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Document Responsibility	AUTOSAR
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Part of AUTOSAR Standard	Classic Platform
Part of Standard Release	4.4.0
Release Life Cycle Status	R4.4 is in Evolution, R4.4 supersedes R4.3

Document Change History			
Date	Release	Changed by	Change Description
2018-10-31	4.4.0	AUTOSAR Release Management	Initial release

Table of Contents

1 Introduction

1.1 Scope of this document

This document provides an overview of the complement of AUTOSAR specifications of the AUTOSAR standard "Classic Platform" comprising the initial Release 4.4.0 and its latest Revision .

1.2 Dependencies to other standards

This release of the Classic Platform depends on the standard "Foundation" in Release 1.5.0, which

- defines protocols implemented by Classic Platform and
- contains main requirements to complete the trace hierarchy.

These dependencies are refined in the trace information of the requirements in the respective specifications, i.e. requirement in SWS DLT refers to the protocol specification in the Foundation standard.

1.3 Content of chapters

This document is structured as follows:

- Chapter 2 provides a list of documentation references.
- Chapter 3 provides a summary of changes that were implemented since the preceding Release 4.3
- Chapter 4 contains the overview of specifications comprising the Release 4.4.0 in its latest Revision . This chapter is structured according to the clusters being in use in AUTOSAR Release 4.4.0.
- Chapter 5 contains remarks about known technical deficiencies.
- Chapter 6 contains the detailed revision history of all released specifications.
- Chapter 7.1 provides a set of definitions aimed to increase the understanding of the content of this document and the Release 4.4.0.

2 Related documentation

1) Release Overview and Revision History
2) AUTOSAR specifications in general
3) Glossary

3 Summary of changes

This chapter contains a summary of changes which were implemented since the previous Release 4.3.

3.1 Release 4.4.0

In AUTOSAR R4.4.0, a broad variety of topics was introduced or improved by the concept work. Concepts focusing on the description in AUTOSAR artifacts (Formal Model Query and Blueprint Derivation Mechanisms, ASAM Units, Logical Execution Time) have been incorporated as well as concepts dealing with bus communication topics (LIN Slave Support, Bus Mirroring, Transport Layer Security). Large steps towards the possibility to build secure ECUs and with that secure cars are provided by the concept Security Extensions.

Find an extensive description of the concepts in the following chapter 3.1.1.

By harmonizing technical content for end-to-end safety mechanisms, network management and time synchronization via communication busses between Classic Platform and Adaptive Platform the interoperability between ECUs built based on these two standards is improved and gains stability.

Additionally, further improvements have been achieved by cleaning up the Classic Platform Header File Structure.

3.1.1 Concepts

3.1.1.1 Introduced Concepts

The following concepts in 3.1.1.1.1 – 3.1.1.1.10 have been introduced.

3.1.1.1.1 ASAMUnits

The concept defines a standardized collection of BluePrint-definitions of Physical Units and related to this a collection of Physical Dimension BluePrint-definitions.
All definitions are synchronized between ASAM and AUTOSAR and should be used whenever interfaces between SW and physical world are described.

3.1.1.1.2 AUTOSARRunTimeInterface

The concept "AUTOSARRunTimeInterface" is released as draft and will be validated in 2019.

The concept "ARTI" defines an interface between build tools and debugging/tracing tools to the AUTOSAR standard. It defines standardized hooks that AUTOSAR components shall contain and also defines a model to export information about the internal representation of the components to ease debugging and tracing.

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3.1.1.1.3 RTEImplementationPlugIns

The concept "RTEImplementationPlugIns" is released as draft and will be validated in 2019.

The concept supports the modular implementation of the RTE with a standard RTE Generator and specialized RTE Plug-Ins.
This supports highly optimized implementations of specific communication scenarios with a domain specific tool chain.

3.1.1.1.4 LINSlaveSupport

The concept introduces the modeling and implementation of LIN slave nodes into the AUTOSAR LIN communication stack.

3.1.1.1.5 Formal Model Query and Blueprint Derivation Mechanisms

The concept "Formal Model Query and Blueprint Derivation Mechanisms" is released as draft and will be validated in 2019.

The concept completes the extension of AUTOSAR Classic (CP) and Adaptive platforms (AP) with the AUTOSAR Model Query Language (ARMQL). This new language enables a highly efficient collaboration of AUTOSAR users due to resolving variation points in CP and AP by the same mechanism. It is published in textual form, not bound to a specific tool and significant better understandable as the existing Formula Language.

3.1.1.1.6 BusMirroring

The concept enables an external tester to listen to the traffic on and check the status of internal communication busses which are not directly accessible to this tester. It introduces a new Mirroring component that can forward LIN and CAN traffic to CAN and can create serialized datagrams that reflect communication on LIN, CAN, and FlexRay busses for transmission over FlexRay or Ethernet. To avoid flooding of intermediate networks, the traffic on monitored buses can be filtered.

3.1.1.1.7 SecurityExtensions

The concept adds important security controls to the AUTOSAR framework which support the efficient implementation of secure automotive systems.
The extensions include secure logging, vehicle key and certificate management, authentic time and diagnostic policy management.

3.1.1.1.8 MCALMulticoreDistribution

The concept "MCALMulticoreDistribution" is released as draft and will be validated in 2019.

This concept describes, how different multicore capabilities of MCAL drivers can be realized and declared by those driver modules. These capabilities enable advanced multicore use cases for application and base software and improve reusability due to the well-known functional scope of the drivers.

3.1.1.1.9 Logical Execution Time

The concept extends the TIMEX with capabilities to specify that data exchange via sender-receiver communication is performed at predefined points in time.
The essential properties of LET intervals (start, end, duration) are introduced as well as their timing behavior (trigger, offset between LET intervals).

3.1.1.1.10   TransportLayerSecurity

The concept "TransportLayerSecurity" is released as draft and will be validated in 2019.

The concept provides the ability to establish a secure ad-hoc session between two Ethernet nodes based on the well-known Transport Layer Security (TLS) standard. This allows to establish an authentic and confidential communication between two ECUs or between an ECU and an external entities.

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3.1.1.2 Impacts of Concepts

The introduced concepts had 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.
- Specifications in *italic* font are affected indirectly as they provide artefacts for the actually impacted specifications.

Concept Name	Specification Long Name	Standard
AUTOSAR Run Time Interface	Requirements on Operating System	CP
	Specification of Operating System	
	Specification of ECU Configuration Parameters (XML)	
	Specification of Synchronized Time-Base Manager	
	Methodology	
	Requirements Requirements on Tracing and Timing-Analysis support of AUTOSAR Components	
	Specification of AUTOSAR Run-Time Interface	
	Requirements Requirements on Tracing and Timing-Analysis support of AUTOSAR Components	FO
	Main Requirements	
	Glossary	
Bus-Mirroring	Requirements on Bus Mirroring	CP
	Specification of Bus Mirroring	
	Basic Software UML Model	
	Specification of ECU Configuration Parameters (XML)	
	Specification of FlexRay Interface	
	Requirements on CAN	
	Specification of CAN Driver	
	Specification of CAN Interface	
	Specification of FlexRay Driver	
	Specification of LIN Interface	
	System Template	
	List of Basic Software Modules	
	Main Requirements	FO
	Glossary	
Extended Serialization for Data Structures in SOME/IP with	Specification of RTE Software	CP
	Requirements on Runtime Environment	
	Software Component Template	
	System Template	

Concept Name	Specification Long Name	Standard
tag/length/value encoding	Requirements on Transformer	CP
	Specification of SOME/IP Transformer	
	Requirements on Software Component Template	
	Requirements on System Template	
Formal Model Query and Blueprint Derivation Mechanisms	Collection of blueprints for AUTOSAR M1 models	CP
	Basic Software UML Model	
	Generic Structure Template	
	Standardization Template	
Harmonization of Physcial Units for ASW and BSW Based on ASAM	Software Component Template	CP
	Supplementary material of general blueprints for AUTOSAR	
	Methodology	
	XML Specification of Application Interfaces	
	Application Interface Examples	
	Collection of blueprints for AUTOSAR M1 models	
	Main Requirements	FO
	Glossary	
LIN-Support for LIN slave	Layered Software Architecture	CP
	Requirements on LIN	
	Specification of Communication Manager	
	Specification of ECU Configuration Parameters (XML)	
	Basic Software UML Model	
	Specification of LIN Driver	
	Specification of LIN Interface	
	Specification of LIN State Manager	
	System Template	
	Main Requirements	FO
	Glossary	
Logical Execution Time	Meta Model	CP
	Requirements on Timing Extensions	
	Specification of Timing Extensions	
	Methodology	
	Glossary	FO

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Concept Name	Specification Long Name	Standard
MCAL Multicore Distribution	Guide to BSW Distribution	CP
	Layered Software Architecture	
	Specification of ADC Driver	
	Specification of ECU Configuration Parameters (XML)	
	Basic Software UML Model	
	Specification of CAN Driver	
	Specification of CAN Transceiver Driver	
	Specification of Core Test	
	Specification of DIO Driver	
	Specification of Ethernet Driver	
	Specification of Ethernet Transceiver Driver	
	Specification of FlexRay Driver	
	Specification of GPT Driver	
	Specification of ICU Driver	
	Specification of LIN Driver	
	Specification of LIN Transceiver Driver	
	Specification of MCU Driver	
	Specification of OCU Driver	
	Specification of PWM Driver	
	Specification of RAM Test	
	Specification of SPI Handler/Driver	
	Specification of Wireless Ethernet Transceiver Driver	
	Specification of Crypto Driver	
	Specification of EEPROM Driver	
	Specification of Flash Driver	
	Specification of Flash Test	
	Specification of Watchdog Driver	
	Specification of Ethernet Switch Driver	
	Specification of FlexRay Transceiver Driver	
	Specification of Port Driver	
	Specification of Wireless Ethernet Driver	
	Specification of TTCAN Driver	
	Glossary	FO
RTE Implementation Plug-Ins	Specification of RTE Software	CP
	Basic Software UML Model	
	Specification of ECU Configuration Parameters (XML)	
	Requirements on Runtime Environment	
	Requirements on System Template	
	System Template	

Concept Name	Specification Long Name	Standard
Security Extensions	Specification of Diagnostic Communication Manager	CP
	Basic Software UML Model	
	Specification of ECU Configuration Parameters (XML)	
	General Requirements on Basic Software Modules	
	Requirements on Crypto Stack	
	Specification of Diagnostic Event Manager	
	Specification of Key Manager	
	List of Basic Software Modules	
	General Specification of Basic Software Modules	
	System Template	
	Collection of blueprints for AUTOSAR M1 models	
	Main Requirements	FO
	Requirements on Diagnostic	
	Glossary	
Transport Layer Security	Requirements on Ethernet Support in AUTOSAR	CP
	Specification of Crypto Service Manager	
	Basic Software UML Model	
	Specification of ECU Configuration Parameters (XML)	
	Specification of Socket Adaptor	
	Specification of Synchronized Time-Base Manager	
	System Template	
	Main Requirements	FO
	Glossary	

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3.1.2 Specifications

3.1.2.1 New Specifications

In addition to the above listed new specifications which were introduced via Concepts, the following documents and templates were added with R4.4.0:

- None, all new specifications in Classic Platform were added through concepts (see list above)

3.1.2.2 Migrated Specifications

With this release, the following specifications were moved from AUTOSAR Classic Platform to the AUTOSAR Foundation standard:

- Requirements on Synchronized Time-Base Manager (UID 420, SRS), where it was merged with the new document Requirements on Time Synchroinzation (UID 906, RS)

3.1.2.3 Obsolete Specifications

The following specification is set to status "obsolete" in this release:

- Requirements on AUTOSAR Features (UID 294, RS)
- Requirements on Interaction with Behavioral Models (UID 102, RS)
- Interaction with Behavioral Models (UID 205, TR)
- Specification of LIN Network Management (UID 297, SWS)
- Requirements on Interoperability of AUTOSAR Tools (UID 101, RS)
- Interoperability of AUTOSAR Tools (UID 204, TR)

3.1.2.4 Removed specifications

The following specification is set to status "removed" in this release:

- Specification of ECU State Manager with fixed state machine (UID 444, SWS)
- Specification of Crypto Abstraction Library (UID 438, SWS)
- Technical Safety Concept Status Report (UID 233, TR)

3.1.2.5 Reworked specifications

The following documents have been changed fundamentally in R4.4.0:

- none

3.1.3 Release Documentation

There were no major changes regarding the Release Documentation.

4 Specification overview

The published specifications are divided up into the clusters

- Body and Comfort
- BSW General
- Chassis
- Communication
- Crypto
- Diagnostics
- General
- Global Time
- HMI
- IO
- Libraries
- MCAL
- Memory
- Methodology and Templates
- Mode Management
- Powertrain
- Release Documentation
- RTE
- Safety
- SWArch
- System Services
- Tools

These clusters are then further structured by subcategories to provide a better orientation to the specification users. The assignment of the specifications to those clusters is shown below.

Long Name	File Name	Life cycle changes
Release Documentation		
Classic Platform Release Overview	AUTOSAR_TR_ClassicPlatformReleaseOverview	
AUTOSAR Classic Platform Specification Hashes	AUTOSAR_TR_ClassicPlatformSpecificationHashes	
Body and Comfort		
Explanation of Application Interfaces of the Body and Comfort Domain	AUTOSAR_EXP_AIBodyAndComfort	
BSW General		
Basic Software UML Model	AUTOSAR_MOD_BSWUMLModel	
Complex Driver design and integration guideline	AUTOSAR_EXP_CDDDesignAndIntegrationGuideline	
Description of the AUTOSAR standard errors	AUTOSAR_EXP_ErrorDescription	

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Long Name	File Name	Life cycle changes
Explanation of Error Handling on Application Level	AUTOSAR_EXP_ApplicationLevelErrorHandling	
Explanation of Interrupt Handling within AUTOSAR	AUTOSAR_EXP_InterruptHandlingExplanation	
General Requirements on Basic Software Modules	AUTOSAR_SRS_BSWGeneral	
General Specification of Basic Software Modules	AUTOSAR_SWS_BSWGeneral	
Guide to BSW Distribution	AUTOSAR_EXP_BSWDistributionGuide	
List of Basic Software Modules	AUTOSAR_TR_BSWModuleList	
Modeling Guidelines of Basic Software EA UML Model	AUTOSAR_TR_BSWUMLModelModelingGuide	
Specification of Communication Stack Types	AUTOSAR_SWS_CommunicationStackTypes	
Specification of Compiler Abstraction	AUTOSAR_SWS_CompilerAbstraction	
Specification of Platform Types	AUTOSAR_SWS_PlatformTypes	
Specification of Standard Types	AUTOSAR_SWS_StandardTypes	
Chassis		
Explanation of Application Interfaces of the Chassis Domain	AUTOSAR_EXP_AIChassis	
Communication		
General Specification on Transformers	AUTOSAR_ASWS_TransformerGeneral	
Requirements on BSW Modules for SAE J1939	AUTOSAR_SRS_SAEJ1939	
Requirements on Bus Mirroring	AUTOSAR_SRS_BusMirroring	Initial release
Requirements on CAN	AUTOSAR_SRS_CAN	
Requirements on Communication	AUTOSAR_SRS_COM	
Requirements on E2E Communication Protection	AUTOSAR_SRS_E2E	
Requirements on Ethernet Support in AUTOSAR	AUTOSAR_SRS_Ethernet	
Requirements on FlexRay	AUTOSAR_SRS_FlexRay	
Requirements on Gateway	AUTOSAR_SRS_Gateway	
Requirements on I-PDU Multiplexer	AUTOSAR_SRS_IPDUMultiplexer	
Requirements on LIN	AUTOSAR_SRS_LIN	
Requirements on Module XCP	AUTOSAR_SRS_XCP	
Requirements on Network Management	AUTOSAR_SRS_NetworkManagement	
Requirements on Secure Onboard Communication	AUTOSAR_SRS_SecureOnboardCommunication	
Requirements on SPI Handler/Driver	AUTOSAR_SRS_SPIHandlerDriver	
Requirements on Transformer	AUTOSAR_SRS_Transformer	
Requirements on TTCAN	AUTOSAR_SRS_TTCAN	
Requirements on Vehicle-2-X Communication	AUTOSAR_SRS_V2XCommunication	
Specification of Large Data COM	AUTOSAR_SWS_LargeDataCOM	

Long Name	File Name	Life cycle changes
Specification of a Request Manager for SAE J1939	AUTOSAR_SWS_SAEJ1939RequestManager	
Specification of a Transport Layer for SAE J1939	AUTOSAR_SWS_SAEJ1939TransportLayer	
Specification of Bus Mirroring	AUTOSAR_SWS_BusMirroring	Initial release
Specification of CAN Driver	AUTOSAR_SWS_CANDriver	
Specification of CAN Interface	AUTOSAR_SWS_CANInterface	
Specification of CAN Network Management	AUTOSAR_SWS_CANNetworkManagement	
Specification of CAN State Manager	AUTOSAR_SWS_CANStateManager	
Specification of CAN Transceiver Driver	AUTOSAR_SWS_CANTransceiverDriver	
Specification of CAN Transport Layer	AUTOSAR_SWS_CANTransportLayer	
Specification of COM Based Transformer	AUTOSAR_SWS_COMBasedTransformer	
Specification of Communication	AUTOSAR_SWS_COM	
Specification of Diagnostic Log and Trace	AUTOSAR_SWS_DiagnosticLogAndTrace	
Specification of Diagnostic over IP	AUTOSAR_SWS_DiagnosticOverIP	
Specification of Ethernet Driver	AUTOSAR_SWS_EthernetDriver	
Specification of Ethernet Interface	AUTOSAR_SWS_EthernetInterface	
Specification of Ethernet State Manager	AUTOSAR_SWS_EthernetStateManager	
Specification of Ethernet Switch Driver	AUTOSAR_SWS_EthernetSwitchDriver	
Specification of Ethernet Transceiver Driver	AUTOSAR_SWS_EthernetTransceiverDriver	
Specification of FlexRay AUTOSAR Transport Layer	AUTOSAR_SWS_FlexRayARTransportLayer	
Specification of FlexRay Driver	AUTOSAR_SWS_FlexRayDriver	
Specification of FlexRay Interface	AUTOSAR_SWS_FlexRayInterface	
Specification of FlexRay ISO Transport Layer	AUTOSAR_SWS_FlexRayISOTransportLayer	
Specification of FlexRay Network Management	AUTOSAR_SWS_FlexRayNetworkManagement	
Specification of FlexRay State Manager	AUTOSAR_SWS_FlexRayStateManager	
Specification of FlexRay Transceiver Driver	AUTOSAR_SWS_FlexRayTransceiverDriver	
Specification of I-PDU Multiplexer	AUTOSAR_SWS_IPDUMultiplexer	
Specification of LIN Driver	AUTOSAR_SWS_LINDriver	
Specification of LIN Interface	AUTOSAR_SWS_LINInterface	
Specification of LIN Network Management	AUTOSAR_SWS_LINNetworkManagement	Set to obsolete
Specification of LIN State Manager	AUTOSAR_SWS_LINStateManager	

Long Name	File Name	Life cycle changes
Specification of LIN Transceiver Driver	AUTOSAR_SWS_LINTransceiverDriver	
Specification of Module E2E Transformer	AUTOSAR_SWS_E2ETransformer	
Specification of Module XCP	AUTOSAR_SWS_XCP	
Specification of Network Management for SAE J1939	AUTOSAR_SWS_SAEJ1939NetworkManagement	
Specification of Network Management Interface	AUTOSAR_SWS_NetworkManagementInterface	
Specification of PDU Router	AUTOSAR_SWS_PDURouter	
Specification of Secure Onboard Communication	AUTOSAR_SWS_SecureOnboardCommunication	
Specification of Service Discovery	AUTOSAR_SWS_ServiceDiscovery	
Specification of Socket Adaptor	AUTOSAR_SWS_SocketAdaptor	
Specification of SOME/IP Transformer	AUTOSAR_SWS_SOMEIPTransformer	
Specification of SPI Handler/Driver	AUTOSAR_SWS_SPIHandlerDriver	
Specification of TCP/IP Stack	AUTOSAR_SWS_TcpIp	
Specification of TTCAN Driver	AUTOSAR_SWS_TTCANDriver	
Specification of TTCAN Interface	AUTOSAR_SWS_TTCANInterface	
Specification of UDP Network Management	AUTOSAR_SWS_UDPNetworkManagement	
Specification of Vehicle-2-X Basic Transport	AUTOSAR_SWS_V2XBasicTransport	
Specification of Vehicle-2-X Facilities	AUTOSAR_SWS_V2XFacilities	
Specification of Vehicle-2-X Geo Networking	AUTOSAR_SWS_V2XGeoNetworking	
Specification of Vehicle-2-X Management	AUTOSAR_SWS_V2XManagement	
Specification of Wireless Ethernet Driver	AUTOSAR_SWS_WirelessEthernetDriver	
Specification of Wireless Ethernet Transceiver Driver	AUTOSAR_SWS_WirelessEthernetTransceiverDriver	
Specification on SOME/IP Transport Protocol	AUTOSAR_SWS_SOMEIPTransportProtocol	
Crypto		
Requirements on Crypto Stack	AUTOSAR_SRS_CryptoStack	
Specification of Crypto Driver	AUTOSAR_SWS_CryptoDriver	
Specification of Crypto Interface	AUTOSAR_SWS_CryptoInterface	
Specification of Crypto Service Manager	AUTOSAR_SWS_CryptoServiceManager	
Specification of Key Manager	AUTOSAR_SWS_KeyManager	Initial release
Utilization of Crypto Services	AUTOSAR_EXP_UtilizationOfCryptoServices	
Diagnostics		
Specification of a Diagnostic Communication Manager for SAE J1939	AUTOSAR_SWS_SAEJ1939DiagnosticCommunicationManager	
Specification of Diagnostic	AUTOSAR_SWS_DiagnosticCommunicationManag	

Long Name	File Name	Life cycle changes
Communication Manager	er	
Specification of Diagnostic Event Manager	AUTOSAR_SWS_DiagnosticEventManager	
General		
Application Design Patterns Catalogue	AUTOSAR_TR_AIDesignPatternsCatalogue	
Application Interface Examples	AUTOSAR_MOD_AISpecificationExamples	
Application Interfaces User Guide	AUTOSAR_EXP_AIUserGuide	
Layered Software Architecture	AUTOSAR_EXP_LayeredSoftwareArchitecture	
Predefined Names in AUTOSAR	AUTOSAR_TR_PredefinedNames	
Requirements on AUTOSAR Features	AUTOSAR_RS_Features	Set to obsolete
Requirements on SW-C and System Modeling	AUTOSAR_RS_SWCModeling	
SW-C and System Modeling Guide	AUTOSAR_TR_SWCModelingGuide	
Unique Names for Documentation, Measurement and Calibration: Modeling and Naming Aspects including Automatic Generation	AUTOSAR_TR_AIMeasurementCalibrationDiagnostics	
Virtual Functional Bus	AUTOSAR_EXP_VFB	
XML Specification of Application Interfaces	AUTOSAR_MOD_AISpecification	
Global Time		
Specification of Synchronized Time-Base Manager	AUTOSAR_SWS_SynchronizedTimeBaseManager	
Specification of Time Synchronization over CAN	AUTOSAR_SWS_TimeSyncOverCAN	
Specification of Time Synchronization over Ethernet	AUTOSAR_SWS_TimeSyncOverEthernet	
Specification of Time Synchronization over FlexRay	AUTOSAR_SWS_TimeSyncOverFlexRay	
HMI		
Explanation of Application Interfaces of the HMI, Multimedia and Telematics Domain	AUTOSAR_EXP_AIHMIMultimediaAndTelematics	
IO		
Requirements on ADC Driver	AUTOSAR_SRS_ADCDriver	
Requirements on DIO Driver	AUTOSAR_SRS_DIODriver	
Requirements on I/O Hardware Abstraction	AUTOSAR_SRS_IOHWAbstraction	
Requirements on ICU Driver	AUTOSAR_SRS_ICUDriver	
Requirements on OCU Driver	AUTOSAR_SRS_OCUDriver	
Requirements on Port Driver	AUTOSAR_SRS_PortDriver	
Requirements on PWM Driver	AUTOSAR_SRS_PWMDriver	
Specification of ADC Driver	AUTOSAR_SWS_ADCDriver	
Specification of DIO Driver	AUTOSAR_SWS_DIODriver	
Specification of I/O Hardware Abstraction	AUTOSAR_SWS_IOHardwareAbstraction	

Long Name	File Name	Life cycle changes
Specification of ICU Driver	AUTOSAR_SWS_ICUDriver	
Specification of OCU Driver	AUTOSAR_SWS_OCUDriver	
Specification of Port Driver	AUTOSAR_SWS_PortDriver	
Specification of PWM Driver	AUTOSAR_SWS_PWMDriver	
Libraries		
Macro Encapsulation of Library Calls	AUTOSAR_EXP_MacroEncapsulationofInterpolation Calls	
Requirements on Libraries	AUTOSAR_SRS_Libraries	
Specification of Bit Handling Routines	AUTOSAR_SWS_BFXLibrary	
Specification of CRC Routines	AUTOSAR_SWS_CRCLibrary	
Specification of Extended Fixed Point Routines	AUTOSAR_SWS_EFXLibrary	
Specification of Fixed Point Interpolation Routines	AUTOSAR_SWS_IFXLibrary	
Specification of Fixed Point Math Routines	AUTOSAR_SWS_MFXLibrary	
Specification of Floating Point Interpolation Routines	AUTOSAR_SWS_IFLLibrary	
Specification of Floating Point Math Routines	AUTOSAR_SWS_MFLLibrary	
Specification of SW-C End-to-End Communication Protection Library	AUTOSAR_SWS_E2ELibrary	
MCAL		
General Requirements on SPAL	AUTOSAR_SRS_SPALGeneral	
Requirements on Core Test	AUTOSAR_SRS_CoreTest	
Requirements on GPT Driver	AUTOSAR_SRS_GPTDriver	
Requirements on MCU Driver	AUTOSAR_SRS_MCUDriver	
Specification of Core Test	AUTOSAR_SWS_CoreTest	
Specification of GPT Driver	AUTOSAR_SWS_GPTDriver	
Specification of MCU Driver	AUTOSAR_SWS_MCUDriver	
Memory		
NV Data Handling Guideline	AUTOSAR_EXP_NVDataHandling	
Requirements on EEPROM Driver	AUTOSAR_SRS_EEPROMDriver	
Requirements on Flash Driver	AUTOSAR_SRS_FlashDriver	
Requirements on Flash Test	AUTOSAR_SRS_FlashTest	
Requirements on Memory Hardware Abstraction Layer	AUTOSAR_SRS_MemoryHWAbstractionLayer	
Requirements on Memory Services	AUTOSAR_SRS_MemoryServices	
Requirements on RAM Test	AUTOSAR_SRS_RAMTest	
Specification of EEPROM Abstraction	AUTOSAR_SWS_EEPROMAbstraction	
Specification of EEPROM Driver	AUTOSAR_SWS_EEPROMDriver	
Specification of Flash Driver	AUTOSAR_SWS_FlashDriver	
Specification of Flash EEPROM Emulation	AUTOSAR_SWS_FlashEEPROMEmulation	
Specification of Flash Test	AUTOSAR_SWS_FlashTest	

Long Name	File Name	Life cycle changes
Specification of Memory Abstraction Interface	AUTOSAR_SWS_MemoryAbstractionInterface	
Specification of Memory Mapping	AUTOSAR_SWS_MemoryMapping	
Specification of NVRAM Manager	AUTOSAR_SWS_NVRAMManager	
Specification of RAM Test	AUTOSAR_SWS_RAMTest	
Methodology and Templates		
ARXML Serialization Rules	AUTOSAR_TPS_ARXMLSerializationRules	
AUTOSAR Feature Model Exchange Format Requirements	AUTOSAR_RS_FeatureModelExchangeFormat	
AUTOSAR Feature Model Exchange Format	AUTOSAR_TPS_FeatureModelExchangeFormat	
AUTOSAR Miscellaneous Support Files	AUTOSAR_MOD_MiscSupport	
Basic Software Module Description Template	AUTOSAR_TPS_BSWModuleDescriptionTemplate	
Collection of blueprints for AUTOSAR M1 models	AUTOSAR_MOD_GeneralBlueprints	
Collection of constraints on AUTOSAR M1 models	AUTOSAR_TR_AutosarModelConstraints	
Diagnostic Extract Template	AUTOSAR_TPS_DiagnosticExtractTemplate	
General Requirements on Methodology and Templates	AUTOSAR_RS_MethodologyAndTemplatesGeneral	
Generic Structure Template	AUTOSAR_TPS_GenericStructureTemplate	
Integration of Franca IDL Software Component Descriptions	AUTOSAR_TR_FrancaIntegration	
Interoperability Of Autosar Tools Supplement	AUTOSAR_TR_InteroperabilityOfAutosarToolsSupplement	
Meta Model	AUTOSAR_MMOD_MetaModel	
Meta Model-generated XML Schema	AUTOSAR_MMOD_XMLSchema	
Methodology	AUTOSAR_TR_Methodology	
Modeling Show Cases Examples	AUTOSAR_EXP_ModelingShowCases	
Modeling Show Cases Report	AUTOSAR_TR_ModelingShowCases	
Requirements on Basic Software Module Description Template	AUTOSAR_RS_BSWModuleDescriptionTemplate	
Requirements on Diagnostic Extract Template	AUTOSAR_RS_DiagnosticExtractTemplate	
Requirements on ECU Configuration	AUTOSAR_RS_ECUConfiguration	
Requirements on ECU Resource Template	AUTOSAR_RS_ECUResourceTemplate	
Requirements on Software Component Template	AUTOSAR_RS_SoftwareComponentTemplate	
Requirements on Standardization Template	AUTOSAR_RS_StandardizationTemplate	
Requirements on System Template	AUTOSAR_RS_SystemTemplate	
Requirements on Timing Extensions	AUTOSAR_RS_TimingExtensions	
Software Component Template	AUTOSAR_TPS_SoftwareComponentTemplate	

Long Name	File Name	Life cycle changes
Specification of ECU Configuration	AUTOSAR_TPS_ECUConfiguration	
Specification of ECU Configuration Parameters (XML)	AUTOSAR_MOD_ECUConfigurationParameters	
Specification of ECU Resource Template	AUTOSAR_TPS_ECUResourceTemplate	
Specification of Timing Extensions	AUTOSAR_TPS_TimingExtensions	
Standardization Template	AUTOSAR_TPS_StandardizationTemplate	
Standardized M1 Models used for the Definition of AUTOSAR	AUTOSAR_MOD_GeneralDefinitions	
Supplementary material of general blueprints for AUTOSAR	AUTOSAR_TR_GeneralBlueprintsSupplement	
Supplementary material of the AUTOSAR XML Schema	AUTOSAR_TR_XMLSchemaSupplement	
System Template	AUTOSAR_TPS_SystemTemplate	
XML Schema Production Rules	AUTOSAR_TPS_XMLSchemaProductionRules	
Mode Management		
Guide to Mode Management	AUTOSAR_EXP_ModeManagementGuide	
Requirements on Mode Management	AUTOSAR_SRS_ModeManagement	
Specification of Basic Software Mode Manager	AUTOSAR_SWS_BSWModeManager	
Specification of ECU State Manager	AUTOSAR_SWS_ECUStateManager	
Powertrain		
Explanation of Application Interfaces of the Powertrain Engine Domain	AUTOSAR_EXP_AIPowertrain	
RTE		
Requirements on Runtime Environment	AUTOSAR_SRS_RTE	
Specification of RTE Software	AUTOSAR_SWS_RTE	
Safety		
Explanation of Application Interfaces of Occupant and Pedestrian Safety Systems Domain	AUTOSAR_EXP_AIOccupantAndPedestrianSafety	
Overview of Functional Safety Measures in AUTOSAR	AUTOSAR_EXP_FunctionalSafetyMeasures	
Requirements on Safety Extensions	AUTOSAR_RS_SafetyExtensions	
Requirements on Watchdog Driver	AUTOSAR_SRS_WatchdogDriver	
Safety Use Case Example	AUTOSAR_EXP_SafetyUseCase	
Specification of Watchdog Driver	AUTOSAR_SWS_WatchdogDriver	
Specification of Watchdog Interface	AUTOSAR_SWS_WatchdogInterface	
Specification of Watchdog Manager	AUTOSAR_SWS_WatchdogManager	
Specifications of Safety Extensions	AUTOSAR_TPS_SafetyExtensions	

Long Name	File Name	Life cycle changes
SWArch		
Requirements on Debugging, Tracing and Profiling support of AUTOSAR Components	AUTOSAR_RS_ClassicPlatformDebugTraceProfile	Initial release
Specification of AUTOSAR Run-Time Interface	AUTOSAR_SWS_ClassicPlatformARTI	Initial release
System Services		
Recommended Methods and Practices for Timing Analysis and Design within the AUTOSAR Development Process	AUTOSAR_TR_TimingAnalysis	
Requirements on Free Running Timer	AUTOSAR_SRS_FreeRunningTimer	
Requirements on Function Inhibition Manager	AUTOSAR_SRS_FunctionInhibitionManager	
Requirements on Hardware Test Manager on start up and shutdown	AUTOSAR_SRS_HWTestManager	
Requirements on Operating System	AUTOSAR_SRS_OS	
Requirements on Time Service	AUTOSAR_SRS_TimeService	
Specification and Integration of Hardware Test Management at start up and shutdown	AUTOSAR_TR_HWTestManagementIntegrationGuide	
Specification of Communication Manager	AUTOSAR_SWS_COMManager	
Specification of Default Error Tracer	AUTOSAR_SWS_DefaultErrorTracer	
Specification of Function Inhibition Manager	AUTOSAR_SWS_FunctionInhibitionManager	
Specification of Hardware Test Manager on start up and shutdown	AUTOSAR_SWS_HWTestManager	
Specification of Operating System	AUTOSAR_SWS_OS	
Specification of Time Service	AUTOSAR_SWS_TimeService	
Tools		
Interaction with Behavioral Models	AUTOSAR_TR_InteractionWithBehavioralModels	Set to obsolete
Interoperability of AUTOSAR Tools	AUTOSAR_TR_InteroperabilityOfAutosarTools	Set to obsolete
Requirements on Interaction with Behavioral Models	AUTOSAR_RS_InteractionWithBehavioralModels	Set to obsolete
Requirements on Interoperability of AUTOSAR Tools	AUTOSAR_RS_InteroperabilityOfAutosarTools	Set to obsolete

5 Remarks to known technical deficiencies

The technical deficiencies per specification are – if applicable – mentioned inside the respective specification in a chapter called "Known Limitations" which is located after the table of contents.

There are the following technical deficiencies to be mentioned which are not related to a specific specification:

- **Specification of Diagnostic Event Manager (UID 019, SWS)**
  The parameter DemOperationCycleAutostart [ECUC_Dem_00805] in SWS Diagnostic Event Manager is obsolete and shall be ignored.

- **Specification of FlexRay ISO Transport Layer (UID 589, SWS)**
  The AUTOSAR architecture defines communication system specific transport protocol layers (FrTp, CanTp, LinTp etc.). Thus, the FlexRay Transport Protocol layer (FrTp) only covers FlexRay transport protocol specifics.

- **Specification of FlexRay ISO Transport Layer (UID 589, SWS)**
  The FlexRay Transport Protocol has an interface to a single underlying FlexRay Interface Layer and a single upper PDU Router module.

- **Specification of Crypto Interface (UID 806, SWS)**
  The Crypto Interface is specifically designed to operate with one or multiple underlying Crypto Drivers. Several Crypto Driver modules covering different HW processing units or cores are represented by just one generic interface as specified in the Crypto Driver specification. Any software based Crypto Driver shall be implemented as a CDD represented by the same interface above.

- **Specification of SOME/IP Transformer (UID 660, SWS)**
  The SOME/IP transformer doesn't implement the whole SOME/IP protocol:

    o a part is implemented by SWS Service Discovery

    o a part is implemented by SWS Socket Adaptor

    o a part is currently not implemented in AUTOSAR. This is documented in Appendix B of SWS SOME/IP Transformer

- **General Specification of Transformers (UID 658, ASWS)**
  With transformers specified and implemented according to ASWS Transformer General, it is not possible to transform whole PDUs.

- **Specification of Large Data COM (UID 655, SWS)**

  - Efficient COM supports communication of linear opaque byte wise data in a very resource-saving way. It does so by skipping all functionality not required for event based non-cyclic communication.

  - Efficient COM does not apply any changes like for instance endianness conversion to the data it transports.
  - Prerequisites for usage of Efficient COM:
    - o PDU contains only 1 Signal and no ISignalGroup
    - o The Signal is of type byte array with either fixed or dynamic length
    - o Transmission mode is either triggered or triggered without repetition

- o Transmission mode selection is not used
- o No update bit is used
- o No minimum delay time is used
- o No timeout supervision is used
- o No byte order conversion is used
- o No Rx/Tx Filtering
- o No Signal Invalidation

- **Specification of ADC Driver (UID 010, SWS)**

  Power State Control APIs are implementable only if the MCAL driver owns the complete underlying HW peripheral i.e. the HW peripheral is not accessed by other MCAL modules.

- **Specification of Diagnostic Communication Manager (UID 018, SWS)**
  The Specification of Diagnostic Communication Manager is currently not correctly supporting the two UDS services RequestFileTransfer and UploadDownloadManagement. This shall be corrected in release 4.5.0.

There are major changes or major extension on/of specifications which shall be pointed out here:

- **Specification of Crypto Interface (UID 806, SWS)**
  The Specification of Crypto Interface was enhanced significantly by modifying the handling of Crypto jobs.

6 Revision history

6.1 Release 4.4.0

Revision 0 of Release 4.4.0. has been released on the 31st of October 2017. The following deliverables had major changes.

Name	Specification history entry
Application Design Patterns Catalogue	• Editorial changes
Application Interfaces User Guide	• Editorial changes
ARXML Serialization Rules	• Editorial changes
AUTOSAR Feature Model Exchange Format Requirements	• Editorial changes
AUTOSAR Feature Model Exchange Format	• Editorial changes
Basic Software Module Description Template	• Added support for Structuring of Measurement and Calibration • Added Use-Case description for Upload and download of data • Added Use-Case description for Hardware Test Manager • Editorial changes
Classic Platform Release Overview	• Initial release
Collection of constraints on AUTOSAR M1 models	• Completion of constraint context by adding tables and class tables referenced by model constraints to this document
Complex Driver design and integration guideline	• Remove SWS_EcuMfixed in Chapters 4.1 & 7.3.2
Description of the AUTOSAR standard errors	• Editorial changes
Diagnostic Extract Template	• minor corrections / clarifications / editorial changes; For details please refer to the ChangeDocumentation
Explanation of Application Interfaces of Occupant and Pedestrian Safety Systems Domain	• Editorial changes
Explanation of Application Interfaces of the Body and Comfort Domain	• Editorial changes
Explanation of Application Interfaces of the Chassis Domain	• Editorial changes
Explanation of Application Interfaces of the HMI, Multimedia and Telematics Domain	• Editorial changes

Name	Specification history entry
Explanation of Application Interfaces of the Powertrain Engine Domain	• Update of figures concerning Skype meeting of Mr. Graf, Mr. Dr. Geiger, W. Bieg, 14.9.2017. • Chapter 7 deleted as agreed in WebEx 13.9.2017/ RfC 76437 • Chapter 3.5: Note to obsolete inter-faces deleted as agreed with Mr. Graf, 14.9.2017. • Figure 2: Torque Reserve concept with Fast and Slow torque requests: update picture – but no content change • Chapter 7: Correction of Correction of wrong Short Name of PtEngTqCrksftMinFast -> PtEngTqCluMinFast • Chapter 5.2: Update of figure "Example of signal flow of gear signals during a single upshift or downshift". • Chapter 3.2: - Figure 1: Modification of "Torque at engine clutch" to "Torque at crankshaft reduced by ancillary losses" - More detailed description of section "Ancillary torque losses". • Chapter 6.3.6: Extension of the table by "Special rules for WP-TRSM specific signals". • Figure 4: Correction of the wrong Short Name PtEngTqCrksftMinFast => PtEngTqCluMinFast. • Chapter 5.3.4 added: Timing- and Accuracy requirements to the signal "Engine Speed Including Start Stop", necessary for transmission.
Explanation of Error Handling on Application Level	• Editorial changes
Explanation of Interrupt Handling within AUTOSAR	• Editorial changes
General Requirements on Basic Software Modules	• Added requirement for classification of security events (SRS_BSW_00488) • Added requirement for errors for module initialization (SRS_BSW_00487) • Header File Cleanup • Obsolete references removed • Editorial Changes
General Requirements on Methodology and Templates	• editorial changes
General Requirements on SPAL	• Editorial changes
General Specification of Basic Software Modules	• minor corrections / clarifications / editorial changes; For details please refer to the ChangeDocumentation
General Specification on Transformers	• Editorial changes
Generic Structure Template	• Update Splitable • Include ARMQL • Refine atp.Status
Guide to BSW Distribution	• Incorporation of concept "MCAL Multicore Distribution"
Guide to Mode Management	• EcuMFixed removed
Integration of Franca IDL Software Component Descriptions	• Editorial changes
Interaction with Behavioral Models	• Marked the specification as obsolete

Name	Specification history entry
Interoperability of AUTOSAR Tools	• Marked the specification as obsolete
Layered Software Architecture	• Adopting LIN Slave Support, LinNm removed • New Concepts: Key Management, 1st draft of MCAL Multicore Distribution • Editorial changes
List of Basic Software Modules	• Added Bus Mirroring • Added Key Manager • Removed LinNm
Macro Encapsulation of Library Calls	• Editorial changes
Methodology	• Removal of references to obsolete requirements • Editorial changes
Modeling Guidelines of Basic Software EA UML Model	• minor corrections / clarifications / editorial changes; For details please refer to the ChangeDocumentation
Modeling Show Cases Report	• Editorial changes
NV Data Handling Guideline	• Editorial changes
Overview of Functional Safety Measures in AUTOSAR	• Editorial changes
Predefined Names in AUTOSAR	• Removed reference to TR_SafetyConceptStatusReport
Recommended Methods and Practices for Timing Analysis and Design within the AUTOSAR Development Process	• Extended section 1.4 to show interaction of AUTOSAR CP and AP concepts • Reworked chapter structure for better readability • Added description of AUTOSAR CP task states and extended timing parameter table in section 8.1.1.1 and section 8.1.1.2 • Added chapter 9 including timing tasks and elements
Requirements on ADC Driver	• Editorial changes
Requirements on AUTOSAR Features	• LIN specification reference adopted to ISO
Requirements on Basic Software Module Description Template	• Editorial changes
Requirements on BSW Modules for SAE J1939	• Support for Request/Ack routing
Requirements on Bus Mirroring	• Initial release
Requirements on CAN	• Added requirements for BusMirroring • Removed half-duplex mode from CanTp
Requirements on Communication	• Editorial changes
Requirements on Core Test	• Editorial changes
Requirements on Crypto Stack	• Adding Coverage of Key Manager • Removed Secure Counter functionality • Editorial changes
Requirements on Diagnostic Extract Template	• Editorial changes

Name	Specification history entry
Requirements on DIO Driver	• Editorial changes
Requirements on E2E Communication Protection	• Migration of document to standard "Classic Platform" • minor corrections / clarifications / editorial changes; For details please refer to the ChangeDocumentation
Requirements on ECU Configuration	• Editorial changes
Requirements on ECU Resource Template	• Editorial changes
Requirements on EEPROM Driver	• Editorial changes
Requirements on Ethernet Support in AUTOSAR	• Introduction of Transport Layer Security - TLS (DRAFT)
Requirements on Flash Driver	• Editorial changes
Requirements on Flash Test	• Editorial changes
Requirements on FlexRay	• Editorial changes
Requirements on Free Running Timer	• Editorial changes
Requirements on Function Inhibition Manager	• Editorial Changes
Requirements on Gateway	• Editorial changes
Requirements on GPT Driver	• Editorial changes
Requirements on Hardware Test Manager on start up and shutdown	• Editorial changes
Requirements on I/O Hardware Abstraction	• Editorial changes
Requirements on ICU Driver	• Editorial changes
Requirements on Interaction with Behavioral Models	• Marked the specification as obsolete
Requirements on Interoperability of AUTOSAR Tools	• Editorial changes
Requirements on I-PDU Multiplexer	• position of I-PDUs inside a Container are dynamic when priority is used
Requirements on Libraries	• Editorial changes
Requirements on LIN	• LIN Slave Support (CONC_631) • Added [SRS_Lin_01593] to make TP timer to connection specific • Replaced references to LIN 2.1 by ISO 17987:2016 (with no functional modification) • Minor corrections / clarifications / editorial changes; For details please refer to the ChangeDocumentation
Requirements on MCU Driver	• Editorial changes
Requirements on Memory Hardware Abstraction Layer	• Editorial changes
Requirements on Memory Services	• Editorial changes

Name	Specification history entry
Requirements on Mode Management	• EcuMFixed is obsolete
Requirements on Module XCP	• Editorial changes
Requirements on Network Management	• Editorial changes
Requirements on OCU Driver	• Editorial changes
Requirements on Operating System	• Incorporation of concept "AUTOSAR Run-Time Interface"
Requirements on Port Driver	• Editorial changes
Requirements on PWM Driver	• Editorial changes
Requirements on RAM Test	• Editorial changes
Requirements on Runtime Environment	• Added support for RTE Implementation Plug-ins: [SRS_Rte_00300] - [SRS_Rte_00317] • Added support for Extended Serialization for Data Structures in SOME/IP with tag/length/value encoding (TLV): [SRS_Rte_00261]
Requirements on Safety Extensions	• Editorial changes
Requirements on Secure Onboard Communication	• Added requirement to send wrong Authentication Information • Added requirement to handle Dynamic length PDUs • Minor corrections / clarifications / editorial changes; For details please refer to the Change Documentation.
Requirements on Software Component Template	• Added requirement for definition of optional elements for communication.
Requirements on SPI Handler/Driver	• Editorial changes
Requirements on Standardization Template	• Editorial changes
Requirements on SW-C and System Modeling	• Editorial changes
Requirements on System Template	• minor corrections / clarifications / editorial changes; For details please refer to the ChangeDocumentation
Requirements on Time Service	• Editorial changes
Requirements on Timing Extensions	• Added requirements RS_TIMEX_00022 and RS_TIMEX_00023.
Requirements on Transformer	• Extended Serialization for Data Structures in SOME/IP with tag/length/value encoding • Minor corrections / clarifications / editorial changes; For details please refer to the ChangeDocumentation
Requirements on TTCAN	• Editorial changes
Requirements on Vehicle-2-X Communication	• Adding requirements for the C-Roads messages IVIM, SPATEM and MAPEM
Requirements on Watchdog Driver	• Editorial changes
Requirements Requirements on Tracing and Timing-Analysis support of AUTOSAR Components	• Inital release

Name	Specification history entry
Safety Use Case Example	• Editorial changes
Software Component Template	• Support for optional elements in structured data types • Improved description of service use cases • minor corrections / clarifications / editorial changes; For details please refer to the ChangeDocumentation
Specification and Integration of Hardware Test Management at start up and shutdown	• Minor corrections
Specification of Large Data COM	• minor corrections / clarifications / editorial changes; For details please refer to the ChangeDocumentation
Specification of RTE Software	• RTE Implementation Plug-Ins • Support for optional elements in structured data types • Minor corrections / clarifications / editorial changes; For details please refer to the ChangeDocumentation
Specification of a Diagnostic Communication Manager for SAE J1939	• Changed header file structure • Separate buffer for DM35 • Fixed "SPN support type" bit value • Fixed API towards DEM
Specification of a Request Manager for SAE J1939	• Changed header file structure • Improved name of J1939Rm_ComRxIpduCallout • Harmonized J1939RM_E_UNINIT • Routing of RQST/RQST2/ACKM
Specification of a Transport Layer for SAE J1939	• Changed header file structure • Fixed reference to protocol type • Harmonized J1939TP_E_UNINIT • Clarifications of timeouts
Specification of ADC Driver	• Header file structure removed • Sequence chart and state diagram updated • Minor modification in API for input parameter passing • Editorial changes
Specification of AUTOSAR Run-Time Interface	• Inital release
Specification of Basic Software Mode Manager	• Reworked handling of EcuM API for shutdown (e.g. BswMEcuMGoDownHaltPoll) • Removed dependency to EcuM-fixed • Changes to BswM_NvM_CurrentJobMode, BswM_ModeType, BswM_UserType and Det error codes
Specification of Bit Handling Routines	• Addition of 64bit handling requirement
Specification of Bus Mirroring	• Initial release
Specification of CAN Driver	• MCALMulticoreDistribution (CONC_639) as DRAFT • BusMirroring (CONC_634) • Header file cleanup • Replaced ChannelId with ShortName for multiple main functions ([SWS_Can_00441] and [SWS_Can_00442]) • Minor corrections / clarifications / editorial changes; For details please refer to the ChangeDocumentation
Specification of CAN Interface	• BusMirroring (CONC_634) • Receive Data Length Check per Pdu • Remove dummy implementations for Cancel Transmit APIs • Header File Cleanup

Name	Specification history entry
Specification of CAN Network Management	• Header File Cleanup • Removed obsolete elements • Fixed documentation structure
Specification of CAN State Manager	• Reclassification of some errors • Editorial changes
Specification of CAN Transceiver Driver	• Removed DET reporting behavior for the APIs CanTrcv_MainFunctionDiagnostics and CanTrcv_MainFunction during un-initialized state.
Specification of CAN Transport Layer	• Removed some limitations for Half-duplex • Minor corrections
Specification of COM Based Transformer	• Updated buffer handling • Removed include file structure
Specification of Communication	• minor corrections / clarifications / editorial changes; For details please refer to the ChangeDocumentation
Specification of Communication Manager	• Introduce "managing" and "managed" ComM channels • Remove relations to EcuMfixed completely • Minor corrections
Specification of Communication Stack Types	• Editorial changes
Specification of Compiler Abstraction	• Editorial changes
Specification of Core Test	• Incorporated changes to support MCALMulticoreDistribution (Draft)
Specification of CRC Routines	• Introduction of a new CRC-16 with the polynomial 0x8005 • Editorial changes
Specification of Crypto Driver	• Remove secure counter • Align return values of interface functions. • Support source and destination buffers for crypto operations located in crypto driver. • Support key management operation in asynchronous mode
Specification of Crypto Interface	• Remove secure counter • Align return values of interface functions. • Support source and destination buffers for crypto operations located in crypto driver. • Support key management operation in asynchronous mode
Specification of Crypto Service Manager	• Client-Server-Interfaces Csm<Service>_{Config} • corrected CS interfaces • removal of references to ryptoAbstractionLibrary
Specification of Default Error Tracer	• Harmonized Parameter Structures • Adapted Specification • Small bug fixes
Specification of Diagnostic Communication Manager	• Incorporation of Concept "Security Extensions" • Rework of SenderReceiver interface support for DIDs: Atomic SenderReceiver interfaces added. • Rework of SenderReceiver interface support for controlling DIDs via service InputOutputControlByIdentifier (0x2F) • Support added for input signals for the RequestRoutineResults (0x03) subfunction of the RoutineControl (0x31) service • minor corrections / clarifications / editorial changes; For details please refer to the ChangeDocumentation

Name	Specification history entry
Specification of Diagnostic Event Manager	• Clarified asynchronous API behavior • IUMPR denominators are locked at operation cycle start • Support of typed C/S interfaces • minor corrections / clarifications / editorial changes; For details please refer to the ChangeDocumentation
Specification of Diagnostic Log and Trace	• Tracing to RS LogAndTrace • Interaction DLT <> DEM removed • Minor corrections
Specification of Diagnostic over IP	• Updated the functionality to receive vehicle announcements • Support to add an increased number of DoIP target addresses • DoIP header file clean-up • Minor corrections / clarifications / editorial changes; for details please refer to the ChangeDocumentation
Specification of DIO Driver	• Introduced MaskedWritePort API
Specification of ECU Configuration	• Removed EcucSymbolic-NameReferenceDef • Introduced postBuildVariantsUsed flag to improve the configuration of postBuild variants • Minor corrections / clarifications / editorial changes; For details please refer to the ChangeDocumentation
Specification of ECU Resource Template	• Editorial changes
Specification of ECU State Manager	• Reworked BswM interface through EcuM_GoDownHaltPoll • Removed EcuM fixed version references
Specification of EEPROM Abstraction	• Editorial changes
Specification of EEPROM Driver	• MCAL Multicore Distribution
Specification of Ethernet Driver	• Support of host controllers with multiple cores • Asynchronous frame transmission • Timestamp improvements • Multicast MAC address handling in Switches
Specification of Ethernet Interface	• Explicite link control in Ethernet transceiver • minor corrections / clarifications / editorial changes; For details please refer to the ChangeDocumentation
Specification of Ethernet State Manager	• Error classification has been fixed • Editorial changes
Specification of Ethernet Switch Driver	• Clarified Port Mirroring concepts • Introduced timeout for ARL table entries • Added counter synchronization for cascaded switches
Specification of Ethernet Transceiver Driver	• Explicite transceiver link control • Support of host controllers with multiple cores
Specification of Extended Fixed Point Routines	• Modified: • Updated the range and resolution of requirements SWS_EFX_00220,SWS_EFX_00223,SWS_EFX_00226,SWS_EFX_00229,SWS_EFX_00232,SWS_EFX_00235,SWS_EFX_00240,SWS_EFX_00243,SWS_EFX_00246,SWS_EFX_00250,SWS_EFX_00253,SWS_EFX_00256
Specification of Fixed Point Interpolation Routines	• Editorial changes
Specification of Fixed Point Math Routines	• Editorial changes
Specification of Flash Driver	• Added support for MCALMulticoreDistribution

Name	Specification history entry
Specification of Flash EEPROM Emulation	• Fixed typo in sequence diagram
Specification of Flash Test	• FlsTstBlockBgndConfigSet and FlsTstBlockFgndConfigSet removed; • FlsTstEcucPartitionRef configuration parameter added
Specification of FlexRay AUTOSAR Transport Layer	• SWS_FrArTp_00292 removed as it is covered by BSW General
Specification of FlexRay Driver	• Supports BusMirror concept • Enhanced multi core usage (DRAFT) • Editorial changes
Specification of FlexRay Interface	• Added bus mirroring support • Changed behavior for TxConflict • Minor corrections
Specification of FlexRay ISO Transport Layer	• Header File Cleanup • Resolved inconsistent behavior of BSW modules in un-initialized state
Specification of FlexRay Network Management	• Introduced Reliable TxConfirmation • Multiple function instance updated to use shortname instead of Ids Removed CBV configuration • Added new Nm notification call for Synchronization • Header File Cleanup • Removed obsolete elements
Specification of FlexRay State Manager	• Minor corrections / clarifications / editorial changes; for details please refer to the ChangeDocumentation
Specification of FlexRay Transceiver Driver	• Incorporation of concept 639 MCALMulticoreDistribution (Draft) • Renaming of initialization error to FRTRCV_E_UNINIT
Specification of Floating Point Interpolation Routines	• Editorial changes

Specification of Floating Point Math Routines	• Added:
	  o Added description for Mfl_Pow_f32 function
	• Modified:
	  o Updated name of parameter dT_f32 in the requirements SWS_Mfl_00045, SWS_Mfl_00047, SWS_Mfl_00301 & SWS_Mfl_00303

Specification of Function Inhibition Manager	• Editorial changes • corrections regarding Dem and Fim interaction during start-up
Specification of GPT Driver	• Incorporation of concept MCAL Multicore Distribution (Draft) • Header File Cleanup
Specification of Hardware Test Manager on start up and shutdown	• Headerfile cleanup
Specification of I/O Hardware Abstraction	• Debugging section removed
Specification of ICU Driver	• MCAL Multicore Distribution (Draft) • Header File Cleanup
Specification of I-PDU Multiplexer	• Introduce priority for Tx ContainedI-Pdus with LastIsBest collection se-mantics • Header File Cleanup • Limitations on Container PDU with MDT • minor corrections / clarifications / editorial changes; For details please refer to the ChangeDocumentation
Specification of Key Manager	• Initial release

Name	Specification history entry
Specification of LIN Driver	• LIN Slave support (CONC_634) • MCALMulticoreDistribution (CONC_639) as DRAFT • Replace references to LIN 2.1 by ISO 17987:2016 (with no functional modification) • Header file cleanup • Minor corrections / clarifications / editorial changes; For details please refer to the ChangeDocumentation
Specification of LIN Interface	• Changed TP Timers to channel specific • Removed dummy APIs (LinIf_CancelTransmit etc.) and replaced ChannelId with LinIfChannel.ShortName • Replaced references to LIN 2.1 by ISO 17987:2016 (with no functional modification) • LIN Slave Support (CONC_631) • Header file cleanup • Minor corrections / clarifications / editorial changes; For details please refer to the ChangeDocumentation
Specification of LIN Network Management	• Marked the specification as obsolete
Specification of LIN State Manager	• LIN Slave support (CONC_631) • Replaced references to Lin 2.1 by ISO 17987:2016 • Editorial changes
Specification of LIN Transceiver Driver	• Minor corrections / clarifications / editorial changes; For details please refer to the ChangeDocumentation
Specification of MCU Driver	• Debugging support was removed • Introduced support for Multicore distribution
Specification of Memory Abstraction Interface	• Editorial changes
Specification of Memory Mapping	• Support splitting of modules in allocatable memory parts • Clarify handling of configuration data • Additional minor corrections / clarifications / editorial changes; For details please refer to the Change Documentation
Specification of Module E2E Transformer	• Fix routine prototypes to correctly list optional parameters. • correction applicable configuration parameter for datalength for profiles 2 and 22 • Corrected reentrancy of E2EXf interfaces. • Clarification of behavior and return value for DISABLE-END-TO-END-CHECK:TRUE.
Specification of Module XCP	• Update XCP on CAN version to support CAN FD
Specification of Network Management for SAE J1939	• Changed header file structure • Harmonized J1939NM_E_UNINIT
Specification of Network Management Interface	• Removed LinNM from the architecture • Removed obsolete elements • Header File Cleanup
Specification of NVRAM Manager	• Removed NvM_GetActiveService API • Remove EcuMfixed completely • Changed single and multi block callbacks • minor corrections / clarifications / editorial changes; For details please refer to the ChangeDocumentation

Name	Specification history entry
Specification of OCU Driver	• OcuGroup removed (ECUC_Ocu_00161, ECUC_Ocu_00162, ECUC_Ocu_00163) • Updated Header File Structure • Multicore feature (SWS_Ocu_00170, SWS_Ocu_CONSTR_00001, SWS_Ocu_CONSTR_00002)
Specification of Operating System	• New asynchronous services • ARTI support (DRAFT) • Editorial changes / clarifications
Specification of PDU Router	• Removal of obsolete elements • Remove dummy implementations for CancelTransmit APIs • minor corrections / clarifications / editorial changes; For details please refer to the ChangeDocumentation
Specification of Platform Types	• Editorial changes. • Clarifications.
Specification of Port Driver	• MCAL Multicore Distribution (Draft)
Specification of PWM Driver	• Editorial changes
Specification of RAM Test	• MCALMulticoreDistribution (CONC_639) as DRAFT • Header File Cleanup • Minor corrections; For details please refer to the ChangeDocumentation
Specification of Secure Onboard Communication	• Handle Dynamic length PDUs • Added option to send wrong Authentication Information • Provide failed verification status to application. • Minor corrections / clarifications / editorial changes; For details please refer to the Change Documentation.
Specification of Service Discovery	• Retry subscription feature added • Load Balancing Option added • Minor bugfixes
Specification of Socket Adaptor	• Introduction of Transport Layer Security - TLS (DRAFT) • minor corrections / clarifications / editorial changes
Specification of SOME/IP Transformer	• Checking for length of received dynamic length strings • Extended Serialization for Data Structures in SOME/IP with tag/length/value encoding • Minor corrections / clarifications / editorial changes; For details please refer to the ChangeDocumentation
Specification of SPI Handler/Driver	• Editorial changes
Specification of Standard Types	• Header File Cleanup (no impact on behavior)
Specification of SW-C End-to-End Communication Protection Library	• Added clarification regarding assumptions on failure modes and detection capabilities in annex A. • Fixed inconsistent definition of length in E2E header for P04, P05, and P06 • Clarification of parameters CounterOffset and CRCOffset in E2E_P01ConfigType
Specification of Synchronized Time-Base Manager	• Modifications to enhance the precision of Global Time Synchronization • Additional minor corrections / clarifications / editorial changes; For details please refer to the ChangeDocumentation
Specification of TCP/IP Stack	• Introduction of Transport Layer Security - TLS (DRAFT) • ARP timing improvements • minor corrections / clarifications / editorial changes

Name	Specification history entry
Specification of Time Service	• Header File Cleanup
Specification of Time Synchronization over CAN	• Modifications to enhance the precision of Global Time Synchronization • Additional minor corrections / clarifications / editorial changes; For details please refer to the ChangeDocumentation
Specification of Time Synchronization over Ethernet	• Modifications to enhance precision of Global Time Synchronization • Split into FO Protocol Spec and CP SWS.
Specification of Time Synchronization over FlexRay	• Modifications to enhance the precision of Global Time Synchronization • Additional minor corrections / clarifications / editorial changes; For details please refer to the Change Documentation
Specification of Timing Extensions	• Added support for Logical Execution Time • Added element SynchronizationPointConstraint • Removed constraint [constr_4535] from specification. • Added element BswCompositionTiming
Specification of TTCAN Driver	• Header File Cleanup • Inconsistent behavior of BSW modules in un-initialized state • MCAL Multicore Distribution
Specification of TTCAN Interface	• Header File Cleanup
Specification of UDP Network Management	• Header file cleanup • Minor corrections
Specification of Vehicle-2-X Basic Transport	• Corrections on init and configuration • Update to ETSI EN 302 636-5-1 V2.1.1 • Editorial changes
Specification of Vehicle-2-X Facilities	• Added IVIM support • Added SPATEM support • Added MAPEM support
Specification of Vehicle-2-X Geo Networking	• Update ETSI EN 302 636-4-1 v1.3.1 • Corrections on init and configuration • Corrections in Tx and Rx flows • Editorial changes
Specification of Vehicle-2-X Management	• Header file clean-up • Fixed position and time parameter names • Editorial changes
Specification of Watchdog Driver	• Added ECUC_Wdg_00353: WdgEcucPartitionRef • minor corrections / clarifications / editorial changes; For details please refer to the ChangeDocumentation
Specification of Watchdog Interface	• Header File Cleanup • Editorial changes
Specification of Watchdog Manager	• Header File Cleanup • EcuPartition vs. OSApplication • Editorial changes
Specification of Wireless Ethernet Driver	• Basic Software Multicore Distribution (DRAFT)
Specification of Wireless Ethernet Transceiver Driver	• Basic Software Multicore Distribution (DRAFT)
Specification on SOME/IP Transport Protocol	• Minor corrections • Editorial changes
Specifications of Safety Extensions	• Editorial change

Name	Specification history entry
Standardization Template	• uptraces wrt. life cycles • include ARMQL relevant parts • harmonize Blueprint parts
Supplementary material of general blueprints for AUTOSAR	• Multi dimensional ValueBlock • Include Physical Dimensions and Units
SW-C and System Modeling Guide	• Editorial changes
System Template	• Added support for BusMirorring • Reworked the modeling of LinSlaves • Introduced Crypto Infrastructure for SecuredIPdu • Minor corrections / clarifications / editorial changes; For details please refer to the ChangeDocumentation
Unique Names for Documentation, Measurement and Calibration: Modeling and Naming Aspects including Automatic Generation	• Editorial changes
Utilization of Crypto Services	• Removed Crypto Abstraction Library references • Editorial changes
Virtual Functional Bus	• Add product abbreviations e.g. CP in page header • Removed references to EcuMfixed
XML Schema Production Rules	• Editorial changes

7 Appendix

7.1 Definitions

As far as not explained in this chapter, a collection of AUTOSAR definitions is provided in 3).

7.1.1 Release number

AUTOSAR applies a two-digit numbering scheme Rx.y to identify Releases. Its primary purpose is to identify a Release as a major (upgrade, can contain non-backward-compatible extensions) or as a minor (update, backward compatible extensions) Release. Referring to previous Releases (e.g. R2.0), incrementing the first digit "x" does identify a Release as major, whereas incrementing "y" will mark a Release as only minor by nature.

7.1.2 Revision number

The Revision Number was first time introduced with Release 2.1 and extends the Release Numbering scheme as explained in section 7.1.1. Combined with the Release Number, the Revision Number shall:

1) Precisely identify the actual content (set of specifications) of a given Release.

2) As depicted in every specification, precisely identify a given specification (with its unique name and three-digit version ID) as being part of the Release.

Item 1) addresses the fact that the set of specifications comprising a Release (in the meaning of a baseline) is rarely established once at a certain point in time ("Big Bang"), but rather evolves and/or varies over a certain timeframe. The maximum duration, which is limited by the timeframe, a Release is declared as "valid" by the AUTOSAR Partnership (see section 7.1.3).

Hence with Item 1), a major prerequisite will be put in place to enable the Standard Maintenance as planned by the AUTOSAR Partnership. In general, the primary objective is to avoid the provision of an additional – previously not planned – Release in case only one or a few specifications were to be modified as part of the Standard Maintenance. Conversely, without the application of a Revision Number, if the AUTOSAR partnership wants to avoid the provision of (an) additional intermediate Release(s), one would have to defer the introduction of any changes until the next planned Release – even in case of changes urgently needed by the applicants of the AUTOSAR Standard.

Item 2) is complementary to Item 1) in that for every specification a unique identifier is provided upon which Revision a) a specification was either 1st time added to/removed from a Release or b) a specification was modified as being part of one and the same Release, as long the latter is valid and therefore subject to Standard Maintenance.

Hence with item 2), the combination of Release and Revision Number in a specification can be interpreted either as a) "specification was (1st time) added to the Release x.y Rev n" or b) as "specification was modified as part of Release x.y Rev m", with m > n.

Conversely, the Revision number will only change for specifications subject to addition or modification of a valid Release (baseline). After their 1st time addition to the Release (baseline), it will not change for specifications which are not modified.

In the light of the above provided background, as an additional remark, the Revision Number will only be applied for each specification's Release version, i.e. it will not be applied to working versions.

7.1.3 Release life cycle of a major release

Each major release goes through four consecutive steps within its lifecycle:

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 contents 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.

7.1.4 Specification item and requirement life cycle states

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.
- **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 obsolete and will be removed in the next release.

If there is no life cycle state information stated then the state is Valid.

The life cycle state of a requirement is found in the attribute „type". The states are the same as the specification item states.

7.1.5 History information in AUTOSAR

The following diagram shows where which changes are documented.

	Information at release / revision
Scope / abstraction	
Specification (all docs) — Release Overview	*Release only:* • Changes on AUTOSAR by concepts (lists also affected docs) *Release and revision:* Chapter "Summary of changes" : • Maintenance work • e.g. Service interfaces • Known deficiencies • Major changes (high impact) Chapter 7: • A subset of external histories of documents shall be given: that would be major changes but not the standard entries
Document — Document external history	*Release only:* • Changes / "influence" on document by concepts • Major changes *Guidance for DocOwner:* Please: • state major changes with high impact (e.g. high BWC or usage) or • put a standard entry: "minor corrections / clarifications/editorial changes; For details please refer to the ChangeDocumentation"
Requirement — ChangeDocumentation Number of entries	• Changes on RfC granularity