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Document Change History			
Date	**Version**	**Changed by**	**Change Description**
31.01.2007	1.0.0	AUTOSAR Administration	Initial release

Release Notes

Compatibility considerations with respect to current release

Expected requirements on the BSW Module Description from other AUTOSAR documents may not have been captured yet.

Errata and known deficiencies

This document has not undergone a full review cycle and is therefore released in DRAFT status.

Known and potential problems resulting from known deficiencies

The requirements and their priorities might change in future releases.

Changes planned for next release

The following changes are planned for the next release:

- Perform a full review cycle.

Disclaimer

Advice to users of AUTOSAR Specification Documents:

AUTOSAR Specification Documents may contain exemplary items (exemplary reference models, "use cases", and/or references to exemplary technical solutions, devices, processes or software).
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1 Scope of Document

This document collects the requirements on the template for the Basic Software Module Description Template (BSWMD). The main goal of the BSWMD is to provide information about implementations of BSW modules to support the integration on an ECU. Another use-case is the support of the conformance tests of BSW modules.
In Figure 1-1 the inputs to the ECU Configuration are shown:

- 'Collection of Available Software Components' contains references to all the descriptions of Software Components mapped to this specific ECU
- 'ECU Extract of System Configuration' contains the subset of the System Configuration which is relevant for this specific ECU. This includes the communication matrix and the data to signal mapping.
- 'BSW Module Description' (requirements are collected in this document).

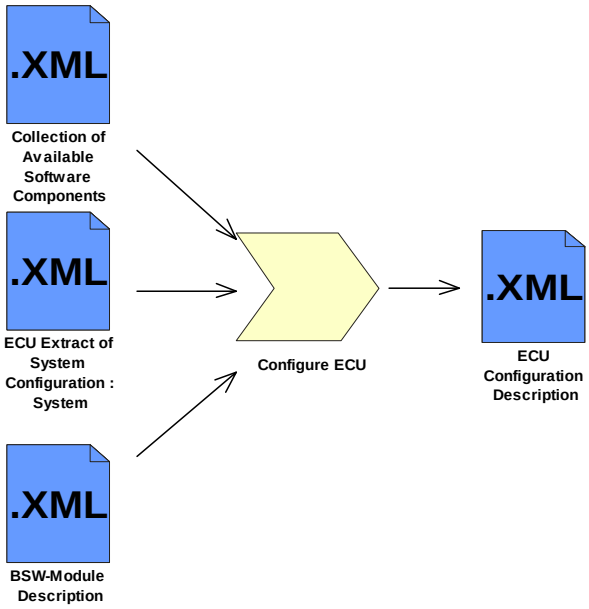

Figure 1-1: Overview ECU Configuration

The requirements are structured in the following sections:

- General Requirements: overall goal of the BSWMD and requirements how to develop the BSWMD format
- Published Information: these are the requirements which information needs to be provided on a BSW Module implementation
- Resources: To allow a resource estimation the needed resources have to be described for the BSW Module.

2 Conventions to be used

- In requirements, the following specific semantics shall be used (based on the Internet Engineering Task Force IETF).

  The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as:

  - SHALL: This word means that the definition is an absolute requirement of the specification.
  - SHALL NOT: This phrase means that the definition is an absolute prohibition of the specification.
  - MUST: This word means that the definition is an absolute requirement of the specification due to legal issues.
  - MUST NOT: This phrase means that the definition is an absolute prohibition of the specification due to legal constraints.
  - SHOULD: This word, or the adjective "RECOMMENDED", mean that there may exist valid reasons in particular circumstances to ignore a particular item, but the full implications must be understood and carefully weighed before choosing a different course.
  - SHOULD NOT: This phrase, or the phrase "NOT RECOMMENDED" mean that there may exist valid reasons in particular circumstances when the particular behavior is acceptable or even useful, but the full implications should be understood and the case carefully weighed before implementing any behavior described with this label.
  - MAY: This word, or the adjective „OPTIONAL“, means that an item is truly optional. One vendor may choose to include the item because a particular marketplace requires it or because the vendor feels that it enhances the product while another vendor may omit the same item. An implementation, which does not include a particular option, MUST be prepared to interoperate with another implementation, which does include the option, though perhaps with reduced functionality. In the same vein an implementation, which does include a particular option, MUST be prepared to interoperate with another implementation, which does not include the option (except, of course, for the feature the option provides.)

3 Related Documentation

3.1 Input Documents

The following input documents have been used in the development of these requirements:

- General Requirements on Basic Software Modules [2]
- AUTOSAR RTE Software Requirement Specification [3]
- AUTOSAR Methodology [9]
- AUTOSAR Glossary [1]
- Technical Overview [10]
- AUTOSAR Template UML Profile and Modeling Guide [5]
- AUTOSAR Model Persistence Rules for XML [6]

3.2 Specification Documents

The requirements collected in this document will be satisfied by two specification documents:

- Specification of the BSW Module Description Template
  This document implements most of the requirements stated here.
- ECU Configuration Specification [12]
  This document provides the outline of the configuration methodology and the development guidelines for the ECU Configuration Parameters.

3.3 Abbreviations

Abbreviation	***Meaning***
BSW	Basic Software
BSWMD	Basic Software Module Description
ECUC	ECU Configuration
SW-C	Software Component

4 Requirements on ECU Configuration

4.1 Functional Requirements

4.1.1 Requirements on the Template

4.1.1.1 [BSWMD0001] Main source of information on BSW Module configuration and integration

Initiator:	WP4.1.1.2
Date:	23.03.2005
Short Description:	Main source of information on BSW Module configuration and integration
Type:	new
Importance:	medium
Description:	The BSWMD shall provide means to describe - or reference to - the information needed for configuration and integration of a BSW Module or cluster of BSW Modules. This description formats SHALL be used for the configuration and integration along with the relevant BSW SWS documents. The needed content of the description is specified by this requirement specification.
Rationale:	By selecting the BSWMD of a BSW Module's implementation, the necessary information for the configuration and integration of that module shall be available. When delivering several BSW Modules in a cluster the BSWMD shall support the integration of this cluster. However this description format might not formalize all aspects needed for taking integration decisions (e.g. scheduling).
Use Case:	To be able to exchange BSW Modules from different vendors only the specified information can be used during the integration.
Dependencies:	[BSWMD0014]
Conflicts:	None identified.
Supporting Material:	None identified.

4.1.1.2 [BSWMD0008] BSW description template shall be tool processable

Initiator:	WP4.1.1.2
Date:	04.04.2005
Short Description:	BSW description template shall be tool processable
Type:	new
Importance:	high
Description:	Work products based on the BSWMD template shall be readable and processable by configuration tools.
Rationale:	The configuration of an ECU shall be supported by tools.
Use Case:	ECU Configuration will have to have tool support.
Dependencies:	None identified.
Conflicts:	None identified.
Supporting Material:	BSW159 [2]

4.1.1.3 [BSWMD0028] Development according to the AUTOSAR Metamodeling Guide

Initiator:	WP4.1.1.2
Date:	29.07.2005
Short Description:	Development according to the AUTOSAR Metamodeling Guide
Type:	new
Importance:	high
Description:	The UML representation of the BSWMD shall be developed according to the AUTOSAR Metamodeling Guide.
Rationale:	The experience and tools already available for the AUTOSAR Metamodeling shall be reused.
Use Case:	The template for the BSWMD is similar to other templates already done with the AUTOSAR Metamodeling Guide.
Dependencies:	None identified.
Conflicts:	None identified.
Supporting Material:	Template UML Profile and Modeling Guide [5]

4.1.1.4 [BSWMD0029] Transformation of BSWMD modeling according to the AUTOSAR Model Persistence Rules for XML

Initiator:	WP4.1.1.2
Date:	26.07.2005
Short Description:	Transformation of BSWMD modeling according to the AUTOSAR Model Persistence Rules for XML
Type:	new
Importance:	high
Description:	The XML representation for the BSWMD Template shall be derived from its UML representation according to the AUTOSAR Model Persistence Rules for XML.
Rationale:	The experience and tools already available for the AUTOSAR Modeling shall be reused.
Use Case:	The template for the BSWMD is similar to other templates already done with the AUTOSAR Metamodeling Guide.
Dependencies:	None identified.
Conflicts:	None identified.
Supporting Material:	Model Persistence Rules for XML [6]

4.1.2 Published Information

4.1.2.1 [BSWMD0043] Support description of common published information

Initiator:	TemplateTeam
Date:	23.01.2007
Short Description:	Support description of common published information
Type:	new
Importance:	high
Description:	The common published information provided by BSW module implementations according to the respective BSW SWS shall be part of the BSWMD template and thus be made tool readable.
Rationale:	Configuration tools shall be able to read the common published information of a BSW implementation as configuration parameters may depend on common published information.
Use Case:	Providing common published information like: Module VERSION, REVISION number or AUTOSAR specification number.

Dependencies:	None identified.
Conflicts:	None identified.
Supporting Material:	None identified.

4.1.2.2 [BSWMD0024] Support description of module specific published information

Initiator:	WP4.1.1.2
Date:	23.03.2005
Short Description:	Support description of module specific published information
Type:	new
Importance:	high
Description:	The module specific published information provided by BSW module implementations according to the respective BSW SWS shall be part of the BSWMD template and thus be made tool readable.
Rationale:	Configuration tools shall be able to read the published information of a BSW implementation as parameter configuration may depend on published information.
Use Case:	Giving values for the hardware influenced information like: EEPROM-ERASE-TIME or the width (uint8, 16, 32) of API parameters like EEP-IF-ADDRESSTYPE.
Dependencies:	None identified.
Conflicts:	None identified.
Supporting Material:	None identified.

4.1.2.3 [BSWMD0039] Identification of implemented API functions

Initiator:	WP4.2.2.3
Date:	04.12.2006
Short Description:	Identification of implemented API functions
Type:	new
Importance:	high
Description:	Describes which API functions
Rationale:	The specifications of the BSW modules allow implementing only a subset of the specified APIs. Which subset is actually implemented shall be described.
Use Case:	
Dependencies:	[BSWMD0040] [BSWMD0041]
Conflicts:	None identified.
Supporting Material:	None identified.

4.1.2.4 [BSWMD0040] Identification of required API functions

Initiator:	WP4.2.2.3
Date:	04.12.2006
Short Description:	Identification of required API functions
Type:	new
Importance:	high
Description:	Describes which API functions of other modules this implementation requires.
Rationale:	The required API functions are described on module level. For the call-chain dependencies refer to [BSWMD0047].
Use Case:	Check whether the provided API functions of other modules match the

	requirements of the BSW module implementation.
Dependencies:	[BSWMD0039] [BSWMD0041] [BSWMD0047]
Conflicts:	None identified.
Supporting Material:	None identified.

4.1.2.5 [BSWMD0041] Declaration of the provided API argument data types

Initiator:	WP4.2.2.3
Date:	04.12.2006
Short Description:	Declaration of the provided API argument data types
Type:	new
Importance:	high
Description:	Description of the actual data types used by the implementation for API function arguments and configuration parameters which have been left open in the specification documents.
Rationale:	The specifications of the BSW modules in some cases do not fix the data type to be used for the implementation. To allow the integration these actual data types need to be described.
Use Case:	
Dependencies:	None identified.
Conflicts:	None identified.
Supporting Material:	None identified.

4.1.2.6 [BSWMD0042] Description of the required API argument data types

Initiator:	WP4.2.2.3
Date:	04.12.2006
Short Description:	Description of the required API argument data types
Type:	new
Importance:	high
Description:	Description of the actual data types required by the implementation for API function arguments which have been left open in the specification documents.
Rationale:	The specifications of the BSW modules in some cases do not fix the data type to be used for the implementation. To allow the integration these actual data types need to be described.
Use Case:	
Dependencies:	None identified.
Conflicts:	None identified.
Supporting Material:	None identified.

4.1.2.7 [BSWMD0011] Guaranteed execution context of API calls

Initiator:	WP4.1.1.2
Date:	18.03.2005
Short Description:	Guaranteed execution context of API calls
Type:	new
Importance:	high
Description:	For API calls to other modules it shall be possible to describe whether the call will be executed in interrupt context by the caller.
Rationale:	If both, the caller and the callee specify the context of the call it is possible to

	detect invalid call chains during ECU configuration. If a call is happening in interrupt context it has some restrictions on execution time and available instructions. The RTE Generator needs to know the context of calls from the BSW services to be able to decouple interrupt context from the application SW-Components.
Use Case:	The Com module expects the notifications from PduR happening in task context, but the PduR just handles the interrupt context which is coming from the CanIf. This is an invalid configuration and should be detected.
Dependencies:	[BSWMD0038] [BSWMD0040]
Conflicts:	None identified.
Supporting Material:	None identified.

4.1.2.8 [BSWMD0038] Required execution context of API calls

Initiator:	WP4.1.1.2
Date:	11.10.2006
Short Description:	Required execution context of API calls
Type:	new
Importance:	high
Description:	A BSW Module shall be able to define for each provided API function in which context it shall be invoked.
Rationale:	If both, the caller and the callee specify the context of the call it is possible to detect invalid call chains during ECU configuration.
Use Case:	The Com module expects the notifications from PduR happening in task context, but the PduR just handles the interrupt context which is coming from the CanIf. This is an invalid configuration and should be detected.
Dependencies:	[BSWMD0011] [BSWMD0039]
Conflicts:	None identified.
Supporting Material:	None identified.

4.1.2.9 [BSWMD0010] Compiler version and settings

Initiator:	WP4.1.1.2
Date:	18.04.2005
Short Description:	Compiler version and settings
Type:	new
Importance:	high
Description:	It shall be possible to describe the actual compiler (vendor, version), and its settings, which has been used for object code delivery or which needs to be used for source code delivery.
Rationale:	When BSW is delivered as object code the integrator needs to know how the object code has been compiled. If it is delivered as source code, the code is often provided for specific compilers and versions.
Use Case:	See Rationale.
Dependencies:	None identified.
Conflicts:	None identified.
Supporting Material:	None identified.

4.1.2.10 [BSWMD0037] Needed libraries

Initiator:	WP4.1.1.2
Date:	11.10.2006
Short Description:	Needed libraries
Type:	new
Importance:	high
Description:	It shall be possible to describe which libraries (vendor and version) have been used for object code deliveries or which need to be included for source code deliveries.
Rationale:	When BSW is delivered as object code the integrator needs to know how the object code has to be integrated. If it is delivered as source code, the code may need a specific version of included libraries only.
Use Case:	See Rationale.
Dependencies:	None identified.
Conflicts:	None identified.
Supporting Material:	None identified.

4.1.2.11 [BSWMD0034] Configuration Editor and Generation required tool version information

Initiator:	TemplateTeam
Date:	19.09.2006
Short Description:	Configuration Editor and Generation required tool version information
Type:	new
Importance:	medium
Description:	It shall be possible to describe the required configuration editor and generator (vendor, version) and its settings.
Rationale:	When BSW is delivered as the integrator needs to know which editing and generation tools can be used to configure the BSW.
Use Case:	See Rationale.
Dependencies:	None identified.
Conflicts:	None identified.
Supporting Material:	None identified.

4.1.2.12 [BSWMD0013] Describe configuration class of configuration parameters

Initiator:	WP4.1.1.2
Date:	21.04.2005
Short Description:	Describe configuration class of configuration parameters
Type:	new
Importance:	high
Description:	When the actual implementation of a BSWM has the freedom to choose the configuration class (pre-compile, link-time, post-build) it shall be possible to describe which alternative has been chosen.
Rationale:	A configuration parameter needs to be handled differently depending on its configuration class.
Use Case:	
Dependencies:	None identified.

Conflicts:	AUTOSAR needs to decide whether the freedom to implement configuration parameters differently is available
Supporting Material:	None identified.

4.1.2.13 [BSWMD0025] Support for shipment information

Initiator:	WP4.1.1.2
Date:	26.07.2005
Short Description:	Support for shipment information
Type:	new
Importance:	medium
Description:	The BSWMD shall support the description which files (source, object, documentation) are included in the delivery of the software module.
Rationale:	Describe which artifacts are shipped in the delivery of the BSW module.
Use Case:	Check for completeness of the delivered artifacts.
Dependencies:	[BSWMD0044]
Conflicts:	None identified.
Supporting Material:	None identified.

4.1.2.14 [BSWMD0044] Description of generated artifacts [open]

Initiator:	TemplateTeam
Date:	23.01.2007
Short Description:	Description of generated artifacts
Type:	new
Importance:	medium
Description:	Support the description of which artifacts a generation tool will create.
Rationale:	The knowledge on which artifacts (header- and c-files, documentation) are generated by the BSW module's generation tool does support integration and build process.
Use Case:	Generate the make-file based on the information from [BSWMD0025] and the generated artifacts.
Dependencies:	[BSWMD0025]
Conflicts:	None identified.
Supporting Material:	None identified.

4.1.2.15 [BSWMD0014] Support of BSW Module clusters

Initiator:	WP4.1.1.2
Date:	03.05.2005
Short Description:	Support of BSW Module clusters
Type:	new
Importance:	high
Description:	Support the description of BSW Module clusters (ICC2) which implement several BSW Modules.
Rationale:	AUTOSAR allows integrating several BSW Modules in a single cluster, treating this BSW Module cluster as one entity.
Use Case:	Delivery of complete COM stack in a single implementation.
Dependencies:	None identified.
Conflicts:	None identified.

Supporting Material:	None identified.

4.1.2.16 [BSWMD0033] Pre-configured Configuration

Initiator:	WP4.1.1.2
Date:	07.02.2006
Short Description:	Pre-configured configuration
Type:	new
Importance:	high
Description:	The BSWMD template shall allow defining a (partial) module configuration description that may hold values for those parameters that are fixed by the implementation.
Rationale:	This pre-configured configuration must be copied into the ECU Configuration Description as part of the base module configuration, once the module implementation has been chosen. It contains values which cannot be altered by the BSW module integrator, since they are fixed by the implementation.
Use Case:	A value may be fixed for different reasons. E.g. all pre-compile parameters are fixed in object code deliveries.
Dependencies:	None identified.
Conflicts:	Currently there are no means to actually forbid the changing of these values, TT needs to investigate a solution here.
Supporting Material:	None identified.

4.1.2.17 [BSWMD0032] Recommended Configuration

Initiator:	WP4.1.1.2
Date:	07.02.2006
Short Description:	Recommended Configuration
Type:	new
Importance:	low
Description:	The BSWMD template shall allow to define a (partial) module configuration that may hold recommended values for parameters.
Rationale:	This configuration may hold the configuration values recommended by the implementer and may be copied into the ECU configuration description as base module configuration, once the module implementation has been chosen. A recommended configuration is more flexible than default values, since it allows to define several container instances with different parameter settings in each container.
Use Case:	Allow BSW vendors to deliver a partial or complete configuration of the module together with the implementation. This eases the work of the integrator who only needs to fill in the missing configuration.
Dependencies:	None identified.
Conflicts:	None identified.
Supporting Material:	None identified.

4.1.2.18 [BSWMD0035] Provide standardized ECU Configuration Parameter Definition

Initiator:	TemplateTeam

Date:	19.09.2006
Short Description:	Provide standardized ECU Configuration Parameter Definition
Type:	new
Importance:	high
Description:	The BSWMD shall contain the definition for the module's standardized ECU Configuration Parameters. The parameters shall be defined in the format used for the ECUC Parameter Definition.
Rationale:	The standardized ECU Configuration Parameters are the base for the configuration of the BSW Modules. Each BSW Module need to provide information which standardized ECU Configuration Parameter Definition shall be used for configuration.
Use Case:	Provide information which standardized ECU Configuration Parameter Definition is used with a certain BSW Module implementation.
Dependencies:	None identified.
Conflicts:	None identified.
Supporting Material:	None identified.

4.1.2.19 [BSWMD0027] Provide vendor-specific ECU Configuration Parameter Definition

Initiator:	WP4.1.1.2
Date:	26.07.2005
Short Description:	Provide vendor-specific ECU Configuration Parameter Definition
Type:	new
Importance:	high
Description:	The BSWMD shall contain the definition for the module's vendor-specific ECU Configuration Parameters together with the standardized ECU Configuration Parameters.
Rationale:	Extending all standardized parameter definitions in the BSWMD has several advantages: • Both, vendor-specific and standardized parameters, are held together in the BSWMD • The BSW implementer may adapt the parameter definition for the standardized parameters to his needs (e.g. restrict the multiplicity or range of a parameter) • Generic configuration tools can view and possibly change vendor-specific configuration parameters
Use Case:	For simple vendor-specific configuration parameters there is no need for a custom configuration editor, so a generic configuration editor could be used.
Dependencies:	For the definition of vendor-specific parameters the ECU Configuration Parameter Definition template SHALL be used.
Conflicts:	None identified.
Supporting Material:	None identified.

4.1.2.20 [BSWMD0007] Support of vendor-specific information

Initiator:	WP4.1.1.2
Date:	04.04.2005
Short Description:	Support of vendor-specific information
Type:	new
Importance:	low
Description:	BSWMD template shall support the definition of vendor-specific published

	information.
Rationale:	Vendors may want to publish proprietary information for usage in their tool chain.
Use Case:	If vendor-specific configuration parameters are allowed in the ECUC template then their configuration could be supported by vendor-specific published information stored in the BSW description template.
Dependencies:	None identified.
Conflicts:	This is diluting the standard; however there is a need for such extensions.
Supporting Material:	ECUC0002 [11]

4.1.2.21 [BSWMD0047] Modeling of call-chain dependencies between BSW Modules

Initiator:	TemplateTeam
Date:	23.01.2007
Short Description:	Modeling of call-chain dependencies between BSW Modules
Type:	new
Importance:	medium
Description:	It shall be possible to describe which other API functions are invoked by a function.
Rationale:	Needed for the development and configuration of BSW Modules. Needed when the OS is configured since OS resources must be mapped to the tasks that utilize them.
Use Case:	Derive which OS resources are used when a main function is invoked and this main function is invoking another API function, and so on.
Dependencies:	[BSWMD0019] [BSWMD0046]
Conflicts:	None identified.
Supporting Material:	None identified.

4.1.2.22 [BSWMD0019] Modeling of Dataflow dependencies between BSW Modules

Initiator:	WP4.1.1.2
Date:	27.05.2005
Short Description:	Modeling of Dataflow dependencies between BSW Modules
Type:	new
Importance:	low
Description:	Dataflow dependencies between the functions of the same and different BSW Modules in a given configuration shall be described.
Rationale:	To allow the analysis of the data flow within and between BSW Modules.
Use Case:	Development/Configuration of BSW Modules.
Dependencies:	[BSWMD0011] [BSWMD0038] [BSWMD0047]
Conflicts:	None identified.
Supporting Material:	None identified.

4.1.3 Resources

4.1.3.1 [BSWMD0005] Description of the memory needs of the BSW Module implementation

Initiator:	WP4.1.1.2
Date:	23.03.2005
Short Description:	Description of the memory needs of the BSW Module implementation
Type:	new
Importance:	low
Description:	The BSWMD template shall support the description of the memory needs of an implementation of a BSW Module. Also specification of the quality (e.g. estimate, measurement, analysis) of these values shall be supported. The memory requirements of the defined memory sections shall be described individually.
Rationale:	Resource estimations/measurements are needed to design & configure the ECU.
Use Case:	The ROM utilization of BSW modules delivered as object code is typically fixed and can be stated in the BSWMD. In most cases the memory needs are dependent on the actual configuration and can only be estimated.
Dependencies:	[BSWMD0031]
Conflicts:	None identified.
Supporting Material:	None identified.

4.1.3.2 [BSWMD0031] Description of used memory section names

Initiator:	WP4.1.1.2
Date:	25.02.2005
Short Description:	Description of used memory section names
Type:	new
Importance:	high
Description:	Support the description of memory section names which have been used while developing/compiling the BSW module.
Rationale:	With the usage of memory section names it is possible to partition the software into several sections which will be placed into memory sections on the ECU in the ECU Configuration.
Use Case:	The ECU State Manager implementation uses the memory section NOINIT to indicate which declared variables shall not be initialized during ECU startup. It is up to the ECU Configuration to actually map this section in an appropriate memory section on the ECU which satisfies this requirement.
Dependencies:	ECUC0068 [11], [BSWMD0005]
Conflicts:	None identified.
Supporting Material:	Specification of Memory Mapping [7]

4.1.3.3 [BSWMD0009] Description of peripheral register usage

Initiator:	WP4.1.1.2
Date:	04.04.2005
Short Description:	Description of peripheral register usage
Type:	new
Importance:	medium
Description:	The BSW description template shall support configuration tools in determining conflicts between different BSW modules accessing the same

	peripheral register. In some cases these needs are dependent on the actual configuration (no formula should be provided in that case!).
Rationale:	BSW module implementations from different vendors may use conflicting configuration of peripheral registers. When these BSW modules are integrated in the same ECU then the configuration tool should detect these conflicts and alert the user.
Use Case:	Two BSW module implementations both writing to the same microcontroller register but using a different setting. Conflict must be identified.
Dependencies:	None identified.
Conflicts:	None identified.
Supporting Material:	None identified.

4.1.3.4 [BSWMD0015] Timing requirements

Initiator:	WP4.1.1.2
Date:	23.03.2005
Short Description:	Timing requirements
Type:	new
Importance:	low
Description:	The BSWMD shall allow specifying the timing requirements on functions called in other modules such as callback functions.
Rationale:	To be able to do timing analysis of Application SW-Components, the BSW needs to define timing requirements additional to the Timing guarantees [BSWMD0016].
Use Case:	
Dependencies:	SW-Component template requirement CONTENT080
Conflicts:	None identified.
Supporting Material:	None identified.

4.1.3.5 [BSWMD0016] Timing guarantees

Initiator:	WP4.1.1.2
Date:	23.03.2005
Short Description:	Timing guarantees
Type:	new
Importance:	low
Description:	The BSWMD shall allow specifying the guaranteed or estimated reaction time of the BSW module functions (main functions and API calls incl. callbacks & ISR).
Rationale:	To be able to do timing analysis of Application SW-Components, the BSW needs to define timing guarantees.
Use Case:	
Dependencies:	SW-Component template requirement CONTENT080
Conflicts:	None identified.
Supporting Material:	None identified.

4.1.3.6 [BSWMD0030] Publish resources needed from the BSW Scheduler

Initiator:	WP4.1.1.2

Date:	21.09.2005
Short Description:	Publish resources needed from the BSW Scheduler
Type:	new
Importance:	high
Description:	BSW modules shall publish resources used by the implementation which need to be provided and integrated by the BSW Scheduler module.
Rationale:	Specific BSW module implementations may use different OS resources like alarms, tasks, interrupts, counters etc. or have main functions which need to be scheduled. The resource usage must be published in order to allow configuration tools to identify conflicts or unused resources. The BSW Scheduler module is responsible to provide such resources and need information how to integrate the BSW module's main functions.
Use Case:	A BSWM implementation may use an OS resource like alarms, tasks, interrupts, counters etc. These OS resources are allowed to use (accessible) by that BSWM must be verified. But the needed resources are not limited to OS resources.
Dependencies:	[BSWMD0046]
Conflicts:	None identified.
Supporting Material:	None identified.

4.1.3.7 [BSWMD0046] Publish OS resource usage

Initiator:	TemplateTeam
Date:	23.01.2007
Short Description:	Publish OS resource usage
Type:	new
Importance:	medium
Description:	For every function (main, API, ISR) it shall be possible to describe the OS resources used within the function.
Rationale:	To configure the OS correctly the access to OS resources has to be specified for every function. The BSW Scheduler must be able to resolve the task context in which any OS resource may be used.
Use Case:	Configure the OS with the right OS resource accesses.
Dependencies:	[BSWMD0030] [BSWMD0047]
Conflicts:	None identified.
Supporting Material:	None identified.

4.1.3.8 [BSWMD0045] Publish resources needed from AUTOSAR Services

Initiator:	TemplateTeam
Date:	23.01.2007
Short Description:	Publish resources needed from AUTOSAR Services
Type:	new
Importance:	medium
Description:	If a BSW module needs resources from AUTOSAR Services the needs have to be described.
Rationale:	To allow the configuration of the AUTOSAR Services the needs from BSW and Application SW Components have to be captured.
Use Case:	When a BSW module requires some NVRAM space it has to provide a description of the attributes this NVRAM has to have.
Dependencies:	None identified.
Conflicts:	None identified.

Supporting Material:	None identified.

4.1.3.9 [BSWMD0026] Description of supported hardware

Initiator:	WP4.1.1.2
Date:	26.07.2005
Short Description:	Description of supported hardware
Type:	new
Importance:	medium
Description:	For software modules that are hardware dependent (like the drivers) the supported hardware shall be describable.
Rationale:	Certain software modules can only be integrated on specific hardware.
Use Case:	When the supported hardware is specified a selection of drivers for a certain hardware can be provided.
Dependencies:	The characterization should be done by referencing the ECU Resource Description.
Conflicts:	None identified.
Supporting Material:	None identified.

5 References

[1] Glossary,
https://svn.autosar.org/repos/10Releases/
AUTOSAR_Glossary.pdf

[2] General Requirements on Basic Software Modules,
https://svn.autosar.org/repos/10Releases/
AUTOSAR_SRS_General.pdf

[3] Requirements on RTE Software,
https://svn.autosar.org/repos/10Releases/
AUTOSAR_SRS_RTE.pdf

[4] Requirements on Basic Software Module Description,
https://svn.autosar.org/repos/10Releases/
AUTOSAR_RS_BSW_ModuleDescription.pdf

[5] Template UML Profile and Modeling Guide,
https://svn.autosar.org/repos/10Releases/
AUTOSAR_TemplateModelingGuide.pdf

[6] Model Persistence Rules for XML,
https://svn.autosar.org/repos/10Releases/
AUTOSAR_ModelPersistenceRulesXML.pdf

[7] Specification of Memory Mapping,
https://svn.autosar.org/repos/10Releases/
AUTOSAR_SWS_MemoryMapping.pdf

[8] Software Component Template,
https://svn.autosar.org/repos/10Releases/
AUTOSAR_SoftwareComponentTemplate.pdf

[9] Methodology,
https://svn.autosar.org/repos/10Releases/
AUTOSAR_Methodology.pdf

[10] Technical Overview,
https://svn.autosar.org/repos/10Releases/
AUTOSAR_TechnicalOverview.pdf

[11] Requirements on ECU Configuration,
https://svn.autosar.org/repos/10Releases/
AUTOSAR_RS_ECU_Configuration.pdf

[12] Specification of ECU Configuration,
https://svn.autosar.org/repos/10Releases/
AUTOSAR_ECU_Configuration.pdf

[13] Specification of ECU Configuration Parameters,
https://svn.autosar.org/repos/10Releases/
AUTOSAR_SWS_ECU_ConfigationParameters.pdf