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4.1.1	AUTOSAR Administration	• Harmonized requirements according to SWS_General
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3.1.1	AUTOSAR Administration	• Legal disclaimer revised
3.0.1	AUTOSAR Administration	• Add Module ID for Complex Drivers • Document meta information extended • Small layout adaptations made
2.1.15	AUTOSAR Administration	• “Advice for users” revised • “Revision Information” added
2.1.1	AUTOSAR Administration	• Changed definition of Standard_ReturnType to match the RTE definition. • A complete overview of definitions and values has been performed to match the requirements in the SRS General. • Legal disclaimer revised
1.0	AUTOSAR Administration	• Initial Release

Disclaimer

Advice for users

AUTOSAR specifications 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 Introduction and functional overview

This document specifies the AUTOSAR standard types header file. It contains all types that are used across several modules of the basic software and that are platform and compiler independent.

It is strongly recommended that those standard types files are unique within the AUTOSAR community to guarantee unique types and to avoid types changes when changing from supplier A to B.

2 Acronyms and abbreviations

Acronyms and abbreviations that have a local scope are not contained in the AUTOSAR glossary. These must appear in a local glossary.

Acronym:	***Description:***
API	Application Programming Interface
OSEK/VDX	Offene Systeme und deren Schnittstellen für die Elektronik im Kraftfahrzeug

Abreviation:	***Description:***
STD	Standard

3 Related documentation

3.1 Input documents

[1] General Requirements on Basic Software Modules
AUTOSAR_SRS_BSWGeneral.pdf

[2] General Requirements on SPAL
AUTOSAR_SRS_SPALGeneral.pdf

[3] Specification of RTE Software
AUTOSAR_SWS_RTE.pdf

[4] Basic Software Module Description Template,
AUTOSAR_TPS_BSWModuleDescriptionTemplate.pdf

[5] List of Basic Software Modules
AUTOSAR_TR_BSWModuleList

[6] General Specification of Basic Software Modules
AUTOSAR_SWS_BSWGeneral.pdf

3.2 Related standards and norms

[7] OSEK/VDX Operating System, Version 2.2.2
www.osek-vdx.org/os222.pdf

[8] ISO/IEC 9899:1990 Programming Language – C

3.3 Related specification

AUTOSAR provides a General Specification on Basic Software modules [6] (SWS BSW General), which is also valid for Standard Types.

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

4 Constraints and assumptions

4.1 Limitations

No limitations.

4.2 Applicability to car domains

Many symbols defined in this specification (like OK, NOT_OK, ON, OFF) are already defined and used within legacy software. These conflicts (‘redefinition of existing symbol’) are expected, but neglected, because of the following reasons:

1. AUTOSAR has to maintain network compatibility with legacy ECUs, but no software architecture compatibility with legacy software Many types are defined and used exactly in the same way that legacy software does. Legacy software can keep on using the symbols, only the definitions have to be removed and taken from this file instead.

5 Software Architecture

5.1 Dependencies to other modules

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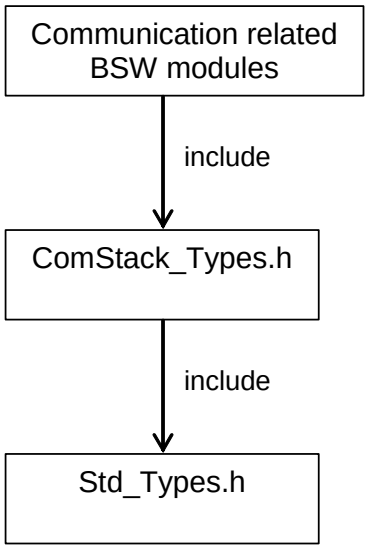
5.2 File structure

The include structure differ between BSW modules which are part of the COM-stack and other modules. BSW modules which is considered part of the COM stack shall include the `ComStack_Types.h` other modules shall include `Std_Types.h`

5.2.1 Communication related BSW modules

[SWS_Std_00016] ⌈The include file structure shall be as follows:



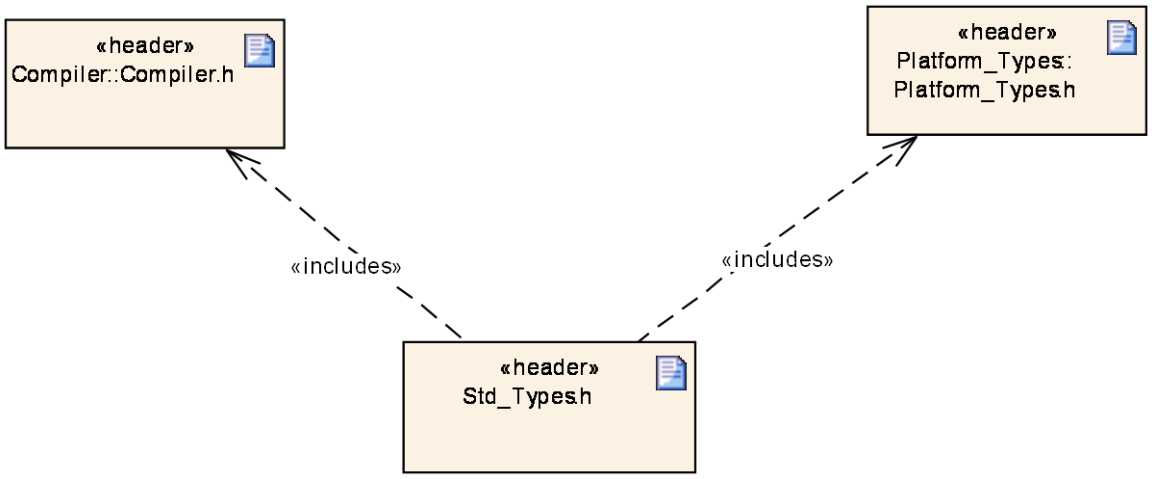
- `ComStack_Types.h` shall include `Std_Types.h`
- Communication related basic software modules shall include `ComStack_Types.h`

⌋()

5.2.2 Hierarchy in Standard Types

The headers are structured as follows:

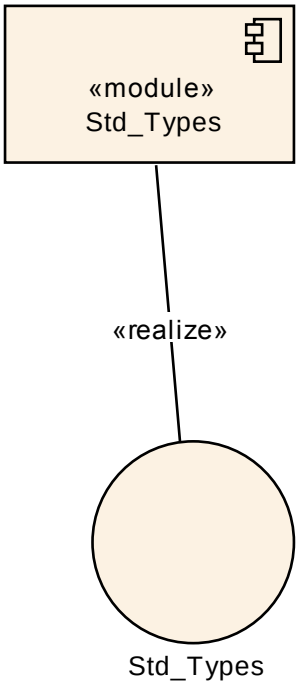
[SWS_Std_00019]⌈



()

The standard types implement the following interface:

[SWS_Std_00020][



()

)

6 Requirements traceability

Requirement	Description	Satisfied by
-	-	SWS_Std_00004
-	-	SWS_Std_00007
-	-	SWS_Std_00010
-	-	SWS_Std_00013
-	-	SWS_Std_00014
-	-	SWS_Std_00016
-	-	SWS_Std_00019
-	-	SWS_Std_00020
BSW00324	-	SWS_Std_00018
BSW00420	-	SWS_Std_00018
BSW00421	-	SWS_Std_00018
BSW00431	-	SWS_Std_00018
BSW00434	-	SWS_Std_00018
SRS_BSW_00004	All Basic SW Modules shall perform a pre-processor check of the versions of all imported include files	SWS_Std_00015
SRS_BSW_00005	Modules of the ÂµC Abstraction Layer (MCAL) may not have hard coded horizontal interfaces	SWS_Std_00018
SRS_BSW_00006	The source code of software modules above the ÂµC Abstraction Layer (MCAL) shall not be processor and compiler dependent.	SWS_Std_00018
SRS_BSW_00007	All Basic SW Modules written in C language shall conform to the MISRA C 2004 Standard.	SWS_Std_00018
SRS_BSW_00009	All Basic SW Modules shall be documented according to a common standard.	SWS_Std_00018
SRS_BSW_00010	The memory consumption of all Basic SW Modules shall be documented for a defined configuration for all supported platforms.	SWS_Std_00018
SRS_BSW_00101	The Basic Software Module shall be able to initialize variables and hardware in a separate initialization function	SWS_Std_00018
SRS_BSW_00158	All modules of the AUTOSAR Basic Software shall strictly separate configuration from implementation	SWS_Std_00018
SRS_BSW_00159	All modules of the AUTOSAR Basic Software shall support a tool based configuration	SWS_Std_00018
SRS_BSW_00160	Configuration files of AUTOSAR Basic SW module shall be readable for human beings	SWS_Std_00018
SRS_BSW_00161	The AUTOSAR Basic Software shall provide a microcontroller abstraction layer which provides a standardized interface to higher software layers	SWS_Std_00018
SRS_BSW_00162	The AUTOSAR Basic Software shall provide a hardware abstraction layer	SWS_Std_00018

SRS_BSW_00164	The Implementation of interrupt service routines shall be done by the Operating System, complex drivers or modules	SWS_Std_00018
SRS_BSW_00167	All AUTOSAR Basic Software Modules shall provide configuration rules and constraints to enable plausibility checks	SWS_Std_00018
SRS_BSW_00168	SW components shall be tested by a function defined in a common API in the Basis-SW	SWS_Std_00018
SRS_BSW_00170	The AUTOSAR SW Components shall provide information about their dependency from faults, signal qualities, driver demands	SWS_Std_00018
SRS_BSW_00171	Optional functionality of a Basic-SW component that is not required in the ECU shall be configurable at pre-compile-time	SWS_Std_00018
SRS_BSW_00172	The scheduling strategy that is built inside the Basic Software Modules shall be compatible with the strategy used in the system	SWS_Std_00018
SRS_BSW_00300	All AUTOSAR Basic Software Modules shall be identified by an unambiguous name	SWS_Std_00018
SRS_BSW_00301	All AUTOSAR Basic Software Modules shall only import the necessary information	SWS_Std_00018
SRS_BSW_00302	All AUTOSAR Basic Software Modules shall only export information needed by other modules	SWS_Std_00018
SRS_BSW_00304	All AUTOSAR Basic Software Modules shall use the following data types instead of native C data types	SWS_Std_00018
SRS_BSW_00305	Data types naming convention	SWS_Std_00018
SRS_BSW_00306	AUTOSAR Basic Software Modules shall be compiler and platform independent	SWS_Std_00018
SRS_BSW_00307	Global variables naming convention	SWS_Std_00018
SRS_BSW_00308	AUTOSAR Basic Software Modules shall not define global data in their header files, but in the C file	SWS_Std_00018
SRS_BSW_00309	All AUTOSAR Basic Software Modules shall indicate all global data with read-only purposes by explicitly assigning the const keyword	SWS_Std_00018
SRS_BSW_00310	API naming convention	SWS_Std_00018
SRS_BSW_00312	Shared code shall be reentrant	SWS_Std_00018
SRS_BSW_00314	All internal driver modules shall separate the interrupt frame definition from the service routine	SWS_Std_00018
SRS_BSW_00321	The version numbers of AUTOSAR Basic Software Modules shall be enumerated according specific rules	SWS_Std_00018
SRS_BSW_00323	All AUTOSAR Basic Software Modules shall check passed API parameters for validity	SWS_Std_00018
SRS_BSW_00325	The runtime of interrupt service routines and functions that are running in interrupt context shall be kept short	SWS_Std_00018
SRS_BSW_00326	-	SWS_Std_00018
SRS_BSW_00327	Error values naming convention	SWS_Std_00018
SRS_BSW_00328	All AUTOSAR Basic Software Modules shall avoid the duplication of code	SWS_Std_00018

SRS_BSW_00329	-	SWS_Std_00018
SRS_BSW_00330	It shall be allowed to use macros instead of functions where source code is used and runtime is critical	SWS_Std_00018
SRS_BSW_00331	All Basic Software Modules shall strictly separate error and status information	SWS_Std_00018
SRS_BSW_00333	For each callback function it shall be specified if it is called from interrupt context or not	SWS_Std_00018
SRS_BSW_00334	All Basic Software Modules shall provide an XML file that contains the meta data	SWS_Std_00018
SRS_BSW_00335	Status values naming convention	SWS_Std_00018
SRS_BSW_00336	Basic SW module shall be able to shutdown	SWS_Std_00018
SRS_BSW_00337	Classification of development errors	SWS_Std_00018
SRS_BSW_00338	-	SWS_Std_00018
SRS_BSW_00339	Reporting of production relevant error status	SWS_Std_00018
SRS_BSW_00341	Module documentation shall contains all needed informations	SWS_Std_00018
SRS_BSW_00342	It shall be possible to create an AUTOSAR ECU out of modules provided as source code and modules provided as object code, even mixed	SWS_Std_00018
SRS_BSW_00343	The unit of time for specification and configuration of Basic SW modules shall be preferably in physical time unit	SWS_Std_00018
SRS_BSW_00344	BSW Modules shall support link-time configuration	SWS_Std_00018
SRS_BSW_00345	BSW Modules shall support pre-compile configuration	SWS_Std_00018
SRS_BSW_00346	All AUTOSAR Basic Software Modules shall provide at least a basic set of module files	SWS_Std_00018
SRS_BSW_00347	A Naming seperation of different instances of BSW drivers shall be in place	SWS_Std_00018
SRS_BSW_00350	All AUTOSAR Basic Software Modules shall apply a specific naming rule for enabling/disabling the detection and reporting of development errors	SWS_Std_00018
SRS_BSW_00353	All integer type definitions of target and compiler specific scope shall be placed and organized in a single type header	SWS_Std_00018
SRS_BSW_00355	-	SWS_Std_00018
SRS_BSW_00357	For success/failure of an API call a standard return type shall be defined	SWS_Std_00005, SWS_Std_00006, SWS_Std_00011
SRS_BSW_00358	The return type of init() functions implemented by AUTOSAR Basic Software Modules shall be void	SWS_Std_00018
SRS_BSW_00359	All AUTOSAR Basic Software Modules callback functions shall avoid return types other than void if possible	SWS_Std_00018
SRS_BSW_00360	AUTOSAR Basic Software Modules callback functions are allowed to have parameters	SWS_Std_00018
SRS_BSW_00361	All mappings of not standardized keywords of compiler specific scope shall be placed and organized	SWS_Std_00018

	in a compiler specific type and keyword header	
SRS_BSW_00369	All AUTOSAR Basic Software Modules shall not return specific development error codes via the API	SWS_Std_00018
SRS_BSW_00370	-	SWS_Std_00018
SRS_BSW_00371	The passing of function pointers as API parameter is forbidden for all AUTOSAR Basic Software Modules	SWS_Std_00018
SRS_BSW_00373	The main processing function of each AUTOSAR Basic Software Module shall be named according the defined convention	SWS_Std_00018
SRS_BSW_00374	All Basic Software Modules shall provide a readable module vendor identification	SWS_Std_00018
SRS_BSW_00375	Basic Software Modules shall report wake-up reasons	SWS_Std_00018
SRS_BSW_00376	-	SWS_Std_00018
SRS_BSW_00377	A Basic Software Module can return a module specific types	SWS_Std_00018
SRS_BSW_00378	AUTOSAR shall provide a boolean type	SWS_Std_00018
SRS_BSW_00379	All software modules shall provide a module identifier in the header file and in the module XML description file.	SWS_Std_00018
SRS_BSW_00380	Configuration parameters being stored in memory shall be placed into separate c-files	SWS_Std_00018
SRS_BSW_00381	The pre-compile time parameters shall be placed into a separate configuration header file	SWS_Std_00018
SRS_BSW_00383	The Basic Software Module specifications shall specify which other configuration files from other modules they use at least in the description	SWS_Std_00018
SRS_BSW_00385	List possible error notifications	SWS_Std_00018
SRS_BSW_00386	The BSW shall specify the configuration for detecting an error	SWS_Std_00018
SRS_BSW_00387	-	SWS_Std_00018
SRS_BSW_00388	Containers shall be used to group configuration parameters that are defined for the same object	SWS_Std_00018
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SRS_BSW_00390	Parameter content shall be unique within the module	SWS_Std_00018
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SRS_BSW_00392	Parameters shall have a type	SWS_Std_00018
SRS_BSW_00393	Parameters shall have a range	SWS_Std_00018
SRS_BSW_00394	The Basic Software Module specifications shall specify the scope of the configuration parameters	SWS_Std_00018
SRS_BSW_00395	The Basic Software Module specifications shall list all configuration parameter dependencies	SWS_Std_00018
SRS_BSW_00396	The Basic Software Module specifications shall specify the supported configuration classes for changing values and multiplicities for each parameter/container	SWS_Std_00018
SRS_BSW_00397	The configuration parameters in pre-compile time are	SWS_Std_00018

	fixed before compilation starts	
SRS_BSW_00398	The link-time configuration is achieved on object code basis in the stage after compiling and before linking	SWS_Std_00018
SRS_BSW_00399	Parameter-sets shall be located in a separate segment and shall be loaded after the code	SWS_Std_00018
SRS_BSW_00400	Parameter shall be selected from multiple sets of parameters after code has been loaded and started	SWS_Std_00018
SRS_BSW_00401	Documentation of multiple instances of configuration parameters shall be available	SWS_Std_00018
SRS_BSW_00404	BSW Modules shall support post-build configuration	SWS_Std_00018
SRS_BSW_00405	BSW Modules shall support multiple configuration sets	SWS_Std_00018
SRS_BSW_00406	A static status variable denoting if a BSW module is initialized shall be initialized with value 0 before any APIs of the BSW module is called	SWS_Std_00018
SRS_BSW_00407	Each BSW module shall provide a function to read out the version information of a dedicated module implementation	SWS_Std_00018
SRS_BSW_00408	All AUTOSAR Basic Software Modules configuration parameters shall be named according to a specific naming rule	SWS_Std_00018
SRS_BSW_00409	All production code error ID symbols are defined by the Dem module and shall be retrieved by the other BSW modules from Dem configuration	SWS_Std_00018
SRS_BSW_00410	Compiler switches shall have defined values	SWS_Std_00018
SRS_BSW_00411	All AUTOSAR Basic Software Modules shall apply a naming rule for enabling/disabling the existence of the API	SWS_Std_00018
SRS_BSW_00412	References to c-configuration parameters shall be placed into a separate h-file	SWS_Std_00018
SRS_BSW_00413	An index-based accessing of the instances of BSW modules shall be done	SWS_Std_00018
SRS_BSW_00414	Init functions shall have a pointer to a configuration structure as single parameter	SWS_Std_00018
SRS_BSW_00415	Interfaces which are provided exclusively for one module shall be separated into a dedicated header file	SWS_Std_00018
SRS_BSW_00416	The sequence of modules to be initialized shall be configurable	SWS_Std_00018
SRS_BSW_00417	Software which is not part of the SW-C shall report error events only after the DEM is fully operational.	SWS_Std_00018
SRS_BSW_00419	If a pre-compile time configuration parameter is implemented as "const" it should be placed into a separate c-file	SWS_Std_00018
SRS_BSW_00422	Pre-de-bouncing of error status information is done within the DEM	SWS_Std_00018
SRS_BSW_00423	BSW modules with AUTOSAR interfaces shall be describable with the means of the SW-C Template	SWS_Std_00018

SRS_BSW_00424	BSW module main processing functions shall not be allowed to enter a wait state	SWS_Std_00018
SRS_BSW_00425	The BSW module description template shall provide means to model the defined trigger conditions of schedulable objects	SWS_Std_00018
SRS_BSW_00426	BSW Modules shall ensure data consistency of data which is shared between BSW modules	SWS_Std_00018
SRS_BSW_00427	ISR functions shall be defined and documented in the BSW module description template	SWS_Std_00018
SRS_BSW_00428	A BSW module shall state if its main processing function(s) has to be executed in a specific order or sequence	SWS_Std_00018
SRS_BSW_00429	BSW modules shall be only allowed to use OS objects and/or related OS services	SWS_Std_00018
SRS_BSW_00432	Modules should have separate main processing functions for read/receive and write/transmit data path	SWS_Std_00018
SRS_BSW_00433	Main processing functions are only allowed to be called from task bodies provided by the BSW Scheduler	SWS_Std_00018
SRS_BSW_00441	Naming convention for type, macro and function	SWS_Std_00011
SRS_BSW_00452	Classification of runtime errors	SWS_Std_00018
SRS_BSW_00458	Classification of production errors	SWS_Std_00018
SRS_BSW_00466	Classification of extended production errors	SWS_Std_00018
SRS_BSW_00473	Classification of transient faults	SWS_Std_00018

7 Functional specification

7.1 General issues

[SWS_Std_00004] ⌈It is not allowed to add any project or supplier specific extension to this file. Any extension invalidates the AUTOSAR conformity. ⌋ ()

[SWS_Std_00014] ⌈The standard types header file shall be protected against multiple inclusion:

```
#ifndef STD_TYPES_H
#define STD_TYPES_H
..
/*
 * Contents of file
 */
..
#endif /* STD_TYPES_H */
```

⌋ ()

8 API specification

8.1 Type definitions

8.1.1 Std_ReturnType

[SWS_Std_00005] ⌈

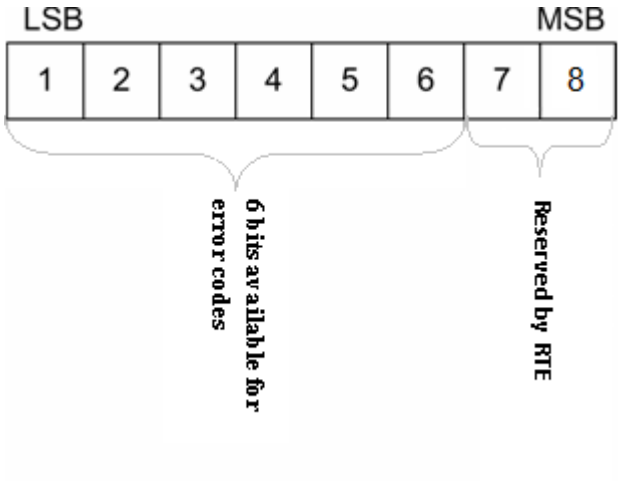
Name:	Std_ReturnType		
Type:	uint8		
Range:	E_OK	--	see 8.2.1, SWS_Std_00006
	E_NOT_OK	--	see 8.2.1, SWS_Std_00006
	0x02-0x3F	--	Available to user specific errors
Description:	This type can be used as standard API return type which is shared between the RTE and the BSW modules. It shall be defined as follows: typedef uint8 Std_ReturnType;		

⌋(SRS_BSW_00357)

[SWS_Std_00011] ⌈The Std_ReturnType shall normally be used with value E_OK or E_NOT_OK. If those return values are not sufficient user specific values can be defined by using the 6 least specific bits.

For the naming of the user defined values the module prefix shall be used as requested in SRS_BSW_00441

Layout of the Std_ReturnType shall be as stated in the RTE specification. Bit 7 and Bit 8 are reserved and defined by the RTE specification.



⌋(SRS_BSW_00357,SRS_BSW_00441)

8.1.2 Std_VersionInfoType

[SWS_Std_00015] ⌈

Name:	Std_VersionInfoType
Type:	Structure

Element:	uint16	vendorID	--
	uint16	moduleID	--
	uint8	sw_major_version	--
	uint8	sw_minor_version	--
	uint8	sw_patch_version	--
Description:	This type shall be used to request the version of a BSW module using the <Module name>_GetVersionInfo() function.		

⌋ (SRS_BSW_00004)

8.2 Symbol definitions

8.2.1 E_OK, E_NOT_OK

[SWS_Std_00006] ⌈

Name:	E_OK, E_NOT_OK	
Type:	Enumeration	
Range:	E_OK	0x00u
	E_NOT_OK	0x01u
Description:	Because E_OK is already defined within OSEK, the symbol E_OK has to be shared. To avoid name clashes and redefinition problems, the symbols have to be defined in the following way (approved within implementation): #ifndef STATUSTYPEDEFINED #define STATUSTYPEDEFINED #define E_OK 0x00u typedef unsigned char StatusType; /* OSEK compliance */ #endif #define E_NOT_OK 0x01u	

⌋ (SRS_BSW_00357)

8.2.2 STD_HIGH, STD_LOW

[SWS_Std_00007] ⌈

Name:	STD_HIGH, STD_LOW	
Type:	Enumeration	
Range:	STD_HIGH	0x01u
	STD_LOW	0x00u
Description:	The symbols STD_HIGH and STD_LOW shall be defined as follows: #define STD_HIGH 0x01u /* Physical state 5V or 3.3V */ #define STD_LOW 0x00u /* Physical state 0V */	

⌋ ()

8.2.3 STD_ACTIVE, STD_IDLE

[SWS_Std_00013] ⌈

Name:	STD_ACTIVE, STD_IDLE	
Type:	Enumeration	
Range:	STD_ACTIVE	0x01u
	STD_IDLE	0x00u
Description:	The symbols STD_ACTIVE and STD_IDLE shall be defined as follows: #define STD_ACTIVE 0x01u /* Logical state active */ #define STD_IDLE 0x00u /* Logical state idle */	

⌋ ()

8.2.4 STD_ON, STD_OFF

[SWS_Std_00010] ⌈

Name:	STD_ON, STD_OFF	
Type:	Enumeration	
Range:	STD_ON	0x01u
	STD_OFF	0x00u
Description:	The symbols STD_ON and STD_OFF shall be defined as follows: #define STD_ON 0x01u #define STD_OFF 0x00u	

⌋ ()

8.3 Function definitions

Not applicable.

9 Sequence diagrams

Not applicable.

10 Configuration specification

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11 Not applicable requirements

[SWS_Std_00018] ⌈These requirements are not applicable to this specification.⌋

(SRS_BSW_00300, SRS_BSW_00301, SRS_BSW_00302, SRS_BSW_00304, SRS_BSW_00305, SRS_BSW_00306, SRS_BSW_00307, SRS_BSW_00308, SRS_BSW_00309, SRS_BSW_00310, SRS_BSW_00312, SRS_BSW_00314, SRS_BSW_00321, BSW00324, SRS_BSW_00325, SRS_BSW_00326, SRS_BSW_00327, SRS_BSW_00328, SRS_BSW_00329, SRS_BSW_00330, SRS_BSW_00331, SRS_BSW_00333, SRS_BSW_00334, SRS_BSW_00335, SRS_BSW_00342, SRS_BSW_00343, SRS_BSW_00341, SRS_BSW_00346, SRS_BSW_00347, SRS_BSW_00350, SRS_BSW_00353, SRS_BSW_00355, SRS_BSW_00358, SRS_BSW_00359, SRS_BSW_00360, SRS_BSW_00361, SRS_BSW_00370, SRS_BSW_00371, SRS_BSW_00373, SRS_BSW_00374, SRS_BSW_00376, SRS_BSW_00377, SRS_BSW_00378, SRS_BSW_00379, SRS_BSW_00401, SRS_BSW_00408, SRS_BSW_00410, SRS_BSW_00411, SRS_BSW_00413, SRS_BSW_00414, SRS_BSW_00415, SRS_BSW_00005, SRS_BSW_00006, SRS_BSW_00007, SRS_BSW_00009, SRS_BSW_00010, SRS_BSW_00158, SRS_BSW_00160, SRS_BSW_00161, SRS_BSW_00162, SRS_BSW_00164, SRS_BSW_00172, SRS_BSW_00344, SRS_BSW_00404, SRS_BSW_00405, SRS_BSW_00345, SRS_BSW_00159, SRS_BSW_00167, SRS_BSW_00171, SRS_BSW_00170, SRS_BSW_00380, SRS_BSW_00419, SRS_BSW_00381, SRS_BSW_00412, SRS_BSW_00383, SRS_BSW_00387, SRS_BSW_00388, SRS_BSW_00389, SRS_BSW_00390, SRS_BSW_00391, SRS_BSW_00392, SRS_BSW_00393, SRS_BSW_00394, SRS_BSW_00395, SRS_BSW_00396, SRS_BSW_00397, SRS_BSW_00398, SRS_BSW_00399, SRS_BSW_00400, SRS_BSW_00375, SRS_BSW_00101, SRS_BSW_00416, SRS_BSW_00406, SRS_BSW_00168, SRS_BSW_00407, SRS_BSW_00423, SRS_BSW_00424, SRS_BSW_00425, SRS_BSW_00426, SRS_BSW_00427, SRS_BSW_00428, SRS_BSW_00429, BSW00431, SRS_BSW_00432, SRS_BSW_00433, BSW00434, SRS_BSW_00336, SRS_BSW_00337, SRS_BSW_00338, SRS_BSW_00369, SRS_BSW_00339, BSW00421, SRS_BSW_00422, BSW00420, SRS_BSW_00417, SRS_BSW_00323, SRS_BSW_00409, SRS_BSW_00385, SRS_BSW_00386, SRS_BSW_00452, SRS_BSW_00473, SRS_BSW_00458, SRS_BSW_00466)