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1 Introduction and functional overview

This specification describes the functionality, API and the configuration for the AUTOSAR Basic Software module BulkNvDataManager.

The demand of non-volatile bulk data is increasing for use-case like variant-coding¹. Such data is used frequently, but rarely updated. The BulkNvDataManager offers in contrast to the NvM an API to read the data directly from flash memory. In consequence a RAM mirror is avoided, but the writing of the data is more complex.

Remark: The whole memory stack in AUTOSAR Classic Platform will have a systematic review within the upcoming release 20/11. This could result in a changed architecture like the integration of the BndM functionality into NvM.

2 Acronyms and Abbreviations

The glossary below includes acronyms and abbreviations relevant to the BulkNvDataManager that are not included in the [1, AUTOSAR glossary].

3 Related documentation

3.1 Input documents & related standards and norms

- [1] Glossary
AUTOSAR_TR_Glossary
- [2] General Specification of Basic Software Modules
AUTOSAR_SWS_BSWGeneral

3.2 Related specification

AUTOSAR provides a General Specification on Basic Software modules [2, SWS BSW General], which is also valid for BulkNvDataManager.

Thus, the specification SWS BSW General shall be considered as additional and required specification for BulkNvDataManager.

¹Variant coding is a vehicle specific dataset which is calculated in the production for each vehicle (and of course stored in the production).

4 Constraints and assumptions

4.1 Limitations

The synchronization of a potential parallel access (e.g. FlashEEPROMEmulation) to the underlying flash driver is not part of this AUTOSAR release.

4.2 Applicability to car domains

5 Dependencies to other modules

This module depends on the capabilities of the underlying flash driver.

6 Requirements Tracing

The following tables reference the requirements specified in <CITATIONS_OF_CONTRIBUTED_DOCUMENTS> and links to the fulfillment of these. Please note that if column “Satisfied by” is empty for a specific requirement this means that this requirement is not fulfilled by this document.

Requirement	Description	Satisfied by
[RS_Diag_04243]	Update of constant parameters through diagnostics	[SWS_BNDM_00001] [SWS_BNDM_00002] [SWS_BNDM_00003] [SWS_BNDM_00004] [SWS_BNDM_00005] [SWS_BNDM_00007] [SWS_BNDM_00008] [SWS_BNDM_00009] [SWS_BNDM_00010] [SWS_BNDM_00011] [SWS_BNDM_00012] [SWS_BNDM_00013] [SWS_BNDM_00014]

7 Functional specification

In general the concept how the BulkNvDataManager will manage its flash memory is vendor-specific.

The base idea is to have an A/B switching of the data blocks. This means the complete Bulk NvData will be stored in partition A. When the writing is started ([BndM_WriteStart](#)) the B partition needs to be erased. The updated blocks ([BndM_WriteBlock](#))

will be written to partition B. The finalization (`BndM_WriteFinalize`) will finally make partition B consistent (e.g. by coping the not updated blocks over to partition B) and switch the active partition to B (further calls to `BndM_GetBlockPtr` will point to the data in the partition B). Nevertheless the vendor solution could consider alternative solutions like an update through a FlashBootloader.

[SWS_BNDM_00001]{DRAFT} [The BndM shall manage its BndM blocks (`BndM_BlockDescriptor`) in the direct accessible memory (i.e. via pointer).] (*RS_Diag_04243*)

[SWS_BNDM_00002]{DRAFT} [A call of `BndM_GetBlockPtr` shall deliver the base pointer to the corresponding BndM block (`BndMBlockDescriptor`) in the currently active partition.] (*RS_Diag_04243*)

[SWS_BNDM_00003]{DRAFT} [A call of `BndM_WriteStart` shall trigger the preparation of the 2nd (free) partition.] (*RS_Diag_04243*)

Note: Depending on the implemented strategy the preparation takes more time. This could be coordinated within the `BndM_MainFunction`. Note: In case of direct writing access to flash the flash-page needs to be erased.

Caveat: Depending on the hardware a parallel read and write access to code flash is not possible. In this case the overall ECU needs to be in a writing mode (e.g. Flash-Bootloader context or all other tasks are interrupted/stopped).

[SWS_BNDM_00007]{DRAFT} [After preparation of the 2nd (free) partition **[SWS_BNDM_00003]** is successfully finished (writing to the 2nd partition is possible) the callback `Xxx_WriteStartFinish` with the result set to `E_OK` shall be triggered in the context of the `BndM_MainFunction`.] (*RS_Diag_04243*)

[SWS_BNDM_00014]{DRAFT} [A call of `BndM_WriteStart` shall be rejected with the errorCode `E_NOT_OK`, if the call is done within an active writing phase (phase between `BndM_WriteStart` and `BndM_WriteFinalize`).] (*RS_Diag_04243*)

[SWS_BNDM_00004]{DRAFT} [A call of `BndM_WriteBlock` shall trigger the writing of the data to the 2nd (unused) partition. The data (`ImplementationDataType`) shall be not modified to allow a pointer access.] (*RS_Diag_04243*)

[SWS_BNDM_00008]{DRAFT} [After writing of **[SWS_BNDM_00004]** the 2nd (free) partition is finished the callback `Xxx_WriteBlockFinish` with the result set to `E_OK` shall be triggered in the context of the `BndM_MainFunction`.] (*RS_Diag_04243*)

[SWS_BNDM_00011]{DRAFT} [A call of `BndM_WriteBlock` shall be rejected with the errorCode `E_NOT_OK`, if the call is done without a previous call of `BndM_WriteStart`. or while another writing of the same or another block is ongoing or the call is done within the finalization mode of the BndM.] (*RS_Diag_04243*)

[SWS_BNDM_00012]{DRAFT} [A call of `BndM_WriteBlock` shall be rejected with the errorCode `E_NOT_OK`, if the call is done while another writing of the same or another block is ongoing.] (*RS_Diag_04243*)

[SWS_BNDM_00013]{DRAFT} [A call of `BndM_WriteBlock` shall be rejected with the `errorCode` `E_NOT_OK`, if the call is done within or after the finalization mode of the `BndM`.] (*RS_Diag_04243*)

[SWS_BNDM_00005]{DRAFT} [A call of `BndM_WriteFinalize` shall trigger the finalization of the 2nd (unused) partition. In background the `BndM` shall make the 2nd (unused) partition consistent by coping all unchanged `BndMBlockDescriptor` to the 2nd (unused) partition. If the finalization is successful the `BndM` shall make the 2nd (unused) partition to the active partition and trigger the callback `Xxx_WriteFinalizeFinish` with the result set to `E_OK`.] (*RS_Diag_04243*) Note: Further calls to `BndM_GetBlockPtr` will point to the data in the 2nd (now active) partition after the finalization is successful.

[SWS_BNDM_00009]{DRAFT} [If the finalization is NOT successful (the 2nd partition is not consistent and could therefore not be used) the `BndM` shall keep the current active partition as the active partition and trigger the callback `Xxx_WriteFinalizeFinish` with the result set to `E_NOT_OK`.] (*RS_Diag_04243*)

[SWS_BNDM_00010]{DRAFT} [A call of `BndM_WriteFinalize` without a previously called `BndM_WriteStart` or within the finalization mode of the `BndM` the DET `BNDM_E_WRONG_SEQUENCE` error shall be thrown.] (*RS_Diag_04243*)

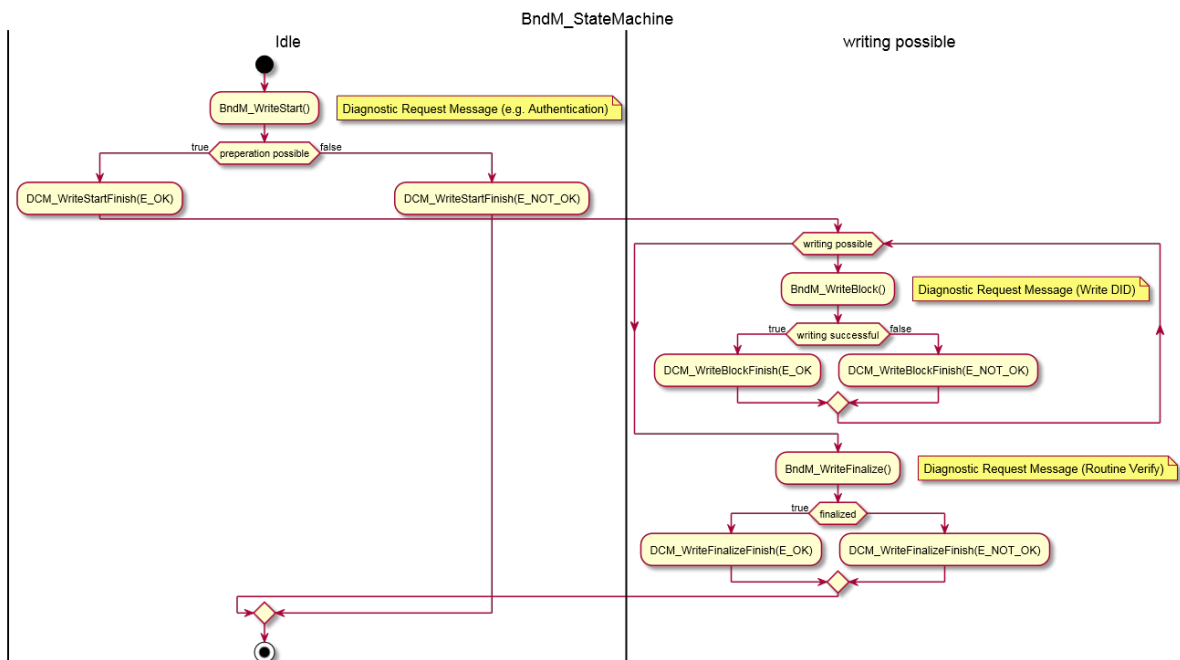


Figure 7.1: Figure BndMStateMachine

7.1 Error Classification

7.1.1 Development Errors

[SWS_BNDM_00006]{DRAFT} [Any API call of BndM with a wrong argument value (e.g. wrong block ID) shall trigger the DET error "API service called with wrong parameter"]()

<i>Type of error</i>	<i>Related error code</i>	<i>Value [hex]</i>
API service called with wrong parameter	BNDM_E_PARAM	0x01
API called in wrong sequence	BNDM_E_WRONG_SEQUENCE	0x02

Table 7.1: Development Error Types for BndM

7.1.2 Runtime Errors

BndM does not have Runtime Errors

7.1.3 Transient Faults

BndM does not have Transient Faults

7.1.4 Production Errors

BndM does not have Production Erros

7.1.5 Extended Production Errors

BndM does not have Extended Production Erros

8 API specification

8.1 Imported types

In this chapter all types included from the following files are listed.

8.2 Type definitions

8.2.1 BndM_ConfigType

[SWS_BNDM_01001]{DRAFT} [

Name	BndM_ConfigType (draft)		
Kind	Structure		
Elements	implementation specific		
	Type	-	
	Comment	-	
Description	This type of the external data structure shall contain the post build initialization data for the BndM. Tags: atp.Status=draft		
Available via	bndm.h		

]()

8.2.2 BndM_BlockIdType

[SWS_BNDM_01002]{DRAFT} [

Name	BndM_BlockIdType (draft)		
Kind	Type		
Derived from	uint16		
Range	0..65535	-	-
Description	Unique identification of an bulk nv block. The BndM_BlockId is assigned by the BndM. Tags: atp.Status=draft		
Available via	bndm.h		

]()

8.2.3 BndM_Block<BlockId.Shortname>Type

[SWS_BNDM_01003]{DRAFT} [

Name	BndM_Block{BlockId.Shortname}Type (draft)		
Kind	Structure		
Description	The elements of this structure data type is the C-structured representation of the configured ImplementationDataPrototype. Tags: atp.Status=draft		
Available via	bndm_externals.h		

]()

8.2.4 BndM_Result

[SWS_BNDM_01017]{DRAFT} [

Name	BndM_ResultType (draft)		
Kind	Type		
Derived from	uint8		
Range	E_OK	0x00	Result of the asynchronous job finish notifications
	E_NOT_OK	0x01	–
Description	Result of the asynchronous job finish notifications Tags: atp.Status=draft		
Available via	bndm.h		

]()

8.3 Function definitions

8.3.1 BndM_Init

[SWS_BNDM_01004]{DRAFT} [

Service Name	BndM_Init (draft)		
Syntax	<pre>void BndM_Init (const BndM_ConfigType* ConfigPtr)</pre>		
Service ID [hex]	0x1		
Sync/Async	Synchronous		
Reentrancy	Non Reentrant		
Parameters (in)	ConfigPtr	Pointer to the configuration set in VARIANT-POST-BUILD.	
Parameters (inout)	None		
Parameters (out)	None		
Return value	None		
Description	Initializes or reinitializes this module. Tags: atp.Status=draft		
Available via	BndM.h		

]()

8.3.2 BndM_GetVersionInfo

[SWS_BNDM_01005]{DRAFT} [

Service Name	BndM_GetVersionInfo (draft)	
Syntax	<pre>void BndM_GetVersionInfo (Std_VersionInfoType* versioninfo)</pre>	
Service ID [hex]	0x2	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	None	
Parameters (inout)	None	
Parameters (out)	versioninfo	Pointer to where to store the version information of this module.
Return value	None	
Description	Returns the version information of this module. API Availability: This API will be available only if (ecuc BndM/BndMGeneral.BndMVersionInfoApi) == true) Tags: atp.Status=draft	
Available via	BndM.h	

]()

8.3.3 BndM_GetBlockPtr

[SWS_BNDM_01006]{DRAFT} [

Service Name	BndM_GetBlockPtr_<BlockId.Shortname> (draft)	
Syntax	<pre>Std_ReturnType BndM_GetBlockPtr_<BlockId.Shortname> (BndM_BlockIdType BlockId, BndM_Block{BlockId.Shortname}Type** BndM_BlockPtr)</pre>	
Service ID [hex]	0x3	
Sync/Async	Synchronous	
Reentrancy	Reentrant Returns an pointer to the structure in flash	
Parameters (in)	BlockId	BlockId
Parameters (inout)	None	
Parameters (out)	BndM_BlockPtr	• BndM_BlockPtr
Return value	Std_ReturnType	-
Description	- Tags: atp.Status=draft	
Available via	BndM_Externals.h	

]()

8.3.4 BndM_WriteStart

[SWS_BNDM_01007]{DRAFT} [

Service Name	BndM_WriteStart (draft)	
Syntax	<pre>Std_ReturnType BndM_WriteStart (void)</pre>	
Service ID [hex]	0x4	
Sync/Async	Asynchronous	
Reentrancy	Non Reentrant	
Parameters (in)	None	
Parameters (inout)	None	
Parameters (out)	None	
Return value	Std_ReturnType	E_OK The preparation request is accepted. E_NOT_OK The preparation request is rejected.
Description	Will trigger the start of writing phase. The finish of asynchronous processing will trigger the callback xxx_WriteFinalizeFinish including the result of this operation. Tags: atp.Status=draft	
Available via	BndM.h	

]()

Note: It is up to the stack-vendor what can run in parallel while the writing to BndM is possible or not (e.g. FEE might not work anymore).

8.3.5 BndM_WriteBlock

[SWS_BNDM_01008]{DRAFT} [

Service Name	BndM_WriteBlock_<BlockId.Shortname> (draft)	
Syntax	<pre>Std_ReturnType BndM_WriteBlock_<BlockId.Shortname> (BndM_BlockIdType BlockId, const BndM_Block{BlockId.Shortname}Type* BndM_SrcPtr)</pre>	
Service ID [hex]	0x5	
Sync/Async	Asynchronous	
Reentrancy	Non Reentrant	
Parameters (in)	BlockId	-
	BndM_SrcPtr	-
Parameters (inout)	None	
Parameters (out)	None	
Return value	Std_ReturnType	E_OK The write request is accepted. E_NOT_OK The write request is rejected.
Description	Will persist the data in flash, that it can later directly accessed via BndM_GetBlockPtr API. The writing take a while and is finished after the successful callback xxx_WriteBlockFinish. Tags: atp.Status=draft	
Available via	BndM_Externals.h	

]()

Note: BndM_WriteStart needs to be called in advance

8.3.6 BndM_WriteFinalize

[SWS_BNDM_01009]{DRAFT} [

Service Name	BndM_WriteFinalize (draft)	
Syntax	<pre>Std_ReturnType BndM_WriteFinalize (void)</pre>	
Service ID [hex]	0x6	
Sync/Async	Asynchronous	
Reentrancy	Reentrant Finalize the writing. After the successful callback xxx_WriteFinalizeFinish the finalization is finished (i.e. the new stored data is available).	
Parameters (in)	None	
Parameters (inout)	None	
Parameters (out)	None	
Return value	Std_ReturnType	E_OK The finalization request is accepted. E_NOT_OK The finalization request is rejected.
Description	Will trigger the finalization of writing phase. The finish of asynchronous processing will trigger the callback xxx_WriteFinalizeFinish including the result of this operation. Tags: atp.Status=draft	
Available via	BndM.h	

]()

8.3.7 BndM_WriteCancel

[SWS_BNDM_01010]{DRAFT} [

Service Name	BndM_WriteCancel (draft)	
Syntax	<pre>void BndM_WriteCancel (void)</pre>	
Service ID [hex]	0x7	
Sync/Async	Asynchronous	
Reentrancy	Reentrant	
Parameters (in)	None	
Parameters (inout)	None	
Parameters (out)	None	
Return value	None	





Description	Cancels the writing Tags: atp.Status=draft
Available via	BndM.h

]()

8.4 Callback notifications

This is a list of functions provided for FLS module.

8.4.1 BndM_JobEndNotification

[SWS_BNDM_01011]{DRAFT} [

Service Name	BndM_JobEndNotification (draft)
Syntax	<pre>void BndM_JobEndNotification (void)</pre>
Service ID [hex]	0x8
Sync/Async	Synchronous
Reentrancy	Non Reentrant
Parameters (in)	None
Parameters (inout)	None
Parameters (out)	None
Return value	None
Description	This callback function is called when a FLS job has been finished with positive result. Tags: atp.Status=draft
Available via	BndM.h

]()

8.4.2 BndM_JobErrorNotification

[SWS_BNDM_01012]{DRAFT} [

Service Name	BndM_JobErrorNotification (draft)
---------------------	-----------------------------------





Syntax	void BndM_JobErrorNotification (void)
Service ID [hex]	0x9
Sync/Async	Synchronous
Reentrancy	Non Reentrant
Parameters (in)	None
Parameters (inout)	None
Parameters (out)	None
Return value	None
Description	This callback function is called when a FLS job has been canceled or finished with negative result. Tags: atp.Status=draft
Available via	BndM.h

]()

8.5 Scheduled functions

These functions are directly called by Basic Software Scheduler. The following functions shall have no return value and no parameter. All functions shall be non re-entrant.

8.5.1 BndM_MainFunction

[SWS_BNDM_01013]{DRAFT} [

Service Name	BndM_MainFunction (draft)
Syntax	void BndM_MainFunction (void)
Service ID [hex]	0x55
Description	Schedule function for the background processing. Tags: atp.Status=draft
Available via	SchM_BndM.h

]()

8.6 Expected interfaces

In this chapter all interfaces required from other modules are listed.

8.6.1 Mandatory interfaces

[SWS_BNDM_01019] [

<i>API Function</i>	<i>Header File</i>	<i>Description</i>
There are no mandatory interfaces.		

]()

Note: This section defines all interfaces, which are required to fulfill the core functionality of the module.

8.6.2 Optional interfaces

This section defines all interfaces, which are required to fulfill an optional functionality of the module.

[SWS_BNDM_01020] [

<i>API Function</i>	<i>Header File</i>	<i>Description</i>
Det_ReportRuntimeError	Det.h	Service to report runtime errors. If a callout has been configured then this callout shall be called.
Fls_Cancel	Fls.h	Cancels an ongoing job.
Fls_Compare	Fls_Com.h	Compares the contents of an area of flash memory with that of an application data buffer.
Fls_Erase	Fls.h	Erases flash sector(s).
Fls_GetJobResult	Fls.h	Returns the result of the last job.
Fls_GetStatus	Fls.h	Returns the driver state.
Fls_Read	Fls.h	Reads from flash memory.
Fls_SetMode	Fls.h	Sets the flash driver's operation mode.
Fls_Write	Fls.h	Writes one or more complete flash pages.

]()

8.6.3 Configurable interfaces

In this section, all interfaces are listed where the target function could be configured. The target function is usually a callback function. The names of this kind of interfaces are not fixed because they are configurable.

8.6.3.1 xxx_WriteStartFinish

[SWS_BNDM_01016]{DRAFT} [

Service Name	Xxx_WriteStartFinish (draft)	
Syntax	<pre>void Xxx_WriteStartFinish (BndM_BlockIdType BlockId, BndM_ResultType result)</pre>	
Service ID [hex]	0x56	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	BlockId	–
	result	–
Parameters (inout)	None	
Parameters (out)	None	
Return value	None	
Description	This callback function is called when BndM_WriteStart is finished. Tags: atp.Status=draft	
Available via	BndM_Externals.h	

}]()

8.6.3.2 xxx_WriteBlockFinish

[SWS_BNDM_01014]{DRAFT} [

Service Name	Xxx_WriteBlockFinish (draft)	
Syntax	<pre>void Xxx_WriteBlockFinish (BndM_BlockIdType BlockId, BndM_ResultType result)</pre>	
Service ID [hex]	0x57	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	BlockId	–
	result	–
Parameters (inout)	None	
Parameters (out)	None	
Return value	None	
Description	This callback function is called when BndM_WriteBlock is finished. Tags: atp.Status=draft	
Available via	BndM_Externals.h	

}]()

8.6.3.3 xxx_WriteFinalizeFinish

[SWS_BNDM_01015]{DRAFT} [

Service Name	Xxx_WriteFinalizeFinish (draft)	
Syntax	<pre>void Xxx_WriteFinalizeFinish (BndM_BlockIdType BlockId, BndM_ResultType result)</pre>	
Service ID [hex]	0x58	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	BlockId	–
	result	–
Parameters (inout)	None	
Parameters (out)	None	
Return value	None	
Description	This callback function is called when BndM_WriteFinalize is finished. Tags: atp.Status=draft	
Available via	BndM_Externals.h	

]()

8.7 Service Interfaces

The BndM does not have service interfaces.

9 Sequence diagrams

10 Configuration specification

In general, this chapter defines configuration parameters and their clustering into containers. In order to support the specification Chapter 10.1 describes fundamentals. It also specifies a template (table) you shall use for the parameter specification. We intend to leave Chapter 10.1 in the specification to guarantee comprehension.

Chapter 10.2 specifies the structure (containers) and the parameters of the module BndM.

Chapter 10.3 specifies published information of the module BndM.

10.1 How to read this chapter

For details refer to the chapter 10.1 “Introduction to configuration specification” in SWS_BSWGeneral.

10.2 Containers and configuration parameters

The following chapters summarize all configuration parameters. The detailed meanings of the parameters describe Chapter 7 and Chapter 8.

10.2.1 BndM

Module SWS Item	ECUC_BndM_00001	
Module Name	BndM	
Module Description	Configuration of the BulkNvDataManager module.	
Post-Build Variant Support	false	
Supported Config Variants	VARIANT-PRE-COMPILE	
Included Containers		
Container Name	Multiplicity	Scope / Dependency
BndMBlockDescriptor	0..*	Each container defines a Bulk NV Block which can be individually accessed. Tags: atp.Status=draft
BndMCallbackBlock	0..*	This container contains the block-specific callbacks. Tags: atp.Status=draft
BndMCallbackGeneral	0..1	This container contains the general callbacks Tags: atp.Status=draft
BndMGeneral	1	Container for common configuration options. Tags: atp.Status=draft

10.2.2 BndMGeneral

SWS Item	[ECUC_BndM_00002]
Container Name	BndMGeneral
Parent Container	BndM
Description	Container for common configuration options. Tags: atp.Status=draft
Configuration Parameters	

Name	BndMDevErrorDetect [ECUC_BndM_00003]		
Parent Container	BndMGeneral		
Description	<p>Switches the development error detection and notification on or off.</p> <ul style="list-style-type: none"> • true: detection and notification is enabled. • false: detection and notification is disabled. <p>Tags: atp.Status=draft</p>		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default Value	false		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local		

Name	BndMMainFunctionPeriod [ECUC_BndM_00004]		
Parent Container	BndMGeneral		
Description	<p>The period between successive calls to the main function in seconds.</p> <p>Tags: atp.Status=draft</p>		
Multiplicity	1		
Type	EcucFloatParamDef		
Range]0 .. INF[
Default Value			
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: ECU		

Name	BndMVersionInfoApi [ECUC_BndM_00005]		
Parent Container	BndMGeneral		
Description	Pre-processor switch to enable / disable the API to read out the modules version information. true: Version info API enabled. false: Version info API disabled. Tags: atp.Status=draft		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default Value	false		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local		

No Included Containers

10.2.3 BndMBlockDescriptor

SWS Item	[ECUC_BndM_00014]
Container Name	BndMBlockDescriptor
Parent Container	BndM
Description	Each container defines a Bulk NV Block which can be individually accessed. Tags: atp.Status=draft
Configuration Parameters	

Name	BndMBlockIdentifier [ECUC_BndM_00007]	
Parent Container	BndMBlockDescriptor	
Description	Unique identification of the block. Tags: atp.Status=draft	
Multiplicity	1	
Type	EcucIntegerParamDef (Symbolic Name generated for this parameter)	
Range	0 .. 65535	
Default Value		
Post-Build Variant Value	false	

Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local		

Name	BndMBlockDescriptor [ECUC_BndM_00006]		
Parent Container	BndMBlockDescriptor		
Description	This parameter defines the data structure of the block. Tags: atp.Status=draft		
Multiplicity	1		
Type	Foreign reference to IMPLEMENTATION-DATA-TYPE		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local		

Name	BndMCallbackRef [ECUC_BndM_00013]		
Parent Container	BndMBlockDescriptor		
Description	Reference to the block-specific callback function. Tags: atp.Status=draft		
Multiplicity	0..1		
Type	Reference to BndMCallbackBlock		
Post-Build Variant Multiplicity	false		
Post-Build Variant Value	false		
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local		

Name	BndMDeviceIndex [ECUC_BndM_00008]		
Parent Container	BndMBlockDescriptor		
Description	Reference to the FLS device this block is stored in. Tags: atp.Status=draft		
Multiplicity	0..1		
Type	Symbolic name reference to FlsGeneral		
Post-Build Variant Multiplicity	false		
Post-Build Variant Value	false		
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency			

No Included Containers

10.2.4 BndMCallbackBlock

SWS Item	[ECUC_BndM_00011]
Container Name	BndMCallbackBlock
Parent Container	BndM
Description	This container contains the block-specific callbacks. Tags: atp.Status=draft
Post-Build Variant Multiplicity	false
Configuration Parameters	

Name	BndMWriteBlockFinishFnc [ECUC_BndM_00012]
Parent Container	BndMCallbackBlock
Description	Callback function for the WriteBlockFinish callback. Tags: atp.Status=draft
Multiplicity	1
Type	EcucFunctionNameDef
Default Value	
Regular Expression	

Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local		

No Included Containers

10.2.5 BndMCallbackGeneral

SWS Item	[ECUC_BndM_00015]
Container Name	BndMCallbackGeneral
Parent Container	BndM
Description	This container contains the general callbacks Tags: atp.Status=draft
Configuration Parameters	

Name	BndMWriteFinalizeFinishFnc [ECUC_BndM_00010]		
Parent Container	BndMCallbackGeneral		
Description	Callback function for the WriteFinalizeFinish callback. Tags: atp.Status=draft		
Multiplicity	1		
Type	EcucFunctionNameDef		
Default Value			
Regular Expression			
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local		

Name	BndMWriteStartFinishFnc [ECUC_BndM_00009]		
Parent Container	BndMCallbackGeneral		
Description	Callback function for the WriteStartFinish callback. Tags: atp.Status=draft		
Multiplicity	1		
Type	EcucFunctionNameDef		
Default Value			
Regular Expression			
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local		

No Included Containers

10.3 Published Information

For details refer to the chapter 10.3 “Published Information” in SWS_BSWGeneral.

A Not applicable requirements

[SWS_BndM_00999]{DRAFT} [These requirements are not applicable to this specification.]()