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References

[1] ISO/IEC Directives, Part 2, Principles and rules for the structure and drafting of ISO and IEC documents
https://www.iso.org/sites/directives/current/part2/index.xhtml

[2] Specification of Operating System
AUTOSAR_CP_SWS_OS

[3] Specification of Watchdog Manager
AUTOSAR_CP_SWS_WatchdogManager

[4] Specification of LIN Interface
AUTOSAR_CP_SWS_LINInterface

1 Introduction

1.1 Scope of This Document

This document provides an overview of the AUTOSAR standard Classic Platform release R25-11.

1.2 Terminology and Licenses

1.2.1 Disclaimer Regarding Language in This Release

This release may contain terminology or phrasing that, while historically or technically conventional, could be perceived as outdated, insensitive, or discriminatory in modern contexts. AUTOSAR wishes to explicitly state that any such language is unintentional and is not meant to offend, exclude, or imply prejudice against any individual or group.

Such instances typically arise from:

Historical Usage Terms that were once common in technical or industry parlance.

Legacy Systems Descriptions inherited from older systems or standards that predate current inclusive language guidelines.

Technical Specificity Language chosen for precise technical meaning, which may inadvertently carry unintended connotations.

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AUTOSAR is committed to fostering an inclusive environment and regularly reviews our documentation to identify and update language that does not align with our values. Among other guidelines, AUTOSAR is referring to the relevant ISO standard ISO/IEC Directives, Part 2 [1].

If you encounter any language within this document that you find concerning, AUTOSAR encourages you to provide feedback so AUTOSAR can address the feedback in future revisions.

1.2.2 Usage of W3C XML Schema

The AUTOSAR XML Schema requires the XML namespace definition file xml.xsd.

There are several occurrences of the “xml.xsd” file within this release. For all occurrences the W3C license applies which can be found on `https://www.w3.org/Consortium/Legal/2015/copyright-software-and-document`.

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1.3 AUTOSAR Standards

1.3.1 Introduction

AUTOSAR addresses a wide range of use cases in automotive software development with its standards. These use cases have different requirements and lead to different technical solutions.

Packaging its deliverables into different standards

- eases the access to AUTOSAR solutions for users and
- allows AUTOSAR to scale with market needs.

1.3.2 Definition

An AUTOSAR standard is a consistent set of AUTOSAR deliverables, which are released at the same time. AUTOSAR deliverables can be of but are not limited to the following kinds:

- Textual explanations
- Textual specifications
- Test specifications
- Source code
- Other formal or semi-formal textual formats (e.g., ARXML, UML models, XML schemata)

At the time of release, AUTOSAR ensures that dependencies are fulfilled.

1.3.3 Overview of AUTOSAR's Standards

AUTOSAR delivers the following standards:

Standard	Abbreviation
Adaptive Platform	AP
Classic Platform	CP
Foundation	FO

1.3.3.1 Adaptive Platform

The Adaptive Platform is AUTOSAR's solution for high-performance computing ECUs to build safety-related systems for use cases such as highly automated and autonomous driving.

1.3.3.2 Classic Platform

The Classic Platform is AUTOSAR's solution for embedded systems with hard real-time and safety constraints.

1.3.3.3 Foundation

The purpose of the Foundation standard is to enforce interoperability between the AUTOSAR platforms.

Foundation contains the generic artifacts that are common for AP and CP to ensure compatibility between

- Classic- and Adaptive Platform and
- Non-AUTOSAR platforms to AUTOSAR platforms.

1.3.4 Dependencies Between Standards

Each release of Classic and Adaptive Platform relies on a dedicated version of Foundation. The specific dependency is documented in chapter 1.4.5.

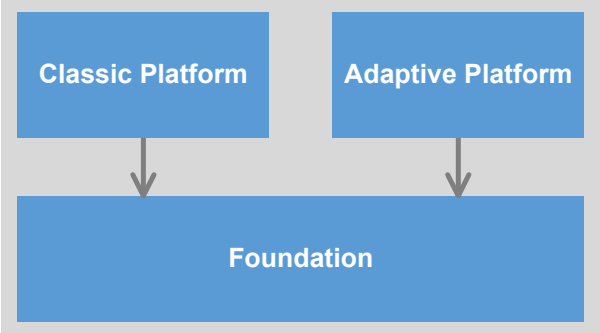

Figure 1.1: Dependencies of AUTOSAR standards

1.3.5 Dependencies to Other Standards

This release of the Classic Platform depends on the standard Foundation in release R25-11, which

- defines protocols implemented by Classic Platform,
- contains the project objectives and the common requirements from which the features of the Classic Platform are derived,
- contains common specification parts which apply to both, the Adaptive Platform and the Classic Platform.

These dependencies are refined in the trace information of the requirements in the respective specifications.

1.4 Release Numbering and Life Cycle

1.4.1 Release Life Cycle of a Major Release

Each major release goes through four consecutive steps within its life cycle (examples based on the internal release numbering scheme):

1. Development: Between start of life cycle and the initial release (e.g., R4.0.1)
2. Evolution: Following the initial release with zero, one or several minor releases and/or revisions (e.g., R4.0.2, R4.1.1)
3. Maintenance: No new content is added to a major release but only maintenance of the existing content with zero, one or several revisions (e.g., R3.2.2) is provided
4. Issue Notice: No more revisions but zero, one or several issue notices, i.e., updates of the list of known issues until end of life cycle.

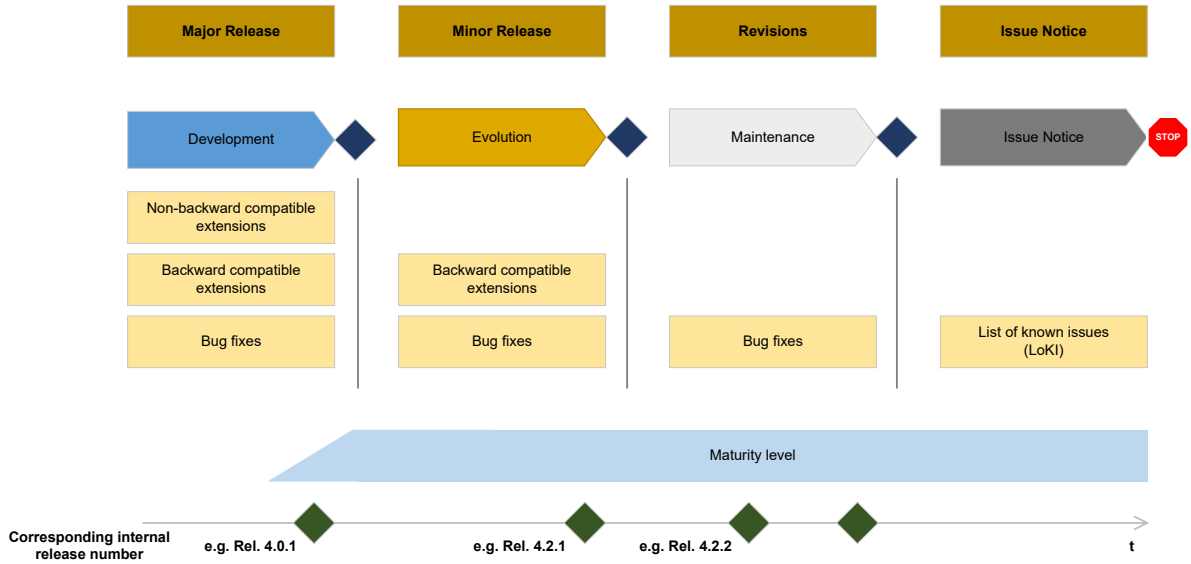

Figure 1.2: Life cycle model of AUTOSAR standards

1.4.2 Life Cycle States of Specification Items and Requirements

The life cycle state of a specification item is found after the specification item ID surrounded by curly brackets. The states are:

VALID This indicates that the related entity is a valid part of the document. This is the default and also applies if no dedicated life cycle status is annotated for the related entity.

DRAFT This indicates that the related entity is newly introduced but still experimental. This information is published but is subject to change without backward compatibility guarantee.

OBSOLETE This indicates that the related entity is subject to be removed in one of the following releases without further notice.

The life cycle state of a requirement is found in the attribute “Status”. The states are the same as the specification item states.

1.4.3 Platform Release Number

AUTOSAR applies a four-digit numbering scheme Ryy-mm to identify releases. The identifiers “yy” and “mm” depict the year and month of the release date, for example, R20-11 for the November 2020 release.

1.4.4 Internal Release Number

AUTOSAR additionally maintains an internal release number for different purposes (e.g., usage in BSW modules in Classic Platform).
The internal release number is used for all platforms and follows up on the Classic Platform release number. In Adaptive Platform this is newly introduced. In Foundation this leads to a discontinuation of the former numbering pattern (e.g., R1.5.0).
A mapping between Platform Releases and corresponding internal release numbers can be found in chapter 1.4.5. The internal release number uses a three-digit numbering scheme R<major>.<minor>.<revision> to identify releases. Its primary purpose is to identify a release as

- a major release: Valid and draft specification parts may be changed backward incompatibly.
- a minor release: Valid specification parts may only be changed backward compatibly. Draft specification parts may be changed backward incompatibly.
- a revision: Does not contain extensions but only backward compatible bugfixes.

1.4.5 Overview of AUTOSAR Releases and Corresponding AUTOSAR Schema Versions

Until the Releases CP R4.4.0 and AP R19-03, AUTOSAR released the platforms separately where a Foundation release went along with each platform release. Since compatibility between the platforms is essential to be able to have AP and CP ECUs within one vehicle project, an XML schema needs to be available that works with the different releases. The following table gives an overview about the different schema versions and the corresponding platform releases they can be used for.

The AUTOSAR schema does not have an impact on the Foundation. The Foundation releases are mentioned for the sake of completeness.

Schema version	Classic Platform release	Adaptive Platform release	Foundation release
AUTOSAR_00042	R4.3.0	R17-03	R1.1.0
AUTOSAR_00043	R4.3.0	R17-10	R1.2.0
AUTOSAR_00044	R4.3.1	R17-10	R1.3.0
AUTOSAR_00045	R4.3.1	R18-03	R1.4.0
AUTOSAR_00046	R4.4.0	R18-10	R1.5.0
AUTOSAR_00047	R4.4.0	R19-03	R1.5.1

Table 1.1: Mapping schema version to platform releases (until CP R4.4.0/AP R19-03)

Starting with release R19-11, all platforms are released as one AUTOSAR release and therefore come along with one schema version.

Schema version	Platform release	Internal release number
AUTOSAR_00048	R19-11	R4.5.0
AUTOSAR_00049	R20-11	R4.6.0
AUTOSAR_00050	R21-11	R4.7.0
AUTOSAR_00051	R22-11	R4.8.0
AUTOSAR_00052	R23-11	R4.9.0
AUTOSAR_00053	R24-11	R4.10.0
AUTOSAR_00054	**R25-11**	**R4.11.0**

Table 1.2: Mapping schema version to platform release and internal release number (since R19-11)

According to the release life cycle of AUTOSAR the release R25-11 is a minor release.

1.5 Content of Chapters

This document is structured as follows:

- Chapter 1 introduces AUTOSAR's release strategy and its standardization approach.
- Chapter 2 provides a summary of changes since the previous release of the Classic Platform.
- Chapter 3 contains the overview of specifications comprising the AUTOSAR release R25-11. This chapter is structured according to the clusters of AUTOSAR release R25-11.
- Chapter 4 contains remarks about known technical deficiencies.
- Chapter 5 contains the detailed revision history of all released specifications.

2 Summary of Changes in Release R25-11

This chapter contains a summary of the changes that have been implemented since the previous release R24-11.

2.1 Concepts

2.1.1 Introduced Concepts

The following concepts in 2.1.1.1–2.1.1.5 have been introduced.

2.1.1.1 Vehicle Data Protocol

The Vehicle Data Protocol (VDP) is introduced as a protocol which is specifically designed to collect data from distributed ECUs in production vehicles. One key part of the suitability of this protocol for in-vehicle data collection is a systematic decoupling between sampling and transmission while supporting flexible sampling and transmission strategies.

2.1.1.2 Revise MACsec Support

The concept focuses on specification gaps and ambiguous requirements regarding the MACsec support in the communication stack of AUTOSAR Classic Platform:

- Clarifies the Ethernet hardware topologies that are supported by the current AUTOSAR specification
- Refines description of SAK handling in MKA
- Introduces MKA sequence diagrams to denote interaction between server and peer based on the MKA protocol
- Introduces link-down handling in MKA module
- Introduces initialization actions important for fast start up of MKA module
- Introduces transmission and reception at the MKA via LSduR
- Introduces retry handling in MKA for API calls towards the lower layers
- Introduces MACsec support for Ethernet switch ports
- Introduces MACsec support for Ethernet controller
- Introduces MAC multicast address as bypass rule
- Clarifies MACsec API handling in EthIf, EthSwt, EthTrcv and Eth driver

- Introduces direct addressing for efficient handling between EthIf and Ethernet driver layers
- Clarifies link state handling in context of EthIf with respect to MACsec configuration and operational state
- Incorporates fixes for bugs which were raised during the last couple of months

2.1.1.3 COMHandler

The concept provides a way to increase the abstraction of the application from the type of communication signal (inter-ECU or intra-ECU) to decrease code changes, increase reusability and flexibility. In order to do that it provides the communication error abstraction, monitoring of errors (data integrity, reception deadline monitoring, data invalidity, data range check) and error reporting. Moreover, it merges LdCom functionality into Com.

2.1.1.4 PRS Time Synchronization Over Can Protocol

The concept splits the existing specification CP SWS TimeSyncOverCAN into two documents:

- FO PRS TimeSyncOverCANProtocol contains the pure protocol specification, which may be used outside of AUTOSAR implementations.
- CP SWS TimeSyncOverCAN specifies how to implement the protocol specification in an AUTOSAR context.

2.1.1.5 DDS Support on Classic Platform

The proposed concept introduces Service-Oriented Architecture (SOA) support into the DDS protocol. Management functionalities for Events, Methods, and Fields, previously available through SOME/IP, are now extended to DDS, offering increased flexibility thanks to its native capability of defining Quality of Service (QoS) parameters at various levels.

This extension is achieved through a functional division into two key components:

- Introduction of new objects within the ECUC model, aimed at the granular implementation of individual SOA functionalities. Introduction of full support of ClientServerInterface and the new BSW module DDS Transformer.
- Integration of the OMG SPDP and SEDP discovery protocols, along with the Service Discovery protocol already defined in the AUTOSAR Adaptive Platform, thus ensuring cross-solution compatibility.

This integration is complemented by an extension of the model and the specification of system-level requirements within the System Template, ensuring coherent alignment of the architecture across the platform.

2.1.2 Impact of Concepts

The introduced concepts have an impact on several specifications. The following table provides a detailed overview.

Please note that some of the specifications are marked by special text formatting:

- Specifications in **bold** font are completely new specifications originating from the particular concept.
- If specifications or models like the BSW UML model or the ECUC model are only indirectly affected because they just provide artifacts for other specifications, they are not listed here.

Concept Name	Specification Name	Affected Standard	Concept Lifecycle
Vehicle Data Protocol	**CP SWS VDPCMRemote**	Classic Platform, Foundation	valid
	CP SWS BSWGeneral		
	CP TPS SystemTemplate		
	CP EXP LayeredSoftwareArchitecture		
	FO TR Features		
Revise MACsec Support	CP SWS EthernetDriver	Classic Platform, Foundation	valid
	CP SWS EthernetInterface		
	CP SWS EthernetSwitchDriver		
	CP SWS EthernetTransceiverDriver		
	CP SWS MACsecKeyAgreement		
	FO RS MACsec		
COM Handler	CP RS COM	Classic Platform, Foundation	valid
	CP RS RTE		
	CP SWS COM		
	CP SWS E2ETransformer		
	CP SWS RTE		
	CP SWS SecureOnboardCommunication		
	CP TPS SoftwareComponentTemplate		
	CP TPS SystemTemplate		
	CP EXP LayeredSoftwareArchitecture		
	CP SWS CommunicationStackTypes		

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Concept Name	Specification Name	Affected Standard	Concept Lifecycle
	CP SWS DataDistributionService		
	CP SWS E2ELibrary		
	CP SWS IEEE1722TransportLayer		
	CP SWS PDURouter		
	CP SWS SoftwareClusterConnection		
	FO RS SecureOnboard-Communication		
	CP SWS SOMEIPTransportProtocol		
	CP TPS DiagnosticExtractTemplate		
	AP TPS ManifestSpecification		
	CP ASWS TransformerGeneral		
	CP RS SoftwareClusterConnection		
PRS Time Synchronization Over Can Protocol	**FO PRS TimeSyncOver-CANProtocol**	Classic Platform, Foundation	valid
	CP SWS TimeSyncOverCAN		
DDS Support on CP	**CP SWS DataDistribution-ServiceTransformer**	Classic Platform, Foundation	valid
	CP ASWS TransformerGeneral		
	CP RS Transformer		
	CP SWS DataDistributionService		
	CP SWS BSWGeneral		
	CP EXP LayeredSoft-wareArchitecture		
	CP TPS SystemTemplate		
	FO RS DataDistributionService		

Table 2.1: Impact of concepts

2.1.3 Validated Concepts

The following concepts have been validated:

- none

2.2 Specifications

2.2.1 New Specifications

The following new specifications have been introduced via concepts:

- CP SWS DataDistributionServiceTransformer
  (Specification of Data Distribution Service Transformer, UID 1140)
- CP SWS VDPCMRemote
  (Specification of VDP Communication Module Remote, UID 1139)

In addition to the above listed new specifications, the following documents have been added with this release:

- CP TR WorkflowExample
  (Technical Report on Supplementary Material of Workflow Example, UID 1145)

2.2.2 Migrated Specifications

With this release, the following specification has been moved from Classic Platform to the Foundation standard:

- FO RS SecureOnboardCommunication
  (Requirements on Secure Onboard Communication, UID 653)

2.2.3 Obsolete Specifications

The following specifications have been set to status “obsolete” in this release:

- CP SWS ChineseV2XManagement
  (Specification of Chinese Vehicle-2-X Management, UID 1031)
- CP SWS ChineseV2XMessage
  (Specification of Chinese Vehicle-2-X Message, UID 990)
- CP SWS V2XDataManager
  (Specification of Vehicle-2-X Data Manager, UID 1023)
- CP SWS ChineseV2XSecurity
  (Specification of Chinese Vehicle-2-X Security, UID 1032)
- CP RS ChineseV2XCommunication
  (Requirements on Chinese Vehicle-2-X Communication, UID 989)
- CP SWS ChineseV2XNetwork
  (Specification of Chinese Vehicle-2-X Network, UID 991)
- CP RS V2XCommunication
  (Requirements on Vehicle-2-X Communication, UID 791)

- CP SWS V2XBasicTransport
  (Specification of Vehicle-2-X Basic Transport, UID 794)
- CP SWS V2XFacilities
  (Specification of Vehicle-2-X Facilities, UID 795)
- CP SWS V2XGeoNetworking
  (Specification of Vehicle-2-X Geo Networking, UID 793)
- CP SWS V2XManagement
  (Specification of Vehicle-2-X Management, UID 796)
- CP SWS WirelessEthernetDriver
  (Specification of Wireless Ethernet Driver, UID 798)
- CP SWS WirelessEthernetTransceiverDriver
  (Specification of Wireless Ethernet Transceiver Driver, UID 799)
- CP SWS CellularV2XDriver
  (Specification of Cellular Vehicle-2-X Driver, UID 1030)
- CP SWS HWTestManager
  (Specification of Hardware Test Manager on start up and shutdown, UID 703)
- CP RS HWTestManager
  (Requirements on Hardware Test Manager on start up and shutdown, UID 760)
- CP TR HWTestManagementIntegrationGuide
  (Specification and Integration of Hardware Test Management at start up and shutdown, UID 804)

2.2.4 Removed Specifications

The following specifications have been set to status “removed” in this release and hence are not released anymore:

- CP SWS FlashDriver
  (Specification of Flash Driver, UID 25)
- CP RS FlashDriver
  (Requirements on Flash Driver, UID 194)
- CP SWS EEPROMDriver
  (Specification of EEPROM Driver, UID 21)
- CP RS EEPROMDriver
  (Requirements on EEPROM Driver, UID 192)
- CP RS BSWModuleDescriptionTemplate
  (Requirements on Basic Software Module Description Template, UID 86)

- CP RS DiagnosticExtractTemplate
  (Requirements on Diagnostic Extract Template, UID 681)
- CP RS ECUConfiguration
  (Requirements on ECU Configuration, UID 85)
- CP RS ECUResourceTemplate
  (Requirements on ECU Resource Template, UID 252)
- CP RS SoftwareComponentTemplate
  (Requirements on Software Component Template, UID 212)
- CP RS SystemTemplate
  (Requirements on System Template, UID 213)
- CP RS Features
  (Requirements on AUTOSAR Features, UID 294)
- CP TR FrancaIntegration
  (Integration of Franca IDL Software Component Descriptions, UID 663)
- CP RS TTCAN
  (Requirements on TTCAN, UID 441)
- CP SWS TTCANDriver
  (Specification of TTCAN Driver, UID 432)
- CP SWS TTCANInterface
  (Specification of TTCAN Interface, UID 433)
- CP SWS LargeDataCOM
  (Specification of Large Data COM, UID 655)

2.2.5 Reworked Specifications

- CP SWS BFXLibrary
  (Specification of Bit Handling Library, UID 399)

2.2.6 Moved Specification Parts

The following specification parts have been moved to other documents in this release:

- none

2.2.7 Renamed Specifications

The following specifications have been renamed in this release:

- CP TR VFB
  (Technical Report on Virtual Functional Bus, UID 56)

2.3 Release Documentation

There are no major changes in the release documentation.

3 Specification Overview

The published specifications are divided into the clusters:

- ReleaseDocumentation
- ApplicationInterfaces
- BSWGeneral
- Communication
- Crypto
- Diagnostics
- General
- GlobalTime
- IO
- Libraries
- MCAL
- Memory
- MethodologyAndTemplates
- ModeManagement
- RTE
- SWArch
- Safety
- Security
- SystemServices

The assignment of the specifications to these clusters is shown below.

Specification Name	Long Name	File Name	Life cycle changes
ReleaseDocumentation			
CP TR ReleaseOverview	Classic Platform Release Overview	AUTOSAR_CP_TR_Release Overview	
CP TR SpecificationHashes	AUTOSAR Classic Platform Specification Hashes	AUTOSAR_CP_TR_ SpecificationHashes	
ApplicationInterfaces			
CP EXP AIADASAndVMC	Explanation of Application Interface of AD/ADAS vehicle motion control	AUTOSAR_CP_EXP_ AIADASAndVMC	

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Specification Name	Long Name	File Name	Life cycle changes
CP EXP AIBodyAndComfort	Explanation of Application Interfaces of the Body and Comfort Domain	AUTOSAR_CP_EXP_AIBody AndComfort	
CP EXP AIChassis	Explanation of Application Interfaces of the Chassis Domain	AUTOSAR_CP_EXP_ AIChassis	
CP EXP AIHMIMultimediaAnd Telematics	Explanation of Application Interfaces of the HMI, Multimedia and Telematics Domain	AUTOSAR_CP_EXP_ AIHMIMultimediaAnd Telematics	
CP EXP AIOccupantAnd PedestrianSafety	Explanation of Application Interfaces of Occupant and Pedestrian Safety Systems Domain	AUTOSAR_CP_EXP_ AIOccupantAndPedestrian Safety	
CP EXP AIPowertrain	Explanation of Application Interfaces of the Powertrain Engine Domain	AUTOSAR_CP_EXP_ AIPowertrain	
CP EXP AIUserGuide	Application Interfaces User Guide	AUTOSAR_CP_EXP_AIUser Guide	
CP MOD AISpecification	XML Specification of Application Interfaces	AUTOSAR_CP_MOD_ AISpecification	
CP MOD AISpecification Examples	Application Interface Examples	AUTOSAR_CP_MOD_ AISpecificationExamples	
CP RS SWCModeling	Requirements on SW-C and System Modeling	AUTOSAR_CP_RS_ SWCModeling	
CP TR AIDesignPatterns Catalogue	Application Design Patterns Catalogue	AUTOSAR_CP_TR_AIDesign PatternsCatalogue	
CP TR AIMeasurement CalibrationDiagnostics	Modeling and Naming Aspects for Documentation, Measurement, and Calibration	AUTOSAR_CP_TR_ AIMeasurementCalibration Diagnostics	
CP TR SWCModelingGuide	SW-C and System Modeling Guide	AUTOSAR_CP_TR_ SWCModelingGuide	
BSWGeneral			
CP EXP ApplicationLevelError Handling	Explanation of Error Handling on Application Level	AUTOSAR_CP_EXP_ ApplicationLevelErrorHandling	
CP EXP BSWDistributionGuide	Guide to BSW Distribution	AUTOSAR_CP_EXP_ BSWDistributionGuide	
CP EXP CDDDesignAnd IntegrationGuideline	Complex Driver design and integration guideline	AUTOSAR_CP_EXP_ CDDDesignAndIntegration Guideline	
CP EXP ErrorDescription	Description of the AUTOSAR standard errors	AUTOSAR_CP_EXP_Error Description	
CP MOD BSWUMLModel	Basic Software UML Model	AUTOSAR_CP_MOD_ BSWUMLModel	
CP RS BSWGeneral	General Requirements on Basic Software Modules	AUTOSAR_CP_RS_ BSWGeneral	
CP SWS BSWGeneral	General Specification of Basic Software Modules	AUTOSAR_CP_SWS_ BSWGeneral	
CP SWS CommunicationStack Types	Specification of Communication Stack Types	AUTOSAR_CP_SWS_ CommunicationStackTypes	
CP SWS PlatformTypes	Specification of Platform Types for Classic Platform	AUTOSAR_CP_SWS_Platform Types	
CP SWS StandardTypes	Specification of Standard Types	AUTOSAR_CP_SWS_ StandardTypes	
CP TR BSWUMLModel ModelingGuide	Modeling Guidelines of Basic Software EA UML Model	AUTOSAR_CP_TR_ BSWUMLModelModelingGuide	
Communication			

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Specification Name	Long Name	File Name	Life cycle changes
CP ASWS TransformerGeneral	General Specification of Transformers	AUTOSAR_CP_ASWS_TransformerGeneral	
CP RS BusMirroring	Requirements on Bus Mirroring	AUTOSAR_CP_RS_BusMirroring	
CP RS CAN	Requirements on CAN	AUTOSAR_CP_RS_CAN	
CP RS COM	Requirements on Communication	AUTOSAR_CP_RS_COM	
CP RS ChargingManager	Requirements on Charging Manager	AUTOSAR_CP_RS_ChargingManager	
CP RS ChineseV2XCommunication	Requirements on Chinese Vehicle-2-X Communication	AUTOSAR_CP_RS_ChineseV2XCommunication	obsolete
CP RS Ethernet	Requirements on Ethernet Support in AUTOSAR	AUTOSAR_CP_RS_Ethernet	
CP RS FlexRay	Requirements on FlexRay	AUTOSAR_CP_RS_FlexRay	
CP RS Gateway	Requirements on Gateway	AUTOSAR_CP_RS_Gateway	
CP RS I2CDriver	Requirements on I2C Driver	AUTOSAR_CP_RS_I2CDriver	
CP RS IPDUMultiplexer	Requirements on I-PDU Multiplexer	AUTOSAR_CP_RS_IPDUMultiplexer	
CP RS LIN	Requirements on LIN	AUTOSAR_CP_RS_LIN	
CP RS SAEJ1939	Requirements on BSW Modules for SAE J1939	AUTOSAR_CP_RS_SAEJ1939	
CP RS SPIHandlerDriver	Requirements on SPI Handler/Driver	AUTOSAR_CP_RS_SPIHandlerDriver	
CP RS Transformer	Requirements on Transformer	AUTOSAR_CP_RS_Transformer	
CP RS V2XCommunication	Requirements on Vehicle-2-X Communication	AUTOSAR_CP_RS_V2XCommunication	obsolete
CP RS XCP	Requirements on Module XCP	AUTOSAR_CP_RS_XCP	
CP SWS BusMirroring	Specification of Bus Mirroring	AUTOSAR_CP_SWS_BusMirroring	
CP SWS CANDriver	Specification of CAN Driver	AUTOSAR_CP_SWS_CANDriver	
CP SWS CANInterface	Specification of CAN Interface	AUTOSAR_CP_SWS_CANInterface	
CP SWS CANNetworkManagement	Specification of CAN Network Management	AUTOSAR_CP_SWS_CANNetworkManagement	
CP SWS CANStateManager	Specification of CAN State Manager	AUTOSAR_CP_SWS_CANStateManager	
CP SWS CANTransceiverDriver	Specification of CAN Transceiver Driver	AUTOSAR_CP_SWS_CANTransceiverDriver	
CP SWS CANTransportLayer	Specification of CAN Transport Layer	AUTOSAR_CP_SWS_CANTransportLayer	
CP SWS CANXLDriver	Specification for CAN XL Driver	AUTOSAR_CP_SWS_CANXLDriver	
CP SWS CANXLTransceiverDriver	Specification of CAN XL Transceiver Driver	AUTOSAR_CP_SWS_CANXLTransceiverDriver	
CP SWS COM	Specification of Communication	AUTOSAR_CP_SWS_COM	
CP SWS COMBasedTransformer	Specification of COM Based Transformer	AUTOSAR_CP_SWS_COMBasedTransformer	
CP SWS CellularV2XDriver	Specification of Cellular Vehicle-2-X Driver	AUTOSAR_CP_SWS_CellularV2XDriver	obsolete

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Specification Name	Long Name	File Name	Life cycle changes
CP SWS ChineseV2 XManagement	Specification of Chinese Vehicle-2-X Management	AUTOSAR_CP_SWS_Chinese V2XManagement	obsolete
CP SWS ChineseV2XMessage	Specification of Chinese Vehicle-2-X Message	AUTOSAR_CP_SWS_Chinese V2XMessage	obsolete
CP SWS ChineseV2XNetwork	Specification of Chinese Vehicle-2-X Network	AUTOSAR_CP_SWS_Chinese V2XNetwork	obsolete
CP SWS ChineseV2XSecurity	Specification of Chinese Vehicle-2-X Security	AUTOSAR_CP_SWS_Chinese V2XSecurity	obsolete
CP SWS DataDistribution Service	Specification of Data Distribution Service for Classic Platform	AUTOSAR_CP_SWS_Data DistributionService	
CP SWS DataDistribution ServiceTransformer	Specification of Data Distribution Service Transformer	AUTOSAR_CP_SWS_Data DistributionServiceTransformer	Initial release
CP SWS DiagnosticLogAnd Trace	Specification of Diagnostic Log and Trace	AUTOSAR_CP_SWS_ DiagnosticLogAndTrace	
CP SWS DiagnosticOverIP	Specification of Diagnostic over IP	AUTOSAR_CP_SWS_ DiagnosticOverIP	
CP SWS E2ETransformer	Specification of Module E2E Transformer	AUTOSAR_CP_SWS_E2 ETransformer	
CP SWS EthernetDriver	Specification of Ethernet Driver	AUTOSAR_CP_SWS_Ethernet Driver	
CP SWS EthernetInterface	Specification of Ethernet Interface	AUTOSAR_CP_SWS_Ethernet Interface	
CP SWS EthernetState Manager	Specification of Ethernet State Manager	AUTOSAR_CP_SWS_Ethernet StateManager	
CP SWS EthernetSwitchDriver	Specification of Ethernet Switch Driver	AUTOSAR_CP_SWS_Ethernet SwitchDriver	
CP SWS EthernetTransceiver Driver	Specification of Ethernet Transceiver Driver	AUTOSAR_CP_SWS_Ethernet TransceiverDriver	
CP SWS FlexRayARTransport Layer	Specification of FlexRay AUTOSAR Transport Layer	AUTOSAR_CP_SWS_FlexRay ARTransportLayer	
CP SWS FlexRayDriver	Specification of FlexRay Driver	AUTOSAR_CP_SWS_FlexRay Driver	
CP SWS FlexRayISOTransport Layer	Specification of FlexRay ISO Transport Layer	AUTOSAR_CP_SWS_FlexRay ISOTransportLayer	
CP SWS FlexRayInterface	Specification of FlexRay Interface	AUTOSAR_CP_SWS_FlexRay Interface	
CP SWS FlexRayNetwork Management	Specification of FlexRay Network Management	AUTOSAR_CP_SWS_FlexRay NetworkManagement	
CP SWS FlexRayState Manager	Specification of FlexRay State Manager	AUTOSAR_CP_SWS_FlexRay StateManager	
CP SWS FlexRayTransceiver Driver	Specification of FlexRay Transceiver Driver	AUTOSAR_CP_SWS_FlexRay TransceiverDriver	
CP SWS I2CDriver	Specification of I2C Driver	AUTOSAR_CP_SWS_I2 CDriver	
CP SWS IEEE1722Transport Layer	Specification of IEEE1722 Transport Protocol Module	AUTOSAR_CP_SWS_ IEEE1722TransportLayer	
CP SWS IPDUMultiplexer	Specification of I-PDU Multiplexer	AUTOSAR_CP_SWS_ IPDUMultiplexer	
CP SWS ISO15118Charging	Specification of ISO15118 Charging	AUTOSAR_CP_SWS_ ISO15118Charging	
CP SWS LINDriver	Specification of LIN Driver	AUTOSAR_CP_SWS_ LINDriver	

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Specification Name	Long Name	File Name	Life cycle changes
CP SWS LINInterface	Specification of LIN Interface	AUTOSAR_CP_SWS_LINInterface	
CP SWS LINStateManager	Specification of LIN State Manager	AUTOSAR_CP_SWS_LINStateManager	
CP SWS LINTransceiverDriver	Specification of LIN Transceiver Driver	AUTOSAR_CP_SWS_LINTransceiverDriver	
CP SWS LSduRouter	Specification of Linklayer Sdu Routing Module	AUTOSAR_CP_SWS_LSduRouter	
CP SWS MACsecKey Agreement	Specification of MACsec Key Agreement	AUTOSAR_CP_SWS_MACsecKeyAgreement	
CP SWS NetworkManagement Interface	Specification of Network Management Interface	AUTOSAR_CP_SWS_NetworkManagementInterface	
CP SWS PDURouter	Specification of PDU Router	AUTOSAR_CP_SWS_PDURouter	
CP SWS SAEJ1939Functional SafetyCommProtocol	Specification of a Functional Safety Communication Protocol Handler for SAE J1939	AUTOSAR_CP_SWS_SAEJ1939FunctionalSafetyCommProtocol	
CP SWS SAEJ1939Network Management	Specification of Network Management for SAE J1939	AUTOSAR_CP_SWS_SAEJ1939NetworkManagement	
CP SWS SAEJ1939Request Manager	Specification of a Request Manager for SAE J1939	AUTOSAR_CP_SWS_SAEJ1939RequestManager	
CP SWS SAEJ1939Transport Layer	Specification of a Transport Layer for SAE J1939	AUTOSAR_CP_SWS_SAEJ1939TransportLayer	
CP SWS SOMEIPTransformer	Specification of SOME/IP Transformer	AUTOSAR_CP_SWS_SOMEIPTransformer	
CP SWS SOMEIPTransport Protocol	Specification on SOME/IP Transport Protocol	AUTOSAR_CP_SWS_SOMEIPTransportProtocol	
CP SWS SPIHandlerDriver	Specification of SPI Handler/Driver	AUTOSAR_CP_SWS_SPIHandlerDriver	
CP SWS SecureOnboard Communication	Specification of Secure Onboard Communication	AUTOSAR_CP_SWS_SecureOnboardCommunication	
CP SWS ServiceDiscovery	Specification of Service Discovery	AUTOSAR_CP_SWS_ServiceDiscovery	
CP SWS SocketAdaptor	Specification of Socket Adaptor	AUTOSAR_CP_SWS_SocketAdaptor	
CP SWS TcpIp	Specification of TCP/IP Stack	AUTOSAR_CP_SWS_TcpIp	
CP SWS UDPNetwork Management	Specification of UDP Network Management	AUTOSAR_CP_SWS_UDPNetworkManagement	
CP SWS V2XBasicTransport	Specification of Vehicle-2-X Basic Transport	AUTOSAR_CP_SWS_V2XBasicTransport	obsolete
CP SWS V2XDataManager	Specification of Vehicle-2-X Data Manager	AUTOSAR_CP_SWS_V2XDataManager	obsolete
CP SWS V2XFacilities	Specification of Vehicle-2-X Facilities	AUTOSAR_CP_SWS_V2XFacilities	obsolete
CP SWS V2XGeoNetworking	Specification of Vehicle-2-X Geo Networking	AUTOSAR_CP_SWS_V2XGeoNetworking	obsolete
CP SWS V2XManagement	Specification of Vehicle-2-X Management	AUTOSAR_CP_SWS_V2XManagement	obsolete
CP SWS VDPCMRemote	Specification of VDP Communication Module Remote	AUTOSAR_CP_SWS_VDPCMRemote	Initial release

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Specification Name	Long Name	File Name	Life cycle changes
CP SWS WirelessEthernet Driver	Specification of Wireless Ethernet Driver	AUTOSAR_CP_SWS_Wireless EthernetDriver	obsolete
CP SWS WirelessEthernet TransceiverDriver	Specification of Wireless Ethernet Transceiver Driver	AUTOSAR_CP_SWS_Wireless EthernetTransceiverDriver	obsolete
CP SWS XCP	Specification of Module XCP	AUTOSAR_CP_SWS_XCP	
Crypto			
CP EXP UtilizationOfCrypto Services	Utilization of Crypto Services	AUTOSAR_CP_EXP_ UtilizationOfCryptoServices	
CP RS CryptoStack	Requirements on Crypto Stack	AUTOSAR_CP_RS_Crypto Stack	
CP SWS CryptoDriver	Specification of Crypto Driver	AUTOSAR_CP_SWS_Crypto Driver	
CP SWS CryptoInterface	Specification of Crypto Interface	AUTOSAR_CP_SWS_Crypto Interface	
CP SWS CryptoService Manager	Specification of Crypto Service Manager	AUTOSAR_CP_SWS_Crypto ServiceManager	
CP SWS KeyManager	Specification of Key Manager	AUTOSAR_CP_SWS_Key Manager	
Diagnostics			
CP SWS Diagnostic CommunicationManager	Specification of Diagnostic Communication Manager	AUTOSAR_CP_SWS_ DiagnosticCommunication Manager	
CP SWS DiagnosticEvent Manager	Specification of Diagnostic Event Manager	AUTOSAR_CP_SWS_ DiagnosticEventManager	
CP SWS SAEJ1939Diagnostic CommunicationManager	Specification of a Diagnostic Communication Manager for SAE J1939	AUTOSAR_CP_SWS_ SAEJ1939Diagnostic CommunicationManager	
General			
CP EXP LayeredSoftware Architecture	Layered Software Architecture	AUTOSAR_CP_EXP_Layered SoftwareArchitecture	
CP SWS BulkNvDataManager	Specification of Bulk NvData Manager	AUTOSAR_CP_SWS_BulkNv DataManager	
CP TR VFB	Virtual Functional Bus	AUTOSAR_CP_TR_VFB	
GlobalTime			
CP SWS SynchronizedTime BaseManager	Specification of Synchronized Time-Base Manager	AUTOSAR_CP_SWS_ SynchronizedTimeBase Manager	
CP SWS TimeSyncOverCAN	Specification of Time Synchronization over CAN	AUTOSAR_CP_SWS_Time SyncOverCAN	
CP SWS TimeSyncOver Ethernet	Specification of Time Synchronization over Ethernet	AUTOSAR_CP_SWS_Time SyncOverEthernet	
CP SWS TimeSyncOverFlex Ray	Specification of Time Synchronization over FlexRay	AUTOSAR_CP_SWS_Time SyncOverFlexRay	
IO			
CP RS ADCDriver	Requirements on ADC Driver	AUTOSAR_CP_RS_ADCDriver	
CP RS DIODriver	Requirements on DIO Driver	AUTOSAR_CP_RS_DIODriver	
CP RS ICUDriver	Requirements on ICU Driver	AUTOSAR_CP_RS_ICUDriver	
CP RS IOHWAbstraction	Requirements on I/O Hardware Abstraction	AUTOSAR_CP_RS_ IOHWAbstraction	

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Specification Name	Long Name	File Name	Life cycle changes
CP RS OCUDriver	Requirements on OCU Driver	AUTOSAR_CP_RS_OCUDriver	
CP RS PWMDriver	Requirements on PWM Driver	AUTOSAR_CP_RS_PWMDriver	
CP RS PortDriver	Requirements on Port Driver	AUTOSAR_CP_RS_PortDriver	
CP SWS ADCDriver	Specification of ADC Driver	AUTOSAR_CP_SWS_ADCDriver	
CP SWS DIODriver	Specification of DIO Driver	AUTOSAR_CP_SWS_DIODriver	
CP SWS ICUDriver	Specification of ICU Driver	AUTOSAR_CP_SWS_ICUDriver	
CP SWS IOHardware Abstraction	Specification of I/O Hardware Abstraction	AUTOSAR_CP_SWS_IOHardwareAbstraction	
CP SWS OCUDriver	Specification of OCU Driver	AUTOSAR_CP_SWS_OCUDriver	
CP SWS PWMDriver	Specification of PWM Driver	AUTOSAR_CP_SWS_PWMDriver	
CP SWS PortDriver	Specification of Port Driver	AUTOSAR_CP_SWS_Port Driver	
Libraries			
CP EXP MacroEncapsulationof InterpolationCalls	Macro Encapsulation of Interpolation Calls	AUTOSAR_CP_EXP_Macro EncapsulationofInterpolation Calls	
CP RS Libraries	Requirements on Libraries	AUTOSAR_CP_RS_Libraries	
CP SWS BFXLibrary	Specification of Bit Handling Library	AUTOSAR_CP_SWS_BFXLibrary	
CP SWS BSWMulticoreLibrary	Specification of Basic Software Multicore Library	AUTOSAR_CP_SWS_BSWMulticoreLibrary	
CP SWS CRCLibrary	Specification of CRC Library	AUTOSAR_CP_SWS_CRCLibrary	
CP SWS E2ELibrary	Specification of SW-C End-to-End Communication Protection Library	AUTOSAR_CP_SWS_E2ELibrary	
CP SWS EFXLibrary	Specification of Extended Fixed Point Library	AUTOSAR_CP_SWS_EFXLibrary	
CP SWS IFLLibrary	Specification of Floating Point Interpolation Library	AUTOSAR_CP_SWS_IFLLibrary	
CP SWS IFXLibrary	Specification of Fixed Point Interpolation Library	AUTOSAR_CP_SWS_IFXLibrary	
CP SWS MFLLibrary	Specification of Floating Point Math Library	AUTOSAR_CP_SWS_MFLLibrary	
CP SWS MFXLibrary	Specification of Fixed Point Math Library	AUTOSAR_CP_SWS_MFXLibrary	
CP SWS MSFLibrary	Specification of MSFLibrary	AUTOSAR_CP_SWS_MSFLibrary	
MCAL			
CP RS CoreTest	Requirements on Core Test	AUTOSAR_CP_RS_CoreTest	
CP RS GPTDriver	Requirements on GPT Driver	AUTOSAR_CP_RS_GPTDriver	
CP RS MCUDriver	Requirements on MCU Driver	AUTOSAR_CP_RS_MCUDriver	
CP RS SPALGeneral	General Requirements on SPAL	AUTOSAR_CP_RS_SPALGeneral	

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Specification Name	Long Name	File Name	Life cycle changes
CP SWS CoreTest	Specification of Core Test	AUTOSAR_CP_SWS_Core Test	
CP SWS GPTDriver	Specification of GPT Driver	AUTOSAR_CP_SWS_ GPTDriver	
CP SWS MCUDriver	Specification of MCU Driver	AUTOSAR_CP_SWS_ MCUDriver	
Memory			
CP EXP FirmwareOverTheAir	Explanation of Firmware Over-The-Air	AUTOSAR_CP_EXP_Firmware OverTheAir	
CP EXP NVDataHandling	NV Data Handling Guideline	AUTOSAR_CP_EXP_NVData Handling	
CP RS FirmwareOverTheAir	Requirements on Firmware Over-The-Air	AUTOSAR_CP_RS_Firmware OverTheAir	
CP RS FlashTest	Requirements on Flash Test	AUTOSAR_CP_RS_FlashTest	
CP RS MemoryHWAbstraction Layer	Requirements on Memory Hardware Abstraction Layer	AUTOSAR_CP_RS_Memory HWAbstractionLayer	
CP RS MemoryServices	Requirements on Memory Services	AUTOSAR_CP_RS_Memory Services	
CP RS RAMTest	Requirements on RAM Test	AUTOSAR_CP_RS_RAMTest	
CP SWS EEPROMAbstraction	Specification of EEPROM Abstraction	AUTOSAR_CP_SWS_ EEPROMAbstraction	
CP SWS Flash EEPROMEmulation	Specification of Flash EEPROM Emulation	AUTOSAR_CP_SWS_Flash EEPROMEmulation	
CP SWS FlashTest	Specification of Flash Test	AUTOSAR_CP_SWS_Flash Test	
CP SWS MemoryAbstraction Interface	Specification of Memory Abstraction Interface	AUTOSAR_CP_SWS_Memory AbstractionInterface	
CP SWS MemoryAccess	Specification of Memory Access	AUTOSAR_CP_SWS_Memory Access	
CP SWS MemoryDriver	Specification of Memory Driver	AUTOSAR_CP_SWS_Memory Driver	
CP SWS MemoryMapping	Specification of Memory Mapping	AUTOSAR_CP_SWS_Memory Mapping	
CP SWS NVRAMManager	Specification of NVRAM Manager	AUTOSAR_CP_SWS_ NVRAMManager	
CP SWS RAMTest	Specification of RAM Test	AUTOSAR_CP_SWS_ RAMTest	
MethodologyAndTemplates			
CP EXP ModelingShowCases	Modeling Show Cases Examples	AUTOSAR_CP_EXP_Modeling ShowCases	
CP MOD ECUConfiguration Parameters	Specification of ECU Configuration Parameters (XML)	AUTOSAR_CP_MOD_ ECUConfigurationParameters	
CP TPS BSWModule DescriptionTemplate	Basic Software Module Description Template	AUTOSAR_CP_TPS_ BSWModuleDescription Template	
CP TPS DiagnosticExtract Template	Diagnostic Extract Template	AUTOSAR_CP_TPS_ DiagnosticExtractTemplate	
CP TPS ECUConfiguration	Specification of ECU Configuration	AUTOSAR_CP_TPS_ ECUConfiguration	
CP TPS ECUResource Template	Specification of ECU Resource Template	AUTOSAR_CP_TPS_ ECUResourceTemplate	

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Specification Name	Long Name	File Name	Life cycle changes
CP TPS SoftwareComponent Template	Software Component Template	AUTOSAR_CP_TPS_Software ComponentTemplate	
CP TPS SystemTemplate	System Template	AUTOSAR_CP_TPS_System Template	
CP TPS TimingExtensions	Specification of Timing Extensions for Classic Platform	AUTOSAR_CP_TPS_Timing Extensions	
CP TR GeneralBlueprints Supplement	Supplementary material of general blueprints for AUTOSAR	AUTOSAR_CP_TR_General BlueprintsSupplement	
CP TR Methodology	Methodology for Classic Platform	AUTOSAR_CP_TR_ Methodology	
CP TR ModelingShowCases	Modeling Show Cases Report	AUTOSAR_CP_TR_Modeling ShowCases	
CP TR WorkflowExample	Technical Report on Supplementary Material of Workflow Example	AUTOSAR_CP_TR_Workflow Example	Initial release
ModeManagement			
CP EXP ModeManagement Guide	Guide to Mode Management	AUTOSAR_CP_EXP_Mode ManagementGuide	
CP RS ModeManagement	Requirements on Mode Management	AUTOSAR_CP_RS_Mode Management	
CP SWS BSWModeManager	Specification of Basic Software Mode Manager	AUTOSAR_CP_SWS_ BSWModeManager	
CP SWS ECUStateManager	Specification of ECU State Manager	AUTOSAR_CP_SWS_ ECUStateManager	
RTE			
CP RS RTE	Requirements on Runtime Environment	AUTOSAR_CP_RS_RTE	
CP SWS RTE	Specification of RTE Software	AUTOSAR_CP_SWS_RTE	
SWArch			
CP EXP ARTI	Explanatory Document for Usage of AUTOSAR Run-Time Interface	AUTOSAR_CP_EXP_ARTI	
CP RS DebugTraceProfile	Requirements on Debugging, Tracing and Profiling support of AUTOSAR Components	AUTOSAR_CP_RS_Debug TraceProfile	
CP SWS ARTI	Specification of AUTOSAR Run-Time Interface	AUTOSAR_CP_SWS_ARTI	
Safety			
CP EXP FunctionalSafety Measures	Overview of Functional Safety Measures in AUTOSAR	AUTOSAR_CP_EXP_ FunctionalSafetyMeasures	
CP EXP SafetyUseCase	Safety Use Case Example	AUTOSAR_CP_EXP_Safety UseCase	
CP RS WatchdogDriver	Requirements on Watchdog Driver	AUTOSAR_CP_RS_Watchdog Driver	
CP SWS WatchdogDriver	Specification of Watchdog Driver	AUTOSAR_CP_SWS_ WatchdogDriver	
CP SWS WatchdogInterface	Specification of Watchdog Interface	AUTOSAR_CP_SWS_ WatchdogInterface	
CP SWS WatchdogManager	Specification of Watchdog Manager	AUTOSAR_CP_SWS_ WatchdogManager	
Security			
CP SWS Firewall	Specification of Firewall for Classic Platform	AUTOSAR_CP_SWS_Firewall	

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Specification Name	Long Name	File Name	Life cycle changes
CP SWS IntrusionDetection SystemManager	Specification of Intrusion Detection System Manager	AUTOSAR_CP_SWS_Intrusion DetectionSystemManager	
SystemServices			
CP EXP SwClusterDesignAnd IntegrationGuideline	Explanation of Software Cluster Design And Integration Guideline for Classic Platform	AUTOSAR_CP_EXP_Sw ClusterDesignAndIntegration Guideline	
CP RS FunctionInhibition Manager	Requirements on Function Inhibition Manager	AUTOSAR_CP_RS_Function InhibitionManager	
CP RS HWTestManager	Requirements on Hardware Test Manager on start up and shutdown	AUTOSAR_CP_RS_HWTest Manager	obsolete
CP RS OS	Requirements on Operating System	AUTOSAR_CP_RS_OS	
CP RS SoftwareCluster Connection	Requirements on Software Cluster Connection module	AUTOSAR_CP_RS_Software ClusterConnection	
CP RS TimeService	Requirements on Time Service	AUTOSAR_CP_RS_Time Service	
CP SWS COMManager	Specification of Communication Manager	AUTOSAR_CP_SWS_ COMManager	
CP SWS DefaultErrorTracer	Specification of Default Error Tracer	AUTOSAR_CP_SWS_Default ErrorTracer	
CP SWS FunctionInhibition Manager	Specification of Function Inhibition Manager	AUTOSAR_CP_SWS_Function InhibitionManager	
CP SWS HWTestManager	Specification of Hardware Test Manager on start up and shutdown	AUTOSAR_CP_SWS_HWTest Manager	obsolete
CP SWS OS	Specification of Operating System	AUTOSAR_CP_SWS_OS	
CP SWS SoftwareCluster Connection	Specification of Software Cluster Connection module	AUTOSAR_CP_SWS_Software ClusterConnection	
CP SWS TimeService	Specification of Time Service	AUTOSAR_CP_SWS_Time Service	
CP TR HWTestManagement IntegrationGuide	Specification and Integration of Hardware Test Management at start up and shutdown	AUTOSAR_CP_TR_HWTest ManagementIntegrationGuide	obsolete

Table 3.1: Specification overview

4 Remarks to Known Technical Deficiencies

This section and its subsections provide an overview of several important technical deficiencies of the specification. All known technical deficiencies and limitations are detailed in the individual documents.

Document UID	Document name	Document type	Section reference
1094	CP SWS LSduRouter	SWS	4.1
1106	CP SWS SAEJ1939FunctionalSafetyCommProtocol	SWS	4.2
873	CP SWS BusMirroring	SWS	4.3
675	CP SWS TimeSyncOverFlexRay	SWS	4.4
674	CP SWS TimeSyncOverCAN	SWS	4.5
658	CP ASWS TransformerGeneral	ASWS	4.6
631	CP EXP BSWDistributionGuide	EXP	4.7
612	CP SWS SAEJ1939NetworkManagement	SWS	4.8
611	CP SWS SAEJ1939RequestManager	SWS	4.9
610	CP SWS SAEJ1939DiagnosticCommunicationManager	SWS	4.10
425	CP SWS SAEJ1939TransportLayer	SWS	4.11
421	CP SWS SynchronizedTimeBaseManager	SWS	4.12
253	CP SWS CANStateManager	SWS	4.13
80	CP SWS WatchdogManager	SWS	4.14
78	CP SWS ECUStateManager	SWS	4.15
73	CP SWS LINInterface	SWS	4.16
72	CP SWS LINDriver	SWS	4.17
34	CP SWS OS	SWS	4.18
1084	CP SWS Firewall	SWS	4.19

4.1 CP SWS LSduRouter

The L-SDU Router module does not:

- have mechanisms for signal extraction or conversion,
- have mechanisms for data integrity checking (like checksums),
- change or modify the L-SDU,
- make any L-SDU payload dependent routing decisions,
- support routing of I-PDUs between Communication Interface modules with rate conversion.

Limitations on supported functionality
The L-SDU Router module supports fan-out of L-SDUs transmitted from a local module (e.g. IEEE1722Tp) to more than one destinations. There are some limitations if the L-SDU shall be transmitted to more than one destination (fan-out 1:n; n>1), because the upper layer module is not aware how many destinations there are:

- The L-SDU Router reports E_OK for a Transmit request from an upper layer if at least one destination lower layer reports E_OK.
- The L-SDU Router gives a TxConfirmation to the upper layer when it receives the last TxConfirmation from destination lower layer.
- The L-SDU Router returns E_OK for a ReleaseRxBuffer requested from the upper layer only if all destination lower layers return E_OK. If the L-SDU fan-out is performed by the L-SDU Router, this has further consequences for upper layer module (e.g. IEEE1722Tp module).
- The TxConfirmation of the Communication Interface API will be handled in the way that the local module (e.g. IEEE1722Tp module) will be informed when the last destination has confirmed the transmission. Note that above limitations are not set as requirements since they do not concern functionality provided by the L-SDU router module. But implication of the use of the L-SDU Router module will affect these functionalities.

4.2 CP SWS SAEJ1939FunctionalSafetyCommProtocol

The SAE J1939 Functional Safety Communication Protocol is specified in accordance with SAE J1939-76, which is able to satisfy the functional safety standards IEC 61508-2:2010 (up to SIL 3) and the industrial safety communication standard IEC 61784-3:2016. It is up to the system designer to perform the analysis and determine if the SAE J1939 Functional Safety Communication Protocol, the E2E protection layers and their integration into the AUTOSAR architecture satisfy the functional safety goals. Some limitations are described in sections 4.3 “Limitations” and 4.4 “SAE J1939 PG Constraints” of SAE J1939-76.

Please note that due to the architecture of AUTOSAR, the SAE J1939 Functional Safety Communication Protocol can only detect a subset of the IEC 61784-3 Communication Errors listed in table A1 in appendix A.1 “Qualitative Analysis” of SAE J1939-76. The majority of the communication errors are detected by the E2E protection layers, and only these can be reported directly to the application alongside the data as overlayed errors.

The following communication errors are detected directly by the SAE J1939 Functional Safety Communication Protocol:

- Unacceptable Delay is detected only for the SRVT, and is reported via runtime error J1939FSCP_E_TIMEOUT_RX_SRVT. The SCT has to be measured and supervised directly by the application.
- Addressing may be reported via runtime errors J1939FSCP_E_UNKNOWN_PGN, J1939FSCP_E_NO_SDM_RECEIVED, or J1939FSCP_E_NO_SHM_RECEIVED, or may result in silently dropping a message, depending on the actually observed problem.

An AUTOSAR ECU may also entirely ignore the SHM by configuring the SDM as ordinary communication message.

4.3 CP SWS BusMirroring

The Bus Mirroring module cannot be used to influence the traffic on one of the buses configured as a source bus. To ensure this and to avoid loop-back of messages leading to bus overload, the generation tool shall ensure that no bus is connected to the Bus Mirroring module both as source bus and destination bus (see [SWS_Mirror_00001]).

The Bus Mirroring module is controlled by a diagnostic control application through the dedicated (service) API listed in Chapter 8. The control functionality is made accessible to a diagnostic tester by special diagnostic services, which are handled by the DCM and implemented by the diagnostic control application. The DCM provides the necessary security to exclude inadvertent activation of the Bus Mirroring. The Bus Mirroring module does not provide another control interface, and it does not receive control messages on the destination bus.

In general, the Bus Mirroring module does not support source buses that have a larger frame size or more additional information than the destination bus can carry, e.g. CAN XL to CAN FD, CAN FD to CAN, CAN to LIN, FlexRay to CAN or CAN FD, Ethernet to CAN, or Ethernet to FlexRay. The Bus Mirroring module does not fragment mirrored frames.

The Bus Mirroring module will only mirror traffic that is actually received or transmitted by the bus interface modules. For CAN this means that besides the transmitted frames only those data frames that pass the hardware filter will be mirrored, and that remote frames and error frames will not be mirrored. For LIN, slave-to-slave communication will not be mirrored by a LIN master. And for FlexRay, only transmitted frames and those received frames for which reception buffers are assigned (possibly as a FIFO) will be mirrored.

Another limitation of the mirroring from a FlexRay source bus concerns the reported time stamps and cycles. The Timestamp reported for a FlexRay frame contains the time when the corresponding job list entry was executed. The actual transmission time has to be calculated from the slot ID contained in the reported FrameID. The cycle contained in the reported FrameID is accurate only for received frames and frames transmitted in the static segment. For frames transmitted in the dynamic segment, the reported cycle can be inaccurate because it can happen that a frame cannot be transmitted in the expected cycle, it is then deferred to the next suitable cycle.

A re-serialization of received serialized frames shall not be done by the Bus Mirroring module, because that would require too much resources. Instead, the serialized PDUs shall be routed directly to the destination bus.

The Bus Mirroring module will also not support the forwarding from Ethernet to Ethernet. This use case is already covered by the Port Mirroring feature of the AUTOSAR Ethernet Switch Driver.

4.4 CP SWS TimeSyncOverFlexRay

Time Masters, Time Gateways and Time Slaves shall work with a Time Base reference clock with a tick duration of 2 µs.

4.5 CP SWS TimeSyncOverCAN

- The Time Base in the SYNC messages is limited to 32 bit, wherefore the maximum supported time value is 4294967295 seconds (2^{32}-1).
- The Time Synchronization on CAN protocol assumes a local reference clock with a maximum tick duration of 2 µs.
- The authentication protection mechanism of the time is not supported on classic CAN busses, due to below reasons.
  - The authentication protection mechanism is complex to achieve on classic CAN busses due to payload limitation and any solution incorporated will leave the security vulnerabilities (e.g., cryptographic attacks, DoS).
  - Today's ECUs in vehicle E/E architecture supports both classic CAN and CanFD channels.

4.6 CP ASWS TransformerGeneral

Both data transformation and communication itself are very extensive fields and can get quite complex because a lot of use cases and scenarios are theoretically possible. Because these have a big impact on the functionality of transformer (especially in the RTE), this diversity makes it necessary to impose a few restrictions and assumptions to the transformers.

If the transformation targets primarily the serialization of large complex data elements, it is most efficient when the transformation is used for communication over busses with large PDU sizes (e.g. Ethernet). If busses with small PDU size are used (e.g CAN), the byte array produced by the serializer would have to be spanned over multiple PDUs which is possible but inefficient.

Subject to transformation are the data elements (VariableDataPrototypes) of ports typed with SenderReceiverInterfaces, the operations (ClientServerOperations) of ports typed with ClientServerInterfaces and non-queued external trigger events of ports typed with TriggerInterfaces with swImplPolicy not set to queued.

This imposes the majority of restrictions and is therefore the most important contraint! As a consequence of this decision, it is not possible to transform whole PDUs. The reason for this is the fact that inside the RTE (where the transformation happens) there exist no PDUs because these are built inside the Com module.

Nonetheless, it is still possible to aggregate multiple transformed data elements of Sender/Receiver-Communication into one large PDU inside Com (each transformed data element is visible within Com as an ISignal). But in this case, all data elements/ISignals contained in this PDU are transformed independently from each other, each including its own header (if the transformation adds headers). As a consequence of this, it is not possible to transform data structures where the data structure's sub-elements are produced by different data elements of different PPortPrototypes/SWCs.

The length of the transformer chains is not limited by the solutions chosen within this concept. But to enable a memory efficient configuration and implementation, the maximum length is artificially limited to 255 because current use cases see a maximum chain length of 3.

4.7 CP EXP BSWDistributionGuide

The support for Basic Software Allocation in AUTOSAR is currently limited to backward compatible changes (w.r.t. AUTOSAR 4.0.3). This currently results in the following restrictions, which may not apply to future releases of AUTOSAR:

- Communication between master and satellites is not standardized.
- BSW functional clusters and their AUTOSAR BSW Cluster Interface are not standardized.

4.8 CP SWS SAEJ1939NetworkManagement

The J1939 Network Management module does not support all features defined in SAE J1939-81, especially:

- Changing the address of a node after reception of CommandedAddress or after an address loss.
- Changing the NAME of a node using the Name Management protocol.
- Detection of address violations by messages other than AddressClaimed.

4.9 CP SWS SAEJ1939RequestManager

The SAE J1939 Request Manager only implements Request, Request2, and Acknowledgement PGs. It does not provide support for the Transfer PG.

4.10 CP SWS SAEJ1939DiagnosticCommunicationManager

The J1939 Diagnostic Communication Manager implements only the subset of 'Diagnostic Messages' defined in [SWS_J1939Dcm_00238].

The DM13 does not support "Suspend Signal" and "Suspend Duration".

NACK is not provided for received DMx messages that are not supported or not configured. This restriction mainly affects handling of DM07 and DM13.

4.11 CP SWS SAEJ1939TransportLayer

The AUTOSAR architecture contains several communication system specific transport layers (J1939Tp, CanTp, FrTp, etc.). All of these modules need to have identical APIs, with the exception of API functions for which the PduR has separate configuration abilities.

The J1939Tp module does not implement the TriggerTransmit API, because it is only needed for time triggered bus architectures.

4.12 CP SWS SynchronizedTimeBaseManager

OS ScheduleTable
The Synchronized Time-Base Manager shall perform the functionality of synchronizing OS ScheduleTables with a respective Synchronized Time Base. However, the StbM considers only the case when the targeted OS ScheduleTable is explicitly synchronized. The implicit synchronization does not affect the StbM, because the synchronization mechanism bypasses the module (for more information about the difference between explicit and implicit synchronization, please refer to [2]. Thus, when talking in the following about synchronization of OS ScheduleTables, always the explicit one is meant.

Synchronized Time Base Identifier
The StbMSynchronizedTimeBaseIdentifier range (128 .. 65535) is currently reserved and might still be used by legacy applications (implementing Triggered Customers). The ID range will however be reassigned to new features in the next release. Legacy applications will then no longer be supported.

Mode switches
The Synchronized Time-Base Manager does not deal with mode switches during runtime.

Configuration
Postbuild configuration of the StbM is limited to enabling or disabling the functionality of a system wide Global Time Master for a Time Base (refer to StbMIsSystemWideGlobalTimeMaster).

Fallback Virtual Local Time
The Synchronized Time-Base Manager allows to configure a Fallback Virtual Local Time. If the Primary Virtual Local Time fails, the Fallback Virtual Local Time provides only a hold-over capability to the local application. That means, that time information derived from that Fallback Virtual Local Time is not distributed on the network. In the next releases of the StbM the behavior of the FallbackVirtual Local Time might be extended to support additional use cases.

4.13 CP SWS CANStateManager

The CanSM module can be used for CAN communication only. Its task is to operate with the CanIf module to control one or multiple underlying CAN Controllers and CAN Transceiver Drivers. Other protocols than CAN (i.e. LIN or FlexRay) are not supported.

The configured DEM event CANSM_E_MODE_REQUEST_TIMEOUT is outdated.

4.14 CP SWS WatchdogManager

(Main limitations mentioned in the [3] Chapter 4.1)

- A Supervised Entity cannot span over multiple EcucPartitions.
- Handling of unconnected transition proxies for Logical Supervision based on Cross-Cluster External Graph by Watchdog Manager is unspecified in this release.
- As libraries cannot call BSWs, libraries cannot be supervised by Watchdog Manager.
- The nesting of Deadline Supervision (i.e. start 1, start 2, end 2, end 1) is not supported.
- The Alive Supervision function with more than one Checkpoint per Supervised Entity is not consistently specified within the document. For now, it is recommended to support only one Alive Supervision Checkpoint per Supervised Entity.

4.15 CP SWS ECUStateManager

ECUs cannot always be switched off (i.e. zero power consumption).
Rationale: The shutdown target OFF can only be reached using ECU special hardware (e.g. a power hold circuit). If this hardware is not available, this specification proposes to issue a reset instead. Other default behaviors are permissible, however.

4.16 CP SWS LINInterface

If `LinTpScheduleChangeDiag` was set to TRUE, simultaneous Schedule Table Switch requests originated from `LinTp` and from Non-`LinTp` (`BswM` or CDD) must be avoided, to prevent premature termination of diagnostic connections. This issue will be fixed in next release(s).

4.17 CP SWS LINDriver

Limitations
Only one LIN channel of an ECU is allowed to connect to a particular LIN cluster. Unless there are unused (not connected) channels in the ECU, the number of LIN channels is equal to the number of LIN clusters.

Driver scope
[SWS_Lin_00045]
Upstream requirements: SRS_BSW_00347 ⌈One LIN driver provides access to one LIN hardware unit type (simple UART or dedicated LIN hardware) that may consist of several LIN channels.⌋

[SWS_Lin_00201] ⌈For different LIN hardware units a separate LIN driver needs to be implemented. It is up to the implementer to adapt the driver to the different instances of similar LIN channels.⌋

[SWS_Lin_00177] ⌈In case several LIN driver instances (of same or different vendor) are implemented in one ECU the file names, API names, and published parameters must be modified such that no two definitions with the same name are generated. The name shall be extended according to [SRS_BSW_00347] with a Vendor Id (needed to distinguish LIN drivers from different vendors) and a Vendor specific name (needed to distinguish different hardware units implemented by one Vendor): <Module abbreviation>_<Vendor Id>_<Vendor specific name>.⌋

The LIN Interface is responsible for calling the correct function. The necessary information shall be given in an XML file during configuration. See [4] for description how the LIN Interface handles several LIN drivers.

Applicability to car domains This specification is applicable to all car domains, where LIN is used

4.18 CP SWS OS

Hardware
The core AUTOSAR operating system assumes free access to hardware resources, which are managed by the OS itself. This includes, but is not limited to, the following hardware:

- interrupt control registers

- processor status words
- stack pointer(s)

Specific (extended) features of the core operating system extend the requirements on hardware resource. The following list outlines the features that have requirements on the hardware. Systems that do not use these OS features do not have these hardware requirements.

Memory Protection: A hardware memory protection unit is required. All memory accesses that have the consequence of writing (e.g. reads that have the side effect of writing to a memory location) shall be treated as writes.

Time Protection: Timer Hardware for monitoring execution times and arrival rates.

Privileged and non-privileged modes on the MCU: to protect the OS against in- ternal corruption caused by writes to OS controlled registers. This mode must not allow OS-Applications to circumvent protection (e.g. write registers which govern memory protection, write to processor status word etc.). The privileged mode must be under full control of the protected OS which uses the mode inter- nally and to transfer control back and forth from a non-trusted OS-Application to a trusted OS-Application. The microprocessor must support a controlled means which moves a processor into this privileged mode.

Local/Global Time Synchronization: A global time source is needed.

In general hardware failures in the processor are not detected by the operating system. In the event of hardware failure, correct operation of the OS cannot be guaranteed.

The resources managed by a specific OS implementation have to be defined within the appropriate configuration file of the OS.

Programming Language
The API of the operating system is defined as C function calls or macros. If other languages are used, they must adapt to the C interface.

Miscellaneous
The operating system does not provide services for dynamic memory management.

4.19 CP SWS Firewall

The firewall supports only filtering of ingress traffic.

5 Release History

5.1 Release R25-11

Specification Name	Specification history entry
CP ASWS TransformerGeneral	• Added error code E_SER_PAYLOAD_LENGTH_ EXCEEDED • Clarified transformer parameters in Client/Server case • Adapted to merge of LdCom into COM • Editorial Changes
CP EXP AIADASAndVMC	• No content changes
CP EXP AIBodyAndComfort	• Editorial changes
CP EXP AIChassis	• No content changes
CP EXP AIHMIMultimediaAndTelematics	• No content changes
CP EXP AIOccupantAndPedestrianSafety	• No content changes
CP EXP AIPowertrain	• Chapter 5.6 added : Electric Powertrain Domain Model
CP EXP AIUserGuide	• Complete rework of all chapters • Transformation to AI-Tool
CP EXP ARTI	• Aligned title of the document • Updated C code examples • Editorial changes
CP EXP ApplicationLevelErrorHandling	• No content changes
CP EXP BSWDistributionGuide	• Added multi-partition service component architecture pattern • Added explanation of EcucBusToPartitionMapping
CP EXP CDDDesignAndIntegrationGuideline	• Clarifications regarding the StbM.
CP EXP ErrorDescription	• No content changes
CP EXP FirmwareOverTheAir	• No content changes
CP EXP FunctionalSafetyMeasures	• Removed mentions of TTCan • Removed E2E protection wrapper specific content • Made smaller improvements
CP EXP LayeredSoftwareArchitecture	• Added information about VDP • Added information about Mirror • Updated slides about libraries, DDS • Removed TTCan • Removed Fls and Eep • Removed LdCom • Minor changes
CP EXP MacroEncapsulationofInterpolationCalls	• No content changes
CP EXP ModeManagementGuide	• Editorial changes.
CP EXP NVDataHandling	• No content changes
CP EXP SafetyUseCase	• Editorial changes
CP EXP SwClusterDesignAndIntegrationGuideline	• Describe MaxNumberOfCallee • Extend example to show multiple phases, remove dispatcher service resource

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Specification Name	Specification history entry
CP EXP UtilizationOfCryptoServices	• No content changes
CP RS ADCDriver	• No content changes
CP RS BSWGeneral	• New (Metadata-handling related) requirement (SRS_BSW_00496) • Removed (Parameter-Scope related) requirement ([SRS_BSW_00394]) • Status changed to "Obsolete" for requirement (SRS_BSW_00492)
CP RS BusMirroring	• Uptraces to RS Main removed
CP RS CAN	• Transmission request queue for TP channels • Remove obsolet requirements SRS_Can_01002, SRS_Can_01003,SRS_Can_01111 • Minor corrections / clarifications / editorial changes
CP RS COM	• Merged LdCom functionality as Large Data Path • Added support for DEM timeout reporting
CP RS ChargingManager	• No content changes
CP RS ChineseV2XCommunication	• Marked the document as obsolete
CP RS CoreTest	• No content changes
CP RS CryptoStack	• No content changes
CP RS DIODriver	• Editorial changes
CP RS DebugTraceProfile	• No content changes
CP RS Ethernet	• No content changes
CP RS FirmwareOverTheAir	• No content changes
CP RS FlashTest	• No content changes
CP RS FlexRay	• No content changes
CP RS FunctionInhibitionManager	• No content changes
CP RS GPTDriver	• No content changes
CP RS Gateway	• Editorial changes
CP RS HWTestManager	• Marked the document as obsolete
CP RS I2CDriver	• No changes
CP RS ICUDriver	• No content changes
CP RS IOHWAbstraction	• No content changes
CP RS IPDUMultiplexer	• Clarified handling of transmission trigger condition
CP RS LIN	• Editorial changes
CP RS Libraries	• Editorial changes
CP RS MCUDriver	• No content changes
CP RS MemoryHWAbstractionLayer	• No content changes
CP RS MemoryServices	• No content changes
CP RS ModeManagement	• Use case based rework of BswM requirements
CP RS OCUDriver	• Editorial changes
CP RS OS	• Timing protection extension for deferrable server • Removed ControlIdle API
CP RS PWMDriver	• No content changes
CP RS PortDriver	• No content changes
CP RS RAMTest	• No content changes

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Specification Name	Specification history entry
CP RS RTE	• Added ComHandler Concept SRS_Rte_00323 - SRS_ Rte_00326 • Removed VENDOR_MODE
CP RS SAEJ1939	• Transmission Request Queue for TP Channels • Uptraces to RS Main removed
CP RS SPALGeneral	• No content changes
CP RS SPIHandlerDriver	• No content changes
CP RS SWCModeling	• Editorial changes
CP RS SoftwareClusterConnection	• Merge of Com and LdCom
CP RS TimeService	• No content changes
CP RS Transformer	• Added support of DDS Transformer
CP RS V2XCommunication	• Marked the document as obsolete • No content changes
CP RS WatchdogDriver	• No content changes
CP RS XCP	• Removed obsolete requirements. • Removed SRS_Xcp_29021 • Editorial changes.
CP SWS ADCDriver	• Datatype definition change
CP SWS ARTI	• Editorial changes
CP SWS BFXLibrary	• Editorial changes
CP SWS BSWGeneral	• Add information about Libraries • Move the "List of Basic Software Modules" to its own chapter and add corresponding requirements • Add support for Timing Protection extension for aperiodic servers • Minor corrections / clarifications / editorial changes
CP SWS BSWModeManager	• Refomulated requirements related to BswMDevError Detect • Remodeled/Renamed BswM_ClientModeRequestEnum and BswM_OfferModeEnum as types • Editorial Changes
CP SWS BSWMulticoreLibrary	• Operations on signed types removed
CP SWS BulkNvDataManager	• No content changes
CP SWS BusMirroring	• Network ID are now pre-compile only configurable • Support of LIN source bus without transceiver • Clarified handling of frames lost bit

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Specification Name	Specification history entry
CP SWS CANDriver	• Add Dynamic bitmask for CAN Driver wakeup Can_Set CanPnFrameDataMask and SWS_Can_00604, SWS_ Can_00605, SWS_Can_00606, SWS_Can_00608, ECUC_Can_00538 • Remove of the TTCan Support • Removed Chapters 10.2.12 CanTTController and 10.2.13 CanTTHardwareObjectTrigger • Removed ECUC_Can_00430, ECUC_Can_00001, ECUC_Can_00139, ECUC_Can_00138, ECUC_Can_ 00136, ECUC_Can_00135, ECUC_Can_00134, ECUC_ Can_00128, ECUC_Can_00140, ECUC_Can_00131 ECUC_Can_00141, ECUC_Can_00127, ECUC_Can_ 00132, ECUC_Can_00129, ECUC_Can_00130, ECUC_ Can_00133, ECUC_Can_00137, ECUC_Can_00158, ECUC_Can_00157, ECUC_Can_00142, ECUC_Can_ 00493 ECUC_Can_00002 ECUC_Can_00147 ECUC_ Can_00148, ECUC_Can_00146, ECUC_Can_00155, ECUC_Can_00145 • Modified items by remove of TTCan References ECUC_ Can_00497, ECUC_Can_00354, ECUC_Can_00324
CP SWS CANInterface	• Abstraction from Driver APIs • Removal of TTCan • Improve mask based reception and transmission • Editorial changes
CP SWS CANNetworkManagement	• Harmonization with FO PRS Network Management • Editorial changes
CP SWS CANStateManager	• API Harmonization • Bus-Off delay adaption for SAE J1939-81 • Editorial changes
CP SWS CANTransceiverDriver	• Editorial changes
CP SWS CANTransportLayer	• Added Transmission Request Queue for TP Channels
CP SWS CANXLDriver	• Abstraction from Driver APIs • Editorial changes
CP SWS CANXLTransceiverDriver	• Abstraction from Driver APIs
CP SWS COM	• Merged LdCom functionality as Large Data Path • Added timeout reporting to DEM • Minor corrections / clarifications / editorial changes
CP SWS COMBasedTransformer	• Changed Definition of API function ComXf_ Inv_<transformerId> • Added list of optional interfaces.
CP SWS COMManager	• Moved ComMPncEnabled from ComMConfigSet to Com MChannel • Reworked chapter of communication inhibition • Added missing SRS uptraces • Minor bug fixes
CP SWS CRCLibrary	• Removed remaining references to CRC hardware implementation • Minor corrections / clarifications / editorial changes
CP SWS CellularV2XDriver	• Marked the document as obsolete

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Specification Name	Specification history entry
CP SWS ChineseV2XManagement	• Marked the document as obsolete • No content changes
CP SWS ChineseV2XMessage	• Marked the document as obsolete
CP SWS ChineseV2XNetwork	• Marked the document as obsolete
CP SWS ChineseV2XSecurity	• Marked the document as obsolete • No content changes
CP SWS CommunicationStackTypes	• added new types RateDeviationStatusType and Rate DeviationWithStatusType • header file names corrected • removed LdCom
CP SWS CoreTest	• Editorial changes
CP SWS CryptoDriver	• Add SecureBoot SecurityEvents reporting. • Remove mapping table of KeyMCertificateElementOf Structure. • Remove actively waiting of Key Management functions while processing a job. • List CRYPTO_E_BUSY as a return value of Crypto_ RandomSeed() API. • List CRYPTO_E_BUSY as a return value of Crypto_Key GetStatus() API.
CP SWS CryptoInterface	• No content changes
CP SWS CryptoServiceManager	• Add Crypto Driver profiles for KeyM Certificate Elements • Extend definition of key elements for other BSW modules • Editorial changes
CP SWS DIODriver	• Editorial changes
CP SWS DataDistributionService	• Added Service Oriented Architecture management • Added SPDP, SEDP, Service Discovery engines management • ECU model extension to handle full SOA and Discovery features • Added Appendix explanation chapters • Moved architecture from LdCom to Com
CP SWS DataDistributionServiceTransformer	• Initial release
CP SWS DefaultErrorTracer	• Removed DLT calls. • Editorial Changes
CP SWS DiagnosticCommunicationManager	• DcmDspRoutineInfoByte support for UDS • OBD RID ranges • DTCSettingControlOptionRecord optional in Control DTCSetting service • Authentication distance supervision • Multiple security events for single diagnostic service • Dcm_StatusType removed • DcmDspMaxDidToRead for UDS • Support of 64-bit DiagnosticDataElements • Minor corrections / clarifications / editorial changes; For details please refer to the ChangeDocumentation

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Specification Name	Specification history entry
CP SWS DiagnosticEventManager	• Added support for handling the initialization of Dem-related NvM data blocks. • Added support for 64-bit DiagnosticDataElements. • Enabled post-build configuration for DTC priority, aging, and OBD-related parameters. • Removed the 'Dem aging cycle counter threshold for TFSLC' feature. • Added support for J1939 DTC class filtering. • Added an overlay for Std_ReturnType using Dem literals. • Added configuration to freeze the monitor numerator if the denominator is inhibited. • Clarified the requirements for Monitor Status.
CP SWS DiagnosticLogAndTrace	• Removed chapter 7.1.5 Log messages from DET • Removed SWS_Dlt_00432 • Minor corrections • Editorial changes
CP SWS DiagnosticOverIP	• Introduction of Security Event reporting • Editorial changes
CP SWS E2ELibrary	• Add 2 new functions for E2E for methods • Remove use cases • Remove all references to E2EPW
CP SWS E2ETransformer	• Order of figures reworked • End-To-End For Methods reworked
CP SWS ECUStateManager	• update related documents • Correct uptraces to SRS document • Convert SequenceDiagram to TraceableDiagrams • Minor content changes, clarifications
CP SWS EEPROMAbstraction	• Removed redundant memory layout table • Editorial changes
CP SWS EFXLibrary	• Corrected description of arcsin and exponential function.
CP SWS EthernetDriver	• Added MACsec support • Added VLAN filtering to Eth_UpdatePhysAddrFilter • Eth_Transmit, Eth_Receive and Eth_TxConfirmation no longer raise ETH_E_INV_MODE if controller mode is not ETH_MODE_ACTIVE • Marked Eth_GetIngressTimeStamp as obsolete • Removed Eth_GetCurrentTime • Removed buffer handling

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Specification Name	Specification history entry
CP SWS EthernetInterface	• Added new requirements and interfaces for MACsec enhancements • Added abstraction support from Driver APIs • Added context data and trigger conditions for the security events • Updated rateDeviation range in EthIf_SetPhcCorrection • Added MKA APIs to Optional Interfaces • Set EthIf_GetIngressTimeStamp to Obsolete • Added new DET error ETHIF_E_INV_CLKUNIT_IDX for invalid ClkUnitIdx • Added optional references to physical controller for an Rx/Tx PDU pool • Created new chapter for Configuration Constraints • Improved VLAN priority usage for transmission • Added new requirements for Ethernet Switch Management • Removed chapters: • EthIf_GetCurrentTime • EthIf_MainFunctionRx_<PriorityProcessing ShortName> • Editorial changes
CP SWS EthernetStateManager	• Added multiplicity for certain containers
CP SWS EthernetSwitchDriver	• Abstraction from Driver APIs through EthIf • Revised MacSec support • Bugfixes (types, VLAN handling, etc.)
CP SWS EthernetTransceiverDriver	• Abstraction from Driver APIs • Added MacSec Support • Moved EcuC configuration from MKA to EthTrcvDrv • Bugfixes
CP SWS Firewall	• Updated context data for security events generated by the firewall
CP SWS FlashEEPROMEmulation	• Updated init sequence: Fee_Init is now synchronous, but explicitly exclude internal management operations, in scope of Fee_MainFunction • Fixed typo in SWS_Fee_00056 • Removed redundant memory layout table
CP SWS FlashTest	• No content changes
CP SWS FlexRayARTransportLayer	• No content changes
CP SWS FlexRayDriver	• No content changes
CP SWS FlexRayISOTransportLayer	• No content changes
CP SWS FlexRayInterface	• No content changes
CP SWS FlexRayNetworkManagement	• Removed wrong figure from sec. 4.1 • Editorial updates in chap. 10 & few requirements • Ref. to PRS instead of redundant spec. in SWS sec. 7.6.2
CP SWS FlexRayStateManager	• API Harmonization • Editorial changes

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Specification Name	Specification history entry
CP SWS FlexRayTransceiverDriver	• Removed requirement
CP SWS FunctionInhibitionManager	• No content changes • Editorial changes
CP SWS GPTDriver	• No content changes
CP SWS HWTestManager	• Marked the document as obsolete
CP SWS I2CDriver	• Use case "combined sequence with repeated start" clarified • Spelling I2C harmonized • Bugfixes
CP SWS ICUDriver	• No content changes
CP SWS IEEE1722TransportLayer	• Consider format dependencies with "IEC 61883" and "IIDC" in ECUC parameter description. • Typo's corrected. IEC68133 -> IEC61883 for related entities (e.g. datatypes)
CP SWS IFLLibrary	• Editorial changes
CP SWS IFXLibrary	• Editorial changes
CP SWS IOHardwareAbstraction	• Editorial changes
CP SWS IPDUMultiplexer	• Introduced "maximum fill-up strategy" for ContanerPdus • Clarified trigger conditions to transmit a ContainerIpdu • Editorial changes
CP SWS ISO15118Charging	• Editorial changes
CP SWS IntrusionDetectionSystemManager	• Introduced Authenticator with MAC and Signature as authentication option • Introduce Transmission Retry Handling in case sink failed • Add BSW ReportingMode API • Remove obsolete elements • Set Status of Chapter 10 ECUC tables to valid
CP SWS KeyManager	• Add optional NvM interfaces. • Add new security events. • Removed obsolete security events. • Editorial changes.
CP SWS LINDriver	• Clarification of an ongoing frame transmission and a new frame transmission is requested • Editorial Changes
CP SWS LINInterface	• Removal of obsolete elements • Editorial changes
CP SWS LINStateManager	• Editorial Changes
CP SWS LINTransceiverDriver	• Editorial changes
CP SWS LSduRouter	• Fixed Post-Build variant and Value configuration class for LSduRPathDestinationPduId and LSduRPathSourcePduId

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Specification Name	Specification history entry
CP SWS MACsecKeyAgreement	• Introduction of LSduR for communication path • Configuration of MACsec bypasses based on VLAN and EtherType moved to EthTrcvDrv and EthSwtDrv • New requirements added to detail the usage of the APIs • New interfaces added to both mandatory and optional lists • New sequence diagrams for the interaction of AUTOSAR modules for an MKA's Key Server and Peer node • Fixes in ECUC model • CP_SWS_Mka_00022 set as not applicable requirement • Editorial changes
CP SWS MCUDriver	• Editorial Changes.
CP SWS MFLLibrary	• Editorial: fix typographic errors introduced in R21-11
CP SWS MFXLibrary	• Editorial change.
CP SWS MSFLibrary	• No content changes
CP SWS MemoryAbstractionInterface	• Editorial changes
CP SWS MemoryAccess	• Clarification of the usage of the terms "direct" and "indirect"
CP SWS MemoryDriver	• Clarification of the usage of the terms "direct" and "indirect"
CP SWS MemoryMapping	• Mandatory MAKW building rules • Clarify usage of CoreScope • Removal of deprecated MemMap values
CP SWS NVRAMManager	• Changes in read & write processing related to verification • Changes in configuration items related to block configuration • Deletion of specification items (see Table B.3)
CP SWS NetworkManagementInterface	• Shutdown clarfication for actively coordinated channels • Editorial changes
CP SWS OCUDriver	• Editorial changes
CP SWS OS	• Removal of "Service Interfaces" • Removal of feature "ControlIdle" • Timing protection extension for aperiodic servers • Several ARTI updates • Minor correction / clarification / editorial changes
CP SWS PDURouter	• Clarification for flushing queues • Clarification on buffer behavior for multi-frame TP gatewaying • Editorial changes
CP SWS PWMDriver	• No content changes
CP SWS PlatformTypes	• No content changes.
CP SWS PortDriver	• Editorial changes
CP SWS RAMTest	• Editorial changes

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Specification Name	Specification history entry
CP SWS RTE	• Support for cyclic handling of communication data added • Support for vendor mode removed • Adaptations for the merge of LdCom functionality as Large Data Path into COM • Minor corrections / clarifications/ editorial changes
CP SWS SAEJ1939DiagnosticCommunicationManager	• Added support for DM41 – DM52 and configuration of DM58 – DM60 • Fixed description of return value of GenericDMxRx Indication • J1939DCM_E_INVALID_STATE is now a Runtime Error • Cleaned up interaction with DEM
CP SWS SAEJ1939FunctionalSafetyCommProtocol	• Fixed Post-Build Configuration
CP SWS SAEJ1939NetworkManagement	• Fixed J1939Nm_GetBusOffDelay to allow for SAE J1939-81 compliant bus-off delays • Unified descriptions of extended production errors • Improved uptracing to RS BSW General
CP SWS SAEJ1939RequestManager	• Improved uptracing to RS BSW General
CP SWS SAEJ1939TransportLayer	• Support for back-to-back routing • Support for non-default priorities and BAM timings • Removed J1939Tp_ChangeParameter() • Improved uptracing to RS BSW General
CP SWS SOMEIPTransformer	• Reverted the handling of receiving less data than expected and substitution of missing elements with default values during deserialization • Marked SOMEIPXF_E_NOT_READY , SOMEIPXF_E_NOT_REACHABLE, SOMEIPXF_E_TIMEOUT as deprecated • Updated the default behavior/values for (de-)serialization parameters • Added a reference to new error code E_SER_PAYLOAD_LENGTH_EXCEEDED that is issued when array length is greater than expected • Clarified the deserialization for duplicate members and invalid wire type • Updated the length field requirements for fixed length string • Added requirements for evaluating return code in case of autonomous error response of a Client-Server operation • Editorial Changes and bug fixes
CP SWS SOMEIPTransportProtocol	• Refined parallel processing of SOME/IP-TP segments • Editorial changes and bug fixes
CP SWS SPIHandlerDriver	• No content changes
CP SWS SecureOnboardCommunication	• Minor corrections / clarifications / editorial changes; For details please refer to the Change Documentation
CP SWS ServiceDiscovery	• Updated ACL check sequence for offer entry and removed redundant requirements • Minor bugfixes and editorial changes

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Specification Name	Specification history entry
CP SWS SocketAdaptor	• Enhanced TCP retransmission handling. • Removed Path MTU discovery.
CP SWS SoftwareClusterConnection	• Join Com and LdCom proxy to common Com Proxy • Clarify implementation aspects of Proxy Modules • Corrections and editorial changes
CP SWS StandardTypes	• Removed SWS_Std_00014 as duplicated of SWS_BSW_00249 • Removed Safety Transformer Error Codes in SWS_Std_00028 (included in SWS_Std_00029) • Editorial Changes
CP SWS SynchronizedTimeBaseManager	• ARMQL statements introduced for variation conditions of service interfaces • Clarifications regarding the NvM storage • Clarifications regarding the user data length • Several minor corrections
CP SWS TcpIp	• Minor corrections and clarifications • Update behavior in case of TcpIp_ReleaseIpAddr Assignment regarding open sockets • Update behavior of TcpIp Checksum calculation and Eth CtrlOffloading consideration • Update non-exclusion of Jacobson's and Karn's algorithm • Remove Path MTU Discovery for IPv4 and IPv6 • Improve Ethernet & TCP/IP SEvs • Add missing state Diagram for chapter 7.8 TCP/IP Stack state handling • Non-exclusion of Jacobson's and Karn's algorithm
CP SWS TimeService	• No content changes
CP SWS TimeSyncOverCAN	• Document split into a protocol spec part (PRS) and a SWS CanTSyn
CP SWS TimeSyncOverEthernet	• Cleanup and Update EthTSyn Configuration • Improve mandatory/optional interfaces • Improve specification of behavior of Timesync message debouncing • Enable PostBuild configuration for GlobalTimeDomainId • Update Uptraces
CP SWS TimeSyncOverFlexRay	• Reporting of security events updated
CP SWS UDPNetworkManagement	• Bug fixes and editorial changes
CP SWS V2XBasicTransport	• Marked the document as obsolete • No content changes
CP SWS V2XDataManager	• Marked the document as obsolete • No content changes
CP SWS V2XFacilities	• Marked the document as obsolete • No content changes
CP SWS V2XGeoNetworking	• Marked the document as obsolete • Removal of obsolete elements

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Specification Name	Specification history entry
CP SWS V2XManagement	• Marked the document as obsolete • No content changes
CP SWS VDPCMRemote	• Initial release
CP SWS WatchdogDriver	• No content changes.
CP SWS WatchdogInterface	• Editorial changes
CP SWS WatchdogManager	• Fixed transition IDs in the statemachines. • Editorial changes
CP SWS WirelessEthernetDriver	• Marked the document as obsolete • Removal of obsolete elements • Harmonization of MAC address regular expression • Update of Production errors
CP SWS WirelessEthernetTransceiverDriver	• Marked the document as obsolete • Update of Production errors
CP SWS XCP	• Add NvM_ReadBlock and NvM_WriteBlock APIs as optional interfaces • Removal of R24-11 obsolete elements • Editorial changes
CP TPS BSWModuleDescriptionTemplate	• Added constraint to explain the applicability of McData Instance attributes depending on the category • Removed Implementation Conformance Statement • Minor corrections / clarifications / editorial changes; For details please refer to the ChangeDocumentation
CP TPS DiagnosticExtractTemplate	• Improve support for post-build variance for OBD • Platform-independent support for extended data records • Add imposition time for AP • minor corrections / clarifications / editorial changes
CP TPS ECUConfiguration	• Minor changes • Editorial: Replace ECU Configuration Value Description by ECU Configuration Values or ECU Configuration Values ARXML • Editorial: Improved descriptions of URI References Chapter 2.3.6.6 • Added BusToPartitionMapping Chapter 3.3.6
CP TPS ECUResourceTemplate	• Removed TTCan examples
CP TPS SoftwareComponentTemplate	• Introduce RunnableEntry argument • Remove End-to-End wrapper • add imposition time for AP • minor corrections / clarifications / editorial changes
CP TPS SystemTemplate	• Removed E2E Wrapper and E2E ComCallout configuration options • Reworked DDS configuration • Introduced CyclicHandlingComDataToOsTaskProxy Mapping • Replaced LdCom by Large Data Path in Com

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Specification Name	Specification history entry
CP TPS TimingExtensions	• Removal of obsolete elements and TDEventTTCan feature • Mark appendices as informative/normative
CP TR AIDesignPatternsCatalogue	• Editorial changes
CP TR AIMeasurementCalibrationDiagnostics	• Editorial changes
CP TR BSWUMLModelModelingGuide	• Clarification of lifecycle states of model elements (see 2.11) • Added option to model API functions sharing the same Service ID (TR_BSWMG_00938) • Added option to set custom export titles for model elements (TR_BSWMG_00940, TR_BSWMG_00941) • Ease modeling by storing the last-used SWS-IDs and Service IDs per module (TR_BSWMG_00936, TR_BSWMG_00937)
CP TR GeneralBlueprintsSupplement	• Removal of Predefined Names • Fix axis order for ROW_DIR
CP TR HWTestManagementIntegrationGuide	• Marked the document as obsolete
CP TR Methodology	• Add methodology for CpSoftwareClusters • Remove support for Data Exchange Points • Remove Franca Integration • Editorial changes - removal of FO RS Methodology
CP TR ModelingShowCases	• Added Integration Requirements description
CP TR ReleaseOverview	• Release Life Cycle Status: R25-11 is in Evolution, R25-11 supersedes R24-11
CP TR SWCModelingGuide	• Added appendix with AI Specification Keyword Set
CP TR VFB	• Document type is changed from EXP to TR • Removed tracing to "Main Requirements" (FO-RS-Main) • Editorial changes: cleaned up image files, fixed spacing and added missing titles
CP TR WorkflowExample	• Initial release

Table 5.1: Overview of specification changes in R25-11