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Document Change History

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Date	**Release**	**Changed by**	**Change Description**
			Performance Plausibility Predictabiliy Proven In Use Argument Recovery Safe State Safety Case Safety Goal Safety Measure Safety Mechanism Service Discovery Service Instance Service Interface Service Oriented Communication Service Proxy Service Skeleton Slave Switch Software package Software Unit Systematic Fault Uplink Port Virtualization Removed terms: Accreditation Body Accreditation Attestation Conformance Declaration Conformance Test Agency (CTA) First party Implementation Conformance Statement Interrupt Logic Partial Model Surveillance Third party Changed terms: Automotive Safety Integrity Levels Availability Acceptance Test Suite

Document Change History			
Date	**Release**	**Changed by**	**Change Description**
			Electronic Control Unit Error Fail-safe Fail-silent Failure Rate Failure Fault Tolerance Fault FlexRay Bus FlexRay Cycle FlexRay L-PDU-Identifier FlexRay L-SDU-Identifier FlexRay Matrix FlexRay Slot Multiplexing Graceful Degradation Fail-degraded Implementation Conformance Class 1 (ICC1) Implementation Conformance Class 2 (ICC2) Implementation Conformance Class 3 (ICC3) Link Time Configuration Partitioning Protocol Control Information Protocol Data Unit Post-build Time Configuration Pre-Compile Time Configuration Probability of Failure Redundancy Risk Safety Service Data Unit

Document Change History			
Date	**Release**	**Changed by**	**Change Description**
2016-11-30	1.0.0	AUTOSAR Release Management	• --Migration of document to standard “Foundation”-- • Following terms added: • AUTOSAR Blueprint (3.19) • Bypassing (3.38) • Hook (3.137) • OS Event (3.174) • Post-build Hooking (3.185) • Pre-build Hooking (3.187) • Rapid Prototyping (RP) (3.195) • Rapid Prototyping Memory Interface (3.196) • Rapid Prototyping Tool (3.197) • Reentrancy (3.200) • Standardized AUTOSAR Blueprint (3.236) • Standardized Blueprint (3.238) • Following terms changed: • Asset (3.11) • Asynchronous Function (3.13) • AUTOSAR Application Interface (3.17) • Availability (3.31) • ECU Abstraction Layer (3.77) • Feature (3.100) • Function (3.127) • Microcontroller Abstraction Layer (MCAL) (3.162)
2015-07-31	4.2.2	AUTOSAR Release Management	• Following terms changed: • ECU Abstraction Layer (3.77) • Standardized AUTOSAR Interface (3.237) • Following terms removed: • Software Module

Document Change History

Date	Release	Changed by	Change Description
2014-10-31	4.2.1	AUTOSAR Release Management	• Following terms changed: • Data Variant Coding (3.67) • OS-Application (3.173) • Post-build time configuration (3.186) • Standardized AUTOSAR Interface (3.237)
2014-03-31	4.1.3	AUTOSAR Release Management	• Extended Abbreviations (0) • Following terms changed: • Software Component (SW-C) (3.229)
2013-03-15	4.1.1	AUTOSAR Administration	• Extended Abbreviations (0) • Following terms added: • Application Interface (3.4) • Asynchronous Functions (3.13) • AUTOSAR Application Interface (3.17) • Dynamic PDU (3.73) • Life Cycle (3.155) • MetaDataLength (3.161) • PDU MetaData (3.179) • Pretended Networking (3.189) • Synchronous Functions (3.245)
2011-12-22	4.0.3	AUTOSAR Administration	• Extended Abbreviations (0) • Following terms added: • Callback (3.40) • Callout (3.41) • ECU (3.76)
2009-12-18	4.0.1	AUTOSAR Administration	• Following terms added: • AUTOSAR Partial Model (3.25) • Bus Wake-Up (3.37) • Empty Function (3.82)

Document Change History			
Date	**Release**	**Changed by**	**Change Description**
2010-02-02	3.1.4	AUTOSAR Administration	• Following terms added: • Automotive Safety Integrity Levels (ASIL) (3.16) • Bit Position (3.34) • Category 1 Interrupt (3.43) • Category 2 Interrupt (3.44) • Code Generator (3.50) • Coordinate (3.63) • E2E Profile (3.75) • Error Detection Rate (3.85) • Failure Rate (3.95) • ICC1 (Implementation Conformance Class 1) (3.139) • ICC2 (Implementation Conformance Class 2) (3.140) • ICC3 (Implementation Conformance Class 3) (3.141) • Interrupt Frames (3.148) • Interrupt Handler (3.149) • Interrupt Logic (3.150) • Meta Model (3.159) • Mode (3.164) • Model (3.165) • Network Interface (NWI) (3.169) • NM Coordination Cluster (3.170) • NM Coordinator (3.171) • Rate Conversion (3.198) • Residual Error Rate (3.205) • SAE J1939 (3.213) • Safety Protocol (3.215) • Software Component Interface (SW-CI) (3.230) • Synchronize (3.243) • Variability (3.256) • Variant (3.257) • Variation Binding (3.259) • Variation Binding Time (3.260)

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Date	**Release**	**Changed by**	**Change Description**
			• Variation Definition Time (3.261) • Variation Point (3.262) • Formal adaptations • Legal disclaimer revised
2008-08-13	3.1.1	AUTOSAR Administration	• Legal disclaimer revised
2007-12-21	3.0.1	AUTOSAR Administration	• Following terms added: • Debugging (3.69) • Implementation Conformance Statement (3.142) • Document meta information extended • Small layout adaptations made
2007-01-24	2.1.15	AUTOSAR Administration	• “Advice for users” revised • “Revision Information” added
2007-11-28	2.1.14	AUTOSAR Administration	• Following terms added: • FlexRay (3.104) • Vendor ID (3.263) • Callback (3.40) • Interrupt frames (3.148) • Interrupt vector table(3.152) • Accreditation (3.1) • Accreditation Body (3.2) • Conformance Test Agency (3.59) • Assessment (3.10) • Surveillance (3.242) • Attestation (3.14) • (Conformance) Declaration (3.70) • First party and (3.101) • Third party (3.252) • Safety (3.214) • ECU Configuration (3.78) • ECU Configuration Description (3.79) • Legal disclaimer revised
2006-05-16	2.0	AUTOSAR Administration	• removed and added some terms • rework of several descriptions • and some formal changes

Document Change History			
Date	**Release**	**Changed by**	**Change Description**
2005-05-31	1.0	AUTOSAR Administration	• Initial Release

Disclaimer

Table of Contents

0 Abbreviations

Abbreviation	*Description*
AA	Adaptive Application
ADC	Analog Digital Converter
AMM	Application Mode Management
AP	AUTOSAR Adaptive Platform
API	Application Programming Interface
ARA	AUTOSAR Runtime for Adaptive Applications
ARP	Address Resolution Protocol
ASAM	Association for Standardization of Automation and Measuring systems
ASIL	Automotive Safety Integrity Levels
ASW	Application SoftWare
ATS	Acceptance Test Suite
AUTOSAR	AUTomotive Open System Architecture
BFx	Bitfield functions for fixed point
BSW	Basic Software
BSWM	Basic SoftWare Mode manager
BSWMD	Basic SoftWare Module Description
CAN	Controller Area Network
CCF	Common Cause Failure
CDD	Complex Driver
CP	Classic Platform
COM	Communication
CPU	Central Processing Unit
CRC	Cyclic Redundancy Check
DAC	Digital to Analog Converter
DEM	Diagnostic Event Manager
DET	Development Error Tracer
DHCP	Dynamic Host Configuration Protocol
DIO	Digital Input/Output
DLC	Data Length Code
DoIP	Diagnostics over Internet Protocol
DTD	Document Type Definition

E2E	End to End
ECU	Electronic Control Unit
EEPROM	Electrically Erasable Programmable Read-Only Memory
FIFO	First In First Out
FPU	Floating Point Unit
FW	Fire Wire
GPT	General Purpose Timer
GSM	Global System for Mobile Communication
HW	Hardware
I-PDU	Interaction Layer Protocol Data Unit
ICC	Implementation Conformance Class
ICMP	Internet Control Message Protocol
ICOM	Intelligent COMmunication controller
ICU	Input Capture Unit
IEC	International Electrotechnical Commission
IFI	Interpolation Floating point
IFx	Interpolation Fixed point
IO	Input/ Output
ISR	Interrupt Service Routine
L-PDU	Protocol Data Unit of the data Link layer
L-SDU	SDU of the data Link layer
LIFO	Last In First Out
LIN	Local Interconnected Network
LSB	Least Significant Bit
µC	MicroController
MCAL	Microcontroller Abstraction Layer
MCU	Micro Controller Unit
MFI	Mathematical Floating point
MFx	Math – Fixed Point
MIPS	Million Instructions Per Second
MMU	Memory Management Unit
MMI	Man Machine Interface
MOST	Media Oriented Systems Transport
µP	MicroProcessor

MPU	Memory Protection Unit
MSB	Most Significant Bit
N-PDU	Protocol Data Unit of the Network layer (transport protocols)
N-SDU	SDU of the Network layer (transport protocols)
NVRAM	Non-Volatile Random Access Memory
OEM	Original Equipment Manufacturer
OIL	OSEK Implementation Language
OS	Operating System
OSEK	Open Systems and the Corresponding Interfaces for Automotive Electronics
PCI	Protocol Control Information
PDU	Protocol Data Unit
PS	Product Supplier
PWM	Pulse Width Modulation
RAM	Random Access Memory
RfC	Request for Change
RP	Rapid Prototyping
RTE	Runtime Environment
SAE	Society of Automotive Engineers
SDU	Service Data Unit
SIL	Safety Integrity Level
SPI	Serial Peripheral Interface
SW	Software
SW-C	Software Component
SWS	Software Specification
TCP	Transmission Control Protocol
TP	Transport Protocol
TTCAN	Time Triggered CAN
TTP	Time Triggered Protocol
UDP	User (Universal) Datagram Protocol
UdpNm	UDP Network Management
USB	Universal Serial Bus
VFB	Virtual Functional Bus
VMM	Vehicle Mode Management

WCET	Worst Case Execution Time
WCRT	Worst Case Response time
XCP	Universal Calibration Protocol
XML	Extensible Markup Language

1 Introduction

This document is the overall glossary of AUTOSAR. It contains definitions of all major terms and notions used within AUTOSAR. It does not claim to be complete and please keep in mind that some WPs have more specific terms defined within their domain specific glossary.

2 How to read this document

The title of the subchapters is identical to the term to be defined.

2.1 <Term> Template

Definition	*<term to be defined>*
Initiator	*<functional cluster which responsible for the term>*
Further Explanations	*<further explanation of the definition>*
Comment	*<comment or hints>*
Example	*<example of the term>*
Reference	*<reference of definition>*

3 Definitions

3.1 Acceptance Test Suite

Definition	A test case description used in the context of Acceptance Testing
Initiator	Acceptance Testing
Further Explanations	ISO 9646 distinguishes between Abstract Test Suites and Executable Test Suites. For AUTOSAR the earlier relates to the Acceptance Test Specifications, whereas the latter to the test implementations or Acceptance Test Suites.
Comment	--
Example	--
Reference	ISO 9646, Parts 1,2 and 4

3.2 Access Control Decision

Definition	The Access Control Decision is a Boolean value indicating if the requested operation is permitted or not. It is based on the identity of the caller and the Access Control Policy (→ definition 3.3).
Initiator	Security
Further Explanations	In the case of IAM, the 'caller' is an Adaptive Application
Comment	--
Example	--
Reference	--

3.3 Access Control Policy

Definition	Access Control Policies are bound to the targets of calls (i.e. Service interfaces) and are used to express what Identity Information (→ definition 3.161) are necessary to access those interfaces.
Initiator	Security
Further Explanations	Policies can be provided through configuration / modeling or by statically pre-programming them into the PDP.
Comment	--
Example	--
Reference	--

3.4 Adaptability

Definition	Adaptability is the ability of a system to adjust itself to changed circumstances in its environment in order to continue to provide the intended functionality.
Initiator	Safety
Further Explanations	One should distinguish between changes in the environment of the system/vehicle (“run-time adaptability”) and changes in the development environment where software architecture (like AUTOSAR) is used (“design-time predictability”).
Comment	--
Example	--
Reference	Antonio Carlos Schneider Beck, Carlos Arthur Lang Lisbôa, Luigi Carro (eds.), Adaptable Embedded Systems, Springer Science & Business Media, 27 Nov 2012 Twan Basten, Roelof Hamberg, Frans Reckers, Jacques Verriet, Model-Based Design of Adaptive Embedded Systems, Springer Science & Business Media, 15 Mar 2013

3.5 Adaptive Application

Definition	Software that follows the Adaptive AUTOSAR specifications and therefore can be deployed onto an Adaptive Platform instance. It consists of its implementation, operational data (e.g. map data) and its metadata given by the Application Design Model. An Adaptive Application contains at least one executable. In order to be deployable on different Adaptive Platforms, it only uses ARA programming interfaces.
Initiator	Execution Management
Further Explanations	Adaptive Applications are generally more coarse grain than SW-Cs of the Classic Platform. They use exclusively Adaptive Platform APIs, and may offer and use services. They are implemented by one or several executables, byte code or libraries with defined entry points and may comprise multiple parts (e.g. libraries, data files).
Comment	The goal of Adaptive Platform is to achieve portability of Adaptive Applications among different implementations of the Adaptive Platform at least on source-code level, potentially also on object-code level.
Example	--
Reference	--

3.6 Adaptive Platform Foundation

Definition	Part of an Adaptive Platform implementation, which provides standardized platform functionality to Applications via software interfaces (APIs).
Initiator	Software and Architecture
Further Explanations	The Adaptive Platform Foundation includes of core system functionalities such as OS, Execution Manager, Communication Management and Persistency.
Comment	The goal of Adaptive Platform is to achieve portability of Adaptive Applications among different implementations of the Adaptive Platform at least on source-code level, potentially also on object-code level.
Example	--
Reference	--

3.7 Adaptive Platform Services

Definition	Standard platform services that is provided by an application which is part of AUTOSAR platform implementation.
Initiator	Communication
Further Explanations	--
Comment	--
Example	--
Reference	--

3.8 Application

Definition	A software (or program) that is specified to the solution of a problem of an end user requiring information processing for its solution. The software configuration (→ definition 3.276) of a software entity.
Initiator	Software and Architecture
Further Explanations	To 1. of Definition: In AUTOSAR Application software is located above the AUTOSAR RTE (RunTimeEnvironment).
Comment	Definition 1 is the “by default” meaning for application in AUTOSAR. When

	definition 2 is meant, it has to be explicitly mentioned.
Example	--
Reference	[ISO 2382-20]

3.9 Application Interface

Definition	A PortInterface (→ definition 3.214) used by a SwComponentType (→ definition 3.273) as specified in the software component template.
Initiator	Software and Architecture
Further Explanations	--
Comment	--
Example	--
Reference	[TPS_SoftwareComponentTemplate]

3.10 Application Programming Interface

Definition	An Application Programming Interface (API) is the prescribed method of a specific software part by which a programmer writing a program can make requests to that software part.
Initiator	Software and Architecture
Further Explanations	--
Comment	--
Example	OSEK OS API (ISO 17356-3)
Reference	--

3.11 Application Software Component

Definition	An Application Software Component is a specific Software Component (→ definition 3.273) which realizes a defined functionality on application level and runs on the AUTOSAR infrastructure. It communicates only through the AUTOSAR Runtime Environment.
Initiator	Software and Architecture
Further Explanations	Application Software Components are located "above" the AUTOSAR Runtime Environment.
Comment	--
Example	--
Reference	--

3.12 Architecture

Definition	The fundamental organization of a system embodied in its components, their static and dynamic relationships to each other, and to the environment, and the principles guiding its design and evolution.
Initiator	Software and Architecture
Further Explanations	--
Comment	“Static and dynamic” added to EAST definition.
Example	--
Reference	[IEEE 1471], [EAST-Glossary]

3.13 Artifact

Definition	This is a Work Product Definition that provides a description and definition for tangible work product types. Artifacts may be composed of other artifacts ([14]). At a high level, an artifact is represented as a single conceptual file.
Initiator	Methodology and Templates
Further Explanations	--
Comment	--
Example	--
Reference	--

3.14 ASIL Decomposition

Definition	See ISO 26262, Part 1, ID 1.7
Initiator	Safety
Further Explanations	--
Comment	--
Example	--
Reference	ISO 26262, Part 1, ID 1.7

3.15 Asserted Property

Definition	A property or quality of a design entity (e.g. SW component or system) is asserted, if the design entity guarantees that this property or quality is fulfilled.
Initiator	Software and Architecture
Further Explanations	A property or quality of a design unit can be asserted by the design unit itself or in combination with another design unit.
Comment	--
Example	If the worst case execution time of a task (w.r.t. a certain CPU etc.) is asserted to be 3 ms, the execution time of this task will under any circumstances be less than or equal to 3 ms.
Reference	Compare required property (→ definition 3.238)

3.16 Assessment

Definition	See ISO 26262, Part 1, ID 1.4
Initiator	Safety
Further Explanations	--
Comment	--
Example	--
Reference	ISO 26262, Part 1, ID 1.4

3.17 Asset

Definition	An item that has been designed for use in multiple contexts.
Initiator	Software and Architecture
Further Explanations	--
Comment	--

Example	An asset can be design, specifications, source code, documentation, test suits, manual procedures, etc.. From a security perspective anything that has a value to any of the stakeholders such as critical data (information, software) and critical functions, that could potentially be subject to attacks and possibly, but not necessarily, motivates countermeasures.
Reference	[IEEE 1517], [EAST-Glossary]

3.18 Asynchronous Communication

Definition	Asynchronous communication does not block the sending software entity. The sending software entity continues its operation without getting a response from the communication partner(s).
Initiator	Communication
Further Explanations	There could be an acknowledgement by the communication system about the sending of the information. A later response to the sending software entity is possible.
Comment	--
Example	--
Reference	--

3.19 Asynchronous Function

Definition	A Function (→ definition 3.142 #2) is called asynchronous if the described functionality is not guaranteed to be completed the moment the function returns to the caller.
Initiator	Software and Architecture
Further Explanations	--
Comment	--
Example	--
Reference	--

3.20 Atomic Software Component

Definition	Non-composed Software-Component.
Initiator	Software and Architecture
Further Explanations	An Atomic Software Component might access HW or not, therefore not all Atomic SW-Cs are relocatable.
Comment	--
Example	Application Software-Component, Complex Driver
Reference	--

3.21 Audit

Definition	See ISO 26262, Part 1, ID 1.5
Initiator	Safety
Further Explanations	--
Comment	--
Example	--
Reference	ISO 26262, Part 1, ID 1.5

3.22 Automotive Safety Integrity Levels

Definition	See ISO 26262, Part 1, ID 1.7
Initiator	Safety
Further Explanations	--
Comment	--
Example	--
Reference	ISO 26262, Part 1, ID 1.7

3.23 AUTOSAR Adaptive Platform

Definition	An adaptive computing platform standardized by AUTOSAR. In a narrow term, it refers to its specification. In a broad term, it may refer to an instance of Adaptive Platform implementation.
Initiator	Software and Architecture
Further Explanations	--
Comment	--
Example	--
Reference	--

3.24 AUTOSAR Application Interface

Definition	A set of Blueprints (→ definition 3.43) which are standardized by AUTOSAR and which can be used for creating AUTOSAR Interfaces (→ definition 3.29) of an Application (→ definition 3.7). AUTOSAR interfaces that are derived from Standardized Blueprints (→ definition 3.286) are Standardized AUTOSAR Interfaces (→ definition 3.285).
Initiator	Application Interfaces
Further Explanations	--
Comment	--
Example	--
Reference	[EXP_AIUserGuide]

3.25 AUTOSAR Authoring Tool

Definition	An AUTOSAR Tool used to create and modify AUTOSAR XML Descriptions (→ definition 3.37).
Initiator	Methodology and Templates
Further Explanations	--
Comment	--
Example	System Description Editor
Reference	--

3.26 AUTOSAR Blueprint

Definition	An AUTOSAR Blueprint is a Blueprint (→ definition 3.43) for an AUTOSAR

	element. It also includes that it is specified within the AUTOSAR project which attributes are mandatory to be specified for the blueprint of a specific class of AUTOSAR element types as well as how to derive an AUTOSAR object from that blueprint.
Initiator	Application Interfaces
Further Explanations	The AUTOSAR meta-model supports the pre-definition of model elements taken as the basis for further modeling. These pre-definitions are called blueprints. [TPS_STDT_00002]
Comment	--
Example	--
Reference	[TPS Standardization Template]

3.27 AUTOSAR Converter Tool

Definition	An AUTOSAR Tool used to create AUTOSAR XML files by converting information from other AUTOSAR XML files.
Initiator	Methodology and Templates
Further Explanations	--
Comment	--
Example	ECU Flattener
Reference	--

3.28 AUTOSAR Definition

Definition	This is the definition of parameters which can have values. One could say that the parameter values are instances of the definitions. But in the meta model hierarchy of AUTOSAR, definitions are also instances of the meta model and therefore considered as a description.
Initiator	Methodology and Templates
Further Explanations	--
Comment	--
Example	--
Reference	--

3.29 AUTOSAR Interface

Definition	The AUTOSAR Interface of a software component (→ definition 3.273) refers to the collection of all ports (→ definition 3.210) of that component through which it interacts with other components.
Initiator	Software and Architecture
Further Explanations	--
Comment	Note that an AUTOSAR Interface is different from a Port Interface (→ definition 3.214). The latter characterizes one specific port of a component.
Example	--
Reference	[AUTOSAR Specification of Virtual Functional Bus], Chapter " Modeling of Communication, Graphical Notation"

3.30 AUTOSAR Metamodel

Definition	The AUTOSAR metamodel is a UML2.0 model that defines the language for describing AUTOSAR systems and related artifacts.
Initiator	Methodology and Templates
Further Explanations	--
Comment	The AUTOSAR XML Schema (→ definition 3.38) is derived from the AUTOSAR metamodel.
Example	--
Reference	[UML 2.0]

3.31 AUTOSAR Model

Definition	This is an instance of the AUTOSAR Metamodel. The AUTOSAR Model represents aspects suitable to the intended use according to the AUTOSAR methodology.
Initiator	Methodology and Templates
Further Explanations	--
Comment	--
Example	--
Reference	--

3.32 AUTOSAR Partial Model

Definition	In AUTOSAR, the possible partitioning of models is marked in the meta-model by <<atpSplitable>>. One partial model is represented in an AUTOSAR XML description (→ definition 3.37) by one file. The partial model does not need to fulfill all semantic constraints applicable to an AUTOSAR model.
Initiator	Methodology and Templates
Further Explanations	--
Comment	--
Example	--
Reference	--

3.33 AUTOSAR Processor Tool

Definition	An AUTOSAR Tool used to create non-AUTOSAR files by processing information from AUTOSAR XML files.
Initiator	Methodology and Templates
Further Explanations	--
Comment	--
Example	RTE Generator
Reference	--

3.34 AUTOSAR Runtime for Adaptive Applications

Definition	A set of standard application interfaces provided by Functional Clusters, which belong to either Adaptive Platform Foundation or Adaptive Platform Services.

Initiator	General
Further Explanations	--
Comment	--
Example	--
Reference	--

3.35 AUTOSAR Service

Definition	The term service is used in the layered software architecture to denote the highest layer of the AUTOSAR software architecture that interacts with the application. The term service is used in the meaning defined by the service-oriented architecture. This meaning has the strongest relation to the usage of the term service on the AUTOSAR adaptive platform. The term service is also used to describe the handling of diagnostic services, e.g.UDS service ReadDataByIdentifier, for the communication between a diagnostic tester and a diagnostic stack on an (AUTOSAR) ECU.
Initiator	Software and Architecture
Further Explanations	--
Comment	--
Example	--
Reference	--

3.36 AUTOSAR Tool

Definition	This is a software tool which supports one or more tasks defined as AUTOSAR tasks in the methodology. Depending on the supported tasks, an AUTOSAR tool can act as an authoring tool (→ definition 3.25), a converter tool (→ definition 3.27), a processor tool (→ definition 3.33) or as a combination of those.
Initiator	Methodology and Templates
Further Explanations	--
Comment	--
Example	--
Reference	--

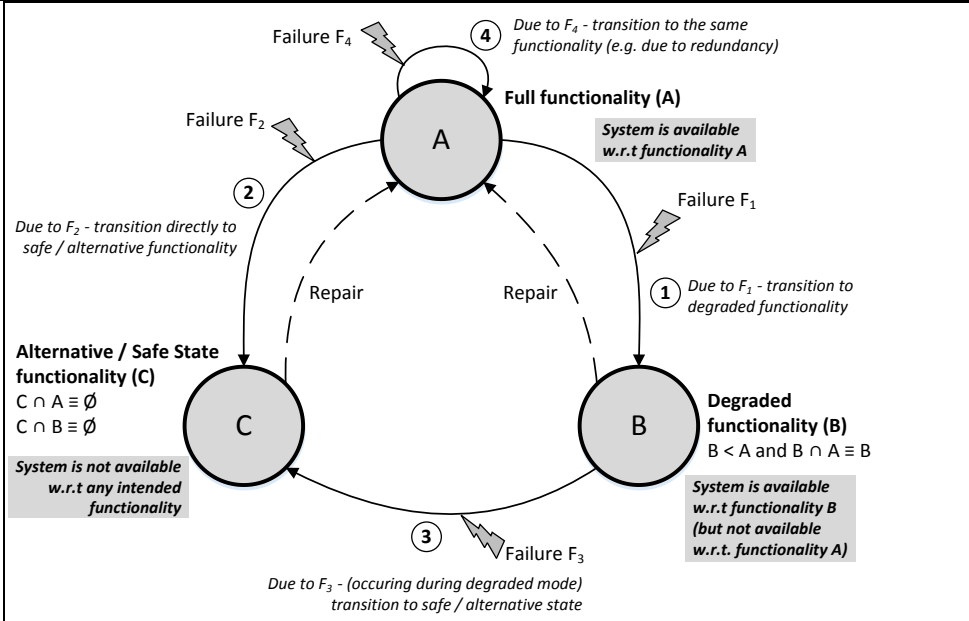
3.37 AUTOSAR XML description

Definition	In AUTOSAR this is a serialized AUTOSAR model. In fact an AUTOSAR XML description is the XML representation of an AUTOSAR model (→ definition 3.31). The AUTOSAR XML description can consist of several files. Each individual file represents an AUTOSAR partial model (→ definition 3.32) and must validate successfully against the AUTOSAR XML schema (→ definition 3.38).
Initiator	Methodology and Templates
Further Explanations	--
Comment	--
Example	--
Reference	--

3.38 AUTOSAR XML Schema

Definition	The AUTOSAR XML Schema is an XML language definition for exchanging AUTOSAR models (→ definition 3.31) and descriptions.
Initiator	Methodology and Templates
Further Explanations	The AUTOSAR XML Schema is a W3C XML schema that defines the language for exchanging AUTOSAR models. This Schema is derived from the AUTOSAR metamodel (→ definition 3.30). The AUTOSAR XML Schema defines the AUTOSAR data exchange format.
Comment	--
Example	--
Reference	--

3.39 Availability

Definition	1. Availability is the ability of the system to perform a function A completely according to its specification. 2. The ratio of the total time the system is performing a function A (according to 1) during a given interval to the length of the interval. Alternative: The probability that the system is performing the function A at a specified time t 3. In a degraded mode the system has the ability to perform a subset B of A if full A is not available. In this case, the functionality B is available.
Initiator	Safety
Further Explanations	
Comment	1. Degraded modes are covered by this definition (see example)
Example	1. Power Steering: if the support function fails it is not available while the steering as a base function has full availability. 2. From a security perspective availability is an attribute that ensures correct and timely access upon demand by an authorized entity.
Reference	See ISO 26262, Part 1, ID 1.8

3.40 Basic Software

Definition	The Basic Software (BSW) provides the infrastructural (schematic dependent and schematic independent) functionalities of an ECU (→ definition 3.92). It consists of Integration Code (→ definition 3.169) and Standard Software (→ definition 3.283).
Initiator	Software and Architecture
Further Explanations	--
Comment	--
Example	MCAL, AUTOSAR services, Communication Layer
Reference	--

3.41 Basic Software Module

Definition	A collection of software files (code and description) that define a certain basic software functionality present on an ECU (→ definition 3.92).
Initiator	Software and Architecture
Further Explanations	Standard software (→ definition 3.283) may be composed of several software modules that are developed independently. A software module may consist of Integration Code (→ definition 3.169), and/or standard software (→ definition 3.283).
Comment	--
Example	A Digital IO Driver, Complex Driver, OS are examples of basic software modules.
Reference	--

3.42 Bit Position

Definition	In AUTOSAR the bit position N within an I-PDU denotes the bit I, with I = N modulo 8, within the byte J, with J = N / 8. The byte J and bit position I is interpreted in accordance to the definition in OSEK COM (ISO 17356-4: COM).
Initiator	Communication
Further Explanations	--
Comment	--
Example	--
Reference	--

3.43 Blueprint

Definition	This is a model from which other models can be derived by copy and refinement. Note that in contrast to meta model resp. types, this process is not an instantiation.
Initiator	Methodology and Templates
Further Explanations	--
Comment	--
Example	Standardized Blueprint (→ definition 3.286) and AUTOSAR Blueprint (→ definition 3.26).
Reference	--

3.44 Bulk Data

Definition	"Bulk Data" is a set of data such big in size, that standard mechanisms used to handle smaller data sets become inconvenient. This implies that bulk data in a software system are modeled, stored, accessed and transported by different mechanisms than smaller data sets.
Initiator	Software and Architecture
Further Explanations	Bulk data are typically handled by adding a level of abstraction (e.g. files) which separates the containment of the data from the internal structure.
Comment	The critical size, above which data must be regarded as bulk data depends on the technical infrastructure (e.g. bus system) and the considered use case (transport, storage etc.).
Example	Data on a persistent medium which has a capacity of a few kBytes (e.g. EEPROM) can be directly accessed via memory addresses, address offsets can be mapped to symbols of a programming language: No bulk data mechanisms are needed. For media with bigger capacity this becomes inconvenient or even impossible, so that a file system is used: The data are treated as bulk data.
Reference	--

3.45 Bus Wake-Up

Definition	A bus wake-up is caused by a specific wake pulse on the bus defined within the specification of the dedicated communication standard (e.g. CAN, LIN, FR). A bus wake-up initiates that the transceiver and controller leave their energy saving mode and enter normal mode to start bus communication again.
Initiator	Communication
Further Explanations	--
Comment	--
Example	--
Reference	--

3.46 Bypassing

Definition	The experimental incorporation of new functionality within an ECU image.
Initiator	Runtime Environment
Further Explanations	Bypassing involves the incorporation of new functionality or to replace existing functionality to an existing ECU image without requiring that the image be rebuilt.
Comment	Bypassing can be either "internal" where the new/ replacement functionality is present on the ECU image or "external" where an RP tool (→ definition 3.230) provides the functionality out with the ECU.
Example	An RP tool intercepts the output of a bypassed RunnableEntity via the RP Memory Interface and replaces the value with the bypass result. Subsequent RunnableEntitys then process the bypass value rather than the original result.
Reference	--

3.47 Calibration

Definition	Calibration is the adjustment of parameters of SW-Components realizing the control functionality (namely parameters of AUTOSAR SW-Cs, ECU abstraction or Complex Drivers (→ definition 3.65).
Initiator	Software and Architecture
Further Explanations	Only those software modules can be calibrated, which are above RTE and ECU Abstraction and CDD. Calibration is always done at post-build time. Used

	techniques to set calibration data include end-of-line programming, garage programming and adaptive calibration (e.g. in the case of anti-pinch protection for power window).
Comment	--
Example	The calibration of the engine control will take into account the production differences of the individual motor this system will control.
Reference	--

3.48 Call Point

Definition	A point in a Software-Component (→ definition 3.273) where the SW-C enforce an execution entity (Entry point → definition 3.94) in another SW-C.
Initiator	Software and Architecture
Further Explanations	--
Comment	--
Example	Request Service Send Information
Reference	--

3.49 Callback

Definition	Functionality that is defined by an AUTOSAR module so that lower-level modules (i.e. lower in the Layered Software Architecture) can provide notification as required (e.g. when certain events occur or asynchronous processing completes).
Initiator	Software and Architecture
Further Explanations	In AUTOSAR, modules usually provide a register mechanism for callback functions which is set through configuration. A module provides callbacks so that other modules can initiate its processing while the module calls Callouts (→ definition 3.50) to execute functionality that could not be specified by AUTOSAR, i.e. integration code (→ 3.125)
Comment	--
Example	(from the viewpoint of a particular SWS): The module being specified (Msws) should be informed about an event (→ definition 3.68) in another module (Mexternal). In this example, Msws calls Mexternal to perform some processing and can only resume when Mexternal completes. Upon completion, Mexternal calls Msws's callback function. That is, the called module (Mexternal) CALLS the calling module (Msws) BACK when complete ==> a callback.
Reference	--

3.50 Callout

Definition	Function stubs that the system designer can replace with code to add functionality to a module which could not be specified by AUTOSAR.
Initiator	Software and Architecture
Further Explanations	A module calls callouts to execute functionality that could not be specified by AUTOSAR, i.e. integration code while the module provides Callbacks (→ definition 3.49) so that other modules can initiate its processing. Callouts can be separated into two classes:

	1) callouts that provide mandatory functionality and thus serve as a hardware abstraction layer 2) callouts that provide optional functionality
Comment	--
Example	In the EcuM: For class 1): EcuM_EnableWakeupSources For class 2): The Init Lists (EcuM_AL_DriverInitZero)
Reference	--

3.51 Cascaded Switch

Definition	A Cascaded Switch is an Ethernet switch that exists of at least two Ethernet switches: a master switch and a slave switch. The master switch and the slave switch are connected by uplink ports.
Initiator	Communication
Further Explanations	--
Comment	--
Example	Request Service Send Information
Reference	--

3.52 Cascading Failure

Definition	See ISO 26262, Part 1, ID 1.13
Initiator	Safety
Further Explanations	--
Comment	--
Example	--
Reference	ISO 26262, Part 1, ID 1.13

3.53 Category 1 Interrupt

Definition	Category 1 (Cat1) Interrupts are supported by the OS but their code is only allowed to call a very small subset of OS functions. Furthermore they can bypass the OS. The code of Category 1 Interrupts depends (normally) on the used compiler and microcontroller. Category 1 Interrupts are not allowed to use the ISR() macro. Category 1 Interrupts need to implement/establish their own Interrupt Frame. Nevertheless they have to be configured in order to be included in the Interrupt Vector Table.
Initiator	Software and Architecture
Further Explanations	--
Comment	--
Example	--
Reference	--

3.54 Category 2 Interrupt

Definition	Category 2 (Cat2) Interrupts are supported by the OS and their code can call a

	subset of OS functions. The definition of the Cat2 Interrupt must use the ISR() macro in order to be recognized by the OS. The Interrupt Frame of a Category 2 Interrupt is managed by the OS.
Initiator	Software and Architecture
Further Explanations	--
Comment	--

Example	ISR(timer1)
	{
	/* here is the code which handles timer1 interrupts */
	…
	}

Reference	--

3.55 Causality of Transmission

Definition	Transmit order of PDUs with the same identifier (instances of PDUs) from a source network is preserved in the destination network.
Initiator	Communication
Further Explanations	Transmission of PDUs (→ definition 3.204) with the same identifier has a particular temporal order in a given source network. After routing over a gateway the temporal order of transmission of PDUs in a destination network may be changed. Only in case that the temporal order is the same, causality is given. Otherwise causality is violated. Causality can be in contradiction to prioritization of PDUs.
Comment	--
Example	--
Reference	--

3.56 Classic Platform

Definition	Software Platform defined by AUTOSAR for deeply embedded systems and Application Software with high demands regarding predictability, safety and responsivness.
Initiator	General
Further Explanations	--
Comment	--
Example	--
Reference	--

3.57 Client

Definition	Software entity which uses services of a server (→ definition 3.263).
Initiator	Software and Architecture
Further Explanations	The client and the server might be located on one ECU (→ definition 3.92) or distributed on different calculation units (e.g. ECU, external diagnostic tester).
Comment	Adapted from Balzert.
Example	--
Reference	[Balzert99]

3.58 Client-Server Communication

Definition	A specific form of communication in a possibly distributed system in which software entities act as clients (→ definition 3.56), servers (→ definition 3.263) or both, where 1...n clients are requesting services via a specific protocol from typically one server.
Initiator	Communication
Further Explanations	Client-server communication can be realized by synchronous or asynchronous communication. • Client takes initiative: requesting that the server performs a service, e.g. client triggers action within server (server does not start action on its own) • Client is after service request blocked / non-blocked • Client expects response from server: data flow (+ control flow, if blocked) One example for 1 client to n server communication (currently not supported) is a functional request by diagnosis. This has to be treated as a specific exception.
Comment	Adapted from Hyper Dictionary
Example	Internet (TCP/IP)
Reference	[Hyper Dictionary]

3.59 Client-Server Interface

Definition	The client-server interface is a special kind of port-interface (→ definition 3.214) used for the case of client-server communication (→ definition 3.58). The client-server interface defines the operations that are provided by the server (→ definition 3.263) and that can be used by the client (→ definition 3.56).
Initiator	Communication
Further Explanations	--
Comment	--
Example	--
Reference	[AUTOSAR Specification of Virtual Functional Bus]

3.60 Cluster Signal

Definition	A cluster signal represents the aggregating system signal on one specific communication cluster. Cluster signals can be defined independently of frames. This allows a development methodology where the signals are defined first, and are assigned to frames in a later stage.
Initiator	Communication
Further Explanations	--
Comment	--
Example	--
Reference	--

3.61 Code Generator

Definition	The Code Generator consumes complete and correctly formed XML for a BSW module and generates code and data that configures the module.
Initiator	Software and Architecture
Further Explanations	--
Comment	--

Example	--
Reference	[AUTOSAR_InterruptHandling_Explanation.doc]

3.62 Code Variant Coding

Definition	Adaptation of SW by selection of functional alternatives according to external requirements
Initiator	Software and Architecture
Further Explanations	Code Variant Coding might influences RTE (RuntimeEnvironment) and BSW modules (→ definition 3.41), not only the application software modules. Code Variant Coding is always done at pre-compile time or at link time. Code Variant Coding also includes vehicle-specific (not user-specific) SW adaptation due to end-customer wishes (e.g. deactivation of speed dependent automatic locking).
Comment	In case of the C language the #if or #ifdef directive can be used for creating code variants. Code Variant Coding is a design time concept.
Example	The same window lifter ECU is used for cars with 2 and 4 doors, however different code segments have to be used in both cases.
Reference	

3.63 Common Cause Failure

Definition	See ISO 26262, Part 1, ID 1.14
Initiator	Safety
Further Explanations	--
Comment	--
Example	--
Reference	ISO 26262, Part 1, ID 1.14

3.64 Communication Attribute

Definition	Communication attributes define, according to the development phase, behavioral as well as implementation aspects of the AUTOSAR communication patterns.
Initiator	Communication
Further Explanations	The exact characteristics of the communication patterns provided by AUTOSAR (client-server and sender-receiver) can be specified more precisely by communication attributes.
Comment	See chapter 4.1.6 in Specification of the Virtual Functional Bus
Example	--
Reference	[AUTOSAR Specification of Virtual Functional Bus]

3.65 Complex Driver

Definition	A software entity not standardized by AUTOSAR that can access or be accessed via AUTOSAR Interfaces (→ definition 3.29) and/ or Basic Software Modules (→ definition 3.41) APIs.
Initiator	Software and Architecture
Further Explanations	CDD used to be the acronym for Complex Device Driver, but is not limited to drivers.
Comment	--
Example	• Communication stack CDD to support the communication on a bus not supported by AUTOSAR

	• Reuse of legacy SW • Integration of software with high HW interraction requirements within a standardized AUTOSAR Architecture
Reference	--

3.66 Composition

Definition	An AUTOSAR Composition encapsulates a collaboration of software components (→ definition 3.273), thereby hiding detail and allowing the creation of higher abstraction levels. Through Delegation Connectors (→ definition 3.71) a Composition (→ definition 3.66) explicitly specifies, which Ports (→ definition 3.210) of the internal components are visible from the outside. AUTOSAR Compositions are a type of Components, e.g. they can be part of further compositions.
Initiator	Software and Architecture
Further Explanations	--
Comment	See Virtual Functional Bus Specification, Chapter “VFB View, Meta-Model
Example	--
Reference	[AUTOSAR Specification of Virtual Functional Bus]

3.67 Compositionality

Definition	Compositionality is given when the behavior of a software component or subsystem of a system is independent of the overall system load and configuration.
Initiator	Software and Architecture
Further Explanations	Compositionality is an important property of deterministic systems. This property leads to a complete decoupling of systems. Smooth subsystem integration without backlashes is then easily achievable.
Comment	--
Example	A new component or a subsystem can be added to a system without changing the behavior of the original components.
Reference	--

3.68 Conditioned Signal

Definition	The conditioned signal is the internal electrical representation of the electrical signal within the ECU. It is delivered to the processor and represented in voltage and time (or, in case of logical signals, by high or low level).
Initiator	General
Further Explanations	The Electrical Signal (→ definition 3.88) usually can not be processed by the peripherals directly, but has to be adopted. This includes amplification and limitation, conversion from a current into a voltage and so on. This conversion is performed by some electronical devices in the ECU and the result of the conversion is called the Conditioned Signal. The description means for the Conditioned Signal can also be the same as for Technical Signals (→ definition 3.297) and Electrical Signals, but limited to electrical voltage
Comment	--
Example	--
Reference	--

3.69 Configuration

Definition	The arrangement of hardware and/or software elements in a system.
Initiator	Software and Architecture
Further Explanations	A configuration in general takes place before runtime.
Comment	--
Example	--
Reference	[AST-Glossary], [SO 61511-1]

3.70 Confirmation

Definition	Service primitive defined in the ISO/OSI Reference model (ISO 7498). With the 'confirmation' service primitive a service provider informs a service user about the result of a preceding service request of the service user.
Initiator	Software and Architecture
Further Explanations	A confirmation is e.g. a specific notification generated by the underlying layer to inform about a Message Transmission Error.
Comment	--
Example	--
Reference	[SEK BD]

3.71 Connector

Definition	A connector connects ports (→ definition 3.210) of software components (→ definition 3.273) and represents the flow of information between those ports.
Initiator	Software and Architecture
Further Explanations	--
Comment	For more information see AUTOSAR Specification of VFB
Example	AssemblyConnector, DelegationConnector
Reference	[AUTOSAR Specification of Virtual Function Bus]

3.72 Control Flow

Definition	The directed transmission of information between multiple entities, directly resulting in a state change of the receiving entity.
Initiator	Software and Architecture
Further Explanations	A state change could result in an activation of a schedulable entity.
Comment	--
Example	--
Reference	--

3.73 Coordinate

Definition	To control and harmonize two or more events or operations to act in an organized and predictable way.
Initiator	Communication
Further Explanations	--
Comment	--

Example	Two NM Channels can be coordinated to synchronize different stages of network sleep.
Reference	AUTOSAR Generic NM Interface

3.74 Data

Definition	A reinterpretable representation of information in a formalized manner suitable for communication, interpretation or processing.
Initiator	General
Further Explanations	--
Comment	--
Example	Flag, Notification, etc.
Reference	[ISO 2382-1]

3.75 Data Element

Definition	Data elements are declared within the context of a “Sender-Receiver Interface” (→ definition 3.261). They serve as the data units that are exchanged between sender and receiver.
Initiator	Software and Architecture
Further Explanations	--
Comment	--
Example	--
Reference	[AUTOSAR SoftwareComponentTemplate]

3.76 Data Flow

Definition	The directed transmission of data (→ definition 3.74) between multiple entities. The transmissioned data are not directly related to a state change at the receiver side.
Initiator	Software and Architecture
Further Explanations	--
Comment	--
Example	Asynchronous communication.
Reference	--

3.77 Data Variant Coding

Definition	Adaptation of SW by setup of certain characteristic data according to external requirements.
Initiator	Software and Architecture
Further Explanations	Data Variant Coding might influences RTE (RunTimeEnvironment) and BSW modules (→ definition 3.41) not only the application software modules (Multiple configuration parameter sets are needed). Variant Coding also includes vehicle-specific (not user-specific) SW adaptation due to end-customer wishes (e.g. deactivation of speed dependent automatic locking). Used techniques to select variants include end-of-line programming and garage programming.
Comment	The major difference with calibration is that this later doesn’t aim to adapt the SW functionality itself but only aims to adjust the characteristic data of the SW to the

	HW/SW environment. Characteristic data in the source code of a software function have a significant impact on the functionality of the software.
Example	- Steering wheel controller adaptation to the left or right side can be done with Variant Coding. (Selection of the configuration.) - Country related adaptation of MMI with respect to speed and/or temperature unit (km/h vs. mph, °C vs. F).
Reference	

3.78 Deadline

Definition	The point in time when an execution of an entity must be finished.
Initiator	Software and Architecture
Further Explanations	A deadline is calculated dependent on its local reference system.
Comment	--
Example	--
Reference	[OS Specification]

3.79 Debugging

Definition	Debugging is the process of gathering information in case of a software problem. The information is used to analyze the software problem.
Initiator	Software and Architecture
Further Explanations	To analyze and later fix a software problem, in many cases more information than the one provided by the software API is necessary. This can be for example the state of internal variables of the software or a trace of the communication. The information can be collected by different means, e.g. an emulator or a tracing tool for the communication bus.
Comment	--
Example	--
Reference	--

3.80 Dependability

Definition	Dependability is defined as the trustworthiness of a computer system such that reliance can justifiable be placed on the service it delivers.
Initiator	Software and Architecture
Further Explanations	--
Comment	--
Example	--
Reference	[EAST-Glossary]

3.81 Dependent Failure

Definition	See ISO 26262, Part 1, ID 1.22
Initiator	Safety
Further Explanations	--
Comment	--
Example	--

Reference	ISO 26262, Part 1, ID 1.22

3.82 Diagnostic Coverage

Definition	See ISO 26262, Part 1, ID 1.25
Initiator	Safety
Further Explanations	--
Comment	--
Example	--
Reference	ISO 26262, Part 1, ID 1.25

3.83 Diagnostic Event

Definition	A diagnostic event defines the atomic unit that can be handled by the DEM module. The status of a diagnostic event represents the result of a monitor. The DEM receives the result of a monitor from SW-C via the RTE or other BSW modules.
Initiator	Diagnostics
Further Explanations	--
Comment	For definition of 'monitor' see chapter "Diagnostic monitor definition" in Specification of DEM
Example	--
Reference	[AUTOSAR Specification of Diagnostic Event Manager]

3.84 Diversity

Definition	See ISO 26262, Part 1, ID 1.28
Initiator	Safety
Further Explanations	--
Comment	--
Example	--
Reference	ISO 26262, Part 1, ID 1.28

3.85 Dynamic PDU

Definition	PDU (→ definition 3.204) with dynamic identifier.
Initiator	Communication
Further Explanations	Dynamic PDUs are PDUs where the <bus> identifier (e.g. CAN ID) is dynamically assigned (transmission) or evaluated (reception) at run time.
Comment	AUTOSAR supports two types of dynamic PDUs in CanIf: CanIf_SetDynamicTxId (only transmission), and PDUs with MetaData (reception and transmission).
Example	PDU with variable source address, encoded in the CAN ID, e.g. ISO15765 NormalFixed.
Reference	--

3.86 Dynamic Routing

Definition	The routing of signals or PDUs (→ definition 3.204) in a gateway can be changed

	throughout operation without change of the operation mode of the gateway.
Initiator	Communication
Further Explanations	Dynamic routing requires the change of routing tables during operation. It is not intended to use dynamic routing in the gateway.
Comment	--
Example	--
Reference	[EAST-Glossary]

3.87 E2E Profile

Definition	A functional and complete description of a specific communication stack in terms of data structures, services, behavioral state-machines, error handling. E2E Profiles are defined in AUTOSAR E2E Library. An E2E Profile is configurable by runtime parameters. A specific set of runtime parameters is called E2E profile variant. In order to reach interoperability, the application developers should use the E2E profile variants defined in the E2E library.
Initiator	Safety
Further Explanations	--
Comment	--
Example	--
Reference	--

3.88 ECU Abstraction Layer

Definition	The ECU Abstraction Layer is located above the Microcontroller Abstraction Layer (→ definition 3.190) and abstracts from the ECU schematic. It is implemented for a specific ECU and offers an API for access to peripherals and devices regardless of their location (onchip/offchip) and their connection to the microcontroller (port pins, type of interface). Task: Make higher software layers independent of the ECU hardware layout.
Initiator	Software and Architecture
Further Explanations	The ECU Abstraction Layer consists of the following parts: • I/O Hardware Abstraction • Communication Hardware Abstraction • Memory Hardware Abstraction • Crypto Hardware Abstraction • Onboard Device Abstraction Properties: • Implementation: µC independent, ECU hardware dependent • Upper Interface (API): µC and ECU hardware independent, dependent on signal type
Comment	--
Example	See Layered Software Architecture
Reference	[AUTOSAR SoftwareArchitecture]

3.89 ECU Configuration

Definition	Activity of integrating and configuring one ECU's software.
Initiator	Methodology and Templates
Further Explanations	Further Explanations: ECU Configuration denotes the activity when one ECU's software is set up for a specific usage inside the ECU. In AUTOSAR the ECU Configuration activity is divided into "Pre-compile time", "Link time" and "Post-build time" configuration.

Comment	--
Example	--
Reference	ECU Configuration Description (→ definition 3.90), Pre-compile time configuration (→ definition 3.218), Link time configuration (→ definition 3.181), Post-build time configuration (→ definition 3.216).

3.90 ECU Configuration Description

Definition	Output of the ECU Configuration activity containing the values of configuration parameters and references.
Initiator	Methodology and Templates
Further Explanations	ECU Configuration Description holds the configuration parameter values and references to other module's configurations which have been defined in the ECU Configuration activity.
Comment	ECU Configuration Description may contain the whole ECU Configuration information or only the parts relevant for a specific configuration step (e.g. Pre-compile time).
Example	--
Reference	ECU Configuration Description (→ definition 3.90), Pre-compile time configuration (→ definition 3.218), Link time configuration (→ definition 3.181), Post-build time configuration (→ definition 3.216).

3.91 Electrical Signal

Definition	The electrical signal is the electrical representation of technical signals (→ definition 3.297). Electrical signals can only be represented in voltage, current and time
Initiator	General
Further Explanations	When a sensor processes the Technical Signal it is converted into an Electrical Signal. The information can be provided in the current, the voltage or in the timely change of the signal (e.g. a pulse width modulation).
Comment	To describe the Electrical Signal the same means as for the Technical Signal can be used, limited to electrical current and voltage.
Example	--
Reference	--

3.92 Electronic Control Unit

Definition	Embedded computer system consisting of at least one CPU and corresponding peripherals which are placed in one housing.
Initiator	General
Further Explanations	An ECU is typified by a connection to one or more in-vehicle networks, sensors and actuators.
Comment	--
Example	--
Reference	--

3.93 Empty Function

Definition	Any C function defined by an AUTOSAR specification which does not implement or alter behavior required to accomplish the assigned functional responsibility.
Initiator	Software and Architecture

Further Explanations	As such an empty function in the context of AUTOSAR can still have code but this code shall not impact the state machine other than error reporting. Auxiliary code like validating arguments to report to the DET does not constitute functional behavior because without the code and proper calling this code would still fulfill its architectural responsibility.
Comment	--
Example	--
Reference	--

3.94 Entry Point

Definition	A point in a Software-Component (→ definition 3.273) where an execution entity of the SW-C begins.
Initiator	Software and Architecture
Further Explanations	--
Comment	--
Example	• Service of the Server in Client/Server Communication • Reaction after receive Information (Notification)
Reference	--

3.95 Error

Definition	See ISO 26262, Part 1, ID 1.36
Initiator	Safety
Further Explanations	--
Comment	--
Example	--
Reference	ISO 26262, Part 1, ID 1.36

3.96 Error Detection Rate

Definition	Ratio between detected lost/faulty words/symbols/blocks, divided by the total number of symbols/words/blocks sent.
Initiator	Safety
Further Explanations	--
Comment	--
Example	--
Reference	--

3.97 Ethernet Switch Port Groups

Definition	Ethernet Switch Port groups are Ethernet switch ports of an Ethernet switch which are grouped to so called port groups. Ethernet Switch Port groups are only relevant for the host ECU. Ethernet Switch Port Groups are derived from the model per VLAN and per PNC. The host port is participating in all port groups. A Ethernet Switch Port Group could be a mix of internal and external ports.
Initiator	Communication
Further Explanations	--

Comment	--
Example	--
Reference	--

3.98 Event

Definition	State change of a hardware and/or software entity.
Initiator	Software and Architecture
Further Explanations	See OS Event (→ definition 3.201), RTE Event (→ definition 3.245), Diagnostic Event (→ definition 3.81) and Event Message (SOME/IP) (→ definition 3.99)
Comment	--
Example	--
Reference	--

3.99 Event Message (SOME/IP)

Definition	Event – a message sent by an ECU implementing a service instance to an ECU using this service instance (Publish/Subscribe).
Initiator	Communication
Further Explanations	Eventgroup – a logical grouping of 1 or more events. An eventgroup is part of a service.
Comment	--
Example	--
Reference	--

3.100 Executable

Definition	Part of an application which consists of either a file containing executable code with a defined entry point and suitable for the platform instance as the target of deployment (deployment time) or software code which is ready to be integrated for a specific platform.
Initiator	Execution Management
Further Explanations	In POSIX systems, an executable is typically running within a single process (→ definition 3.224). Therefore, intra-executable communication is different from inter-executable communication and should therefore be considered during design time of an executable.
Comment	--
Example	--
Reference	--

3.101 Execution Time

Definition	The time during which a program is actually executing, or more precisely during which a certain thread of execution is active.
Initiator	Software and Architecture
Further Explanations	The execution time of software is the time during which the CPU is executing its instructions. The time the CPU spends on task switches or on the execution of other pieces of software is not considered here. See also: response time, worst case execution time, worstcase response time.
Comment	--
Example	--
Reference	--

3.102 Exit Point

Definition	A point in a Software-Component (→ definition 3.273) where an execution entity of the SW-C ends.
Initiator	Software and Architecture
Further Explanations	--
Comment	--
Example	Return point.
Reference	--

3.103 External Port

Definition	External Ports are ports of an automotive Ethernet switch used to communicate over an Ethernet physical connection with other ECUs (e.g. 100BASE-TX, 100BASE-T1).
Initiator	Communication
Further Explanations	--
Comment	--
Example	--
Reference	--

3.104 Fail-operational

Definition	Property of a system or functional unit. Describes the ability of a system or functional unit to continue normal operation at its output interfaces despite the presence of hardware or software faults.
Initiator	Safety
Further Explanations	--
Comment	1. Typically, a fail-operational system or functional unit has no safe state. 2. Safety means are not regarded as a part of the normal functionality respectively operation.
Example	Braking system
Reference	--

3.105 Fail-safe

Definition	Property of a system or functional unit. In case of a fault the system or functional unit transits to a safe state.
Initiator	Safety
Further Explanations	Fail safe systems needs to have a safe state. Note: not all the systems have a safe state.
Comment	--
Example	--
Reference	See also note of ISO 26262, Part 1, ID 1.137

3.106 Fail-silent

Definition	Fail-silent is a property of a system in which no output is produced in the presence of a fault. In automotive domain, fail-silent systems are usually only used if the next hierarchical system level provides a safe-state.
Initiator	Safety
Further Explanations	Fail-silent is a special case of the fail-safe property.
Comment	--
Example	The fail-silent property can be used to avoid that “babbling idiots” disturb the overall communication.
Reference	--

3.107 Failure Mode

Definition	See ISO 26262, Part 1, ID 1.40
Initiator	Safety
Further Explanations	--
Comment	--
Example	--
Reference	ISO 26262, Part 1, ID 1.40

3.108 Failure

Definition	See ISO 26262, Part 1, ID 1.39
Initiator	Safety
Further Explanations	Termination is a reduction in, or loss of, ability of an element or an item to perform a function as required. There is a difference between “to perform a function as required” (stronger definition, use-oriented) and ”to perform a function as specified”, so a failure can result from an incorrect specification.
Comment	--
Example	--
Reference	ISO 26262, Part 1, ID 1.39

3.109 Failure Rate

Definition	See ISO 26262, Part 1, ID 1.41
Initiator	Safety
Further Explanations	--
Comment	--
Example	--
Reference	ISO 26262, Part 1, ID 1.41

3.110 Fault

Definition	See ISO 26262, Part 1, ID 1.42
Initiator	Safety
Further	--

Explanations	
Comment	--
Example	--
Reference	ISO 26262, Part 1, ID 1.42

3.111 Fault Detection

Definition	The action of monitoring errors and setting fault states to specific values is called fault detection.
Initiator	Software and Architecture
Further Explanations	The different states are called “not detected”/ “present”/ ”intermittent or maturing”/… The names of the fault states are following the ISO/SAE norms; however there is a coordination step in between the states of the DTCs (Diagnostic Trouble Code → see definition in ISO 15765/ ISO14229) and the states of the faults. The SW-C’s Fault Detection is executed decentralized, e.g. each SW-C sets the state of a fault according to the defined fault qualification (SW-C Template). Therefore the Fault Detection is implemented in the SW-C (SW-C could be either Application SW Component or Basic SW Component). There are exceptions; these will be pointed out individually for each fault. The SW-C’s developer will define the conditions (=fault qualification), when these conditions are fulfilled the SW-C notifies a fault to the Diagnostic Memory Management.
Comment	--
Example	--
Reference	[ISO 15765], [ISO14229] [AUTOSAR Specification of Virtual Functional Bus]

3.112 Fault Reaction

Definition	In case of a Failure of a SW-C there is a specific action to be carried out. This action is called “Fault Reaction”.
Initiator	Software and Architecture
Further Explanations	--
Comment	--
Example	Fault Reactions can be implemented decentralized in the SW-C. There might also be the need of coordinating the fault reactions since there are reactions excluding each other. This will be done by a central fault reaction manager.
Reference	--

3.113 Fault Reaction Time

Definition	See ISO 26262, Part 1, ID 1.44
Initiator	Safety
Further Explanations	--
Comment	--
Example	--
Reference	See ISO 26262, Part 1, ID 1.44

3.114 Fault Tolerance

Definition	Ability to deliver the specified functionality in the presence of one or more specified faults.
Initiator	Safety
Further Explanations	--
Comment	--
Example	--
Reference	--

3.115 Fault Tolerant Time Interval

Definition	See ISO 26262, Part 1, ID 1.45
Initiator	Safety
Further Explanations	--
Comment	--
Example	--
Reference	ISO 26262, Part 1, ID 1.45

3.116 Feature

Definition	A Feature is a notable characteristic of a system.
Initiator	General
Further Explanations	AUTOSAR defines and interacts with many entities where the term Feature can be applied (e.g. the AUTOSAR standard itself, its implementations, ECUs built with AUTOSAR, AUTOSAR Authoring Tools, AUTOSAR Feature Model). For each usage the term Feature may be used in a refined way - which is then defined for that specific usage (e.g. [TPS_FeatureModelExchangeFormat]).
Comment	--
Example	CAN FD support, Automatic windshield wiper, Editing of the FlexRay schedule
Reference	[EAST-Glossary], [TPS_FeatureModelExchangeFormat]

3.117 Flag

Definition	A piece of data that can take on one of two values indicating whether a logical condition is true or false.
Initiator	Software and Architecture
Further Explanations	--
Comment	--
Example	Notification flag
Reference	--

3.118 FlexRay Base Cycle

Definition	One operand of the equation used to calculate the Cycle Numbers (→ definition 3.124) of the FlexRay Cells (→ definition 3.120) being used for periodic transmission of FlexRay Frames (→ definition 3.127) in a given FlexRay Slot (→ definition 3.135). Equation:

	Cycle Number = $(B + n * 2^R)_{mod64}$ Where: • Base Cycle **B** = 0 … 63 • Cycle Repetition **2^R** = 2^0 … 2^6 = 1, 2, 4, 8, … 64 • Variable **n** = 0 … 64 • **B** < **2^R** (See also graphic in FlexRay L-SDU-Identifier → definition 3.130)
Initiator	Communication
Further Explanations	--
Comment	Synonym: “Cycle Offset”, “Cycle Counter Offset”
Example	--
Reference	--

3.119 FlexRay Bus

Definition	A communication system topology in which Nodes (→ definition 3.133) are directly connected to a single, common communication media (as opposed to connection through Stars (→ definition 3.138), gateways, etc.). The term “bus” is also used to refer to the media itself.
Initiator	Communication
Further Explanations	The term “FlexRay Bus” is not to be confused with the term “FlexRay Cluster” (→ definition 3.122) or “FlexRay Network” (→ definition 3.132).
Comment	Synonym: “FlexRay Communication Bus”
Example	--
Reference	[**FR_PROTOCOL**]

3.120 FlexRay Cell

Definition	One element in a FlexRay Matrix (→ definition 3.131) unequivocally defined by a combination of exactly one FlexRay Slot (or FlexRay Slot Number) (→ definition 3.135) and exactly one FlexRay Cycle (or FlexRay Cycle Number) (→ definition 3.123). In other words: a FlexRay Cell is defined by the tuple <Slot Number, Cycle Number>. Each FlexRay Cell represents one (possible) transmission time interval for at most one FlexRay Frame (→ definition 3.127). If a FlexRay Network (→ definition 3.132) consists of two Channels (→ definition 3.121), there is one FlexRay Matrix per Channel , so there are also two FlexRay Cells defined by the same tuple <Slot Number, Cycle Number>, one for “Channel A” and one for “Channel B”.
Initiator	Communication
Further Explanations	In order to achieve periodic transmission of FlexRay Frames in a given FlexRay Slot, the Cycle Numbers of the FlexRay Cells being used for transmission have to fulfill the following equation: Equation: Cycle Number = $(B + n * 2^R)_{mod64}$ Where: • Base Cycle B = 0 … 63 • Cycle Repetition 2^R = 2^0 … 2^6 = 1, 2, 4, 8, … 64 • Variable n = 0 … 64 • B < 2^R
Comment	Synonym: “FlexRay Matrix Cell”

Example	--
Reference	--

3.121 FlexRay Channel

Definition	The inter-Node (→ definition 3.133) connection through which signals are conveyed for the purpose of communication. The communication channel abstracts both the network topology, i.e., Bus (→ definition 3.119) or Star (→ definition 3.138), as well as the physical transmission medium, i.e. electrical or optical.
Initiator	Communication
Further Explanations	According to the FlexRay Protocol Specification, the two possible Channels of a FlexRay Network (→ definition 3.132) are named “Channel A” and “Channel B”.
Comment	Synonym: “FlexRay Communication Channel”
Example	--
Reference	[**FR_PROTOCOL**]

3.122 FlexRay Cluster

Definition	A communication system of multiple Nodes (→ definition 3.133) connected directly (Bus topology) or by Star Couplers (Star topology) (→ definition 3.138) via a Communication Network consisting of at least one Communication Channel.
Initiator	Communication
Further Explanations	The term “FlexRay Cluster” is not to be confused with the term “FlexRay Bus” (→ definition 3.119) which describes a communication system topology. A FlexRay Cluster consists of a FlexRay Network (→ definition 3.132) and several FlexRay Nodes.
Comment	--
Example	--
Reference	[**FR_PROTOCOL**]

3.123 FlexRay Cycle

Definition	One complete instance of the communication structure that is periodically repeated to comprise the media access method of the FlexRay system. The Communication Cycle consists of a Static Segment, an optional Dynamic Segment, an optional Symbol Window, and a Network Idle Time. The FlexRay Cycles are unequivocally numbered by the FlexRay Cycle Number (→ definition 3.124) ranging from 0 to 63. Even if a FlexRay Network (→ definition 3.132) consists of two Channels, the FlexRay Cycle is always a common quantity of both Channels, irrespective of the data transmission schedule possibly being different for the two Channels.
Initiator	Communication
Further Explanations	--
Comment	Synonym: “FlexRay Communication Cycle”
Example	--
Reference	[**FR_PROTOCOL**]

3.124 FlexRay Cycle Number

Definition	An unequivocal number of a FlexRay Cycle (→ definition 3.123), ranging from 0 to

	63.
Initiator	Communication
Further Explanations	--
Comment	Synonym: “FlexRay Communication Cycle Number”
Example	--
Reference	[**FR_PROTOCOL**]

3.125 FlexRay Cycle Offset

Definition	See definition of Base Cycle (→ definition 3.118).
Initiator	Communication
Further Explanations	--
Comment	This term is mentioned here to simplify finding it via this document’s table of contents. Synonym: “Cycle Counter Offset”, “Base Cycle”
Example	--
Reference	--

3.126 FlexRay Cycle Repetition

Definition	One operand of the equation used to calculate the Cycle Numbers (→ definition 3.124) of the FlexRay Cells (→ definition 3.120) being used for periodic transmission of FlexRay Frames (→ definition 3.127) in a given FlexRay Slot (→ definition 3.135). Equation: Cycle Number = $(B + n * 2^R)_{mod64}$ Where: • Base Cycle B = 0 … 63 • Cycle Repetition $2^R = 2^0 … 2^6$ = 1, 2, 4, 8, … 64 • Variable n = 0 … 64 • $B < 2^R$ (See also graphic in FlexRay L-SDU-Identifier → definition 3.130)
Initiator	Communication
Further Explanations	--
Comment	Synonym: “Cycle Counter Repetition”
Example	--
Reference	--

3.127 FlexRay Frame

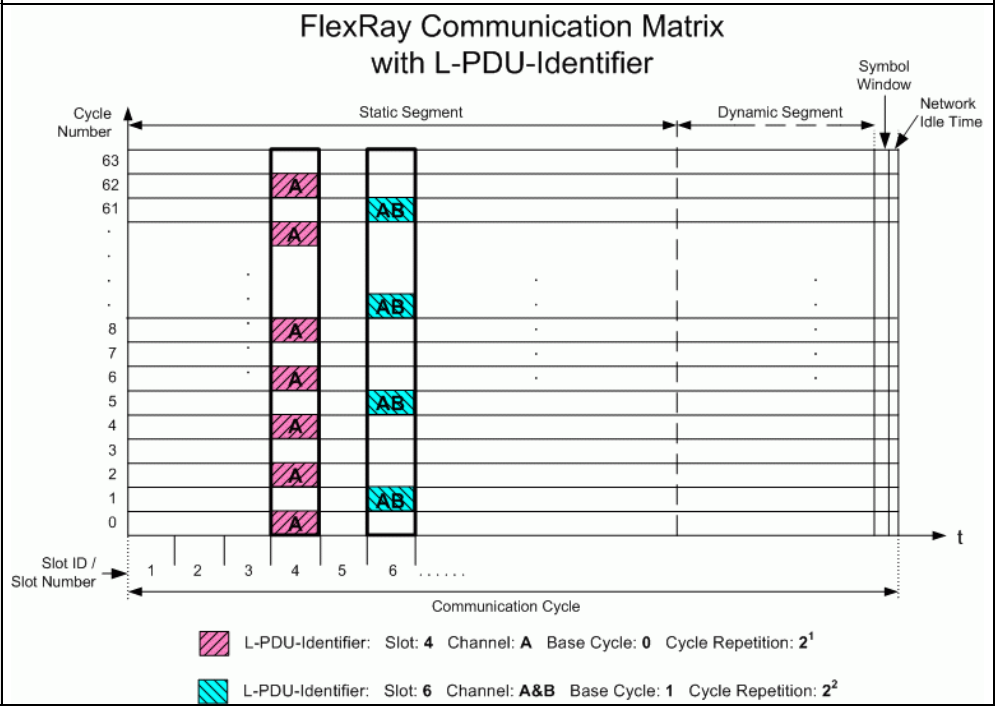
Definition	A structure used by the communication system to exchange information within the system. A FlexRay Frame consists of a header segment, a payload segment and a trailer segment. The payload segment is used to convey application data.
Initiator	Communication
Further Explanations	A FlexRay Frame is a “data package” that may be transmitted within a FlexRay Cell (→ definition 3.120).
Comment	Synonym: “FlexRay L-PDU”
Example	--

Reference	[**FR_PROTOCOL**]

3.128 FlexRay L-PDU

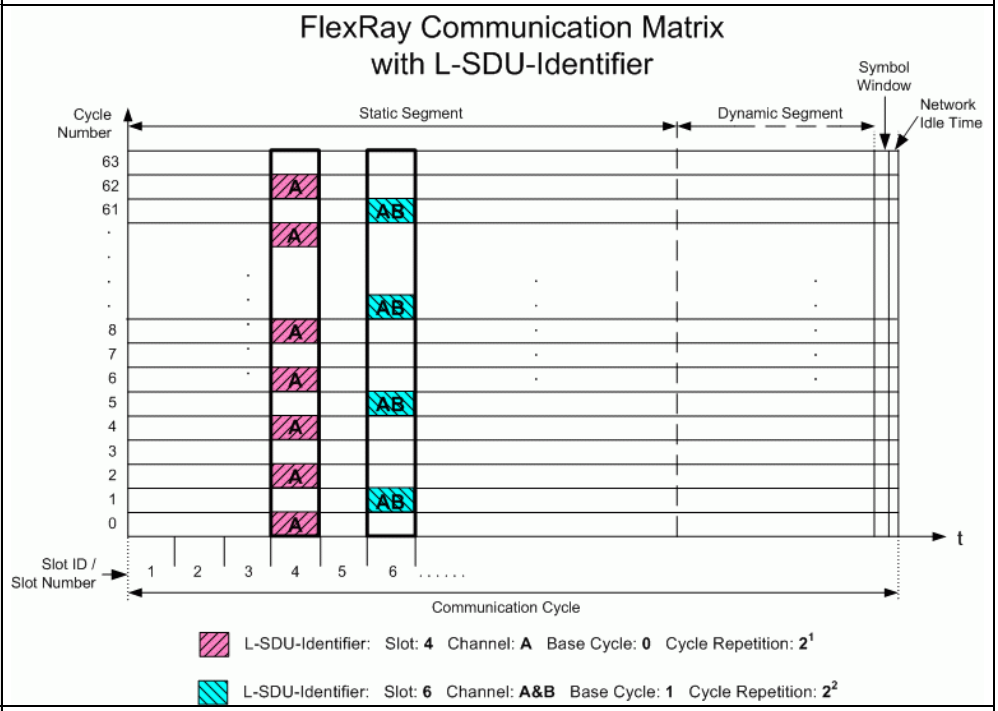
Definition	See definition of FlexRay Frame (→ definition 3.127).
Initiator	Communication
Further Explanations	--
Comment	This term is mentioned here to simplify finding it via this document's table of contents.
Example	--
Reference	Synonym: "FlexRay Frame"

3.129 FlexRay L-PDU-Identifier

Definition	A unequivocal identifier of a set of FlexRay Cells (→ definition 3.120) used for periodic transmission of FlexRay Frames (→ definition 3.127) over one or both FlexRay Channels (→ definition 3.121) in a specific FlexRay Slot (→ definition 3.135), which fulfill the equation: Cycle Number = $(B + n * 2^R)_{mod64}$ with exactly one tuple of values for B and 2^R. (See also graphics below.) In other words: a FlexRay L-PDU-ID comprises the 4 parameters: • Slot Number = 1 … MaxSlotNumber (≤ 2047) • Base Cycle B = 0 … 63 • Cycle Repetition $2^R = 2^0 … 2^6$ = 1, 2, 4, 8, … 64 • Channel = "A", "B", "A and B" In order to prevent collisions of FlexRay Frames on the Bus (→ definition 3.119), the FlexRay Cells of different FlexRay L-PDU-Identifiers used for transmission shall be disjunctive.
Initiator	Communication
Further Explanations	

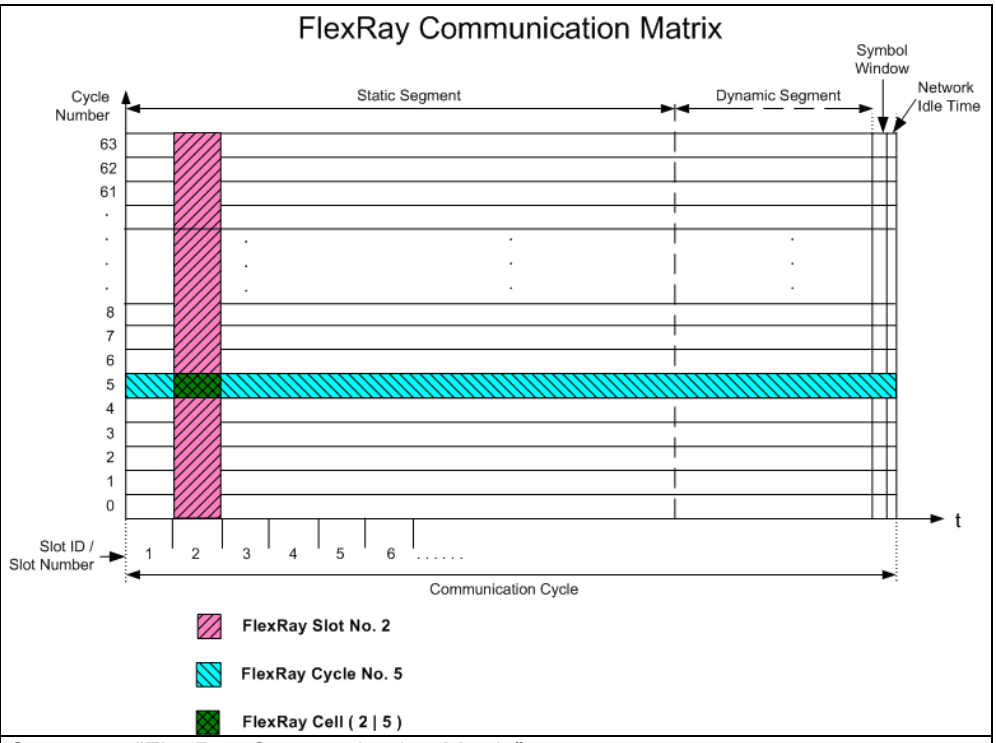
Comment	Usually, on one specific FlexRay Node (→ definition 3.133), one FlexRay L-PDU-Identifier has one configuration of a FlexRay Communication Controller buffer assigned to it. Synonym: “FlexRay L-PDU-ID”
Example	--
Reference	--

3.130 FlexRay L-SDU-Identifier

Definition	A unequivocal identifier of the **payload** contained in one or multiple FlexRay Frames (→ definition 3.127) assigned to the same FlexRay L-PDU-Identifier (→ definition 3.129) and therefore periodically transmitted over one or both FlexRay Channels (→ definition 3.121) in one or multiple FlexRay Cells (→ definition 3.120) in a specific FlexRay Slot (→ definition 3.135), and where the equation: **Cycle Number = $(B + n * 2^R)_{mod64}$** is fulfilled with **exactly one tuple** of values for **B** and 2^R. (See also graphics below.)
Initiator	Communication
Further Explanations	
Comment	Synonym: “FlexRay L-SDU-ID”
Example	--
Reference	--

3.131 FlexRay Matrix

Definition	A two-dimensional array with a width of the number of FlexRay Slots (→ definition 3.135) within one FlexRay Cycle (→ definition 3.123) and a height of 64 FlexRay Cycles, numbered 0 … 63. (See also graphics below.) This array is being used to describe the (possible) transmission time intervals on a FlexRay Channel (→ definition 3.121). If a FlexRay Network (→ definition 3.132) consists of two Channels, there is one FlexRay Matrix per Channel (resulting in a total of two Matrixes), since the data transmission schedule may be different for the two FlexRay Channels.
Initiator	Communication

Further Explanations	
Comment	Synonym: “FlexRay Communication Matrix”
Example	--
Reference	[FR_PROTOCOL]

3.132 FlexRay Network

Definition	The combination of the (up to two) FlexRay Communication Channels that connect the FlexRay Nodes (→ definition 3.133) of a FlexRay Cluster (→ definition 3.122).
Initiator	Communication
Further Explanations	The term “FlexRay Network” is not to be confused with the term “FlexRay Cluster” or “FlexRay Bus” (→ definition 3.119).
Comment	Synonym: “FlexRay Communication Network”
Example	--
Reference	[FR_PROTOCOL]

3.133 FlexRay Node

Definition	A logical entity connected to the FlexRay Network (→ definition 3.132) that is capable of sending and/or receiving frames.
Initiator	Communication
Further Explanations	--
Comment	--
Example	--
Reference	[FR_PROTOCOL]

3.134 FlexRay Physical Communication Link

Definition	An inter-Node (→ definition 3.133) connection through which signals are conveyed for the purpose of communication. All Nodes connected to a given Physical Communication Link share the same electrical or optical signals (i.e., they are not

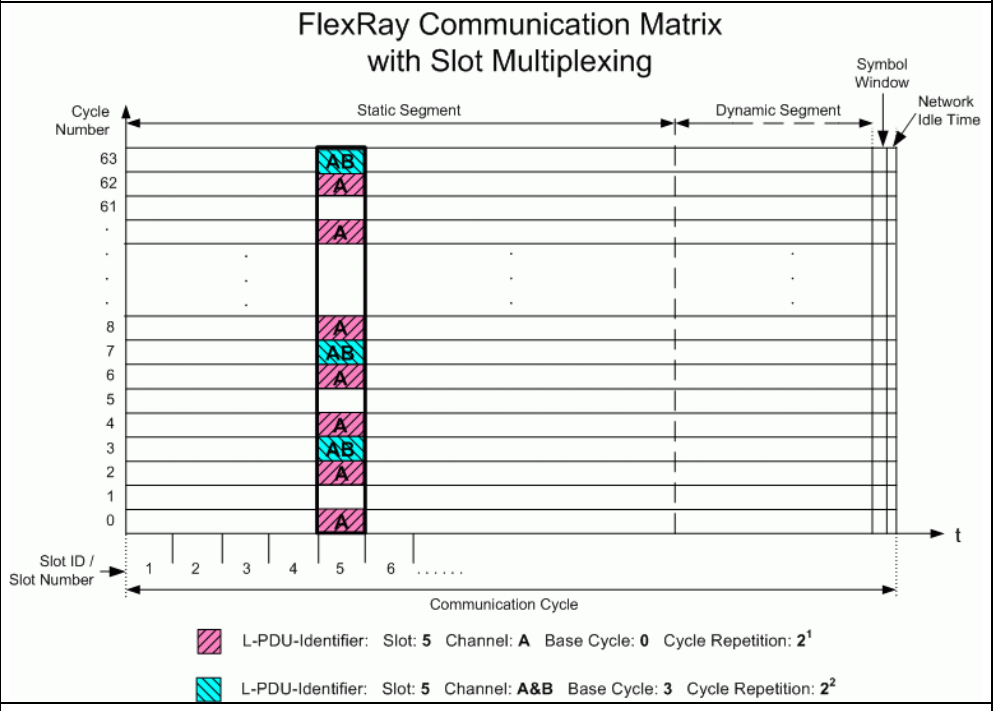
	connected through repeaters, Stars (→ definition 3.138), gateways, etc.). Examples of a Physical Communication Link include a Bus (→ definition 3.119) Network or a point-to-point connection between a Node and a Star. A Communication Channel may be constructed by combining one or more Physical Communication Links together using Stars.
Initiator	Communication
Further Explanations	--
Comment	--
Example	--
Reference	[FR_PROTOCOL]

3.135 FlexRay Slot

Definition	An interval of time during which access to a Communication Channel is granted exclusively (at least in the static segment) to a specific Node (→ definition 3.133) for the transmission of a Frame (→ definition 3.127) with a frame ID corresponding to the Slot Number (→ definition 3.137) of that Slot. FlexRay distinguishes between Static Communication Slots and Dynamic Communication Slots. The FlexRay Slots are unequivocally numbered by the FlexRay Slot Number ranging from 1 to a configurable maximum number ≤ 2047. If a FlexRay Network (→ definition 3.132) consists of two Channels (→ definition 3.121), the Static Slots of “Channel A” and the Static Slots of “Channel B” occur concurrently, since all Static FlexRay Slots have the same length irrespective of the data transmission schedule. However, the Dynamic Slots of “Channel A” are independent from the Dynamic Slots of “Channel B”, since the data transmission schedule may be different for the two FlexRay Channels.
Initiator	Communication
Further Explanations	In the dynamic segment, Slot Multiplexing between multiple Nodes is allowed. In the static segment each Slot (→ definition 3.135) on a Channel is owned by exactly one Node (i.e., Slot Multiplexing is **not** allowed in the static segment). Slot Multiplexing (i.e., different FlexRay Nodes owning a Slot in different Cycles (→ definition3.123) for data transmission) is allowed in the dynamic segment, and it is up to the application to ensure that in any given Cycle no two Nodes transmit in the same Slot on the same Channel.
Comment	Synonym: “FlexRay Communication Slot”
Example	--
Reference	[FR_PROTOCOL]

3.136 FlexRay Slot Multiplexing

Definition	A method used to fill a FlexRay Slot (→ definition 3.135) on a Channel (→ definition 3.121) more efficiently by alternating the Frames being sent in this Slot from Cycle (→ definition 3.123) to Cycle. In order to achieve periodic transmission of FlexRay Frames (→ definition 3.127) in a given FlexRay Slot, the Cycle Numbers (→ definition 3.124) of the FlexRay Cells (→ definition 3.120) being used for transmission have to fulfill the equation: $\text{Cycle Number} = (B + n * 2^R)_{mod64}$ Where: • Base Cycle B = 0 … 63 • Cycle Repetition $2^R = 2^0 \ldots 2^6 = 1, 2, 4, 8, \ldots 64$ • Variable n = 0 … 64 • $\mathbf{B < 2^R}$ In the static segment, each Slot on a Channel is owned by exactly one Node (→

	definition 3.133). Therefore, in the static segment Slot Multiplexing is only allowed amongst semantically different Frames sent by the same Node, but **not** amongst different Nodes of a FlexRay Cluster (→ definition 3.122). Thus, this form of Multiplexing is called "**Single Sender Slot Multiplexing**". In the dynamic segment, Slot Multiplexing is also allowed amongst different Nodes of a FlexRay Cluster, i.e. different Nodes may send in the same dynamic Slot on the same Channel in different Cycles, hence with different FlexRay L-PDU-Identifier (→ definition 3.129) defining disjunctive FlexRay Cells. Thus, this form of Multiplexing is called "**Multiple Sender Slot Multiplexing**". In any case, it is up to the software to prevent concurrent sending attempts (of different Nodes or applications) in the same Cell. (See also graphics below.)
Initiator	Communication
Further Explanations	
Comment	--
Example	--
Reference	[FR_PROTOCOL]

3.137 FlexRay Slot Number

Definition	An unequivocal number of a FlexRay Slot (→ definition 3.135), ranging from 1 to a configurable maximum number ≤ 2047.
Initiator	Communication
Further Explanations	--
Comment	Synonym: “FlexRay Slot Identifier”, “FlexRay Slot ID”
Example	--
Reference	[FR_PROTOCOL]

3.138 FlexRay Star

Definition	A device that allows information to be transferred from one Physical Communication Link (→ definition 3.134) to one or more other Physical Communication Links. A star duplicates information present on one of its links to the other links connected to the star. A star can be either passive or active.

Initiator	Communication
Further Explanations	--
Comment	Synonym: “Star”, “Star Couplers”
Example	--
Reference	[FR_PROTOCOL]

3.139 Frame

Definition	Data unit according to the data link protocol specifying the arrangement and meaning of bits or bit fields in the sequence of transfer across the transfer medium .
Initiator	Communication
Further Explanations	--
Comment	--
Example	A CAN frame consists of up to 8 bytes of payload data and additional protocol specific bits / bit fields (e.g. CAN-Identifier).
Reference	[ISO 17356, Glossary]

3.140 Frame PDU

Definition	A PDU that fits into 1 frame instance e.g. it does not need to be fragmented across more than 1 frame for transmission over a network.
Initiator	Communication
Further Explanations	--
Comment	--
Example	--
Reference	--

3.141 Freedom from Interference

Definition	See ISO 26262, Part 1, ID 1.49
Initiator	Safety
Further Explanations	--
Comment	--
Example	--
Reference	ISO 26262, Part 1, ID 1.49

3.142 Function

Definition	1. A task, action or activity that must be accomplished to achieve a desired outcome. 2. A part of programming code that is invoked by other parts of the program to fulfill a desired purpose. 3. In mathematics, a function is an association between two sets of values in which each element of one set has one assigned element in the other set so that any element selected becomes the independent variable and its associated element is the dependent variable.
Initiator	Software and Architecture

Further Explanations	--
Comment	Due to the different meanings in texts using the term application the appropriate meaning should be explained in detail or referenced.
Example	2. C-Code Function 3. Y=f(x)
Reference	[IEEE12331], [EAST-Glossary]

3.143 Functional Cluster

Definition	Set of requirements grouped by the aspect they refer to.
Initiator	Software and Architecture
Further Explanations	--
Comment	--
Example	--
Reference	--

3.144 Functional Network

Definition	A logical structure of interconnections between defined functional parts of features (→ definition 3.116).
Initiator	Software and Architecture
Further Explanations	--
Comment	--
Example	--
Reference	--

3.145 Functional Safety Concept

Definition	See ISO 26262, Part 1, ID 1.52
Initiator	Safety
Further Explanations	--
Comment	--
Example	--
Reference	ISO 26262, Part 1, ID 1.52

3.146 Functional Safety Requirement

Definition	See ISO 26262, Part 1, ID 1.53
Initiator	Safety
Further Explanations	--
Comment	--
Example	--
Reference	ISO 26262, Part 1, ID 1.53

3.147 Functional Unit

Definition	An entity of software or hardware, or both, capable of accomplishing a specified purpose.
Initiator	Software and Architecture
Further Explanations	--
Comment	--
Example	ECU, Software Component, ...
Reference	[ISO 2382-1]

3.148 Functionality

Definition	Functionality comprises User-visible and User-non-visible functional aspects of a system.
Initiator	Software and Architecture
Further Explanations	--
Comment	EAST glossary not applicable, due to use of function.
Example	Functionality of a communication system is a user-non-visible aspect.
Reference	--

3.149 Gateway

Definition	A gateway is functionality within an ECU that performs a frame or signal mapping function between two communication systems. Communication system in this context means e.g. a CAN system or one channel of a FlexRay system.
Initiator	Communication
Further Explanations	--
Comment	--
Example	--
Reference	Gateway ECU 0

3.150 Gateway ECU

Definition	A gateway ECU is an ECU (→ definition 3.92) that is connected to two or more communication channels, and performs gateway functionality.
Initiator	Communication
Further Explanations	--
Comment	--
Example	--
Reference	Gateway 3.149

3.151 Graceful Degradation

Definition	Graceful Degradation: The system continues to operate in the presence of errors, accepting a partial degradation of functionality or performance during recovery or repair. Found in the literature also as “fail soft”.
Initiator	Safety
Further	--

Explanations	
Comment	Safety means are not regarded as a part of the normal functionality respectively operation. Also known as: Fail-reduced, Fail-soft
Example	"Limp home" functionality for ECU (reduce torque to assure an arrival at home or service station)
Reference	See also: ISO 26262:DIS Part 1: 3.181 - warning and degradation strategy.

3.152 Hardware Connection

Definition	HW Connections are used to describe the connection of HW elements (→ definition 3.153) among each other. It defines/characterizes the interrelationship among HW Elements (for abstract modelling). The HW Ports (→ definition 3.155) of the HW Elements serve as connection points for this purpose.
Initiator	General
Further Explanations	In AUTOSAR are 2 kinds of HW Connections defined: Assembly HW Connection Delegation HW Connection
Comment	--
Example	--
Reference	[AUTOSAR Specfication of ECU Resource Template]

3.153 Hardware Element

Definition	The HW Element is the main describing element of an ECU (→ definition 3.92). It provides HW ports (→ definition 3.155) for being interconnected among each others. A generic HW Element specifies definitions valid for all specific HW Elements.
Initiator	General
Further Explanations	A HW Element is the piece or a part of the piece to be described with the ECU Resource Template. It uses other elements as primitive: This means HW elements can be nested (trough HW Containers, a hierarchical structur of HW Elements). At the lowest level a HW Element only uses promitives
Comment	--
Example	--
Reference	[AUTOSAR Specification of ECU Resource Template]

3.154 Hardware Interrupt

Definition	Interrupt triggered by HW event
Initiator	Software and Architecture
Further Explanations	2 sorts of HW events • Processor-intern: events as for example division by zero, arithmetical overflow, non-implemented instruction • Processor-extern: events as for example response of peripheral device (e.g. PWM), memory error, timer
Comment	--
Example	--
Reference	Translation/Adaptation from [VDI Lexikon]

3.155 Hardware Port

Definition	The HW port exposes functionality to the exterior of the HW element (→ definition

	3.153). HW elements can be connected via HW Connections (→ definition 3.151). It defines a connection Endpoint for the HW Element.
Initiator	Communication
Further Explanations	HW elements provide HW ports for being interconnected among each others. Each HW port has a name which is unique within the HW element it is located in.
Comment	--
Example	--
Reference	[AUTOSAR Specification of ECU Resource Template]

3.156 Hook

Definition	An intervention point within ECU software for the exchange of data.
Initiator	Runtime Environment
Further Explanations	--
Comment	--
Example	Hooks used to read ECU variables and/ or overwrite ECU variables with values generated by RP (→ definition 3.228) algorithm.
Reference	--

3.157 Host ECU

Definition	A Host ECU is a ECU that controls one or more automotive Ethernet switches (e.g. switch on / off the Ethernet switch and its ports, read and write the Ethernet switch configuration). For this purpose the host ECU is connected to the Ethernet switch over a common control interface (e.g. SPI, MDIO). The host ecu also take part in the network communication. For this purpose the host ecu is connected by a data interface (e.g. MII) to a specific Ethernet switch port (host port).It transmits and receives Ethernet frames.
Initiator	Communication
Further Explanations	--
Comment	--
Example	--
Reference	--

3.158 Host Port

Definition	A host port is a port of an automotive Ethernet switch where the data interface (e.g. MII) of the Host ECU (→ definition 3.157) is connected to. The host port could either be an internal port or an external port. The host port has a special role from the perspective of the software. (see link accumulation and port groups)
Initiator	Communication
Further Explanations	--
Comment	--
Example	--
Reference	--

3.159 Hypervisor

Definition	Low-level software that provides and manages several virtual machines in one

	physical machine. Maybe an independent software or contained as an OS functionality.
Initiator	Execution Management
Further Explanations	Shared physical resources are either exclusively assigned to single virtual machine, or accessed through virtual device which is managed by Hypervisor. Various hardware and software mechanisms can support the efficient implementation of virtual devices.
Comment	--
Example	--
Reference	--

3.160 Identity and Access Management (IAM)

Definition	IAM is about managing access rights of Adaptive Applications to interfaces of the Adaptive Platform Foundation and Services.
Initiator	Security
Further Explanations	--
Comment	--
Example	--
Reference	--

3.161 Identity Information

Definition	The access control is decided / enforced upon the identity information which represents properties of the Adaptive Applications.
Initiator	Security
Further Explanations	--
Comment	--
Example	An example for identity information are Capabilities.
Reference	--

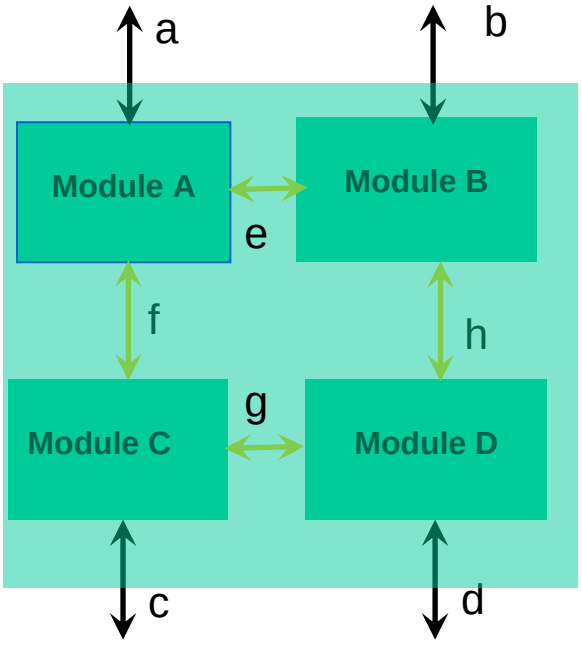
3.162 Implementation Conformance Class 1 (ICC1)

Definition	An ICC1 cluster offers a software-component interface (SW-CI) (→ definition 3.275) and/ or an AUTOSAR network interface (NWI) (→ definition 3.196). The SW-CI and NWI of an ICC1 cluster provide the functional behavior as specified in the AUTOSAR specifications on ICC3 level.
Initiator	Software and Architecture
Further Explanations	In an ICC1 cluster the basic software is regarded as a black box. It allows legacy platforms to migrate to AUTOSAR: - to be integrated into an AUTOSAR network - to support SW-Cs (→ definition 3.273). The features of an ICC1 cluster can be a subset of the ICC3 features (e.g. FlexRay not used). This has to be indicated in the Implementation Conformance Statement (ICS). The functionality represented in AUTOSAR by the RTE must be a part of any ICC1 cluster that provides an SW-CI. Typically an ICC1 cluster - is not structured into Basic Software (BSW) modules (ICC3) or BSW module

	clusters (ICC2) - has a proprietary internal structure and might consist of legacy/proprietary or highly optimized code. An ICC1 cluster shall provide an interface to the boot loader. ICC1 shall support SW-C compatible configuration for SW-CI and AUTOSAR Network compatible Configuration for NWI.
Comment	Up to Release 4.0 the boot loader architecture is not standardized in AUTOSAR. Therefore the term ICC1 is not applicable to the boot loader architecture itself.
Example	--
Reference	--

3.163 Implementation Conformance Class 2 (ICC2)

Definition	ICC2 clusters logically related ICC3 Basic Software (BSW) modules (2… N modules). The number of Cluster Features in an ICC2 cluster is a subset of the union of the number of features of the clustered ICC3 modules.
Initiator	Software and Architecture
Further Explanations	Each ICC2 cluster presents a subset of the clustered ICC3 module's interfaces. ICC2 cluster provides the functional behavior as specified in the AUTOSAR specifications on ICC3 level. ICC2 cluster have a proprietary internal structure and might consist of proprietary or highly optimized code. ICC2 shall support AUTOSAR ECU Configuration description as an input for the Cluster Configuration It shall be possible to combine ICC2 Clusters and ICC3 Modules in a BSW Architecture. Application interface Conformance (above RTE, software-component interface, SW-CI (→ definition 3.275)) and Bus Conformance (AUTOSAR network interface, NWI (→ definition 3.196)) must be testable for a BSW which contain one or more ICC2 clusters.
Comment	--
Example	Example of a ICC2 Cluster ICC2 Cluster Y ⊆ (ICC3 Module A **U** ICC3 Module B **U** ICC3 Module C **U** ICC3 Module D)

	 External Interfaces relevant for ICC2 clustering, subset of ICC3 interfaces to other BSW modules or clusters. Internal Interfaces not relevant for ICC2 clustering (can be proprietary).
Reference	--

3.164 Implementation Conformance Class 3 (ICC3)

Definition	For ICC3 the AUTOSAR BSW consists of BSW modules as defined in the Basic Software Module List, including the RTE. ICC3 is the highest level of granularity.
Initiator	Software and Architecture
Further Explanations	All Basic Software modules as defined in the BSW module list including the RTE, must comply with the defined interfaces and functionality as specified in their respective Software specification document (SWS).
Comment	--
Example	--
Reference	--

3.165 Independence

Definition	See ISO 26262, Part 1, ID 1.61
Initiator	Safety
Further Explanations	--
Comment	--
Example	--
Reference	ISO 26262, Part 1, ID 1.61

3.166 Independent Failures

Definition	See ISO 26262, Part 1, ID 1.62
Initiator	Safety
Further Explanations	--
Comment	--
Example	--
Reference	ISO 26262, Part 1, ID 1.62

3.167 Indication

Definition	Service primitive defined in the ISO/OSI Reference Model (ISO 7498). With the service primitive 'indication' a service provider informs a service user about the occurrence of either an internal event or a service request issued by another service user.
Initiator	Software and Architecture
Further Explanations	An indication is e.g. a specific notification generated by the underlying layer to inform about a Message Reception Error.
Comment	--
Example	--
Reference	--

3.168 Integration

Definition	The progressive assembling of system components into the whole system.
Initiator	Software and Architecture
Further Explanations	--
Comment	--
Example	--
Reference	[ISO 2382-20]

3.169 Integration Code

Definition	Code that the Integrator needs to add to an AUTOSAR System, to adapt non-standardized functionalities. Examples are Callouts (--> definition 3.50) of the ECU State Manager and Callbacks (--> definition 3.48) of various other BSW Modules (--> definition 3.41).
Initiator	Software and Architecture
Further Explanations	--
Comment	--
Example	--
Reference	--

3.170 Interface

Definition	A shared boundary between two functional units (→ definition 3.145) defined by various characteristics pertaining to the functions, physical interconnections, signal exchanges, and other characteristics, as appropriate.
Initiator	Software and Architecture

Further Explanations	In AUTOSAR the interface has specific meanings: See Standardized AUTOSAR Interface (→ definition 3.285) and Standardized Interface (→ definition 3.287).
Comment	--
Example	Diagnosis Service
Reference	[ISO 2382-1]

3.171 Internal Port

Definition	Internal ports are ports (→ definition 3.210) of an automotive Ethernet switch (→ definition 3.210) used for local communication (host ECU (→ definition 3.157) or cascaded switch)
Initiator	Communication
Further Explanations	--
Comment	--
Example	--
Reference	--

3.172 Interrupt Frames

Definition	An interrupt frame is the code which handles the entering/leaving of (C written) interrupt service routines. This code is microcontroller specific and often written in assembly language. Interrupt frames are typically generated by the OS generation tool.
Initiator	Software and Architecture
Further Explanations	--
Comment	--
Example	--
Reference	[AUTOSAR_InterruptHandling_Explanation.doc]

3.173 Interrupt Handler

Definition	In the case of a Category 2 interrupt, the ISR is synonymous with Interrupt Handler. In the case of Category 1 interrupt the Interrupt Handler is the function called by the hardware interrupt vector. In both cases the Interrupt handler is the user code that is normally a part of the BSW module. So the Interrupt Handler is a user level piece of code.
Initiator	Software and Architecture
Further Explanations	--
Comment	--
Example	--
Reference	[AUTOSAR_InterruptHandling_Explanation.doc]

3.174 Interrupt Service Routine

Definition	A software routine called in case of an interrupt (→ definition 3.171)
Initiator	Software and Architecture
Further Explanations	ISRs have normally higher priority than normal processes and can only be suspended by another ISR which presents a higher priority than the one running.

Comment	--
Example	--
Reference	[VDI Lexikon]

3.175 Interrupt Vector Table

Definition	An interrupt vector table is a table of interrupt vectors that associates the interrupt service routines (→ definition 3.174) with the corresponding interrupt request (typically by an array of jumps or similar mechanisms).
Initiator	Software and Architecture
Further Explanations	--
Comment	--
Example	--
Reference	--

3.176 Interrupt

Definition	Event that enforces the processor to change its state. This interruption causes the normal sequence of instructions to be stopped. Once an interrupt occurred, the running software entity is suspended and an interrupt service routine (→ definition 0) (the one dedicated to this interrupt) is called.
Initiator	Software and Architecture
Further Explanations	Two sorts of interrupts exists: HW and SW interrupts (→ definition 3.154 and definition 3.277)
Comment	--
Example	--
Reference	Translation/Adaptation from [VDI Lexikon]

3.177 Invalid Flag

Definition	For a signal in a PDU an optional invalid flag can be added to the PDU payload layout. This flag indicates the validity of other signals in the payload. In case the invalid flag of a signal is set to true in a PDU instance, the respective signal in the payload of the PDU instance does not contain a valid signal value.
Initiator	Communication
Further Explanations	This mechanism may be used in gateways to indicate that parts of a PDU do not contain valid data.
Comment	--
Example	--
Reference	--

3.178 Invalid Value of Signal

Definition	For a signal in a PDU an optional invalid value can be defined.
Initiator	Communication
Further Explanations	The invalid value is element of the signal value range that can be represented and transported by the signal. The invalid value is the value that is used in all situations where the receiver should be notified that the value in a signal is not valid.
Comment	--
Example	In case a PDU for a destination network of a gateway is composed from two PDUs

	of two different source networks, the failure to receive one PDU can be indicated as invalid values in the respective signals of the transmitted PDU in the destination network.
Reference	--

3.179 I-PDU

Definition	Interaction Layer Protocol Data Unit Collection of messages for transfer between nodes in a network. At the sending node the Interaction Layer (*IL*) is responsible for packing messages into an I-PDU and then sending it to the Data Link Layer (*DLL)* for transmission. At the receiving node the DLL passes each I-PDU to the IL which then unpacks the messages sending their contents to the application.
Initiator	Communication
Further Explanations	--
Comment	--
Example	ISO 17356-4 specifies an Interaction Layer and works on I-PDUs
Reference	[ISO 17356, Glossary]

3.180 Life Cycle

Definition	The course of development/evolutionary stages of a model element during its life time.
Initiator	Methodology and Templates
Further Explanations	A life cycle consists of a set of life cycle states. A life cycle state can be attached to an element in parallel to its version information. A typical life cycle is {valid, obsolete} and means that a valid element is up to date when first introduced but is substituted later by a new one and therefore gets the life cycle state “obsolete”.
Comment	--
Example	--
Reference	--

3.181 Link State Accumulation

Definition	The link state of a certain switch port group is accumulated by embracing the link state of each port that is part of the port group. The rule how to embracing the link state is specified in the Ethernet Interface.
Initiator	Communication
Further Explanations	--
Comment	--
Example	--
Reference	--

3.182 Link Time Configuration

Definition	The configuration of the SW module is done until link time.
Initiator	Methodology and Templates
Further Explanations	The object code of the SW modules receives parts of its configuration from another object code file or it is defined by linker options.

Comment	--
Example	Initial value of a signal.
Reference	--

3.183 Machine

Definition	A Machine consists of a set of computing resources – such as CPU cores, memory or peripheral (e.g. communication) devices – and has the abilty to execute software applications.
Initiator	Execution Management
Further Explanations	Computing resources can exist either physically or virtually. A Machine may have physical access to its resources or may run in a virtualized environment.
Comment	--
Example	--
Reference	--

3.184 Manifest

Definition	A Manifest represents a piece of AUTOSAR model description that is created to support the configuration of an AUTOSAR Adaptive Platform product and which is uploaded to the AUTOSAR Adaptive Platform product, potentially in combination with other artifacts (like binary files) that contain executable code to which the Manifest applies.
Initiator	Methodology and Templates
Further Explanations	Manifests are often used to denote a piece of configuration content that ships along a given piece of software and is used to deploy the software in the field. Three examples of manifest are: - Application Manifest - Service Instance Manifest - Machine Manifest
Comment	The Manifest may contain platform implementation dependent data, as well as generic data derived from Application System Description.
Example	--
Reference	--

3.185 Mapping

Definition	Mapping designates the distribution of elements in the logical view to elements in the physical view.
Initiator	Software and Architecture
Further Explanations	In general several entities may be allocated to one container but an entity may be allocated to only one container.
Comment	--
Example	a) Mapping of AUTOSAR Signals onto Frames (for inter-ECU communication). b) Mapping of SW-C onto ECUs (Distribution of the SW-Components to the ECUs).
Reference	--

3.186 Master Switch

Definition	A Master Switch is an Ethernet switch where the host port is located.
Initiator	Communication

Further Explanations	--
Comment	--
Example	--
Reference	--

3.187 MCAL Signal

Definition	The MCAL signal is the software representation of the conditioned signal (→ definition 3.68). It is provided by the microcontroller abstraction layer (MCAL) and is further processed by the ECU abstraction.
Initiator	General
Further Explanations	The processing unit is accessing the Conditioned Signal through some peripheral device that typically digitises the Conditioned Signal into a software representation. The transformation from the Conditioned Signal to the MCAL Signal has to take the digitalization error into account in order to provide information about the quality loss between the Technical Signal and the MCAL Signal.
Comment	--
Example	--
Reference	--

3.188 Metadata

Definition	Metadata is data about data
Initiator	Methodology and Templates
Further Explanations	Metadata includes pertinent information about data, including information about the authorship, versioning, access-rights, timestamps etc..
Comment	--
Example	--
Reference	--

3.189 MetaDataItem

Definition	Defined item of MetaData for a PDU (→ definition 3.204), e.g. a diagnostic address, a MAC address, a CAN ID, or a J1939 node address.
Initiator	Communication
Further Explanations	An ordered list of MetaDataItems defines the layout of PDU MetaData (-> definition 3.205). Each MetaDataItem has a fixed type and length, and enables the accessing modules to parse the PDU MetaData, and to access items of the types that are relevant for the module.
Comment	MetaData was revised with AUTOSAR 4.3.
Example	A PDU exchanged between CanIf and PduR can carry the CAN ID as MetaDataItem to enable range routing of CAN messages.
Reference	--

3.190 Microcontroller

Definition	Hardware element that integrates computing and communication resources as well as peripheral circuits in a single chip, including memories.
Initiator	General
Further	Microcontrollers are normally designed for small embedded systems and allow

Explanations	hardware designs with minimal amount of external parts. Microcontroller designs are normally optimized for silicon area and often support hard real-time and high-integrity demands.
Comment	Classic AUTOSAR is intended for Microcontroller based embedded systems.
Example	--
Reference	--

3.191 Microcontroller Abstraction Layer

Definition	Software layer containing drivers to enable the access of onchip peripheral devices of a microcontroller and offchip memory mapped peripheral devices by a defined API (→ definition 3.10). Task: make higher software layers independent of the microcontroller.
Initiator	Software and Architecture
Further Explanations	The Microcontroller Abstraction Layer is the lowest software layer of the Basic Software. The Microcontroller Abstraction Layer consists of the following parts: • I/O Drivers • Communication Drivers • Memory Drivers • Crypto Drivers • Microcontroller Drivers Properties: • Implementation: µC dependent • Upper Interface (API): standardizable and µC independent
Comment	--
Example	Examples of drivers located in the Microcontroller Abstraction Layer are: • onchip eeprom driver • onchip adc driver • offchip flash driver
Reference	[AUTOSAR Software Architecture]

3.192 Mistake

Definition	Human error
Initiator	Software and Architecture
Further Explanations	--
Comment	--
Example	--
Reference	[DIN 40041]

3.193 Mode

Definition	A Mode is a certain set of states of the various state machines that are running in the vehicle that are relevant to a particular entity, e.g. a SW-C, a BSW module, an application or a whole vehicle. In its lifetime, an entity changes between a set of mutually exclusive Modes. These changes are triggered by environmental data, e.g. signal reception, operation invocation.
Initiator	Runtime Environment
Further Explanations	--
Comment	--

Example	--
Reference	--

3.194 Multimedia Stream

Definition	A consistent sequence of digital data versus time which is suited as input for devices which transfer these data into a continuous visible or audible impression to humans. When transferred over a physical link, multimedia stream data typically are produced at the same rate (by the data source), as they are consumed (by the data sinks).
Initiator	General
Further Explanations	A multimedia stream usually follows a certain standard (e.g. MPEG-x). When transferred over a physical link, a multimedia stream needs a certain minimum bandwidth (in terms of bits/second) in order to allow continuous impressions. A multimedia stream in a car typically exists for several seconds (a warning signal, a navigation hint) up to several hours (a video film, a phone call, playing a radio program). Resources (e.g. bus system channels) needed by the stream have to be allocated continuously over this lifetime (this is a difference to e.g. file transfer, which may be split into several chunks of data). The source of a multimedia stream typically is a specialized device and/or software program (a tuner, a microphone, a text-to-speech engine, etc.). The same holds for the sinks (an audio amplifier or mixer, a voice recognition software, an MPEG decoder, etc.).
Comment	The term “visible or audible impression to humans” should not be taken too literally, because streams can also be used to transfer machine readable data (e.g. modem, encrypted signals). But it is this condition, which defines the standards and technology used in multimedia streams.
Example	Audio stream as output of or input to a telephone (mono, low bandwidth) Audio stream as output of a radio tuner (stereo, high bandwidth) Video stream as output of a television tuner An example for the physical implementation on a multimedia bus is the Firewire isochronous stream. see reference
Reference	[IEEE 1394]

3.195 Multiplexed PDU

Definition	A multiplexed PDU is a PDU with a configurable number of different payload layouts.
Initiator	Communication
Further Explanations	Each instance of a multiplexed PDU has a distinct layout. The set of possible layouts is statically defined. A selector signal defines which layout is used in a PDU instance. The selector signal must reside at the same position in all layouts. Each layout is identified by a unique selector value. The length of each instance of a multiplexed PDU is fixed.
Comment	--
Example	--
Reference	--

3.196 Network Interface

Definition	A Network Interface is the sum of all interfaces offered by the Basic Software (→ definition 3.40) towards its connected network.
Initiator	Communication

Further Explanations	The interface that the Basic Software shares via the communication lines with other systems that behave like AUTOSAR ECUs in order to - allow distributed SW-Cs (→ definition 3.273) to exchange inter-ECU signals and to - operate the communication lines (the network) is called Network Interface. A Network Interface (NWI) denotes the interface between the Basic Software and the physical network (OSI Layer 0) to which the ECU executing the Basic Software is connected to (e.g. CAN, LIN, FlexRay). The NWI therefore transports network data packets between the Basic Software and the physical network. The interfaces included within the term NWI are: - Logical interfaces, including o Network Management o Data Management o Data transmission/reception The interfaces excluded from the term NWI are: - The physical network interface (CAN, FlexRay etc). Note that, attention must be given to the physical form of the network, since it is not formally specified by AUTOSAR. The NWI provided by a given ECU supports the transfer of data to and from the ECU, and management of the network. For the purposes of this definition, the Basic Software can be designed according to ICC1, ICC2 or ICC3.
Comment	The term has been introduced as a short-hand to aid in discussion of the conformance of the content of ICC1 / 2 and to define the backward compatibility between releases and revisions. However, since from the network perspective, the clustering of the Basic Software is invisible, the Network Interface is applicable to all potential Basic Software conformance classes (ICC1, ICC2, ICC3) in the same way.
Example	--
Reference	Software Component Interface (SW-CI)

3.197 NM Coordination Cluster

Definition	A discrete set of NM Channels on which shutdown is coordinated.
Initiator	Communication
Further Explanations	The NM Coordinator will keep all presently awake NM Channels of an NM Coordination Cluster awake until it is possible to coordinate network sleep on all the awake channels.
Comment	--
Example	--
Reference	AUTOSAR Generic NM Interface

3.198 NM Coordinator

Definition	A functionality of the Generic NM Interface which allows coordination of network sleep for multiple NM Channels.
Initiator	Communication
Further Explanations	Depending on configuration, different level of synchronous network sleep can be achieved. The NM Coordinator is using a generic coordination algorithm which, by means of individually configured timeout and synchronization indications can coordinate a synchronized shutdown of multiple NM Channels.

Comment	--
Example	--
Reference	AUTOSAR Generic NM Interface

3.199 Notification

Definition	Informing a software entity about a state change of a hardware and/or software entity which has occurred.
Initiator	Software and Architecture
Further Explanations	The informing about a state change can be done by an activation of a software part or by setting a flag (→ definition 3.117).
Comment	--
Example	--
Reference	--

3.200 OS Application

Definition	A block of software including tasks, interrupts, hooks and user services that form a cohesive functional unit.
Initiator	Software and Architecture
Further Explanations	Trusted: An OS-Application that may be executed in privileged mode and may have unrestricted access to the API and hardware resources. Only trusted applications can provide trusted functions. Non-trusted: An OS-Application that is executed in non-privileged mode has restricted access to the API and hardware resources.
Comment	The trusted / non-trusted attribute of an OS-Application is not related to ASIL/non-ASIL.
Example	--
Reference	[AUTOSAR Specification of OS]

3.201 OS Event

Definition	The event mechanism • is a means of synchronization • is only provided for extended tasks • initiates state transitions of tasks to and from the waiting state.
Initiator	Software and Architecture
Further Explanations	--
Comment	--
Example	--
Reference	[ISO 17356-3: OS]

3.202 Partitioning

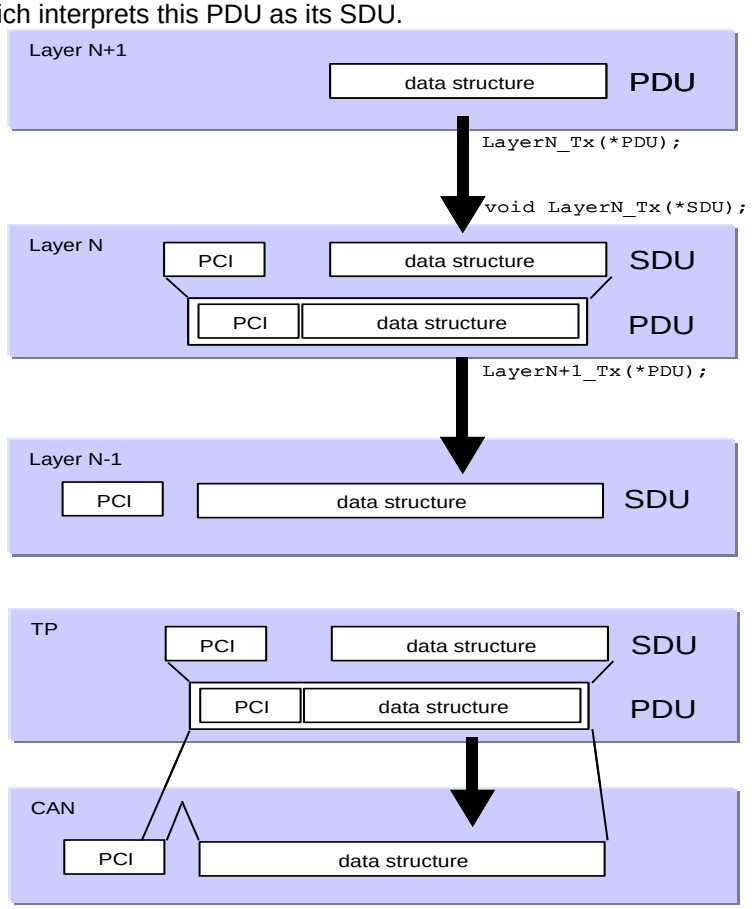
Definition	See ISO 26262, Part 1, ID 1.85
Initiator	Safety
Further Explanations	--
Comment	--

Example	--
Reference	ISO 26262, Part 1, ID 1.85

3.203 Protocol Control Information

Definition	Information which is needed to pass a SDU (→ definition 3.258) from one instance of a specific protocol layer to another instance. E.g. it contains source and target information.
Initiator	Communication
Further Explanations	The PCI is added by a protocol layer on the transmission side and is removed again on the receiving side.
Comment	--
Example	--
Reference	--

3.204 Protocol Data Unit

Definition	The Protocol Data Unit (PDU) contains SDU (→ definition 3.258) and PCI (→ definition 3.203).
Initiator	Communication
Further Explanations	On the transmission side the PDU is passed from the upper layer to the lower layer, which interprets this PDU as its SDU. 
Comment	--
Example	ISO 17356-4: COM
Reference	[ISO 17356-4: COM]

3.205 PDU MetaData

Definition	Additional data of a PDU (→ definition 3.204), which is not part of the payload.
Initiator	Communication
Further Explanations	MetaData (→ definition 3.188) is placed alongside the PDU payload in a separate buffer. The layout of the MetaData is determined by an ordered list of MetaDataItems (→ definition 3.189)
Comment	MetaData was introduced to transport parts of the CAN ID or addressing information alongside the data of a PDU.
Example	Diagnostics according to ISO 15765/14229, J1939 parameter group handling.
Reference	--

3.206 PDU Timeout

Definition	Maximum time between the receptions of two instances of one PDU is exceeded.
Initiator	Communication
Further Explanations	This timeout indicates that the last reception of a PDU instance is too long in the past. As a consequence it can be concluded that the data in the last PDU instance is outdated.
Comment	--
Example	--
Reference	--

3.207 Performance

Definition	Performance is a set of measurable characteristics (e.g. time, memory, resources usage, power consumption, etc.) which may be used to compare different system, SW element, algorithm, etc. implementations.
Initiator	Safety
Further Explanations	Scalability refers to the characteristic of a system to increase performance by adding additional resources. If the software performance requirements change (e.g more functions that impact the response time), scalability comes into play. Scalability is the ability of a system to continue to meet its response time or throughput objectives as the demand for the software functions increases.
Comment	--
Example	--
Reference	--

3.208 Peripheral Hardware

Definition	Hardware devices integrated in micro-controller architecture to interact with the environment.
Initiator	Software and Architecture
Further Explanations	--
Comment	--
Example	Memory, CAN-Controller, ADC, DIO, etc.
Reference	--

3.209 Personalization

Definition	User-specific and memorized adjustment of SW data or selection of functional alternatives.
Initiator	Software and Architecture
Further Explanations	--
Comment	--
Example	Seat parameters (position, activation status of drive-dynamic seat) can be stored in correlation to a user ID. For a given user ID the seat can be adjusted according to the stored position parameters and the drive-dynamic seat can be activated or deactivated.
Reference	--

3.210 Plausibility

Definition	Runtime Plausibility check is a method to verify during runtime if inputs for a computation/algorithm or results of a computation/algorithm are reasonable against corresponding values of a simplified reference model.
Initiator	Safety
Further Explanations	Range checks are a subset of plausibility checks. The additional knowledge can be taken from various sources, e.g. the physical domain of the value or from a model representing the computation/algorithm more roughly and calculating in parallel to the actual computation/algorithm.
Comment	--
Example	▪ Range Check: for determination that a value for a car velocity is plausible, the knowledge that a normal vehicle cannot be faster than 400km/h. ▪ Plausibility: for determination that that a value for a car velocity is plausible, the history of the values can be used and the knowledge that a certain acceleration for a car cannot be exceeded. E.g. velocity was 10 km/h and increases within 1 Sec to 100 km/h.
Reference	--

3.211 Policy Decision Point (PDP)

Definition	The PDP represents the logic in which the access control decision is made. It determines if the application is allowed to perform the requested task.
Initiator	Security
Further Explanations	The PDP provides an Access Control Decision (→ definition 3.2).
Comment	--
Example	--
Reference	--

3.212 Policy Enforcement Point (PEP)

Definition	The PEP represents the logic in which the Access Control Decision (→ definition 3.2) is enforced. It communicates directly with the corresponding PDP Decision (→ definition 3.211) to receive the Access Control Decision (→ definition 3.2).
Initiator	Security
Further Explanations	--
Comment	--
Example	--
Reference	--

3.213 Port

Definition	A port belongs to a software component (→ definition 3.273) and is the interaction point between the component and other components. The interaction between specific ports of specific components is modeled using connectors (→ definition 3.71). A port can either be a p-port (→ definition 3.225) or an r-port (→ definition 3.237).
Initiator	Software and Architecture
Further Explanations	--
Comment	For more information see AUTOSAR Specification of VFB
Example	--
Reference	[AUTOSAR Specification of Virtual Functional Bus]

3.214 Port Interface

Definition	A Port Interface characterizes the information provided or required by a port (→ definition 3.210) of a software component (→ definition 3.273).
Initiator	Software and Architecture
Further Explanations	A Port Interface is either a Client-Server Interface (→ definition 3.59) in case client-server communication (→ definition 3.58) is chosen or a sender-receiver Interface (→ definition 3.261) in case sender-receiver communication (→ definition 3.260) is used.
Comment	For more information see: AUTOSAR Specification of VFB
Example	--
Reference	[AUTOSAR Specification of Virtual Functional Bus]

3.215 Post-build Hooking

Definition	The insertion of Hooks (→ definition 3.156) to facilitate Rapid Prototyping (→ definition 3.228) support into a (complete) ECU hex image.
Initiator	Runtime Environment
Further Explanations	--
Comment	--
Example	Detection of reads and/or writes of ECU variables by analysis of the instruction stream.
Reference	--

3.216 Post-build Time Configuration

Definition	The configuration of the SW module is possible after building the SW module.
Initiator	Methodology and Templates
Further Explanations	The SW may receive its configuration file that can be downloaded to the ECU separately, avoiding a re-compilation and re-build of the ECU SW modules. In order to make the post-build time re-configuration possible, the re-configurable elements shall be stored at a known position in the ECU storage area
Comment	--
Example	Identifiers of the CAN frames
Reference	--

3.217 Pre-build Hooking

Definition	The insertion of Hooks (→ definition 3.156) to facilitate Rapid Prototyping (→ definition 3.228) support into software source prior to creating an ECU hex image.
Initiator	Runtime Environment
Further Explanations	--
Comment	--
Example	--
Reference	--

3.218 Pre-Compile Time Configuration

Definition	The configuration of the SW module is done at source code level and will be effective after compile time.
Initiator	Methodology and Templates
Further Explanations	The source code contains all the ECU configuration data and when compiled together, it produces the given SW.
Comment	--
Example	Preprocessor switch for enabling the development error detection and reporting
Reference	--

3.219 Predictabiliy

Definition	Predictability is the degree to which a correct prediction or forecast of a system's state / behavior can be made either qualitatively or quantitatively.
Initiator	Safety
Further Explanations	Important type of predictability occurs in the design of systems that are subject to real-time requirements. A good overview of predictability criteria and how to achieve them can be found in
Comment	--
Example	--
Reference	John A. Stankovic, Krithi Ramamritham, What is predictability for real-time systems?, Journal of Real-Time Systems, Volume 2 Issue 4, Nov. 1990, 247-254

3.220 Pretended Networking

Definition	Method to reduce energy consumption in an existing active network without changing network infrastructure.

Initiator	Communication
Further Explanations	--
Comment	--
Example	--
Reference	--

3.221 Private Interface

Definition	A private interface is an interface within the Basic Software (→ definition 3.40) of AUTOSAR which is neither standardized nor defined within AUTOSAR.
Initiator	Software and Architecture
Further Explanations	The goal of the private interface is to enable a more efficient implementation of basic software modules. Basic software modules sharing a private interface have to be distributed as one package. This package has to behave exactly the same as separate modules would. It must provide the same standardized interfaces to the rest of the basic software and/or RTE as separate modules would. It has to be configured exactly the same as separate modules would be configured.
Comment	Private interfaces contradict the goal of exchangeability of standard software modules and should be avoided.
Example	--
Reference	--

3.222 Probability of Failure

Definition	Probability of the occurrence of a failure in a system or functional unit.
Initiator	Safety
Further Explanations	--
Comment	--
Example	--
Reference	--

3.223 Procedure Call

Definition	A simple statement that provides the actual parameters for and invokes the execution of a procedure (software function).
Initiator	Software and Architecture
Further Explanations	A synchronous communication mechanism can be implemented by a procedure call.
Comment	--
Example	--
Reference	[ISO 2382-15]

3.224 Process

Definition	An executable unit managed by an operating system scheduler that has its own name space and resources (including memory) protected against use from other processes.
Initiator	Software and Architecture
Further Explanations	A process consists of n Task (n>=1)

Comment	--
Example	--
Reference	--

3.225 Processed Manifest

Definition	A Processed Manifest is a Manifest that is storred in the implementation specific format and is uploaded to the AUTOSAR Adaptive Platform product. Potentially this is done in combination with other artifacts (like binary files) that contain executable code to which the Manifest applies.
Initiator	Execution Management
Further Explanations	Manifests are often used to denote a piece of configuration content that ships along a given piece of software and is used to deploy the software in the field. There are several kinds of manifest: ▪ Application Manifest ▪ Machine Manifest
Comment	The Manifest may contain platform implementation dependent data, as well as generic data derived from Application System Description.
Example	--
Reference	--

3.226 Proven In Use Argument

Definition	See ISO 26262, Part 1, ID 1.90
Initiator	Safety
Further Explanations	--
Comment	--
Example	--
Reference	ISO 26262, Part 1, ID 1.90

3.227 Provide Port

Definition	Specific Port (→ definition 3.210) providing data (→ definition 3.74) or providing a service of a server (→ definition 3.263).
Initiator	Software and Architecture
Further Explanations	The Provide Port is sometimes abbreviated as PPort or P-Port.
Comment	--
Example	• Server Port • Sender Port
Reference	--

3.228 Rapid Prototyping

Definition	The experimental incorporation of new functionality.
Initiator	Runtime Environment
Further Explanations	Rapid Prototyping (RP) permits a user to quickly perform experiments to add new functionality, or to replace/bypass existing functionality, without requiring an ECU image to be built.
Comment	--

Example	--
Reference	--

3.229 Rapid Prototyping Memory Interface

Definition	The memory access pattern necessary for RP tool (→ definition 3.230).
Initiator	Runtime Environment
Further Explanations	The RP memory interface provides the well-defined memory access pattern required by RP tool to ensure consistent and complete access to bypass (→ definition 3.46) values.
Comment	--
Example	A mandated “write-read” cycle within RTE APIs provides the RP tool with an opportunity to bypass (i.e. substitute with value generated from an alternative algorithm) the written value before it is read and then subsequently used within the generated code.
Reference	--

3.230 Rapid Prototyping Tool

Definition	Software and/ or hardware tools to support Rapid Prototyping (→ definition 3.228).
Initiator	Runtime Environment
Further Explanations	--
Comment	--
Example	Dedicated prototyping interfaces on ECUs accessed by PC-based software tools.
Reference	--

3.231 Rate Conversion

Definition	Operation to change the timing between two transmissions of the same PduId on one physical Network.
Initiator	Communication
Further Explanations	--
Comment	--
Example	--
Reference	--

3.232 Recovery

Definition	Returning to intended functionality after fault detection without violating the safety goals.
Initiator	Safety
Further Explanations	▪ Restart mode: Restart Operation from the initial state of operation ▪ Continue mode: Restart Operation from the last known state of operation ▪ Recovery by repetition: repeat until timeout to cope i.e. random transmission errors. ▪ Forward error recovery: relies on continue from an erroneous state by making selective corrections to the system state. This includes making the controlled environment safe, which may be damaged because of the failure ▪ Backward error recovery: relies on restoring the system to a previous safe state and executing an alternative section of the program. This has the same

	functionality but uses a different algorithm (c.f. N-Version Programming) ▪ Recovery Point: The point to which a process is restored is called a recovery point and the act of establishing it is termed check-pointing (saving appropriate system state) ▪ Recovery testing is the forced failure of the software in a variety of ways to verify that recovery is properly performed.
Comment	--
Example	--
Reference	--

3.233 Redundancy

Definition	Existence of means in addition to the means that would be sufficient for an element to perform a required function or to represent information. Hardware element redundancy includes replicated or additional hardware means added to the system to support fault tolerance. Software element redundancy includes the additional SW units and/or data used to support fault tolerance.
Initiator	Safety
Further Explanations	--
Comment	--
Example	--
Reference	See ISO 26262, Part 1, ID 1.94

3.234 Reentrancy

Definition	In AUTOSAR a Function (→ definition 3.142) is called reentrant if it can be interrupted in the middle of its execution and then safely called again ("re-entered") before its previous invocations complete execution. AUTOSAR differs between • (full) reentrancy • non reentrancy and • conditional reentrancy.
Initiator	Software and Architecture
Further Explanations	Reentrancy is always considered from the viewpoint of the caller. A Function which is conditional reentrant has to document the conditions for the reentrancy. Typical cases for conditional reentrancy are functions which are reentrant as long as a function parameter is different to (possible) ongoing calls.
Comment	An implementation of a Function might be reentrant for one system but only conditional reentrant (or even non reentrant) for another one. It always depend how the reentrancy was realized (e.g. locks). As an example, just consider a function which uses interrupt locks to realize full reentrancy on a single core system. If this implementation is used in a multi core system its reentrancy will only be conditional reentrant for calls from the same core.
Example	--
Reference	--

3.235 Reliability

Definition	Probability of a system or functional unit to perform as expected under specified conditions within a time interval.
Initiator	Safety

Further Explanations	--
Comment	--
Example	--
Reference	--

3.236 Relocatability

Definition	Capability of a software part being executed on different hardware environments without changing the code of the software part.
Initiator	Software and Architecture
Further Explanations	--
Comment	--
Example	--
Reference	--

3.237 Require Port

Definition	Specific Port (→ definition 3.210) requiering data (→ definition 3.74) or requiering a service of a server.
Initiator	Software and Architecture
Further Explanations	The Require Port is sometimes abbreviated as RPort or R-Port.
Comment	--
Example	• Client Port • Receiver Port
Reference	--

3.238 Required property

Definition	A *required* property or quality of a design entity (e.g. SW component or system) is a property or quality which has to be fulfilled by the environment of this design entity.
Initiator	Software and Architecture
Further Explanations	A property or quality can be required by a stakeholder (e.g. customer) or another design entity.
Comment	--
Example	1) In order to meet its functionality, a SW component A requires a minimum temporal resolution of a signal (information on a required port) which has to be fulfilled by SW component B. 2) SW component requires to be activated by the runtime environment every 100ms with a jitter of 10ms.
Reference	Compare term asserted property (→ definition 3.15)

3.239 Residual Error Rate

Definition	The ratio of the number of bits, unit elements, or blocks incorrectly received and undetected, to the total number of bits, unit elements, characters, or blocks sent.
Initiator	Safety
Further Explanations	--

Comment	--
Example	--
Reference	--

3.240 Resource

Definition	A resource is a required but limited hardware entity of an ECU (→ definition 3.92), which in general can be accessed concurrently, but not simultaneously, by multiple software entities.
Initiator	Software and Architecture
Further Explanations	--
Comment	The OSEK definition [ISO 17356-3: OS] cannot be used, due to the specific usage in ISO 17356.
Example	CPU-load, interrupts (mechanism itself and the resulting CPU-load), memory, peripheral hardware, communication, …
Reference	--

3.241 Resource-Management

Definition	Entity which controls the use of resources (→ definition 3.240).
Initiator	Software and Architecture
Further Explanations	The main functionality of resource management is the control of simultaneous use of a single resource by several entities, e.g. scheduling of requests, multiple access protection.
Comment	--
Example	OS-scheduler (CPU-load management)
Reference	--

3.242 Response Time

Definition	Time between receiving a stimulus and delivering an appropriate response or reaction.
Initiator	Software and Architecture
Further Explanations	The response time describes the time between a stimulus like e.g. the state change of hardware or software entity and the expected reaction of the system (e.g. response, actuator activation). Synonym: reaction time See also: execution time, worst case execution time and worst case response time.
Comment	--
Example	--
Reference	--

3.243 Risk

Definition	See ISO 26262, Part 1, ID 1.99
Initiator	Safety
Further Explanations	--
Comment	--
Example	--

Reference	ISO 26262, Part 1, ID 1.99

3.244 Robustness

Definition	Ability of a system or functional unit to perform as expected also under unexpected conditions.
Initiator	Safety
Further Explanations	--
Comment	--
Example	--
Reference	--

3.245 RTE Event

Definition	An RTE Event encompasses all possible situations that can trigger execution of a runnable entity (→ definition 3.246) by the RTE. Thus they can address timing, data sending and receiving, invoking operations, call server returning, mode switching, or external events. RTE Events can either activate a runnable entity or wakeup a runnable entity at its waitpoints.
Initiator	Runtime Environment
Further Explanations	Note 'event' in this context is not necessarily synonymous with 'RTEEvent' as defined in the VFB specification. In particular, RTE Events that result from communication are handled by communication-triggered runnable entities.
Comment	Events can have a variety of sources including time.
Example	Scheduling of runnable entities from angular position, e.g. a crankshaft, that are used to trigger an interrupt and hence an RTE notification. A software component needs to perform a regular interval, e.g. flash an LED, reset a watchdog, etc.
Reference	--

3.246 Runnable Entity

Definition	A Runnable Entity is a part of an Atomic Software-Component (→ definition 3.20) which can be executed and scheduled independently from the other Runnable Entities of this Atomic Software-Component. It is described by a sequence of instructions that can be started by the RTE (definition→ 3.245). Each runnable entity is associated with exactly one Entry Point (definition→ 3.94).
Initiator	Software and Architecture
Further Explanations	A Runnable Entity contains at least two points for the Scheduler (→ definition 3.257): 1 Entry Point (→ definition 3.94) and 1 Exit Point (→ definition 3.102). Due to the reason that an Atomic Software Component is not dividable, all its Runnable Entities are executed on the same ECU.
Comment	In general a task in the runtime system consists out of n Runnable Entities of m Atomic Software-Components.
Example	Server function of a Software Component.
Reference	--

3.247 SAE J1939

Definition	SAE J1939 is a vehicle bus standard created by the SAE (Society of Automotive Engineers, a USA standards body) for car and heavy duty truck industries.

Initiator	Communication
Further Explanations	The J1939 standard encompasses the following areas: - bus physics (J1939/11, J1939/15) - CAN message layout (J1939/21) - request/response and multi packet transport protocols (J1939/21) - network management used to assign a unique address to each node (J1939/81) - diagnostics layer comparable to UDS in complexity (J1939/73) - standardized application signals and messages (J1939/71)
Comment	The J1939 standard is used by most truck manufacturers worldwide and is prescribed for OBD in some states of the USA. It is also used as a base for other standards for maritime (NMEA 2000), agricultural (ISO 11783), and military (MilCAN A) applications.
Example	--
Reference	http://www.sae.org/

3.248 Safe State

Definition	See ISO 26262, Part 1, ID 1.102
Initiator	Safety
Further Explanations	--
Comment	--
Example	--
Reference	ISO 26262, Part 1, ID 1.102

3.249 Safety

Definition	See ISO 26262, Part 1, ID 1.103
Initiator	Safety
Further Explanations	--
Comment	--
Example	--
Reference	ISO 26262, Part 1, ID 1.103

3.250 Safety Case

Definition	See ISO 26262, Part 1, ID 1.106
Initiator	Safety
Further Explanations	--
Comment	--
Example	--
Reference	ISO 26262, Part 1, ID 1.106

3.251 Safety Goal

Definition	See ISO 26262, Part 1, ID 1.108
Initiator	Safety
Further	--

Explanations	
Comment	--
Example	--
Reference	ISO 26262, Part 1, ID 1.108

3.252 Safety Measure

Definition	See ISO 26262, Part 1, ID 1.110
Initiator	Safety
Further Explanations	--
Comment	--
Example	--
Reference	ISO 26262, Part 1, ID 1.110

3.253 Safety Mechanism

Definition	See ISO 26262, Part 1, ID 1.111
Initiator	Safety
Further Explanations	--
Comment	--
Example	--
Reference	ISO 26262, Part 1, ID 1.111

3.254 Safety Protocol

Definition	A communication protocol defining the necessary mechanisms to ensure the integrity of transmitted data and to detect any communication related error.
Initiator	Safety
Further Explanations	--
Comment	--
Example	--
Reference	--

3.255 Sample Application

Definition	Defined system used for evaluation purposes.
Initiator	Software and Architecture
Further Explanations	The application may be simplified for better understanding within the evaluation phase.
Comment	--
Example	Diagnosis Application Exterior Light Management
Reference	--

3.256 Scalability

Definition	The degree to which assets can be adapted to specific target environments for various defined measures.
Initiator	Software and Architecture
Further Explanations	--
Comment	Target environment introduced compared to EAST-Glossary.
Example	--
Reference	[EAST-Glossary]

3.257 Scheduler

Definition	The scheduler handles the scheduling of the tasks/runnable entities (definition→ 3.296 / 3.246) according to the priority and scheduling policy (pre-defined or configurable). It has the responsibility to decide during run-time when which task can run on on the CPU of the ECU.
Initiator	Software and Architecture
Further Explanations	There are many strategies (priority-based, time-triggered, round-robbin, …) a scheduler can use, depending of the selected and/or implemented algorythms
Comment	--
Example	--
Reference	[AUTOSAR Specification of Virtual Functional Bus]

3.258 Service Data Unit

Definition	Service Data Unit is the data passed by an upper layer, with the request to transmit the data. It is as well the data, which is extracted after reception by the lower layer and passed to the upper layer.
Initiator	Communication
Further Explanations	A SDU is part of a PDU (→ definition 3.204).
Comment	--
Example	--
Reference	--

3.259 Security

Definition	Protection of data, software entities or resources from accidental or malicious acts.
Initiator	Software and Architecture
Further Explanations	--
Comment	Slightly adapted norm.
Example	--
Reference	[ISO 2382-8]

3.260 Sender-Receiver Communication

Definition	A communication pattern which offers asyncronous distribution of information where a sender communicates information to one or more receivers, or a receiver receives information from one or several senders.

Initiator	Software and Architecture
Further Explanations	The process of sending data does not block the sender and the sender usually gets no response from the receivers
Comment	Often used for data or event distribution
Example	--
Reference	[AUTOSAR Specification of Virtual Functional Bus]

3.261 Sender-Receiver Interface

Definition	A sender-receiver interface is a special kind of port-interface (→ definition 3.214) used for the case of sender-receiver communication (→ definition 3.260). The sender-receiver interface defines the data-elements which are sent by a sending component (which has a p-port providing the sender-receiver interface) or received by a receiving component (which has an r-port requiring the sender-receiver interface).
Initiator	Software and Architecture
Further Explanations	--
Comment	A special kind of Port-Interface
Example	--
Reference	[AUTOSAR Specification of Virtual Functional Bus]

3.262 Sensor/Actuator SW-Component

Definition	SW-Component (→ definition 3.273) dedicated to the control of a sensor or actuator.
Initiator	Software and Architecture
Further Explanations	There will be several Sensor/ Actuator SW-Cs in each ECU. In general there will be one Sensor/Actuator SW-C for each sensor and one for each actuator (=> number of Sensor/Actuator SW-C = number of sensors + number of actuators).
Comment	--
Example	--
Reference	--

3.263 Server

Definition	Software entity which provides services for clients (→ definition 3.56).
Initiator	Software and Architecture
Further Explanations	The server (→ definition 3.263) and the clients using its service might be located on one ECU or distributed on different calculation units (e.g. ECU).
Comment	Adapted from Balzert.
Example	--
Reference	[Balzert99]

3.264 Service

Definition	A service is a type of operation that has a published specification of interface and behavior, involving a contract between the provider of the capability and the potential clients.
Initiator	Software and Architecture
Further Explanations	--

Comment	--
Example	Diagnosis service, …
Reference	[EAST-Glossary]

3.265 Service Discovery

Definition	Generic functionality provided by the Communication Management to Applications that allows Applications at runtime to find locally or remotely available Service Instances providing the requested service.
Initiator	Communication
Further Explanations	Based on Application query, the Communication Management provides list of compatible Service Instances. Compatibility is defined by compatibility rules and may consider version or QoS attributes.
Comment	--
Example	--
Reference	--

3.266 Service Instance

Definition	The properties of a service instance are described by a specific service interface. A service instance has a unique identity.
Initiator	Communication
Further Explanations	It is accessible by other Applications by using a Service Requester Proxy at runtime and is typed by a specific Service Interface. It is addressable within the vehicle network by its Service Instance ID, an abstraction from of the physical location. Optionally, authentication data is associated with a Service Instance for authentication at runtime.
Comment	--
Example	--
Reference	--

3.267 Service Interface

Definition	A service interface is a special kind of port interface (see Port Interface) used in the Adaptive platform. It defines both data elements for event based communication and operations that are provided by the service provider and that can be used by the service requester.
Initiator	Communication
Further Explanations	--
Comment	--
Example	--
Reference	--

3.268 Service Oriented Communication

Definition	Communication, for which communication partners are generally not defined during design time, but dynamically discovered and bound during runtime.
Initiator	Communication
Further	Communication partners are generally not defined during design time, but

Explanations	dynamically discovered and bound during runtime. Adaptive AUTOSAR Applications are therefore developed agnostic to the concrete context, assuming model of loosely-coupled components.
Comment	This is the standard communication paradigm for communication between AUTOSAR Adaptive Applications.
Example	--
Reference	--

3.269 Service Port

Definition	A Service Port is a Port (→ definition 3.210) of an SW-C (→ definition 3.273), Complex Driver (→ definition 3.65) and/or ECU Abstraction (→ definition 3.88) connected to an AUTOSAR Service (→ definition 3.35).
Initiator	Software and Architecture
Further Explanations	The interface of a Service Port has to be a Standardized AUTOSAR Interface (→ definition 3.29 and 3.285). A Service Port does not need to be connected to another Port in the VFB View (→ definition 3.310).
Comment	If a service is provided by the ECU where a specific Atomic Software Component is located the VFB View is sufficient. If a service is provided by another ECU the connection of the service call to the service has to be done explicitly during the mapping step.
Example	Write data to non volatile memory.
Reference	--

3.270 Service Proxy

Definition	A facade that represents a specific service on code level from the perspective of the service consumer providing methods for all functionalities offered by the represented service.
Initiator	Communication
Further Explanations	The service consumer side Application code interacts with this local facade, which then knows how to propagate these calls to the real service implementation and back. The Service Proxy is typically an instance of a service proxy class which itself is potentially generated from ServiceInterface according to standardized patterns and implemented by platform-specific Communication Management. The Service Proxy provides placeholder for Service Instance ID, which is set at runtime by requesting Application implementation using Service Discovery or statically based on Planned Dynamics.
Comment	--
Example	--
Reference	--

3.271 Service Skeleton

Definition	A representation of a specific service on code level from the perspective of the service implementation, which provides functionalities according to the service definition and allows to connect the service implementation to the Communication Management transport layer, so that the service implementation can be contacted by service consumers.
Initiator	Communication
Further	The Service Skeleton is typically an instance of a service skeleton class which

Explanations	itself is potentially generated from a ServiceInterface according to standardized patterns and implemented by platform-specific Communication Management. The skeleton provides placeholder for the Service Instance ID, which is set by platform implementation, e.g. based on Application Description at design time, or by the Vehicle Software Configuration Manager at setup.
Comment	--
Example	--
Reference	--

3.272 Services Layer

Definition	The Services Layer is the highest layer of the Basic Software which also applies for its relevance for the application software: while access to I/O signals is covered by the Hardware Abstraction Layer, the Services Layer offers Operating system services Vehicle network communication and management services Memory services (NVRAM management) Diagnosis Services (including KWP2000 interface and error memory) ECU state management Task: Provide basic services for application and basic software modules
Initiator	Software and Architecture
Further Explanations	The Services Layer consists of the following parts: Communication Services Memory Services System Services
Comment	--
Example	Network Management, NVRAM Manager, ECU State Manager
Reference	[AUTOSAR Software Architecture]

3.273 Slave Switch

Definition	A Slave Switch is an Ethernet switch which is connected to a master switch by uplink ports
Initiator	Communication
Further Explanations	--
Comment	--
Example	--
Reference	--

3.274 Software Component

Definition	Software-Components are architectural elements that provide and/or require interfaces and are connected to each other through the Virtual Function Bus to fulfill architectural responsibilities.
Initiator	Software and Architecture
Further Explanations	A Software Component has a formal description defined by the software component template. Software Components can be abbreviated as SW-Cs. SW-Cs may be atomic components, parameter components or compositions. Also the software modules providing the Software Component Interface (→ definition 3.275) of a Basic Software Module (→ definition 3.41) are called Software

	Components.
Comment	--
Example	--
Reference	--

3.275 Software Component Interface

Definition	A SoftWare-Component Interface (SW-CI) is the sum of all interfaces offered by the Basic Software (→ definition 3.40), towards the SW-Cs (→ definition 3.273).
Initiator	Software and Architecture
Further Explanations	A SW-CI denotes the interface between an SW-C and the underlying Basic Software cluster including the RTE. The SW-CI therefore comprises all API (→ definition 3.10), functions (→ definition 3.142) and Callbacks (→ definition 3.48) that the SW-C requires from and provides to the Basic Software (generally by means of RTE mechanisms). It includes also the mechanisms allowing SW-Cs sharing the SW-CI to communicate with one another. For the purposes of this definition, the Basic Software clustered on an ECU can be designed according to ICC1, 2 and 3.
Comment	The term has been introduced as a short-hand to aid in discussion of the conformance of the content of Basic Software clusters of conformance class ICC1 / 2 and to define the backward compatibility between releases and revisions. However, since from the SW-C perspective, the clustering of the Basic Software is invisible, the Component Interface is applicable to all potential Basic Software conformance classes (ICC1, ICC2, ICC3) in the same way.
Example	--
Reference	Network Interface (NWI)

3.276 Software Configuration

Definition	The arrangement of software elements in a SW system.
Initiator	Software and Architecture
Further Explanations	A software element is a clearly definable software part. A software configuration is a selection version of software modules, software components, parameters and generator configurations. Calibration and Variant Coding (→ definition 3.304) can be regarded as subset of Software Configuration.
Comment	--
Example	--
Reference	[EAST-Glossary]

3.277 Software Interrupt

Definition	Interrupt triggered by SW event.
Initiator	Software and Architecture
Further Explanations	SW events are for example calling an operating system service, starting a process with higher priority.
Comment	--
Example	--
Reference	Translation/Adaptation from [VDI Lexikon]

3.278 Software Package

Definition	Unit for deployment of software onto Adaptive AUTOSAR Platform instances

	containing zero or more executables and the metadata to install and execute it on the Machine.
Initiator	Software and Architecture
Further Explanations	Typically, a software package contains one or more executables however it is permitted to have no executables to enable update of configuration metadata.
Comment	--
Example	--
Reference	Translation/Adaptation from [VDI Lexikon]

3.279 Software Signal

Definition	A Software Signal is an asynchronous event transmitted between one process and another.
Initiator	Software and Architecture
Further Explanations	A SW Signal is the software implementation of an (control-) information. Additionally it may have attributes (e.g. freshness, data type, …). It is exchanged between SW-Components.
Comment	--
Example	--
Reference	--

3.280 Software Unit

Definition	See ISO 26262, Part 1, ID 1.125
Initiator	Safety
Further Explanations	--
Comment	--
Example	--
Reference	ISO 26262, Part 1, ID 1.125

3.281 Special Periphery Access

Definition	Special functions to standard peripheral devices or special peripherals.
Initiator	Software and Architecture
Further Explanations	Is only used when, because of technical issues, no standard periphery access can be used
Comment	--
Example	--
Reference	--

3.282 Standard Periphery Access

Definition	Standard functions to typical standard peripheral devices that are available on an ECU (most microcontroller integrated) used in automotive embedded applications.
Initiator	Software and Architecture
Further Explanations	--
Comment	--
Example	Digital Input/Output, Analog/Digital Converter, Pulse Width (De)Modulator, EEPROM, FLASH, Capture Compare Unit, Watchdog Timer
Reference	--

3.283 Standard Software

Definition	Standard Software is software which provides schematic independent infrastructural functionalities on an ECU. It contains only Standardized Interfaces (→ definition 3.287), Standardized AUTOSAR Interfaces (→ definition 3.285) and/or Private Interfaces (→ definition 3.221).
Initiator	Software and Architecture
Further Explanations	--
Comment	--
Example	OSEK (ISO 17356), MCAL, Services
Reference	--

3.284 Standardized AUTOSAR Blueprint

Definition	A Standardized AUTOSAR Blueprint is an AUTOSAR Blueprint (→ definition 3.26) standardized within the AUTOSAR project. Its derived objects are considered as being standardized within the AUTOSAR project as well.
Initiator	Application Interfaces
Further Explanations	Blueprints were introduced within the AUTOSAR projects to enable standardization of ports without standardizing the static view of the architecture (i.e. the software components providing or requesting the ports). Sometimes it is not possible to standardize all attributes of an AUTOSAR element because the values of some attributes are project specific. Nevertheless it enables better collaboration if some of the attributes are standardized. Additionally blueprints enable adding descriptions and long names in different languages.
Comment	--
Example	--
Reference	[MOD AI Specification]

3.285 Standardized AUTOSAR Interface

Definition	This is an AUTOSAR Interface which is standardized within the AUTOSAR project.
Initiator	Software and Architecture
Further Explanations	AUTOSAR Services (→ definition 3.35) interact with other components through a Standardized AUTOSAR Interface. AUTOSAR Interfaces can be derived from AUTOSAR Application Interfaces (→ definition 3.23).
Comment	--
Example	--
Reference	--

3.286 Standardized Blueprint

Definition	A Blueprint (→ definition 3.43) is called a Standardized Blueprint if the derived objects are considered as being standardized as well. It also includes that additionally concrete standardized rules exist how to specify the blueprint as well as how to derive an object from that blueprint. This is typically not done for a specific blueprint but for all blueprints of the same class.
Initiator	Application Interfaces

Further Explanations	--
Comment	--
Example	--
Reference	--

3.287 Standardized Interface

Definition	A software interface is called Standardized Interface if a concrete standardized API exists.
Initiator	Software and Architecture
Further Explanations	Modules in the Basic Software interact which each other through Standardized Interfaces.
Comment	--
Example	ISO 17356-4: COM Interface
Reference	--

3.288 Static Configuration

Definition	A setup where the routing configuration cannot be changed during normal operation of the gateway.
Initiator	Communication
Further Explanations	Static configuration doesn't allow reconfiguration of the routing during normal operation e.g. during driving. Static configuration does not restrict the update of the configuration in specific maintenance operation modes (e.g. programming mode).
Comment	--
Example	A software update may change a routing configuration such that a PDU is routed into two instead of one destination networks.
Reference	--

3.289 Synchronize

Definition	To make two or more events or operations to occur at the same predefined moment in time.
Initiator	Communication
Further Explanations	--
Comment	--
Example	Two NM Channels can enter Bus Sleep Mode at the same time ("synchronized network sleep") or they can be ordered to go to sleep at the same time ("synchronized shutdown initiation").
Reference	AUTOSAR Generic NM Interface

3.290 Synchronous Communication

Definition	A communication is synchronous when the calling software entity is blocked until the called operation is evaluated. The calling software entity continues its operation by getting the result.
Initiator	Software and Architecture
Further Explanations	Synchronous communication between distributed functional units has to be implemented as remote procedure call.

Comment	Are further mechanisms possible?
Example	--
Reference	--

3.291 Synchronous Function

Definition	A function is called synchronous if the described functionality is guaranteed to be completed the moment the function returns to the caller.
Initiator	Software and Architecture
Further Explanations	--
Comment	--
Example	--
Reference	--

3.292 System

Definition	An integrated composite that consists of one or more of the processes, hardware, software, facilities and people, that provides a capability to satisfy a stated need or objective.
Initiator	General
Further Explanations	--
Comment	ITEA EAST uses IEEE 14407 standard. Here not applicable because of problem with the definition of function. One correct interpretation is: - it might be a composition of one or more ECUs
Example	Braking system
Reference	[ISO 12207]

3.293 System Constraint

Definition	Boundary conditions that restrict the Design-Freedom of the (cars E/E-) System.
Initiator	Software and Architecture
Further Explanations	The design of ECU Networks and the distribution of functionalities to ECUs are limited by several constrains. These constraints result mostly by the communication matrix and safety requirements
Comment	--
Example	An existing communication matrix that restricts the distribution of signals to frames is a system constraint. Another system constraint is a safety requirement that does not allow to map a specified Software component to specific ECU.
Reference	--

3.294 System Signal

Definition	The system signal represents the communication system's view of data exchanged between SW components which reside on different ECUs. The system signals allow to represent this communication in a flattened structure, with (at least) one system signal defined for each data element sent or received by a SW component instance. If data has to be sent over gateways, there is still only one system signal representing this data. The representation of the data on the individual communication systems is done by the cluster signals.

Initiator	Communication
Further Explanations	--
Comment	--
Example	--
Reference	--

3.295 Systematic Fault

Definition	See ISO 26262, Part 1, ID 1.131
Initiator	Safety
Further Explanations	--
Comment	--
Example	--
Reference	ISO 26262, Part 1, ID 1.131

3.296 Task

Definition	A Task is the smallest schedulable unit managed by the OS. The OS decides when which task can run on the CPU of the ECU.
Initiator	Software and Architecture
Further Explanations	A runnable entity (→ definition 3.246) of a software component runs in the context of a task. Also the Basic Software Modules runs in the context of a task.
Comment	--
Example	--
Reference	[AUTOSAR Specification of Virtual Functional Bus]

3.297 Technical Signal

Definition	The technical signal is the physical value of an external event coupled to an AUTOSAR system. Technical signals are represented in SI units (e.g. pressure in PA).
Initiator	General
Further Explanations	The term Technical Signal is used when we are referring to the "real world" signal that is under consideration. So typical Technical Signals are temperature, velocity, torque, force, electrical current and voltage, etc.
Comment	--
Example	--
Reference	--

3.298 Timeout

Definition	Notification with respect to deadline violation of an event or task (e.g. while working on/with information: receiving, sending, processing, etc.).
Initiator	Software and Architecture
Further Explanations	--
Comment	--
Example	--
Reference	--

3.299 Uplink Port

Definition	A Uplink Port is a port of an automotive Ethernet switch which is connected to another Ethernet automotive switch (cascaded switch). A Uplink Port could either be an internal port or an external port. One Uplink Port is connected to another Uplink Port. The Uplink Port has a special role from the perspective of the software.
Initiator	Communication
Further Explanations	--
Comment	--
Example	--
Reference	--

3.300 Use Case

Definition	A model of the usage by the user of a system in order to realize a certain functional feature of the system.
Initiator	General
Further Explanations	--
Comment	Added certain compared to EAST-glossary.
Example	--
Reference	[EAST-Glossary]

3.301 Validation

Definition	Confirmation by examination and provisions of objective evidence that the particular requirements for a specific intended use are fulfilled.
Initiator	General
Further Explanations	In design and development, validation concerns the process of examining a product to determine conformity with user needs. Validation is normally performed on the final product under defined operating conditions. It may be necessary in earlier stages. “Validated” is used to designate the corresponding status. Multiple validations may be carried out if there are different intended uses. [ISO 8402: 1994]
Comment	--
Example	--
Reference	[IEEE 1012:1998]

3.302 Variability

Definition	Variability of a system is its quality to describe a set of variants. These variants are characterized by variant specific property settings and / or selections.
Initiator	Methodology and Templates
Further Explanations	--
Comment	--
Example	As an example, such a system property selection manifests itself in a particular “receive port” for a connection.
Reference	--

3.303 Variant

Definition	A system variant is a concrete realization of a system, so that all its properties have been set respectively selected. The software system has no variability anymore with respect to the binding time.
Initiator	Methodology and Templates
Further Explanations	--
Comment	--
Example	--
Reference	--

3.304 Variant Coding

Definition	Adaptation of SW by selection of functional alternatives according to external requirements (e.g. country-dependent or legal restrictions).
Initiator	Software and Architecture
Further Explanations	The major difference with calibration is that this later doesn't aim to adapt the SW functionality itself but only aims to adjust the SW to the HW/SW environment, e.g. the calibration of engine control SW that is adjusted to the physical parameters of every engine. Variant Coding also includes vehicle-specific (not user-specific) SW adaptation due to end-customer wishes (e.g. deactivation of speed-dependent automatic locking). Variant Coding is always done after compile time. Used techniques to select variants include end-of-line programming and garage programming.
Comment	--
Example	Country related adaptation of MMI with respect to speed and/or temperature unit (km/h vs. mph, °C vs. F).
Reference	--

3.305 Variation Binding

Definition	A variant is the result of a variation binding process that resolves the variability of the system by assigning particular values/selections to all the system's properties.
Initiator	Methodology and Templates
Further Explanations	--
Comment	--
Example	--
Reference	--

3.306 Variation Binding Time

Definition	The variation binding time determines the step in the methodology at which the variability given by a set of variable properties is resolved.
Initiator	Methodology and Templates
Further Explanations	--
Comment	--
Example	--
Reference	--

3.307 Variation Point

Definition	A variation point indicates that a property is subject to variation. Furthermore, it is associated with a condition and a binding time which define the system context for the selection / setting of a concrete variant.
Initiator	Methodology and Templates
Further Explanations	--
Comment	--
Example	--
Reference	--

3.308 Vendor ID

Definition	A vendor ID is a unique identification of the vendor of a software component. All basic software modules (→definition 3.41) conformant to the AUTOSAR standard shall provide a readable vendor ID.
Initiator	General
Further Explanations	AUTOSAR Vendor IDs are used to determine vendors of basic software modules before and during runtime. The mechanism is used to improve bug handling. AUTOSAR currently only provides Vendor IDs to members of the AUTOSAR partnership.
Comment	To apply for an AUTOSAR vendor ID the possible member has to send an E-Mail to request@autosar.org. Within the request name of the company, company address and contact person should be listed.
Example	Vendor ID for EEPROM driver is called: EEP_VENDOR_ID
Reference	SRS_BSW_00374

3.309 Verification

Definition	Confirmation by examination and provisions of objective evidence that specified requirements have been fulfilled.
Initiator	General
Further Explanations	In design and development, verification concerns the process of examining the result of a given activity to determine conformity with the stated requirement for that activity. “Verified” is used to designate the corresponding status. [ISO 8402: 1994]
Comment	--
Example	--
Reference	[IEEE 1012:1998]

3.310 VFB View

Definition	The VFB View describes systems or subsystems in the car independently of these resources; in other words, independently of: • what kind of and how many ECUs are present in the car • on what ECUs the entities in the VFB-View run • how the ECUs are interconnected: what kind of network technology (CAN, LIN,…) and what kind of topology (presence of gateways) is used
Initiator	Software and Architecture
Further Explanations	In the VFB-View, the system or subsystem under consideration is a Composition which consists out of Connectors and Components.
Comment	--
Example	--

Reference	[AUTOSAR Specification of Virtual Functional Bus]

3.311 Virtual Functional Bus

Definition	The Virtual Functional Bus is an abstraction of the communication between Atomic Software Components (→ definition 3.20) and AUTOSAR Services (→ definition 3.35). This abstraction is such that specification of the communication mechanisms is independent from the concrete technology chosen to realize the communication.
Initiator	Software and Architecture
Further Explanations	After compilation and linking of software for a dedicated ECU (→ definition 3.92) the Virtual Functional Bus interfaces are realized by the AUTOSAR Runtime Environment.
Comment	--
Example	--
Reference	--

3.312 Virtual Integration

Definition	The simulated, modeled and/or calculated (not real) combination of software entities forming a system (→ definition 3.292).
Initiator	Software and Architecture
Further Explanations	By virtual integration several constraints and/or requirements are checked without the need of real hardware units, like needed CPU load, needed memory, completeness of interfaces, fulfillment of timing requirements etc.).
Comment	--
Example	--
Reference	--

3.313 Virtualization

Definition	Virtualization is a mechanism which hides the physical characteristics of a computing platform from the users, presenting instead another abstract computing platform. It can be used to fulfill functional safety requirements like availability, partitioning, resource conflict management, recovery etc.
Initiator	Safety
Further Explanations	Different types of hardware virtualization include: ▪ Full virtualization – almost complete simulation of the actual hardware to allow software, which typically consists of a guest operating system, to run unmodified. ▪ Partial virtualization – some but not all of the target environment attributes are simulated. As a result, some guest programs may need modifications to run in such virtual environments. ▪ Paravirtualization – a hardware environment is not simulated; however, the guest programs are executed in their own isolated domains, as if they are running on a separate system. Guest programs need to be specifically modified to run in this environment.
Comment	--
Example	--
Reference	--

3.314 Worst Case Execution Time

Definition	Maximum possible time during which a program is actually executing
Initiator	Software and Architecture
Further Explanations	The worst case execution time of a piece of software is the maximum possible time during which the CPU is executing instructions which belong to this piece. The worst case execution time is often identified by analytical methods. It is required to determine if a schedule meets the overall timing requirements. Abbreviation: WCET See also: response time, execution time, worst case response time
Comment	This definition has been extended by WP COM
Example	--
Reference	--

3.315 Worst Case Response Time

Definition	Maximum possible time between receiving a stimulus and delivering an appropriate response or reaction.
Initiator	Software and Architecture
Further Explanations	The worst case response time describes the maximum possible time between a stimulus like e.g. the state change of hardware or software entity and the expected reaction of the system (e.g. response, actuator activation). Typically: worst-case execution-time + infrastructure-overhead + scheduling-policy = worst-case reaction time Synonym: worst case reaction time See also: response time, execution time, worst case execution time
Comment	Worst case reaction time was renamed to worst case response time because response time is the more common terminology. This definition has been extended by WP COM.
Example	--
Reference	--

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