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2020-11-30	R20-11	AUTOSAR Release Management	• Editorial Changes
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2018-10-31	4.4.0	AUTOSAR Release Management	• Harmonized Parameter Structures • Adapted Specification • Small bug fixes
2017-12-08	4.3.1	AUTOSAR Release Management	• Clarified signature of callbacks • Clarification in Error handling • Removed some DET errors from DET itself

2016-11-30	4.3.0	AUTOSAR Release Management	• Improved Sequence Diagrams • Added Description of Callouts (8.1.5) • Changed Port Defined Arguments in Service • Improved traceability • Added DetModuleInstance parameter • Made TransientFaults an BSW-Service
2015-07-31	4.2.2	AUTOSAR Release Management	• Harmonized Traceability • NEnsured consistent usage of development errors in all modules
2014-03-31	4.2.1	AUTOSAR Release Management	• Extended and renamed DevelopmentErrorTracer to DefaultErrorTracer by adding routines • New Routines Det_ReportRountineError and Det_ReportTransientFault • New configuration paramaters Det_ReportRountineErrorCallout and Det_ReportTransientFaultCallout
2014-03-31	4.1.3	AUTOSAR Release Management	• Improved requirement format of SWS_DET_00050
2013-10-31	4.1.2	AUTOSAR Release Management	• Structural but non-functional improvements in document structure and creation • Editorial changes • Removed chapter(s) on change documentation
2013-03-15	4.1.1	AUTOSAR Administration	• Harmonized requirements according to SWS_General • Formalized service descriptions
2011-12-22	4.0.3	AUTOSAR Administration	• Clarifications related to include structure etc.

2010-09-30	3.1.5	AUTOSAR Administration	• DLT is now an optional interface of DET • Harmonized parameter error handling • Removed known limitation of Revision 4.0.1
2010-02-02	3.1.4	AUTOSAR Administration	• Changed Tracing to requirements now located in SRS_Debugging • Added a Std_ReturnType value to Det_ReportError • Harmonized configuration classes • Adopted to the changed general requirements • Legal disclaimer revised • Chapter 10.3 revised
2008-08-13	3.1.1	AUTOSAR Administration	• Legal disclaimer revised
2008-02-01	3.0.2	AUTOSAR Administration	• Added API GetVersionInfo to harmonize SWS with AUTOSAR conventions • Document meta information extended • Small layout adaptations made
2007-12-21	3.0.1	AUTOSAR Administration	• Added SRS_BSW_00436 to traceability matrix • Added Memmap.h • Added Chapter 11 • Legal disclaimer revised • "Advice for users" revised • "Revision Information" added
2006-05-16	2.0	AUTOSAR Release Administration	• Changed to new SWS template
2005-05-31	1.0	AUTOSAR Administration	• Initial Release

Table of Contents

1 Introduction and functional overview

This specification describes the API of the Default Error Tracer. All detected development and runtime errors in the Basic Software are reported to this module. The API parameters allow for tracing source and kind of error:

- Module in which error has been detected
- Function in which error has been detected
- Type of error

The functionality behind the API of this module is not in scope of this specification. It is up to the software developer and software integrator to choose the optimal strategy for his specific application and testing environment. Possible functionalities could be:

- Set debugger breakpoint within error reporting API
- Count reported errors
- Handle the runtime errors by using default values
- Log calls and passed parameters in RAM buffer
- Send reported errors via communication interface to external logger

Note: The software requirements of the Default Error Tracer are specified in the SRS Diagnostics document.

2 Acronyms and Abbreviations

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

DET: Default Error Tracer.

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] Requirements on Diagnostics
AUTOSAR_RS_Diagnostics

[4] General Requirements on Basic Software Modules
AUTOSAR_SRS_BSWGeneral

3.2 Related specification

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

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

4 Constraints and assumptions

4.1 Limitations

This specification does not define the functionality behind the error reporting API.

Memory protection mechanisms of the operating system are not taken into account.

4.2 Applicability to car domains

No restrictions.

5 Dependencies to other modules

5.1 File structure

[SWS_Det_00037] ⌈Det.h includes all user relevant information for the tracing of errors reported via its services.⌋*(SRS_BSW_00346)*

6 Requirements Tracing

The following tables reference the requirements specified in [3] and [4] 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_04085]	No description	[SWS_Det_00009]

Requirement	Description	Satisfied by
[RS_Diag_04086]	No description	[SWS_Det_00009] [SWS_Det_01001] [SWS_Det_01003]
[RS_Diag_04087]	No description	[SWS_Det_00202] [SWS_Det_00205]
[RS_Diag_04143]	No description	[SWS_Det_01001]
[RS_Diag_04144]	No description	[SWS_Det_01003]
[SRS_ARTICP_-04087]	No description	[SWS_Det_00204]
[SRS_BSW_00004]	All Basic SW Modules shall perform a pre-processor check of the versions of all imported include files	[SWS_Det_00999]
[SRS_BSW_00005]	Modules of the μC Abstraction Layer (MCAL) may not have hard coded horizontal interfaces	[SWS_Det_00999]
[SRS_BSW_00006]	The source code of software modules above the μC Abstraction Layer (MCAL) shall not be processor and compiler dependent.	[SWS_Det_00999]
[SRS_BSW_00007]	All Basic SW Modules written in C language shall conform to the MISRA C 2012 Standard.	[SWS_Det_00999]
[SRS_BSW_00009]	All Basic SW Modules shall be documented according to a common standard.	[SWS_Det_00999]
[SRS_BSW_00010]	The memory consumption of all Basic SW Modules shall be documented for a defined configuration for all supported platforms.	[SWS_Det_00999]
[SRS_BSW_00101]	The Basic Software Module shall be able to initialize variables and hardware in a separate initialization function	[SWS_Det_00019] [SWS_Det_00020]
[SRS_BSW_00158]	No description	[SWS_Det_00999]
[SRS_BSW_00159]	All modules of the AUTOSAR Basic Software shall support a tool based configuration	[SWS_Det_00018]
[SRS_BSW_00160]	Configuration files of AUTOSAR Basic SW module shall be readable for human beings	[SWS_Det_00999]
[SRS_BSW_00161]	The AUTOSAR Basic Software shall provide a microcontroller abstraction layer which provides a standardized interface to higher software layers	[SWS_Det_00999]
[SRS_BSW_00162]	The AUTOSAR Basic Software shall provide a hardware abstraction layer	[SWS_Det_00999]
[SRS_BSW_00164]	The Implementation of interrupt service routines shall be done by the Operating System, complex drivers or modules	[SWS_Det_00999]

Requirement	Description	Satisfied by
[SRS_BSW_00167]	All AUTOSAR Basic Software Modules shall provide configuration rules and constraints to enable plausibility checks	[SWS_Det_00035]
[SRS_BSW_00168]	SW components shall be tested by a function defined in a common API in the Basis-SW	[SWS_Det_00999]
[SRS_BSW_00170]	The AUTOSAR SW Components shall provide information about their dependency from faults, signal qualities, driver demands	[SWS_Det_00999]
[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_Det_00015]
[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_Det_00999]
[SRS_BSW_00301]	All AUTOSAR Basic Software Modules shall only import the necessary information	[SWS_Det_00999]
[SRS_BSW_00304]	All AUTOSAR Basic Software Modules shall use only AUTOSAR data types instead of native C data types	[SWS_Det_00999]
[SRS_BSW_00305]	Data types naming convention	[SWS_Det_00999]
[SRS_BSW_00306]	AUTOSAR Basic Software Modules shall be compiler and platform independent	[SWS_Det_00999]
[SRS_BSW_00307]	Global variables naming convention	[SWS_Det_00999]
[SRS_BSW_00308]	AUTOSAR Basic Software Modules shall not define global data in their header files, but in the C file	[SWS_Det_00999]
[SRS_BSW_00309]	All AUTOSAR Basic Software Modules shall indicate all global data with read-only purposes by explicitly assigning the const keyword	[SWS_Det_00999]
[SRS_BSW_00310]	API naming convention	[SWS_Det_00008] [SWS_Det_00009] [SWS_Det_00010] [SWS_Det_00011] [SWS_Det_01001] [SWS_Det_01003]
[SRS_BSW_00312]	Shared code shall be reentrant	[SWS_Det_00039]
[SRS_BSW_00314]	All internal driver modules shall separate the interrupt frame definition from the service routine	[SWS_Det_00999]
[SRS_BSW_00318]	Each AUTOSAR Basic Software Module file shall provide version numbers in the header file	[SWS_Det_00011]

Requirement	Description	Satisfied by
[SRS_BSW_00323]	All AUTOSAR Basic Software Modules shall check passed API parameters for validity	[SWS_Det_00999]
[SRS_BSW_00325]	The runtime of interrupt service routines and functions that are running in interrupt context shall be kept short	[SWS_Det_00999]
[SRS_BSW_00328]	All AUTOSAR Basic Software Modules shall avoid the duplication of code	[SWS_Det_00999]
[SRS_BSW_00330]	It shall be allowed to use macros instead of functions where source code is used and runtime is critical	[SWS_Det_00999]
[SRS_BSW_00331]	All Basic Software Modules shall strictly separate error and status information	[SWS_Det_00999]
[SRS_BSW_00334]	All Basic Software Modules shall provide an XML file that contains the meta data	[SWS_Det_00999]
[SRS_BSW_00335]	Status values naming convention	[SWS_Det_00999]
[SRS_BSW_00336]	Basic SW module shall be able to shutdown	[SWS_Det_00999]
[SRS_BSW_00337]	Classification of development errors	[SWS_Det_00026] [SWS_Det_00301]
[SRS_BSW_00339]	Reporting of production relevant error status	[SWS_Det_00999]
[SRS_BSW_00341]	Module documentation shall contains all needed informations	[SWS_Det_00999]
[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_Det_00999]
[SRS_BSW_00343]	The unit of time for specification and configuration of Basic SW modules shall be preferably in physical time unit	[SWS_Det_00999]
[SRS_BSW_00344]	BSW Modules shall support link-time configuration	[SWS_Det_00999]
[SRS_BSW_00345]	BSW Modules shall support pre-compile configuration	[SWS_Det_00014]
[SRS_BSW_00346]	All AUTOSAR Basic Software Modules shall provide at least a basic set of module files	[SWS_Det_00037]
[SRS_BSW_00347]	A Naming seperation of different instances of BSW drivers shall be in place	[SWS_Det_00999]
[SRS_BSW_00348]	All AUTOSAR standard types and constants shall be placed and organized in a standard type header file	[SWS_Det_00999]

Requirement	Description	Satisfied by
[SRS_BSW_00350]	All AUTOSAR Basic Software Modules shall allow the enabling/disabling of detection and reporting of development errors.	[SWS_Det_00025] [SWS_Det_00999]
[SRS_BSW_00353]	All integer type definitions of target and compiler specific scope shall be placed and organized in a single type header	[SWS_Det_00999]
[SRS_BSW_00357]	For success/failure of an API call a standard return type shall be defined	[SWS_Det_00999]
[SRS_BSW_00358]	The return type of init() functions implemented by AUTOSAR Basic Software Modules shall be void	[SWS_Det_00008]
[SRS_BSW_00359]	All AUTOSAR Basic Software Modules callback functions shall avoid return types other than void if possible	[SWS_Det_00999]
[SRS_BSW_00360]	AUTOSAR Basic Software Modules callback functions are allowed to have parameters	[SWS_Det_00999]
[SRS_BSW_00361]	All mappings of not standardized keywords of compiler specific scope shall be placed and organized in a compiler specific type and keyword header	[SWS_Det_00999]
[SRS_BSW_00369]	All AUTOSAR Basic Software Modules shall not return specific development error codes via the API	[SWS_Det_00999]
[SRS_BSW_00371]	No description	[SWS_Det_00999]
[SRS_BSW_00373]	The main processing function of each AUTOSAR Basic Software Module shall be named according the defined convention	[SWS_Det_00999]
[SRS_BSW_00375]	Basic Software Modules shall report wake-up reasons	[SWS_Det_00999]
[SRS_BSW_00377]	A Basic Software Module can return a module specific types	[SWS_Det_00999]
[SRS_BSW_00378]	AUTOSAR shall provide a boolean type	[SWS_Det_00999]
[SRS_BSW_00379]	All software modules shall provide a module identifier in the header file and in the module XML description file.	[SWS_Det_00999]
[SRS_BSW_00380]	Configuration parameters being stored in memory shall be placed into separate c-files	[SWS_Det_00999]
[SRS_BSW_00381]	No description	[SWS_Det_00999]

Requirement	Description	Satisfied by
[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_Det_00999]
[SRS_BSW_00385]	List possible error notifications	[SWS_Det_00999]
[SRS_BSW_00386]	The BSW shall specify the configuration for detecting an error	[SWS_Det_00999]
[SRS_BSW_00388]	Containers shall be used to group configuration parameters that are defined for the same object	[SWS_Det_00999]
[SRS_BSW_00389]	Containers shall have names	[SWS_Det_00999]
[SRS_BSW_00390]	Parameter content shall be unique within the module	[SWS_Det_00999]
[SRS_BSW_00392]	Parameters shall have a type	[SWS_Det_00035]
[SRS_BSW_00393]	Parameters shall have a range	[SWS_Det_00999]
[SRS_BSW_00394]	The Basic Software Module specifications shall specify the scope of the configuration parameters	[SWS_Det_00035] [SWS_Det_00180]
[SRS_BSW_00395]	The Basic Software Module specifications shall list all configuration parameter dependencies	[SWS_Det_00999]
[SRS_BSW_00396]	The Basic Software Module specifications shall specify the supported configuration classes for changing values and multiplicities for each parameter/ container	[SWS_Det_00999]
[SRS_BSW_00397]	The configuration parameters in pre-compile time are fixed before compilation starts	[SWS_Det_00999]
[SRS_BSW_00398]	The link-time configuration is achieved on object code basis in the stage after compiling and before linking	[SWS_Det_00999]
[SRS_BSW_00399]	Parameter-sets shall be located in a separate segment and shall be loaded after the code	[SWS_Det_00999]
[SRS_BSW_00400]	Parameter shall be selected from multiple sets of parameters after code has been loaded and started	[SWS_Det_00999]
[SRS_BSW_00401]	Documentation of multiple instances of configuration parameters shall be available	[SWS_Det_00999]

Requirement	Description	Satisfied by
[SRS_BSW_00403]	The Basic Software Module specifications shall specify for each parameter/container whether it supports different values or multiplicity in different configuration sets	[SWS_Det_00018]
[SRS_BSW_00404]	BSW Modules shall support post-build configuration	[SWS_Det_00999]
[SRS_BSW_00405]	BSW Modules shall support multiple configuration sets	[SWS_Det_00999]
[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_Det_00024] [SWS_Det_00208] [SWS_Det_00999]
[SRS_BSW_00407]	Each BSW module shall provide a function to read out the version information of a dedicated module implementation	[SWS_Det_00999]
[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_Det_00999]
[SRS_BSW_00410]	Compiler switches shall have defined values	[SWS_Det_00999]
[SRS_BSW_00412]	No description	[SWS_Det_00999]
[SRS_BSW_00413]	An index-based accessing of the instances of BSW modules shall be done	[SWS_Det_00999]
[SRS_BSW_00414]	Init functions shall have a pointer to a configuration structure as single parameter	[SWS_Det_00008] [SWS_Det_00210]
[SRS_BSW_00415]	Interfaces which are provided exclusively for one module shall be separated into a dedicated header file	[SWS_Det_00999]
[SRS_BSW_00416]	The sequence of modules to be initialized shall be configurable	[SWS_Det_00999]
[SRS_BSW_00417]	Software which is not part of the SW-C shall report error events only after the DEM is fully operational.	[SWS_Det_00999]
[SRS_BSW_00419]	If a pre-compile time configuration parameter is implemented as "const" it should be placed into a separate c-file	[SWS_Det_00999]
[SRS_BSW_00422]	Pre-de-bouncing of error status information is done within the DEM	[SWS_Det_00999]
[SRS_BSW_00423]	BSW modules with AUTOSAR interfaces shall be describable with the means of the SW-C Template	[SWS_Det_00999]

Requirement	Description	Satisfied by
[SRS_BSW_00424]	BSW module main processing functions shall not be allowed to enter a wait state	[SWS_Det_00999]
[SRS_BSW_00425]	The BSW module description template shall provide means to model the defined trigger conditions of schedulable objects	[SWS_Det_00999]
[SRS_BSW_00426]	BSW Modules shall ensure data consistency of data which is shared between BSW modules	[SWS_Det_00999]
[SRS_BSW_00427]	ISR functions shall be defined and documented in the BSW module description template	[SWS_Det_00999]
[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_Det_00999]
[SRS_BSW_00429]	Access to OS is restricted	[SWS_Det_00999]
[SRS_BSW_00432]	Modules should have separate main processing functions for read/receive and write/transmit data path	[SWS_Det_00999]
[SRS_BSW_00433]	Main processing functions are only allowed to be called from task bodies provided by the BSW Scheduler	[SWS_Det_00999]
[SRS_BSW_00437]	Memory mapping shall provide the possibility to define RAM segments which are not to be initialized during startup	[SWS_Det_00999]
[SRS_BSW_00438]	Configuration data shall be defined in a structure	[SWS_Det_00999]
[SRS_BSW_00439]	Enable BSW modules to handle interrupts	[SWS_Det_00999]
[SRS_BSW_00440]	The callback function invocation by the BSW module shall follow the signature provided by RTE to invoke servers via Rte_Call API	[SWS_Det_00999]
[SRS_BSW_00441]	Naming convention for type, macro and function	[SWS_Det_00999]
[SRS_BSW_00458]	Classification of production errors	[SWS_Det_00999]
[SRS_BSW_00463]	Naming convention of callout prototypes	[SWS_Det_00180] [SWS_Det_00181] [SWS_Det_00184] [SWS_Det_00187]
[SRS_BSW_00466]	Classification of extended production errors	[SWS_Det_00999]
[SRS_BSW_00480]	NullPointer Errors shall follow a naming rule	[SWS_Det_00052]

7 Functional specification

The Default Error Tracer provides functionality to support error detection and tracing of errors during the development and runtime of Software Components and other Basic Software Modules. For this purpose the Default Error Tracer receives and evaluates error messages from these components and modules.

Due to the always specific (non generic!) requirements regarding functionality in error cases there is no explicit specification of the DET implementation, except:

- Configurable lists of error hooks will be executed in case of an error report.
- Interfaces will be provided to report errors, allow optional error recovery after reset, to handle optional error recovery information and to retrieve version information.

7.1 Initialization

[SWS_Det_00019] ⌈The DET shall provide the initialization function Det_Init (see SWS_Det_00008).⌋*(SRS_BSW_00101)*

[SWS_Det_00020] ⌈Each call of the Det_Init function shall be used to set the Default Error Tracer to a defined initial status (e.g. by removing optional error recovery information).⌋*(SRS_BSW_00101)*

Note: SWS_Det_00020 is not testable without knowledge about the non specified functionality and the probably used optional error recovery information.

Note: The usage and meaning of error recovery information is optional and not specified.

[SWS_Det_00025] ⌈The Default Error Tracer shall provide the function Det_Start (see SWS_Det_00010).⌋*(SRS_BSW_00350)*

Note: The Default Error Tracer's environment can use the function Det_Start to trigger the Default Error Tracer module for instance (if needed) in case of completed NVRAM initialization for persistent error storage.

Note: In case the Default Error Tracer does not require a startup call the Det_Start function can be empty.

Note: The integrator can decide by configuration of the EcuM, when Det_Init will be called.

Note: The integrator can decide by configuration of the EcuM or ModeM, when and whether Det_Start will be called.

7.2 Error Hooks

[SWS_Det_00207] ⌈To support debugging and error tracing during development and runtime, the Default Error Tracer provides functionality for notification of received error reports. Therefore so called error hooks are configurable. The error hooks will be used to forward error notifications. If at least one error hook has been configured, the Default Error Tracer will notify each received error report by calling the configured error hook(s).⌋*()*

Configuration of error hooks is done by the AUTOSAR configuration methods described in chapter 10.

[SWS_Det_00035] ⌈Each Error_Hook shall be called with the same set of parameters as the corresponding functions Det_ReportError, Det_ReportTransientFault and Det_ReportRuntimeError. The configured callout functions are ECU configurations, see ECUC_DET_00005, ECUC_DET_00010 and ECUC_DET_00011⌋*(SRS_BSW_00167, SRS_BSW_00392, SRS_BSW_00394)*

7.3 Error Reporting

[SWS_Det_00024] ⌈If the Default Error Tracer has not been initialized before Det_ReportTransientFault or Det_ReportRuntimeError reporting functions are called, these functions shall return immediately without any other action (no Error_Hook shall be used, no implementer specific function shall be performed and no error shall be reported).⌋*(SRS_BSW_00406)*

[SWS_Det_00208] ⌈If the Default Error Tracer has not been initialized before Det_ReportError is called, the execution shall stop. (no Error_Hook shall be used, no implementer specific function shall be performed and no error shall be reported).⌋*(SRS_BSW_00406)*

[SWS_Det_00014] ⌈The error report functions Det_ReportError, Det_ReportTransient Fault and Det_ReportRuntimeError shall call immediately all configured Error_Hooks (see ECUC_Det_00010, ECUC_Det_00011).⌋*(SRS_BSW_00345)*

[SWS_Det_00018] ⌈The Default Error Tracer shall execute the corresponding list of configured DetErrorHook (refer to ECUC_Det_00005) in the order given by the configuration.⌋*(SRS_BSW_00403, SRS_BSW_00159)*

[SWS_Det_00015] ⌈Optional implementation specific functionality shall only be performed after all configured Error_Hooks (see ECUC_Det_00010 and ECUC_Det_0011) have been called. Furthermore this functionality shall be pre-compile-time configurable⌋*(SRS_BSW_00171)*

[SWS_Det_00034] ⌈Each call of the Det_ReportError, Det_ReportTransientFault and Det_ReportRuntimeError function shall be forwarded to the DLT module, if this is available/configured.⌋*()*

[SWS_Det_00039] ⌈The Det_ReportError, Det_ReportTransientFault and Det_Report RuntimeError functions shall be reentrant.⌋*(SRS_BSW_00312)*

[SWS_Det_00026] ⌈Det_ReportError shall stop execution. Ensure that DET runtime errors and DET transient faults are handled such that DET is not called recursively.⌋ *(SRS_BSW_00337)*

Note: Such recursive call could happen in case of calling an un-initialized module via an Error_Hook and would lead to a stack overflow.

7.4 Version Information

No deviations from specified handling in [2].

7.5 Error Classification

The Default Error Tracer has the following AUTOSAR errors:

- Development errors, see Section 7.5.1
- Runtime errors: not applicable
- Transient faults: not applicable
- Production errors: not applicable
- Extended production errors: not applicable

The call of default error functions will cause calls to all configured callout functions see parameter DetErrorHook, DetReportTransientFault and DetReportRuntimeError.

[SWS_Det_00501] ⌈The calls of Det_ReportError shall invoke all callback functions configured in DetErrorHook (see parameter DetErrorHook, ECUC_Det_00005).(SRS_BSW_00345)⌋*()*

[SWS_Det_00502] ⌈The calls of Det_ReportTransientFault shall invoke all callback functions configured in DetReportTransientFaultCallout (ECUC_Det_00011). (SRS_BSW_00345)⌋*()*

[SWS_Det_00503] ⌈The calls of Det_ReportRuntimeError shall invoke all callback functions configured in DetReportRuntimeErrorCallout (ECUC_Det_00010). (SRS_BSW_00345)

Note: In case no Error_Hooks are configured no additional functions are called. However the forwarding to DLT is still active if configured.⌋*()*

[SWS_Det_00052] ⌈The DET shall notify the error DET_E_PARAM_POINTER to all functions configured in callouts in case a null pointer error occurs in Det_GetVersion Info.⌋*(SRS_BSW_00480)*

7.5.1 Development Errors

DET cannot report development errors except the DET_E_PARAM_POINTER in Det_GetVersionInfo:

[SWS_Det_00301] ⌈

Type of error	*Related error code*	*Error value*
Det_GetVersionInfo called with null parameter pointer	DET_E_PARAM_POINTER	0x01

⌋*(SRS_BSW_00337)*

7.5.2 Runtime Errors

DET cannot report runtime errors.

7.5.3 Transient Faults

DET cannot report transient faults.

7.5.4 Production Errors

There are no production errors in DET.

7.5.5 Extended Production Errors

There are no extended production errors in DET.

8 API specification

The specification of the default error tracer API is provided here.

8.1 API

8.1.1 Imported types

This section lists all imported types used by the API. Even if the DET does not require new types, some RTE or Component types can be used within the configuration of the hook functions. Therefore the DET also has the standardized include structure (see SRS_BSW_00447) for modules with service interfaces.

[] ⌈

Module	**Header File**	**Imported Type**
Std	Std_Types.h	Std_ReturnType
	Std_Types.h	Std_VersionInfoType

⌋*()*

8.1.2 Type definitions

8.1.2.1 Det_ConfigType

[SWS_Det_00210] ⌈

Name	Det_ConfigType	
Kind	Structure	
Elements	implementation specific	
	Type	–
	Comment	–
Description	Configuration data structure of the Det module.	
Available via	Det.h	

⌋*(SRS_BSW_00414)*

8.1.3 Function definitions

8.1.3.1 Det_Init

[SWS_Det_00008] ⌈

Service Name	Det_Init	
Syntax	`void Det_Init ( const Det_ConfigType* ConfigPtr )`	
Service ID [hex]	0x00	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	ConfigPtr	Pointer to the selected configuration set.
Parameters (inout)	None	
Parameters (out)	None	

▽

△

Return value	None
Description	Service to initialize the Default Error Tracer.
Available via	Det.h

⌋*(SRS_BSW_00310, SRS_BSW_00358, SRS_BSW_00414)*

8.1.3.2 Det_ReportError

[SWS_Det_00009] ⌈

Service Name	Det_ReportError	

Syntax	`Std_ReturnType Det_ReportError (`
	`  uint16 ModuleId,`
	`  uint8 InstanceId,`
	`  uint8 ApiId,`
	`  uint8 ErrorId`
	`)`	

Service ID [hex]	0x01	
Sync/Async	Synchronous	
Reentrancy	Reentrant	
Parameters (in)	ModuleId	Module ID of calling module.
	InstanceId	The identifier of the index based instance of a module, starting from 0, If the module is a single instance module it shall pass 0 as the InstanceId.
	ApiId	ID of API service in which error is detected (defined in SWS of calling module)
	ErrorId	ID of detected development error (defined in SWS of calling module).
Parameters (inout)	None	
Parameters (out)	None	
Return value	Std_ReturnType	never returns a value, but has a return type for compatibility with services and hooks
Description	Service to report development errors.	
Available via	Det.h	

⌋*(SRS_BSW_00310, RS_Diag_04086, RS_Diag_04085)* Note: Det_ReportError may be callable in interrupt context. Since the DET can be called in normal mode or in interrupt context (from stack or integration) this has to be considered during implementation of the hook functions: Det_ReportError can be called in interrupt context; this should be considered when halting the system.

8.1.3.3 Det_Start

[SWS_Det_00010] ⌈

Service Name	Det_Start

Syntax	`void Det_Start (`
	`  void`
	`)`

Service ID [hex]	0x02
Sync/Async	Synchronous
Reentrancy	Non Reentrant
Parameters (in)	None
Parameters (inout)	None
Parameters (out)	None
Return value	None
Description	Service to start the Default Error Tracer.
Available via	Det.h

⌋(*SRS_BSW_00310*)

8.1.3.4 Det_ReportRuntimeError

[SWS_Det_01001] ⌈

Service Name	Det_ReportRuntimeError	

Syntax	`Std_ReturnType Det_ReportRuntimeError (`
	`  uint16 ModuleId,`
	`  uint8 InstanceId,`
	`  uint8 ApiId,`
	`  uint8 ErrorId`
	`)`	

Service ID [hex]	0x04	
Sync/Async	Synchronous	
Reentrancy	Reentrant	
Parameters (in)	ModuleId	Module ID of calling module.
	InstanceId	The identifier of the index based instance of a module, starting from 0, If the module is a single instance module it shall pass 0 as the InstanceId.
	ApiId	ID of API service in which error is detected (defined in SWS of calling module)
	ErrorId	ID of detected runtime error (defined in SWS of calling module).
Parameters (inout)	None	
Parameters (out)	None	
Return value	Std_ReturnType	returns always E_OK (is required for services)
Description	Service to report runtime errors. If a callout has been configured then this callout shall be called.	
Available via	Det.h	

⌋(*SRS_BSW_00310*, *RS_Diag_04086*, *RS_Diag_04143*) Note: Det_ReportRuntime Error may be callable in interrupt context. Since the DET can be called in normal mode or in interrupt context (from stack or integration) this has to be considered during implementation of the hook functions: Det_ReportRuntimeError can be called in interrupt context; this hook should be reentrant and sufficiently performant.

8.1.3.5 Det_ReportTransientFault

[SWS_Det_01003] ⌈

Service Name	Det_ReportTransientFault	
Syntax	`Std_ReturnType Det_ReportTransientFault ( uint16 ModuleId, uint8 InstanceId, uint8 ApiId, uint8 FaultId )`	
Service ID [hex]	0x05	
Sync/Async	Synchronous	
Reentrancy	Reentrant	
Parameters (in)	ModuleId	Module ID of calling module.
	InstanceId	The identifier of the index based instance of a module, starting from 0, If the module is a single instance module it shall pass 0 as the InstanceId.
	ApiId	ID of API service in which transient fault is detected (defined in SWS of calling module)
	FaultId	ID of detected transient fault (defined in SWS of calling module).
Parameters (inout)	None	
Parameters (out)	None	
Return value	Std_ReturnType	If no callout exists it shall return E_OK, otherwise it shall return the value of the configured callout. In case several callouts are configured the logical or (sum) of the callout return values shall be returned. Rationale: since E_OK=0, E_OK will be only returned if all are E_OK, and for multiple error codes there is a good chance to detect several of them.
Description	Service to report transient faults. If a callout has been configured than this callout shall be called and the returned value of the callout shall be returned. Otherwise it returns immediately with E_OK.	
Available via	Det.h	

⌋*(SRS_BSW_00310, RS_Diag_04086, RS_Diag_04144)* Note: Det_ReportTransient Fault may be callable in interrupt context. Since the DET can be called in normal mode or in interrupt context (from stack or integration) this has to be considered during implementation of the hook functions: Det_ReportTransientFault can be called in interrupt context; this hook should be reentrant and sufficiently performant.

8.1.3.6 Det_GetVersionInfo

[SWS_Det_00011] ⌈

Service Name	Det_GetVersionInfo	
Syntax	`void Det_GetVersionInfo ( Std_VersionInfoType* versioninfo )`	
Service ID [hex]	0x03	
Sync/Async	Synchronous	
Reentrancy	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.	
Available via	Det.h	

⌋*(SRS_BSW_00310, SRS_BSW_00318)* In case a null pointer is passed, DET_E_PARAM_POINTER is returned, see SWS_Det_00052.

8.1.4 Expected Interfaces

This chapter specifies all required interfaces of other modules.

8.1.4.1 Mandatory Interfaces

There is no mandatory expected interface, but all <User_ErrorHooks> APIs that are used and are configured as callouts have to be included.

Note: The name of the user API will not be specified, <User_ErrorHook> is a synonym only.

Note: A list of User_ErrorHook can be defined.

8.1.4.2 Optional Interfaces

This chapter defines the interfaces that are required to fulfill an optional functionality of the Default Error Tracer.

[] ⌈

API Function	***Header File***	***Description***
Dlt_DetForwardErrorTrace	Dlt_Det.h	Service to forward error reports from Det to Dlt.

⌋*()*

8.1.5 Callout Functions / Configurable Interfaces

[SWS_Det_00180] ⌈if callout functions are configured, they should have the same signatures as the corresponding functions. If several callouts are defined for the same service they should have the same ID.⌋*(SRS_BSW_00463, SRS_BSW_00394)*

If Det_ReportError function is called, all configured callout functions shall be called (see SWS_Det_00501). User_ErrorHooks functions should have the Service ID 0x10.

[SWS_Det_00181] ⌈

Service Name	<User_Error_Hooks>	
Syntax	`Std_ReturnType <User_Error_Hooks> ( uint16 ModuleId, uint8 InstanceId, uint8 ApiId, uint8 ErrorId )`	
Service ID [hex]	0x10	
Sync/Async	Synchronous	
Reentrancy	Reentrant	
Parameters (in)	ModuleId	Module ID of calling module.
	InstanceId	The identifier of the index based instance of a module, starting from 0, If the module is a single instance module it shall pass 0 as the InstanceId.
	ApiId	ID of API service in which error is detected (defined in SWS of calling module)
	ErrorId	ID of detected development error (defined in SWS of calling module).
Parameters (inout)	None	
Parameters (out)	None	
Return value	Std_ReturnType	returns always E_OK (is required for services)
Description	–	
Available via	Det_Externals.h	

⌋*(SRS_BSW_00463)* If Det_ReportRuntimeError function is called, all configured callout functions shall be called (see SWS_Det_00503). DetReportRuntimeErrorCallout functions should have the Service ID 0x11.

[SWS_Det_00184] ⌈

Service Name	<DetReportRuntimeErrorCallout>
Syntax	`Std_ReturnType <DetReportRuntimeErrorCallout> ( uint16 ModuleId, uint8 InstanceId, uint8 ApiId, uint8 ErrorId )`
Service ID [hex]	0x11
Sync/Async	Synchronous

▽

△

Reentrancy	Reentrant	
Parameters (in)	ModuleId	Module ID of calling module.
	InstanceId	The identifier of the index based instance of a module, starting from 0, If the module is a single instance module it shall pass 0 as the InstanceId.
	ApiId	ID of API service in which error is detected (defined in SWS of calling module)
	ErrorId	ID of detected runtime error (defined in SWS of calling module).
Parameters (inout)	None	
Parameters (out)	None	
Return value	Std_ReturnType	returns always E_OK (is required for services)
Description	–	
Available via	Det_Externals.h	

⌋(*SRS_BSW_00463*)

If Det_ReportTransientFault function is called, all configured callout functions are called (see SWS_Det_00502).

[SWS_Det_00187] ⌈

Service Name	<DetReportTransientFaultCallout>	

Syntax	`Std_ReturnType <DetReportTransientFaultCallout> (`
	`  uint16 ModuleId,`
	`  uint8 InstanceId,`
	`  uint8 ApiId,`
	`  uint8 FaultId`
	`)`	

Service ID [hex]	0x12	
Sync/Async	Synchronous	
Reentrancy	Reentrant	
Parameters (in)	ModuleId	Module ID of calling module.
	InstanceId	The identifier of the index based instance of a module, starting from 0, If the module is a single instance module it shall pass 0 as the InstanceId.
	ApiId	ID of API service in which transient fault is detected (defined in SWS of calling module)
	FaultId	ID of detected transient fault (defined in SWS of calling module).
Parameters (inout)	None	
Parameters (out)	None	
Return value	Std_ReturnType	Value is propagated to caller of Det_ReportTransientFault.
Description	–	
Available via	Det_Externals.h	

⌋(*SRS_BSW_00463*)

8.2 Service Interfaces

8.2.1 Specification of the Ports and Port Interfaces

This chapter specifies the ports and port interfaces which are needed in order to operate the Default Error Tracer functionality over the VFB.

Each AUTOSAR SW-C which uses the service must contain "service ports" in its own SW-C description which will be typed by the same interfaces and which has to be connected to the ports of the Default Error Tracer, so that the RTE, the appropriate IDs and the required symbols can be generated.

8.2.1.1 General Approach

The client-server paradigm is used since more than one parameter has to be transferred.

In order to reuse the C API already defined in the Default Error Tracer BSW module, the Default Error Tracer services uses the same argument names as in the C API, even though the names can not directly be mapped into the SW-C world. "Module ID" can preferably be interpreted as either a component or runnable entity but this is the decision of the implementer of the SW-C.

The Default Error Tracer services need a "Module ID" as first argument for the C-function.

In order to keep the client code independent from the configuration of number of clients, the "Module IDs" are not passed from the clients to Default Error Tracer but are modeled as "port defined argument values" of the Provide ports on the Default Error Tracer side. As a consequence, the "Module IDs" will not show up as arguments in the operation of the client-server interface. As a further consequence for this approach, there will be separate ports for each "Module ID" both on the client side as well as on the server side.

The Module ID type is of range 0...65535. Values in the range of 0...254 are reserved for Basic Software Modules, complex drivers use either 255 or a value between 2048 and 4095. All others can be used for application software components.

8.2.1.2 Data Types

[SWS_Det_00200] ⌈For the port interface of the Default Error Tracer service uint8 and uint16 are required and refer to the AUTOSAR data types.⌋*()*

8.2.1.3 Port Interface

[SWS_Det_00202] ⌈

Name	DETService		
Comment	Service of Default Error Tracer		
IsService	true		
Variation	–		
Possible Errors	0	E_OK	Operation successful

Operation	ReportError	
Comment	calls Det_ReportError with the Module ID of the port	
Variation	–	
Parameters	ApiId	
	Type	uint8
	Direction	IN
	Comment	ID of API service in which error is detected (defined in SWS of calling module).
	Variation	–
	ErrorId	
	Type	uint8
	Direction	IN
	Comment	ID of detected development error (defined in SWS of calling module).
	Variation	–
Possible Errors	E_OK	

Operation	ReportRuntimeError	
Comment	calls ReportRuntimeError with the Module ID of the port	
Variation	–	
Parameters	ApiId	
	Type	uint8
	Direction	IN
	Comment	ID of API service in which error is detected (defined in SWS of calling module).
	Variation	–
	ErrorId	
	Type	uint8
	Direction	IN
	Comment	ID of detected runtime error (defined in SWS of calling module).
	Variation	–
Possible Errors	E_OK	

⌋*(RS_Diag_04087)*

[SWS_Det_00203] ⌈The arguments of the C-Api ModuleId and InstanceId are used to identify the component and component instance by using "port defined argument values". The arguments ApiId and ErrorId are not standardized by AUTOSAR for software components. It is up to the implementer of a SW-C to decide about the semantics of the arguments. However, the ApiId typically corresponds to the operations that can report an error, and ErrorId corresponds to the type of error that is reported. Both Api

Id and ErrorId are numbered 0x00..0xFF without specific order. Note that the returned values is always true (E_OK), since a Std_ReturnType is required for all services⌋*()*

8.2.2 Definition of the Service

[SWS_Det_00204] ⌈The Provide Ports have a certain relation to the internal behavior of the DET: With each call, the "Module ID" is passed as an additional argument by the RTE to the C-function which implements the associated runnable entity (feature "port defined argument value").⌋*(SRS_ARTICP_04087)*

The DET shall provide the following Port for each configured SWC module with the given name.

[SWS_Det_00205] ⌈

Name	Det_{Name}		
Kind	ProvidedPort	***Interface***	DETService
Description	–		
Port Defined Argument Value(s)	***Type***	uint16	
	Value	{ecuc(Det/DetConfigSet/DetModule/DetModuleId.value)}	
	Type	uint8	
	Value	{ecuc(Det/DetConfigSet/DetModule/DetModuleInstance/DetInstanceId.value)}	
Variation	Name = {ecuc(Det/DetConfigSet/DetModule.SHORT-NAME)}_{ecuc(Det/DetConfigSet/DetModule/DetModuleInstance.SHORT-NAME)}		

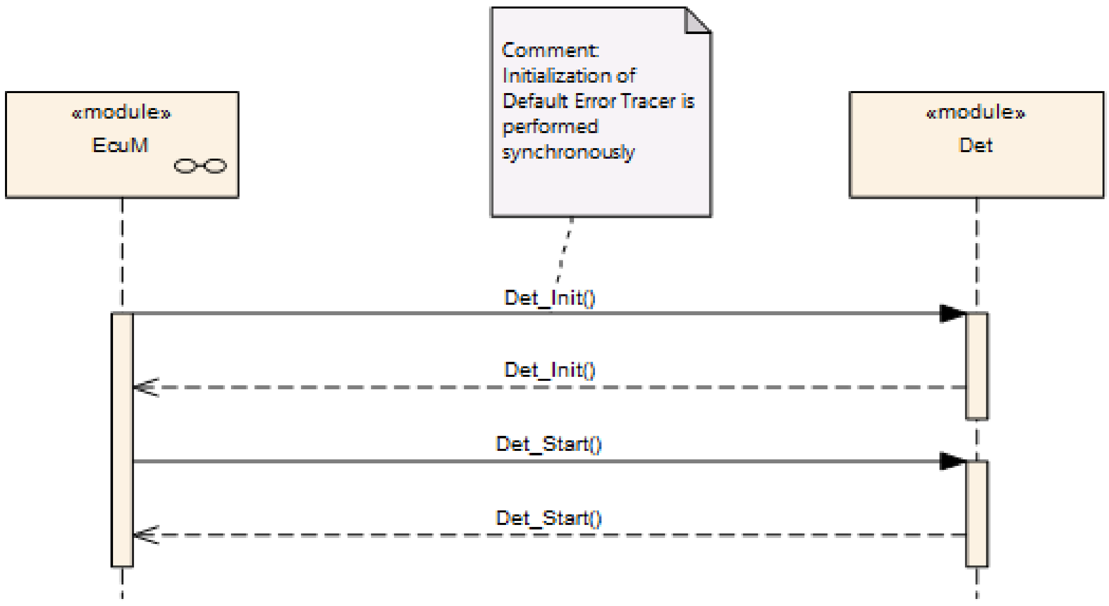
⌋*(RS_Diag_04087)*

8.2.3 Configuration of the DET

[SWS_Det_00206] ⌈The "Module IDs" of the DET service are modeled as "port defined argument values". Thus the configuration of those values is part of the RTE configuration. Pre-compile configuration can be done by changing the XML specification for the ports on the client (SW-C) or service (i.e. DET) side.⌋*()*

9 Sequence diagrams

9.1 Initialization



9.2 Error Reporting

There are different scenarios: one for each error class (DevelopmentError, Runtime Error and TransientFault) and one for each configuration: no hooks configured, at least one hook configured.

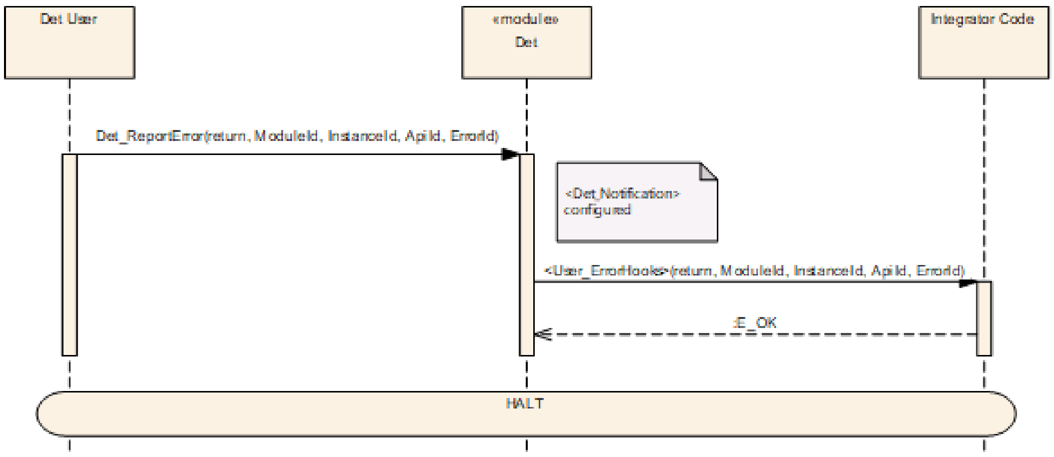

Det User
«module»
Det
Integrator Code
Det_ReportError(return, ModuleId, InstanceId, ApiId, ErrorId)
<Det_Notification>
configured
<User_ErrorHooks>(return, ModuleId, InstanceId, ApiId, ErrorId)
:E_OK
HALT

Figure 9.2: Det:_ReportError with configured hook

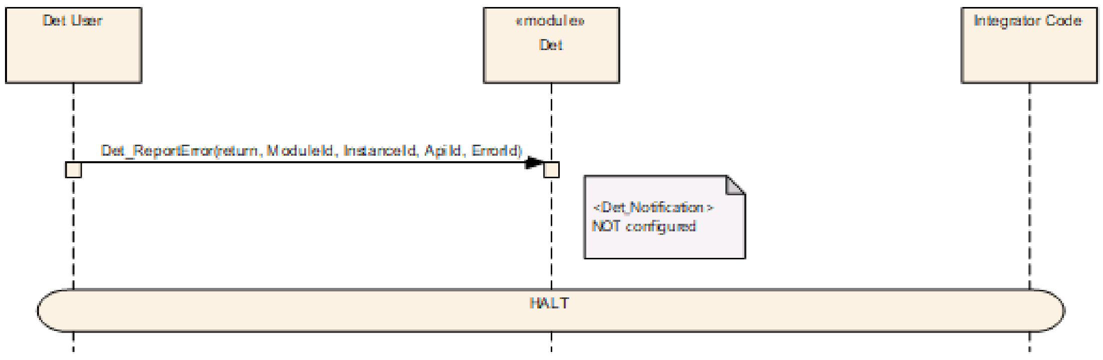


Figure 9.3: Det:_ReportError without configured hook

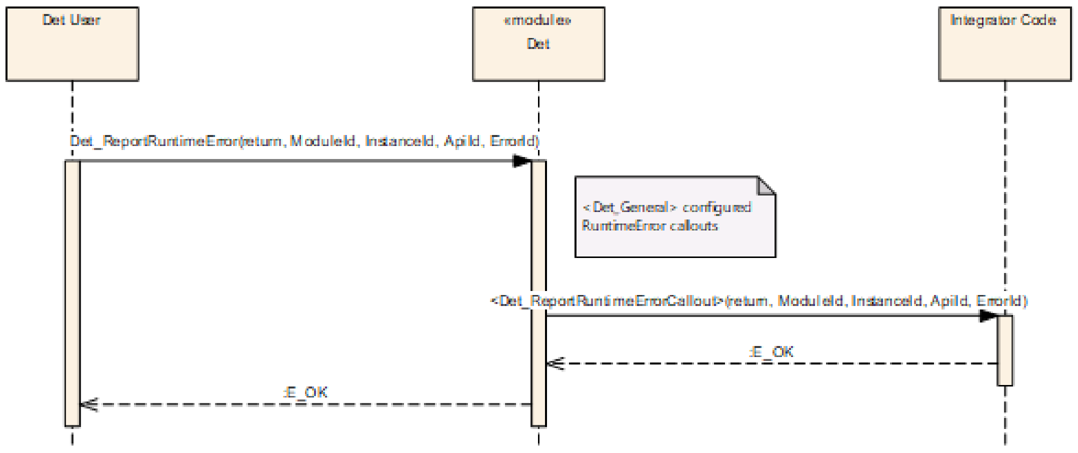

Det User
«module»
Det
Integrator Code
Det_ReportRuntimeError(return, ModuleId, InstanceId, ApiId, ErrorId)
< Det_General> configured RuntimeError callouts
<Det_ReportRuntimeErrorCallout>(return, ModuleId, InstanceId, ApiId, ErrorId)
:E_OK
:E_OK

Figure 9.4: Det:_ ReportRuntimeError with configured hook

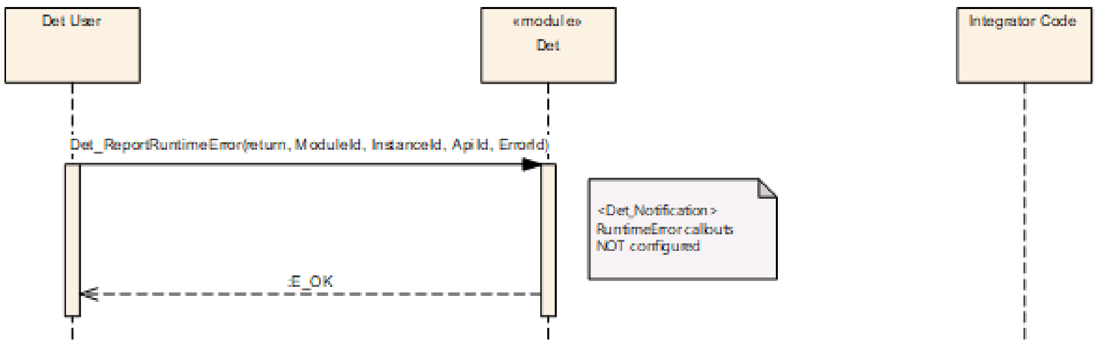


Figure 9.5: Det:_ ReportRuntimeError without configured hook

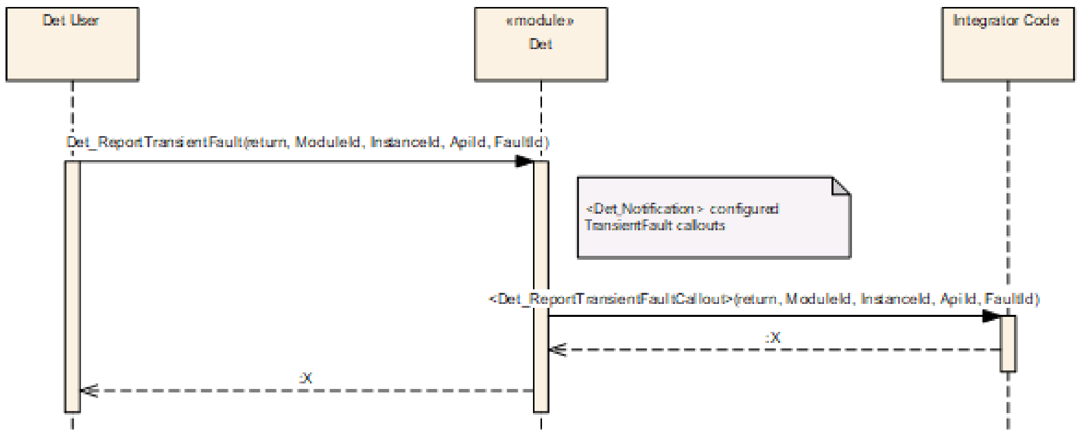

Det User
«module»
Det
Integrator Code
Det_ReportTransientFault(return, ModuleId, InstanceId, ApiId, FaultId)
<Det_Notification> configured TransientFault callouts
<Det_ReportTransientFaultCallout>(return, ModuleId, InstanceId, ApiId, FaultId)
:X
:X

Figure 9.6: Det:_ ReportTransientFault with configured hook

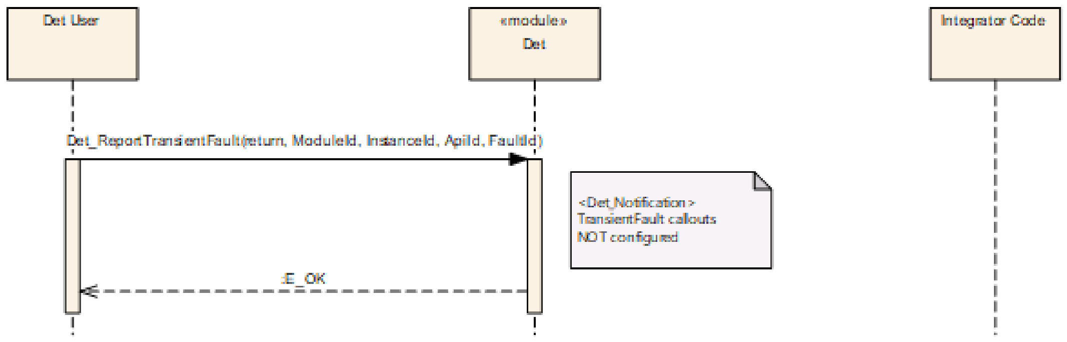


Figure 9.7: Det:_ ReportTransientFault without configured hook

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 Default Error Tracer.

Chapter 10.4 specifies published information of the module Default Error Tracer.

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 Parameters of DET are described in the following sub-sections.

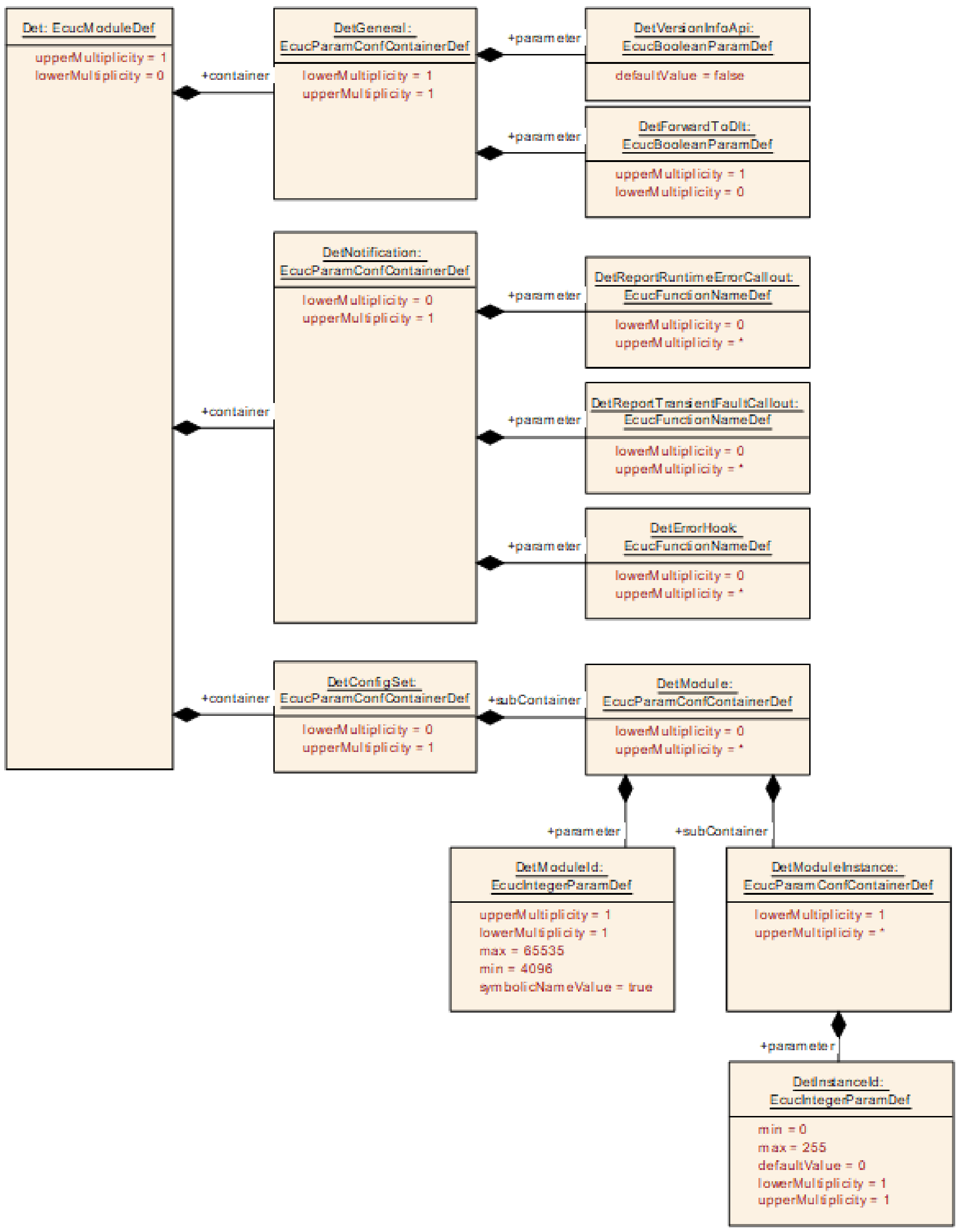


Figure 10.1: Parameters of DET

Figure 10.1 gives an overview over them.

10.2.1 Det

Module SWS Item	ECUC_Det_00001	
Module Name	Det	
Module Description	Det configuration includes the functions to be called at notification. On one side the application functions are specified and in general it can be decided whether Dlt shall be called at each call of Det.	
Post-Build Variant Support	false	
Supported Config Variants	VARIANT-PRE-COMPILE	
Included Containers		
Container Name	**Multiplicity**	**Scope / Dependency**
DetConfigSet	0..1	Configuration set container for Det.
DetGeneral	1	Generic configuration parameters of the Det module.
DetNotification	0..1	Configuration of the notification functions.

10.2.2 DetGeneral

SWS Item	[ECUC_Det_00002]
Container Name	DetGeneral
Parent Container	Det
Description	Generic configuration parameters of the Det module.
Configuration Parameters	

Name	DetForwardToDlt [ECUC_Det_00006]		
Parent Container	DetGeneral		
Description	Only if the parameter is present and set to true, the Det requires the Dlt interface and forwards it's call to the function Dlt_DetForwardErrorTrace. In this case the optional interface to Dlt_Det is required.		
Multiplicity	0..1		
Type	EcucBooleanParamDef		
Default Value			
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	DetVersionInfoApi [ECUC_Det_00003]		
Parent Container	DetGeneral		
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.		
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 DetNotification

SWS Item	[ECUC_Det_00004]
Container Name	DetNotification
Parent Container	Det
Description	Configuration of the notification functions.
Configuration Parameters	

Name	DetErrorHook [ECUC_Det_00005]		
Parent Container	DetNotification		
Description	Optional list of functions to be called by the Default Error Tracer in context of each call of Det_ReportError. The type of these functions shall be identical the type of Det_ReportError itself: Std_ReturnType (*f)(uint16, uint8, uint8, uint8).		
Multiplicity	0..*		
Type	EcucFunctionNameDef		
Default Value			
Regular Expression			
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	DetReportRuntimeErrorCallout [ECUC_Det_00010]		
Parent Container	DetNotification		
Description	This parameter defines the existence and the names of callout functions for the corresponding runtime error handler. The type of these functions shall be identical the type of Det_ReportRuntimeError itself: Std_ReturnType (*f)(uint16, uint8, uint8, uint8)		
Multiplicity	0..*		
Type	EcucFunctionNameDef		
Default Value			
Regular Expression			
Value Configuration Class	**Pre-compile time**	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local		

Name	DetReportTransientFaultCallout [ECUC_Det_00011]		
Parent Container	DetNotification		
Description	This parameter defines the existence and the names of callout functions for the corresponding transient fault handler. The type of these functions shall be identical the type of Det_ReportTransientFault itself: Std_ReturnType (*f)(uint16, uint8, uint8, uint8)		
Multiplicity	0..*		
Type	EcucFunctionNameDef		
Default Value			
Regular Expression			
Value Configuration Class	**Pre-compile time**	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local		

No Included Containers

10.2.4 DetConfigSet

SWS Item	[ECUC_Det_00007]

Container Name	DetConfigSet
Parent Container	Det
Description	Configuration set container for Det.
Configuration Parameters	

Included Containers		
Container Name	**Multiplicity**	**Scope / Dependency**
DetModule	0..*	This container describes a non BSW module that is using the Det via Service Interface.

10.2.5 DetModule

SWS Item	[ECUC_Det_00008]
Container Name	DetModule
Parent Container	DetConfigSet
Description	This container describes a non BSW module that is using the Det via Service Interface.
Configuration Parameters	

Name	DetModuleId [ECUC_Det_00009]		
Parent Container	DetModule		
Description	Unique identifier of the error reporting component. When reporting errors to the DET, a symbolic name derived from the moduleID has to be used to identify the reporter.		
Multiplicity	1		
Type	EcucIntegerParamDef (Symbolic Name generated for this parameter)		
Range	4096 .. 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		

Included Containers		
Container Name	**Multiplicity**	**Scope / Dependency**
DetModuleInstance	1..*	Describes the Instance used for the according Service Port. It shall be used to differentiate software component instances when multiple instantiation is used.

10.2.6 DetModuleInstance

SWS Item	[ECUC_Det_00013]
Container Name	DetModuleInstance
Parent Container	DetModule

Description	Describes the Instance used for the according Service Port. It shall be used to differentiate software component instances when multiple instantiation is used.		
Post-Build Variant Multiplicity	true		
Multiplicity Configuration Class	**Pre-compile time**	X	All Variants
	Link time	–	
	Post-build time	–	
Configuration Parameters			

Name	DetInstanceId [ECUC_Det_00012]		
Parent Container	DetModuleInstance		
Description	Describes the InstanceId used for the according Service Port. It shall be used to differentiate software component instances when multiple instantiation is used. Else it shall be set to 0.		
Multiplicity	1		
Type	EcucIntegerParamDef		
Range	0 .. 255		
Default Value	0		
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

Additional module-specific published parameters are listed below if applicable.

10.4 Published Information

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

A Not applicable requirements

[SWS_Det_00999] ⌈These requirements are not applicable to this specification.⌋*(SRS_BSW_00301, SRS_BSW_00304, SRS_BSW_00305, SRS_BSW_00306, SRS_-BSW_00307, SRS_BSW_00308, SRS_BSW_00309, SRS_BSW_00439, SRS_-BSW_00314, SRS_BSW_00325, SRS_BSW_00328, SRS_BSW_00330, SRS_-BSW_00331, SRS_BSW_00334, SRS_BSW_00335, SRS_BSW_00341, SRS_-BSW_00342, SRS_BSW_00343, SRS_BSW_00347, SRS_BSW_00441, SRS_-BSW_00353, SRS_BSW_00350, SRS_BSW_00359, SRS_BSW_00360, SRS_-BSW_00440, SRS_BSW_00361, SRS_BSW_00371, SRS_BSW_00373, SRS_-BSW_00377, SRS_BSW_00378, SRS_BSW_00379, SRS_BSW_00401, SRS_-BSW_00410, SRS_BSW_00413, 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_00170, SRS_BSW_00380, SRS_BSW_00419, SRS_-BSW_00381, SRS_BSW_00412, SRS_BSW_00383, SRS_BSW_00388, SRS_-BSW_00389, SRS_BSW_00390, SRS_BSW_00393, SRS_BSW_00395, SRS_-BSW_00396, SRS_BSW_00397, SRS_BSW_00398, SRS_BSW_00399, SRS_-BSW_00400, SRS_BSW_00438, SRS_BSW_00375, SRS_BSW_00416, SRS_-BSW_00406, SRS_BSW_00437, 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, SRS_BSW_00432, SRS_-BSW_00433, SRS_BSW_00336, SRS_BSW_00369, SRS_BSW_00339, SRS_-BSW_00348, SRS_BSW_00357, SRS_BSW_00422, SRS_BSW_00417, SRS_-BSW_00323, SRS_BSW_00004, SRS_BSW_00409, SRS_BSW_00385, SRS_-BSW_00386, SRS_BSW_00458, SRS_BSW_00466)*