchend	ara com
61	Sensor pose angle correction limit rollbegin(A.5.48)	SensorPoseAngleCorrectionLimitRollbegin	ara com
62	Sensor pose angle correction limit rollend(A.5.48)	SensorPoseAngleCorrectionLimitRollend	ara com
63	Sensor cluster(Table 48)	SensorCluster	0
64	Information Interface extension(Table 30)	InformationInterfaceExtension	0
65	Tracking motion model(A.1.13)	TrackingMotionModel	ara com
66	Motion type(A.1.14)	MotionType	ara com
67	Colour model type(A.1.15)	ColourModelType	ara com
68	Information ambiguity domain(Table 30)	InformationAmbiguityDomain	0
69	Radial velocity ambiguity domain begin(A.1.16)	RadialVelocityAmbiguityDomainBegin	ara com
70	Radial velocity ambiguity domain end(A.1.16)	RadialVelocityAmbiguityDomainEnd	ara com
71	Range ambiguity domain begin(A.1.17)	RangeAmbiguityDomainBegin	ara com
72	Range ambiguity domain end(A.1.17)	RangeAmbiguityDomainEnd	ara com
73	Angle azimuth ambiguity domain begin(A.1.18)	AngleAzimuthAmbiguityDomainBegin	ara com
74	Angle azimuth ambiguity domain end(A.1.18)	AngleAzimuthAmbiguityDomainEnd	ara com
75	Angle elevation ambiguity domain begin(A.1.19)	AngleElevationAmbiguityDomainBegin	ara com
76	Angle elevation ambiguity domain end(A.1.19)	AngleElevationAmbiguityDomainEnd	ara com
77	Interface applicability(A.1.20)	InterfaceApplicability	ara com
78	Recognised features capability(A.2.48)	RecognisedFeaturesCapability	ara com
79	Recognised features status(A.2.49)	RecognisedFeaturesStatus	ara com
80	Feature ID(A.2.52)	FeatureID	ara com
81	Object ID reference feature level(A.2.53)	ObjectIDReferenceFeatureLevel	ara com
82	Number of valid observations feature level(A.2.54)	NumberOfValidObservationsFeatureLevel	Autosar vector
83	Time stamp reference feature level()	TimeStampReferenceFeatureLevel	ara com
84	Observation status feature level(A.2.8)	ObservationStatusFeatureLevel	ara com
85	Position feature level z(A.2.6)	PositionFeatureLevelZ	ara com
86	Position feature level z error(A.2.8)	PositionFeatureLevelZError	ara com
87	Orientation feature level pitch(A.2.9)	OrientationFeatureLevelPitch	ara com
88	Orientation feature level pitch error()	OrientationFeatureLevelPitchError	ara com
89	Height feature level(Table 12)	HeightFeatureLevel	ara com
90	Height feature level error(A.2.56)	HeightFeatureLevelError	ara com
91	Velocity x feature level()	VelocityXFeatureLevel	ara com
92	Velocity x feature level error(A.2.58)	VelocityYObjectLevelError	ara com
93	Measurement status feature level(A.2.61)	MeasurementStatusFeatureLevel	ara com

Table 10.5: Capability Vector of USSFeatureService

10.3 Detection Level Service

10.3.1 RadarDetectionService Capability Vector

The table below includes the capability bit setting for the optional elements for RadarDetectionService, which also refers to ISO 23150.The Bit setting to 1 means the presence of the optional element, while 0 means absent.

Bit	Reference Singal in ISO23150	Reference Element in RadarDetectionService	Option
1	Interface ID(A.1.4)	InterfaceID	Autosar Service
2	Cycle counter(A.1.6.1)	CycleCounter	ara com
3	Interface cycle time(A.1.7)	InterfaceCycleTime	ara com
4	Interface cycle time variation(A.1.8)	InterfaceCycleTimeVariation	ara com
5	Information vehicle coordinate system(Table 46)	InformationVehicleCoordinateSystem	0
6	Information sensor pose(Table 46)	InformationSensorPose	0
7	Sensor origin point x error(A.1.23)	SensorOriginPointXError	ara com
8	Sensor origin point y error(A.1.23)	SensorOriginPointYError	ara com
9	Sensor origin point z error(A.1.23)	SensorOriginPointZError	ara com
10	Sensor origin point x x error (A.1.23)	SensorOriginPointXXError	ara com
11	Sensor origin point x y error (A.1.23)	SensorOriginPointXYError	ara com
12	Sensor origin point x z error (A.1.23)	SensorOriginPointXZError	ara com
13	Sensor origin point y x error (A.1.23)	SensorOriginPointYXError	ara com
14	Sensor origin point y y error (A.1.23)	SensorOriginPointYYError	ara com
15	Sensor origin point y z error (A.1.23)	SensorOriginPointYZError	ara com
16	Sensor origin point z x error (A.1.23)	SensorOriginPointZXError	ara com
17	Sensor origin point z y error (A.1.23)	SensorOriginPointZYError	ara com
18	Sensor origin point z z error (A.1.23)	SensorOriginPointZZError	ara com
19	Sensor orientation yaw error(A.1.25)	SensorOrientationYawError	ara com
20	Sensor orientation pitch error(A.1.25)	SensorOrientationPitchError	ara com
21	Sensor orientation roll error(A.1.25)	SensorOrientationRollError	ara com
22	Sensor orientation yaw yaw error (A.1.25)	SensorOrientationYawYawError	ara com
23	Sensor orientation yaw pitch error (A.1.25)	SensorOrientationYawPitchError	ara com
24	Sensor orientation yaw roll error (A.1.25)	SensorOrientationYawRollError	ara com
25	Sensor orientation pitch yaw error (A.1.25)	SensorOrientationPitchYawError	ara com
26	Sensor orientation pitch pitch error (A.1.25)	SensorOrientationPitchPitchError	ara com
27	Sensor orientation pitch roll error (A.1.25)	SensorOrientationPitchRollError	ara com
28	Sensor orientation roll yaw error (A.1.25)	SensorOrientationRollYawError	ara com
29	Sensor orientation roll pitch error (A.1.25)	SensorOrientationRollPitchError	ara com
30	Sensor orientation roll roll error (A.1.25)	SensorOrientationRollRollError	ara com
31	Calibration(Table 48)	Calibration	0
32	Calibration process state(A.5.42)	CalibrationProcessState	ara com
33	Sensor origin point correction x(A.5.43)	SensorOriginPointCorrectionX	ara com
34	Sensor origin point correction y(A.5.43)	SensorOriginPointCorrectionY	ara com
35	Sensor origin point correction z(A.5.43)	SensorOriginPointCorrectionZ	ara com
36	Sensor origin point correction x error(A.5.44)	SensorOriginPointCorrectionXError	ara com
37	Sensor origin point correction y error(A.5.44)	SensorOriginPointCorrectionYError	ara com

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Bit	Reference Singal in ISO23150	Reference Element in RadarDetectionService	Option
38	Sensor origin point correction z error(A.5.44)	SensorOriginPointCorrectionZError	ara com
39	Sensor origin translation correction limit xbegin(A.5.45)	SensorOriginTranslationCorrectionLimitXbegin	ara com
40	Sensor origin translation correction limit xend(A.5.45)	SensorOriginTranslationCorrectionLimitXend	ara com
41	Sensor origin translation correction limit ybegin(A.5.45)	SensorOriginTranslationCorrectionLimitYbegin	ara com
42	Sensor origin translation correction limit yend(A.5.45)	SensorOriginTranslationCorrectionLimitYend	ara com
43	Sensor origin translation correction limit zbegin(A.5.45)	SensorOriginTranslationCorrectionLimitZbegin	ara com
44	Sensor origin translation correction limit zend(A.5.45)	SensorOriginTranslationCorrectionLimitZend	ara com
45	Sensor orientation correction yaw(A.5.46)	SensorOrientationCorrectionYaw	ara com
46	Sensor orientation correction pitch(A.5.46)	SensorOrientationCorrectionPitch	ara com
47	Sensor orientation correction roll(A.5.46)	SensorOrientationCorrectionRoll	ara com
48	Sensor orientation correction yaw error(A.5.47)	SensorOrientationCorrectionYawError	ara com
49	Sensor orientation correction pitch error(A.5.47)	SensorOrientationCorrectionPitchError	ara com
50	Sensor orientation correction roll error(A.5.47)	SensorOrientationCorrectionRollError	ara com
51	Sensor pose angle correction limit yawbegin(A.5.48)	SensorPoseAngleCorrectionLimitYawbegin	ara com
52	Sensor pose angle correction limit yawend(A.5.48)	SensorPoseAngleCorrectionLimitYawend	ara com
53	Sensor pose angle correction limit pitchbegin(A.5.48)	SensorPoseAngleCorrectionLimitPitchbegin	ara com
54	Sensor pose angle correction limit pitchend(A.5.48)	SensorPoseAngleCorrectionLimitPitchend	ara com
55	Sensor pose angle correction limit rollbegin(A.5.48)	SensorPoseAngleCorrectionLimitRollbegin	ara com
56	Sensor pose angle correction limit rollend(A.5.48)	SensorPoseAngleCorrectionLimitRollend	ara com
57	Sensor cluster(Table 48)	SensorCluster	0
58	Tracking motion model(A.1.13)	TrackingMotionModel	ara com
59	Motion type(A.1.14)	MotionType	ara com
60	Colour model type(A.1.15)	ColourModelType	ara com
61	Radial velocity ambiguity domain begin(A.1.16)	RadialVelocityAmbiguityDomainBegin	ara com
62	Radial velocity ambiguity domain end(A.1.16)	RadialVelocityAmbiguityDomainEnd	ara com
63	Range ambiguity domain begin(A.1.17)	RangeAmbiguityDomainBegin	ara com
64	Range ambiguity domain end(A.1.17)	RangeAmbiguityDomainEnd	ara com
65	Angle azimuth ambiguity domain begin(A.1.18)	AngleAzimuthAmbiguityDomainBegin	ara com
66	Angle azimuth ambiguity domain end(A.1.18)	AngleAzimuthAmbiguityDomainEnd	ara com
67	Angle elevation ambiguity domain begin(A.1.19)	AngleElevationAmbiguityDomainBegin	ara com
68	Angle elevation ambiguity domain end(A.1.19)	AngleElevationAmbiguityDomainEnd	ara com
69	Interface applicability(A.1.20)	InterfaceApplicability	ara com
70	Recognised detections capability(A.2.48)	RecognisedDetectionsCapability	ara com
71	Recognised detections status(A.2.49)	RecognisedDetectionsStatus	ara com
72	Object ID reference detection level(A.2.52)	ObjectIDReferenceDetectionLevel	ara com
73	Feature ID reference(A.2.53)	FeatureIDReference	ara com

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Bit	Reference Singal in ISO23150	Reference Element in RadarDetectionService	Option
74	Radar cross section error(A.2.8)	RadarCrossSectionError	ara com
75	Signal to noise ratio detection level error()	SignalToNoiseRatioDetectionLevelError	ara com
76	Multi target probability(Table 12)	MultiTargetProbability	ara com
77	Ambiguity ID(A.1.10.2)	AmbiguityID	ara com
78	Detection ambiguity probability(A.1.11.2)	DetectionAmbiguityProbability	ara com
79	Free space probability(A.1.12.2)	FreeSpaceProbability	ara com
80	Number of valid detection classifications()	NumberOfValidDetectionClassifications	Autosar vector
81	Detection classification type(A.2.1)	DetectionClassificationType	ara com
82	Detection classification type confidence(A.2.2)	DetectionClassificationTypeConfidence	ara com
83	Position elevation(A.2.7)	PositionElevation	ara com
84	Position elevation error(A.2.9)	PositionElevationError	ara com
85	Relative velocity radial distance error()	RelativeVelocityRadialDistanceError	ara com

Table 10.6: Capability Vector of RadarDetectionService

10.3.2 LidarDetectionService Capability Vector

The table below includes the capability bit setting for the optional elements for LidarDetectionService, which also refers to ISO 23150.The Bit setting to 1 means the presence of the optional element, while 0 means absent.

Bit	Reference Singal in ISO23150	Reference Element in LidarDetectionService	Option
1	Interface ID(A.1.4)	InterfaceID	Autosar Service
2	Cycle counter(A.1.6.1)	CycleCounter	ara com
3	Interface cycle time(A.1.7)	InterfaceCycleTime	ara com
4	Interface cycle time variation(A.1.8)	InterfaceCycleTimeVariation	ara com
5	Information vehicle coordinate system(Table 46)	InformationVehicleCoordinateSystem	0
6	Information sensor pose(Table 46)	InformationSensorPose	0
7	Sensor origin point x error(A.1.23)	SensorOriginPointXError	ara com
8	Sensor origin point y error(A.1.23)	SensorOriginPointYError	ara com
9	Sensor origin point z error(A.1.23)	SensorOriginPointZError	ara com
10	Sensor origin point x x error (A.1.23)	SensorOriginPointXXError	ara com
11	Sensor origin point x y error (A.1.23)	SensorOriginPointXYError	ara com
12	Sensor origin point x z error (A.1.23)	SensorOriginPointXZError	ara com
13	Sensor origin point y x error (A.1.23)	SensorOriginPointYXError	ara com
14	Sensor origin point y y error (A.1.23)	SensorOriginPointYYError	ara com
15	Sensor origin point y z error (A.1.23)	SensorOriginPointYZError	ara com
16	Sensor origin point z x error (A.1.23)	SensorOriginPointZXError	ara com
17	Sensor origin point z y error (A.1.23)	SensorOriginPointZYError	ara com
18	Sensor origin point z z error (A.1.23)	SensorOriginPointZZError	ara com
19	Sensor orientation yaw error(A.1.25)	SensorOrientationYawError	ara com
20	Sensor orientation pitch error(A.1.25)	SensorOrientationPitchError	ara com

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Bit	Reference Singal in ISO23150	Reference Element in LidarDetectionService	Option
21	Sensor orientation roll error(A.1.25)	SensorOrientationRollError	ara com
22	Sensor orientation yaw yaw error (A.1.25)	SensorOrientationYawYawError	ara com
23	Sensor orientation yaw pitch error (A.1.25)	SensorOrientationYawPitchError	ara com
24	Sensor orientation yaw roll error (A.1.25)	SensorOrientationYawRollError	ara com
25	Sensor orientation pitch yaw error (A.1.25)	SensorOrientationPitchYawError	ara com
26	Sensor orientation pitch pitch error (A.1.25)	SensorOrientationPitchPitchError	ara com
27	Sensor orientation pitch roll error (A.1.25)	SensorOrientationPitchRollError	ara com
28	Sensor orientation roll yaw error (A.1.25)	SensorOrientationRollYawError	ara com
29	Sensor orientation roll pitch error (A.1.25)	SensorOrientationRollPitchError	ara com
30	Sensor orientation roll roll error (A.1.25)	SensorOrientationRollRollError	ara com
31	Calibration(Table 48)	Calibration	0
32	Calibration process state(A.5.42)	CalibrationProcessState	ara com
33	Sensor origin point correction x(A.5.43)	SensorOriginPointCorrectionX	ara com
34	Sensor origin point correction y(A.5.43)	SensorOriginPointCorrectionY	ara com
35	Sensor origin point correction z(A.5.43)	SensorOriginPointCorrectionZ	ara com
36	Sensor origin point correction x error(A.5.44)	SensorOriginPointCorrectionXError	ara com
37	Sensor origin point correction y error(A.5.44)	SensorOriginPointCorrectionYError	ara com
38	Sensor origin point correction z error(A.5.44)	SensorOriginPointCorrectionZError	ara com
39	Sensor origin translation correction limit xbegin(A.5.45)	SensorOriginTranslationCorrectionLimitXbegin	ara com
40	Sensor origin translation correction limit xend(A.5.45)	SensorOriginTranslationCorrectionLimitXend	ara com
41	Sensor origin translation correction limit ybegin(A.5.45)	SensorOriginTranslationCorrectionLimitYbegin	ara com
42	Sensor origin translation correction limit yend(A.5.45)	SensorOriginTranslationCorrectionLimitYend	ara com
43	Sensor origin translation correction limit zbegin(A.5.45)	SensorOriginTranslationCorrectionLimitZbegin	ara com
44	Sensor origin translation correction limit zend(A.5.45)	SensorOriginTranslationCorrectionLimitZend	ara com
45	Sensor orientation correction yaw(A.5.46)	SensorOrientationCorrectionYaw	ara com
46	Sensor orientation correction pitch(A.5.46)	SensorOrientationCorrectionPitch	ara com
47	Sensor orientation correction roll(A.5.46)	SensorOrientationCorrectionRoll	ara com
48	Sensor orientation correction yaw error(A.5.47)	SensorOrientationCorrectionYawError	ara com
49	Sensor orientation correction pitch error(A.5.47)	SensorOrientationCorrectionPitchError	ara com
50	Sensor orientation correction roll error(A.5.47)	SensorOrientationCorrectionRollError	ara com
51	Sensor pose angle correction limit yawbegin(A.5.48)	SensorPoseAngleCorrectionLimitYawbegin	ara com
52	Sensor pose angle correction limit yawend(A.5.48)	SensorPoseAngleCorrectionLimitYawend	ara com
53	Sensor pose angle correction limit pitchbegin(A.5.48)	SensorPoseAngleCorrectionLimitPitchbegin	ara com
54	Sensor pose angle correction limit pitchend(A.5.48)	SensorPoseAngleCorrectionLimitPitchend	ara com
55	Sensor pose angle correction limit rollbegin(A.5.48)	SensorPoseAngleCorrectionLimitRollbegin	ara com

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Bit	Reference Singal in ISO23150	Reference Element in LidarDetectionService	Option
56	Sensor pose angle correction limit rollend(A.5.48)	SensorPoseAngleCorrectionLimitRollend	ara com
57	Sensor cluster(Table 48)	SensorCluster	0
58	Information Interface extension(Table 30)	InformationInterfaceExtension	0
59	Tracking motion model(A.1.13)	TrackingMotionModel	ara com
60	Motion type(A.1.14)	MotionType	ara com
61	Colour model type(A.1.15)	ColourModelType	ara com
62	Information ambiguity domain(Table 30)	InformationAmbiguityDomain	0
63	Radial velocity ambiguity domain begin(A.1.16)	RadialVelocityAmbiguityDomainBegin	ara com
64	Radial velocity ambiguity domain end(A.1.16)	RadialVelocityAmbiguityDomainEnd	ara com
65	Range ambiguity domain begin(A.1.17)	RangeAmbiguityDomainBegin	ara com
66	Range ambiguity domain end(A.1.17)	RangeAmbiguityDomainEnd	ara com
67	Angle azimuth ambiguity domain begin(A.1.18)	AngleAzimuthAmbiguityDomainBegin	ara com
68	Angle azimuth ambiguity domain end(A.1.18)	AngleAzimuthAmbiguityDomainEnd	ara com
69	Angle elevation ambiguity domain begin(A.1.19)	AngleElevationAmbiguityDomainBegin	ara com
70	Angle elevation ambiguity domain end(A.1.19)	AngleElevationAmbiguityDomainEnd	ara com
71	Interface applicability(A.1.20)	InterfaceApplicability	ara com
72	Recognised detections capability(A.1.10.8)	RecognisedDetectionsCapability	ara com
73	Recognised detections status(A.1.11.8)	RecognisedDetectionsStatus	ara com
74	Object ID reference detection level(A.4.2)	ObjectIDReferenceDetectionLevel	ara com
75	Feature ID reference(A.4.3)	FeatureIDReference	ara com
76	Reflectivity error(A.4.23)	ReflectivityError	ara com
77	Free space probability(A.4.12)	FreeSpaceProbability	ara com
78	Number of valid detection classifications(A.4.13)	NumberOfValidDetectionClassifications	Autosar vector
79	Detection classification type(A.4.14)	DetectionClassificationType	ara com
80	Detection classification type confidence(A.4.15)	DetectionClassificationTypeConfidence	ara com
81	Height lidar(A.4.20)	HeightLidar	ara com
82	Height lidar error(A.4.21)	HeightLidarError	ara com
83	Dynamics(Table 33)	LidarDetectionsDynamics	was in 715
84	Relative velocity radial distance error(A.4.19)	RelativeVelocityRadialDistanceError	ara com

Table 10.7: Capability Vector of LidarDetectionService

10.3.3 CameraDetectionService Capability Vector

The table below includes the capability bit setting for the optional elements for CameraDetectionService, which also refers to ISO 23150.The Bit setting to 1 means the presence of the optional element, while 0 means absent.

Bit	Reference Singal in ISO23150	Reference Element in CameraDetectionService	Option
1	Interface ID(A.1.4)	InterfaceID	Autosar Service
2	Cycle counter(A.1.6.1)	CycleCounter	ara com
3	Interface cycle time(A.1.7)	InterfaceCycleTime	ara com
4	Interface cycle time variation(A.1.8)	InterfaceCycleTimeVariation	ara com
5	Information vehicle coordinate system(Table 46)	InformationVehicleCoordinateSystem	0
6	Information sensor pose(Table 46)	InformationSensorPose	0
7	Sensor origin point x error(A.1.23)	SensorOriginPointXError	ara com
8	Sensor origin point y error(A.1.23)	SensorOriginPointYError	ara com
9	Sensor origin point z error(A.1.23)	SensorOriginPointZError	ara com
10	Sensor origin point x x error (A.1.23)	SensorOriginPointXXError	ara com
11	Sensor origin point x y error (A.1.23)	SensorOriginPointXYError	ara com
12	Sensor origin point x z error (A.1.23)	SensorOriginPointXZError	ara com
13	Sensor origin point y x error (A.1.23)	SensorOriginPointYXError	ara com
14	Sensor origin point y y error (A.1.23)	SensorOriginPointYYError	ara com
15	Sensor origin point y z error (A.1.23)	SensorOriginPointYZError	ara com
16	Sensor origin point z x error (A.1.23)	SensorOriginPointZXError	ara com
17	Sensor origin point z y error (A.1.23)	SensorOriginPointZYError	ara com
18	Sensor origin point z z error (A.1.23)	SensorOriginPointZZError	ara com
19	Sensor orientation yaw error(A.1.25)	SensorOrientationYawError	ara com
20	Sensor orientation pitch error(A.1.25)	SensorOrientationPitchError	ara com
21	Sensor orientation roll error(A.1.25)	SensorOrientationRollError	ara com
22	Sensor orientation yaw yaw error (A.1.25)	SensorOrientationYawYawError	ara com
23	Sensor orientation yaw pitch error (A.1.25)	SensorOrientationYawPitchError	ara com
24	Sensor orientation yaw roll error (A.1.25)	SensorOrientationYawRollError	ara com
25	Sensor orientation pitch yaw error (A.1.25)	SensorOrientationPitchYawError	ara com
26	Sensor orientation pitch pitch error (A.1.25)	SensorOrientationPitchPitchError	ara com
27	Sensor orientation pitch roll error (A.1.25)	SensorOrientationPitchRollError	ara com
28	Sensor orientation roll yaw error (A.1.25)	SensorOrientationRollYawError	ara com
29	Sensor orientation roll pitch error (A.1.25)	SensorOrientationRollPitchError	ara com
30	Sensor orientation roll roll error (A.1.25)	SensorOrientationRollRollError	ara com
31	Calibration(Table 48)	Calibration	0
32	Calibration process state(A.5.42)	CalibrationProcessState	ara com
33	Sensor origin point correction x(A.5.43)	SensorOriginPointCorrectionX	ara com
34	Sensor origin point correction y(A.5.43)	SensorOriginPointCorrectionY	ara com
35	Sensor origin point correction z(A.5.43)	SensorOriginPointCorrectionZ	ara com
36	Sensor origin point correction x error(A.5.44)	SensorOriginPointCorrectionXError	ara com
37	Sensor origin point correction y error(A.5.44)	SensorOriginPointCorrectionYError	ara com
38	Sensor origin point correction z error(A.5.44)	SensorOriginPointCorrectionZError	ara com
39	Sensor origin translation correction limit xbegin(A.5.45)	SensorOriginTranslationCorrectionLimitXbegin	ara com
40	Sensor origin translation correction limit xend(A.5.45)	SensorOriginTranslationCorrectionLimitXend	ara com
41	Sensor origin translation correction limit ybegin(A.5.45)	SensorOriginTranslationCorrectionLimitYbegin	ara com

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Bit	Reference Singal in ISO23150	Reference Element in CameraDetectionService	Option
42	Sensor origin translation correction limit yend(A.5.45)	SensorOriginTranslationCorrectionLimitYend	ara com
43	Sensor origin translation correction limit zbegin(A.5.45)	SensorOriginTranslationCorrectionLimitZbegin	ara com
44	Sensor origin translation correction limit zend(A.5.45)	SensorOriginTranslationCorrectionLimitZend	ara com
45	Sensor orientation correction yaw(A.5.46)	SensorOrientationCorrectionYaw	ara com
46	Sensor orientation correction pitch(A.5.46)	SensorOrientationCorrectionPitch	ara com
47	Sensor orientation correction roll(A.5.46)	SensorOrientationCorrectionRoll	ara com
48	Sensor orientation correction yaw error(A.5.47)	SensorOrientationCorrectionYawError	ara com
49	Sensor orientation correction pitch error(A.5.47)	SensorOrientationCorrectionPitchError	ara com
50	Sensor orientation correction roll error(A.5.47)	SensorOrientationCorrectionRollError	ara com
51	Sensor pose angle correction limit yawbegin(A.5.48)	SensorPoseAngleCorrectionLimitYawbegin	ara com
52	Sensor pose angle correction limit yawend(A.5.48)	SensorPoseAngleCorrectionLimitYawend	ara com
53	Sensor pose angle correction limit pitchbegin(A.5.48)	SensorPoseAngleCorrectionLimitPitchbegin	ara com
54	Sensor pose angle correction limit pitchend(A.5.48)	SensorPoseAngleCorrectionLimitPitchend	ara com
55	Sensor pose angle correction limit rollbegin(A.5.48)	SensorPoseAngleCorrectionLimitRollbegin	ara com
56	Sensor pose angle correction limit rollend(A.5.48)	SensorPoseAngleCorrectionLimitRollend	ara com
57	Sensor cluster(Table 48)	SensorCluster	0
58	Tracking motion model(A.1.13)	TrackingMotionModel	ara com
59	Motion type(A.1.14)	MotionType	ara com
60	Information ambiguity domain(Table 30)	InformationAmbiguityDomain	0
61	Radial velocity ambiguity domain begin(A.1.16)	RadialVelocityAmbiguityDomainBegin	ara com
62	Radial velocity ambiguity domain end(A.1.16)	RadialVelocityAmbiguityDomainEnd	ara com
63	Range ambiguity domain begin(A.1.17)	RangeAmbiguityDomainBegin	ara com
64	Range ambiguity domain end(A.1.17)	RangeAmbiguityDomainEnd	ara com
65	Angle azimuth ambiguity domain begin(A.1.18)	AngleAzimuthAmbiguityDomainBegin	ara com
66	Angle azimuth ambiguity domain end(A.1.18)	AngleAzimuthAmbiguityDomainEnd	ara com
67	Angle elevation ambiguity domain begin(A.1.19)	AngleElevationAmbiguityDomainBegin	ara com
68	Angle elevation ambiguity domain end(A.1.19)	AngleElevationAmbiguityDomainEnd	ara com
69	Interface applicability(A.1.20)	InterfaceApplicability	ara com
70	Recognised detections capability(A.1.10.8)	RecognisedDetectionsCapability	ara com
71	Recognised detections status(A.1.11.8)	RecognisedDetectionsStatus	ara com
72	Object ID reference detection level(A.4.2)	ObjectIDReferenceDetectionLevel	ara com
73	Feature ID reference(A.4.3)	FeatureIDReference	ara com
74	Free space probability(A.4.12)	FreeSpaceProbability	ara com
75	Shape ambiguity ID(A.4.27)	ShapeAmbiguityID	ara com
76	Colour tone confidence detection level(A.4.29)	ColourToneConfidenceDetectionLevel	ara com
77	Position radial distance(A.4.16)	PositionRadialDistance	ara com
78	Position radial distance error(A.4.17)	PositionRadialDistanceError	ara com

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Bit	Reference Singal in ISO23150	Reference Element in CameraDetectionService	Option
79	Shape reference points(Table 36)	CameraShapesShapeReferencePoints	0
80	Position radial distance(A.4.16)	PositionRadialDistance	ara com
81	Position radial distance error(A.4.17)	PositionRadialDistanceError	ara com
82	Translation rate x detection level(A.4.34)	TranslationRateXDetectionLevel	ara com
83	Translation rate y detection level(A.4.34)	TranslationRateYDetectionLevel	ara com
84	Translation rate z detection level(A.4.34)	TranslationRateZDetectionLevel	ara com
85	Translation rate x detection level error(A.4.35)	TranslationRateXDetectionLevelError	ara com
86	Translation rate y detection level error(A.4.35)	TranslationRateYDetectionLevelError	ara com
87	Translation rate z detection level error(A.4.35)	TranslationRateZDetectionLevelError	ara com

Table 10.8: Capability Vector of CameraDetectionService

10.3.4 USSDetectionService Capability Vector

The table below includes the capability bit setting for the optional elements for USSDetectionService, which also refers to ISO 23150.The Bit setting to 1 means the presence of the optional element, while 0 means absent.

Bit	Reference Singal in ISO23150	Reference Element in USSDetectionService	Option
1	Interface ID(A.1.4)	InterfaceID	Autosar Service
2	Cycle counter(A.1.6.1)	CycleCounter	ara com
3	Interface cycle time(A.1.7)	InterfaceCycleTime	ara com
4	Interface cycle time variation(A.1.8)	InterfaceCycleTimeVariation	ara com
5	Information vehicle coordinate system(Table 46)	InformationVehicleCoordinateSystem	0
6	Information sensor pose(Table 46)	InformationSensorPose	0
7	Sensor origin point x error(A.1.23)	SensorOriginPointXError	ara com
8	Sensor origin point y error(A.1.23)	SensorOriginPointYError	ara com
9	Sensor origin point z error(A.1.23)	SensorOriginPointZError	ara com
10	Sensor origin point x x error (A.1.23)	SensorOriginPointXXError	ara com
11	Sensor origin point x y error (A.1.23)	SensorOriginPointXYError	ara com
12	Sensor origin point x z error (A.1.23)	SensorOriginPointXZError	ara com
13	Sensor origin point y x error (A.1.23)	SensorOriginPointYXError	ara com
14	Sensor origin point y y error (A.1.23)	SensorOriginPointYYError	ara com
15	Sensor origin point y z error (A.1.23)	SensorOriginPointYZError	ara com
16	Sensor origin point z x error (A.1.23)	SensorOriginPointZXError	ara com
17	Sensor origin point z y error (A.1.23)	SensorOriginPointZYError	ara com
18	Sensor origin point z z error (A.1.23)	SensorOriginPointZZError	ara com
19	Sensor orientation yaw error(A.1.25)	SensorOrientationYawError	ara com
20	Sensor orientation pitch error(A.1.25)	SensorOrientationPitchError	ara com
21	Sensor orientation roll error(A.1.25)	SensorOrientationRollError	ara com
22	Sensor orientation yaw yaw error (A.1.25)	SensorOrientationYawYawError	ara com
23	Sensor orientation yaw pitch error (A.1.25)	SensorOrientationYawPitchError	ara com

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Bit	Reference Singal in ISO23150	Reference Element in USSDetectionService	Option
24	Sensor orientation yaw roll error (A.1.25)	SensorOrientationYawRollError	ara com
25	Sensor orientation pitch yaw error (A.1.25)	SensorOrientationPitchYawError	ara com
26	Sensor orientation pitch pitch error (A.1.25)	SensorOrientationPitchPitchError	ara com
27	Sensor orientation pitch roll error (A.1.25)	SensorOrientationPitchRollError	ara com
28	Sensor orientation roll yaw error (A.1.25)	SensorOrientationRollYawError	ara com
29	Sensor orientation roll pitch error (A.1.25)	SensorOrientationRollPitchError	ara com
30	Sensor orientation roll roll error (A.1.25)	SensorOrientationRollRollError	ara com
31	Calibration(Table 48)	Calibration	0
32	Calibration process state(A.5.42)	CalibrationProcessState	ara com
33	Sensor origin point correction x(A.5.43)	SensorOriginPointCorrectionX	ara com
34	Sensor origin point correction y(A.5.43)	SensorOriginPointCorrectionY	ara com
35	Sensor origin point correction z(A.5.43)	SensorOriginPointCorrectionZ	ara com
36	Sensor origin point correction x error(A.5.44)	SensorOriginPointCorrectionXError	ara com
37	Sensor origin point correction y error(A.5.44)	SensorOriginPointCorrectionYError	ara com
38	Sensor origin point correction z error(A.5.44)	SensorOriginPointCorrectionZError	ara com
39	Sensor origin translation correction limit xbegin(A.5.45)	SensorOriginTranslationCorrectionLimitXbegin	ara com
40	Sensor origin translation correction limit xend(A.5.45)	SensorOriginTranslationCorrectionLimitXend	ara com
41	Sensor origin translation correction limit ybegin(A.5.45)	SensorOriginTranslationCorrectionLimitYbegin	ara com
42	Sensor origin translation correction limit yend(A.5.45)	SensorOriginTranslationCorrectionLimitYend	ara com
43	Sensor origin translation correction limit zbegin(A.5.45)	SensorOriginTranslationCorrectionLimitZbegin	ara com
44	Sensor origin translation correction limit zend(A.5.45)	SensorOriginTranslationCorrectionLimitZend	ara com
45	Sensor orientation correction yaw(A.5.46)	SensorOrientationCorrectionYaw	ara com
46	Sensor orientation correction pitch(A.5.46)	SensorOrientationCorrectionPitch	ara com
47	Sensor orientation correction roll(A.5.46)	SensorOrientationCorrectionRoll	ara com
48	Sensor orientation correction yaw error(A.5.47)	SensorOrientationCorrectionYawError	ara com
49	Sensor orientation correction pitch error(A.5.47)	SensorOrientationCorrectionPitchError	ara com
50	Sensor orientation correction roll error(A.5.47)	SensorOrientationCorrectionRollError	ara com
51	Sensor pose angle correction limit yawbegin(A.5.48)	SensorPoseAngleCorrectionLimitYawbegin	ara com
52	Sensor pose angle correction limit yawend(A.5.48)	SensorPoseAngleCorrectionLimitYawend	ara com
53	Sensor pose angle correction limit pitchbegin(A.5.48)	SensorPoseAngleCorrectionLimitPitchbegin	ara com
54	Sensor pose angle correction limit pitchend(A.5.48)	SensorPoseAngleCorrectionLimitPitchend	ara com
55	Sensor pose angle correction limit rollbegin(A.5.48)	SensorPoseAngleCorrectionLimitRollbegin	ara com
56	Sensor pose angle correction limit rollend(A.5.48)	SensorPoseAngleCorrectionLimitRollend	ara com
57	Sensor cluster(Table 48)	SensorCluster	0
58	Information Interface extension(Table 30)	InformationInterfaceExtension	0
59	Tracking motion model(A.1.13)	TrackingMotionModel	ara com

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Bit	Reference Singal in ISO23150	Reference Element in USSDetectionService	Option
60	Motion type(A.1.14)	MotionType	ara com
61	Colour model type(A.1.15)	ColourModelType	ara com
62	Information ambiguity domain(Table 30)	InformationAmbiguityDomain	0
63	Radial velocity ambiguity domain begin(A.1.16)	RadialVelocityAmbiguityDomainBegin	ara com
64	Radial velocity ambiguity domain end(A.1.16)	RadialVelocityAmbiguityDomainEnd	ara com
65	Range ambiguity domain begin(A.1.17)	RangeAmbiguityDomainBegin	ara com
66	Range ambiguity domain end(A.1.17)	RangeAmbiguityDomainEnd	ara com
67	Angle azimuth ambiguity domain begin(A.1.18)	AngleAzimuthAmbiguityDomainBegin	ara com
68	Angle azimuth ambiguity domain end(A.1.18)	AngleAzimuthAmbiguityDomainEnd	ara com
69	Angle elevation ambiguity domain begin(A.1.19)	AngleElevationAmbiguityDomainBegin	ara com
70	Angle elevation ambiguity domain end(A.1.19)	AngleElevationAmbiguityDomainEnd	ara com
71	Interface applicability(A.1.20)	InterfaceApplicability	ara com
72	Recognised detections capability(A.1.10.8)	RecognisedDetectionsCapability	ara com
73	Recognised detections status(A.1.11.8)	RecognisedDetectionsStatus	ara com
74	Object ID reference detection level(A.4.2)	ObjectIDReferenceDetectionLevel	ara com
75	Feature ID reference(A.4.3)	FeatureIDReference	ara com
76	Second sensor ID reference(A.4.36)	SecondSensorIDReference	ara com
77	Reflectivity(A.4.22)	Reflectivity	ara com
78	Height ultrasonic(A.4.39)	HeightUltrasonic	ara com
79	Height ultrasonic error(A.4.40)	HeightUltrasonicError	ara com

Table 10.9: Capability Vector of USSDetectionService

10.4 Supportive Service

10.4.1 SensorPerformanceService Capability Vector

The table below includes the capability bit setting for the optional elements for SensorPerformanceService, which also refers to ISO 23150.The Bit setting to 1 means the presence of the optional element, while 0 means absent.

Bit	Reference Singal in ISO23150	Reference Element in SensorPerformanceService	Option
1	Interface ID(A.1.4)	InterfaceID	Autosar Service
2	Message counter(A.1.6.2)	MessageCounter	ara com
3	Interface cycle time(A.1.7)	InterfaceCycleTime	ara com
4	Interface cycle time variation(A.1.8)	InterfaceCycleTimeVariation	ara com
5	Sensor origin point x error(A.1.23)	SensorOriginPointXError	ara com
6	Sensor origin point y error(A.1.23)	SensorOriginPointYError	ara com
7	Sensor origin point z error(A.1.23)	SensorOriginPointZError	ara com
8	Sensor origin point x x error (A.1.23)	SensorOriginPointXXError	ara com
9	Sensor origin point x y error (A.1.23)	SensorOriginPointXYError	ara com

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Bit	Reference Singal in ISO23150	Reference Element in SensorPerformance-Service	Option
10	Sensor origin point x z error (A.1.23)	SensorOriginPointXZError	ara com
11	Sensor origin point y x error (A.1.23)	SensorOriginPointYXError	ara com
12	Sensor origin point y y error (A.1.23)	SensorOriginPointYYError	ara com
13	Sensor origin point y z error (A.1.23)	SensorOriginPointYZError	ara com
14	Sensor origin point z x error (A.1.23)	SensorOriginPointZXError	ara com
15	Sensor origin point z y error (A.1.23)	SensorOriginPointZYError	ara com
16	Sensor origin point z z error (A.1.23)	SensorOriginPointZZError	ara com
17	Sensor orientation yaw error(A.1.25)	SensorOrientationYawError	ara com
18	Sensor orientation pitch error(A.1.25)	SensorOrientationPitchError	ara com
19	Sensor orientation roll error(A.1.25)	SensorOrientationRollError	ara com
20	Sensor orientation yaw yaw error (A.1.25)	SensorOrientationYawYawError	ara com
21	Sensor orientation yaw pitch error (A.1.25)	SensorOrientationYawPitchError	ara com
22	Sensor orientation yaw roll error (A.1.25)	SensorOrientationYawRollError	ara com
23	Sensor orientation pitch yaw error (A.1.25)	SensorOrientationPitchYawError	ara com
24	Sensor orientation pitch pitch error (A.1.25)	SensorOrientationPitchPitchError	ara com
25	Sensor orientation pitch roll error (A.1.25)	SensorOrientationPitchRollError	ara com
26	Sensor orientation roll yaw error (A.1.25)	SensorOrientationRollYawError	ara com
27	Sensor orientation roll pitch error (A.1.25)	SensorOrientationRollPitchError	ara com
28	Sensor orientation roll roll error (A.1.25)	SensorOrientationRollRollError	ara com
29	Calibration(Table 48)	Calibration	0
30	Calibration process state(A.5.42)	CalibrationProcessState	ara com
31	Sensor origin point correction x(A.5.43)	SensorOriginPointCorrectionX	ara com
32	Sensor origin point correction y(A.5.43)	SensorOriginPointCorrectionY	ara com
33	Sensor origin point correction z(A.5.43)	SensorOriginPointCorrectionZ	ara com
34	Sensor origin point correction x error(A.5.44)	SensorOriginPointCorrectionXError	ara com
35	Sensor origin point correction y error(A.5.44)	SensorOriginPointCorrectionYError	ara com
36	Sensor origin point correction z error(A.5.44)	SensorOriginPointCorrectionZError	ara com
37	Sensor origin translation correction limit xbegin(A.5.45)	SensorOriginTranslationCorrectionLimitXbegin	ara com
38	Sensor origin translation correction limit xend(A.5.45)	SensorOriginTranslationCorrectionLimitXend	ara com
39	Sensor origin translation correction limit ybegin(A.5.45)	SensorOriginTranslationCorrectionLimitYbegin	ara com
40	Sensor origin translation correction limit yend(A.5.45)	SensorOriginTranslationCorrectionLimitYend	ara com
41	Sensor origin translation correction limit zbegin(A.5.45)	SensorOriginTranslationCorrectionLimitZbegin	ara com
42	Sensor origin translation correction limit zend(A.5.45)	SensorOriginTranslationCorrectionLimitZend	ara com
43	Sensor orientation correction yaw(A.5.46)	SensorOrientationCorrectionYaw	ara com
44	Sensor orientation correction pitch(A.5.46)	SensorOrientationCorrectionPitch	ara com
45	Sensor orientation correction roll(A.5.46)	SensorOrientationCorrectionRoll	ara com
46	Sensor orientation correction yaw error(A.5.47)	SensorOrientationCorrectionYawError	ara com
47	Sensor orientation correction pitch error(A.5.47)	SensorOrientationCorrectionPitchError	ara com
48	Sensor orientation correction roll error(A.5.47)	SensorOrientationCorrectionRollError	ara com

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Bit	Reference Singal in ISO23150	Reference Element in SensorPerformance-Service	Option
49	Sensor pose angle correction limit yawbegin(A.5.48)	SensorPoseAngleCorrectionLimitYawbegin	ara com
50	Sensor pose angle correction limit yawend(A.5.48)	SensorPoseAngleCorrectionLimitYawend	ara com
51	Sensor pose angle correction limit pitchbegin(A.5.48)	SensorPoseAngleCorrectionLimitPitchbegin	ara com
52	Sensor pose angle correction limit pitchend(A.5.48)	SensorPoseAngleCorrectionLimitPitchend	ara com
53	Sensor pose angle correction limit rollbegin(A.5.48)	SensorPoseAngleCorrectionLimitRollbegin	ara com
54	Sensor pose angle correction limit rollend(A.5.48)	SensorPoseAngleCorrectionLimitRollend	ara com
55	Sensor cluster(Table 48)	SensorCluster	0
56	Tracking motion model(A.1.13)	TrackingMotionModel	ara com
57	Motion type(A.1.14)	MotionType	ara com
58	Colour model type(A.1.15)	ColourModelType	ara com
59	Information ambiguity domain(Table 30)	InformationAmbiguityDomain	0
60	Radial velocity ambiguity domain begin(A.1.16)	RadialVelocityAmbiguityDomainBegin	ara com
61	Radial velocity ambiguity domain end(A.1.16)	RadialVelocityAmbiguityDomainEnd	ara com
62	Range ambiguity domain begin(A.1.17)	RangeAmbiguityDomainBegin	ara com
63	Range ambiguity domain end(A.1.17)	RangeAmbiguityDomainEnd	ara com
64	Angle azimuth ambiguity domain begin(A.1.18)	AngleAzimuthAmbiguityDomainBegin	ara com
65	Angle azimuth ambiguity domain end(A.1.18)	AngleAzimuthAmbiguityDomainEnd	ara com
66	Angle elevation ambiguity domain begin(A.1.19)	AngleElevationAmbiguityDomainBegin	ara com
67	Angle elevation ambiguity domain end(A.1.19)	AngleElevationAmbiguityDomainEnd	ara com
68	Interface applicability(A.1.20)	InterfaceApplicability	ara com
69	Information sensor surrounding(Table 46)	InformationSensorSurrounding	0
70	Vanishing point azimuth error(A.1.27)	VanishingPointAzimuthError	ara com
71	Vanishing point elevation error(A.1.27)	VanishingPointElevationError	ara com
72	Measurement grid resolution radial distance(A.5.3)	MeasurementGridResolutionRadialDistance	ara com
73	Measurement grid resolution azimuth(A.5.3)	MeasurementGridResolutionAzimuth	ara com
74	Measurement grid resolution elevation(A.5.3)	MeasurementGridResolutionElevation	ara com
75	Beam divergence azimuth(A.5.4)	BeamDivergenceAzimuth	ara com
76	Beam divergence elevation(A.5.4)	BeamDivergenceElevation	ara com
77	Range gain(A.5.5)	RangeGain	ara com
78	Field of view reduction(Table 46)	FieldOfViewReduction	0
79	Real world object recognition capabilities (Table 46)	RealWorldObjectRecognitionCapabilities	0
80	True positive rate(A.5.13)	TruePositiveRate	ara com
81	False positive rate(A.5.14)	FalsePositiveRate	ara com
82	Positive predictive value(A.5.15)	PositivePredictiveValue	ara com
83	Reference target recognition capabilities(Table 46)	ReferenceTargetRecognitionCapabilities	0
84	Reference target type(A.5.17)	ReferenceTargetType	ara com
85	Radar cross section reference target(A.5.18)	RadarCrossSectionReferenceTarget	ara com

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Bit	Reference Singal in ISO23150	Reference Element in SensorPerformance-Service	Option
86	Reflectivity reference target(A.5.19)	ReflectivityReferenceTarget	ara com
87	True positive rate(A.5.13)	TruePositiveRate	ara com
88	Relative radial velocity range begin(A.5.20)	RelativeRadialVelocityRangeBegin	ara com
89	Relative radial velocity range end(A.5.20)	RelativeRadialVelocityRangeEnd	ara com
90	Spatial separability radial distance(A.5.22)	SpatialSeparabilityRadialDistance	ara com
91	Spatial separability azimuth(A.5.22)	SpatialSeparabilityAzimuth	ara com
92	Spatial separability elevation(A.5.22)	SpatialSeparabilityElevation	ara com
93	Velocity separability radial distance(A.5.23)	VelocitySeparabilityRadialDistance	ara com
94	Velocity separability azimuth(A.5.23)	VelocitySeparabilityAzimuth	ara com
95	Velocity separability elevation(A.5.23)	VelocitySeparabilityElevation	ara com

Table 10.10: Capability Vector of SensorPerformanceService

10.4.2 SensorHealthService Capability Vector

The table below includes the capability bit setting for the optional elements for SensorHealthService, which also refers to ISO 23150.The Bit setting to 1 means the presence of the optional element, while 0 means absent.

Bit	Reference Singal in ISO23150	Reference Element in SensorHealthService	Option
1	Interface ID(A.1.4)	InterfaceID	Autosar Service
2	Message counter(A.1.6.2)	MessageCounter	ara com
3	Interface cycle time(A.1.7)	InterfaceCycleTime	ara com
4	Interface cycle time variation(A.1.8)	InterfaceCycleTimeVariation	ara com
5	Information vehicle coordinate system(Table 46)	InformationVehicleCoordinateSystem	0
6	Information sensor pose(Table 46)	InformationSensorPose	0
7	Sensor origin point x error(A.1.23)	SensorOriginPointXError	ara com
8	Sensor origin point y error(A.1.23)	SensorOriginPointYError	ara com
9	Sensor origin point z error(A.1.23)	SensorOriginPointZError	ara com
10	Sensor origin point x x error (A.1.23)	SensorOriginPointXXError	ara com
11	Sensor origin point x y error (A.1.23)	SensorOriginPointXYError	ara com
12	Sensor origin point x z error (A.1.23)	SensorOriginPointXZError	ara com
13	Sensor origin point y x error (A.1.23)	SensorOriginPointYXError	ara com
14	Sensor origin point y y error (A.1.23)	SensorOriginPointYYError	ara com
15	Sensor origin point y z error (A.1.23)	SensorOriginPointYZError	ara com
16	Sensor origin point z x error (A.1.23)	SensorOriginPointZXError	ara com
17	Sensor origin point z y error (A.1.23)	SensorOriginPointZYError	ara com
18	Sensor origin point z z error (A.1.23)	SensorOriginPointZZError	ara com
19	Sensor orientation yaw error(A.1.25)	SensorOrientationYawError	ara com
20	Sensor orientation pitch error(A.1.25)	SensorOrientationPitchError	ara com
21	Sensor orientation roll error(A.1.25)	SensorOrientationRollError	ara com

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Bit	Reference Singal in ISO23150	Reference Element in SensorHealthService	Option
22	Sensor orientation yaw yaw error (A.1.25)	SensorOrientationYawYawError	ara com
23	Sensor orientation yaw pitch error (A.1.25)	SensorOrientationYawPitchError	ara com
24	Sensor orientation yaw roll error (A.1.25)	SensorOrientationYawRollError	ara com
25	Sensor orientation pitch yaw error (A.1.25)	SensorOrientationPitchYawError	ara com
26	Sensor orientation pitch pitch error (A.1.25)	SensorOrientationPitchPitchError	ara com
27	Sensor orientation pitch roll error (A.1.25)	SensorOrientationPitchRollError	ara com
28	Sensor orientation roll yaw error (A.1.25)	SensorOrientationRollYawError	ara com
29	Sensor orientation roll pitch error (A.1.25)	SensorOrientationRollPitchError	ara com
30	Sensor orientation roll roll error (A.1.25)	SensorOrientationRollRollError	ara com
31	Calibration(Table 48)	Calibration	Q This should be in the header or in the body for Sensor Health information
32	Calibration process state(A.5.42)	CalibrationProcessState	ara com
33	Sensor origin point correction x(A.5.43)	SensorOriginPointCorrectionX	ara com
34	Sensor origin point correction y(A.5.43)	SensorOriginPointCorrectionY	ara com
35	Sensor origin point correction z(A.5.43)	SensorOriginPointCorrectionZ	ara com
36	Sensor origin point correction x error(A.5.44)	SensorOriginPointCorrectionXError	ara com
37	Sensor origin point correction y error(A.5.44)	SensorOriginPointCorrectionYError	ara com
38	Sensor origin point correction z error(A.5.44)	SensorOriginPointCorrectionZError	ara com
39	Sensor origin translation correction limit xbegin(A.5.45)	SensorOriginTranslationCorrectionLimitXbegin	ara com
40	Sensor origin translation correction limit xend(A.5.45)	SensorOriginTranslationCorrectionLimitXend	ara com
41	Sensor origin translation correction limit ybegin(A.5.45)	SensorOriginTranslationCorrectionLimitYbegin	ara com
42	Sensor origin translation correction limit yend(A.5.45)	SensorOriginTranslationCorrectionLimitYend	ara com
43	Sensor origin translation correction limit zbegin(A.5.45)	SensorOriginTranslationCorrectionLimitZbegin	ara com
44	Sensor origin translation correction limit zend(A.5.45)	SensorOriginTranslationCorrectionLimitZend	ara com
45	Sensor orientation correction yaw(A.5.46)	SensorOrientationCorrectionYaw	ara com
46	Sensor orientation correction pitch(A.5.46)	SensorOrientationCorrectionPitch	ara com
47	Sensor orientation correction roll(A.5.46)	SensorOrientationCorrectionRoll	ara com
48	Sensor orientation correction yaw error(A.5.47)	SensorOrientationCorrectionYawError	ara com
49	Sensor orientation correction pitch error(A.5.47)	SensorOrientationCorrectionPitchError	ara com
50	Sensor orientation correction roll error(A.5.47)	SensorOrientationCorrectionRollError	ara com
51	Sensor pose angle correction limit yawbegin(A.5.48)	SensorPoseAngleCorrectionLimitYawbegin	ara com
52	Sensor pose angle correction limit yawend(A.5.48)	SensorPoseAngleCorrectionLimitYawend	ara com
53	Sensor pose angle correction limit pitchbegin(A.5.48)	SensorPoseAngleCorrectionLimitPitchbegin	ara com
54	Sensor pose angle correction limit pitchend(A.5.48)	SensorPoseAngleCorrectionLimitPitchend	ara com
55	Sensor pose angle correction limit rollbegin(A.5.48)	SensorPoseAngleCorrectionLimitRollbegin	ara com

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Bit	Reference Singal in ISO23150	Reference Element in SensorHealthService	Option
56	Sensor pose angle correction limit rollend(A.5.48)	SensorPoseAngleCorrectionLimitRollend	ara com
57	Sensor cluster(Table 48)	SensorCluster	0
58	Information Interface extension(Table 30)	InformationInterfaceExtension	0
59	Tracking motion model(A.1.13)	TrackingMotionModel	ara com
60	Motion type(A.1.14)	MotionType	ara com
61	Colour model type(A.1.15)	ColourModelType	ara com
62	Information ambiguity domain(Table 30)	InformationAmbiguityDomain	0
63	Radial velocity ambiguity domain begin(A.1.16)	RadialVelocityAmbiguityDomainBegin	ara com
64	Radial velocity ambiguity domain end(A.1.16)	RadialVelocityAmbiguityDomainEnd	ara com
65	Range ambiguity domain begin(A.1.17)	RangeAmbiguityDomainBegin	ara com
66	Range ambiguity domain end(A.1.17)	RangeAmbiguityDomainEnd	ara com
67	Angle azimuth ambiguity domain begin(A.1.18)	AngleAzimuthAmbiguityDomainBegin	ara com
68	Angle azimuth ambiguity domain end(A.1.18)	AngleAzimuthAmbiguityDomainEnd	ara com
69	Angle elevation ambiguity domain begin(A.1.19)	AngleElevationAmbiguityDomainBegin	ara com
70	Angle elevation ambiguity domain end(A.1.19)	AngleElevationAmbiguityDomainEnd	ara com
71	Interface applicability(A.1.20)	InterfaceApplicability	ara com
72	Sensor externally disturbed(A.5.33)	SensorExternallyDisturbed	ara com
73	Sensor transmit power reduced(A.5.34)	SensorTransmitPowerReduced	ara com
74	Status sensor heating(A.5.35)	StatusSensorHeating	ara com
75	Status sensor cleaning(A.5.36)	StatusSensorCleaning	ara com
76	Sensor time sync(A.5.37)	SensorTimeSync	ara com
77	Sensor time sync offset value(A.5.38)	SensorTimeSyncOffsetValue	ara com

Table 10.11: Capability Vector of SensorHealthService

A Change history of AUTOSAR traceable items

Please note that the lists in this chapter also include traceable items that have been removed from the specification in a later version. These items do not appear as hyperlinks in the document.

A.1 Traceable item history of this document according to AUTOSAR Release R23-11

A.1.1 Added Specification Items in R23-11

none

A.1.2 Changed Specification Items in R23-11

Number	Heading
[SWS_ADI_00001]	The Camera Sensor Data periodical Transmission
[SWS_ADI_00002]	The Lidar Sensor Data periodical Transmission
[SWS_ADI_00003]	The Radar Sensor Data periodical Transmission
[SWS_ADI_00004]	The Ultrasonic Sensor Data periodical Transmission
[SWS_ADI_00005]	Receving periodical sensor data
[SWS_ADI_00006]	Sensor specific services for different level ISO interfaces
[SWS_ADI_00101]	Definition of ImplementationDataType InterfaceVersionID
[SWS_ADI_00103]	Definition of ImplementationDataType InterfaceID
[SWS_ADI_00104]	Definition of ImplementationDataType DataQualifier
[SWS_ADI_00105]	Definition of ImplementationDataType RecognizedStatus
[SWS_ADI_00106]	Definition of ImplementationDataType TrackingMotionModel
[SWS_ADI_00107]	Definition of ImplementationDataType MotionType
[SWS_ADI_00108]	Definition of ImplementationDataType ColourModelType
[SWS_ADI_00113]	Definition of ImplementationDataType InterfaceApplicability
[SWS_ADI_00114]	Definition of ImplementationDataType VehicleCoordinateSystemType
[SWS_ADI_00125]	Definition of ImplementationDataType SensorIDList
[SWS_ADI_00126]	Definition of ImplementationDataType InformationInterface
[SWS_ADI_00200]	Definition of ImplementationDataType MeasurementStatus
[SWS_ADI_00201]	Definition of ImplementationDataType ReferencePoint
[SWS_ADI_00202]	Definition of ImplementationDataType MovementStatus
[SWS_ADI_00203]	Definition of ImplementationDataType RoadLevel
[SWS_ADI_00206]	Definition of ImplementationDataType IncludedGeometricStructures

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Number	Heading
[SWS_ADI_00207]	Definition of ImplementationDataType PotentiallyMovingObjectClassification Type
[SWS_ADI_00208]	Definition of ImplementationDataType LightStatus
[SWS_ADI_00209]	Definition of ImplementationDataType LightType
[SWS_ADI_00210]	Definition of ImplementationDataType PersonPoseType
[SWS_ADI_00211]	Definition of ImplementationDataType ObjectLaneAssociation
[SWS_ADI_00216]	Definition of ImplementationDataType ObjectStatus
[SWS_ADI_00231]	Definition of ImplementationDataType PotentiallyMovingObjects
[SWS_ADI_00234]	Definition of ImplementationDataType ObservationStatus
[SWS_ADI_00300]	Definition of ImplementationDataType RoadType
[SWS_ADI_00301]	Definition of ImplementationDataType RoadSurfaceClassificationType
[SWS_ADI_00302]	Definition of ImplementationDataType RoadConditionClassificationType
[SWS_ADI_00303]	Definition of ImplementationDataType RoadMarkingType
[SWS_ADI_00304]	Definition of ImplementationDataType ArrowDirection
[SWS_ADI_00305]	Definition of ImplementationDataType SignClassificationType
[SWS_ADI_00306]	Definition of ImplementationDataType SignValueUnit
[SWS_ADI_00307]	Definition of ImplementationDataType ConnectionType
[SWS_ADI_00313]	Definition of ImplementationDataType PolylineInterpolationMethod
[SWS_ADI_00315]	Definition of ImplementationDataType RoadBoundaryType
[SWS_ADI_00316]	Definition of ImplementationDataType RoadObjectLaneAssociation
[SWS_ADI_00317]	Definition of ImplementationDataType RoadBoundaries
[SWS_ADI_00319]	Definition of ImplementationDataType SignState
[SWS_ADI_00325]	Definition of ImplementationDataType RoadMarkingClassification
[SWS_ADI_00328]	Definition of ImplementationDataType ValidConnection
[SWS_ADI_00330]	Definition of ImplementationDataType ValidPolynomial
[SWS_ADI_00347]	Definition of ImplementationDataType SupportedAxis
[SWS_ADI_00401]	Definition of ImplementationDataType GeneralLandmarkClassificationType
[SWS_ADI_00402]	Definition of ImplementationDataType SignGeometry
[SWS_ADI_00405]	Definition of ImplementationDataType LaneRelevanceClassificationType
[SWS_ADI_00406]	Definition of ImplementationDataType SupplementarySignClassificationType
[SWS_ADI_00407]	Definition of ImplementationDataType RelativePosition
[SWS_ADI_00408]	Definition of ImplementationDataType StructureLightClassificationType
[SWS_ADI_00409]	Definition of ImplementationDataType ColourClassificationType
[SWS_ADI_00410]	Definition of ImplementationDataType LightModeClassificationType
[SWS_ADI_00411]	Definition of ImplementationDataType LightShapeClassificationType
[SWS_ADI_00417]	Definition of ImplementationDataType GeneralLandmark
[SWS_ADI_00419]	Definition of ImplementationDataType GeneralLandmarks
[SWS_ADI_00432]	Definition of ImplementationDataType TrafficSigns
[SWS_ADI_00445]	Definition of ImplementationDataType TrafficLightSpots

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Number	Heading
[SWS_ADI_00448]	Definition of ImplementationDataType TrafficLights
[SWS_ADI_00449]	Definition of ImplementationDataType StaticObjectInterface
[SWS_ADI_00506]	Definition of ImplementationDataType BlockageStatus
[SWS_ADI_00508]	Definition of ImplementationDataType FieldOfViewReductionReasonType
[SWS_ADI_00511]	Definition of ImplementationDataType RecognizedObjectType
[SWS_ADI_00513]	Definition of ImplementationDataType RecognizableObjectTypes
[SWS_ADI_00514]	Definition of ImplementationDataType ValidRecognizableObjectTypesVector
[SWS_ADI_00515]	Definition of ImplementationDataType RealWorldObjectRecognition Capabilities
[SWS_ADI_00516]	Definition of ImplementationDataType ReferenceTargetType
[SWS_ADI_00523]	Definition of ImplementationDataType SensorOperationMode
[SWS_ADI_00524]	Definition of ImplementationDataType SensorDefectDetected
[SWS_ADI_00525]	Definition of ImplementationDataType SensorDefectReason
[SWS_ADI_00527]	Definition of ImplementationDataType StatusSupplyVoltage
[SWS_ADI_00528]	Definition of ImplementationDataType SensorTemperatureStatus
[SWS_ADI_00530]	Definition of ImplementationDataType SensorInputSignalType
[SWS_ADI_00531]	Definition of ImplementationDataType SensorInputSignalStatus
[SWS_ADI_00532]	Definition of ImplementationDataType SensorExternalDisturbed
[SWS_ADI_00533]	Definition of ImplementationDataType SensorTransmitPowerReduced
[SWS_ADI_00534]	Definition of ImplementationDataType StatusSensorHeating
[SWS_ADI_00535]	Definition of ImplementationDataType StatusSensorCleaning
[SWS_ADI_00536]	Definition of ImplementationDataType SensorTimeSync
[SWS_ADI_00539]	Definition of ImplementationDataType SensorCalibratableComponent
[SWS_ADI_00540]	Definition of ImplementationDataType SensorCalibrationStatus
[SWS_ADI_00546]	Definition of ImplementationDataType Calibration
[SWS_ADI_00548]	Definition of ImplementationDataType CalibrationProcessState
[SWS_ADI_00551]	Definition of ImplementationDataType SensorCluster
[SWS_ADI_00601]	Definition of ImplementationDataType ShapeType
[SWS_ADI_00602]	Definition of ImplementationDataType ShapeClassificationType
[SWS_ADI_00603]	Definition of ImplementationDataType UltrasonicFeatureClassificationType
[SWS_ADI_00605]	Definition of ImplementationDataType Point2DError
[SWS_ADI_00606]	Definition of ImplementationDataType TrilaterationStatus
[SWS_ADI_00607]	Definition of ImplementationDataType MeasurementStatusFeature
[SWS_ADI_00614]	Definition of ImplementationDataType ShapeReferencePoint
[SWS_ADI_00617]	Definition of ImplementationDataType FeatureStatus
[SWS_ADI_00620]	Definition of ImplementationDataType CameraFeatureInterface
[SWS_ADI_00628]	Definition of ImplementationDataType UltrasonicFeatureInterface
[SWS_ADI_00703]	Definition of ImplementationDataType DetectionClassificationType
[SWS_ADI_00714]	Definition of ImplementationDataType RadarDetectionsInterface

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Number	Heading
[SWS_ADI_00719]	Definition of ImplementationDataType LidarDetectionsInterface
[SWS_ADI_00732]	Definition of ImplementationDataType UltrasonicDetectionsInformation
[SWS_ADI_00733]	Definition of ImplementationDataType UltrasonicDetection
[SWS_ADI_01008]	Definition of ServiceInterface CameraDetectionsService

Table A.1: Changed Specification Items in R23-11

A.1.3 Deleted Specification Items in R23-11

none