

# MICROSAR EcuM Flex


Document Information

History

Author	Date	Version	Remarks
	- -		
	- -		
	- -		- -

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	- -		-
	- -		
	- -		

Reference Documents

No.	Source	Title	Version
[1]			
[2]			
[3]			
[4]			
[5]			
[6]			
[7]			
[8]			



**Caution**



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## Illustrations

[illegible]

## Tables

[illegible]

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2 Introduction

Supported AUTOSAR Release*:		
Supported Configuration Variants:	-	-
Vendor ID:		-
Module ID:		

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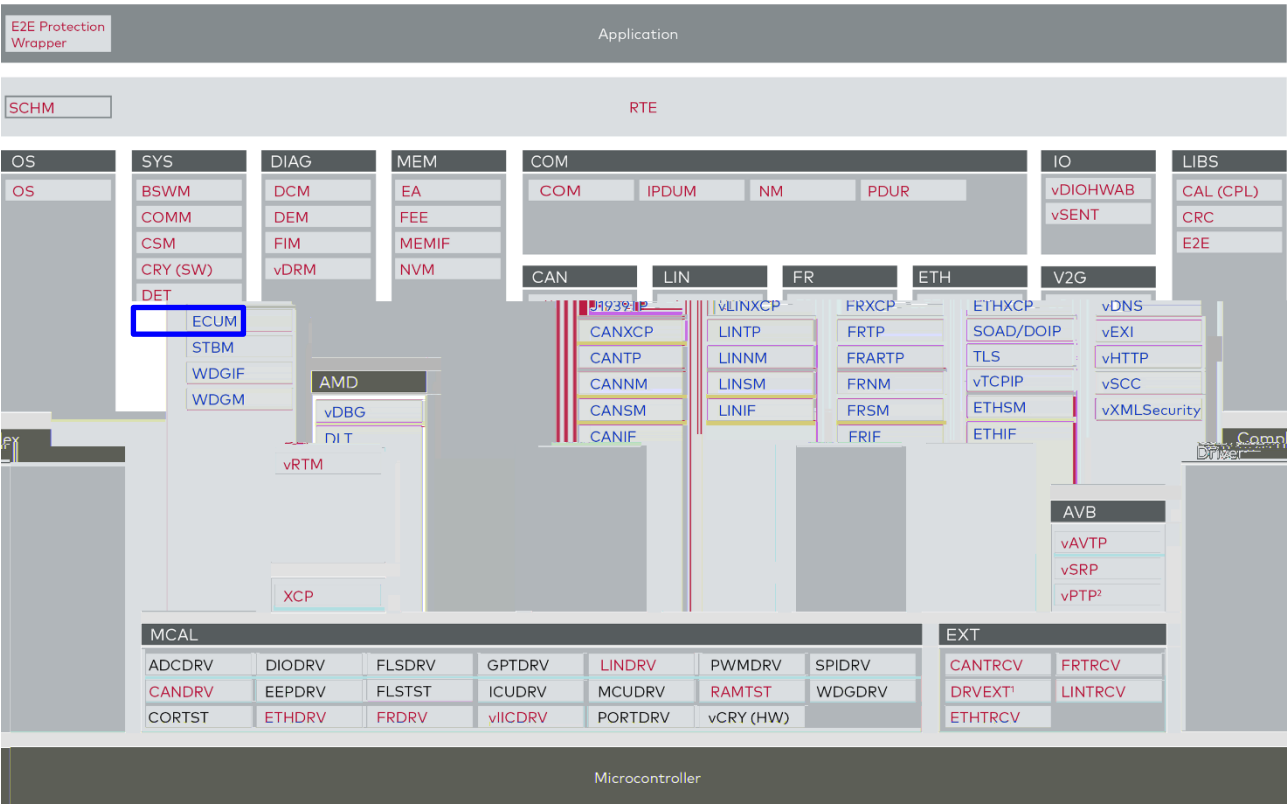
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## 2.1 Architecture Overview

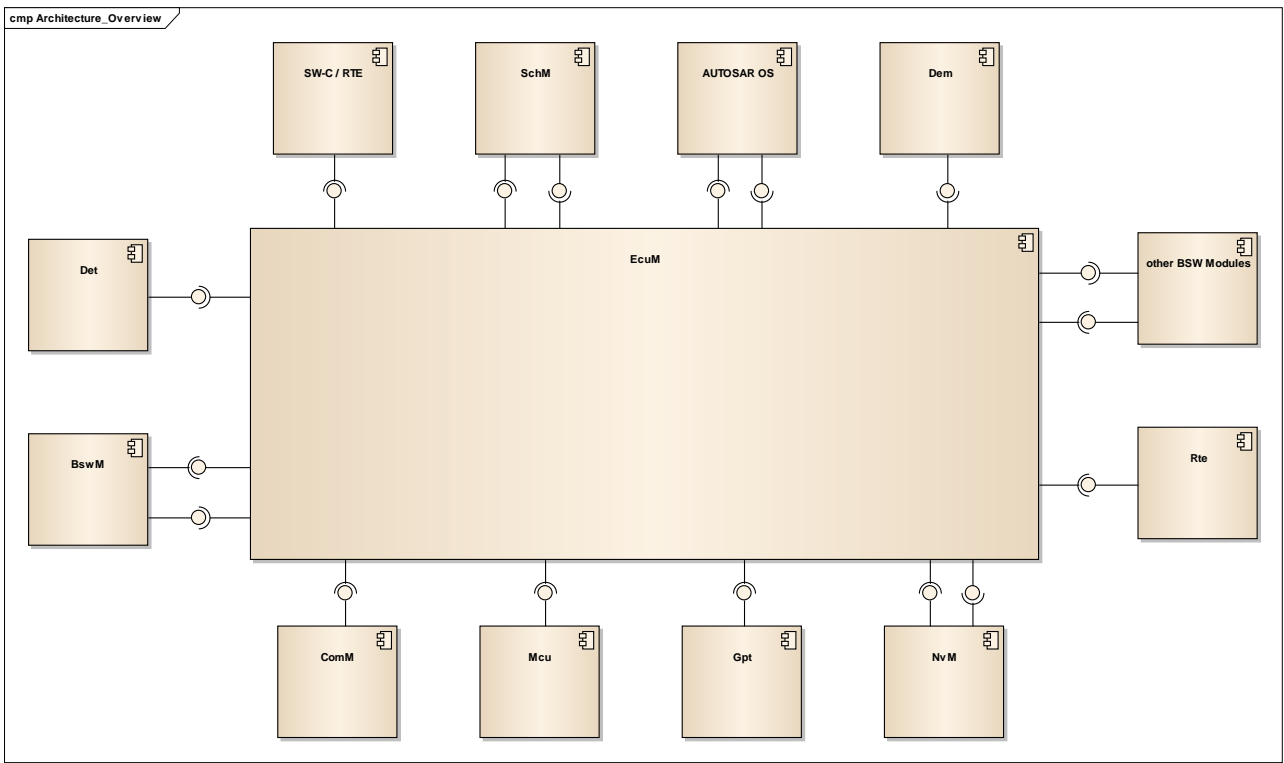


T Vector Standard Software 3rd Party Software

4

<sup>1</sup> Includes EXTADC, EEPEXT, FLSEXT, ETHDRVEX and WDGEXT

<sup>2</sup> Functionality represented in ETHTSYN and STB





### 3 Functional Description

#### 3.1 Features

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Supported AUTOSAR Standard Conform Features		
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-		

Supported AUTOSAR EcuM flex Features

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Supported AUTOSAR EcuM fixed Features

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Features Provided Beyond The AUTOSAR Standard
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### 3.2 States of EcuM flex

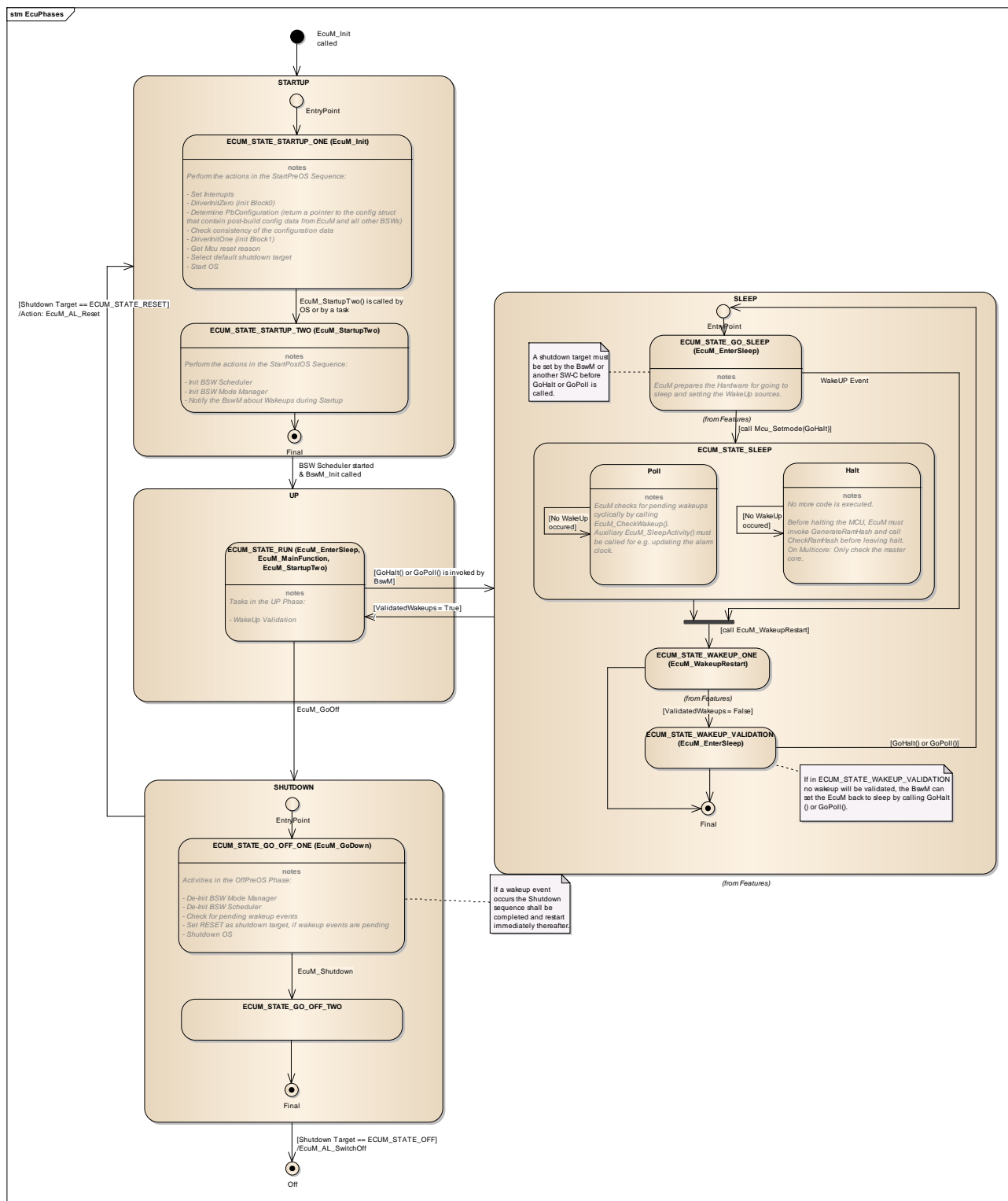
[illegible]

### 3.3

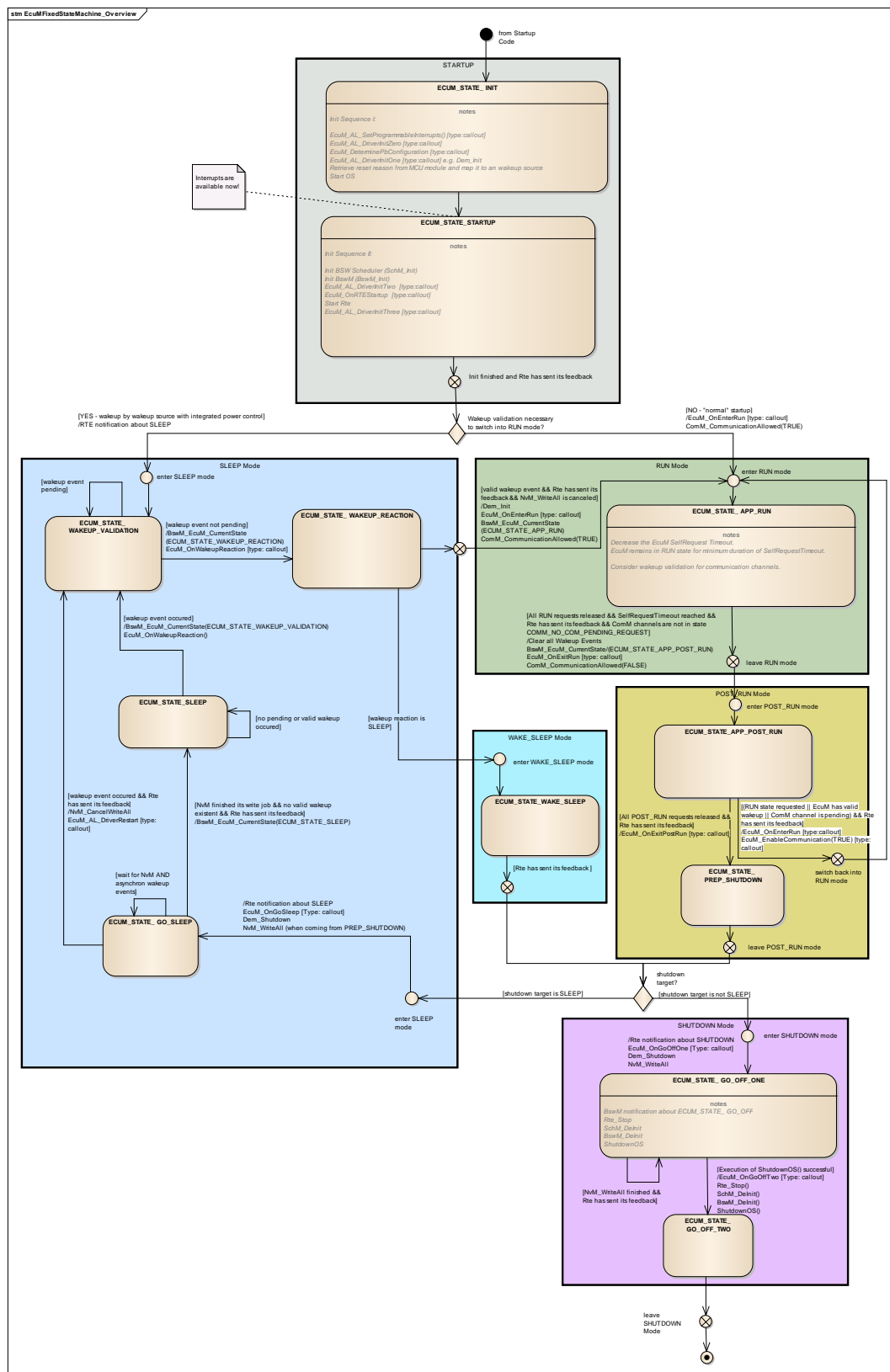
[illegible]

Module State	Activities	RTE Mode
	-	
		-

### 3.4 The State Diagram of the EcuM flex



### 3.5 The State Diagram of the EcuM with fixed state machine



## 3.6 Initialization

### 3.6.1 EcuM\_Init

### 3.6.2 EcuM\_StartupTwo

#### 3.6.2.1 EcuM\_StartupTwo in case of EcuM flex



#### Caution

#### 3.6.2.2 EcuM\_StartupTwo in case of EcuM fixed



#### Caution

### 3.6.3 Initialization Order



Initialization Group

3.6.4 Additional Code in the Initialization Callouts



Example

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3.6.5 Inclusion of Additional Header Files



**Note**

3.6.6 Configuration Set Selection

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**Caution**

### 3.7 Initialization of a MultiCore ECU

### 3.8 Shutdown Targets

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&gt;

&gt;

**Note**

#### 3.8.1 Using the API EcuM\_SelectShutdownTarget()

#### 3.8.2 Default Shutdown Target

#### 3.8.3 Reset Modes

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**Note**

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**Caution**

**3.8.4 Sleep Modes**

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**3.9 Wake-up Sources**

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**3.9.1 Validation Timeout**

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Note

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3.9.2 Check-Wakeup Validation Timeout

3.9.3 ComM Channel Reference



Note

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3.9.4 Polling of Wake-up Sources

3.9.5 MCU Reset Reason



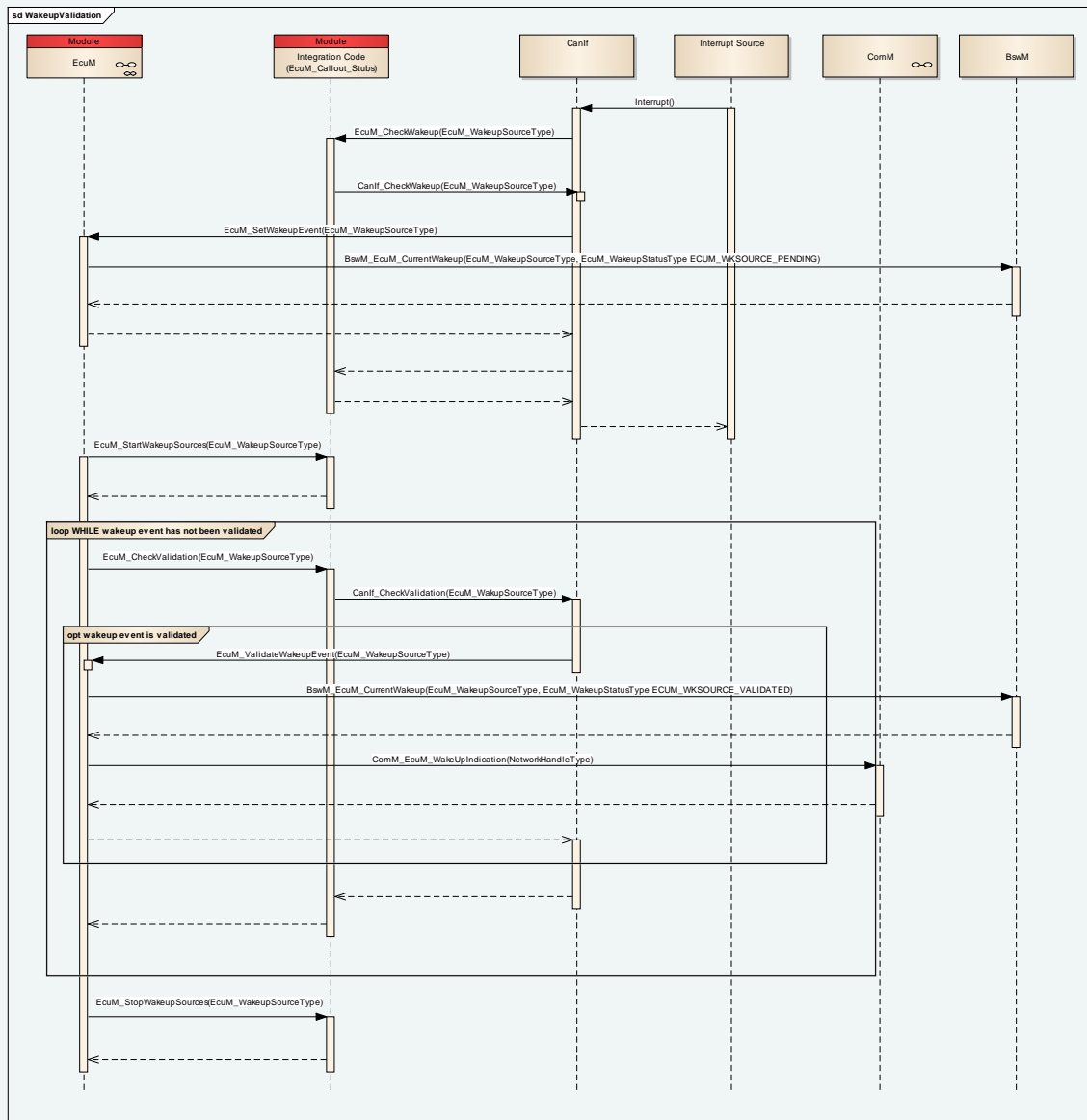
Note

**3.10 Main Functions**

**3.10.1 Wake-up Validation Protocol**



## Example







### 3.11 Error Handling

### 3.11.1 Development Error Reporting

[illegible]

[illegible]

Error Code	Description
	-

3.11.2 Production Code Error Reporting

Dem\_ReportErrorStatus()

Dem\_ReportErrorStatus()

Error Code	Description
	-



Caution

3.11.3 EcuM\_ErrorHook

Error Code	Description
ECUM_E_HOOK_RAM_CHECK_FAILED	
ECUM_E_HOOK_CONFIGURATION_DATA_INCONSISTENT	- - -
ECUM_E_HOOK_WRONG_ECUM_USAGE	

Error Code	Description
ECUM_E_HOOK_INVALID_COREID	

3.12 Callout Execution Sequences



Caution

3.12.1 Callouts from Startup to Run



### 3.12.2 Callouts from Run to Sleep (Halt) and back to Run

Run - Sleep (Halt) - Run

3.12.3 Callouts from Run to Reset

Run – Reset	
<div><div></div></div>	
<div><div></div></div>	
<div><div></div><div></div><div></div><div></div></div>	
<div><div></div></div>	
<div><div></div><div></div></div>	

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3.12.4 Callouts from Run to Off

Run – Reset	
<div><div></div></div>	
<div><div></div></div>	
<div><div></div></div>	
<div><div></div><div></div><div></div><div></div></div>	
<div><div></div><div></div></div>	
<div><div></div></div>	
<div><div></div><div></div></div>	

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### 3.13 EcuM Flex Users and Defensive Behavior



#### Note

3.14 Alarm Clock

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Note

3.14.1 Configuring the Gpt to provide the Time base

Gpt Channel Parameter	Value



Caution

3.14.2 Configuring the EcuM for using the Alarm Clock



### 3.14.3 Setting of the EcuM Clock

### 3.14.4 Setting of a Time Triggered Wake Up Alarm



#### Note



#### Caution

## 3.15 MultiCore Ecu

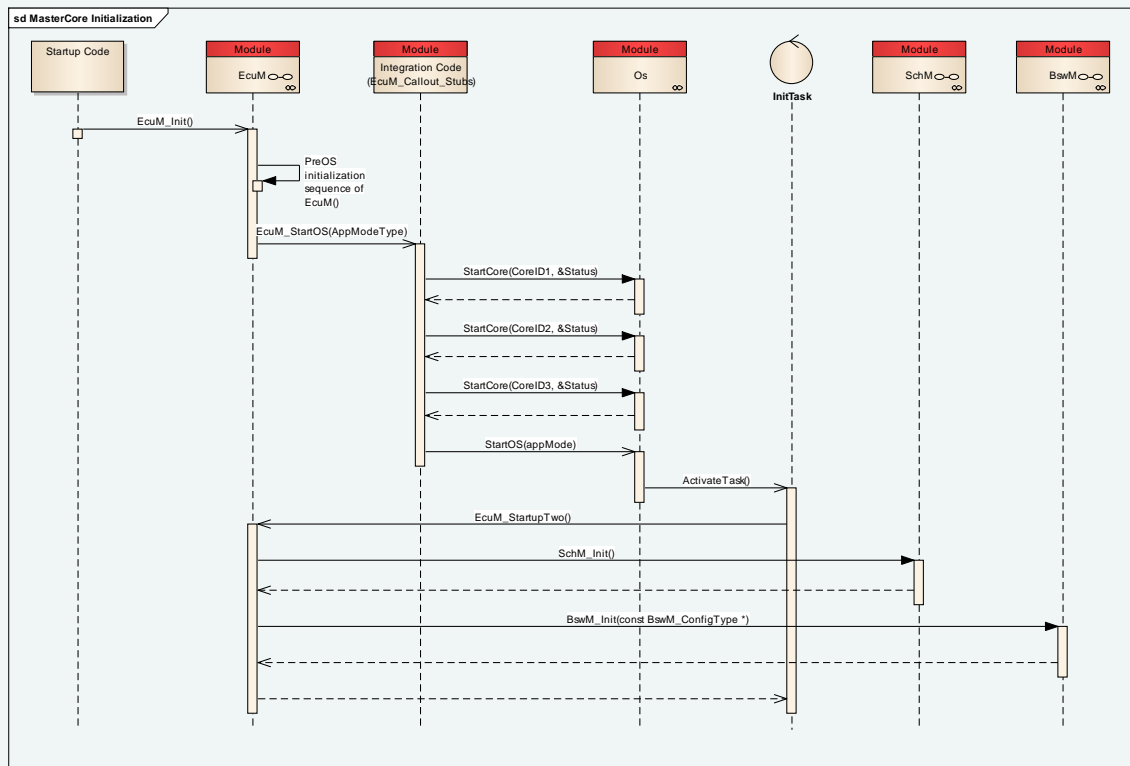
### 3.15.1 Initialization of a MultiCore ECU

#### 3.15.1.1 Initialization on the Master Core

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#### Example



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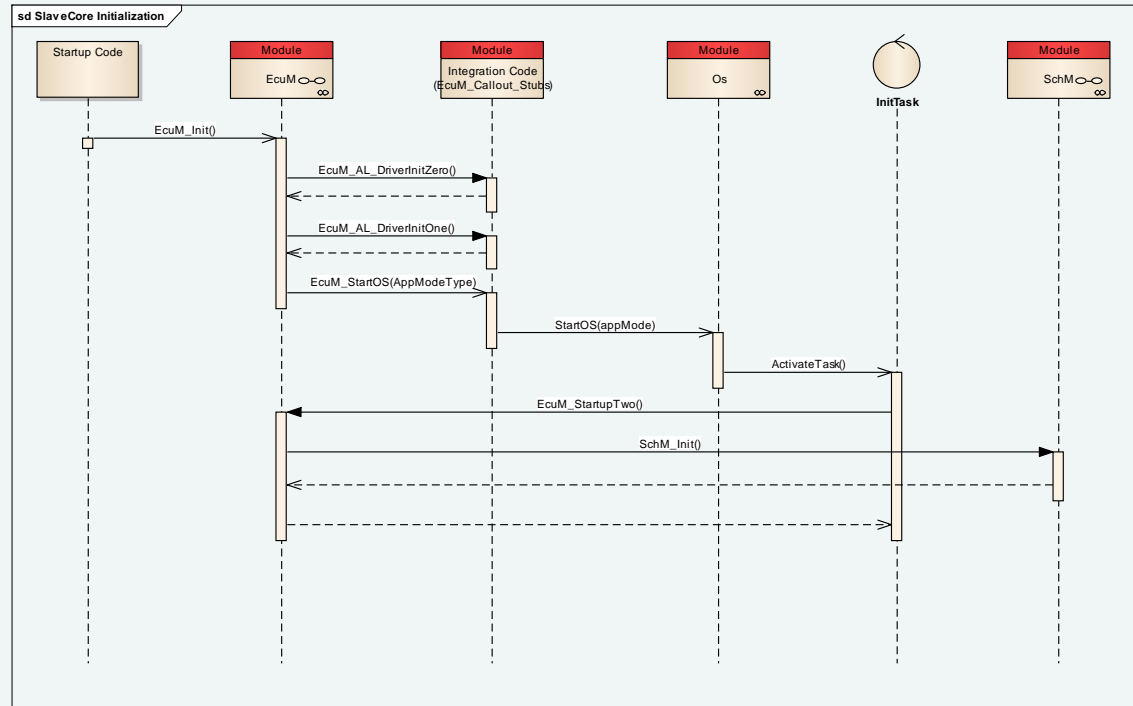


#### Note

### 3.15.1.2 Initialization on the Slave Core



#### Example



#### Caution

#### 3.15.1.2.1 Driver initialization on the Slave Core



### Example

```

/*****
 * EcuM_AL_DriverInitZero
 *****/
FUNC(void, ECUM_CODE) EcuM_AL_DriverInitZero(void)
{
    if(GetCoreID() == ECUM_CORE_ID_MASTER)
    {
        MasterCore_Init();
    }

    /*****
     * DO NOT CHANGE THIS COMMENT!  <USERBLOCK EcuM_AL_DriverInitZero>
     DO NOT CHANGE THIS COMMENT!
     *****/
    /* Add implementation of EcuM_AL_DriverInitZero() */

    return;
    /*****
     * DO NOT CHANGE THIS COMMENT!  </USERBLOCK> DO NOT CHANGE THIS
     COMMENT!
     *****/
}

```

## 3.15.2 Sleep handling of slave cores

EcuMSlaveCoreHandling	Behavior

### 3.15.3 Blocking of the BSW Scheduler during Sleep

### 3.15.4 Shutdown of the MultiCore ECU

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#### Note

### 3.15.5 Reconfiguration of the BSW Core ID

3.16 Mode Handling for EcuM Flex

3.16.1 Mode Handling

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EcuM State	EcuM Mode

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**Note**

3.16.2 Run Request Protocol

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3.17 Generated Template Files

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Caution

3.18 Wake-up Event Handling and Wake-up Validation

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3.18.1 Wake-up after a Physical Sleep Mode

3.18.1.1 Use Case Description

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### 3.18.1.2 Execution Flow

```
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```

### 3.18.1.3 Callout Implementation Examples

```
FUNC(void, ECUM_CODE) EcuM_EnableWakeupSources(EcuM_WakeupSourceType
wakeupSource)
```

```
{
    /* Check for each configured wake-up source the corresponding bit
     * is set. Here the bit for the ICU wake-up source must be set
     */
    if ((wakeupSource & ECUM_WKSOURCE_ICU_CH0) != 0)
    {
        Icu_EnableNotification(Icu_Channel0);
        Icu_EnableWakeup(Icu_Channel0);
        Icu_SetMode(ICU_MODE_SLEEP);
    }
    /* ... */
}
```

```
FUNC(void, ECUM_CODE) EcuM_CheckWakeup(EcuM_WakeupSourceType wakeupSource)
```

```
{
    if ((wakeupSource & ECUM_WKSOURCE_ICU_CH0) != 0)
    {
        /* no validation necessary, so call EcuM_SetWakeupEvent() */

        EcuM_SetWakeupEvent(ECUM_WKSOURCE_ICU_CH0);
    }
    /* ... */
}
```

```
FUNC(void, ECUM_CODE) EcuM_DisableWakeupSources(EcuM_WakeupSourceType
wakeupSource)
```

```
{
    if ((wakeupSource & ECUM_WKSOURCE_ICU_CH0) != 0)
    {
        Icu_DisableNotification(Icu_Channel0);
        Icu_DisableWakeup(Icu_Channel0);
        Icu_SetMode(ICU_MODE_NORMAL);
    }
}
```

### 3.18.2 Wake-up Validation of Communication Channels (ECUM in RUN State)

### 3.18.2.1 Use Case Description

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### 3.18.2.2 Execution Flow

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>

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### 3.18.2.3 Callout Implementation Examples

#### 3.18.2.3.1 EcuM\_CheckWakeup

```
FUNC(void, ECUM_CODE) EcuM_CheckWakeup(EcuM_WakeupSourceType wakeupSource)
{
    if((wakeupSource & ECUM_WKSOURCE_CAN0) != 0)
    {
        CanIf_CheckWakeup(ECUM_WKSOURCE_CAN0);
    }
}
```

#### 3.18.2.3.2 EcuM\_CheckValidation

```
FUNC(void, ECUM_CODE) EcuM_CheckValidation(EcuM_WakeupSourceType wakeupSource)
{
    if ((wakeupSource & ECUM_WKSOURCE_CAN0) != 0)
    {
        /* Query the driver if the wake-up event was valid */
        CanIf_CheckValidation(ECUM_WKSOURCE_CAN0);
    }
}
```

#### 3.18.2.3.3 EcuM\_StartWakeupSources and EcuM\_StopWakeupSources in the case of a MICROSAR CanSM

```
FUNC(void, ECUM_CODE) EcuM_StartWakeupSources(EcuM_WakeupSourceType
wakeupSource)
{
    if ((wakeupSource & ECUM_WKSOURCE_CAN0) != 0)
    { /* CanSM needs the corresponding Network Handle */
        if (CanSM_StartWakeupSources(0x00) == E_NOT_OK)
        {
            /* place ECU depended error handling here */
        }
    }
}

void EcuM_StopWakeupSources(EcuM_WakeupSourceType wakeupSource)
{
    if ((wakeupSource & ECUM_WKSOURCE_CAN0) != 0)
    { /* CanSM needs the corresponding Network Handle */
        if (CanSM_StopWakeupSources(0x00, wakeupSource) == E_NOT_OK)
        {
            /* place ECU depended error handling here */
        }
    }
}
```

### 3.18.2.3.4 EcuM\_StartWakeupSources and EcuM\_StopWakeupSources in the case of a non MICROSAR CanSM

```
FUNC(void, ECUM_CODE) EcuM_StartWakeupSources(EcuM_WakeupSourceType
wakeupSource)
{
    CanIf_ControllerModeType CanIfCtrlMode;
    if ((wakeupSource & ECUM_WKSOURCE_CAN0) != 0)
    {
        /* determine in which is the current Can Controller state */
        (void)CanIf_GetControllerMode(0, &CanIfCtrlMode);
        /* in case the Can Controller is not CANIF_CS_STARTED */

        if (CANIF_CS_STARTED != CanIfCtrlMode)
        {
            /* Set the controller and transceiver mode into normal operation mode*/
            CanIf_SetTrcvMode(0, CANIF_TRCV_MODE_NORMAL);
            CanIf_SetControllerMode(0, CANIF_CS_STOPPED);
            CanIf_SetControllerMode(0, CANIF_CS_STARTED);
        }
    }
    else
    {
        /* Stack already up and running */
    }
}

FUNC(void, ECUM_CODE) EcuM_StopWakeupSources(EcuM_WakeupSourceType wakeupSource)
{
    if ((wakeupSource & ECUM_WKSOURCE_CAN0) != 0)
    {
        /* Validation was not successful, set the CAN controller and
        * Transceiver back to sleep mode. */
        CanIf_SetControllerMode(0, CANIF_CS_STOPPED);
        CanIf_SetControllerMode(0, CANIF_CS_SLEEP);
        CanIf_SetTrcvMode(0, CANIF_TRCV_MODE_STANDBY);
    }
}
```

4 Integration

4.1 Scope of Delivery

4.1.1 Static Files

File Name	Source Code Delivery	Object Code Delivery	Description
	■		
	■	■	
	■	■	



Do not edit manually

4.1.2 Dynamic Files



File Name	Description
	-
	-
	-
	- -

4.2 Critical Sections

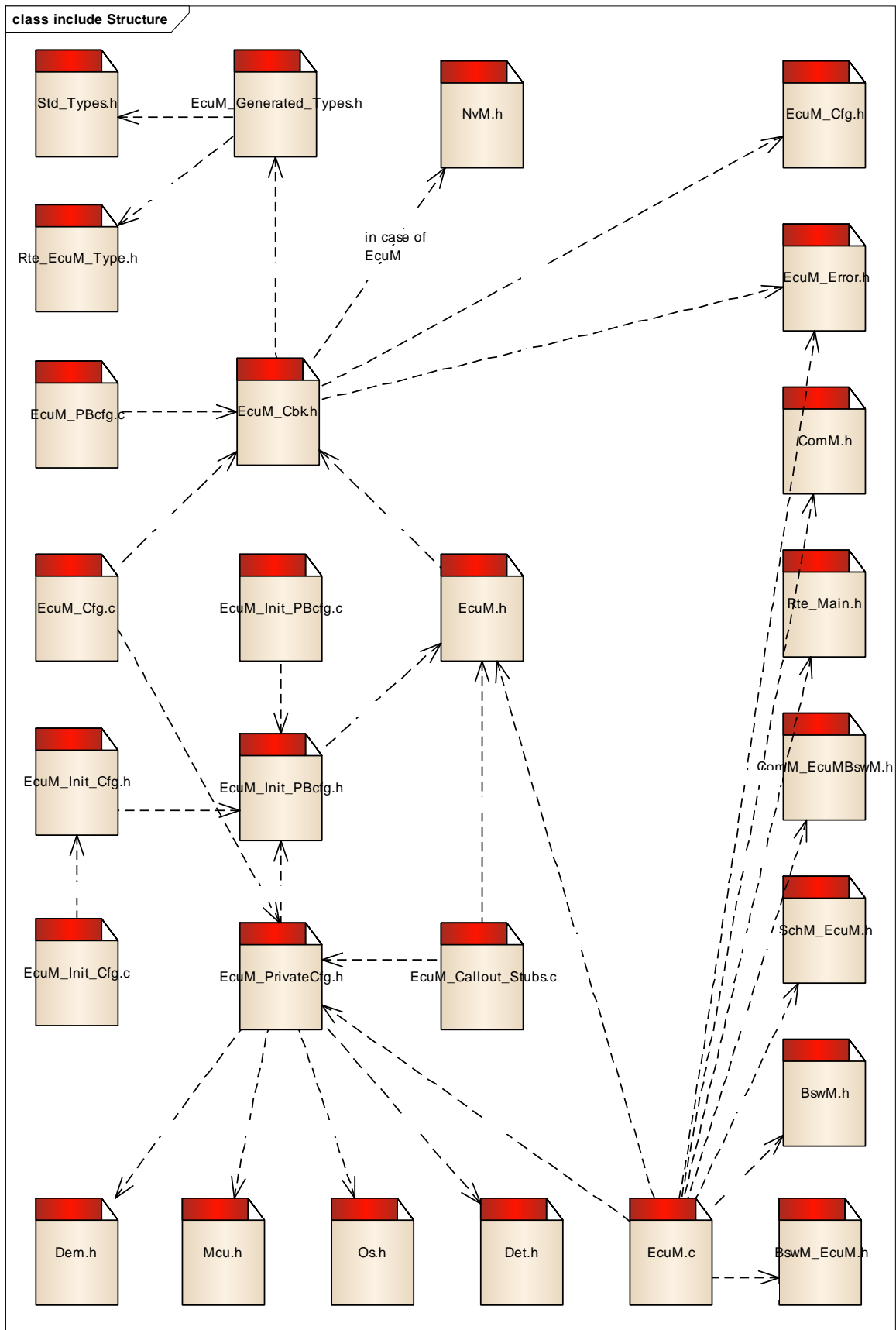
>

>

>

Critical Section Define	Interrupt Lock
	-
	<div><div></div><div>Note</div></div>
	<div><div></div><div>Note</div></div>

### 4.3 Include Structure



## **4.4 Dependencies on other BSW Modules**

### **4.4.1 BswM**

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#### **4.4.1.1 BswM and EcuM fixed**

### **4.4.2 AUTOSAR OS**

### **4.4.3 MCU**

### **4.4.4 DEM**

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### **4.4.5 DET**

### **4.4.6 ComM**

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#### **4.4.6.1 ComM and EcuM fixed**



#### 4.4.7 SchM

#### 4.4.8 Gpt

#### 4.4.9 NvM



**Caution**

5 API Description

5.1 Type Definitions

Type Name	C-Type	Description	Value Range
			-
			-
			-
			-

Type Name	C-Type	Description	Value Range

Type Name	C-Type	Description	Value Range
			-
			-
		-	-
			-
			-
			-
			-
			-
			-


Type Name	C-Type	Description	Value Range

5.2 Services Provided by EcuM


5.2.1 EcuM\_MainFunction

Prototype	
EcuM_MainFunction	
Parameter	
Return code	
Functional Description	
<div>-</div> <div><div>■</div><div>-</div></div> <div><div>■</div></div>	
Particularities and Limitations	
<div><div>■</div><div>■</div><div>■</div><div>■</div><div>-</div></div>	
<div><div>■</div></div>	

5.2.2 EcuM\_Init



Prototype	
EcuM_Init	
Parameter	
Return code	
Functional Description	
<div><div></div><div>Caution</div></div>	
Particularities and Limitations	
<ul style="list-style-type: none"><li></li><li></li><li></li><li></li></ul>	
<ul style="list-style-type: none"><li></li></ul>	

5.2.3 EcuM\_StartupTwo

Prototype	
EcuM_StartupTwo	
Parameter	
Return code	
Functional Description	
<div><div></div><div>Caution</div></div>	
Particularities and Limitations	
<div><div><div><div>■</div></div><div><div>■</div></div><div><div>■</div></div></div><div>-</div></div>	
<div><div><div>■</div></div></div> <div>-</div>	



5.2.4 EcuM\_Shutdown

Prototype	
EcuM_Shutdown	
Parameter	
Return code	
Functional Description	
<div><div></div><div>Note</div></div>	
<div><div></div><div>Caution</div></div>	
Particularities and Limitations	
<ul style="list-style-type: none"><li></li><li></li><li></li><li></li></ul>	
<ul style="list-style-type: none"><li></li></ul>	

### 5.2.5 EcuM\_SelectShutdownTarget

Prototype	
EcuM_SelectShutdownTarget	
Parameter	
	<ul style="list-style-type: none"><li></li><li></li><li></li></ul>
Return code	
Functional Description	
Particularities and Limitations	
<ul style="list-style-type: none"><li></li><li></li><li></li><li></li></ul>	
<ul style="list-style-type: none"><li></li></ul>	



### 5.2.6 EcuM\_GetShutdownTarget

Prototype	
EcuM_GetShutdownTarget	
Parameter	
	<ul style="list-style-type: none"> <li></li> <li></li> <li></li> </ul>

5.2.7 EcuM\_GetLastShutdownTarget

Prototype	
EcuM_GetLastShutdownTarget	
Parameter	
	<ul style="list-style-type: none"><li></li></ul>
Return code	
Functional Description	
Particularities and Limitations	
<ul style="list-style-type: none"><li></li></ul>	
<ul style="list-style-type: none"><li></li></ul>	

5.2.8 EcuM\_GetPendingWakeupEvents

Prototype	
EcuM_GetPendingWakeupEvents	
Parameter	
Return code	
	-
Functional Description	
-	
Particularities and Limitations	
<ul style="list-style-type: none"><li>■</li><li>■</li><li>■</li></ul>	
<ul style="list-style-type: none"><li>■</li></ul>	

5.2.9 EcuM\_ClearWakeupEvent


Prototype	
EcuM_ClearWakeupEvent	
Parameter	
	-
Return code	
Functional Description	
-	
Particularities and Limitations	
<ul style="list-style-type: none"><li>■</li><li>■</li><li>■</li></ul>	
<ul style="list-style-type: none"><li>■</li></ul>	

5.2.10 EcuM\_ClearValidatedWakeupEvent

Prototype	
EcuM_ClearValidatedWakeupEvent	
Parameter	
	-
Return code	
Functional Description	
-	
Particularities and Limitations	
<ul style="list-style-type: none"><li>■</li><li>■</li><li>■</li></ul>	
<ul style="list-style-type: none"><li>■</li></ul>	

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5.2.11 EcuM\_GetValidatedWakeupEvents

Prototype	
EcuM_GetValidatedWakeupEvents	
Parameter	
Return code	
	-
Functional Description	
<div><div></div><div>Caution</div></div>	
Particularities and Limitations	
<ul style="list-style-type: none"><li></li><li></li><li></li></ul>	
<ul style="list-style-type: none"><li></li></ul>	

5.2.12 EcuM\_GetExpiredWakeupEvents

Prototype	
EcuM_GetExpiredWakeupEvents	
Parameter	
Return code	
	-
Functional Description	
Particularities and Limitations	
<ul style="list-style-type: none"><li>■</li><li>■</li><li>■</li></ul>	
<ul style="list-style-type: none"><li>■</li></ul>	

5.2.13 EcuM\_GetBootTarget


Prototype	
EcuM_GetBootTarget	
Parameter	
Return code	
Functional Description	
Particularities and Limitations	
<ul style="list-style-type: none"><li>■</li><li>■</li><li>■</li></ul>	
<ul style="list-style-type: none"><li>■</li></ul>	



5.2.14 EcuM\_SelectBootTarget

Prototype	
EcuM_SelectBootTarget	
Parameter	
Return code	
Functional Description	
Particularities and Limitations	
<ul style="list-style-type: none"><li>■</li><li>■</li><li>■</li></ul>	
<ul style="list-style-type: none"><li>■</li></ul>	

5.2.15 EcuM\_StartCheckWakeup

Prototype	
EcuM_StartCheckWakeup	
Parameter	
	-
Return code	
Functional Description	
<div><div></div><div>Caution</div></div> <div>-</div>	
Particularities and Limitations	
<div><div><div>■</div></div><div><div>■</div></div><div><div>■</div></div></div>	
<div><div><div>■</div></div></div>	


5.2.16 EcuM\_EndCheckWakeup

Prototype	
EcuM_EndCheckWakeup	
Parameter	
	-
Return code	
Functional Description	
Particularities and Limitations	
<ul style="list-style-type: none"><li>■</li><li>■</li><li>■</li></ul>	
<ul style="list-style-type: none"><li>■</li></ul>	

5.2.17 EcuM\_GetVersionInfo

Prototype	
EcuM_GetVersionInfo	
Parameter	
Return code	
Functional Description	
Particularities and Limitations	
<ul style="list-style-type: none"><li>■</li><li>■</li><li>■</li><li>■</li></ul>	
<ul style="list-style-type: none"><li>■</li></ul>	


5.2.18 EcuM\_RequestRUN

Prototype	
EcuM_RequestRUN (EcuM_UserType user)	
Parameter	
Return code	
Functional Description	
<div><div></div><div>Note</div></div>	
Particularities and Limitations	
<ul style="list-style-type: none"><li></li><li></li><li></li></ul>	
<ul style="list-style-type: none"><li></li></ul>	

5.2.19 EcuM\_ReleaseRUN

Prototype	
EcuM_ReleaseRUN (EcuM_UserType user)	
Parameter	
Return code	
Functional Description	
Particularities and Limitations	
<ul style="list-style-type: none"><li>■</li><li>■</li><li>■</li></ul>	
<ul style="list-style-type: none"><li>■</li></ul>	

5.2.20 EcuM\_RequestPOST\_RUN

Prototype	
EcuM_RequestPOST_RUN (EcuM_UserType user)	
Parameter	
Return code	
Functional Description	
<div><div></div><div>Note</div></div>	
Particularities and Limitations	
<ul style="list-style-type: none"><li>■</li><li>■</li><li>■</li></ul>	
<ul style="list-style-type: none"><li>■</li></ul>	

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5.2.21 EcuM\_ReleasePOST\_RUN

Prototype	
EcuM_ReleasePOST_RUN (EcuM_UserType user)	
Parameter	
Return code	
Functional Description	
Particularities and Limitations	
<ul style="list-style-type: none"><li>■</li><li>■</li><li>■ -</li></ul>	
<ul style="list-style-type: none"><li>■</li></ul>	

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5.3 Services Provided by EcuM flex

5.3.1 EcuM\_SelectShutdownCause

Prototype	
EcuM_SelectShutdownCause	
Parameter	
Return code	
Functional Description	
Particularities and Limitations	
<ul style="list-style-type: none"><li>■</li><li>■</li><li>■</li></ul>	
<ul style="list-style-type: none"><li>■</li></ul>	



5.3.2 EcuM\_GetShutdownCause

Prototype	
EcuM_GetShutdownCause	
Parameter	
Return code	
Functional Description	
Particularities and Limitations	
<ul style="list-style-type: none"><li>■</li><li>■</li><li>■</li></ul>	
<ul style="list-style-type: none"><li>■</li></ul>	

5.3.3 EcuM\_GoHalt

Prototype	
EcuM_GoHalt	
Parameter	
Return code	
Functional Description	
Particularities and Limitations	
<ul style="list-style-type: none"><li>■</li><li>■</li><li>■</li><li>■</li></ul>	

5.3.4 EcuM\_GoPoll

Prototype	
EcuM_GoPoll	
Parameter	
Return code	
Functional Description	
-	
Particularities and Limitations	
<ul style="list-style-type: none"><li>■</li><li>■</li><li>■</li><li>■</li></ul>	
■	

5.3.5 EcuM\_GoDown



Prototype	
EcuM_GoDown	
Parameter	
Return code	
Functional Description	
Particularities and Limitations	
<ul style="list-style-type: none"><li>■</li><li>■</li><li>■ -</li><li>■</li></ul>	
■	

-

5.3.6 EcuM\_GoToSelectedShutdownTarget

Prototype	
EcuM_GoToSelectedShutdownTarget	
Parameter	
Return code	
Functional Description	
Particularities and Limitations	
<ul style="list-style-type: none"><li>■</li><li>■</li><li>■ -</li></ul>	
<ul style="list-style-type: none"><li>■</li></ul>	

5.3.7 EcuM\_SetRelWakeupAlarm


Prototype	
EcuM_SetRelWakeupAlarm	
Parameter	
	-
Return code	
Functional Description	
<div><div></div><div>Caution</div></div>	
<div><div></div><div>Note</div></div>	
Particularities and Limitations	
<div><div><div><div>■</div></div><div><div>■</div></div><div><div>■</div></div></div><div>-</div></div>	
<div><div><div>■</div></div></div>	



5.3.9 EcuM\_AbortWakeupAlarm

Prototype	
EcuM_AbortWakeupAlarm	
Parameter	
	-
Return code	
Functional Description	
-	
Particularities and Limitations	
<ul style="list-style-type: none"><li>■</li><li>■</li><li>■</li></ul>	
-	

5.3.10 EcuM\_GetWakeupTime

Prototype	
EcuM_GetWakeupTime	
Parameter	
	-
Return code	
Functional Description	
-	
	<b>Note</b> -
Particularities and Limitations	
<ul style="list-style-type: none"><li>▪</li><li>▪</li><li>▪</li></ul>	
<ul style="list-style-type: none"><li>▪</li></ul>	



5.3.11 EcuM\_SetClock

Prototype	
EcuM_SetClock	
Parameter	
Return code	
Functional Description	
Particularities and Limitations	
<ul style="list-style-type: none"><li>■</li><li>■</li><li>■</li></ul>	
■	

5.3.12 EcuM\_GetCurrentTime

Prototype	
EcuM_GetCurrentTime	
Parameter	
Return code	
Functional Description	
Particularities and Limitations	
<ul style="list-style-type: none"><li>■</li><li>■</li><li>■</li></ul>	
<ul style="list-style-type: none"><li>■</li></ul>	

-

5.3.13 EcuM\_SetState


Prototype	
EcuM_SetState	
Parameter	
Return code	
Functional Description	
Particularities and Limitations	
<ul style="list-style-type: none"><li>■</li><li>■</li><li>■</li></ul>	
<ul style="list-style-type: none"><li>■</li></ul>	

5.4 Services Provided by EcuM fixed

5.4.1 EcuM\_GetState

Prototype	
EcuM_GetState	
Parameter	
Return code	
Functional Description	
3.3	
Particularities and Limitations	
<ul style="list-style-type: none"><li>■</li><li>■</li><li>■</li></ul>	
<ul style="list-style-type: none"><li>■</li></ul>	

### 5.4.2 EcuM\_KillAllRUNRequests

Prototype	
EcuM_KillAllRUNRequests (void)	
Parameter	
Return code	
Functional Description	
-	
	<b>Note</b>
Particularities and Limitations	
<ul style="list-style-type: none"> <li>■</li> <li>■</li> <li>■</li> </ul>	
-	
<ul style="list-style-type: none"> <li>■</li> </ul>	

5.4.3 EcuM\_KillAllPostRUNRequests

Prototype	
EcuM_KillAllPostRUNRequests (void)	
Parameter	
Return code	
Functional Description	
Particularities and Limitations	
<ul style="list-style-type: none"><li>■</li><li>■</li><li>■</li></ul>	
<ul style="list-style-type: none"><li>■</li></ul>	

-

5.5 Services Used by EcuM

Component	API	EcuM flex	EcuM fixed
		■	■
		■	■
		■	■
		■	
		■	■
		■	■
		■	■
		■	■
			■
			■
			■
		■	■
		■	■
			■
			■
		■	
		■	
		■	
		■	
		■	■
		■	■
			■
			■
			■
		■	■
		■	■
		■	■
		■	■
		■	■
		■	■
		■	■
			■
			■
			■
			■
		■	■

Component	API	EcuM flex	EcuM fixed
		■	■
		■	■
		■	■
		■	■
		■	■
		■	■
		■	■
		■	■

5.6     **Callback Functions**

5.6.1   **EcuM\_SetWakeupEvent**

Prototype	
<b>EcuM_SetWakeupEvent</b>	
Parameter	
	-
Return code	
Functional Description	
-	
Particularities and Limitations	
■	
■	



5.6.2 EcuM\_ValidateWakeupEvent

Prototype	
EcuM_ValidateWakeupEvent	
Parameter	
	-
Return code	
Functional Description	
-	-
Particularities and Limitations	
■	-
■	

-

5.6.3 EcuM\_AlarmCheckWakeup

Prototype	
EcuM_AlarmCheckWakeup	
Parameter	
Return code	
Functional Description	
-	
Particularities and Limitations	
<ul style="list-style-type: none"><li>■</li><li>■</li><li>■</li></ul>	
<ul style="list-style-type: none"><li>■</li></ul>	

5.6.4    Callback Functions by EcuM fixed

5.6.4.1    EcuM\_CB\_NfyNvMJobEnd

Prototype	
EcuM_CB_NfyNvMJobEnd	
Parameter	
Return code	
Functional Description	
Particularities and Limitations	
<ul style="list-style-type: none"><li>■</li><li>■</li><li>■</li></ul>	
■	

5.7    Configurable Interfaces

5.7.1    Notifications

5.7.2    Callout Functions

5.7.2.1 EcuM\_ErrorHook

Prototype	
EcuM_ErrorHook	
Parameter	
Return code	
Functional Description	
<ul style="list-style-type: none"><li>▪</li></ul>	
Particularities and Limitations	
<ul style="list-style-type: none"><li>▪</li></ul>	
<ul style="list-style-type: none"><li>▪</li></ul>	

5.7.2.2 EcuM\_OnGoOffOne

Prototype	
EcuM_OnGoOffOne	
Parameter	
Return code	
Functional Description	
Particularities and Limitations	
<ul style="list-style-type: none"><li>▪</li></ul>	
<ul style="list-style-type: none"><li>▪</li><li>▪</li></ul>	

5.7.2.3 EcuM\_OnGoOffTwo

Prototype	
EcuM_OnGoOffTwo	
Parameter	
Return code	
Functional Description	
Particularities and Limitations	
■	
■	
■	

-

5.7.2.4 EcuM\_AL\_SwitchOff

Prototype	
EcuM_AL_SwitchOff	
Parameter	
Return code	
Functional Description	
Particularities and Limitations	
■	
■	

-

5.7.2.5 EcuM\_AL\_Reset

Prototype	
EcuM_AL_Reset	
Parameter	
Return code	
Functional Description	
Particularities and Limitations	
■	
■	

-

5.7.2.6 EcuM\_AL\_DriverInitZero

Prototype	
EcuM_AL_DriverInitZero	
Parameter	
Return code	
Functional Description	
Particularities and Limitations	
■	
■	

-



5.7.2.8 EcuM\_AL\_DriverRestart

Prototype	
EcuM_AL_DriverRestart	
Parameter	
Return code	
Functional Description	
Particularities and Limitations	
<div><div></div><div></div></div>	
<div><div><div>i</div></div><div>Note</div></div>	
<div><div><div>i</div></div><div>Note</div></div>	
<div><div></div><div></div></div>	



5.7.2.9 EcuM\_AL\_SetProgrammableInterrupts

Prototype	
EcuM_AL_SetProgrammableInterrupts	
Parameter	
Return code	
Functional Description	
Particularities and Limitations	
■	
■	


5.7.2.10 EcuM\_McuSetMode

Prototype	
EcuM_McuSetMode	
Parameter	
Return code	
Functional Description	
Particularities and Limitations	


5.7.2.11 EcuM\_WaitForSlaveCores

Prototype	
EcuM_WaitForSlaveCores	
Parameter	
Return code	
Functional Description	
Particularities and Limitations	
■	
■	

5.7.2.12 EcuM\_StartOS

Prototype	
EcuM_StartOS	
Parameter	
Return code	
Functional Description	
<div><div></div><div>Note</div></div>	
Particularities and Limitations	
■	
■	

5.7.2.13 EcuM\_ShutdownOS

Prototype	
EcuM_ShutdownOS	
Parameter	
Return code	
Functional Description	
<div><div></div><div>Note</div></div>	
Particularities and Limitations	
<div><div></div><div></div></div>	
<div><div></div><div></div></div>	


5.7.2.14 EcuM\_GenerateRamHash

Prototype	
EcuM_GenerateRamHash	
Parameter	
Return code	
Functional Description	
Particularities and Limitations	
■	
■	
■	

5.7.2.15 EcuM\_CheckRamHash

Prototype	
EcuM_CheckRamHash	
Parameter	
Return code	
Functional Description	
Particularities and Limitations	
■	
■	
■	

5.7.2.16 EcuM\_SleepActivity

Prototype	
EcuM_SleepActivity	
Parameter	
Return code	
Functional Description	
<div><div></div><div>Caution</div></div>	
Particularities and Limitations	
■	
■	

5.7.2.17 EcuM\_EnableWakeupSources

Prototype	
EcuM_EnableWakeupSources	
Parameter	
	-
Return code	
Functional Description	
-	
Particularities and Limitations	
■	
■	
■	

5.7.2.18 EcuM\_DisableWakeupSources

Prototype	
EcuM_DisableWakeupSources	
Parameter	
	-

5.7.2.19 EcuM\_StartWakeupSources

Prototype	
EcuM_StartWakeupSources	
Parameter	
	-
Return code	
Functional Description	
-	
Particularities and Limitations	
■	
■	

5.7.2.20 EcuM\_StopWakeupSources

Prototype	
EcuM_StopWakeupSources	
Parameter	
	-
Return code	
Functional Description	
-	
Particularities and Limitations	
■	
■	

5.7.2.21 EcuM\_CheckWakeup


Prototype	
EcuM_CheckWakeup	
Parameter	
	-
Return code	
Functional Description	
-	
Particularities and Limitations	
■	
■	

5.7.2.22 EcuM\_CheckValidation

Prototype	
EcuM_CheckValidation	
Parameter	
	-
Return code	
Functional Description	
-	
Particularities and Limitations	
■	
■	
■	



5.7.2.23 EcuM\_DeterminePbConfiguration


Prototype	
EcuM_DeterminePbConfiguration	
Parameter	
Return code	
	-
Functional Description	
-	
	Note
Particularities and Limitations	
■	
■	

5.7.2.24 EcuM\_BswErrorHook


Prototype	
EcuM_BswErrorHook	
Parameter	
Return code	
Functional Description	
<ul style="list-style-type: none"><li></li><li></li><li></li></ul>	
Particularities and Limitations	
<ul style="list-style-type: none"><li></li></ul>	
<ul style="list-style-type: none"><li></li></ul>	

5.7.3 Callout Functions by EcuM flex


5.7.3.1 EcuM\_GptStartClock

Prototype	
EcuM_GptStartClock	
Parameter	
Return code	
Functional Description	
<div><div></div><div>Note</div></div>	
Particularities and Limitations	
<div><div></div><div></div></div>	
<div><div></div><div></div></div>	


5.7.3.2 EcuM\_GptSetSleep

Prototype	
EcuM_GptSetSleep	
Parameter	
Return code	
Functional Description	
<div><div></div><div>Note</div></div>	
Particularities and Limitations	
<div><div></div><div></div></div>	
<div><div></div><div></div></div>	

5.7.3.3 EcuM\_GptSetNormal

Prototype	
EcuM_GptSetNormal	
Parameter	
Return code	
Functional Description	
<div><div></div><div>Note</div></div>	
Particularities and Limitations	
■	
■	

5.7.3.4 EcuM\_AL\_DriverInitBswM\_<ID>

Prototype	
EcuM_AL_DriverInitBswM_<ID>	
Parameter	
Return code	
Functional Description	
<div><div></div><div>Note</div></div>	
Particularities and Limitations	
<div><div></div><div></div></div>	
<div><div></div><div></div></div>	

5.7.4 Callout Functions by EcuM fixed

5.7.4.1 EcuM\_AL\_DriverInitTwo

Prototype	
EcuM_AL_DriverInitTwo	
Parameter	
Return code	
Functional Description	
Particularities and Limitations	
<div><div></div><div></div></div>	
<div><div>i</div><div>Note</div></div>	<div>-</div>
<div><div>i</div><div>Note</div></div>	<div>-</div>
<div><div></div><div></div></div>	

5.7.4.2 EcuM\_AL\_DriverInitThree

Prototype	
EcuM_AL_DriverInitThree	
Parameter	
Return code	
Functional Description	
Particularities and Limitations	
<div><div></div><div></div></div>	
<div><div><div>i</div></div><div><div>Note</div><div>-</div></div></div>	
<div><div><div>i</div></div><div><div>Note</div><div>-</div></div></div>	
<div><div></div><div></div></div>	



5.7.4.3 EcuM\_OnEnterRun

Prototype	
EcuM_OnEnterRun	
Parameter	
Return code	
Functional Description	
Particularities and Limitations	
■	
■	
■	

5.7.4.4 EcuM\_OnExitRun

Prototype	
EcuM_OnExitRun	
Parameter	

5.7.4.5 EcuM\_OnGoSleep

Prototype	
EcuM_OnGoSleep	
Parameter	
Return code	

5.7.4.7 EcuM\_OnExitPostRun

Prototype	
EcuM_OnExitPostRun	
Parameter	
Return code	
Functional Description	
Particularities and Limitations	
■	
■	
■	

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5.7.4.8 EcuM\_OnFailedNvmWriteAllJobReaction

Prototype	
EcuM_OnFailedNvmWriteAllJobReaction	
Parameter	
Return code	
Functional Description	
Particularities and Limitations	
■	
■	

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5.7.4.9 EcuM\_OnWakeupReaction

Prototype		
	EcuM_OnWakeupReaction	
Parameter		
Return code		
Functional Description		
Particularities and Limitations		
	<div>■</div>	
	<div>■</div> <div>■</div>	

(FDX) 7.1.1.1 Q 5 D•g

5.7.4.10 EcuM\_OnRTEShutdown

Prototype	
	<b>EcuM_OnRTEShutdown</b>
Parameter	

5.8 Service Ports

5.8.1 Client Server Interface

5.8.1.1 Provide Ports on EcuM Side

-

5.8.1.1.1 ShutdownTarget Port

Operation	API Function

-

5.8.1.1.2 BootTarget Port

Operation	API Function

-

5.8.1.1.3 AlarmClock Port

Operation	API Function



Caution

5.8.1.1.4 StateRequest Port

Operation	API Function	Port Defined Argument Value



Info

```
EcuM_GetStateWrapper()  
  
EcuM_GetState().
```

5.8.1.2    Require Ports on EcuM Side

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1.1.1.1.1    currentMode Port

Operation	RTE Interface	Mode Declaration Group
	Rte_Switch_currentMode_currentMode	

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Caution

## 6 AUTOSAR Standard Compliance

### 6.1 Deviations

#### 6.1.1 Deviation in the Naming of API Parameters

##### 6.1.1.1 ResetSleepMode

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##### 6.1.1.2 TargetState

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##### 6.1.1.3 ShutdownTarget

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##### 6.1.1.4 Target (ShutdownTarget)

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##### 6.1.1.5 Target (BootTarget)

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##### 6.1.1.6 Sources

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### 6.1.2 Starting of the Validation Timer

### 6.1.3 Multiplicity of Parameters

#### 6.1.3.1 EcuMResetReasonRef



#### 6.1.3.2 EcuMSleepMode

#### 6.1.3.3 EcuMConfigConsistencyHash

#### 6.1.3.4 Removed parameter ConfigPtr from DriverInit Lists

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### 6.2 Additions/ Extensions

#### 6.2.1 Additional Configuration Parameters

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#### 6.2.2 Buffering of Wake ups if the BswM is Not Initialized

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### **6.2.3 Buffering of Wake ups if the ComM is Not Initialized**

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### **6.2.4 Additional API EcuM\_ClearValidatedWakeupEvent**

### **6.2.5 Support of Asynchronous Transceiver Handling**

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### **6.2.6 Deferred notification of the BswM about wake-up events**

### **6.2.7 Additional Callback EcuM\_AlarmCheckWakeup**

### **6.2.8 Additional API EcuM\_GoToSelectedShutdownTarget**

### **6.2.9 Additional Callout EcuM\_WaitForSlaveCores**

### **6.2.10 Support of EcuM fixed**

#### **6.2.10.1 Shutdown Target ECUM\_STATE\_RESET**

## 6.2.10.2 Synchronization of EcuM and RTE modes

### 6.3 Limitations

#### 6.3.1 Inter Module Checks

#### 6.3.2 Recording of Shutdown Causes

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#### 6.3.3 Not Supported Configuration Parameters and Containers

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#### 6.3.4 Wake-up Events after Reset Reason Translation are not Validated

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#### 6.3.5 EcuM Fixed Limitations

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## 7 Glossary and Abbreviations

## 7.1 Glossary

Term	Description

## 7.2 Abbreviations

[illegible]

8    Contact

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