MICROSAR CAN State Manager

1 Document Information

1.1 History

Author	Date	Version	Remarks
			CANSM_E_SETTRANSCEIVERMODE
			Disable Pdu Group BusOff Notification

©

			➔
			CANSM_EXCLUSIVE_AREA_4

1.2 Reference Documents

No.	Title	Version

©

1.3 Scope of the Document

Please note

©

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Illustrations

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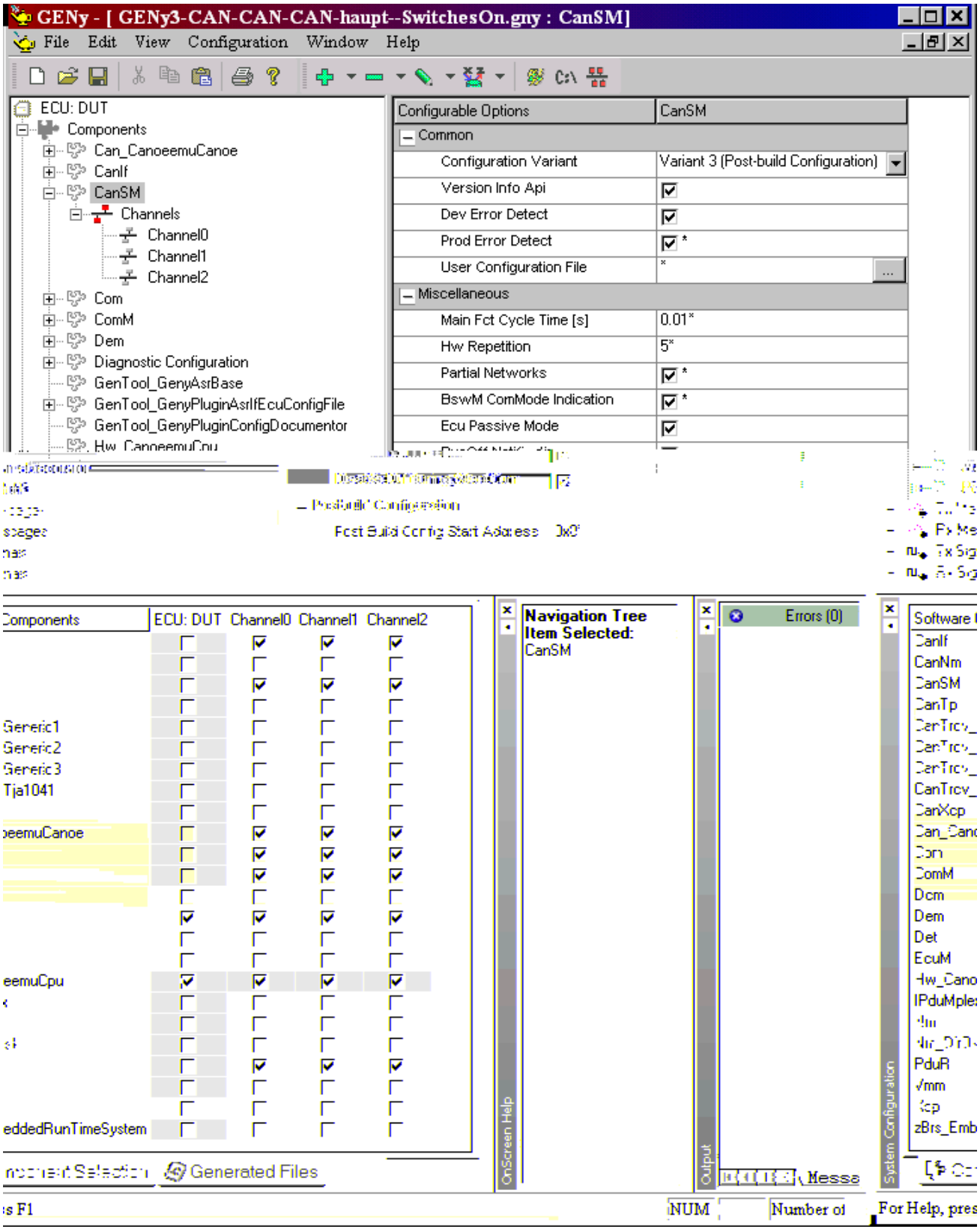
GENy - [GENy3-CAN-CAN-CAN-haupt--SwitchesOn.gny : CanSM]
File Edit View Configuration Window Help
ECU: DUT
Components
Can_CanoeemuCanoe
CanIf
CanSM
Channels
Channel0
Channel1
Channel2
Com
ComM
Dem
Diagnostic Configuration
GenTool_GenyAsrBase
GenTool_GenyPluginAsrIfEcuConfigFile
GenTool_GenyPluginConfigDocumentor
Configurable Options
CanSM
Common
Configuration Variant
Variant 3 (Post-build Configuration)
Version Info Api
Dev Error Detect
Prod Error Detect
User Configuration File
Miscellaneous
Main Fct Cycle Time [s]
0.01*
Hw Repetition
5*
Partial Networks
BswM ComMode Indication
Ecu Passive Mode
Post Build Config Start Address
0x0*
Components
ECU: DUT
Channel0
Channel1
Channel2
Generic1
Generic2
Generic3
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Navigation Tree Item Selected:
CanSM
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©

2 Component History

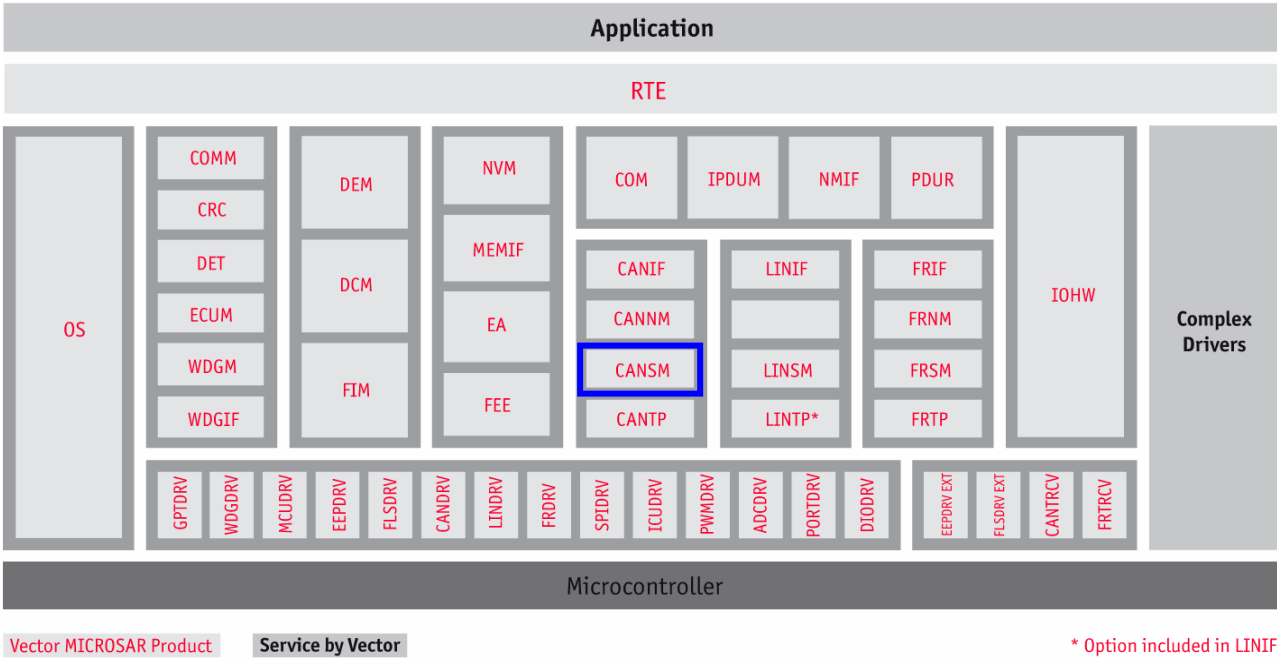
New Features

©

3 Introduction

Supported AUTOSAR Release*:		
Supported Configuration Variants:		
Vendor ID:		
Module ID:		0x8C

3.1 Architecture Overview



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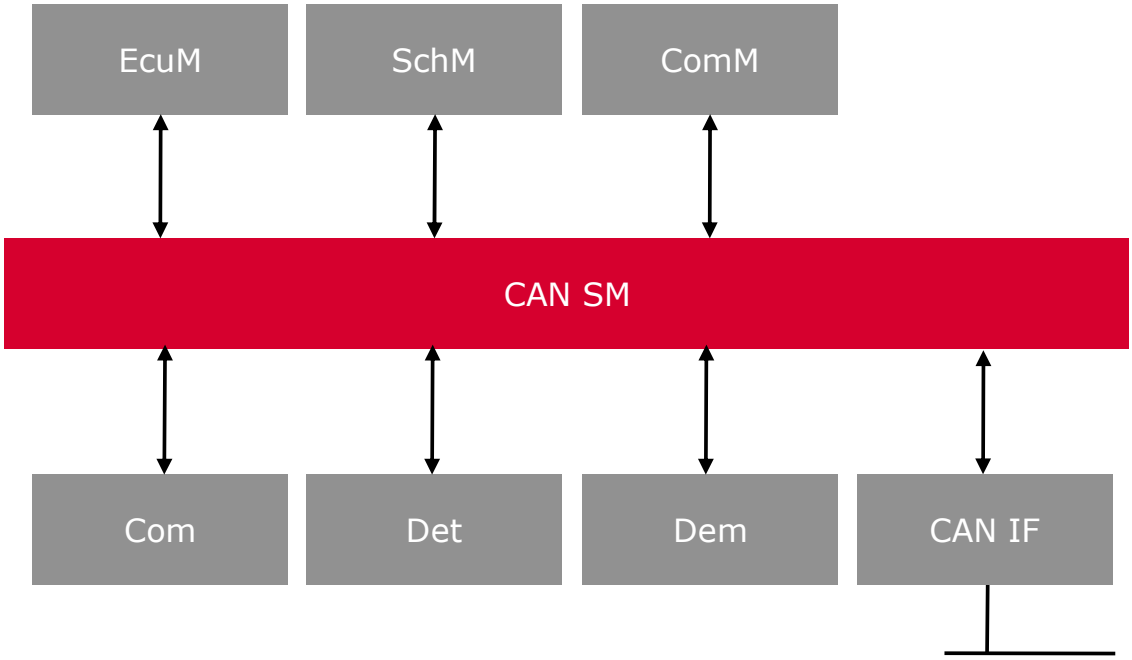
EcuM
SchM
ComM
CAN SM
Com
Det
Dem
CAN IF

©

4 Functional Description

4.1 Features

Feature

Feature

4.2 Initialization

CanSM_Init CanSM_InitMemory(void)

CanSM_Init

©

Info

4.3 State Machines

4.3.1 Network Mode State Machine

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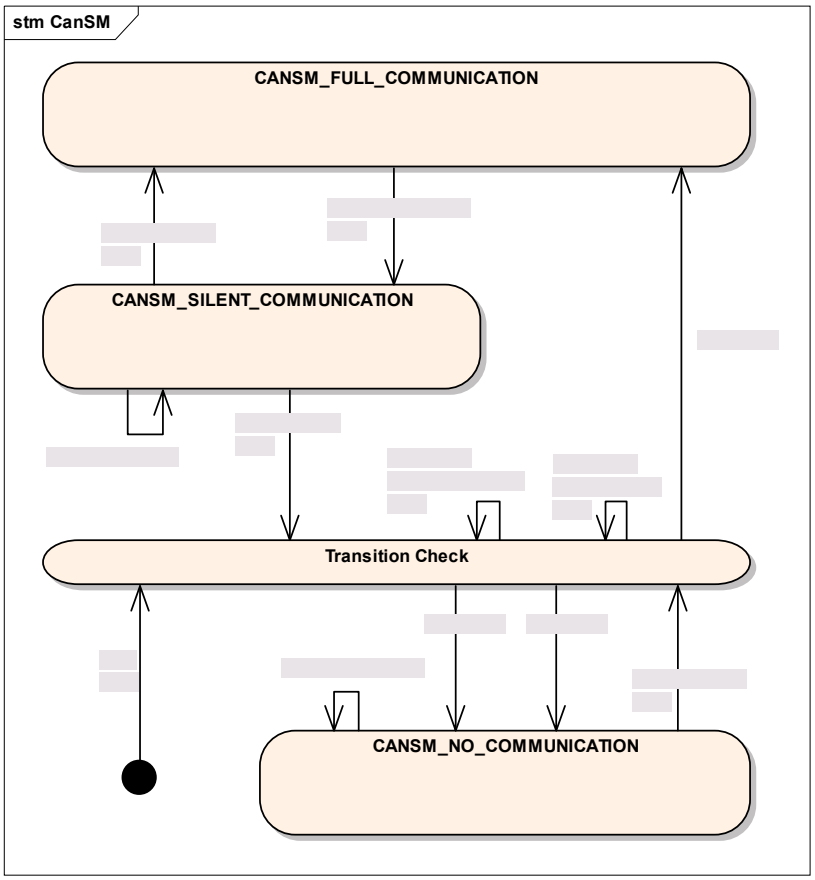


Initial

CanSM_Init

CANSM_NO_COMMUNNICATION

Transition Check

Hw Repetition

CANSM_E_MODE_CHANGE_NETWORK_x

©

CANSM_NO_COMMUNICATION

CANSM_FULL_COMMUNICATION

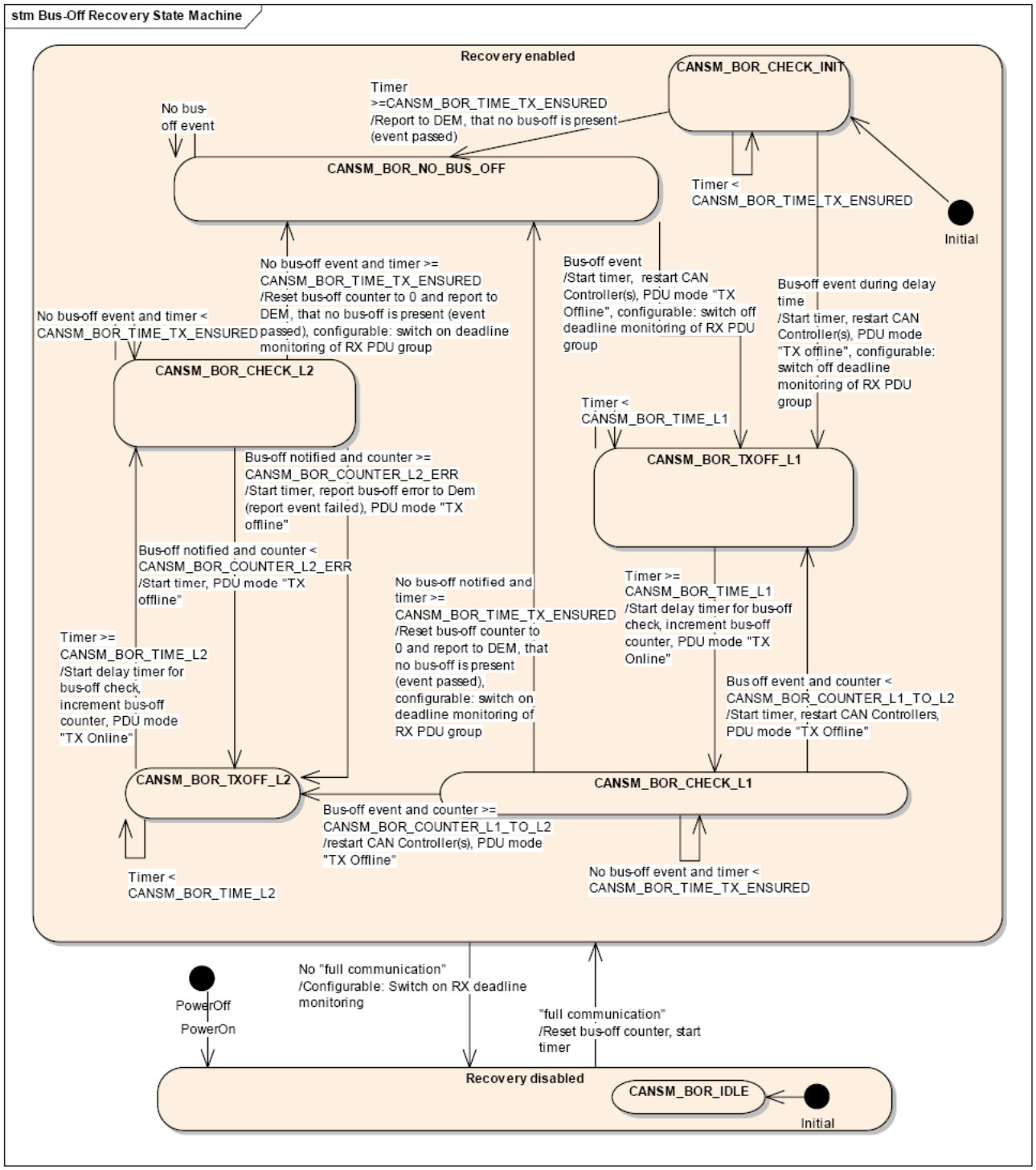
CANSM_SILENT_COMMUNICATION

CANSM_NO_COMMUNNICATION
CANSM_FULL_COMMUNICATION

CANSM_FULL_COMMUNICATION
CANSM_NO_COMMUNICATION

©

4.3.2 Bus-off Recovery State Machine



CANSM_BOR_IDLE

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CANSM_BOR_IDLE

CANSM_FULL_COMMUNICATION

CANSM_BOR_CHECK_INIT

TxEnsured
CANSM_BOR_NO_BUS_OFF

CANSM_BOR_TXOFF_L1

CANSM_BOR_NO_BUS_OFF

CANSM_FULL_COMMUNICATION

DEM_EVENT_STATUS_PASSED

CANSM_BOR_TXOFF_L1

CANSM_BOR_TXOFF_L1, CANSM_BOR_TXOFF_L2

Level 2 recovery time
CANSM_BOR_CHECK_Lx

ComM_BusSM_ModeIndication

CanSM_GetCurrentComMode

CANSM_BOR_CHECK_L1, CANSM_BOR_CHECK_L2

TxEnsured
CANSM_BOR_NO_BUS_OFF

Counter L1 to L2 CANSM_BOR_TXOFF_L1
CANSM_BOR_TXOFF_L2.

L2 error counter
DEM_EVENT_STATUS_FAILED

©

Bus-off notification functions Appl_CanSM_BusOffBegin and Appl_CanSM_BusOffEnd

Appl_CanSM_BusOffBegin

CANSM_BOR_CHECK_L1 CANSM_BOR_CHECK_L2

Appl_CanSM_BusOffEnd

BusOffBegin

_BOR_NO_BUS_OFF

TxEnsured

Appl_CanSM_BusOffBegin

Appl_CanSM_BusOffEnd

Info

Caution

Appl_CanSM_BusOffBegin

Caution

Appl_CanSM_BusOffEnd

CANSM_EXCLUSIVE_AREA_4

4.4 XCP notification function

©

4.5 ECU passive mode

4.6 Main Function

4.7 Communication Modes

CanSM_RequestComMode.

4.8 Communication Mode Polling

ComM_BusSM_ModeIndication.

CanSM_GetCurrentComMode

4.9 Error Handling

4.9.1 Development Error Reporting

Det_ReportError()

CANSM_DEV_ERROR_DETECT

STD_ON

0x8C

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Service ID	Service
0x00	CANSM_INIT_SERVICE_ID
0x01	CANSM_GETVERSIONINFO_SERVICE_ID
0x02	CANSM_REQUESTCOMMODE_SERVICE_ID
0x03	CANSM_GETCURRENTCOMMODE_SERVICE_ID
0x04	CANSM_CONTROLLERBUSOFF_SERVICE_ID
0x05	CANSM_MAINFUNCTION_SERVICE_ID
0x06	CANSM_PREVENTBUSSLEEPATSTARTUP_SERVICE_ID

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5 Integration

5.1 Brief Instruction

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> CanSM_InitMemory

> CanSM_PreventBusSleepAtStartUp

> CanSM_Init

> CanSM_RequestComMode

> CanSM_MainFunction

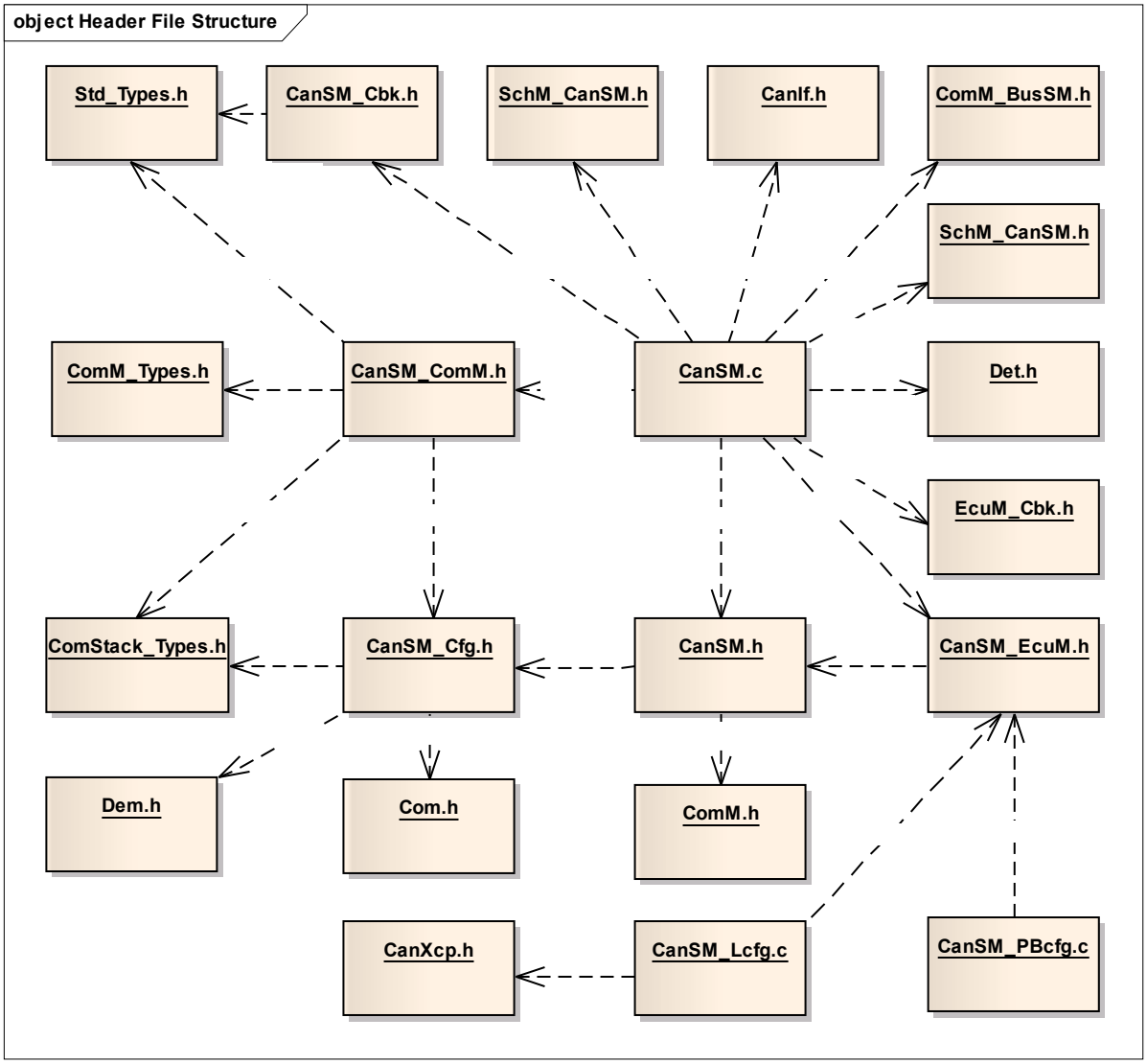
5.2 Scope of Delivery ereuster inst communica2/MC3 1 Tf7.00Tf0.000fi8 0 whif narf

5.9

5.2.2 Dynamic Files

File Name	Description

5.3 Include Structure



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5.4 Compiler Abstraction and Memory Mapping

Memory Mapping Sections \ Compiler Abstraction Definitions	CANSM_VAR_NOINIT	CANSM_VAR_ZERO_INIT	CANSM_CONST	CANSM_PBCFG	CANSM_CODE
CANSM_START_SEC_VAR_NOINIT_UNSPECIFIED CANSM_STOP_SEC_VAR_NOINIT_UNSPECIFIED	■				
CANSM_START_SEC_VAR_ZERO_INIT_8BIT CANSM_STOP_SEC_VAR_ZERO_INIT_8BIT		■			
CANSM_START_SEC_VAR_NOINIT_8BIT CANSM_STOP_SEC_VAR_NOINIT_8BIT	■				
CANSM_START_SEC_CONST_8BIT CANSM_STOP_SEC_CONST_8BIT			■		
CANSM_START_SEC_CONST_32BIT CANSM_STOP_SEC_CONST_32BIT			■		
CANSM_START_SEC_CONST_UNSPECIFIED CANSM_STOP_SEC_CONST_UNSPECIFIED			■		
CANSM_START_SEC_PBCFG CANSM_STOP_SEC_PBCFG				■	
CANSM_START_SEC_CODE CANSM_STOP_SEC_CODE					■

5.5 Critical Areas

>

>

>

©

> CANSM_EXCLUSIVE_AREA_1
CanSM_MainFunction()
CanSM_RequestComMode() CanSM_SetEcuPassive()

> CANSM_EXCLUSIVE_AREA_2
CanSM_RequestComMode()
CanSM_MainFunction() CanSM_SetEcuPassive()

> CANSM_EXCLUSIVE_AREA_3
CanSM_SetEcuPassive()
CanSM_RequestComMode() CanSM_MainFunction ()

> CANSM_EXCLUSIVE_AREA_4
CanSM_MainFunction() CanSM_RequestComMode()

1.
2.
3.

> CANSM_EXCLUSIVE_AREA_5
CanSM_MainFunction() CanSM_RequestComMode()

1.
2.
3.

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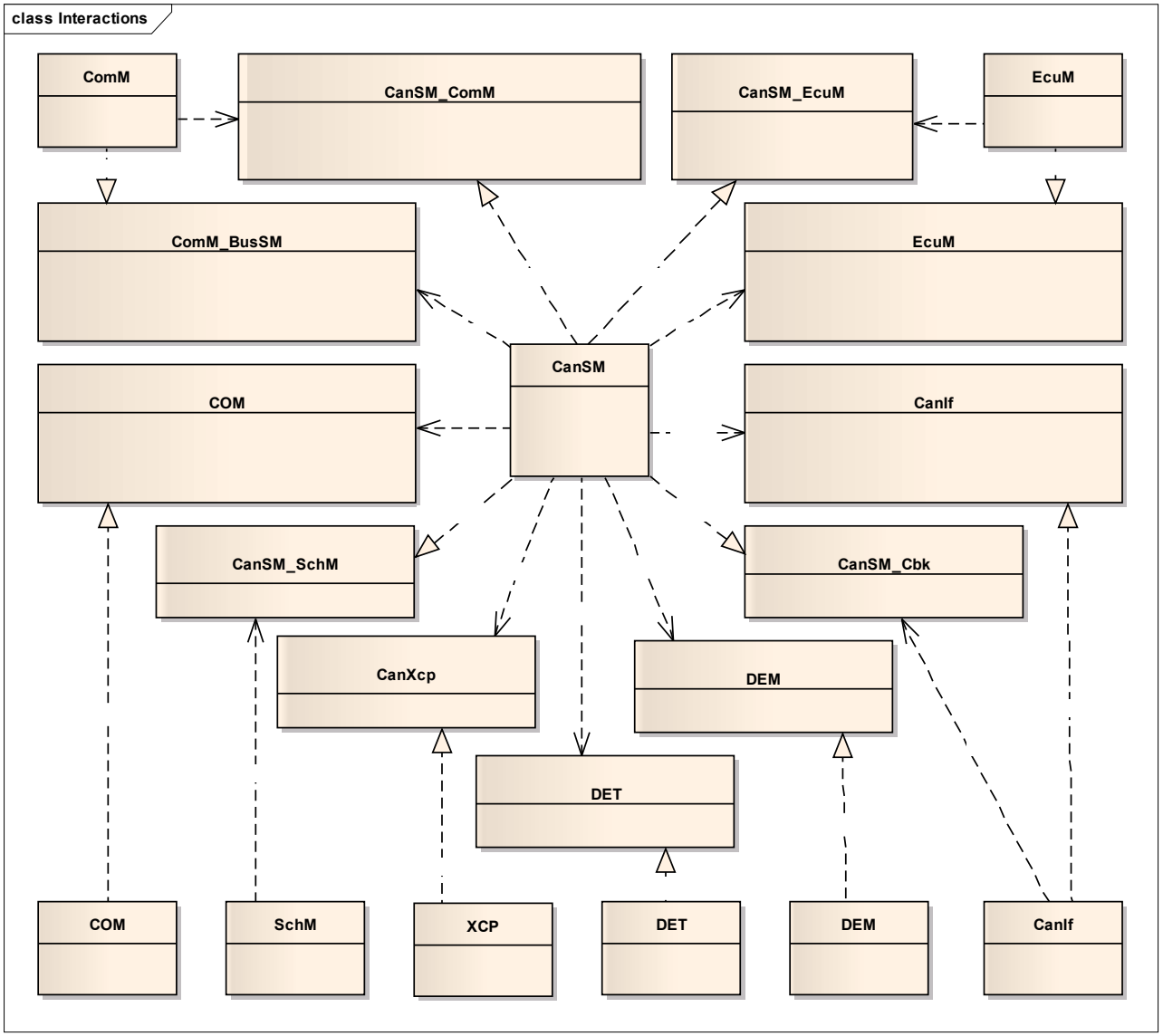
6 API Description

6.1 Interfaces Overview



6.2 Type Definitions

Type Name	C-Type	Description	Value Range
			CANSM_UNINITED
			CANSM_NO_COMMUNICATION

©

Type Name	C-Type	Description	Value Range
			COMM_NO_COMMUNICATION
			CANSM_SILENT_COMMUNICATION COMM_SILENT_COMMUNICATION
			CANSM_FULL_COMMUNICATION COMM_FULL_COMMUNICATION
			CANSM_BOR_IDLE
			CANSM_BOR_CHECK
			CANSM_BOR_NO_BUS_OFF
			CANSM_BOR_TXOFF_L1
			CANSM_BOR_CHECK_L1
			CANSM_BOR_TXOFF_L2
			CANSM_BOR_CHECK_L2

6.3 Services Provided by CanSM

Return value	Function name	Function parameter
void	CanSM_Init	
void	CanSM_GetVersionInfo	
Std_ReturnType	CanSM_RequestComMode	

©

Void	CanSM_SetEcuPassive	
Std_ReturnType	CanSM_GetCurrentComMode	
void	CanSM_ControllerBusOff	
void	CanSM_MainFunction	
Std_ReturnType	CanSM_PreventBusSleepAtStartUp	

6.3.1 CanSM_InitMemory

Prototype	
void CanSM_InitMemory(void)	
Parameter	
Return code	
Functional Description	
CanSm_IsInitialized FALSE	
Particularities and Limitations	
■	
■	

6.3.2 CanSM_Init

Prototype	
	void CanSM_Init(void)
	void CanSM_Init(const CanSM_ConfigType* ConfigPtr)
Parameter	
ConfigPtr	
Return code	
Functional Description	
Particularities and Limitations	
■	
■	

©

■

6.3.3 CanSM_MainFunction

Prototype	
`void CanSM_MainFunction( void );`	
Parameter	
Return code	
Functional Description	
Particularities and Limitations	
■ ■	
■	

6.3.4 CanSM_RequestComMode

Prototype	
`Std_ReturnType CanSM_RequestComMode( NetworkHandleType NetworkHandle, ComM_ModeType ComM_Mode )`	
Parameter	
`NetworkHandle`	
`ComM_Mode`	
Return code	
`ReturnType`	
Functional Description	
Particularities and Limitations	
■ ■	
■	

©

6.3.5 CanSM_SetEcuPassive

Prototype	
`void CanSM_SetEcuPassive( boolean CanSM_EcuPassiveMode )`	
Parameter	
`CanSM_EcuPassiveMode`	
Return code	
Functional Description	
Particularities and Limitations	
■	
■	

6.3.6 CanSM_GetCurrentComMode

Prototype	
`Std_ReturnType CanSM_GetCurrentComMode( NetworkHandleType NetworkHandle, ComM_ModeType* ComM_ModePtr )`	
Parameter	
`NetworkHandle`	
`ComM_ModePtr`	
Return code	
`ReturnType`	
Functional Description	
Particularities and Limitations	
■	
■	

6.3.7 CanSM_GetVersionInfo

Prototype	
`void CanSM_GetVersionInfo( Std_VersionInfoType * VersionInfo )`	
Parameter	
`VersionInfo`	
Return code	

©

Functional Description
Particularities and Limitations
■
■

6.3.8 CanSM_PreventBusSleepAtStartUp

Prototype	
`Std_ReturnType CanSM_PreventBusSleepAtStartUp( NetworkHandleType CanSM_NetworkHandle )`	
Parameter	
`NetworkHandleType`	
Return code	
`Std_ReturnType`	
Functional Description	
Particularities and Limitations	
■	
■	

6.4 Services used by CanSM

Component	API

©

Component	API

6.5 Callback Functions

6.5.1 CanSM_ControllerBusOff

Prototype	
`void CanSM_ControllerBusOff( uint8 Controller )`	
Parameter	
`Controller`	
Return code	
Functional Description	
Particularities and Limitations	
■	
■	

6.5.2 Appl_CanSM_BusOffBegin

Prototype
`void Appl_CanSM_BusOffBegin( NetworkHandleType CanSm_NetworkHandle, CanSM_BorCounterType CanSM_BusOffNotificationCounter )`

©

Parameter	
NetworkHandleType	
CanSM_BusOffNotificationCounter	
Return code	
-	
Functional Description	
Particularities and Limitations	

7 Configuration

>

7.1 Configuration with GENy

7.1.1.1 Basic

Components, CanSM

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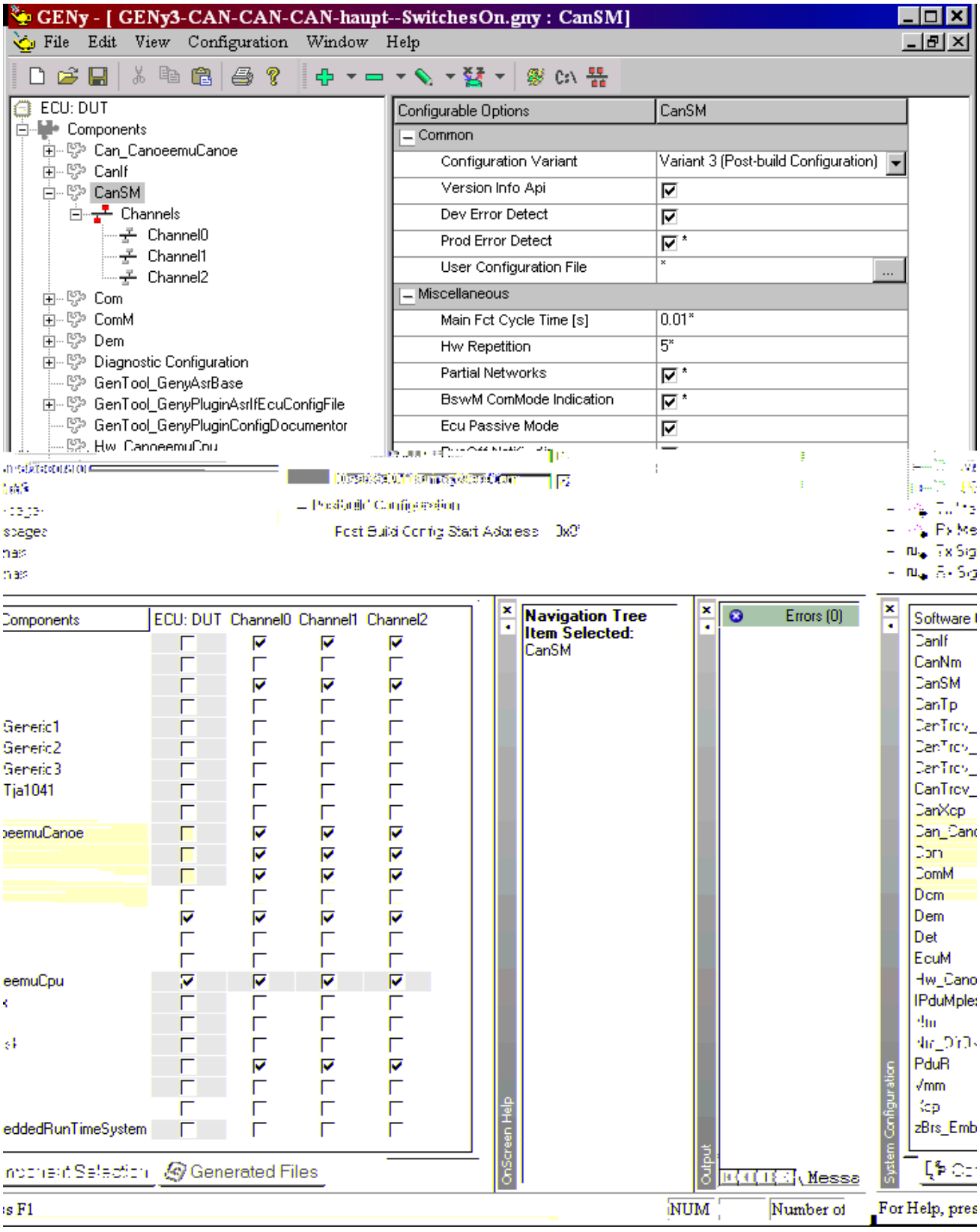

7.1.2 Activation of the CAN State Manager

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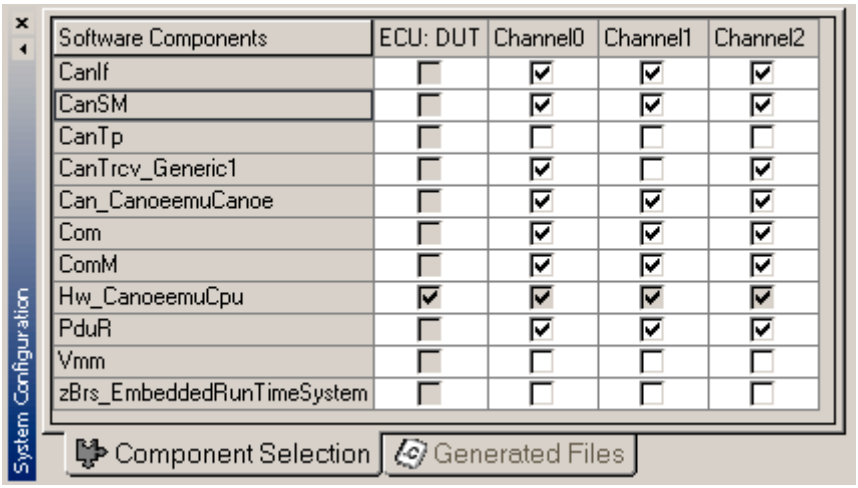
CanSM Component Selection
System Configuration
Configuration Add Channel



Com ComM
CanSM Com

Info

View | OnScreen Help

Help | Help topics

7.1.3 General Settings

Main Fct Cycle Time

Caution

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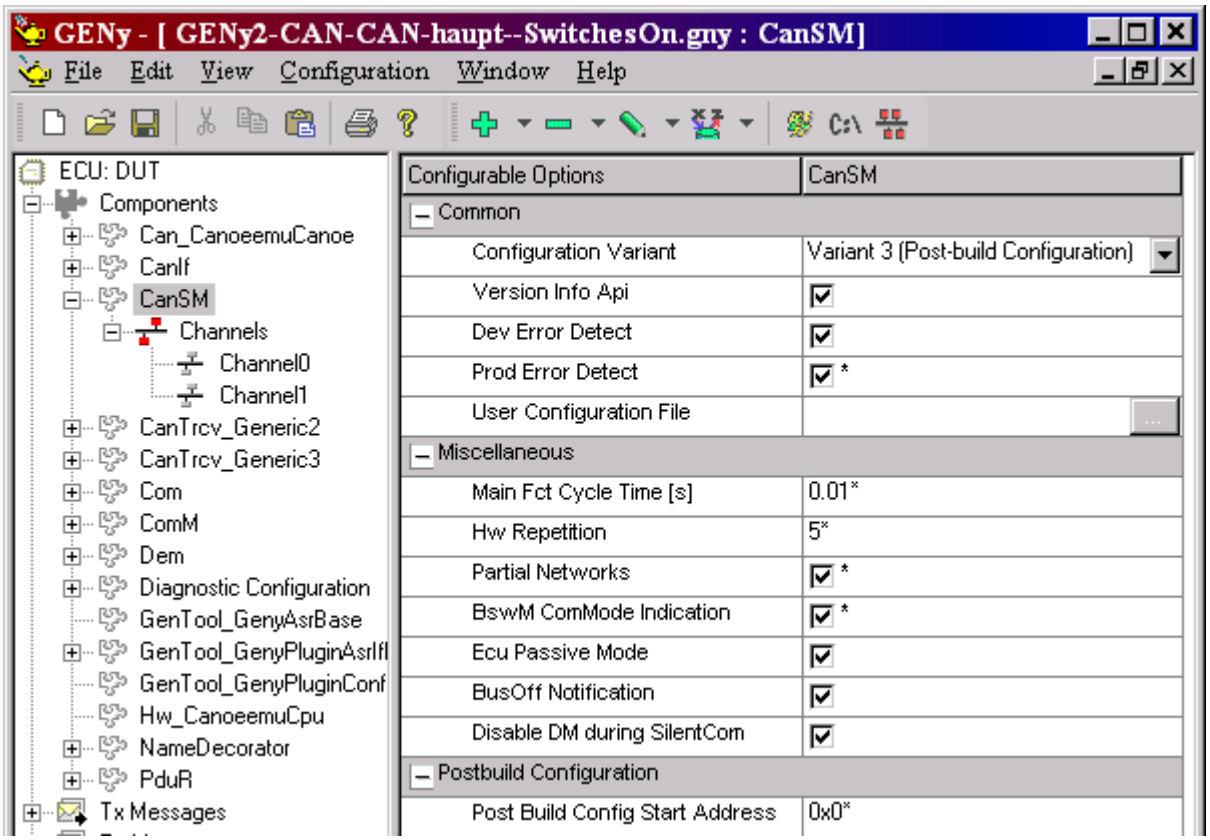

Attribute Name	Configuration Variant	Value Type	Values	Description
Configuration Variant			**1**	
Version Info Api			**STD_OFF**	
Dev Error Detect			**STD_OFF**	
Prod Error Detect			**STD_OFF**	

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Attribute Name	Configuration Variant	Value Type	Values	Description
User Configuration File			-	
Main Fct Cycle Time [s]			0.0100	
Hw Repetition			5	
Partial Networks			STD_OFF	
BswM ComMode Indication			STD_OFF	
Ecu Passive Mode			STD_OFF	
BusOff Notification			STD_OFF	Appl_CanSM_BusOffBegin Appl_CanSM_BusOffEnd
Disable DM during SilentCom			STD_OFF	CANSM_SILENT_COMMUNICATION

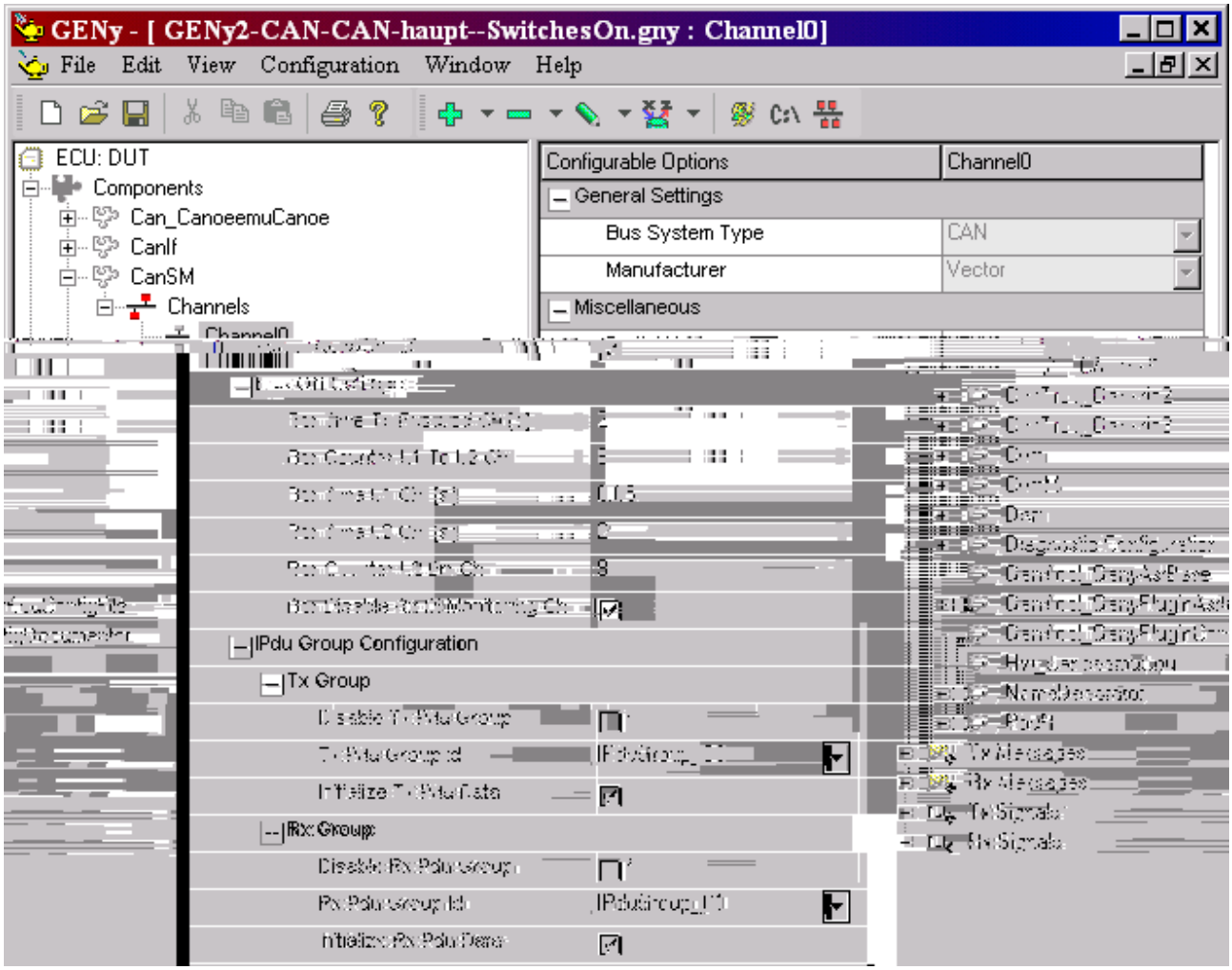
©

Info

Component Selection

7.1.4 Network Settings

7.1.5 General CAN Channel Specific Settings



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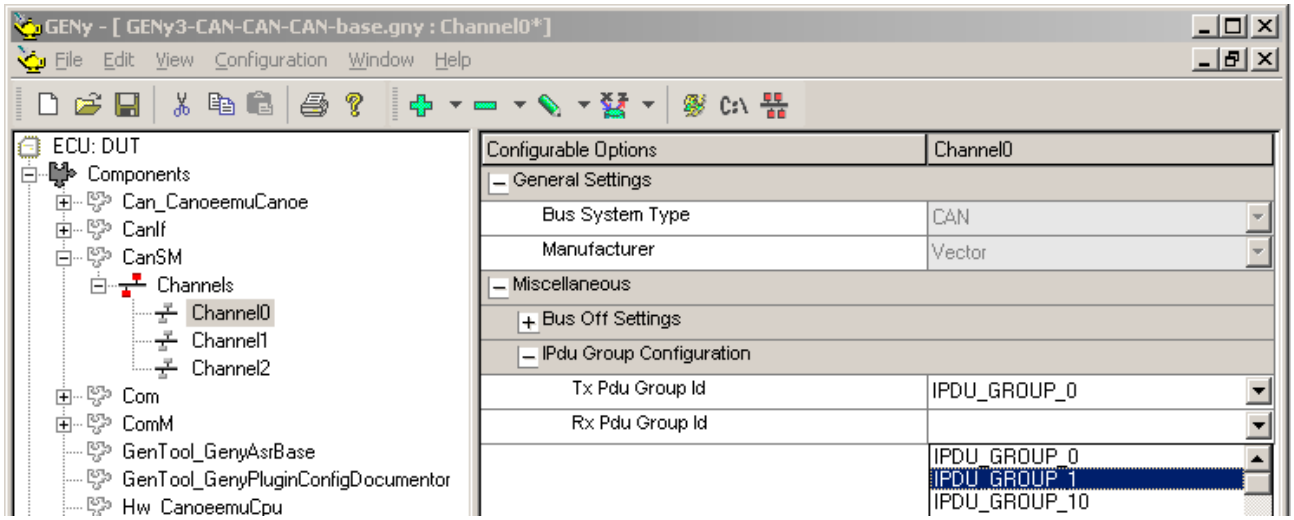
Attribute Name	Configuration Variant	Value Type	Values	Description
Partial Network Ch			**false**	If Enabled then the CanSM changes the shutdown sequence to the needs of the partial network feature. The global switch has to be enabled, too.



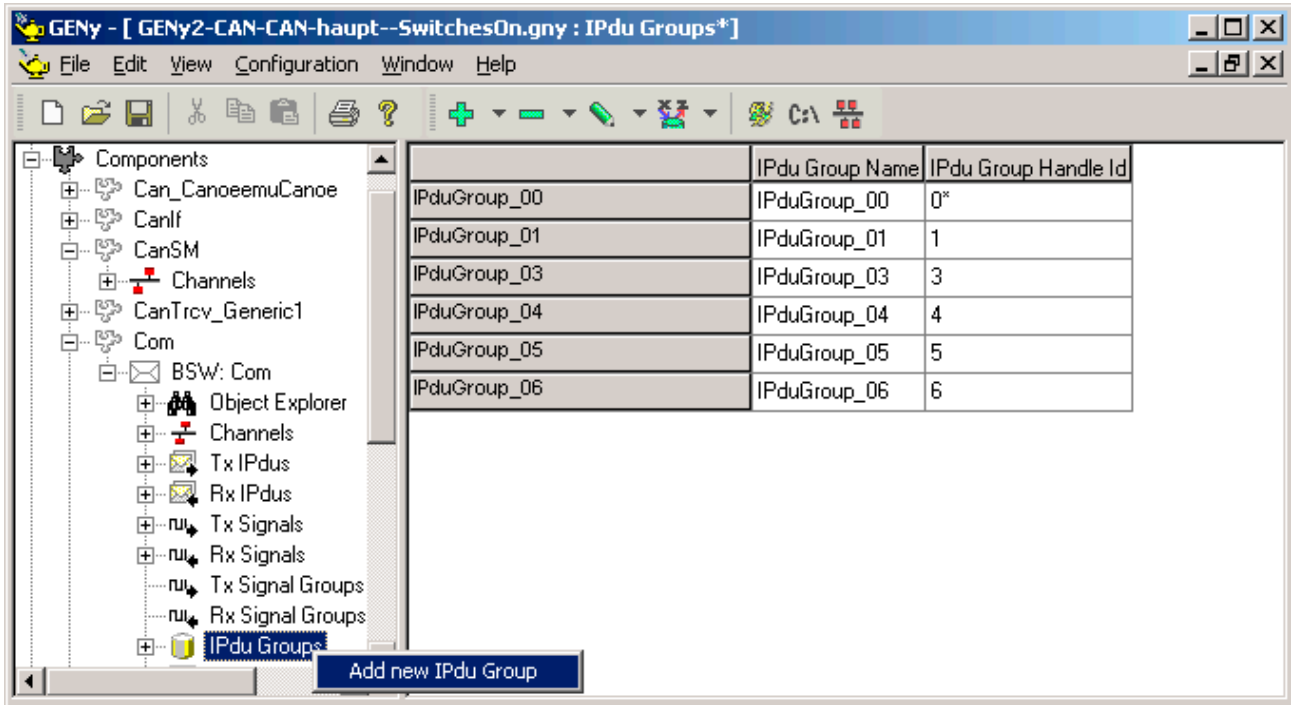
Attribute Name	Configuration Variant	Value Type	Values	Description
Disable Tx Pdu Group			**false**	
Tx PDU Group Id			**-**	
Initialize Tx Pdu Data			**false**	Com_IpduGroupStart
Disable Rx Pdu Group			**false**	
Rx PDU Group Id			**-**	
Initialize Rx			**false**	

©

Attribute Name	Configuration Variant	Value Type	Values	Description
Pdu Data				Com_IpduGroupStart

IPdu

Groups



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7.1.6 Bus-off Recovery State Machine Configuration

Bus Off Settings

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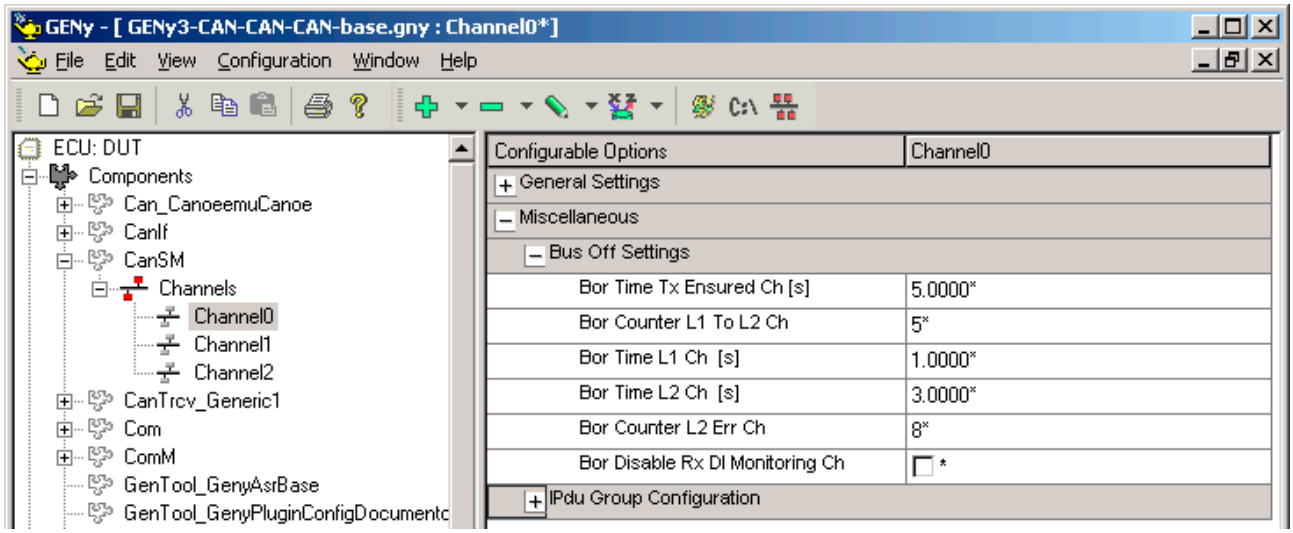

Attribute Name	Configuration Variant	Value Type	Values	Description
Bor Time Tx Ensured Ch [s]			**5.000**	**The entered value is multiplied by the Cycle Time. The result has to be covered by the 16 bit integer range are allowed. E.g. if the Cycle Time is set 0.010 only values between 0.0 and 655.3500 are allowed.**
Bor Counter L1 To L2 Ch			**5**	
Bor Time L1 Ch [s]			**1.000**	**The entered value is multiplied by the Cycle Time. The result has to be covered by the 16 bit integer range are allowed. E.g. if the Cycle Time is set 0.010 only values between 0.0 and 655.3500 are allowed.**
Bor Time L2 Ch			**3.000**	

©

Attribute Name	Configuration Variant	Value Type	Values	Description
[s]				**The entered value is multiplied by the Cycle Time. The result have to be covered by the 16 bit integer range are allowed. E.g. if the Cycle Time is set 0.010 only values between 0.0 and 655.3500 are allowed.**
Bor Counter L2 Err Ch			**8**	
Bor Disable Rx Dl Monitoring Ch			**STD_OFF**	

Info

Bor Counter L1 To L2 Ch

Info

Bor Counter L1 To L2 Ch Bor Counter L2 Err Ch

Bor Counter L1 To L2 Ch

7.1.7 Values from other BSW Modules

©

CANSM_E_BUSOFF_NETWORK_<X>

Example

©

8 AUTOSAR Standard Compliance

8.1 Additions / Extensions

8.1.1 Additional Error Handling in the Network Mode State Machine

8.1.2 API CanSM_InitMemory()

8.1.3 Error Code

> CANSM_E_PARAM_CONTROLLER

> CANSM_E_MODE_CHANGE

> CANSM_E_SETTRANSCEIVERMODE

8.1.4 Configuration Options

>

> Rx deadline monitoring

> Rx deadline monitoring

8.1.5 API CanSM_PreventBusSleepAtStartUp()

8.1.6 ECU passive mode

8.1.7 Bus-off notification

8.1.8 Support for XCP shutdown

©

8.1.9 No mode notification during CanSM_Init

CANSM_INIT

CANSM_NO_COMMUNNICATION

8.1.10 Partial Networks

8.1.11 BswM ComMode Indication

- CANSM_BSWM_NO_COMMUNICATION
- CANSM_BSWM_SILENT_COMMUNICATION
- CANSM_BSWM_FULL_COMMUNICATION
- CANSM_BSWM_BUS_OFF

8.1.12 Multiple Identity

8.1.13 Additional Dem error

>

Hw Repetition

>

8.1.14 Additional bus-off recovery in state silent

8.2 Limitations

8.2.1 Controllers

©

9 Glossary and Abbreviations

9.1 Glossary

Term	Description

9.2 Abbreviations

Abbreviation	Description

©

10 Contact

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