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1 Introduction

1.1 Scope of this document

This document provides an overview of the complement of AUTOSAR specifications comprising the initial Release 4.2 and its latest Revision 2.

1.2 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 4.1.
- Chapter 4 contains the overview of specifications comprising the Release 4.2 in its latest Revision 2. This chapter is structured according to the clusters being in use in AUTOSAR Release 4.2.
- 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 4.2.

2 Related documentation

1) Release Overview and Revision History
2) AUTOSAR Specifications in general
3) Change Documentation
4) Glossary

3 Summary of changes

This chapter contains a summary of changes which were implemented since the previous Release 4.1.

3.1 Release 4.2.1

In AUTOSAR R4.2.1, several concepts were introduced, focusing on improvements of two main areas:

1. Large data communication via Ethernet and CAN FD and
2. Safety and Security

The AUTOSAR Data Handling for Ethernet/CAN FD comprises the introduction of Ethernet Switch capabilities paired with the ability to handle large blocks of data in the COM stack domain, e.g. via serialized data communication.
The safety and security aims on improvements of the support of functional safety in the AUTOSAR Meta Model, new E2E profiles for large data communication, and the secure interaction of in-vehicle components.
Further improvements introduced in R4.2.1 are extended support of BSW distribution according different safety levels, synchronized timing information across various bus systems and loadable post-built configuration sets for BSW modules.

3.1.1 Introduced Concepts

The following concepts have been introduced.

3.1.1.1 CAN Flexible Data Rate

Support of CAN FD, allowing switching to a faster bit rate after the arbitration, higher data rates than 1 Mbit/s and payloads longer than 8 bytes per frame.

3.1.1.2 Decentralized Configuration

This concept allows the configuration of the “Diagnostic Extract” – the demand of diagnostic services and fault memory content – in the System Description.

3.1.1.3 Efficient COM for Large Data

Introduction of new functionality in the COM interaction layer to allow handling of large blocks of data, e.g. for Ethernet communication.

3.1.1.4 Efficient NV Data Handling via RTE

An efficient mechanism for software components (SW-Cs) in order to handle non-volatile (NV) data via RTE.

3.1.1.5 Enhancement EcuM Fixed for Multi Core

For ease of integration the fixed state machine of the ECU State Manager Fixed is available also in case of a multicore configuration.

3.1.1.6 Ethernet Configuration and System Description for Manageable Switched Systems

Mechanisms for configuring and controlling Ethernet switches, including modeling of configuration parameters and a learning process for semi-static auto-configuration.

3.1.1.7 Extension of E2E Protection

Mechanism for a safe communication between SWCs, fully integrated within the AUTOSAR methodology and which does not require any additional non-standard code (like wrappers above RTE).

3.1.1.8 Global Time Synchronization

Mechanisms to distribute one or more master time bases across various busses and bus systems.

3.1.1.9 Integration of Non-AUTOSAR Systems

Extension of AUTOSAR description means, process, and technology in such a way that other — non-AUTOSAR — software systems can be integrated into an AUTOSAR system during its development.

3.1.1.10 Mechanisms and constraints to protect ASIL BSW against QM BSW

AUTOSAR currently supports BSW distribution for multi core. This concept introduces BSW distribution to be able to separate the BSW according to different safety levels (e.g. QM requirements / ASIL requirements).

3.1.1.11 Safety Extensions for Methodology and Templates

Specification of extensions in AUTOSAR Methodology and Templates to realize and document functional safety of AUTOSAR systems and the according usage of meta-model.

3.1.1.12 Secure Onboard Communication

Standardization of security mechanisms to protect communication on in-vehicle networks.

3.1.1.13 Sender Receiver Serialization

Introduction of a serialization mechanism to enable transferring large amounts of data over an Ethernet network (sender/receiver communication), without mapping complex data elements to several signals.

3.1.1.14 Support for post-build loadable and post-build selectable ECU configuration

Support of the post-build loadable updates to previously generated post-build selectable configuration sets for BSW modules.

3.1.2 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.

	Affected specifications	
Concept Name	**Specification Long Name**	**Classification**
CAN Flexible Data-rate	Specification of CAN Driver	Standard
	Specification of CAN Interface	
	Specification of CAN Transport Layer	
	Specification of Communication	
	Specification of Diagnostic Communication Manager	
	Specification of ECU Configuration Parameters (XML)	
	Specification of I-PDU Multiplexer	
	Specification of PDU Router	
	System Template	
	Basic Software UML Model	Auxiliary
	Layered Software Architecture	
	Requirements on AUTOSAR Features	
	Requirements on CAN	
	Requirements on Communication	
	Requirements on I-PDU Multiplexer	
	Requirements on System Template	
Decentralized Configuration	**Diagnostic Extract Template**	Standard
	Software Component Template	
	Specification of ECU Configuration Parameters (XML)	
	Requirements on Diagnostic Extract Template	Auxiliary
	Basic Software UML Model	
	Methodology	
	Requirements on Methodology	
Efficient COM for Large Data	**Specification of Large Data COM**	Standard
	Specification of RTE Software	
	Specification of ECU Configuration Parameters (XML)	
	System Template	
	Basic Software UML Model	Auxiliary
	Layered Software Architecture	
	List of Basic Software Modules	
	Requirements on AUTOSAR Features	
	Requirements on Communication	
	Requirements on Runtime Environment	
	Requirements on System Template	
Efficient NV Data Handling via RTE	Software Component Template	Standard
	Specification of RTE Software	
	Specification of ECU Configuration Parameters	

	(XML)	
	Specification of NVRAM Manager	
	Basic Software UML Model	Auxiliary
	Requirements on Memory Services	
	Requirements on Runtime Environment	
Enhancement EcuM Fixed for Multi Core	Specification of Basic Software Mode Manager	Standard
	Specification of ECU Configuration Parameters (XML)	
	Specification of ECU State Manager	
	Specification of ECU State Manager with fixed state machine	
	Basic Software UML Model	Auxiliary
	Guide to Mode Management	
Ethernet Configuration and System Description for Manageable Switched Systems	**Specification on Ethernet Switch Driver**	Standard
	Specification of ECU Configuration Parameters (XML)	
	Specification of ECU State Manager	
	Specification of ECU State Manager with fixed state machine	
	Specification of Ethernet Interface	
	Specification of TCP/IP Stack	
	System Template	
	Basic Software UML Model	Auxiliary
	Layered Software Architecture	
	List of Basic Software Modules	
	Requirements on Ethernet Support in AUTOSAR	
	Requirements on System Template	
Extension of E2E Protection	**Specification of Module E2E Transformer**	Standard
	Software Component Template	
	Specification of CRC Routines	
	Specification of ECU Configuration Parameters (XML)	
	Specification of SW-C End-to-End Communication Protection Library	
	System Template	
	Requirements on E2E Communication Protection	Auxiliary
	Basic Software UML Model	
	Layered Software Architecture	
	List of Basic Software Modules	
	Methodology	
	Requirements on AUTOSAR Features	
	Requirements on Libraries	
	Requirements on System Template	

Global Time Synchronization	**Specification of Time Synchronization over CAN**	Standard
	Specification of Time Synchronization over Ethernet	
	Specification of Time Synchronization over FlexRay	
	Specification of CAN Interface	
	Specification of ECU Configuration Parameters (XML)	
	Specification of Ethernet Driver	
	Specification of Ethernet Interface	
	Specification of FlexRay Interface	
	Specification of Synchronized Time-Base Manager	
	System Template	
	Basic Software UML Model	Auxiliary
	Layered Software Architecture	
	List of Basic Software Modules	
	Requirements on AUTOSAR Features	
	Requirements on Ethernet Support in AUTOSAR	
	Requirements on Synchronized Time-Base Manager	
Integration of Non-AUTOSAR Systems	**Integration of Franca IDL Software Component Descriptions**)	Standard
	Specification of ECU Configuration Parameters (XML	
	Methodology	Auxiliary
Mechanisms and constraints to protect ASIL BSW against QM BSW	Software Component Template	Standard
	Specification of RTE Software	
	Specification of ECU Configuration	
	Specification of ECU Configuration Parameters (XML)	
	Specification of Memory Mapping	
	Specification of Operating System	
	Basic Software UML Model	Auxiliary
	Collection of blueprints for AUTOSAR M1 models	
	Glossary	
	Guide to BSW Distribution	
	Layered Software Architecture	
	Requirements on AUTOSAR Features	
	Requirements on Operating System	
Safety Extensions for Methodology and Templates	**Specifications of Safety Extensions**	Standard
	Specification of ECU Configuration Parameters (XML)	
	Standardization Template	

	Requirements on Safety Extensions	Auxiliary
	Methodology	
	Requirements on AUTOSAR Features	
	Requirements on Methodology	
	Specification of Predefined Names in AUTOSAR	
Secure Onboard Communication	**Specification of Secure Onboard Communication**	Standard
	Specification of ECU Configuration Parameters (XML)	
	Specification of PDU Router	
	System Template	
	Requirements on Secure Onboard Communication	Auxiliary
	Basic Software UML Model	
	Layered Software Architecture	
	List of Basic Software Modules	
	Main Requirements	
	Methodology	
	Requirements on AUTOSAR Features	
	Requirements on System Template	
Sender Receiver Serialization	**General Specification on Transformers**	Standard
	Specification of COM Based Transformer	
	Specification of SOME/IP Transformer	
	Software Component Template	
	Specification of RTE Software	
	Specification of Communication	
	Specification of ECU Configuration Parameters (XML)	
	System Template	
	Requirements on Transformer	Auxiliary
	Basic Software UML Model	
	Layered Software Architecture	
	List of Basic Software Modules	
	Methodology	
	Requirements on AUTOSAR Features	
	Requirements on Communication	
	Requirements on Runtime Environment	
	Requirements on Software Component Template	
	Requirements on System Template	
Support for post-build loadable and post-build selectable ECU configuration	General Specification of Basic Software Modules	Standard
	Specification of ECU Configuration	
	Specification of ECU Configuration Parameters (XML)	
	General Requirements on Basic Software Modules	Auxiliary

	Glossary	
	Layered Software Architecture	
	Methodology	
	Requirements on AUTOSAR Features	
	Requirements on ECU Configuration	

3.2 Release 4.2.2

The AUTOSAR Release 4.2.2 focuses on bug fixing according to the objective of revisions in the AUTOSAR release strategy.

3.2.1 Specifications

The following specifications change their life cycle status with this release.

3.2.1.1 New Specifications

The following specifications are added to this release:

- Supplementary material of general blueprints for AUTOSAR (UID 682, TR, aux)
- Functional Safety analysis of an exemplary system using AUTOSAR (UID 641, EXP, aux)

3.2.1.2 Obsolete Specifications

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

- Requirements on Debugging in AUTOSAR (UID 332, SRS, aux)
- Specification of Debugging in AUTOSAR (UID 315, SWS, std)

These specifications are scheduled for cancellation, i.e. removal from standard with the next minor release.
In case of objections against the planned cancellation of any of the specifications listed above, please submit your objections to AUTOSAR by an e-mail to request@autosar.org.

3.2.1.3 Canceled

The following specifications are set to status “canceled” in this release:

- Example for a Serialization Protocol (SOME/IP) (UID 637, TR, aux)

The content of this technical report will be merged into a new specification of a future release.

3.2.2 Concepts

No concepts have been incorporated in this release.

3.2.3 Release Documentation

The following changes to the infrastructure are introduced in this release:

1) Change Documentation (UID 695, TR, inf):
   provides a detailed and at the same time easy to use overview on all changes per specification.
   a) The straight forward approach highlights the changes per specification item with a simple color code (removed part red and the added parts green).

Furthermore changes are documented based on the AUTOSAR trace hierarchies so the influence of requirement changes on specification items can easily be identified.

b) The Change Documentation will be released shortly after the specifications.

2) AUTOSAR Specification Hashes (UID 759, TR, inf):
The integrity of all released AUTOSAR specifications can be checked via this list.

a) Due to the new approach the released specifications are not protected against modifications via PDF attributes anymore. Instead the integrity of each specification can be checked by its original hash value provided in this list.

4 Specification overview

The published specifications are divided up into the following clusters:

- Release Documentation,
- Main Specifications,
- Basic Software Architecture and Runtime Environment,
- Methodology and Templates and
- Application Interfaces.

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	Classi-fication	File Name	Life cycle changes
Cluster: Release Documentation			
Backward Compatibility Statement	inf	AUTOSAR_TR_BWCStatement	Canceled in R4.2.2 as it is part of the Change Documentation now
Change Documentation	inf	AUTOSAR_TR_ChangeDocumentation	New in R4.2.2
Release Overview and Revision History	inf	AUTOSAR_TR_ReleaseOverviewAndRevHistory	
AUTOSAR Specification Hashes	inf	AUTOSAR_TR_SpecificationHashes	New in R4.2.2
Cluster: Main Specifications			
Glossary	aux	AUTOSAR_TR_Glossary	
Main Requirements	aux	AUTOSAR_RS_Main	
Project Objectives	aux	AUTOSAR_RS_ProjectObjectives	
Requirements on AUTOSAR Features	aux	AUTOSAR_RS_Features	
Predefined Names in AUTOSAR	aux	AUTOSAR_TR_PredefinedNames	
Cluster: Basic Software Architecture and Runtime Environment			
Basic Software UML Model	aux	AUTOSAR_MOD_BSWUMLModel	
Complex Driver design and integration guideline	aux	AUTOSAR_EXP_CDDDesignAndIntegrationGuideline	
Description of the AUTOSAR standard errors	aux	AUTOSAR_EXP_ErrorDescription	
Example for a Serialization Protocol (SOME/IP)	aux	AUTOSAR_TR_SomeIpExample	Canceled in R4.2.2
Explanation of Error Handling on Application Level	aux	AUTOSAR_EXP_ApplicationLevelErrorHandling	
Explanation of Interrupt Handling within AUTOSAR	aux	AUTOSAR_EXP_InterruptHandlingExplanation	
Safety Use Case Example	Aux	AUTOSAR_EXP_SafetyUseCase	New in R4.2.2
General Requirements on Basic Software Modules	aux	AUTOSAR_SRS_BSWGeneral	
General Requirements on SPAL	aux	AUTOSAR_SRS_SPALGeneral	

Long Name	Classi-fication	File Name	Life cycle changes
General Specification of Basic Software Modules	std	AUTOSAR_SWS_BSWGeneral	
General Specification on Transformers	std	AUTOSAR_ASWS_TransformerGeneral	New in R4.2.1
Guide to BSW Distribution	aux	AUTOSAR_EXP_BSWDistributionGuide	New in R4.2.1
Guide to Mode Management	aux	AUTOSAR_EXP_ModeManagementGuide	
Layered Software Architecture	aux	AUTOSAR_EXP_LayeredSoftwareArchitecture	
List of Basic Software Modules	aux	AUTOSAR_TR_BSWModuleList	
Modeling Guidelines of Basic Software EA UML Model	aux	AUTOSAR_TR_BSWUMLModelModelingGuide	
Overview of Functional Safety Measures in AUTOSAR	aux	AUTOSAR_EXP_FunctionalSafetyMeasures	New in R4.2.1
Requirements on ADC Driver	aux	AUTOSAR_SRS_ADCDriver	
Requirements on BSW Modules for SAE J1939	aux	AUTOSAR_SRS_SAEJ1939	
Requirements on CAN	aux	AUTOSAR_SRS_CAN	
Requirements on Communication	aux	AUTOSAR_SRS_COM	
Requirements on Core Test	aux	AUTOSAR_SRS_CoreTest	
Requirements on Crypto Service Manager	aux	AUTOSAR_SRS_CryptoServiceManager	
Requirements on Debugging in AUTOSAR	aux	AUTOSAR_SRS_Debugging	Obsolete in R4.2.2
Requirements on Diagnostic	aux	AUTOSAR_SRS_Diagnostic	
Requirements on Diagnostic Log and Trace	aux	AUTOSAR_SRS_DiagnosticLogAndTrace	
Requirements on DIO Driver	aux	AUTOSAR_SRS_DIODriver	
Requirements on E2E Communication Protection	aux	AUTOSAR_SRS_E2E	New in R4.2.1
Requirements on EEPROM Driver	aux	AUTOSAR_SRS_EEPROMDriver	
Requirements on Ethernet Support in AUTOSAR	aux	AUTOSAR_SRS_Ethernet	
Requirements on Flash Driver	aux	AUTOSAR_SRS_FlashDriver	
Requirements on Flash Test	aux	AUTOSAR_SRS_FlashTest	
Requirements on FlexRay	aux	AUTOSAR_SRS_FlexRay	
Requirements on Free Running Timer	aux	AUTOSAR_SRS_FreeRunningTimer	
Requirements on Function Inhibition Manager	aux	AUTOSAR_SRS_FunctionInhibitionManager	
Requirements on Gateway	aux	AUTOSAR_SRS_Gateway	
Requirements on GPT Driver	aux	AUTOSAR_SRS_GPTDriver	
Requirements on I/O Hardware Abstraction	aux	AUTOSAR_SRS_IOHWAbstraction	
Requirements on ICU Driver	aux	AUTOSAR_SRS_ICUDriver	
Requirements on I-PDU Multiplexer	aux	AUTOSAR_SRS_IPDUMultiplexer	
Requirements on Libraries	aux	AUTOSAR_SRS_Libraries	
Requirements on LIN	aux	AUTOSAR_SRS_LIN	
Requirements on MCU Driver	aux	AUTOSAR_SRS_MCUDriver	
Requirements on Memory Hardware Abstraction Layer	aux	AUTOSAR_SRS_MemoryHWAbstractionLayer	

Long Name	Classi-fication	File Name	Life cycle changes
Requirements on Memory Services	aux	AUTOSAR_SRS_MemoryServices	
Requirements on Mode Management	aux	AUTOSAR_SRS_ModeManagement	
Requirements on Module XCP	aux	AUTOSAR_SRS_XCP	
Requirements on Network Management	aux	AUTOSAR_SRS_NetworkManagement	
Requirements on OCU Driver	aux	AUTOSAR_SRS_OCUDriver	
Requirements on Operating System	aux	AUTOSAR_SRS_OS	
Requirements on Port Driver	aux	AUTOSAR_SRS_PortDriver	
Requirements on PWM Driver	aux	AUTOSAR_SRS_PWMDriver	
Requirements on RAM Test	aux	AUTOSAR_SRS_RAMTest	
Requirements on Runtime Environment	aux	AUTOSAR_SRS_RTE	
Requirements on Secure Onboard Communication	aux	AUTOSAR_SRS_SecureOnboardCommunication	New in R4.2.1
Requirements on SPI Handler/Driver	aux	AUTOSAR_SRS_SPIHandlerDriver	
Requirements on Synchronized Time-Base Manager	aux	AUTOSAR_SRS_SynchronizedTimeBaseManager	
Requirements on Time Service	aux	AUTOSAR_SRS_TimeService	
Requirements on Transformer	aux	AUTOSAR_SRS_Transformer	New in R4.2.1
Requirements on TTCAN	aux	AUTOSAR_SRS_TTCAN	
Requirements on Watchdog Driver	aux	AUTOSAR_SRS_WatchdogDriver	
Specification of Large Data COM	std	AUTOSAR_SWS_LargeDataCOM	New in R4.2.1
Specification of RTE Software	std	AUTOSAR_SWS_RTE	
Specification of a Diagnostic Communication Manager for SAE J1939	std	AUTOSAR_SWS_SAEJ1939DiagnosticCommunicationManager	
Specification of a Request Manager for SAE J1939	std	AUTOSAR_SWS_SAEJ1939RequestManager	
Specification of a Transport Layer for SAE J1939	std	AUTOSAR_SWS_SAEJ1939TransportLayer	
Specification of ADC Driver	std	AUTOSAR_SWS_ADCDriver	
Specification of Basic Software Mode Manager	std	AUTOSAR_SWS_BSWModeManager	
Specification of Bit Handling Routines	std	AUTOSAR_SWS_BFXLibrary	
Specification of CAN Driver	std	AUTOSAR_SWS_CANDriver	
Specification of CAN Interface	std	AUTOSAR_SWS_CANInterface	
Specification of CAN Network Management	std	AUTOSAR_SWS_CANNetworkManagement	
Specification of CAN State Manager	std	AUTOSAR_SWS_CANStateManager	
Specification of CAN Transceiver Driver	std	AUTOSAR_SWS_CANTransceiverDriver	
Specification of CAN Transport Layer	std	AUTOSAR_SWS_CANTransportLayer	
Specification of COM Based Transformer	std	AUTOSAR_SWS_COMBasedTransformer	New in R4.2.1
Specification of Communication	std	AUTOSAR_SWS_COM	
Specification of Communication	std	AUTOSAR_SWS_COMManager	

Long Name	Classi-fication	File Name	Life cycle changes
Manager			
Specification of Communication Stack Types	std	AUTOSAR_SWS_CommunicationStackTypes	
Specification of Compiler Abstraction	std	AUTOSAR_SWS_CompilerAbstraction	
Specification of Core Test	std	AUTOSAR_SWS_CoreTest	
Specification of CRC Routines	std	AUTOSAR_SWS_CRCLibrary	
Specification of Crypto Abstraction Library	std	AUTOSAR_SWS_CryptoAbstractionLibrary	
Specification of Crypto Service Manager	std	AUTOSAR_SWS_CryptoServiceManager	
Specification of Debugging in AUTOSAR	std	AUTOSAR_SWS_Debugging	Obsolete in R4.2.2
Specification of Default Error Tracer	std	AUTOSAR_SWS_DefaultErrorTracer	
Specification of Diagnostic Communication Manager	std	AUTOSAR_SWS_DiagnosticCommunicationManager	
Specification of Diagnostic Event Manager	std	AUTOSAR_SWS_DiagnosticEventManager	
Specification of Diagnostic Log and Trace	std	AUTOSAR_SWS_DiagnosticLogAndTrace	
Specification of Diagnostic over IP	std	AUTOSAR_SWS_DiagnosticOverIP	
Specification of DIO Driver	std	AUTOSAR_SWS_DIODriver	
Specification of ECU State Manager	std	AUTOSAR_SWS_ECUStateManager	
Specification of ECU State Manager with fixed state machine	std	AUTOSAR_SWS_ECUStateManagerFixed	
Specification of EEPROM Abstraction	std	AUTOSAR_SWS_EEPROMAbstraction	
Specification of EEPROM Driver	std	AUTOSAR_SWS_EEPROMDriver	
Specification of Ethernet Driver	std	AUTOSAR_SWS_EthernetDriver	
Specification of Ethernet Interface	std	AUTOSAR_SWS_EthernetInterface	
Specification of Ethernet State Manager	std	AUTOSAR_SWS_EthernetStateManager	
Specification of Ethernet Transceiver Driver	std	AUTOSAR_SWS_EthernetTransceiverDriver	
Specification of Extended Fixed Point Routines	std	AUTOSAR_SWS_EFXLibrary	
Specification of Fixed Point Interpolation Routines	std	AUTOSAR_SWS_IFXLibrary	
Specification of Fixed Point Math Routines	std	AUTOSAR_SWS_MFXLibrary	
Specification of Flash Driver	std	AUTOSAR_SWS_FlashDriver	
Specification of Flash EEPROM Emulation	std	AUTOSAR_SWS_FlashEEPROMEmulation	
Specification of Flash Test	std	AUTOSAR_SWS_FlashTest	
Specification of FlexRay AUTOSAR Transport Layer	std	AUTOSAR_SWS_FlexRayARTransportLayer	
Specification of FlexRay Driver	std	AUTOSAR_SWS_FlexRayDriver	
Specification of FlexRay Interface	std	AUTOSAR_SWS_FlexRayInterface	
Specification of FlexRay ISO	std	AUTOSAR_SWS_FlexRayISOTr	

Long Name	Classi-fication	File Name	Life cycle changes
Transport Layer		ansportLayer	
Specification of FlexRay Network Management	std	AUTOSAR_SWS_FlexRayNetworkManagement	
Specification of FlexRay State Manager	std	AUTOSAR_SWS_FlexRayStateManager	
Specification of FlexRay Transceiver Driver	std	AUTOSAR_SWS_FlexRayTransceiverDriver	
Specification of Floating Point Interpolation Routines	std	AUTOSAR_SWS_IFLLibrary	
Specification of Floating Point Math Routines	std	AUTOSAR_SWS_MFLLibrary	
Specification of Function Inhibition Manager	std	AUTOSAR_SWS_FunctionInhibitionManager	
Specification of GPT Driver	std	AUTOSAR_SWS_GPTDriver	
Specification of I/O Hardware Abstraction	aux	AUTOSAR_SWS_IOHardwareAbstraction	
Specification of ICU Driver	std	AUTOSAR_SWS_ICUDriver	
Specification of I-PDU Multiplexer	std	AUTOSAR_SWS_IPDUMultiplexer	
Specification of LIN Driver	std	AUTOSAR_SWS_LINDriver	
Specification of LIN Interface	std	AUTOSAR_SWS_LINInterface	
Specification of LIN Network Management	std	AUTOSAR_SWS_LINNetworkManagement	
Specification of LIN State Manager	std	AUTOSAR_SWS_LINStateManager	
Specification of LIN Transceiver Driver	std	AUTOSAR_SWS_LINTransceiverDriver	
Specification of MCU Driver	std	AUTOSAR_SWS_MCUDriver	
Specification of Memory Abstraction Interface	std	AUTOSAR_SWS_MemoryAbstractionInterface	
Specification of Memory Mapping	std	AUTOSAR_SWS_MemoryMapping	
Specification of Module E2E Transformer	std	AUTOSAR_SWS_E2ETransformer	New in R4.2.1
Specification of Module XCP	std	AUTOSAR_SWS_XCP	
Specification of Network Management for SAE J1939	std	AUTOSAR_SWS_SAEJ1939NetworkManagement	
Specification of Network Management Interface	std	AUTOSAR_SWS_NetworkManagementInterface	
Specification of NVRAM Manager	std	AUTOSAR_SWS_NVRAMManager	
Specification of OCU Driver	std	AUTOSAR_SWS_OCUDriver	
Specification of Operating System	std	AUTOSAR_SWS_OS	
Specification of PDU Router	std	AUTOSAR_SWS_PDURouter	
Specification of Platform Types	std	AUTOSAR_SWS_PlatformTypes	
Specification of Port Driver	std	AUTOSAR_SWS_PortDriver	
Specification of PWM Driver	std	AUTOSAR_SWS_PWMDriver	
Specification of RAM Test	std	AUTOSAR_SWS_RAMTest	
Specification of Secure Onboard Communication	std	AUTOSAR_SWS_SecureOnboardCommunication	New in R4.2.1
Specification of Service Discovery	std	AUTOSAR_SWS_ServiceDiscovery	
Specification of Socket Adaptor	std	AUTOSAR_SWS_SocketAdaptor	
Specification of SOME/IP	std	AUTOSAR_SWS_SOMEIPTrans	New in R4.2.1

Long Name	Classi-fication	File Name	Life cycle changes
Transformer		former	
Specification of SPI Handler/Driver	std	AUTOSAR_SWS_SPIHandlerDriver	
Specification of Standard Types	std	AUTOSAR_SWS_StandardTypes	
Specification of SW-C End-to-End Communication Protection Library	std	AUTOSAR_SWS_E2ELibrary	
Specification of Synchronized Time-Base Manager	std	AUTOSAR_SWS_SynchronizedTimeBaseManager	
Specification of TCP/IP Stack	std	AUTOSAR_SWS_TcpIp	
Specification of Time Service	std	AUTOSAR_SWS_TimeService	
Specification of Time Synchronization over CAN	std	AUTOSAR_SWS_TimeSyncOverCAN	New in R4.2.1
Specification of Time Synchronization over Ethernet	std	AUTOSAR_SWS_TimeSyncOverEthernet	New in R4.2.1
Specification of Time Synchronization over FlexRay	std	AUTOSAR_SWS_TimeSyncOverFlexRay	New in R4.2.1
Specification of TTCAN Driver	std	AUTOSAR_SWS_TTCANDriver	
Specification of TTCAN Interface	std	AUTOSAR_SWS_TTCANInterface	
Specification of UDP Network Management	std	AUTOSAR_SWS_UDPNetworkManagement	
Specification of Watchdog Driver	std	AUTOSAR_SWS_WatchdogDriver	
Specification of Watchdog Interface	std	AUTOSAR_SWS_WatchdogInterface	
Specification of Watchdog Manager	std	AUTOSAR_SWS_WatchdogManager	
Specification on Ethernet Switch Driver	std	AUTOSAR_SWS_EthernetSwitchDriver	New in R4.2.1
Technical Safety Concept Status Report	aux	AUTOSAR_TR_SafetyConceptStatusReport	
Utilization of Crypto Services	aux	AUTOSAR_EXP_UtilizationOfCryptoServices	
Virtual Functional Bus	aux	AUTOSAR_EXP_VFB	
Cluster: Methodology and Templates			
AUTOSAR Feature Model Exchange Format Requirements	aux	AUTOSAR_RS_FeatureModelExchangeFormat	
AUTOSAR Feature Model Exchange Format	std	AUTOSAR_TPS_FeatureModelExchangeFormat	
AUTOSAR Miscellaneous Support Files	aux	AUTOSAR_MOD_MiscSupport	
Basic Software Module Description Template	std	AUTOSAR_TPS_BSWModuleDescriptionTemplate	
Collection of blueprints for AUTOSAR M1 models	aux	AUTOSAR_MOD_GeneralBlueprints	
Collection of constraints on AUTOSAR M1 models	std	AUTOSAR_TR_AutosarModelConstraints	
Diagnostic Extract Template	std	AUTOSAR_TPS_DiagnosticExtractTemplate	New in R4.2.1
General Requirements on Methodology and Templates	aux	AUTOSAR_RS_MethodologyAndTemplatesGeneral	
Generic Structure Template	std	AUTOSAR_TPS_GenericStructureTemplate	
Integration of Franca IDL	aux	AUTOSAR_TR_FrancaIntegratio	New in R4.2.1

Long Name	Classi-fication	File Name	Life cycle changes
Software Component Descriptions		n	
Meta Model	aux	AUTOSAR_MMOD_MetaModel	
Meta Model-generated XML Schema	std	AUTOSAR_MMOD_XMLSchema	
Methodology	aux	AUTOSAR_TR_Methodology	
Model Persistence Rules for XML	std	AUTOSAR_TR_XMLPersistenceRules	
Recommended Methods and Practices for Timing Analysis and Design within the AUTOSAR Development Process	aux	AUTOSAR_TR_TimingAnalysis	
Requirements on Basic Software Module Description Template	aux	AUTOSAR_RS_BSWModuleDescriptionTemplate	
Requirements on Diagnostic Extract Template	aux	AUTOSAR_RS_DiagnosticExtractTemplate	New in R4.2.1
Requirements on ECU Configuration	aux	AUTOSAR_RS_ECUConfiguration	
Requirements on ECU Resource Template	aux	AUTOSAR_RS_ECUResourceTemplate	
Requirements on Interaction with Behavioral Models	aux	AUTOSAR_RS_InteractionWithBehavioralModels	
Requirements on Interoperability of AUTOSAR Tools	aux	AUTOSAR_RS_InteroperabilityOfAutosarTools	
Requirements on Methodology	aux	AUTOSAR_RS_Methodology	
Requirements on Safety Extensions	aux	AUTOSAR_RS_SafetyExtensions	New in R4.2.1
Requirements on Software Component Template	aux	AUTOSAR_RS_SoftwareComponentTemplate	
Requirements on Standardization Template	aux	AUTOSAR_RS_StandardizationTemplate	
Requirements on System Template	aux	AUTOSAR_RS_SystemTemplate	
Requirements on Timing Extensions	aux	AUTOSAR_RS_TimingExtensions	
Software Component Template	std	AUTOSAR_TPS_SoftwareComponentTemplate	
Specification of ECU Configuration	std	AUTOSAR_TPS_ECUConfiguration	
Specification of ECU Configuration Parameters (XML)	std	AUTOSAR_MOD_ECUConfigurationParameters	
Specification of ECU Resource Template	std	AUTOSAR_TPS_ECUResourceTemplate	
Interaction with Behavioral Models	aux	AUTOSAR_TR_InteractionWithBehavioralModels	
Interoperability of AUTOSAR Tools	aux	AUTOSAR_TR_InteroperabilityOfAutosarTools	
Specification of Timing Extensions	std	AUTOSAR_TPS_TimingExtensions	
Specifications of Safety Extensions	std	AUTOSAR_TPS_SafetyExtensions	New in R4.2.1
Standardization Template	std	AUTOSAR_TPS_StandardizationTemplate	
Standardized M1 Models used for the Definition of AUTOSAR	std	AUTOSAR_MOD_GeneralDefinitions	
Supplementary material of	aux	AUTOSAR_TR_GeneralBlueprint	New in R4.2.2

Long Name	Classi-fication	File Name	Life cycle changes
general blueprints for AUTOSAR		sSupplement	
Supplementary material of the AUTOSAR XML Schema	aux	AUTOSAR_TR_XMLSchemaSupplement	
System Template	std	AUTOSAR_TPS_SystemTemplate	
Cluster: Application Interfaces			
Application Design Patterns Catalogue	aux	AUTOSAR_TR_AIDesignPatternsCatalogue	New in R4.2.1
Application Interface Examples	aux	AUTOSAR_MOD_AISpecificationExamples	
Application Interfaces User Guide	aux	AUTOSAR_EXP_AIUserGuide	
Explanation of Application Interfaces of Occupant and Pedestrian Safety Systems Domain	aux	AUTOSAR_EXP_AIOccupantAndPedestrianSafety	
Explanation of Application Interfaces of the Body and Comfort Domain	aux	AUTOSAR_EXP_AIBodyAndComfort	
Explanation of Application Interfaces of the Chassis Domain	aux	AUTOSAR_EXP_AIChassis	
Explanation of Application Interfaces of the HMI, Multimedia and Telematics Domain	aux	AUTOSAR_EXP_AIHMIMultimediaAndTelematics	
Explanation of Application Interfaces of the Powertrain Engine Domain	aux	AUTOSAR_EXP_AIPowertrain	
Requirements on SW-C and System Modeling	aux	AUTOSAR_RS_SWCModeling	
SW-C and System Modeling Guide	aux	AUTOSAR_TR_SWCModelingGuide	
Unique Names for Documentation, Measurement and Calibration: Modeling and Naming Aspects including Automatic Generation	aux	AUTOSAR_TR_AIMeasurementCalibrationDiagnostics	
XML Specification of Application Interfaces	std	AUTOSAR_MOD_AISpecification	
Application Interface Examples	aux	AUTOSAR_MOD_AISpecificationExamples	

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:

- none

There is a major change of one specification which shall be pointed out here:

- **Bigger parts of the specification of the SynchronizedTimeBaseManager (UID 421) have become obsolete**
  The concept "Global Time Synchronization" was initiated to improve the functionality of the SynchronizedTimeBaseManager significantly. It has been incorporated for R4.2.1, therefore bigger parts of the specification of the SynchronizedTimeBaseManager (UID 421) have become obsolete. This module was not in broad use up to now, so AUTOSAR has opted for the backward incompatible change and removed the obsolete parts (instead of labeling them).

6 Revision history

6.1 Release 4.2.1

Revision 1 of Release 4.2.has been released on the 31th of October 2014. The following deliverables had major changes.

Name	Specification history entry
Application Design Patterns Catalogue	- First Release of document. Patterns covered: o Sensor and Actuator Pattern o Arbitration of Several Set-point Requester Pattern - Previously published as part of EXP_AIPowertrain.
Application Interfaces User Guide	- Sensors and Actuators Pattern adopted in the AI Domain - Obsolete AI Table substituted by new official AI Tool for content development phase and arxml generation - Enhanced collections arxml deliverables structure
AUTOSAR Feature Model Exchange Format	- Added [TPS_FMDT_00064]
Basic Software Module Description Template	- Extended splitables for BSW - Added Uses-Case descrpitions for BSW modules - Editorial changes
Complex Driver design and integration guideline	- Update for TcpIp
Diagnostic Extract Template	- Initial Release
Example for a Serialization Protocol (SOME/IP)	- Added SD Peer Identification - Extended Error Handling - Minor corrections and clarifications
Explanation of Application Interfaces of the Chassis Domain	- Changing Status->state; current, actual -> consolidate after Harmonization with Engine
Explanation of Application Interfaces of the Powertrain Engine Domain	- Chapter “Sensor/Actuator Design Pattern” moved to new document “AIDesignPatternsCatalogue” Integrate new interfaces / update existing interfaces for network representation of engine & transmission interfaces
General Requirements on Basic Software Modules	- Alignment of post-build configuration to SWS_BSWGeneral - Rephrasing of definition of runtime errors - Incorporation of concept SupportForPBLAndPBSECUConfiguration - Editorial changes
General Requirements on Methodology and Templates	- Support variant rich Special Data
General Specification of Basic Software Modules	- Update in error handling classification - Update in initialization function requirements Updated due to SupportForPBLAndPBSECUConfiguration concept - minor corrections / clarifications / editorial changes; For details please refer to the BWCStatement
General Specification on Transformers	- Initial Release
Generic Structure Template	- Propagation of LifeCycleState Editorial changes
Glossary	- Following terms changed: Data Variant Coding (3.65) OS-Application (3.168) Post-build time configuration (3.179)

Name	Specification history entry
Guide to BSW Distribution	- Incorporation of concept “Mechanisms and constraints to protect ASIL BSW against QM BSW” Minor clarifications
Guide to Mode Management	- Incorporation of Concept "EcuMFixedMC" Clarified LIN Schedule Table Switching
Integration of Franca IDL Software Component Descriptions	- Initial Release
Layered Software Architecture	- Incorporated new 4.2 concepts for: Switch Configuration; Sender-Receiver-Serialization; CAN-FD; Large-Data-COM; E2E-Extension; Global Time Synchronization; Support for Post-build ECU-Configuration; Secure-Onboard-Communication; ASIL/QM-Protection Introduction of new error classification Editorial changes
List of Basic Software Modules	- Added COMBased-Transformer - Added E2E-Transformer - Added SOME/IP-Transformer - Added Ethernet Switch Driver - Added Large Data COM - Added Secure Onboard Communication - Added Global Time Synch Modules
Main Requirements	- New requirement for Secure Onboard Communication - New requirement for naming schemes and conventions
Methodology	- Support for Safety Extensions added - Support for Diagnostic Extract added - Support for Rapid Prototyping added - Support for Sender Receiver Serialization added
Model Persistence Rules for XML	- Formal adaptations concerning traceability
Overview of Functional Safety Measures in AUTOSAR	- Initial Release
Recommended Methods and Practices for Timing Analysis and Design within the AUTOSAR Development Process	- Editorial changes only: improvements, corrections and additions. - New chapter End-to-End Timing Analysis for Distributed Functions; - Chapter Properties and Methods for Timing Analysis: additional information and restructuring; Added further use-cases; Added examples, see figures 1.2, 3.1 and 4.1; Added index at the end of the document;
Release Overview and Revision History	- added
Requirements on AUTOSAR Features	- Incorporation of features for new R4.2 concepts Added chapter “Standardization and Documentation” - Added features for LinTP and DoIP - Minor corrections
Requirements on Basic Software Module Description Template	- Layout update. - Tracing update.
Requirements on CAN	- Added requirements for CAN FD support Removed requirements for transmit cancellation
Requirements on Communication	- added support for Large Data COM - added support for Sender/ Receiver Serialization - updated to support CAN FD

Name	Specification history entry
Requirements on Diagnostic	- Support of WWH-OBD (Major change) - Support of UDS service $38 (“RequestFileTransfer”), (Change) - Added new requirements for runtime errors and transient errors (Change) - Aging of events (Change)
Requirements on Diagnostic Extract Template	- Initial Release
Requirements on E2E Communication Protection	- Initial release
Requirements on ECU Configuration	- Updated [RS_ECUC_00008]. - Added [RS_ECUC_00085]. - Added [RS_ECUC_00086]. - Tracing update
Requirements on ECU Resource Template	- Layout update.
Requirements on Ethernet Support in AUTOSAR	- Introduction of IPv6 for in-vehicle communication - Support for Global Time Synchronization over Ethernet - Support for Switch Control/Configuration, Semi-Static Auto-Configuration - TcpIp generic upper layer support (CDD)
Requirements on Gateway	- Support of multi-frame TP fanout added
Requirements on GPT Driver	- New RS feature linked to GPT Predef Timer requirements
Requirements on Interoperability of AUTOSAR Tools	- added requirement for naming conventions [RS_IOAT_00003] - minor editorial changes
Requirements on I-PDU Multiplexer	- added Multiple PDU to Container Mapping extension of IpduMSelectorFieldLength
Requirements on Libraries	- Removed the section "5.1.7 - Added polynomial to CRC Library
Requirements on LIN	- Changed [SRS_Lin_01564] Schedule Table change request buffering
Requirements on Memory Hardware Abstraction Layer	- Requirements linked to BSW features
Requirements on Memory Services	- Requirements linked to BSW features
Requirements on Methodology	- Support for Safety Extensions added - Support for Diagnostic Extract added
Requirements on Mode Management	- Moved former SWS EcuM item describing the handling of sleep modes / shutdown targets to SRS level - Removed Defensive Behavior
Requirements on Module XCP	- Removing the limitation "Flash Programming for ECU development purposes" - Editorial changes
Requirements on Operating System	- Incorporation of concept “Mechanisms and constraints to protect ASIL BSW against QM BSW”

Name	Specification history entry
Requirements on Runtime Environment	- Added support for concepts: – NVDataHandlingRTE: [SRS_Rte_00245] – EfficientCOMforLargeData: [SRS_Rte_00246] - SenderReceiverSerialization: [SRS_Rte_00247], [SRS_Rte_00248], [SRS_Rte_00249], [SRS_Rte_00250], [SRS_Rte_00251] - Added requirement: [SRS_Rte_00252]
Requirements on Safety Extensions	- Initial release based on Concept "'Safety extensions"'
Requirements on Secure Onboard Communication	- Initial Release
Requirements on Software Component Template	- Added requirements for configuration of data transformation. - Added requirement for naming conventions
Requirements on Standardization Template	- extend traceability to new document artefacts
Requirements on Synchronized Time-Base Manager	- Concept "Global Time Synchronization" incorporated to replace (and by that improve) original functionality and to support new functionality, e.g.: support of CAN and Ethernet support for gateways to enable time domains spanning several busses Due to deficiencies R4.0/1 content has been removed (e.g. customer API + polling of time-base providers). Exception: API to synchronize OS schedule tables.
Requirements on System Template	- Added requirements [RS_SYST_00049], [RS_SYST_00050], [RS_SYST_00051], [RS_SYST_00052], [RS_SYST_00053], [RS_SYST_00054], [RS_SYST_00055], [RS_SYST_00056]
Requirements on Time Service	- New RS_BRF_ feature linked to all requirements
Requirements on Transformer	- Initial Release
Software Component Template	- Efficient NV data handling - Introduction of data transformation - Support for variable-size Arrays of arbitrary data types - Support for ASIL/QM development - Minor corrections / clarifications / editorial changes; For details please refer to the BWCStatement
Specification of Large Data COM	- Initial Release
Specification of RTE Software	- Efficient NV data handling - Introduction of data transformation - Support for variable-size Arrays of arbitrary data types - Various fixes and clarifications
Specification of a Diagnostic Communication Manager for SAE J1939	- Optimizations - Editorial changes
Specification of a Request Manager for SAE J1939	- Improved interaction with COM Harmonized with SWS BSW General

Name	Specification history entry
Specification of a Transport Layer for SAE J1939	- Removed obsolete configuration elements Harmonized with SWS BSW General
Specification of ADC Driver	- AdcGroupId is changed to pre-compile time value in all variants.
Specification of Basic Software Mode Manager	- New API and configuration containers to support EcuM Fixed for Multi Core - Addition of new container for defining mode values: BswMCompuScaleModeValue - New Action BswMFrSMAllSlots for invoking - FrSM_AllSlots - New requirements for: Action list execution (SWS_BswM_00223) and Deadline Monitoring (SWS_BswM_00224,00225)
Specification of Bit Handling Routines	- Correct usage of const in function declarations - Editoral changes
Specification of CAN Driver	- Full CAN FD Support (incl. Trigger Transmit) - Removed CanIf_CancelTxConfirmation - Time-out and wake up event handling - Small improvements and minor bug-fixes
Specification of CAN Interface	- Full CAN FD Support - Global Time Synchronization over CAN - Removed CanIf_CancelTxConfirmation - Small improvements
Specification of CAN Network Management	- Removed obsolete configuration parameters - Partial Network Handling Improvements - Const usage in APIs reworked
Specification of CAN State Manager	- API for ECU passive mode activation - Baudrate change without reinitialisation, if possible - Interface handling to CanIf module improved - Interface handling to ComM module improved
Specification of CAN Transceiver Driver	- Revised the configuration of CAN Tranceiver. - Minor corrections in wait state functionality. - Clarification regarding the wakeup sources.
Specification of CAN Transport Layer	- Introduced support for CAN Flexible Data rate - Minor corrections - Clarifications
Specification of COM Based Transformer	- Initial Release
Specification of Communication	- added support for Sender/ Receiver Serialization - updated to support CAN FD - minor corrections
Specification of Communication Manager	- Release of PNC related FULL_COM request already upon leaving PNC_REQUESTED - Several clarifications - Minor corrections
Specification of Communication Stack Types	- MetaData information is added in PduInfoType
Specification of Compiler Abstraction	- The compiler symbol definitions are not allowed to contain any value behind the symbol - Rework the document structure in order to follow TMPS_SRS_SWS and replace hardcoded diagrams with artifacts - Remove all MISRA/ C/ C++ related statements and references - Correct the unresolved references that point in SRS_BSWGeneral

Name	Specification history entry
Specification of Core Test	- CORTST_E_CORE_FAILURE extended production error formalization, including healing. - Correction of CorTst_GetCurrentStatus prototype
Specification of CRC Routines	- Introduction of a new CRC-32 with the polynomial 0xF4ACFB13 - Editorial changes
Specification of Crypto Service Manager	- Obsolete configuration elements removed - Error fixing and consistency improvements - Editorial changes
Specification of Debugging in AUTOSAR	- Removed Post Buid information - Other small modifications
Specification of Default Error Tracer	- Extended & renamed DevelopmentErrorTracer to DefaultErrorTracer by adding routines - New Routines Det_ReportRountineError and Det_ReportTransientFault - New configuration paramaters - Det_ReportRountineErrorCallout and Det_ReportTransientFaultCallout
Specification of Diagnostic Communication Manager	- Update to ISO 14229-1:2013 (Order of NRCs, SID 0x19 and 0x28 extended subfunctions, SID 0x38) - Specify security mechanisms (security Lock time, static seed). - Refine service ReadDataByPeriodicIdentifier (0x2A) and provide UUDT transfer. - Reorganize the configuration parameters for the routines.
Specification of Diagnostic Event Manager	- Support of ISO 27145 (WWH-OBD / Euro VI)[1] - Update to support ISO 14229-1:2013[2] - Introduction of event dependencies - Refined DTC/Event suppression
Specification of Diagnostic Log and Trace	- Changed requirements: SWS_Dlt_00515, SWS_Dlt_00516, SWS_Dlt_00332, SWS_Dlt_0028
Specification of Diagnostic over IP	- Harmonization of identical APIs within BSW - Handling UUDT messages within DoIP Harmonization of callback functions and configuration parameter names - Editorial changes
Specification of DIO Driver	- DIO: ReadChannelGroup / WriteChannelGroup pointer parameters. Provided support for Link time only. - The generation of link-time parameters aggregated by a postBuildChangeable container may not be possible. Reference to SWS_BSW_00380 is removed.
Specification of ECU Configuration	- Improved description of Post-build variants - Improved Post-build loadable approach - Introduction of Uri References - Minor corrections / clarifications / editorial changes; For details please refer to the BWCStatement
Specification of ECU Resource Template	- Layout update
Specification of ECU State Manager	- Added switch configuration - Defined initialization order for InitListZero/InitListOne - Definition of the name pattern of c-init-data struct corrected - Type conflicts solved - Editorial changes
Specification of ECU State Manager with fixed state machine	- Incorporation of MultiCore concept - Defined initialization order for InitListZero/InitListOne - Definition of the name pattern of c-init-data struct corrected - Editorial changes

Name	Specification history entry
Specification of EEPROM Abstraction	- Requirements linked to BSW features, general and module specific requirements
Specification of EEPROM Driver	- Added pass/fail criteria and additional attributes for extended production errors - Removed redundant SWS IDs with respect to NULL_PTR check for Eep_Init()
Specification of Ethernet Driver	- Change from Synchronous to Asynchronous API gPTP Timestamp Support - Enhanced Production Errors - Changed Access to Statistic Frame Handling Registers
Specification of Ethernet Interface	- Change from Synchronous to Asynchronous API gPTP Timestamp Support - Ethernet Switch Support - Ethernet Wakeup Support
Specification of Ethernet State Manager	- Change from Synchronous to Asynchronous API Additional callback functions added - Existing behavior of functions changes - Editorial changes
Specification of Ethernet Transceiver Driver	- Change from Synchronous to Asynchronous API Ethernet Wakeup Support
Specification of Extended Fixed Point Routines	- Added: New Variants for SWS_Efx_00412 (0xE2 - 0xE9) Note has been added for SWS_Efx_00053, SWS_Efx_00072 & Section 8.5.3.1. A statement has been added to clarify the formula used for Hypotenuse function just below the section 8.5.9 A statement has been added to provide more clarity on the formula mentioned in SWS_Efx_00451 Modified: Updated usage of const in a consistent manner in EFX document. (SWS_Efx_00050, SWS_Efx_00067, SWS_Efx_00085, SWS_Efx_00519, SWS_Efx_00107, SWS_Efx_00122, SWS_Efx_00146, SWS_Efx_00172, SWS_Efx_00205, SWS_Efx_00379 & SWS_Efx_00404) Formula for TeQ_<size> has been corrected in section 8.5.3.1 and font has been updated for SWS_Efx_00071 Condition check included for SWS_Efx_00053, SWS_Efx_00072 & Section 8.5.3.1 and corrected for SWS_Efx_00054, SWS_Efx_00073 & SWS_Efx_00504. Formula updated for SWS_Efx_00073.
Specification of Fixed Point Interpolation Routines	- Added: IFX RecordLayout Blueprint reference in section 3.1 Modified: The usage of const is corrected in function parameters for SWS_Ifx_00004, SWS_Ifx_00014, SWS_Ifx_00015, SWS_Ifx_00017, SWS_Ifx_00020, SWS_Ifx_00022, SWS_Ifx_00025, SWS_Ifx_00027, SWS_Ifx_00030, SWS_Ifx_00032, SWS_Ifx_00205 & SWS_Ifx_00209. Serial numbers in Section 3.2
Specification of Fixed Point Math Routines	- Minor corrections and clarifications
Specification of Flash Driver	- Requirements linked to features and BSW requirements.
Specification of Flash EEPROM Emulation	- Requirement for blank checking added - Requirements linked to features, general and module specific requirements

Name	Specification history entry
Specification of Flash Test	- Formal text modifications in: SWS_FlsTst_00138, SWS_FlsTst_00140, SWS_FlsTst_00142, SWS_FlsTst_00143, SWS_FlsTst_00071, SWS_FlsTst_00115, SWS_FlsTst_00116, SWS_FlsTst_00117, ECUC_FlsTst_00160, Figure 7/8/9/10 ECUC_FlsTst_00086: configuration - FlsTstConfigurationOfOptApiServices added
Specification of FlexRay AUTOSAR Transport Layer	- Clarification regarding NULL pointer handling - Removed obsolete ECU configuration elements
Specification of FlexRay Driver	- Removed obsolete configuration parameters - Improved description of extended production errors
Specification of FlexRay Interface	- Support for GlobalTimeSynchronization added - Minor corrections
Specification of FlexRay ISO Transport Layer	- Added FRTP_TIME_CS in table 2, FRTP_TIMEOUT_BR and FRTP_TIMEOUT_CS in table3. - Updated for “Use cases for NULL_PTR in CopyRxData and CopyTxData should be allowed”. - Updated SWS_FrTp_01132, SWS_FrTp_01140, SWS_FrTp_01146, SWS_FrTp_01148, SWS_FrTp_01150 for FRTP_E_PARAM_POINTER. - Added FRTP_E_INIT_FAILED in the SWS_FrTp_01132 (table).
Specification of FlexRay Network Management	- Correction of Partial Networking aggregation algorithm - Harmonize description of identical API’s - Const usage consistent in specifications
Specification of FlexRay State Manager	- Changed development error checking of FrSM_Init pointer parameter. - Editorial changes
Specification of FlexRay Transceiver Driver	- Reworked development and production errors according to the new SWS_BSWGeneral - Supports multiple branch ids per transceiver - Supports new busy wait time service
Specification of Floating Point Interpolation Routines	- Added: IFL RecordLayout Blueprint reference in section 3.1 - Modified: The usage of const is updated in function parameters for SWS_Ifl_00010, SWS_Ifl_00021 & SWS_Ifl_00025 - IFL Blueprint modified for the schema version Serial numbers in Section 3.2
Specification of Floating Point Math Routines	- Added: New Functions are added to convert values between Float and Integer. (SWS_Mfl_00837, SWS_Mfl_838, SWS_Mfl_840, SWS_Mfl_841 & SWS_Mfl_842) - Modified: BSWUML Model was updated for "Mfl_FloatToIntCvrt_f32" & "Mfl_IntToFloatCvrt" functions. (SWS_Mfl_00836 & SWS_Mfl_839) Updated usage of const in a consistent manner.
Specification of Function Inhibition Manager	- Simplification of FiM configuration - Support of "Monitored Components" - Postbuild configuration clean up - Editorial changes
Specification of GPT Driver	- Init pointer check harmonized with BSW_General, redundant SWS_GPT_00294, SWS_GPT_00340 items removed - Added new error code GPT_E_INIT_FAILED

Name	Specification history entry
Specification of ICU Driver	- IcuChannelId: postBuildVariantValue set to false SWS IDs with respect to NULL_PTR check for Icu_Init() removed ICU_E_PARAM_POINTER and ICU_E_INIT_FAILED added to Error classification - ICU_E_PARAM_CONFIG and ICU_E_PARAM_BUFFER_PTR removed from Error classification
Specification of Interoperability of AUTOSAR Tools	- added requirement for naming conventions [RS_IOAT_00003] minor editorial changes
Specification of I-PDU Multiplexer	- Added Multiple PDU to Container Mapping Extension of IpduMSelectorFieldLength
Specification of LIN Driver	- Replaced SWS_Lin_00064 with SWS_Lin_00268
Specification of LIN Interface	- Changed the description of return value E_NOT_OK for LinIf_Wakeup Changed the parameter LinIfFrameRef.upperMultiplicity from '*' to '1' Revised the typo in SWS_LinIf_00614 Editorial changes
Specification of LIN Network Management	- Added SWS_LinNm_00172 for LinNm_ConfigType, LINNM170 for LinNm_MainFunction, ECUC_LinNm_00027 for LinNmTimeoutTime and ECUC_LinNm_00028 for LinNmMainFunctionPeriod. Updated SWS_LinNm_00029 and SWS_LinNm_00054 for LinNm initialization ConfigPtr. Updated “Figure 7-1”, “Figure 7-2” and “9.2 LinNm_PassiveStartUp” to enter the Lin channel into sleep mode once the LinNmTimeoutTime elapsed in passive startup. Updated the requirements for const usage in function parameters.
Specification of LIN State Manager	- Removed NULL pointer check requirement (moved to BSW General - Corrections in ECU parameter configuration
Specification of LIN Transceiver Driver	- Supports Time service for transceiver state change waits
Specification of MCU Driver	- Removed requirements for NULL pointer checking as redundant with BSW General. - Specified pass/fail criteria for extended production errors
Specification of Memory Abstraction Interface	- Requirements linked to features, general and module specific requirements
Specification of Memory Mapping	- Support partitioning of BSW for safety systems - Remove obsolete memory sections in Recommendation A - Clarifications about the handling of SIZE and ALIGNMENT - editorial changes
Specification of Module E2E Transformer	- Initial release
Specification of Module XCP	- Editorial corrections. - Minor corrections. - Changed the multiplicity of XcpEventChannelTriggeredDaqListRef. Remove limitation "Flash Programming for ECU development purposes".
Specification of Network Management for SAE J1939	- Enhanced description of extended production error J1939NM_E_ADDRESS_LOST - Fixed usage of ‘const’ in NM APIs - Harmonized with SWS BSW General

Name	Specification history entry
Specification of Network Management Interface	- Corrections on the requirement tracing - Clarification at use of callback versus callout - Editorial changes
Specification of NVRAM Manager	- Detailed pass/fail conditions for production errors - Added the NvM_ValidateAll functionality Updated return values for Init and SingleBlock callbacks - Other small clarifications
Specification of OCU Driver	- Set the postBuildVariantValue and postBuildVariantMultiplicity to false and also set the valueConfigClass and the multiplicityConfigClass for all variants to preCompile. - Removal of automatically supported BSW requirement. Reference to SWS_BSW_00380 is removed.
Specification of Operating System	- Add support for AsilQmProtection - Minor updates/clarification of descriptions - Editorial changes
Specification of PDU Router	- Support multi-frame TP fanout CAN-FD and SecOC Concept incorporation Improved Cancel Transmission handling in case of gatewaying - Editorial changes
Specification of Platform Types	- removed SWS_Platform_00063 as the influence of Post-build time configuration parameters on header files is already specified in SWS_BswGeneral
Specification of Predefined Names in AUTOSAR	- Complete list of Module Abbreviation for each AUTOSAR document - Include additional keywords
Specification of PWM Driver	- Updated trace reference for code file structure requirement
Specification of RAM Test	- Added Pass/Fail Criterias for Extended Production Errors
Specification of Secure Onboard Communication	- Initial Release
Specification of Service Discovery	- Fixed Service Migration support at client side - Support for more efficient SoAd interface - Optimized StopSubscribe/Subscribe load
Specification of Socket Adaptor	- Introduction of IPv6 for in-vehicle communication - Support for Service Migration of Service Discovery Clients (SpecificRoutingGroup Handling) - SoAd_RequestIpAddrAssignment API extension Clarifications and corrections of requirements and sequence charts
Specification of SOME/IP Transformer	- Initial Release
Specification of SPI Handler/Driver	- Added SWS_Spi_00383, SWS_Spi_00384, SWS_Spi_00385, SWS_Spi_00386 and ECUC_Spi_00243 - New configuration parameter - SpiUserCallbackHeaderFile - SPI hardware error is applicable for sync and async transmits - Editorial changes
Specification of SW-C End-to-End Communication Protection Library	- Introduction of E2E profiles 4, 5, 6 - Introduction of E2E state machine - Introduction of init functions and status mapping fucntions for profiles 1, 2 - Overview of wrapper, by means of several new diagrams.

Name	Specification history entry
Specification of Synchronized Time-Base Manager	- Concept "Global Time Synchronization" incorporated to replace (and by that improve) original functionality and to support new functionality, e.g.: support of CAN and Ethernet support for gateways to enable time domains spanning several busses Due to deficiencies R4.0/1 content has been removed (e.g. customer API + polling of time-base providers). Exception: API to synchronize OS schedule tables.
Specification of TCP/IP Stack	- Introduction of IPv6 for in-vehicle communication - Support for Switch Control/Configuration, Semi-Static Auto-Configuration - TcpIp generic upper layer support (CDD) - Clarifications and corrections of requirements and sequence charts
Specification of Time Synchronization over CAN	- Initial Release
Specification of Time Synchronization over Ethernet	- Initial Release
Specification of Time Synchronization over FlexRay	- Initial Release
Specification of Timing Extensions	- Added the capability in Execution Order - Constraint to reference RTE and BSW Events - Added description about how to specify time sets - Minor corrections / clarifications / editorial changes; For details please refer to the BWCStatement
Specification of TTCAN Driver	- Updated disclaimer - Editorial changes
Specification of TTCAN Interface	- Improved extended production error description - Updated disclaimer - Editorial changes
Specification of UDP Network Management	- Harmonization of API description - Revised Partial Networking Requirements - Extended Production Errors - Editorial Changes
Specification of Watchdog Driver	- Adapt specification of extended production errors. - WDG_E_INIT_FAILED added (error code is referenced by SWS_BSWGeneral)
Specification of Watchdog Manager	- Introduced of the modeling of system services - Reformulated some requirements to constraints - Minor corrections
Specification on Ethernet Switch Driver	- Initial Release
Specifications of Safety Extensions	- Initial specification based on Concept "'Safety Extensions"'
Standardization Template	- introduction of Blueprint Policy - include safety extension relevant items - extension of acceptanace test items

Name	Specification history entry
SW-C and System Modeling Guide	- Generic CompuMethods reuse mechanism - enhanced through new modeling rules - Extended naming rules and recommendations for Long Names standardization - Extended description of blueprint mechanism applied to Application Interfaces Domain
System Template	- Introduction of data transformation - Introduction of SecuredIPdu - Introduction of Switch Configuration - Introduction of Global Time Synchronization - Improved support for CanFD - Minor corrections / clarifications / editorial changes; For details please refer to the BWCStatement
Unique Names for Documentation, Measurement and Calibration: Modeling and Naming Aspects including Automatic Generation	- P/L-List now also available as .arxml as part of MOD_AISpecification
Virtual Functional Bus	- Introduction of PRPortPrototype

More specifications might have been changed, which are not listed here. Those specifications have then only “minor corrections, clarifications or editorial changes; for details please refer to the Change Documentation [3].

6.2 Release 4.2.2

Revision 2 of Release 4.2.has been released on the 31th of July 2015. The following specifications had major changes.

Name	Specification history entry
Application Design Patterns Catalogue	- reconsideration of signal definitions and tailored pattern for smart actuators and actuators with no feedback loop - specification items added - minor changes
Application Interfaces User Guide	- Updated explanation of the COMPU_METHOD reusage - Updated the Linear Conversion Example
AUTOSAR Specification Hashes	- Initial Release
Change Documentation	- Initial Release
Complex Driver design and integration guideline	- Update for Default Error Tracer - Re-entrancy of interfaces
Explanation of Application Interfaces of the Powertrain Engine Domain	- Chapter “Timing and Accuracy Requirements to Torque Signals” and related figure removed and moved into description of related Interfaces in AI-Tool
General Requirements on Basic Software Modules	- Introduce new requirement SRS_BSW_00403 - Introduce new requirement SRS_BSW_00351 - Modified requirement SRS_BSW_00406 and SRS_BSW_00450 - Debugging support marked as obsolete
General Specification of Basic Software Modules	- Debugging support marked as obsolete - minor corrections / clarifications / editorial changes; For details please refer to the ChangeDocumentation
General Specification on Transformers	- Transformation of intra-ECU communication - Transformation of external-trigger events - Autonomous error responses of transformers - Minor corrections / clarifications / editorial changes; For details please refer to the ChangeDocumentation
Generic Structure Template	- Update View Approach - Combinations of status values - Update Inline Text Model Element
Glossary	- Following terms changed: - ECU Abstraction Layer (3.74) - Standardized AUTOSAR Interface (3.224) - Following terms removed: - Software Module
Guide to Mode Management	- Description of wakeup handling on multiple cores - Description of inter-partition mode communication
Interaction with Behavioral Models	- Long name of document changed
List of Basic Software Modules	- Adopted name for "DefaultErrorTracer"
Overview of Functional Safety Measures in AUTOSAR	- New Chapter: „Hardware Diagnostics“ covers Core Test and RAM Test. - Minor corrections / clarifications / editorial changes.
Predefined Names in AUTOSAR	- Include abbreviations for Acceptance Tests

Name	Specification history entry
Recommended Methods and Practices for Timing Analysis and Design within the AUTOSAR Development Process	- Section 6.3: introduced basic timing tasks like "Collect Timing Requirement" or "Create Timing Model". Adapted introduction of chapter 6 accordingly. - Clarified relation of the timing properties described in section 6.4 to AUTOSAR TIMEX. - improved glossary and index - New figures for improved overview of use-cases (figures 3.2 and 4.2)
Release Overview and Revision History	- Update according to revision 4.2.2
Requirements on AUTOSAR Features	- Debugging features marked as obsolete - Added missing memory stack features
Requirements on Basic Software Module Description Template	- Set Debugging support to obsolete [RS_BSWMD_00061].
Requirements on Debugging in AUTOSAR	- Marked the document as obsolete
Requirements on Diagnostic	- Clarification of bootloader interaction - Interfaces for DCM communication via PDU router - Rework of document structure
Requirements on Function Inhibition Manager	- Fim considers EventAvailbilty/ EventSuppression
Requirements on Interoperability of AUTOSAR Tools	- added use case section that was part of the TR_IOAT
Requirements on Memory Hardware Abstraction Layer	- Requirements linked to BSW features
Requirements on Memory Services	- Requirements linked to BSW features
Requirements on Mode Management	- Clarified post-build configurability of some requirements
Requirements on RAM Test	- Update of the document for Diverse corrections - Editorial changes
Requirements on Runtime Environment	- Added requirement: [SRS_Rte_00253]
Safety Use Case Example	- Initial Release
Specification of Large Data COM	- Fixed TriggerTransmit for dynamic length PDUs - Added PreCompile configuration class for all symbolicNameValue parameters
Specification of a Diagnostic Communication Manager for SAE J1939	- Clarifications - DM01 handling on multiple networks - DM19 updated negative response code
Specification of a Request Manager for SAE J1939	- Fixed names and signatures of service ports - Support for explicit broadcast of ACKM - Introduction of further error classes
Specification of a Transport Layer for SAE J1939	- Fixed retry behavior - Clarified effect of MetaData on SA/DA/Protocol - Introduction of further error classes
Specification of ADC Driver	- DET changed from 'Development Error Tracer' to 'Default Error Tracer'.

Name	Specification history entry
Specification of Basic Software Mode Manager	- Improved specification of service interfaces - Additional functional requirements for BswMPduGroupSwitch action - Added BswMNmIfCarWakeUpIndication as a new BswMModeRequestSource - Deprecated some spec. elements (marked with “obsolete”), editorial changes, increased requirement traceability and minor changes to configuration containers/parameters
Specification of Bit Handling Routines	- Updated SWS_Bfx_00017 for the return type of Bfx_GetBit function from 1 and 0 to TRUE and FALSE - Updated chapter 8.1 for the definition of bit addressing and updated the examples of Bfx_SetBit, Bfx_ClrBit, Bfx_GetBit, Bfx_SetBits, Bfx_CopyBit, Bfx_PutBits, Bfx_PutBit - Updated SWS_Bfx_00017 for the return type of Bfx_GetBit function from 1 and 0 to TRUE and FALSE without changing the formula - Updated SWS_Bfx_00011 and SWS_Bfx_00022 for the review comments provided for the examples
Specification of CAN Driver	- CanHwObjectCount parameter multiplicity is changed to 1 Error Classification has changed - Improved 8.4.2 Enabling/Disabling wakeup notification - DET has been renamed from "Development Error Tracer" to "Default Error Tracer - Small improvements and minor bug-fixes
Specification of CAN Interface	- Clarified wakeup, buffering, transmit, and variants - Removed deprecated APIs - Editorial changes
Specification of CAN Network Management	- Clarification NM message transmission start - Clarification of configuration dependencies - Clarification NM timers while communication is disabled
Specification of CAN State Manager	- Development Error Tracer replaced with Default Error Tracer - Bus-off recovery time dependencies specified more precisely - Optional interface to check and to change baudrate removed
Specification of CAN Transceiver Driver	- Clarification regarding wake-up flag indication - Editorial changes
Specification of CAN Transport Layer	- File structure correction - FC_OVFL clarification - DET Renaming and Extension Incorporation
Specification of COM Based Transformer	- Exclude support for external trigger communication [SWS_ComXf_00032]
Specification of Communication Manager	- Chapter added to explain partial network usecase - Minor corrections
Specification of Compiler Abstraction	- Cleanup the requirements traceability - Clarify the list of compiler symbols
Specification of Core Test	- Correction of CorTst_Init prototype - Added CorTst_ConfigType and CorTst_ResultType - Debugging support marked as obsolete - Minor corrections
Specification of CRC Routines	- Corrected the magic check for the CRC32 and CRC32P4
Specification of Crypto Service Manager	- Changed return type from Csm_ReturnType to Std_Types in all API functions - Added detailed description of RTE interfaces - Error fixing and consistency improvements
Specification of Debugging in AUTOSAR	- Marked the specification as obsolete
Specification of Default Error Tracer	- Harmonized Traceability - Ensured consistent usage of development errors in all modules

Name	Specification history entry
Specification of Diagnostic Communication Manager	- Specify the NRCs to be sent by the Dcm in case of Dem interfaces return negative values. - Clarify Routine operation prototypes - Debugging support marked as obsolete - Minor corrections / clarifications / editorial changes; For details please refer to the ChangeDocumentation
Specification of Diagnostic Event Manager	- New APIs Dem_GetEventFreezeFrameDataEx and Dem_GetEventExtendedDataRecordEx with buffersize as parameter and corrected return value defintions. - Providing OBD FreezFrame for UDS service 0x19 0x05 - ISO 14229-1:2013[1] NRC handling for service 0x14 - Refined service interfaces for DataElements - minor corrections / clarifications / editorial changes; For details please refer to the ChangeDocumentation
Specification of Diagnostic Log and Trace	- Minor corrections
Specification of Diagnostic over IP	- DET Renaming and Extension Incorporation Support for parallel diagnostic sessions
Specification of DIO Driver	- DET Renaming and Extension Incorporation - Changed DioChannelId, DioPortId precomplile configuration
Specification of ECU State Manager	- Reworked slave core poll sequence - Reviewed multicore shutdown synchronization - Reclassified error types - Editorial changes
Specification of ECU State Manager with fixed state machine	- Adaptations related to renaming of DET table for "EcuM_SleepModeType" added missing modules in Table2 "Driver Initialization Details" added - Requirement regarding "state of wakeup sources belonging to previous sleep modes" added
Specification of EEPROM Abstraction	- Error classification reworked - Debug support marked as obsolete Parameter ranges corrected - Job result clarified if requested block can’t be found
Specification of EEPROM Driver	- DET renaming and adaptation - Chapter 7 adaptation for error classification
Specification of Ethernet Driver	- Eth_ControllerInit functionality merged into Eth_Init API - Development Error Tracer renamed to Default Error Tracer - IRQ handler API removed
Specification of Ethernet Interface	- EthIf_TransceiverInit and EthIf_ControllerInit removed - Development Error Tracer renamed to Default Error Tracer
Specification of Ethernet State Manager	- Harmonize Sequence diagrams, Network State Machine and Functional Description - Debugging support marked as obsolete Report to DET if TcpIp state is not accepted - Adaptations related to renaming of DET, - Error Handling: tables for Runtime Errors and Transient Faults added
Specification of Ethernet Transceiver Driver	- EthTrcv_TransceiverInit functionality merged into EthTrcv_Init API - Development Error Tracer renamed to Default Error Tracer

Name	Specification history entry

Specification of Extended Fixed Point Routines	- Modified:
	  - Updated the requirement ID for SWS_Efx_00033 as per the convention
	  - Updated requirement ID SWS_Efx_00436 (UML) for OutTypeMn as per the standard convention
	  - Updated SWS_Efx_00001 for naming convention under Section 5.1, File Structure
	  - Updated SWS_Efx_00365 to correct the data type of input parameters

Specification of Fixed Point Interpolation Routines	- Added:
	  - Added a new statement in Section 8.5 below the formula to provide more clarity to the users
	- Modified:
	  - Updated the "Requirements traceability" section
	  - Updated Record layouts for distributed interpolation routines in SWS_Ifx_00185
	  - Updated SWS_Ifx_00001 for naming convetion under Section 5.1, File Structure

Specification of Fixed Point Math Routines	- Modified
	  - Updated SWS_Mfx_00017 for shift value of Function ID 0x200 to 0x205 from 64 to 63
	  - Updated SWS_Mfx_00001 under Section 5.1 File Structure.

Specification of Flash Driver	- Debugging support marked as obsolete - Error classification reworked - Reference to DEM removed - Description for configuration parameter FlsUseInterrupts clarified
Specification of Flash EEPROM Emulation	- Behaviour during FEE_BUSY_INTERNAL reworked - Error classification reworked - Debugging support marked as obsolete - Job result clarified if requested block can't be found
Specification of Flash Test	- Debugging support marked as obsolete - ECUC_FlsTst_00119 set to obsolete; - ECUC_FlsTst_00161 created; - ECUC_FlsTst_00151 modified (pre-compile only); - SWS_FlsTst_00023, SWS_FlsTst_00026, - SWS_FlsTst_00133 removed; - SWS_FlsTst_00007: Error code 0x05 modified - SWS_FlsTst_00168 created: Extended production error table with pass/fail criteria; - SWS_FlsTst_00161 modified; - SWS_FlsTst_00167 created; - Renaming from Development Error Tracer to Default Error Tracer; changes in abbreviations, chapter 3.1, SWS_FlsTst_00011; - Template changes; chapters runtime errors and transient faults added; - Formal text modifications in: SWS_FlsTst_00138, SWS_FlsTst_00140, SWS_FlsTst_00142, SWS_FlsTst_00143, SWS_FlsTst_00071, SWS_FlsTst_00115, SWS_FlsTst_00116, SWS_FlsTst_00117, ECUC_FlsTst_00160, Figure 7/8/9/10 - ECUC_FlsTst_00086: configuration - FlsTstConfigurationOfOptApiServices added
Specification of FlexRay AUTOSAR Transport Layer	- Changed attribute Ecuc.postBuildVariantValue to false for FrArTpSduRxId and FrArTpSduTxId
Specification of FlexRay Driver	- Changed development errors to default errors

Name	Specification history entry
Specification of FlexRay ISO Transport Layer	- Updated the SWS requirements for DET renaming. - Updated the SWS requirement SWS_FrTp_01047 and added a note for the Tx Pdu processing.
Specification of FlexRay Network Management	- Clarification on FrNmPassiveModeEnabled - Clarification on FrNmNumberOfClusters - Clarity on scheduling of MainFunction - Debugging support marked as obsolete - Minor corrections
Specification of FlexRay State Manager	- Revised development error handling. - Debugging support marked as obsolete - Minor corrections / clarifications / editorial changes; for details please refer to the ChangeDocumentation
Specification of FlexRay Transceiver Driver	- Redesigned extended production error chapter, updated to default error tracer - Added a (dummy) configuration parameter to the initialization interface - Debugging support marked as obsolete - Removed chapter(s) on change documentation

Specification of Floating Point Interpolation Routines	- Modified:
	  - Updated Record layouts definitions for SWS_Ifx_00170
	  - Updated SWS_Ifl_00001 for naming convention under Section 5.1, File Structure
	  - Updated valid range for float32 in Table 1 of Section 8.1

Specification of Floating Point Math Routines	- Modified:
	  - BSWUML Model for "Mfl_HystCenterHalfDelta_f32_u8", "Mfl_HystLeftRight_f32_u8", "Mfl_HystDeltaRight_f32_u8" & "Mfl_HystLeftDelta_f32_u8" functions were updated in the Word Document.
	  - Statement has been updated for Mfl_DT1Typ1Calc and Mfl_DT1Typ2Calc to clearly mention the data type for the Time Equivalent parameter.
	  - Description field has been updated/rectified for Tv_C and Tnrec_C parameters in Mfl_ParamPID_Type.
	  - Updated naming convention for TeQ_f32 Parameter.
	  - Corrected the description for TeQ_<Size> in section 8.5.4.1 and statement in section 8.5.4.4.
	  - Naming convention followed for Tnrec Parameter in Mfl_PISetParam function.
	  - Statement has been updated to correct naming convention for TeQ_f32.
	  - Updated SWS_Mfl_00001 for naming convention under Section 5.1, File Structure
	  - BSWUML Model for "Mfl_ArrayAverage_f32_f32" function was updated to include pointer to constant to avoid MISRA violation/warning. (SWS_Mfl_00192)
	  - Valid range for float32 has been updated in Section 8.2 and removed float64 data type from Section 8.1, 8.2 and Section 2
	- Deleted:
	  - Removed the requirements SWS_Mfl_00240, SWS_Mfl_00245, SWS_Mfl_00250 & SWS_Mfl_00255
	  - Removed redundant requirements SWS_Mfl_00034, SWS_Mfl_00046 & SWS_Mfl_00302, which were cov-ered as part of section 8.5.4.4.

Name	Specification history entry
Specification of Function Inhibition Manager	- Fim considers EventAvailbilty/ EventSuppression - Modified Initialization Sequence - minor corrections / clarifications / editorial changes; For details please refer to the ChangeDocumentation
Specification of GPT Driver	- Det renaming and extension incorporation - Debugging support marked as obsolete - Remove duplicated requirements in traceability
Specification of I/O Hardware Abstraction	- Updated IoHwAb_Init function protoptype
Specification of ICU Driver	- Editorial changes - DET renamed from "Development Error Tracer" to "Default Error Tracer". - All references to obsolete SWS_Icu_00048 removed from the document
Specification of LIN Driver	- Chapter 6 "Requirements traceability" clean up - Reference to DET are named as “Default” Error Tracer instead of “Development” Error Tracer - Dependency on Module DET listed in Chapter 5 is linked to SWS_Lin_00048 instead of SWS_Lin_00052
Specification of LIN Interface	- Removed PostBuildTime from the configuration class of optional interfaces - Changed to call the <User_TriggerTransmit> with the buffer length - Changed to Default Error Tracer from Development Error Tracer
Specification of LIN Network Management	- Updated the SWS requirements for DET renaming. - Updated the SWS for LinNmComUserDataSupport. - Removed SWS requirement SWS_LinNm_00040. - Removed SWS numbers LINNM170, LINNM171 and updated with SWS_LinNm_00173, SWS_LinNm_00174.
Specification of LIN State Manager	- Modified header file structure - Debugging support marked as obsolete - Editorial changes
Specification of LIN Transceiver Driver	- Development Error Tracer replaced with Default Error Tracer - Standardized the initialization function
Specification of MCU Driver	- Minor change regarding DET renaming and extension Incorporation - Clarifications regarding configuration class of symbolicNameValue parameters
Specification of Memory Abstraction Interface	- Block result MEMIF_BLOCK_INCONSISTENT extended to blocks which can’t be foundError classification reworked - Links to requirements added
Specification of Memory Mapping	- Support core scope specific memory allocation - Clean up requirement tracing - editorial changes
Specification of Module E2E Transformer	- Various minor fixes
Specification of Module XCP	- Debugging support marked as obsolete - Editorial corrections. - Modifications in some parameters multiplicity of XcpDaqlist container.
Specification of Network Management for SAE J1939	- Support for networks without address claiming - Fixed state notifications to BswM - Introduction of further error classes
Specification of Network Management Interface	- "‘Coordination algorithm"’ and "‘Coordinated shutdown"’ redefined - Make the CarWakeup feature available - Debugging support marked as obsolete - Editorial changes

Name	Specification history entry
Specification of NVRAM Manager	- Clarified behavior related to restoring default data for blocks and for handling of MEMIF_BLOCK_INVALID job result - Added additional information related to the block states in chapter 7.2.2.14 and related subchapters - Updated NvM_Init and NvM_ValidateAll function prototypes - Debugging support marked as obsolete
Specification of OCU Driver	- DET has been renamed. - SWS_Ocu_00041 and SWS_Ocu_00042 requirements are removed. - OCU_E_PARAM_CONFIG is removed. - Added OCU_E_INIT_FAILED - Invalid requirement IDs: Updated SWS_Ocu_156, SWS_Ocu_169
Specification of Operating System	- Allow calls to ControlIdle from all cores - Minor updates/clarification of descriptions - Editorial changes
Specification of PDU Router	- Added support of TriggerTransmit for dynamic length PDUs - Clarification on output parameter 'availableDataPtr' of PduR_<User:LoTp>CopyTxData - Clarification for releasing of buffer on return of E_NOT_OK from <DstLoTp_Transmit> API - Clarified behavior for disabled TxPduId of upper layer - Clarified Routing PDUs between local modules - Cleanup of references to former SoAd API - DET Renaming and Extension Incorporation - LdCom asupper module - Clarification for releasing of buffer on return of - E_NOT_OK from <DstLoTp_Transmit> API
Specification of Platform Types	- Float types shall follow the appropriate binary interchange format of IEEE 754-2008. - Editorial changes
Specification of Port Driver	- Rephrased SWS_Port_00077, SWS_Port_00087, SWS_Port_00087, SWS_Port_00223 - Editorial changes on Chapter 7 - Remove SWS_Port_0105 - Replace PORT_E_PARAM_CONFIG by PORT_E_INIT_FAILED
Specification of PWM Driver	- Removed requirements with respect to NULL_PTR check - DET has been renamed
Specification of RAM Test	- Updated Pass/Fail Criterias for Extended Production Errors - Debugging support marked as obsolete - Diverse corrections - Editorial changes
Specification of RTE Software	- Debugging support marked as obsolete - Minor corrections / clarifications / editorial changes; - For details please refer to the ChangeDocumentation
Specification of Service Discovery	- Debugging support marked as obsolete - Clarifications - Minor bugfixes
Specification of Socket Adaptor	- Clarifications and corrections of requirements - Editorial changes
Specification of SOME/IP Transformer	- Size of length fields is configurable - External trigger events are communciated as fire-and-forget methods - Autonomous error reactions of SOME/IP transformer - Minor corrections / clarifications / editorial changes; For details please refer to the ChangeDocumentation

Name	Specification history entry
Specification of SPI Handler/Driver	- Cleanup of requirements chapter - Debugging support marked as obsolete - Editorial changes
Specification of Standard Types	- Harmonized Traceability
Specification of SW-C End-to-End Communication Protection Library	- Introduced new E2E state machine profile status E2E_P_NONEWDATA. Adapted figures, API tables and mapping functions. This solves an issue with deterministic startup of the state machine. - Updated Figure 7-7, added behavior in case ReceivedCounter is out of range. - Assigned new specification ID SWS_E2E_00478 to duplicate specification SWS_E2E_00324 (specification of profile 4). - Fixed figure 7-6 “Calculate CRC over Data ID and Data”, which was already fixed in R4.1.2 but falsely included as of R4.1.1.
Specification of Synchronized Time-Base Manager	- Config parameter argument added to StbM_Init - StbM_TimeStampRawType changed uint32 - StbM_BusSetGlobalTime allow NULL as userDataPtr - 'const' added to input arguments passed by pointer - Debugging support marked as obsolete
Specification of TCP/IP Stack	- Support for transmission of fragmented IPv4/IPv6 frames - Clarifications and corrections of requirements - Editorial changes
Specification of Time Synchronization over CAN	- CanTSyn_SetTransmissionMode changed to return "void" - minor corrections / clarifications / editorial changes
Specification of Time Synchronization over Ethernet	- <Bus>TSyn_SetTransmissionMode changed to return "void" - Call of StbM_BusSetGlobalTime() added - sequence diagrams corrected - 'const' added to input arguments passed by pointer
Specification of Time Synchronization over FlexRay	- Error code FRTSYN_E_INVALID_PDU_SDU_ID replaced by FRTSYN_E_INVALID_PDUID - FlexRay communication state handling simplified (FrIf_GetPOCStatus replaced by FrIf_GetState)
Specification of Timing Extensions	- Minor corrections and editorial changes - Added appendices C and D
Specification of TTCAN Driver	- Fixed error section
Specification of TTCAN Interface	- Fixed error section - Editorial changes
Specification of UDP Network Management	- Revised Error Classification - Added support for Car Wakeup - Bug fixes and editorial changes
Specification of Watchdog Driver	- Debugging support marked as obsolete - minor corrections / clarifications / editorial changes; For details please refer to the ChangeDocumentation
Specification of Watchdog Interface	- Minor fixes
Specification of Watchdog Manager	- Debugging support marked as obsolete - Several minor fixes. - Fixed handling of development errors.
Standardization Template	- introduction of LifeCycleState for constraint and specification items - editorial changes
Supplementary material of general blueprints for AUTOSAR	- Initial Release

Name	Specification history entry
SW-C and System Modeling Guide	- System Level description introduced in the CompositionSWComponents domain. - IDENTICAL CompuMethods modeling rules aligned to ASAM representation. - Complete traceability towards Modeling Requirements Document
Virtual Functional Bus	- Reference to Application Interfaces

More specifications might have been changed, which are not listed here. Those specifications have then only “minor corrections, clarifications or editorial changes; for details please refer to the Change Documentation [3]

7 Appendix

7.1 Definitions

As far as not explained in this chapter, a collection of AUTOSAR definitions is provided in 1).

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 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 Standard specifications and auxiliary material

Standard Specifications are documents, models or formats which comprise the main result of the AUTOSAR Partnership. It includes the standardized results which have to be fulfilled to achieve AUTOSAR conformance.

In Release 4.2, Standard Specifications are stored at the following URL:
https://svn.autosar.org/repos/work/26_Products/10_CP_R4/02_Releases/R4.2/01_Standard

Auxiliary Material is a supporting document, model or format meant to further explain and/or improve the usability of standard specifications of the AUTOSAR partnership. Auxiliary material is recommended to read and/or use for a better understanding or harmonized usage of the AUTOSAR standard but is not mandatory to follow for AUTOSAR conformance.

In Release 4.2, Auxiliary Material is stored at the following URL:
https://svn.autosar.org/repos/work/26_Products/10_CP_R4/02_Releases/R4.2/02_Auxiliary

Contents of auxiliary documents remain of auxiliary nature even if they are referenced from standard documents.

7.1.5 History information in AUTOSAR

The following diagram shows where which changes are documented.