

|                                   |  |
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## Known Limitations

Currently, chapter 5 Dependencies to other modules does not describe the versions of dependent modules. Thus, a version check will extend the chapter.

# 1 Introduction and functional overview

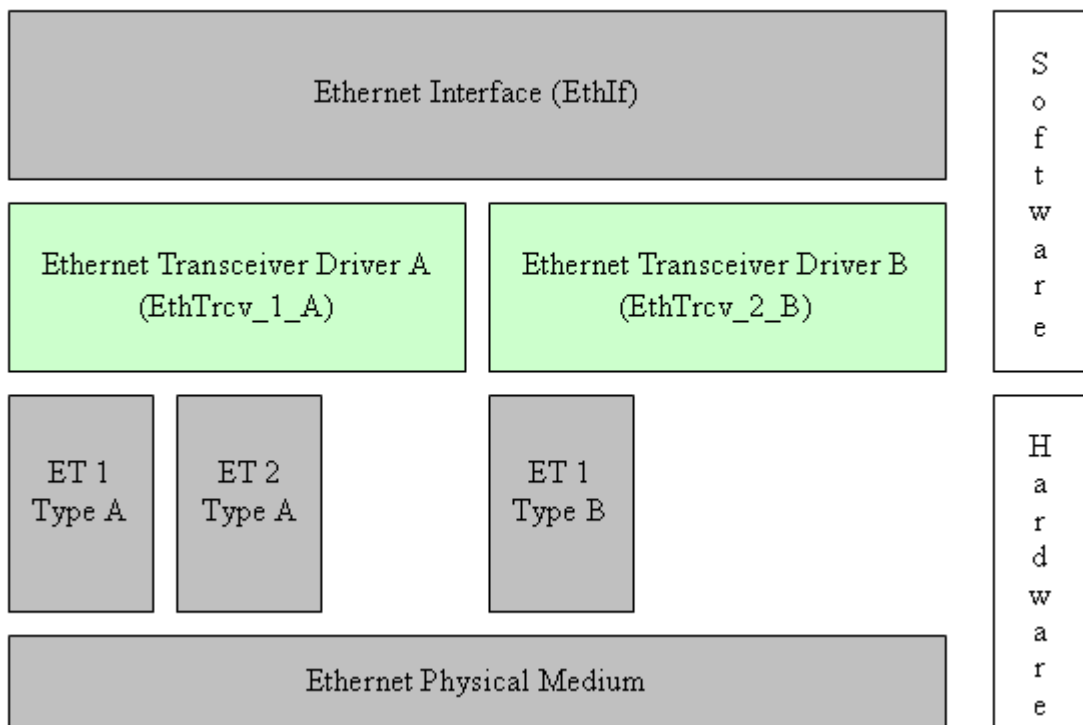
This specification specifies the functionality, API and the configuration of the AUTOSAR Basic Software module Ethernet Transceiver Driver.

In the AUTOSAR Layered Software Architecture, the Ethernet Transceiver Driver belongs to the *Microcontroller Abstraction Layer*, or more precisely, to the *Communication Drivers*.

This indicates the main task of the Ethernet Transceiver Driver:  
 Provide to the upper layer (Ethernet Interface) a hardware independent interface comprising multiple equal transceivers. This interface shall be uniform for all transceivers. Thus, the upper layer (Ethernet Interface) may access the underlying bus system in a uniform manner. The configuration of the Ethernet Transceiver Driver however is bus specific, since it takes into account the specific features of the communication transceiver.

A single Ethernet Transceiver Driver module supports only one type of transceiver hardware, but several transceivers of the same type. The Ethernet Transceiver Driver's prefix requires a unique namespace. The Ethernet Interface can access different Ethernet controller types using different Ethernet Transceiver Drivers using this prefix. The decision which driver to use to access a particular transceiver is a configuration parameter of the Ethernet Interface.

Figure 1.1 depicts the lower part of the Ethernet stack. One Ethernet Interface accesses several transceivers using one or several Ethernet Transceiver Drivers.



**Figure 1.1: Ethernet stack module overview**

Note: The Ethernet Transceiver Driver is specified in a way that allows for object code delivery of the code module, following the "one-fits-all" principle, i.e. the entire configuration of the Ethernet Interface can be carried out without modifying any source code. Thus, the configuration of the Ethernet Transceiver Driver can be carried out largely without detailed knowledge of the Ethernet Transceiver Driver software.



## 2 Acronyms and abbreviations

| <b>Abbreviation / Acronym:</b> | <b>Description:</b>   |
|--------------------------------|---|
| EC                             | Ethernet controller   |
| ET                             | Ethernet transceiver  |
| Eth                            | Ethernet Controller Driver (AUTOSAR BSW module)   |
| EthIf                          | Ethernet Interface (AUTOSAR BSW module)   |
| EthTrcv                        | Ethernet Transceiver Driver (AUTOSAR BSW module)  |
| MCG                            | Module Configuration Generator  |
| MII                            | Media Independent Interface (standardized Interface provided by Ethernet controllers to access Ethernet transceivers, see [21]) |

## 3 Related documentation

### 3.1 Input documents

- [1] List of Basic Software Modules  
AUTOSAR\_TR\_BSWModuleList.pdf
- [2] Layered Software Architecture  
AUTOSAR\_EXP\_LayeredSoftwareArchitecture.pdf
- [3] AUTOSAR General Requirements on Basic Software Modules  
AUTOSAR\_SRS\_BSWGeneral.pdf
- [4] Specification of Communication  
AUTOSAR\_SWS\_COM.pdf
- [5] Requirements on Ethernet Support in AUTOSAR  
AUTOSAR\_SRS\_Ethernet.pdf
- [6] Specification of Ethernet Interface  
AUTOSAR\_SWS\_EthernetInterface.pdf
- [7] Specification of Ethernet State Manager  
AUTOSAR\_SWS\_EthernetStateManager.pdf
- [8] Specification of Ethernet Interface  
AUTOSAR\_SWS\_EthernetInterface.pdf
- [9] Specification of Socket Adapter  
AUTOSAR\_SWS\_SocketAdapter.pdf
- [10] Specification of UDP Network Management  
AUTOSAR\_SWS\_UDPNetworkManagement.pdf
- [11] Specification of PDU Router  
AUTOSAR\_SWS\_PDURouter.pdf
- [12] BSW Scheduler Specification  
AUTOSAR\_SWS\_Scheduler.pdf
- [13] Specification of ECU Configuration  
AUTOSAR\_TPS\_ECUConfiguration.pdf
- [14] Specification of Memory Mapping  
AUTOSAR\_SWS\_MemoryMapping.pdf
- [15] Specification of Standard Types  
AUTOSAR\_SWS\_StandardTypes.pdf

- [16] Specification of Default Error Tracer  
AUTOSAR\_SWS\_DefaultErrorTracer.pdf
- [17] Specification of Diagnostics Event Manager  
AUTOSAR\_SWS\_DiagnosticEventManager
- [18] Specification of ECU State Manager  
AUTOSAR\_SWS\_ECUSTateManager.pdf
- [19] General Specification of Basic Software Modules  
AUTOSAR\_SWS\_BSWGeneral.pdf

### **3.2 Related standards and norms**

- [20] IEC 7498-1 The Basic Model, IEC Norm, 1994
- [21] IEEE 802.3-2006

### **3.3 Related specification**

AUTOSAR provides a General Specification on Basic Software modules [19] (SWS BSW General), which is also valid for Ethernet Transceiver Driver.

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

## **4 Constraints and assumptions**

### **4.1 Limitations**

The Ethernet Transceiver Driver module is only able to handle a single thread of execution. The execution must not be pre-empted by itself.

### **4.2 Applicability to car domains**

The Ethernet BSW stack is intended to be used wherever high data rates are required but no hard real-time is required. Of course, it can also be used for less-demanding use cases, i.e. for low data rates.

## 5 Dependencies to other modules

This chapter lists the modules interacting with the Ethernet Transceiver Driver module.

Modules that use Ethernet Transceiver Driver module:

- Ethernet Interface (EthIf)

Modules used by the Ethernet Transceiver Driver module:

- Ethernet Controller Driver (Eth) for transceiver access via Media Independent Interface (MII).

Dependencies to other Modules:

- On certain systems the transceiver might share resources with other components (e.g. the MCU, Port), and may depend on their configuration. If those resources are within scope of the other modules (e.g. PLL configuration, memory mapping, etc.) the Ethernet Transceiver Driver module does not take care of configuring those components but requires their preceding initialization.

## 5.1 File structure

### 5.1.1 Header file structure

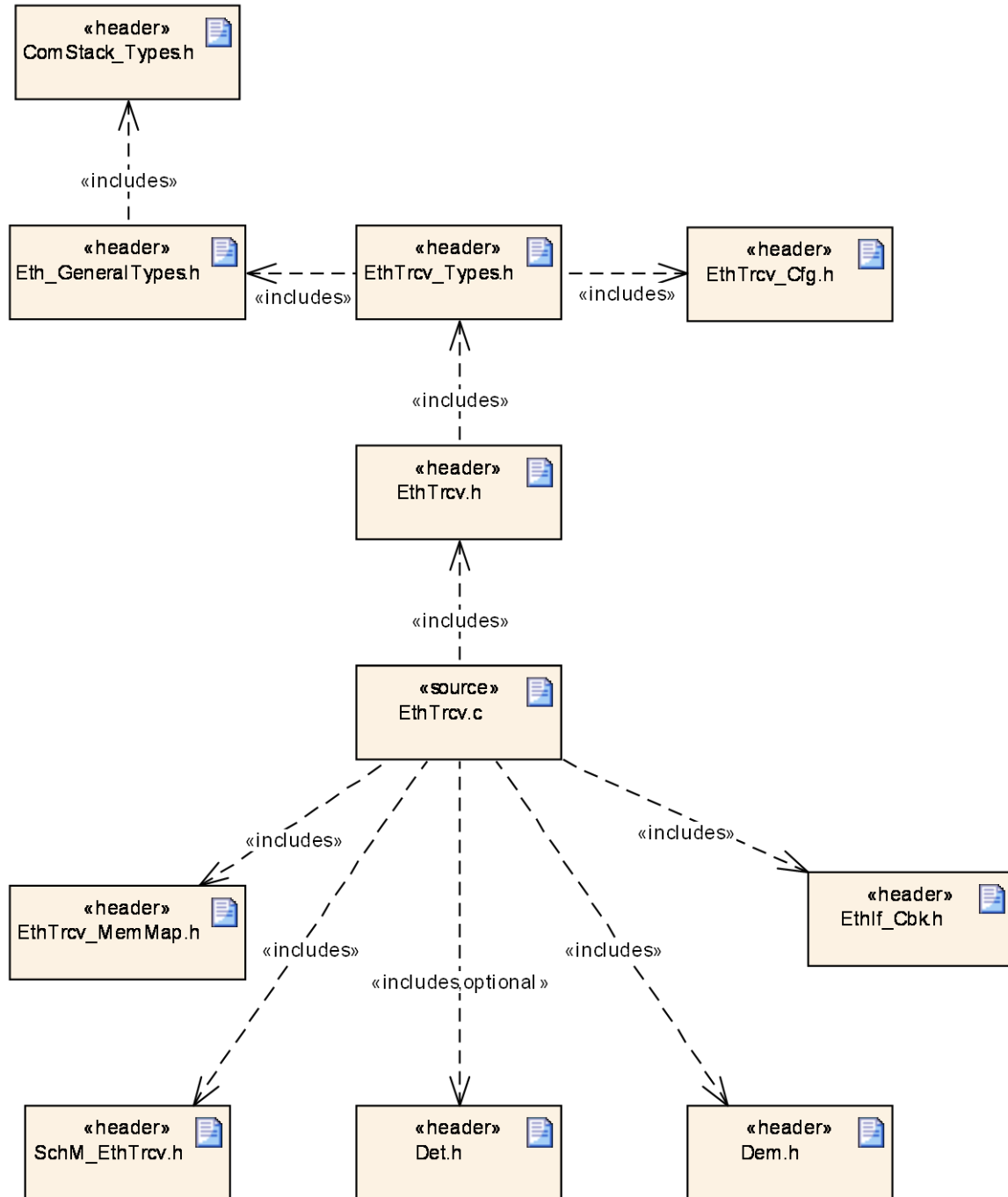


Figure 5.1: Ethernet Transceiver Driver file structure

## 6 Requirements traceability

| Requirement   | Description  | Satisfied by   |
|---------------|--|--|
| SRS_Eth_00106 | The Ethernet Transceiver Driver shall switch on/off wake up functionality at pre compile time. | SWS_EthTrcv_00124, SWS_EthTrcv_00139   |
| SRS_Eth_00107 | The Ethernet Transceiver Driver shall support access to the wake up reason.                    | SWS_EthTrcv_00135  |
| SRS_Eth_00108 | The Ethernet Transceiver Driver shall be able to wake-up the bus.                              | SWS_EthTrcv_00118  |
| SRS_Eth_00117 | The Ethernet Transceiver Driver shall provide access to standardized hardware features         | SWS_EthTrcv_00147, SWS_EthTrcv_00149, SWS_EthTrcv_91001, SWS_EthTrcv_91002, SWS_EthTrcv_91003, SWS_EthTrcv_91004, SWS_EthTrcv_91005, SWS_EthTrcv_91006, SWS_EthTrcv_91007, SWS_EthTrcv_91008, SWS_EthTrcv_91009, SWS_EthTrcv_91010 |

## 7 Functional specification

### 7.1 Ethernet BSW stack

As part of the AUTOSAR Layered Software Architecture according to Figure 7.1, the Ethernet BSW modules also form a layered software stack. Figure 7.1 depicts the basic structure of this Ethernet BSW stack. The EthIf module accesses several transceivers using the Ethernet Transceiver Driver layer, which can be made up of several Ethernet Transceiver Drivers modules.

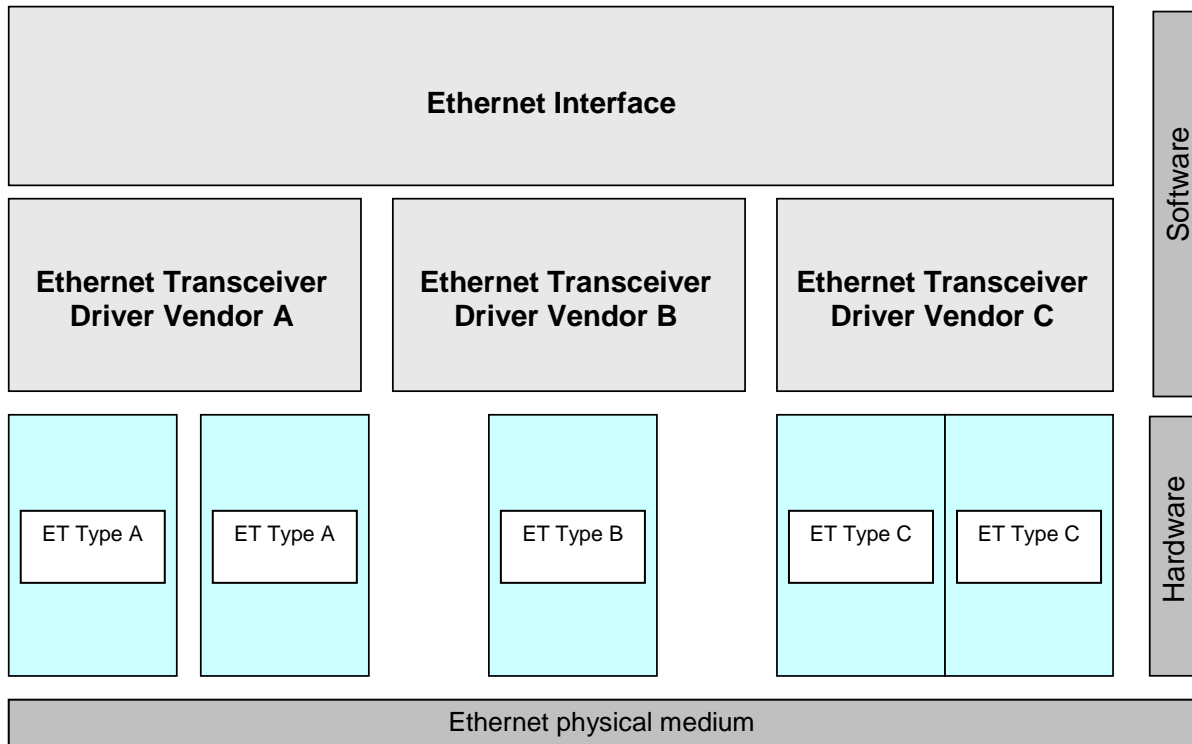
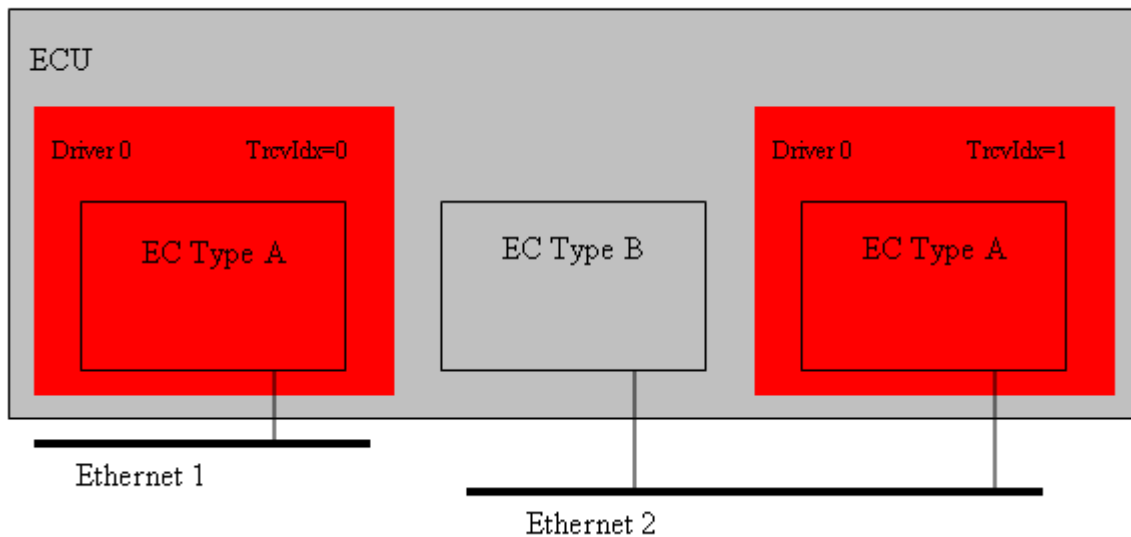


Figure 7.1: Basic Structure of the Ethernet BSW stack

#### 7.1.1 Indexing scheme

Users of the Ethernet Transceiver Driver identify transceiver resources using an indexing scheme as depicted in Figure 7.2.





**Figure 7.2: Ethernet Transceiver Driver indexing scheme**

[SWS\_EthTrcv\_00003] [

The Ethernet Transceiver Driver is using a zero-based index to abstract the access for upper software layers. The parameter `EthTrcv_CtrlIdx` within configuration corresponds to parameter `TrcvIdx` used in the API. ]()

### 7.1.2 Requirements

This chapter lists requirements that shall be fulfilled by Ethernet Transceiver Driver module implementations.

The Ethernet Interface module environment comprises all modules which are calling interfaces of the Ethernet Interface module.

[SWS\_EthTrcv\_00004] [

The Ethernet Transceiver Driver module shall support pre-compile time, link time and post-build time configuration. ]()

[SWS\_EthTrcv\_00005] [

The header file `EthTrcv.h` shall include a software and specification version number. ]()

[SWS\_EthTrcv\_00006] [

The Ethernet Transceiver Driver module shall perform a consistency check between code files and header files based on pre-process-checking the version numbers of related code files and header files. ]()

[SWS\_EthTrcv\_00007] [

In case development error detection is enabled for the Ethernet Transceiver Driver module: The Ethernet Transceiver Driver module shall check API parameters for validity and report detected errors to the DET. ]()

DET API functions are specified in [16].

[SWS\_EthTrcv\_00009] ]

The Ethernet Transceiver Driver module shall implement the API functions specified by the Ethernet Transceiver Driver SWS as real C-code functions and shall not implement the API as macros for object code deliveries. ]()

[SWS\_EthTrcv\_00010] ]

None of the Ethernet Transceiver Driver module header files shall define global variables. ]()

### 7.1.3 Configuration description

[SWS\_EthTrcv\_00011] ]

The Ethernet Transceiver Driver module shall provide an XML file that contains the data, which is required for the SW identification (it shall contain the vendor identification, module ID and software version information), configuration and integration process. This file should describe vendor specific configuration parameters as well as it should contain recommended configuration parameter values. ]()

[SWS\_EthTrcv\_00012] ]

The MCG shall read the ECU configuration description of the Ethernet Driver module(s). Ethernet Driver related configuration data is contained in the Ethernet Driver module configuration description. ]()

[SWS\_EthTrcv\_00013] ]

The MCG shall ensure the consistency of the generated configuration data. ]()

[SWS\_EthTrcv\_00014] ]

The configuration of the Ethernet Transceiver Driver module shall be calculated at ECU configuration time. None of the communication parameters shall be calculated at runtime. ]()

[SWS\_EthTrcv\_00015] ]

The start address of post-build time configuration data shall be passed during module initialization (see chapter 8.3.1). ]()

An assignment of those configuration classes to configuration parameters can be found in chapter 10.

A detailed description of all Ethernet Transceiver Driver related configuration parameters can be found in chapter 10 of this document.

### 7.1.4 Wake-up support

[SWS\_EthTrcv\_00110] [

The Ethernet Transceiver driver shall support wake up depending on the configuration parameter EthTrcvWakeUpSupport either not at all (ETHTRCV\_WAKEUP\_NOT\_SUPPORTED) or by Interrupt (ETHTRCV\_WAKEUP\_BY\_INTERRUPT) or by polling (ETHTRCV\_WAKEUP\_BY\_POLLING). ]()

Note: If the Ethernet Transceiver driver detects a wakeup it will map the wake-up reason provided by the transceiver hardware to wake-up events defined by EcuM. The Ethernet Transceiver driver will support the following scenarios:

- Sleeping ECU and sleeping bus -> wake up detection via EthTrcv\_Init (called during Power On)
- Awake ECU and sleeping bus -> wake up detection via EthTrcv\_MainFunction or Wake up interrupt handler (checked by EcuM within CheckWakeup)

[SWS\_EthTrcv\_00111] [

If the wake-up mode of the corresponding transceiver is ETHTRCV\_WUM\_ENABLE and transceiver is requested to low power mode (ETHTRCV\_MODE\_DOWN), the transceiver driver shall enable the corresponding ICU channel (see EthTrcvIcuChannelRef) by calling Icu\_EnableNotification. ]()

[SWS\_EthTrcv\_00112] [

If the wake-up mode of the corresponding transceiver is ETHTRCV\_WUM\_ENABLE and transceiver is requested to active (ETHTRCV\_MODE\_ACTIVE), the transceiver driver shall disable the corresponding ICU channel (see EthTrcvIcuChannelRef) by calling Icu\_DisableNotification. ]()

[SWS\_EthTrcv\_00146] [

The Wake up interrupt handler (if present) shall clear the interrupt and identify the wake up reason and store it. ]()

## 7.2 Error classification

### 7.2.1 Development Errors

[SWS\_EthTrcv\_00017] [

| Type or error                      | Relevance         | Related error code      | Value [hex] |
|------------------------------------|-------------------|-------------------------|-------------|
| Invalid transceiver index          | Development error | ETHTRCV_E_INV_TRCV_IDX  | 0x01        |
| EthTrcv module was not initialized | Development error | ETHTRCV_E_UNINIT        | 0x02        |
| Invalid pointer in parameter list  | Development error | ETHTRCV_E_PARAM_POINTER | 0x03        |

]()

### 7.2.2 Runtime Errors

There are no runtime errors.

### 7.2.3 Transient Faults

There are no transient faults.

### 7.2.4 Production Errors

There are no production errors.

### 7.2.5 Extended Production Errors

Extended production errors are handled as events of the Diagnostic Event Manager. The event IDs are defined in the following tables, while the actual values are assigned externally by the configuration of the Diagnostic Event Manager, and are included in the module via Dem.h.

[SWS\_EthTrcv\_00105] [

|                              |  |   |
|------------------------------|--|---|
| <b>Error Name:</b>           | ETHTRCV_E_ACCESS                                 |   |
| <b>Short Description:</b>    | Ethernet Transceiver Access Failure.             |   |
| <b>Long Description:</b>     | Monitors the access to the Ethernet Transceiver. |   |
| <b>Detection Criteria:</b>   | Fail   | When access to the Ethernet Transceiver fails the module shall report the extended production error with event status DEM_EVENT_STATUS_PREFAILED to DEM.    |
|                              | Pass   | When access to the Ethernet Transceiver succeeds the module shall report the extended production error with event status DEM_EVENT_STATUS_PREPASSED to DEM. |
| <b>Secondary Parameters:</b> | None.  |   |
| <b>Time Required:</b>        | None.  |   |
| <b>Monitor Frequency</b>     | None.  |   |

]0

## 8 API specification

### 8.1 Imported types

This chapter lists all types included from the following files:

[SWS\_EthTrcv\_00027] [

| <i>Module</i>          | <i>Imported Type</i>        |
|------------------------|-----------------------------|
| Dem                    | Dem_EventIdType             |
|                        | Dem_EventStatusType         |
| EcuM                   | EcuM_WakeupSourceType       |
| Eth_GeneralTypes       | EthTrcv_BaudRateType        |
|                        | EthTrcv_CableDiagResultType |
|                        | EthTrcv_ConfigType          |
|                        | EthTrcv_DuplexModeType      |
|                        | EthTrcv_LinkStateType       |
|                        | EthTrcv_ModeType            |
|                        | EthTrcv_PhyLoopbackModeType |
|                        | EthTrcv_PhyTestModeType     |
|                        | EthTrcv_PhyTxModeType       |
| EthTrcv_WakeupModeType |                             |
| Icu                    | Icu_ChannelType             |
| Std_Types              | Std_ReturnType              |
|                        | Std_VersionInfoType         |

] ()

### 8.2 Type definitions

[SWS\_EthTrcv\_00095] [

EthTrcv.h shall include Eth\_GeneralTypes.h for include of general EthTrcv type declarations. ]()

[SWS\_EthTrcv\_00096] [

The types specified in SWS\_EthernetTransceiverDriver shall be declared in Eth\_GeneralTypes.h. ]()

#### 8.2.1 EthTrcv\_ConfigType

[SWS\_EthTrcv\_00098] [

|                     |   |
|---------------------|---|
| <b>Name:</b>        | EthTrcv_ConfigType  |
| <b>Type:</b>        | Structure   |
| <b>Range:</b>       | Implementation specific.  |
| <b>Description:</b> | Implementation specific structure of the post build configuration |

] ()

#### 8.2.2 EthTrcv\_ModeType

[SWS\_EthTrcv\_00099] [

|              |                  |
|--------------|------------------|
| <b>Name:</b> | EthTrcv_ModeType |
|--------------|------------------|

|                     |   |      |                      |
|---------------------|---|------|----------------------|
| <b>Type:</b>        | Enumeration                             |      |                      |
| <b>Range:</b>       | ETHTRCV_MODE_DOWN                       | 0x00 | Transceiver disabled |
|                     | ETHTRCV_MODE_ACTIVE                     | 0x01 | Transceiver enabled  |
| <b>Description:</b> | This type defines the transceiver modes |      |                      |

] ()

### 8.2.3 EthTrcv\_LinkStateType

[SWS\_EthTrcv\_00100] [

|                     |   |      |   |
|---------------------|---|------|---|
| <b>Name:</b>        | EthTrcv_LinkStateType   |      |   |
| <b>Type:</b>        | Enumeration   |      |   |
| <b>Range:</b>       | ETHTRCV_LINK_STATE_DOWN   | 0x00 | No physical Ethernet connection established |
|                     | ETHTRCV_LINK_STATE_ACTIVE   | 0x01 | Physical Ethernet connection established    |
| <b>Description:</b> | This type defines the Ethernet link state. The link state changes after an Ethernet cable gets plugged in and the transceivers on both ends negotiated the transmission parameters (i.e. baud rate and duplex mode) |      |   |

] ()

### 8.2.4 EthTrcv\_StateType

[SWS\_EthTrcv\_00101] [

|                     |  |      |                              |
|---------------------|--|------|------------------------------|
| <b>Name:</b>        | EthTrcv_StateType  |      |                              |
| <b>Type:</b>        | Enumeration  |      |                              |
| <b>Range:</b>       | ETHTRCV_STATE_UNINIT   | 0x00 | Driver is not yet configured |
|                     | ETHTRCV_STATE_INIT   | 0x01 | Driver is configured         |
| <b>Description:</b> | Status supervision used for Development Error Detection. The state shall be available for debugging. |      |                              |

] ()

### 8.2.5 EthTrcv\_BaudRateType

[SWS\_EthTrcv\_00102] [

|                     |  |      |                              |
|---------------------|--|------|------------------------------|
| <b>Name:</b>        | EthTrcv_BaudRateType   |      |                              |
| <b>Type:</b>        | Enumeration  |      |                              |
| <b>Range:</b>       | ETHTRCV_BAUD_RATE_10MBIT   | 0x00 | 10MBIT Ethernet connection   |
|                     | ETHTRCV_BAUD_RATE_100MBIT  | 0x01 | 100MBIT Ethernet connection  |
|                     | ETHTRCV_BAUD_RATE_1000MBIT   | 0x02 | 1000MBIT Ethernet connection |
| <b>Description:</b> | This type defines the Ethernet baud rate. The baud rate gets either negotiated between the connected transceivers or has to be configured. |      |                              |

] ()

### 8.2.6 EthTrcv\_DuplexModeType

[SWS\_EthTrcv\_00103] [

|                     |  |      |                                 |
|---------------------|--|------|---------------------------------|
| <b>Name:</b>        | EthTrcv_DuplexModeType   |      |                                 |
| <b>Type:</b>        | Enumeration  |      |                                 |
| <b>Range:</b>       | ETHTRCV_DUPLEX_MODE_HALF   | 0x00 | Half duplex Ethernet connection |
|                     | ETHTRCV_DUPLEX_MODE_FULL   | 0x01 | Full duplex Ethernet connection |
| <b>Description:</b> | This type defines the Ethernet duplex mode. The duplex mode gets either negotiated between the connected transceivers or has to be configured. |      |                                 |

] ()

### 8.2.7 EthTrcv\_WakeupModeType

#### [SWS\_EthTrcv\_00113] [

|                     |  |      |                                     |
|---------------------|--|------|-------------------------------------|
| <b>Name:</b>        | EthTrcv_WakeupModeType   |      |                                     |
| <b>Type:</b>        | Enumeration  |      |                                     |
| <b>Range:</b>       | ETHTRCV_WUM_DISABLE  | 0x00 | Transceiver wake up disabled        |
|                     | ETHTRCV_WUM_ENABLE   | 0x01 | Transceiver wake up enabled         |
|                     | ETHTRCV_WUM_CLEAR  | 0x02 | Transceiver wake up reason cleared. |
| <b>Description:</b> | This type controls the transceiver wake up modes and/or clears the wake-up reason. |      |                                     |

] ()

### 8.2.8 EthTrcv\_WakeupReasonType

#### [SWS\_EthTrcv\_00114] [

|                     |  |      |   |
|---------------------|--|------|---|
| <b>Name:</b>        | EthTrcv_WakeupReasonType                           |      |   |
| <b>Type:</b>        | Enumeration  |      |   |
| <b>Range:</b>       | ETHTRCV_WUR_NONE                                   | 0x00 | No wake up reason detected.   |
|                     | ETHTRCV_WUR_GENERAL                                | 0x01 | General wake up detected, no distinct reason supported by hardware. |
|                     | ETHTRCV_WUR_BUS                                    | 0x02 | Bus wake up detected. Available if supported by hardware.           |
|                     | ETHTRCV_WUR_INTERNAL                               | 0x03 | Internal wake up detected. Available if supported by hardware.      |
|                     | ETHTRCV_WUR_RESET                                  | 0x04 | Reset wake up detected. Available if supported by hardware.         |
|                     | ETHTRCV_WUR_POWER_ON                               | 0x05 | Power on wake up detected. Available if supported by hardware.      |
|                     | ETHTRCV_WUR_PIN                                    | 0x06 | Pin wake up detected. Available if supported by hardware.           |
|                     | ETHTRCV_WUR_SYSERR                                 | 0x07 | System error wake up detected. Available if supported by hardware.  |
| <b>Description:</b> | This type defines the transceiver wake up reasons. |      |   |

] ()

### 8.2.9 EthTrcv\_PhyTestModeType

#### [SWS\_EthTrcv\_91002] [

|                     |                                       |      |  |
|---------------------|---------------------------------------|------|--|
| <b>Name:</b>        | EthTrcv_PhyTestModeType               |      |  |
| <b>Type:</b>        | Enumeration                           |      |  |
| <b>Range:</b>       | ETHTRCV_PHYTESTMODE_NONE              | 0x00 | normal operation                       |
|                     | ETHTRCV_PHYTESTMODE_1                 | 0x01 | test transmitter droop                 |
|                     | ETHTRCV_PHYTESTMODE_2                 | 0x02 | test master timing jitter              |
|                     | ETHTRCV_PHYTESTMODE_3                 | 0x03 | test slave timing jitter               |
|                     | ETHTRCV_PHYTESTMODE_4                 | 0x04 | test transmitter distortion            |
|                     | ETHTRCV_PHYTESTMODE_5                 | 0x05 | test power spectral density (PSD) mask |
| <b>Description:</b> | Describes the possible PHY test modes |      |  |

] (SRS\_Eth\_00117)

### 8.2.10 EthTrcv\_PhyLoopbackModeType

#### [SWS\_EthTrcv\_91004] [

|               |                             |      |                  |
|---------------|-----------------------------|------|------------------|
| <b>Name:</b>  | EthTrcv_PhyLoopbackModeType |      |                  |
| <b>Type:</b>  | Enumeration                 |      |                  |
| <b>Range:</b> | ETHTRCV_PHYLOOPBACK_NONE    | 0x00 | normal operation |

|                     |   |      |                   |
|---------------------|---|------|-------------------|
|                     | ETHTRCV_PHYLOOPBACK_INTERNAL              | 0x01 | internal loopback |
|                     | ETHTRCV_PHYLOOPBACK_EXTERNAL              | 0x02 | external loopback |
|                     | ETHTRCV_PHYLOOPBACK_REMOTE                | 0x03 | remote loopback   |
| <b>Description:</b> | Describes the possible PHY loopback modes |      |                   |

] (SRS\_Eth\_00117)

### 8.2.11 EthTrcv\_PhyTxModeType

[SWS\_EthTrcv\_91006] [

|                     |   |      |                      |
|---------------------|---|------|----------------------|
| <b>Name:</b>        | EthTrcv_PhyTxModeType                     |      |                      |
| <b>Type:</b>        | Enumeration                               |      |                      |
| <b>Range:</b>       | ETHTRCV_PHYTXMODE_NORMAL                  | 0x00 | normal operation     |
|                     | ETHTRCV_PHYTXMODE_TX_OFF                  | 0x01 | transmitter disabled |
|                     | ETHTRCV_PHYTXMODE_SCRAMBLER_OFF           | 0x02 | scrambler disabled   |
| <b>Description:</b> | Describes the possible PHY transmit modes |      |                      |

] (SRS\_Eth\_00117)

### 8.2.12 EthTrcv\_CableDiagResultType

[SWS\_EthTrcv\_91008] [

|                     |   |      |                         |
|---------------------|---|------|-------------------------|
| <b>Name:</b>        | EthTrcv_CableDiagResultType                     |      |                         |
| <b>Type:</b>        | Enumeration                                     |      |                         |
| <b>Range:</b>       | ETHTRCV_CABLEDIAG_OK                            | 0x00 | Cable diagnostic ok     |
|                     | ETHTRCV_CABLEDIAG_ERROR                         | 0x01 | Cable diagnostic failed |
|                     | ETHTRCV_CABLEDIAG_SHORT                         | 0x02 | Short circuit detected  |
|                     | ETHTRCV_CABLEDIAG_OPEN                          | 0x03 | Open circuit detected   |
| <b>Description:</b> | Describes the results of the cable diagnostics. |      |                         |

] (SRS\_Eth\_00117)

## 8.3 Function definitions

This is a list of functions provided for upper layer modules.

### 8.3.1 EthTrcv\_Init

[SWS\_EthTrcv\_00028] [

|                            |  |   |  |
|----------------------------|--|---|--|
| <b>Service name:</b>       | EthTrcv_Init   |   |  |
| <b>Syntax:</b>             | <pre>void EthTrcv_Init(     const EthTrcv_ConfigType* CfgPtr )</pre> |   |  |
| <b>Service ID[hex]:</b>    | 0x01   |   |  |
| <b>Sync/Async:</b>         | Synchronous  |   |  |
| <b>Reentrancy:</b>         | Non Reentrant  |   |  |
| <b>Parameters (in):</b>    | CfgPtr   | Points to the implementation specific structure |  |
| <b>Parameters (inout):</b> | None   |   |  |
| <b>Parameters (out):</b>   | None   |   |  |
| <b>Return value:</b>       | None   |   |  |
| <b>Description:</b>        | Initializes the Ethernet Transceiver Driver                          |   |  |

] ()

[SWS\_EthTrcv\_00029] [



The function shall store the access to the configuration structure for subsequent API calls. ]()

[SWS\_EthTrcv\_00035] [

The function shall:

- Configure all transceiver configuration parameters (e.g. baud rate, duplex mode, automatic negotiation, ...) ]()

[SWS\_EthTrcv\_00030] [

The function shall change the state of the component from ETHTRCV\_STATE\_UNINIT to ETHTRCV\_STATE\_INIT. ]()

[SWS\_EthTrcv\_00115] [

If the wake-up mode of the corresponding transceiver is ETHTRCV\_WUM\_ENABLE the function shall check for wake-up reasons and propagate the corresponding wake-up source (see EthTrcvWakeupMap configuration) to the EcuM by calling EcuM\_SetWakeupEvent. ]()

[SWS\_EthTrcv\_00040] [

The function shall check the access to the Ethernet transceiver. If the check fails, the function shall raise the production error ETHTRCV\_E\_ACCESS and return E\_NOT\_OK, otherwise pass the production error ETHTRCV\_E\_ACCESS and return E\_OK. ]()

[SWS\_EthTrcv\_00032] [

Caveat: The API has to be called during initialization. ]()

### 8.3.2 EthTrcv\_SetTransceiverMode

[SWS\_EthTrcv\_00042] [

|                            |  |   |
|----------------------------|--|---|
| <b>Service name:</b>       | EthTrcv_SetTransceiverMode   |   |
| <b>Syntax:</b>             | Std_ReturnType EthTrcv_SetTransceiverMode(<br>uint8 TrcvIdx,<br>EthTrcv_ModeType CtrlMode<br>) |   |
| <b>Service ID[hex]:</b>    | 0x03   |   |
| <b>Sync/Async:</b>         | Asynchronous   |   |
| <b>Reentrancy:</b>         | Non Reentrant  |   |
| <b>Parameters (in):</b>    | TrcvIdx  | Index of the transceiver within the context of the Ethernet Transceiver Driver            |
|                            | CtrlMode   | ETHTRCV_MODE_DOWN: disable the transceiver<br>ETHTRCV_MODE_ACTIVE: enable the transceiver |
| <b>Parameters (inout):</b> | None   |   |
| <b>Parameters (out):</b>   | None   |   |
| <b>Return value:</b>       | Std_ReturnType   | E_OK: Service accepted<br>E_NOT_OK: Service denied  |
| <b>Description:</b>        | Enables / disables the indexed transceiver   |   |

]()

[SWS\_EthTrcv\_00043] [

The function shall put the index transceiver in the specified mode and indicate the new mode by the API `EthIf_TrcvModeIndication` latest during the next `EthTrcv_MainFunction`. ]()

[SWS\_EthTrcv\_00117] ]

If the wake up mode of the corresponding transceiver is `ETHTRCV_WUM_ENABLE` and the function is called with `ETHTRCV_MODE_DOWN`, it shall set the transceiver into a mode (e.g. sleep mode) where wakeups can be detected. ]()

[SWS\_EthTrcv\_00118] ]

If `EthTrcv_SetTransceiverMode()` is called with parameter `ETHTRCV_MODE_ACTIVE`, the Ethernet Transceiver driver shall

- (\*) check for wake-up reasons when entering the transceiver's active mode.
- (\*) In case no wake-up reason has been detected, the Ethernet transceiver shall send a wake-up symbol on the bus if configured.
- (\*) Invoke the call-out `<EthTrcvWakeUpCallout>` function if configured.

] (SRS\_Eth\_00108)

[SWS\_EthTrcv\_00044] ]

If development error detection is enabled: the function shall check that the service `EthTrcv_Init` was previously called. If the check fails, the function shall raise the development error `ETHTRCV_E_UNINIT` otherwise (if DET is disabled) return `E_NOT_OK`. ]()

[SWS\_EthTrcv\_00045] ]

If development error detection is enabled: the function shall check the parameter `TrcvIdx` for being valid. If the check fails, the function shall raise the development error `ETHTRCV_E_INV_TRCV_IDX` otherwise (if DET is disabled) return `E_NOT_OK`. ]()

[SWS\_EthTrcv\_00046] ]

The function shall be pre compile time configurable On/Off by the configuration parameter: `EthTrcvSetTransceiverModeApi`. ]()

[SWS\_EthTrcv\_00094] ]

If the transceiver is already in the requested mode `E_OK` shall be returned and no development error shall be raised. ]()

[SWS\_EthTrcv\_00104] ]

The function shall check the access to the Ethernet transceiver. If the check fails, the function shall raise the production error `ETHTRCV_E_ACCESS` and return `E_NOT_OK`, otherwise pass the production error `ETHTRCV_E_ACCESS` and return `E_OK`. ]()

[SWS\_EthTrcv\_00047] ]

Caveat: The function requires previous transceiver initialization (`EthTrcv_Init`). ]()

### 8.3.3 EthTrcv\_GetTransceiverMode

[SWS\_EthTrcv\_00048] ]

|                            |   |  |
|----------------------------|---|--|
| <b>Service name:</b>       | EthTrcv_GetTransceiverMode  |  |
| <b>Syntax:</b>             | Std_ReturnType EthTrcv_GetTransceiverMode (<br>uint8 TrcvIdx,<br>EthTrcv_ModeType* TrcvModePtr<br>) |  |
| <b>Service ID[hex]:</b>    | 0x04  |  |
| <b>Sync/Async:</b>         | Synchronous   |  |
| <b>Reentrancy:</b>         | Non Reentrant   |  |
| <b>Parameters (in):</b>    | TrcvIdx   | Index of the transceiver within the context of the Ethernet Transceiver Driver                   |
| <b>Parameters (inout):</b> | None  |  |
| <b>Parameters (out):</b>   | TrcvModePtr   | ETHTRCV_MODE_DOWN: the transceiver is disabled<br>ETHTRCV_MODE_ACTIVE: the transceiver is enable |
| <b>Return value:</b>       | Std_ReturnType  | E_OK: success<br>E_NOT_OK: transceiver could not be initialized                                  |
| <b>Description:</b>        | Obtains the state of the indexed transceiver  |  |

] () [SWS\_EthTrcv\_00049] [

The function shall read the current transceiver mode. ]()

[SWS\_EthTrcv\_00050] [

If development error detection is enabled: the function shall check that the service EthTrcv\_Init was previously called. If the check fails, the function shall raise the development error ETHTRCV\_E\_UNINIT otherwise (if DET is disabled) return E\_NOT\_OK. ]()

[SWS\_EthTrcv\_00051] [

If development error detection is enabled: the function shall check the parameter TrcvIdx for being valid. If the check fails, the function shall raise the development error ETHTRCV\_E\_INV\_TRCV\_IDX otherwise (if DET is disabled) return E\_NOT\_OK. ]()

[SWS\_EthTrcv\_00052] [

If development error detection is enabled: the function shall check the parameter TrcvModePtr for being valid. If the check fails, the function shall raise the development error ETHTRCV\_E\_PARAM\_POINTER otherwise (if DET is disabled) return E\_NOT\_OK. ]()

[SWS\_EthTrcv\_00053] [

The function shall be pre compile time configurable On/Off by the configuration parameter: EthTrcvGetTransceiverModeApi. ]()

[SWS\_EthTrcv\_00054] [

Caveat: The function requires previous transceiver initialization (EthTrcv\_Init). ]()

### 8.3.4 EthTrcv\_SetTransceiverWakeupMode

[SWS\_EthTrcv\_00119] [

|                      |   |  |
|----------------------|---|--|
| <b>Service name:</b> | EthTrcv_SetTransceiverWakeupMode  |  |
| <b>Syntax:</b>       | Std_ReturnType EthTrcv_SetTransceiverWakeupMode (<br>uint8 TrcvIdx,<br>EthTrcv_WakeupModeType TrcvWakeupMode<br>) |  |

|                            |  |  |
|----------------------------|--|--|
|                            | )  |  |
| <b>Service ID[hex]:</b>    | 0x0d   |  |
| <b>Sync/Async:</b>         | Synchronous  |  |
| <b>Reentrancy:</b>         | Non Reentrant  |  |
| <b>Parameters (in):</b>    | TrcvIdx  | Index of the transceiver within the context of the Ethernet Transceiver Driver   |
|                            | TrcvWakeupMode   | ETHTRCV_WUM_DISABLE: disable transceiver wake up<br>ETHTRCV_WUM_ENABLE: enable transceiver wake up<br>ETHTRCV_WUM_CLEAR: clears transceiver wake up reason |
| <b>Parameters (inout):</b> | None   |  |
| <b>Parameters (out):</b>   | None   |  |
| <b>Return value:</b>       | Std_ReturnType   | E_OK: transceiver wake up mode has been changed.<br>E_NOT_OK: transceiver wake up mode could not be changed or the wake-up reason could not be cleared.    |
| <b>Description:</b>        | Enables / disables the wake-up mode or clear the wake-up reason of the indexed transceiver |  |

] ()

[SWS\_EthTrcv\_00120] ]

If function EthTrcv\_SetTransceiverWakeupMode() is called with ETHTRCV\_WUM\_DISABLE or ETHTRCV\_WUM\_ENABLE it shall put the indexed transceiver in the specified wake up mode. ]()

[SWS\_EthTrcv\_00121] ]

If function EthTrcv\_SetTransceiverWakeupMode() is called with ETHTRCV\_WUM\_CLEAR it shall clear stored wakeup events on the indexed transceiver. ]()

[SWS\_EthTrcv\_00122] ]

If development error detection is enabled: The function EthTrcv\_SetTransceiverWakeupMode() shall check that the service EthTrcv\_Init was previously called. If the check fails, the function shall raise the development error ETHTRCV\_E\_UNINIT otherwise (if DET is disabled) return E\_NOT\_OK. ]()

[SWS\_EthTrcv\_00123] ]

If development error detection is enabled: The function EthTrcv\_SetTransceiverWakeupMode() shall check the parameter TrcvIdx for being valid. If the check fails, the function shall raise the development error ETHTRCV\_E\_INV\_TRCV\_IDX otherwise (if DET is disabled) return E\_NOT\_OK. ]()

[SWS\_EthTrcv\_00124] ]

The function EthTrcv\_SetTransceiverWakeupMode() shall be only available if EthTrcvWakeUpSupport is not disabled (set to ETHTRCV\_WAKEUP\_NOT\_SUPPORTED). ] (SRS\_Eth\_00106)

[SWS\_EthTrcv\_00125] ]

If the transceiver is already in the requested wake-up mode, E\_OK shall be returned and no development error shall be raised. ]()

[SWS\_EthTrcv\_00126] ]

Caveat: The function EthTrcv\_SetTransceiverWakeupMode() requires previous transceiver initialization (EthTrcv\_Init). ]()

### 8.3.5 EthTrcv\_GetTransceiverWakeupMode

#### [SWS\_EthTrcv\_00127] [

|                            |  |  |
|----------------------------|--|--|
| <b>Service name:</b>       | EthTrcv_GetTransceiverWakeupMode   |  |
| <b>Syntax:</b>             | Std_ReturnType EthTrcv_GetTransceiverWakeupMode (uint8 TrcvIdx, EthTrcv_WakeupModeType* TrcvWakeupModePtr) |  |
| <b>Service ID[hex]:</b>    | 0x0e   |  |
| <b>Sync/Async:</b>         | Synchronous  |  |
| <b>Reentrancy:</b>         | Non Reentrant  |  |
| <b>Parameters (in):</b>    | TrcvIdx  | Index of the transceiver within the context of the Ethernet Transceiver Driver                             |
| <b>Parameters (inout):</b> | None   |  |
| <b>Parameters (out):</b>   | TrcvWakeupModePtr  | ETHTRCV_WUM_DISABLE: transceiver wake up is disabled<br>ETHTRCV_WUM_ENABLE: transceiver wake up is enabled |
| <b>Return value:</b>       | Std_ReturnType   | E_OK: success<br>E_NOT_OK: transceiver wake up mode could not be obtained                                  |
| <b>Description:</b>        | Returns the wake up mode of the indexed transceiver  |  |

] ()

#### [SWS\_EthTrcv\_00128] [

The function EthTrcv\_GetTransceiverWakeupMode() shall read the current transceiver wake up mode and provide it into TrcvWakeupModePtr. ]()

#### [SWS\_EthTrcv\_00129] [

If development error detection is enabled: The function EthTrcv\_GetTransceiverWakeupMode() shall check that the service EthTrcv\_Init was previously called. If the check fails, the function shall raise the development error ETHTRCV\_E\_UNINIT otherwise (if DET is disabled) return E\_NOT\_OK. ]()

#### [SWS\_EthTrcv\_00130] [

If development error detection is enabled: The function EthTrcv\_GetTransceiverWakeupMode() shall check the parameter TrcvIdx for being valid. If the check fails, the function shall raise the development error ETHTRCV\_E\_INV\_TRCV\_IDX otherwise (if DET is disabled) return E\_NOT\_OK. ]()

#### [SWS\_EthTrcv\_00131] [

If development error detection is enabled: The function EthTrcv\_GetTransceiverWakeupMode() shall check the parameter TrcvWakeupModePtr for being valid. If the check fails, the function shall raise the development error ETHTRCV\_E\_PARAM\_POINTER otherwise (if DET is disabled) return E\_NOT\_OK. ]()

#### [SWS\_EthTrcv\_00132] [

The function EthTrcv\_GetTransceiverWakeupMode() shall be only available if EthTrcvGetTransceiverWakeupModeApi is set to TRUE. ]()

#### [SWS\_EthTrcv\_00133] [

Caveat: The function EthTrcv\_GetTransceiverWakeupMode() requires previous transceiver initialization (EthTrcv\_Init). ]()

### 8.3.6 EthTrcv\_CheckWakeup

#### [SWS\_EthTrcv\_00134] [

|                            |   |  |
|----------------------------|---|--|
| <b>Service name:</b>       | EthTrcv_CheckWakeup   |  |
| <b>Syntax:</b>             | Std_ReturnType EthTrcv_CheckWakeup(<br>uint8 TrcvIdx<br>)           |  |
| <b>Service ID[hex]:</b>    | 0x0f  |  |
| <b>Sync/Async:</b>         | Synchronous   |  |
| <b>Reentrancy:</b>         | Reentrant   |  |
| <b>Parameters (in):</b>    | TrcvIdx   | Index of the transceiver within the context of the Ethernet Transceiver Driver                                 |
| <b>Parameters (inout):</b> | None  |  |
| <b>Parameters (out):</b>   | None  |  |
| <b>Return value:</b>       | Std_ReturnType  | E_OK: The function has been successfully executed<br>E_NOT_OK: The function could not be successfully executed |
| <b>Description:</b>        | Service is called by EthIf in case a wake-up interrupt is detected. |  |

] ()

#### [SWS\_EthTrcv\_00135] [

If the wake-up mode of the corresponding transceiver is ETHTRCV\_WUM\_ENABLE the function EthTrcv\_CheckWakeup() shall check if a wake up has been detected and if yes propagate the corresponding wake up source (see EthTrcvWakeupMap configuration) to the EcuM by calling EcuM\_SetWakeupEvent. ](SRS\_Eth\_00107)

#### [SWS\_EthTrcv\_00136] [

If the wake-up mode of the corresponding transceiver is not ETHTRCV\_WUM\_ENABLE, the function EthTrcv\_CheckWakeup() shall return E\_OK. ]()

#### [SWS\_EthTrcv\_00137] [

If development error detection is enabled: The function EthTrcv\_CheckWakeup() shall check that the service EthTrcv\_Init was previously called. If the check fails, the function shall raise the development error ETHTRCV\_E\_UNINIT otherwise (if DET is disabled) return E\_NOT\_OK. ]()

#### [SWS\_EthTrcv\_00138] [

If development error detection is enabled: The function EthTrcv\_CheckWakeup() shall check the parameter TrcvIdx for being valid. If the check fails, the function shall raise the development error ETHTRCV\_E\_INV\_TRCV\_IDX otherwise (if DET is disabled) return E\_NOT\_OK. ]()

#### [SWS\_EthTrcv\_00139] [

The function EthTrcv\_CheckWakeup() shall be only available if EthTrcvWakeUpSupport is something else than ETHTRCV\_WAKEUP\_NOT\_SUPPORTED. ](SRS\_Eth\_00106)

#### [SWS\_EthTrcv\_00140] [

Caveat: The function EthTrcv\_CheckWakeup() requires previous transceiver initialization (EthTrcv\_Init). ]()

### 8.3.7 EthTrcv\_StartAutoNegotiation

#### [SWS\_EthTrcv\_00055] [

|                            |   |  |
|----------------------------|---|--|
| <b>Service name:</b>       | EthTrcv_StartAutoNegotiation  |  |
| <b>Syntax:</b>             | Std_ReturnType EthTrcv_StartAutoNegotiation(<br>uint8 TrcvIdx<br>)                      |  |
| <b>Service ID[hex]:</b>    | 0x05  |  |
| <b>Sync/Async:</b>         | Synchronous   |  |
| <b>Reentrancy:</b>         | Non Reentrant   |  |
| <b>Parameters (in):</b>    | TrcvIdx   | Index of the transceiver within the context of the Ethernet Transceiver Driver |
| <b>Parameters (inout):</b> | None  |  |
| <b>Parameters (out):</b>   | None  |  |
| <b>Return value:</b>       | Std_ReturnType  | E_OK: success<br>E_NOT_OK: transceiver could not be initialized                |
| <b>Description:</b>        | Restarts the negotiation of the transmission parameters used by the indexed transceiver |  |

#### ] () [SWS\_EthTrcv\_00056] [

The function shall restart the automatic negotiation of the transmission parameters used by the indexed transceiver. ]()

#### [SWS\_EthTrcv\_00057] [

If development error detection is enabled: the function shall check that the service EthTrcv\_Init was previously called. If the check fails, the function shall raise the development error ETHTRCV\_E\_UNINIT otherwise (if DET is disabled) return E\_NOT\_OK. ]()

#### [SWS\_EthTrcv\_00058] [

If development error detection is enabled: the function shall check the parameter TrcvIdx for being valid. If the check fails, the function shall raise the development error ETHTRCV\_E\_INV\_TRCV\_IDX otherwise (if DET is disabled) return E\_NOT\_OK. ]()

#### [SWS\_EthTrcv\_00059] [

The function shall be pre compile time configurable On/Off by the configuration parameter: EthTrcvStartAutoNegotiationApi. ]()

#### [SWS\_EthTrcv\_00060] [

Caveat: The function requires previous transceiver initialization (EthTrcv\_Init). ]()

#### [SWS\_EthTrcv\_00088] [

Caveat: The function is not required or called by an upper layer BSW software component. ]()

### 8.3.8 EthTrcv\_GetLinkState

#### [SWS\_EthTrcv\_00061] [

|                      |                      |
|----------------------|----------------------|
| <b>Service name:</b> | EthTrcv_GetLinkState |
|----------------------|----------------------|

|                            |  |   |
|----------------------------|--|---|
| <b>Syntax:</b>             | Std_ReturnType EthTrcv_GetLinkState (uint8 TrcvIdx, EthTrcv_LinkStateType* LinkStatePtr) |   |
| <b>Service ID[hex]:</b>    | 0x06   |   |
| <b>Sync/Async:</b>         | Synchronous  |   |
| <b>Reentrancy:</b>         | Non Reentrant  |   |
| <b>Parameters (in):</b>    | TrcvIdx  | Index of the transceiver within the context of the Ethernet Transceiver Driver                              |
| <b>Parameters (inout):</b> | None   |   |
| <b>Parameters (out):</b>   | LinkStatePtr   | ETHTRCV_LINK_STATE_DOWN: transceiver is disconnected<br>ETHTRCV_LINK_STATE_ACTIVE: transceiver is connected |
| <b>Return value:</b>       | Std_ReturnType   | E_OK: success<br>E_NOT_OK: transceiver could not be initialized   |
| <b>Description:</b>        | Obtains the link state of the indexed transceiver  |   |

] () [SWS\_EthTrcv\_00062] [

The function shall read the current transceiver link state. ]()

[SWS\_EthTrcv\_00063] [

If development error detection is enabled: the function shall check that the service EthTrcv\_Init was previously called. If the check fails, the function shall raise the development error ETHTRCV\_E\_UNINIT otherwise (if DET is disabled) return E\_NOT\_OK. ]()

[SWS\_EthTrcv\_00064] [

If development error detection is enabled: the function shall check the parameter TrcvIdx for being valid. If the check fails, the function shall raise the development error ETHTRCV\_E\_INV\_TRCV\_IDX otherwise (if DET is disabled) return E\_NOT\_OK. ]()

[SWS\_EthTrcv\_00065] [

If development error detection is enabled: the function shall check the parameter LinkStatePtr for being valid. If the check fails, the function shall raise the development error ETHTRCV\_E\_PARAM\_POINTER otherwise (if DET is disabled) return E\_NOT\_OK. ]()

[SWS\_EthTrcv\_00066] [

The function shall be pre compile time configurable On/Off by the configuration parameter: EthTrcvGetLinkStateApi. ]()

[SWS\_EthTrcv\_00067] [

Caveat: The function requires previous transceiver initialization (EthTrcv\_Init). ]()

### 8.3.9 EthTrcv\_GetBaudRate

[SWS\_EthTrcv\_00068] [

|                      |   |  |
|----------------------|---|--|
| <b>Service name:</b> | EthTrcv_GetBaudRate   |  |
| <b>Syntax:</b>       | Std_ReturnType EthTrcv_GetBaudRate (uint8 TrcvIdx, EthTrcv_BaudRateType* BaudRatePtr) |  |



|                            |  |   |
|----------------------------|--|---|
| <b>Service ID[hex]:</b>    | 0x07   |   |
| <b>Sync/Async:</b>         | Synchronous                                      |   |
| <b>Reentrancy:</b>         | Non Reentrant                                    |   |
| <b>Parameters (in):</b>    | TrcvIdx  | Index of the transceiver within the context of the Ethernet Transceiver Driver  |
| <b>Parameters (inout):</b> | None   |   |
| <b>Parameters (out):</b>   | BaudRatePtr                                      | ETHTRCV_BAUD_RATE_10MBIT: 10MBit connection<br>ETHTRCV_BAUD_RATE_100MBIT: 100MBit connection<br>ETHTRCV_BAUD_RATE_1000MBIT: 1000MBit connection |
| <b>Return value:</b>       | Std_ReturnType                                   | E_OK: success<br>E_NOT_OK: transceiver could not be initialized   |
| <b>Description:</b>        | Obtains the baud rate of the indexed transceiver |   |

] () [SWS\_EthTrcv\_00069] [

The function shall read the current transceiver baud rate. ]()

[SWS\_EthTrcv\_00070] [

If development error detection is enabled: the function shall check that the service EthTrcv\_Init was previously called. If the check fails, the function shall raise the development error ETHTRCV\_E\_UNINIT otherwise (if DET is disabled) return E\_NOT\_OK. ]()

[SWS\_EthTrcv\_00071] [

If development error detection is enabled: the function shall check the parameter TrcvIdx for being valid. If the check fails, the function shall raise the development error ETHTRCV\_E\_INV\_TRCV\_IDX otherwise (if DET is disabled) return E\_NOT\_OK. ]()

[SWS\_EthTrcv\_00072] [

If development error detection is enabled: the function shall check the parameter BaudRatePtr for being valid. If the check fails, the function shall raise the development error ETHTRCV\_E\_PARAM\_POINTER otherwise (if DET is disabled) return E\_NOT\_OK. ]()

[SWS\_EthTrcv\_00073] [

The function shall be pre compile time configurable On/Off by the configuration parameter: EthTrcvGetBaudRateApi. ]()

[SWS\_EthTrcv\_00074] [

Caveat: The function requires previous transceiver initialization (EthTrcv\_Init). ]()

[SWS\_EthTrcv\_00089] [

Caveat: The function is not required or called by an upper layer BSW software component. ]()

### 8.3.10 EthTrcv\_GetDuplexMode

[SWS\_EthTrcv\_00075] [

|                      |  |
|----------------------|--|
| <b>Service name:</b> | EthTrcv_GetDuplexMode                                    |
| <b>Syntax:</b>       | Std_ReturnType EthTrcv_GetDuplexMode (<br>uint8 TrcvIdx, |

|                            |  |   |
|----------------------------|--|---|
|                            | EthTrcv_DuplexModeType* DuplexModePtr<br>)         |   |
| <b>Service ID[hex]:</b>    | 0x08   |   |
| <b>Sync/Async:</b>         | Synchronous  |   |
| <b>Reentrancy:</b>         | Non Reentrant                                      |   |
| <b>Parameters (in):</b>    | TrcvIdx  | Index of the transceiver within the context of the Ethernet Transceiver Driver                        |
| <b>Parameters (inout):</b> | None   |   |
| <b>Parameters (out):</b>   | DuplexModePtr                                      | ETHTRCV_DUPLEX_MODE_HALF: half duplex connections<br>ETHTRCV_DUPLEX_MODE_FULL: full duplex connection |
| <b>Return value:</b>       | Std_ReturnType                                     | E_OK: success<br>E_NOT_OK: transceiver could not be initialized                                       |
| <b>Description:</b>        | Obtains the duplex mode of the indexed transceiver |   |

] () [SWS\_EthTrcv\_00076] [

The function shall read the current transceiver duplex mode. ]()

[SWS\_EthTrcv\_00077] [

If development error detection is enabled: the function shall check that the service EthTrcv\_Init was previously called. If the check fails, the function shall raise the development error ETHTRCV\_E\_UNINIT otherwise (if DET is disabled) return E\_NOT\_OK. ]()

[SWS\_EthTrcv\_00078] [

If development error detection is enabled: the function shall check the parameter TrcvIdx for being valid. If the check fails, the function shall raise the development error ETHTRCV\_E\_INV\_TRCV\_IDX otherwise (if DET is disabled) return E\_NOT\_OK. ]()

[SWS\_EthTrcv\_00079] [

If development error detection is enabled: the function shall check the parameter DuplexModePtr for being valid. If the check fails, the function shall raise the development error ETHTRCV\_E\_PARAM\_POINTER otherwise (if DET is disabled) return E\_NOT\_OK. ]()

[SWS\_EthTrcv\_00080] [

The function shall be pre compile time configurable On/Off by the configuration parameter: EthTrcvGetDuplexModeApi. ]()

[SWS\_EthTrcv\_00081] [

Caveat: The function requires previous transceiver initialization (EthTrcv\_Init). ]()

[SWS\_EthTrcv\_00090] [

Caveat: The function is not required or called by an upper layer BSW software component. ]()

### 8.3.11 EthTrcv\_SetPhyTestMode

[SWS\_EthTrcv\_91003] [

|                      |   |
|----------------------|---|
| <b>Service name:</b> | EthTrcv_SetPhyTestMode                  |
| <b>Syntax:</b>       | Std_ReturnType EthTrcv_SetPhyTestMode ( |

|                            |  |   |
|----------------------------|--|---|
|                            | <pre>uint8 TrcvIdx, EthTrcv_PhyTestModeType Mode )</pre>             |   |
| <b>Service ID[hex]:</b>    | 0x11   |   |
| <b>Sync/Async:</b>         | Synchronous  |   |
| <b>Reentrancy:</b>         | Reentrant for different TrcvIdx. Non reentrant for the same TrcvIdx. |   |
| <b>Parameters (in):</b>    | TrcvIdx  | Index of the transceiver within the context of the Ethernet Transceiver Driver      |
|                            | Mode   | Test mode to be activated   |
| <b>Parameters (inout):</b> | None   |   |
| <b>Parameters (out):</b>   | None   |   |
| <b>Return value:</b>       | Std_ReturnType   | E_OK: The request has been accepted<br>E_NOT_OK: The request has not been accepted. |
|                            |  |   |
| <b>Description:</b>        | Activates a given test mode.   |   |

] (SRS\_Eth\_00117)

[SWS\_EthTrcv\_00147]

If development error detection is enabled: the function EthTrcv\_SetPhyTestMode shall check the parameter Mode for being supported by the hardware. If the check fails, the function shall raise the development error ETHTRCV\_E\_NOT\_SUPPORTED.] (SRS\_Eth\_00117)

### 8.3.12 EthTrcv\_SetPhyLoopbackMode

[SWS\_EthTrcv\_91005] [

|                            |   |   |
|----------------------------|---|---|
| <b>Service name:</b>       | EthTrcv_SetPhyLoopbackMode  |   |
| <b>Syntax:</b>             | <pre>Std_ReturnType EthTrcv_SetPhyLoopbackMode( uint8 TrcvIdx, EthTrcv_PhyLoopbackModeType Mode )</pre> |   |
| <b>Service ID[hex]:</b>    | 0x12  |   |
| <b>Sync/Async:</b>         | Synchronous   |   |
| <b>Reentrancy:</b>         | Reentrant for different TrcvIdx. Non reentrant for the same TrcvIdx.                                    |   |
| <b>Parameters (in):</b>    | TrcvIdx   | Index of the transceiver within the context of the Ethernet Transceiver Driver      |
|                            | Mode  | Loopback mode to be activated   |
| <b>Parameters (inout):</b> | None  |   |
| <b>Parameters (out):</b>   | None  |   |
| <b>Return value:</b>       | Std_ReturnType  | E_OK: The request has been accepted<br>E_NOT_OK: The request has not been accepted. |
|                            |   |   |
| <b>Description:</b>        | Activates a given loopback mode.  |   |

] (SRS\_Eth\_00117)

[SWS\_EthTrcv\_00149]

If development error detection is enabled: the function EthTrcv\_SetPhyLoopbackMode shall check the parameter Mode for being supported by the hardware. If the check fails, the function shall raise the development error ETHTRCV\_E\_NOT\_SUPPORTED.] (SRS\_Eth\_00117)

### 8.3.13 EthTrcv\_GetPhySignalQuality

[SWS\_EthTrcv\_91001] [

|                            |  |   |
|----------------------------|--|---|
| <b>Service name:</b>       | EthTrcv_GetPhySignalQuality  |   |
| <b>Syntax:</b>             | Std_ReturnType EthTrcv_GetPhySignalQuality(<br>uint8 TrcvIdx,<br>uint32* SignalQualityPtr<br>) |   |
| <b>Service ID[hex]:</b>    | 0x10   |   |
| <b>Sync/Async:</b>         | Synchronous  |   |
| <b>Reentrancy:</b>         | Reentrant for different TrcvIdx. Non reentrant for the same TrcvIdx.                           |   |
| <b>Parameters (in):</b>    | TrcvIdx  | Index of the transceiver within the context of the Ethernet Transceiver Driver      |
| <b>Parameters (inout):</b> | None   |   |
| <b>Parameters (out):</b>   | SignalQualityPtr   | Pointer to the memory where the signal quality shall be stored.                     |
| <b>Return value:</b>       | Std_ReturnType   | E_OK: The request has been accepted<br>E_NOT_OK: The request has not been accepted. |
| <b>Description:</b>        | Obtains the current signal quality of the link of the indexed transceiver                      |   |

] (SRS\_Eth\_00117)

### 8.3.14 EthTrcv\_SetPhyTxMode

[SWS\_EthTrcv\_91007] [

|                            |   |  |
|----------------------------|---|--|
| <b>Service name:</b>       | EthTrcv_SetPhyTxMode  |  |
| <b>Syntax:</b>             | Std_ReturnType EthTrcv_SetPhyTxMode(<br>uint8 TrcvIdx,<br>EthTrcv_PhyTxModeType Mode<br>) |  |
| <b>Service ID[hex]:</b>    | 0x13  |  |
| <b>Sync/Async:</b>         | Synchronous   |  |
| <b>Reentrancy:</b>         | Reentrant for different TrcvIdx. Non reentrant for the same TrcvIdx.                      |  |
| <b>Parameters (in):</b>    | TrcvIdx   | Index of the transceiver within the context of the Ethernet Transceiver Driver     |
|                            | Mode  | Transmission mode to be activated  |
| <b>Parameters (inout):</b> | None  |  |
| <b>Parameters (out):</b>   | None  |  |
| <b>Return value:</b>       | Std_ReturnType  | E_OK: The request has been accepted<br>E_NOT_OK: The request has not been accepted |
| <b>Description:</b>        | Activates a given transmission mode.  |  |

] (SRS\_Eth\_00117)

[SWS\_EthTrcv\_00148]

If development error detection is enabled: the function EthTrcv\_SetPhyTxMode shall check the parameter Mode for being supported by the hardware. If the check fails, the function shall raise the development error ETHTRCV\_E\_NOT\_SUPPORTED.] ( )

### 8.3.15 EthTrcv\_GetCableDiagnosticsResult

[SWS\_EthTrcv\_91009] [

|                         |  |  |
|-------------------------|--|--|
| <b>Service name:</b>    | EthTrcv_GetCableDiagnosticsResult  |  |
| <b>Syntax:</b>          | Std_ReturnType EthTrcv_GetCableDiagnosticsResult(<br>uint8 TrcvIdx,<br>EthTrcv_CableDiagResultType* ResultPtr<br>) |  |
| <b>Service ID[hex]:</b> | 0x14   |  |
| <b>Sync/Async:</b>      | Synchronous  |  |
| <b>Reentrancy:</b>      | Reentrant for different TrcvIdx. Non reentrant for the same TrcvIdx.   |  |

|                            |  |  |
|----------------------------|--|--|
| <b>Parameters (in):</b>    | TrcvIdx  | Index of the transceiver within the context of the Ethernet Transceiver Driver     |
| <b>Parameters (inout):</b> | None   |  |
| <b>Parameters (out):</b>   | ResultPtr  | Pointer to the location where the cable diagnostics result shall be stored         |
| <b>Return value:</b>       | Std_ReturnType   | E_OK: The request has been accepted<br>E_NOT_OK: The request has not been accepted |
| <b>Description:</b>        | Retrieves the cable diagnostics result of a given transceiver. |  |

] (SRS\_Eth\_00117)

### 8.3.16 EthTrcv\_GetPhyIdentifier

[SWS\_EthTrcv\_91010] [

|                            |  |   |
|----------------------------|--|---|
| <b>Service name:</b>       | EthTrcv_GetPhyIdentifier   |   |
| <b>Syntax:</b>             | <pre>Std_ReturnType EthTrcv_GetPhyIdentifier(     uint8 TrcvIdx,     uint32* OrgUniqueIdPtr,     uint8* ModelNrPtr,     uint8* RevisionNrPtr )</pre> |   |
| <b>Service ID[hex]:</b>    | 0x15   |   |
| <b>Sync/Async:</b>         | Synchronous  |   |
| <b>Reentrancy:</b>         | Reentrant for different TrcvIdx. Non reentrant for the same TrcvIdx.   |   |
| <b>Parameters (in):</b>    | TrcvIdx  | Index of the transceiver within the context of the Ethernet Transceiver Driver      |
| <b>Parameters (inout):</b> | None   |   |
| <b>Parameters (out):</b>   | OrgUniqueIdPtr   | Pointer to the memory where the Organizationally Unique Identifier shall be stored. |
|                            | ModelNrPtr   | Pointer to the memory where the Manufacturer's Model Number shall be stored.        |
|                            | RevisionNrPtr  | Pointer to the memory where the Revision Number shall be stored.                    |
| <b>Return value:</b>       | Std_ReturnType   | E_OK: The request has been accepted<br>E_NOT_OK: The request has not been accepted  |
| <b>Description:</b>        | Obtains the PHY identifier of the Ethernet Transceiver according to IEEE 802.3-2015 chapter 22.2.4.3.1 PHY Identifier.                               |   |

] (SRS\_Eth\_00117)

### 8.3.17 EthTrcv\_GetVersionInfo

[SWS\_EthTrcv\_00082] [

|                            |   |                                    |
|----------------------------|---|------------------------------------|
| <b>Service name:</b>       | EthTrcv_GetVersionInfo  |                                    |
| <b>Syntax:</b>             | <pre>void EthTrcv_GetVersionInfo(     Std_VersionInfoType* VersionInfoPtr )</pre> |                                    |
| <b>Service ID[hex]:</b>    | 0x0b  |                                    |
| <b>Sync/Async:</b>         | Synchronous   |                                    |
| <b>Reentrancy:</b>         | Reentrant   |                                    |
| <b>Parameters (in):</b>    | None  |                                    |
| <b>Parameters (inout):</b> | None  |                                    |
| <b>Parameters (out):</b>   | VersionInfoPtr  | Version information of this module |
| <b>Return value:</b>       | None  |                                    |

|                     |  |
|---------------------|--|
| <b>Description:</b> | Returns the version information of this module |
|---------------------|--|

] ()

[SWS\_EthTrcv\_00093] [

If development error detection is enabled: the function shall check the parameter VersionInfoPtr for being valid. If the check fails, the function shall raise the development error ETHTRCV\_E\_PARAM\_POINTER. ]()

## 8.4 Callback notifications

### 8.4.1 EthTrcv\_ReadMiiIndication

[SWS\_EthTrcv\_00108] [

|                            |   |   |
|----------------------------|---|---|
| <b>Service name:</b>       | EthTrcv_ReadMiiIndication   |   |
| <b>Syntax:</b>             | <pre>void EthTrcv_ReadMiiIndication(     uint8 CtrlIdx,     uint8 TrcvIdx,     uint8 RegIdx,     uint8 RegVal )</pre>                           |   |
| <b>Service ID[hex]:</b>    | 0x09  |   |
| <b>Sync/Async:</b>         | Synchronous   |   |
| <b>Reentrancy:</b>         | Non Reentrant for the same CtrlIdx, reentrant for different   |   |
| <b>Parameters (in):</b>    | CtrlIdx   | Index of the controller within the context of the Ethernet Driver |
|                            | TrcvIdx   | Index of the transceiver on the MII                               |
|                            | RegIdx  | Index of the transceiver register on the MII                      |
|                            | RegVal  | Value contained in the indexed register                           |
| <b>Parameters (inout):</b> | None  |   |
| <b>Parameters (out):</b>   | None  |   |
| <b>Return value:</b>       | None  |   |
| <b>Description:</b>        | Called when information has been read out via MII interface. Triggered by previous Eth_ReadMii call. Can directly be called within Eth_ReadMii. |   |

] ()

### 8.4.2 EthTrcv\_WriteMiiIndication

[SWS\_EthTrcv\_00109] [

|                            |  |   |
|----------------------------|--|---|
| <b>Service name:</b>       | EthTrcv_WriteMiiIndication   |   |
| <b>Syntax:</b>             | <pre>void EthTrcv_WriteMiiIndication(     uint8 CtrlIdx,     uint8 TrcvIdx,     uint8 RegIdx )</pre> |   |
| <b>Service ID[hex]:</b>    | 0x0a   |   |
| <b>Sync/Async:</b>         | Synchronous  |   |
| <b>Reentrancy:</b>         | Non Reentrant for the same CtrlIdx, reentrant for different  |   |
| <b>Parameters (in):</b>    | CtrlIdx  | Index of the controller within the context of the Ethernet Driver |
|                            | TrcvIdx  | Index of the transceiver on the MII                               |
|                            | RegIdx   | Index of the transceiver register on the MII                      |
| <b>Parameters (inout):</b> | None   |   |
| <b>Parameters (out):</b>   | None   |   |

|                      |  |
|----------------------|--|
| <b>Return value:</b> | None   |
| <b>Description:</b>  | Called when information has been written via MII interface. Triggered by previous Eth_WriteMii call. Can directly be called within Eth_WriteMii. |

] ()

## 8.5 Interrupt service routines

The Ethernet Transceiver Driver does not provide any interrupt service routines.

## 8.6 Scheduled functions

### 8.6.1 EthTrcv\_MainFunction

[SWS\_EthTrcv\_00106] [

|                         |   |
|-------------------------|---|
| <b>Service name:</b>    | EthTrcv_MainFunction  |
| <b>Syntax:</b>          | void EthTrcv_MainFunction(<br>void<br>)   |
| <b>Service ID[hex]:</b> | 0x0c  |
| <b>Description:</b>     | Used for polling state changes and wakeup reasons. Calls EthIf_TrcvModelIndication when the transceiver mode changed. Stores wakeup events if EthTrcvWakeUpSupport is set to ETHTRCV_WAKEUP_BY_POLLING. |

] () [SWS\_EthTrcv\_00107] [

Used for polling state changes. Calls EthIf\_TrcvModelIndication when the transceiver mode changed. ]()

[SWS\_EthTrcv\_00141] [

The function EthTrcv\_MainFunction() shall check for wake up reasons and shall store wakeup events if EthTrcvWakeUpSupport is set to ETHTRCV\_WAKEUP\_BY\_POLLING. ]()

[SWS\_EthTrcv\_00142] [

If development error detection is enabled: The function EthTrcv\_MainFunction() shall check that the service EthTrcv\_Init was previously called. If the check fails, the function shall raise the development error ETHTRCV\_E\_UNINIT. ]()

## 8.7 Expected Interfaces

This chapter lists all interfaces required from other modules.

### 8.7.1 Mandatory Interfaces

This chapter defines all interfaces required to fulfill the core functionality of the module.

[SWS\_EthTrcv\_00085] [

| API function       | Description   |
|--------------------|---|
| Dem_SetEventStatus | Called by SW-Cs or BSW modules to report monitor status information |

|                          |  |
|--------------------------|--|
|                          | to the Dem. BSW modules calling Dem_SetEventStatus can safely ignore the return value.   |
| EthIf_TrvcModeIndication | Called asynchronously when a mode change has been read out. If the function is triggered by previous call of EthTrcv_SetTransceiverMode it can directly be called within the trigger function. |
| SchM_Enter_EthTrcv       | Invokes the SchM_Enter function to enter a module local exclusive area.  |
| SchM_Exit_EthTrcv        | Invokes the SchM_Exit function to exit an exclusive area.  |

] ()

### 8.7.2 Optional Interfaces

This chapter defines all interfaces required to fulfill an optional functionality of the module.

[SWS\_EthTrcv\_00086] [

| API function             | Description  |
|--------------------------|--|
| Det_ReportError          | Service to report development errors.  |
| EcuM_SetWakeupEvent      | Sets the wakeup event.   |
| Eth_ReadMii              | Reads a transceiver register   |
| Eth_WriteMii             | Configures a transceiver register or triggers a function offered by the receiver |
| EthSwt_ReadTrcvRegister  | Generic API for reading the content of a transceiver register                    |
| EthSwt_WriteTrcvRegister | Generic API for writing the content of a transceiver register                    |
| Icu_DisableNotification  | This function disables the notification of a channel.                            |
| Icu_EnableNotification   | This function enables the notification on the given channel.                     |

] ()

### 8.7.3 Configurable interfaces

This chapter lists all interfaces with configurable target functions. The target function is usually a callback function. The function names are configurable.

[SWS\_EthTrcv\_00144] [

|                            |  |
|----------------------------|--|
| <b>Service name:</b>       | <EthTrcvWakeUpCallout>   |
| <b>Syntax:</b>             | void <EthTrcvWakeUpCallout>(<br>uint8 TrcvIdx<br>)   |
| <b>Service ID[hex]:</b>    | 0x11   |
| <b>Sync/Async:</b>         | Asynchronous   |
| <b>Reentrancy:</b>         | Non Reentrant Dont care  |
| <b>Parameters (in):</b>    | TrcvIdx      Index of the Ethernet Transceiver   |
| <b>Parameters (inout):</b> | None   |
| <b>Parameters (out):</b>   | None   |
| <b>Return value:</b>       | None   |
| <b>Description:</b>        | Indicates an wake-up request for the specified Ethernet Transceiver. Can be used to trigger integrator code that initiates a remote wake-up. |

] ()

[SWS\_EthTrcv\_00145] [

The callback function shall be configurable by the configuration parameter: EthTrcvWakeUpCallout. ]()





## 9 Sequence diagrams

The usage of the Ethernet Transceiver Driver is depicted in the sequence diagrams of the Ethernet Interface.

## 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 Ethernet Transceiver Driver.

Chapter 10.3 specifies published information of the module Ethernet Transceiver Driver.

### 10.1 Containers and configuration parameters

The following chapters summarize all configuration parameters. The detailed meanings of the parameters describe Chapters 7 and Chapter 10.

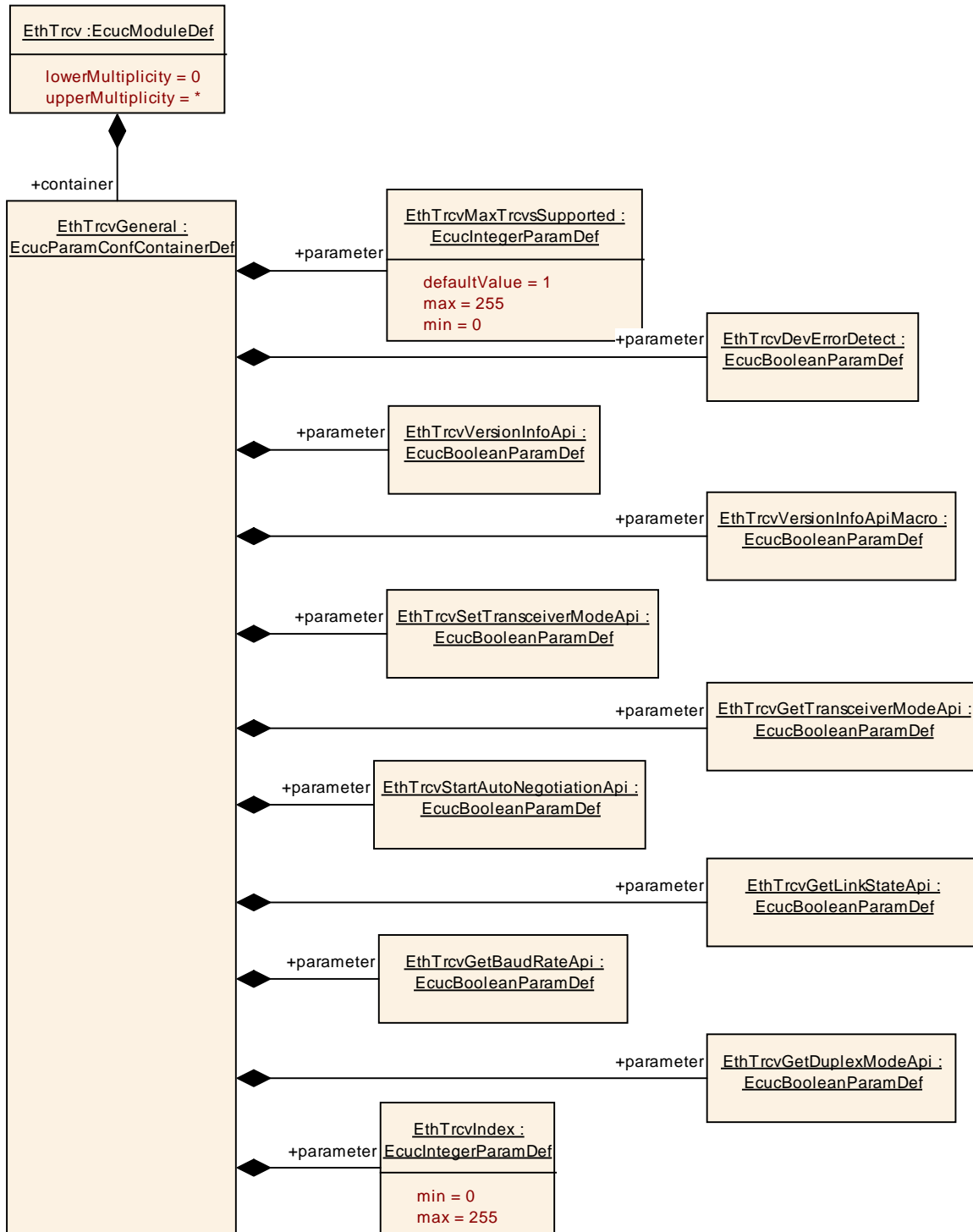


Figure 10.1: Ethernet Transceiver Driver configuration structure

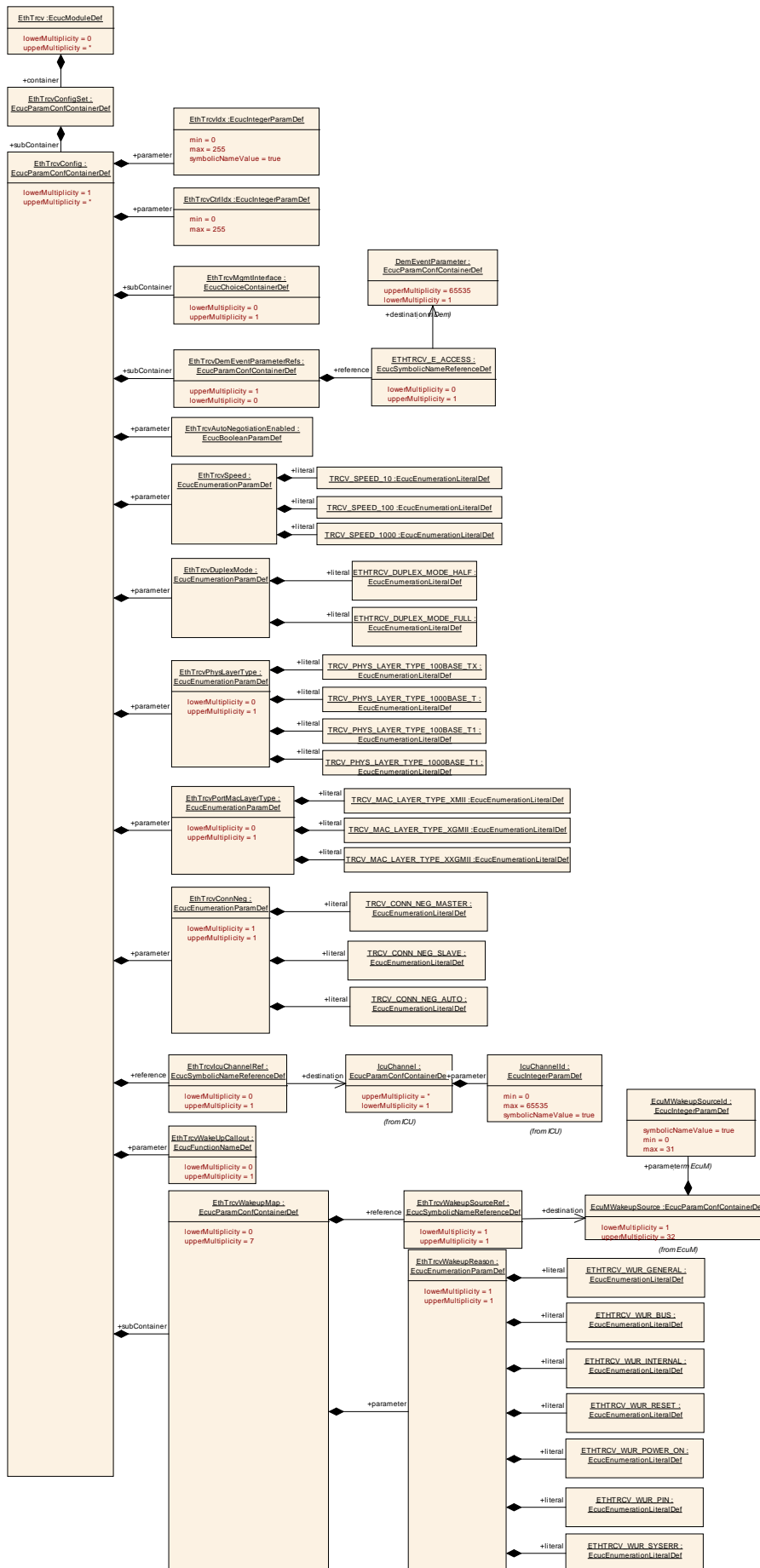


Figure 10.2: Ethernet Transceiver Driver Transceiver configuration structure

### 10.1.1 EthTrcv

|                                   |  |
|-----------------------------------|--|
| <b>SWS Item</b>                   | <b>ECUC_EthTrcv_00034 :</b>                                |
| <b>Module Name</b>                | EthTrcv  |
| <b>Module Description</b>         | Configuration of Ethernet Transceiver Driver module        |
| <b>Post-Build Variant Support</b> | true   |
| <b>Supported Config Variants</b>  | VARIANT-LINK-TIME, VARIANT-POST-BUILD, VARIANT-PRE-COMPILE |

| <b>Included Containers</b> |                     |  |
|----------------------------|---------------------|--|
| <b>Container Name</b>      | <b>Multiplicity</b> | <b>Scope / Dependency</b>  |
| EthTrcvConfigSet           | 1                   | This container contains the configuration parameters and sub containers of the AUTOSAR EthTrcv module. |
| EthTrcvGeneral             | 1                   | General configuration of Ethernet Transceiver Driver module  |

### 10.1.2 EthTrcvConfigSet

|                                 |  |
|---------------------------------|--|
| <b>SWS Item</b>                 | <b>ECUC_EthTrcv_00016 :</b>  |
| <b>Container Name</b>           | EthTrcvConfigSet   |
| <b>Description</b>              | This container contains the configuration parameters and sub containers of the AUTOSAR EthTrcv module. |
| <b>Configuration Parameters</b> |  |

| <b>Included Containers</b> |                     |   |
|----------------------------|---------------------|---|
| <b>Container Name</b>      | <b>Multiplicity</b> | <b>Scope / Dependency</b>                   |
| EthTrcvConfig              | 1..*                | Configuration of the individual transceiver |

### 10.1.3 EthTrcvConfig

|                                 |   |
|---------------------------------|---|
| <b>SWS Item</b>                 | <b>ECUC_EthTrcv_00012 :</b>                 |
| <b>Container Name</b>           | EthTrcvConfig                               |
| <b>Description</b>              | Configuration of the individual transceiver |
| <b>Configuration Parameters</b> |   |

|                                  |  |   |                     |
|----------------------------------|--|---|---------------------|
| <b>SWS Item</b>                  | <b>ECUC_EthTrcv_00021 :</b>  |   |                     |
| <b>Name</b>                      | EthTrcvAutoNegotiationEnabled  |   |                     |
| <b>Parent Container</b>          | EthTrcvConfig  |   |                     |
| <b>Description</b>               | Specifies if Auto-Negotiation is enabled (TRUE) or disabled (FALSE) for determination of the Ethernet transceiver speed. |   |                     |
| <b>Multiplicity</b>              | 1  |   |                     |
| <b>Type</b>                      | EcucBooleanParamDef  |   |                     |
| <b>Default value</b>             | --   |   |                     |
| <b>Post-Build Variant Value</b>  | true   |   |                     |
| <b>Value Configuration Class</b> | <b>Pre-compile time</b>  | X | VARIANT-PRE-COMPILE |
|                                  | <b>Link time</b>   | X | VARIANT-LINK-TIME   |
|                                  | <b>Post-build time</b>   | X | VARIANT-POST-BUILD  |
| <b>Scope / Dependency</b>        | scope: local   |   |                     |

|                         |  |
|-------------------------|--|
| <b>SWS Item</b>         | <b>ECUC_EthTrcv_00025 :</b>  |
| <b>Name</b>             | EthTrcvConnNeg   |
| <b>Parent Container</b> | EthTrcvConfig  |
| <b>Description</b>      | Specifies the connection negotiation of the Ethernet transceiver link. |

|                                  |                         |                       |                     |
|----------------------------------|-------------------------|-----------------------|---------------------|
| <b>Multiplicity</b>              | 1                       |                       |                     |
| <b>Type</b>                      | EcucEnumerationParamDef |                       |                     |
| <b>Range</b>                     | TRCV_CONN_NEG_AUTO      | Automatic Negotiation |                     |
|                                  | TRCV_CONN_NEG_MASTER    | Master                |                     |
|                                  | TRCV_CONN_NEG_SLAVE     | Slave                 |                     |
| <b>Post-Build Variant Value</b>  | true                    |                       |                     |
| <b>Value Configuration Class</b> | <b>Pre-compile time</b> | X                     | VARIANT-PRE-COMPILE |
|                                  | <b>Link time</b>        | X                     | VARIANT-LINK-TIME   |
|                                  | <b>Post-build time</b>  | X                     | VARIANT-POST-BUILD  |
| <b>Scope / Dependency</b>        | scope: local            |                       |                     |

|                                  |   |   |                     |
|----------------------------------|---|---|---------------------|
| <b>SWS Item</b>                  | <b>ECUC_EthTrcv_00014 :</b>                                     |   |                     |
| <b>Name</b>                      | EthTrcvCtrlIdx  |   |                     |
| <b>Parent Container</b>          | EthTrcvConfig   |   |                     |
| <b>Description</b>               | Specifies the controller used for MII access to the transceiver |   |                     |
| <b>Multiplicity</b>              | 1   |   |                     |
| <b>Type</b>                      | EcucIntegerParamDef   |   |                     |
| <b>Range</b>                     | 0 .. 255  |   |                     |
| <b>Default value</b>             | --  |   |                     |
| <b>Post-Build Variant Value</b>  | true  |   |                     |
| <b>Value Configuration Class</b> | <b>Pre-compile time</b>   | X | VARIANT-PRE-COMPILE |
|                                  | <b>Link time</b>  | X | VARIANT-LINK-TIME   |
|                                  | <b>Post-build time</b>  | X | VARIANT-POST-BUILD  |
| <b>Scope / Dependency</b>        | scope: local  |   |                     |

|                                  |   |              |                     |
|----------------------------------|---|--------------|---------------------|
| <b>SWS Item</b>                  | <b>ECUC_EthTrcv_00023 :</b>   |              |                     |
| <b>Name</b>                      | EthTrcvDuplexMode   |              |                     |
| <b>Parent Container</b>          | EthTrcvConfig   |              |                     |
| <b>Description</b>               | Specifies the duplex mode of the Ethernet transceiver link if Auto-Negotiation is disabled. This parameter is ignored if Auto-Negotiation is enabled. |              |                     |
| <b>Multiplicity</b>              | 1   |              |                     |
| <b>Type</b>                      | EcucEnumerationParamDef   |              |                     |
| <b>Range</b>                     | ETHTRCV_DUPLEX_MODE_FULL  | Full duplex. |                     |
|                                  | ETHTRCV_DUPLEX_MODE_HALF  | Half duplex. |                     |
| <b>Post-Build Variant Value</b>  | true  |              |                     |
| <b>Value Configuration Class</b> | <b>Pre-compile time</b>   | X            | VARIANT-PRE-COMPILE |
|                                  | <b>Link time</b>  | X            | VARIANT-LINK-TIME   |
|                                  | <b>Post-build time</b>  | X            | VARIANT-POST-BUILD  |
| <b>Scope / Dependency</b>        | scope: local<br>dependency: EthTrcvAutoNegotiationEnabled   |              |                     |

|                                  |  |    |              |
|----------------------------------|--|----|--------------|
| <b>SWS Item</b>                  | <b>ECUC_EthTrcv_00013 :</b>                                      |    |              |
| <b>Name</b>                      | EthTrcvIdx   |    |              |
| <b>Parent Container</b>          | EthTrcvConfig  |    |              |
| <b>Description</b>               | Specifies the instance ID of the configured transceiver.         |    |              |
| <b>Multiplicity</b>              | 1  |    |              |
| <b>Type</b>                      | EcucIntegerParamDef (Symbolic Name generated for this parameter) |    |              |
| <b>Range</b>                     | 0 .. 255   |    |              |
| <b>Default value</b>             | --   |    |              |
| <b>Post-Build Variant Value</b>  | false  |    |              |
| <b>Value Configuration Class</b> | <b>Pre-compile time</b>  | X  | All Variants |
|                                  | <b>Link time</b>   | -- |              |
|                                  | <b>Post-build time</b>   | -- |              |

|                           |            |
|---------------------------|------------|
| <b>Scope / Dependency</b> | scope: ECU |
|---------------------------|------------|

|   |   |   |
|---|---|---|
| <b>SWS Item</b>                         | <b>ECUC_EthTrcv_00024 :</b>   |   |
| <b>Name</b>                             | EthTrcvPhysLayerType  |   |
| <b>Parent Container</b>                 | EthTrcvConfig   |   |
| <b>Description</b>                      | Specifies the physical layer type of the Ethernet transceiver link. |   |
| <b>Multiplicity</b>                     | 0..1  |   |
| <b>Type</b>                             | EcucEnumerationParamDef   |   |
| <b>Range</b>                            | TRCV_PHYS_LAYER_TYPE_1000BASE_T                                     | physical layer interface 1000BASE-T (1Gbit/s, 4 pairs). Used for consumer electronic.   |
|   | TRCV_PHYS_LAYER_TYPE_1000BASE_T1                                    | physical layer interface 1000BASE-T1 (1Gbit/s, 1 pair). Used for automotive.            |
|   | TRCV_PHYS_LAYER_TYPE_100BASE_T1                                     | physical layer interface 100BASE-T1 (100Mbit/s, 1 pair). Used for automotive.           |
|   | TRCV_PHYS_LAYER_TYPE_100BASE_TX                                     | physical layer interface 100BASE-TX (100Mbit/s, 2 pairs). Used for consumer electronic. |
| <b>Post-Build Variant Multiplicity</b>  | true  |   |
| <b>Post-Build Variant Value</b>         | true  |   |
| <b>Multiplicity Configuration Class</b> | <b>Pre-compile time</b>   | X VARIANT-PRE-COMPILE   |
|   | <b>Link time</b>  | X VARIANT-LINK-TIME   |
|   | <b>Post-build time</b>  | X VARIANT-POST-BUILD  |
| <b>Value Configuration Class</b>        | <b>Pre-compile time</b>   | X VARIANT-PRE-COMPILE   |
|   | <b>Link time</b>  | X VARIANT-LINK-TIME   |
|   | <b>Post-build time</b>  | X VARIANT-POST-BUILD  |
| <b>Scope / Dependency</b>               | scope: local  |   |

|   |   |   |
|---|---|---|
| <b>SWS Item</b>                         | <b>ECUC_EthTrcv_00044 :</b>             |   |
| <b>Name</b>                             | EthTrcvPortMacLayerSpeed                |   |
| <b>Parent Container</b>                 | EthTrcvConfig                           |   |
| <b>Description</b>                      | Defines the baud rate of the MAC layer. |   |
| <b>Multiplicity</b>                     | 0..1                                    |   |
| <b>Type</b>                             | EcucEnumerationParamDef                 |   |
| <b>Range</b>                            | ETH_MAC_LAYER_SPEED_100M                | --                                      |
|   | ETH_MAC_LAYER_SPEED_10G                 | --                                      |
|   | ETH_MAC_LAYER_SPEED_10M                 | --                                      |
|   | ETH_MAC_LAYER_SPEED_1G                  | --                                      |
| <b>Post-Build Variant Multiplicity</b>  | true                                    |   |
| <b>Post-Build Variant Value</b>         | true                                    |   |
| <b>Multiplicity Configuration Class</b> | <b>Pre-compile time</b>                 | X VARIANT-PRE-COMPILE                   |
|   | <b>Link time</b>                        | X VARIANT-LINK-TIME, VARIANT-POST-BUILD |
|   | <b>Post-build time</b>                  | --                                      |
| <b>Value Configuration Class</b>        | <b>Pre-compile time</b>                 | X VARIANT-PRE-COMPILE                   |
|   | <b>Link time</b>                        | X VARIANT-LINK-TIME, VARIANT-POST-BUILD |



|                           |                        |    |  |
|---------------------------|------------------------|----|--|
|                           | <b>Post-build time</b> | -- |  |
| <b>Scope / Dependency</b> | scope: ECU             |    |  |

|   |  |    |                                       |
|---|--|----|---------------------------------------|
| <b>SWS Item</b>                         | <b>ECUC_EthTrcv_00043 :</b>                    |    |                                       |
| <b>Name</b>                             | EthTrcvPortMacLayerSubType                     |    |                                       |
| <b>Parent Container</b>                 | EthTrcvConfig                                  |    |                                       |
| <b>Description</b>                      | Defines the MAC layer subtype of a switch port |    |                                       |
| <b>Multiplicity</b>                     | 0..1   |    |                                       |
| <b>Type</b>                             | EcucEnumerationParamDef                        |    |                                       |
| <b>Range</b>                            | REDUCED  | -- |                                       |
|   | REVERSED                                       | -- |                                       |
|   | SERIAL   | -- |                                       |
|   | STANDARD                                       | -- |                                       |
|   | UNIVERSAL_SERIAL                               | -- |                                       |
| <b>Post-Build Variant Multiplicity</b>  | true   |    |                                       |
| <b>Post-Build Variant Value</b>         | true   |    |                                       |
| <b>Multiplicity Configuration Class</b> | <b>Pre-compile time</b>                        | X  | VARIANT-PRE-COMPILE                   |
|   | <b>Link time</b>                               | X  | VARIANT-LINK-TIME, VARIANT-POST-BUILD |
|   | <b>Post-build time</b>                         | -- |                                       |
| <b>Value Configuration Class</b>        | <b>Pre-compile time</b>                        | X  | VARIANT-PRE-COMPILE                   |
|   | <b>Link time</b>                               | X  | VARIANT-LINK-TIME, VARIANT-POST-BUILD |
|   | <b>Post-build time</b>                         | -- |                                       |
| <b>Scope / Dependency</b>               | scope: ECU                                     |    |                                       |

|   |   |   |  |
|---|---|---|--|
| <b>SWS Item</b>                         | <b>ECUC_EthTrcv_00035 :</b>                             |   |  |
| <b>Name</b>                             | EthTrcvPortMacLayerType                                 |   |  |
| <b>Parent Container</b>                 | EthTrcvConfig   |   |  |
| <b>Description</b>                      | Defines the MAC layer type of the ethernet transceiver. |   |  |
| <b>Multiplicity</b>                     | 0..1  |   |  |
| <b>Type</b>                             | EcucEnumerationParamDef                                 |   |  |
| <b>Range</b>                            | TRCV_MAC_LAYER_TYPE_XGMII                               |   | MAC layer interface (data) bandwidth class 1Gbit/s (e.g. GMII, RGMII, SGMII, RvGMII, USGMII) |
|   | TRCV_MAC_LAYER_TYPE_XMII                                |   | MAC layer interface (data) bandwidth class 100Mbit/s (e.g. RMII, RvMII, SMII, RvMII)         |
|   | TRCV_MAC_LAYER_TYPE_XXGMII                              |   | MAC layer interface (data) bandwidth class 10Gbit/s  |
| <b>Post-Build Variant Multiplicity</b>  | true  |   |  |
| <b>Post-Build Variant Value</b>         | true  |   |  |
| <b>Multiplicity Configuration Class</b> | <b>Pre-compile time</b>                                 | X | VARIANT-PRE-COMPILE  |
|   | <b>Link time</b>  | X | VARIANT-LINK-TIME  |
|   | <b>Post-build time</b>                                  | X | VARIANT-POST-BUILD   |
| <b>Value Configuration Class</b>        | <b>Pre-compile time</b>                                 | X | VARIANT-PRE-COMPILE  |
|   | <b>Link time</b>  | X | VARIANT-LINK-TIME  |
|   | <b>Post-build time</b>                                  | X | VARIANT-POST-BUILD   |
| <b>Scope / Dependency</b>               | scope: ECU  |   |  |

|                                  |  |   |                     |
|----------------------------------|--|---|---------------------|
| <b>SWS Item</b>                  | <b>ECUC_EthTrcv_00022 :</b>  |   |                     |
| <b>Name</b>                      | EthTrcvSpeed   |   |                     |
| <b>Parent Container</b>          | EthTrcvConfig  |   |                     |
| <b>Description</b>               | Specifies the speed of the Ethernet transceiver link in [MBit/s]. If AutoNegotiation is enabled this is the maximum speed advertised for Auto-Negotiation. |   |                     |
| <b>Multiplicity</b>              | 1  |   |                     |
| <b>Type</b>                      | EcucEnumerationParamDef  |   |                     |
| <b>Range</b>                     | TRCV_SPEED_10  |   | 10 MBit/s           |
|                                  | TRCV_SPEED_100   |   | 100 MBit/s          |
|                                  | TRCV_SPEED_1000  |   | 1000 MBit/s         |
| <b>Post-Build Variant Value</b>  | true   |   |                     |
| <b>Value Configuration Class</b> | <b>Pre-compile time</b>  | X | VARIANT-PRE-COMPILE |
|                                  | <b>Link time</b>   | X | VARIANT-LINK-TIME   |
|                                  | <b>Post-build time</b>   | X | VARIANT-POST-BUILD  |
| <b>Scope / Dependency</b>        | scope: local<br>dependency: EthTrcvAutoNegotiationEnabled  |   |                     |

|   |   |    |              |
|---|---|----|--------------|
| <b>SWS Item</b>                         | <b>ECUC_EthTrcv_00028 :</b>   |    |              |
| <b>Name</b>                             | EthTrcvWakeUpCallout  |    |              |
| <b>Parent Container</b>                 | EthTrcvConfig   |    |              |
| <b>Description</b>                      | Configuration of the call-out name.   |    |              |
| <b>Multiplicity</b>                     | 0..1  |    |              |
| <b>Type</b>                             | EcucFunctionNameDef   |    |              |
| <b>Default value</b>                    | --  |    |              |
| <b>maxLength</b>                        | --  |    |              |
| <b>minLength</b>                        | --  |    |              |
| <b>regularExpression</b>                | --  |    |              |
| <b>Post-Build Variant Multiplicity</b>  | false   |    |              |
| <b>Post-Build Variant Value</b>         | false   |    |              |
| <b>Multiplicity Configuration Class</b> | <b>Pre-compile time</b>   | X  | All Variants |
|   | <b>Link time</b>  | -- |              |
|   | <b>Post-build time</b>  | -- |              |
| <b>Value Configuration Class</b>        | <b>Pre-compile time</b>   | X  | All Variants |
|   | <b>Link time</b>  | -- |              |
|   | <b>Post-build time</b>  | -- |              |
| <b>Scope / Dependency</b>               | dependency: Only valid if EthTrcvWakeUpSupport is not ETHTRCV_WAKEUP_NOT_SUPPORTED. |    |              |

|   |   |    |              |
|---|---|----|--------------|
| <b>SWS Item</b>                         | <b>ECUC_EthTrcv_00026 :</b>   |    |              |
| <b>Name</b>                             | EthTrcvIcuChannelRef  |    |              |
| <b>Parent Container</b>                 | EthTrcvConfig   |    |              |
| <b>Description</b>                      | Reference to the IcuChannel to enable/disable the interrupts for wakeups. |    |              |
| <b>Multiplicity</b>                     | 0..1  |    |              |
| <b>Type</b>                             | Symbolic name reference to [ IcuChannel ]                                 |    |              |
| <b>Post-Build Variant Multiplicity</b>  | false   |    |              |
| <b>Post-Build Variant Value</b>         | false   |    |              |
| <b>Multiplicity Configuration Class</b> | <b>Pre-compile time</b>   | X  | All Variants |
|   | <b>Link time</b>  | -- |              |
|   | <b>Post-build time</b>  | -- |              |
| <b>Value Configuration Class</b>        | <b>Pre-compile time</b>   | X  | All Variants |
|   | <b>Link time</b>  | -- |              |
|   | <b>Post-build time</b>  | -- |              |
| <b>Scope / Dependency</b>               | scope: local  |    |              |

| <b>Included Containers</b>   |                     |  |
|------------------------------|---------------------|--|
| <b>Container Name</b>        | <b>Multiplicity</b> | <b>Scope / Dependency</b>  |
| EthTrcvDemEventParameterRefs | 0..1                | Container for the references to DemEventParameter elements which shall be invoked using the API Dem_SetEventStatus in case the corresponding error occurs. The EventId is taken from the referenced DemEventParameter's DemEventId symbolic value. The standardized errors are provided in this container and can be extended by vendor-specific error references. |
| EthTrcvMgmtInterface         | 0..1                | The choice container allow to configure either the EthTrcv is accessed by a MII interface or Switch interface.   |
| EthTrcvWakeupMap             | 0..7                | Container for the mapping of wake up reasons to wake up sources. At least one container is needed if EthTrcvWakeUpSupport is not ETHTRCV_WAKEUP_NOT_SUPPORTED.   |

### 10.1.4 EthTrcvDemEventParameterRefs

|                                 |  |
|---------------------------------|--|
| <b>SWS Item</b>                 | <b>ECUC_EthTrcv_00017 :</b>  |
| <b>Container Name</b>           | EthTrcvDemEventParameterRefs   |
| <b>Description</b>              | Container for the references to DemEventParameter elements which shall be invoked using the API Dem_SetEventStatus in case the corresponding error occurs. The EventId is taken from the referenced DemEventParameter's DemEventId symbolic value. The standardized errors are provided in this container and can be extended by vendor-specific error references. |
| <b>Configuration Parameters</b> |  |

|   |   |   |                     |
|---|---|---|---------------------|
| <b>SWS Item</b>                         | <b>ECUC_EthTrcv_00018 :</b>   |   |                     |
| <b>Name</b>                             | ETHTRCV_E_ACCESS  |   |                     |
| <b>Parent Container</b>                 | EthTrcvDemEventParameterRefs  |   |                     |
| <b>Description</b>                      | Reference to the DemEventParameter which shall be issued when the error "Transceiver access failed" has occurred. |   |                     |
| <b>Multiplicity</b>                     | 0..1  |   |                     |
| <b>Type</b>                             | Symbolic name reference to [ DemEventParameter ]  |   |                     |
| <b>Post-Build Variant Multiplicity</b>  | true  |   |                     |
| <b>Post-Build Variant Value</b>         | true  |   |                     |
| <b>Multiplicity Configuration Class</b> | <b>Pre-compile time</b>   | X | VARIANT-PRE-COMPILE |
|   | <b>Link time</b>  | X | VARIANT-LINK-TIME   |
|   | <b>Post-build time</b>  | X | VARIANT-POST-BUILD  |
| <b>Value Configuration Class</b>        | <b>Pre-compile time</b>   | X | VARIANT-PRE-COMPILE |
|   | <b>Link time</b>  | X | VARIANT-LINK-TIME   |
|   | <b>Post-build time</b>  | X | VARIANT-POST-BUILD  |
| <b>Scope / Dependency</b>               | scope: local  |   |                     |

**No Included Containers**

### 10.1.5 EthTrcvMgmtInterface

|                              |   |
|------------------------------|---|
| <b>SWS Item</b>              | <b>ECUC_EthTrcv_00036 :</b>   |
| <b>Choice container Name</b> | EthTrcvMgmtInterface  |
| <b>Description</b>           | The choice container allow to configure either the EthTrcv is accessed by a |

|   |                                    |    |              |
|---|------------------------------------|----|--------------|
|   | MII interface or Switch interface. |    |              |
| <b>Post-Build Variant Multiplicity</b>  | false                              |    |              |
| <b>Multiplicity Configuration Class</b> | <b>Pre-compile time</b>            | X  | All Variants |
|   | <b>Link time</b>                   | -- |              |
|   | <b>Post-build time</b>             | -- |              |

| Container Choices      |              |   |
|------------------------|--------------|---|
| Container Name         | Multiplicity | Scope / Dependency  |
| EthTrcvMiiInterface    | 0..1         | This container includes the MII interface configuration between an Ethernet Controller and the Ethernet Transceiver. If this container is configured the EthTrcv shall call Eth_WriteMii / Eth_ReadMii API to access the hardware ethernet tranceiver.                        |
| EthTrcvSwitchInterface | 0..1         | This container includes the Switch interface configuration between an Ethernet Switch and an Ethernet Transceiver. If this container is configured the EthTrcv shall call EthSwT_WriteTrcvRegister / EthSwT_WriteTrcvRegister API to access the hardware ethernet tranceiver. |

### 10.1.6 EthTrcvMiiInterface

|   |  |    |              |
|---|--|----|--------------|
| <b>SWS Item</b>                         | <b>ECUC_EthTrcv_00037 :</b>  |    |              |
| <b>Container Name</b>                   | EthTrcvMiiInterface  |    |              |
| <b>Description</b>                      | This container includes the MII interface configuration between an Ethernet Controller and the Ethernet Transceiver. If this container is configured the EthTrcv shall call Eth_WriteMii / Eth_ReadMii API to access the hardware ethernet tranceiver. |    |              |
| <b>Post-Build Variant Multiplicity</b>  | false  |    |              |
| <b>Multiplicity Configuration Class</b> | <b>Pre-compile time</b>  | X  | All Variants |
|   | <b>Link time</b>   | -- |              |
|   | <b>Post-build time</b>   | -- |              |
| <b>Configuration Parameters</b>         |  |    |              |

|                                  |  |    |              |
|----------------------------------|--|----|--------------|
| <b>SWS Item</b>                  | <b>ECUC_EthTrcv_00038 :</b>  |    |              |
| <b>Name</b>                      | EthTrcvMiiIdx  |    |              |
| <b>Parent Container</b>          | EthTrcvMiiInterface  |    |              |
| <b>Description</b>               | Specifies the transceiver index used for MII access to the tranceiver. |    |              |
| <b>Multiplicity</b>              | 1  |    |              |
| <b>Type</b>                      | EcucIntegerParamDef  |    |              |
| <b>Range</b>                     | 0 .. 255   |    |              |
| <b>Default value</b>             | --   |    |              |
| <b>Post-Build Variant Value</b>  | false  |    |              |
| <b>Value Configuration Class</b> | <b>Pre-compile time</b>  | X  | All Variants |
|                                  | <b>Link time</b>   | -- |              |
|                                  | <b>Post-build time</b>   | -- |              |
| <b>Scope / Dependency</b>        | scope: local   |    |              |

|                         |   |  |  |
|-------------------------|---|--|--|
| <b>SWS Item</b>         | <b>ECUC_EthTrcv_00039 :</b>   |  |  |
| <b>Name</b>             | EthTrcvMiiSelection   |  |  |
| <b>Parent Container</b> | EthTrcvMiiInterface   |  |  |
| <b>Description</b>      | This parameter specifies the type of transceiver / controller interface. The interface is either MII, Light-MII or RGMII. |  |  |
| <b>Multiplicity</b>     | 1   |  |  |
| <b>Type</b>             | EcucEnumerationParamDef   |  |  |

|                                  |                         |    |              |
|----------------------------------|-------------------------|----|--------------|
| <b>Range</b>                     | LIGHT_MII               | -- |              |
|                                  | MII                     | -- |              |
|                                  | RGMII                   | -- |              |
| <b>Post-Build Variant Value</b>  | false                   |    |              |
| <b>Value Configuration Class</b> | <b>Pre-compile time</b> | X  | All Variants |
|                                  | <b>Link time</b>        | -- |              |
|                                  | <b>Post-build time</b>  | -- |              |
| <b>Scope / Dependency</b>        | scope: local            |    |              |

**No Included Containers**

### 10.1.7 EthTrcvSwitchInterface

|   |  |    |              |
|---|--|----|--------------|
| <b>SWS Item</b>                         | <b>ECUC_EthTrcv_00040 :</b>  |    |              |
| <b>Container Name</b>                   | EthTrcvSwitchInterface   |    |              |
| <b>Description</b>                      | This container includes the Switch interface configuration between an Ethernet Switch and an Ethernet Transceiver. If this container is configured the EthTrcv shall call EthSwt_WriteTrcvRegister / EthSwt_WriteTrcvRegister API to access the hardware ethernet transceiver. |    |              |
| <b>Post-Build Variant Multiplicity</b>  | false  |    |              |
| <b>Multiplicity Configuration Class</b> | <b>Pre-compile time</b>  | X  | All Variants |
|   | <b>Link time</b>   | -- |              |
|   | <b>Post-build time</b>   | -- |              |
| <b>Configuration Parameters</b>         |  |    |              |

|                                  |   |    |              |
|----------------------------------|---|----|--------------|
| <b>SWS Item</b>                  | <b>ECUC_EthTrcv_00042 :</b>               |    |              |
| <b>Name</b>                      | EthTrcvSwitchPortRef                      |    |              |
| <b>Parent Container</b>          | EthTrcvSwitchInterface                    |    |              |
| <b>Description</b>               | Reference to a switch port.               |    |              |
| <b>Multiplicity</b>              | 1   |    |              |
| <b>Type</b>                      | Symbolic name reference to [ EthSwtPort ] |    |              |
| <b>Post-Build Variant Value</b>  | false                                     |    |              |
| <b>Value Configuration Class</b> | <b>Pre-compile time</b>                   | X  | All Variants |
|                                  | <b>Link time</b>                          | -- |              |
|                                  | <b>Post-build time</b>                    | -- |              |
| <b>Scope / Dependency</b>        | scope: local                              |    |              |

|                                  |  |    |              |
|----------------------------------|--|----|--------------|
| <b>SWS Item</b>                  | <b>ECUC_EthTrcv_00041 :</b>                    |    |              |
| <b>Name</b>                      | EthTrcvSwitchRef                               |    |              |
| <b>Parent Container</b>          | EthTrcvSwitchInterface                         |    |              |
| <b>Description</b>               | Reference to a switch configuration container. |    |              |
| <b>Multiplicity</b>              | 1  |    |              |
| <b>Type</b>                      | Symbolic name reference to [ EthSwtConfig ]    |    |              |
| <b>Post-Build Variant Value</b>  | false  |    |              |
| <b>Value Configuration Class</b> | <b>Pre-compile time</b>                        | X  | All Variants |
|                                  | <b>Link time</b>                               | -- |              |
|                                  | <b>Post-build time</b>                         | -- |              |
| <b>Scope / Dependency</b>        | scope: local                                   |    |              |

**No Included Containers**

### 10.1.8 EthTrcvGeneral

|                                 |   |
|---------------------------------|---|
| <b>SWS Item</b>                 | <b>ECUC_EthTrcv_00001 :</b>                                 |
| <b>Container Name</b>           | EthTrcvGeneral  |
| <b>Description</b>              | General configuration of Ethernet Transceiver Driver module |
| <b>Configuration Parameters</b> |   |

|                                  |   |    |              |
|----------------------------------|---|----|--------------|
| <b>SWS Item</b>                  | <b>ECUC_EthTrcv_00003 :</b>   |    |              |
| <b>Name</b>                      | EthTrcvDevErrorDetect   |    |              |
| <b>Parent Container</b>          | EthTrcvGeneral  |    |              |
| <b>Description</b>               | Switches the development error detection and notification on or off. <ul style="list-style-type: none"> <li>• true: detection and notification is enabled.</li> <li>• false: detection and notification is disabled.</li> </ul> |    |              |
| <b>Multiplicity</b>              | 1   |    |              |
| <b>Type</b>                      | EcucBooleanParamDef   |    |              |
| <b>Default value</b>             | false   |    |              |
| <b>Post-Build Variant Value</b>  | false   |    |              |
| <b>Value Configuration Class</b> | <b>Pre-compile time</b>   | X  | All Variants |
|                                  | <b>Link time</b>  | -- |              |
|                                  | <b>Post-build time</b>  | -- |              |
| <b>Scope / Dependency</b>        | scope: local  |    |              |

|                                  |  |    |              |
|----------------------------------|--|----|--------------|
| <b>SWS Item</b>                  | <b>ECUC_EthTrcv_00010 :</b>                |    |              |
| <b>Name</b>                      | EthTrcvGetBaudRateApi                      |    |              |
| <b>Parent Container</b>          | EthTrcvGeneral                             |    |              |
| <b>Description</b>               | Enables / Disables EthTrcv_GetBaudRate API |    |              |
| <b>Multiplicity</b>              | 1  |    |              |
| <b>Type</b>                      | EcucBooleanParamDef                        |    |              |
| <b>Default value</b>             | --   |    |              |
| <b>Post-Build Variant Value</b>  | false                                      |    |              |
| <b>Value Configuration Class</b> | <b>Pre-compile time</b>                    | X  | All Variants |
|                                  | <b>Link time</b>                           | -- |              |
|                                  | <b>Post-build time</b>                     | -- |              |
| <b>Scope / Dependency</b>        | scope: local                               |    |              |

|   |   |    |              |
|---|---|----|--------------|
| <b>SWS Item</b>                         | <b>ECUC_EthTrcv_00049 :</b>                               |    |              |
| <b>Name</b>                             | EthTrcvGetCableDiagnosticsResultApi                       |    |              |
| <b>Parent Container</b>                 | EthTrcvGeneral  |    |              |
| <b>Description</b>                      | Enables / Disables EthTrcv_GetCableDiagnosticsResult API. |    |              |
| <b>Multiplicity</b>                     | 1   |    |              |
| <b>Type</b>                             | EcucBooleanParamDef                                       |    |              |
| <b>Default value</b>                    | --  |    |              |
| <b>Post-Build Variant Multiplicity</b>  | false   |    |              |
| <b>Post-Build Variant Value</b>         | false   |    |              |
| <b>Multiplicity Configuration Class</b> | <b>Pre-compile time</b>                                   | X  | All Variants |
|   | <b>Link time</b>  | -- |              |
|   | <b>Post-build time</b>                                    | -- |              |
| <b>Value Configuration Class</b>        | <b>Pre-compile time</b>                                   | X  | All Variants |
|   | <b>Link time</b>  | -- |              |
|   | <b>Post-build time</b>                                    | -- |              |

|                           |              |
|---------------------------|--------------|
| <b>Scope / Dependency</b> | scope: local |
|---------------------------|--------------|

|                                  |  |    |              |
|----------------------------------|--|----|--------------|
| <b>SWS Item</b>                  | <b>ECUC_EthTrcv_00011 :</b>                  |    |              |
| <b>Name</b>                      | EthTrcvGetDuplexModeApi                      |    |              |
| <b>Parent Container</b>          | EthTrcvGeneral                               |    |              |
| <b>Description</b>               | Enables / Disables EthTrcv_GetDuplexMode API |    |              |
| <b>Multiplicity</b>              | 1  |    |              |
| <b>Type</b>                      | EcucBooleanParamDef                          |    |              |
| <b>Default value</b>             | --   |    |              |
| <b>Post-Build Variant Value</b>  | false  |    |              |
| <b>Value Configuration Class</b> | <b>Pre-compile time</b>                      | X  | All Variants |
|                                  | <b>Link time</b>                             | -- |              |
|                                  | <b>Post-build time</b>                       | -- |              |
| <b>Scope / Dependency</b>        | scope: local                                 |    |              |

|                                  |   |    |              |
|----------------------------------|---|----|--------------|
| <b>SWS Item</b>                  | <b>ECUC_EthTrcv_00009 :</b>                 |    |              |
| <b>Name</b>                      | EthTrcvGetLinkStateApi                      |    |              |
| <b>Parent Container</b>          | EthTrcvGeneral                              |    |              |
| <b>Description</b>               | Enables / Disables EthTrcv_GetLinkState API |    |              |
| <b>Multiplicity</b>              | 1   |    |              |
| <b>Type</b>                      | EcucBooleanParamDef                         |    |              |
| <b>Default value</b>             | --  |    |              |
| <b>Post-Build Variant Value</b>  | false                                       |    |              |
| <b>Value Configuration Class</b> | <b>Pre-compile time</b>                     | X  | All Variants |
|                                  | <b>Link time</b>                            | -- |              |
|                                  | <b>Post-build time</b>                      | -- |              |
| <b>Scope / Dependency</b>        | scope: local                                |    |              |

|   |   |    |              |
|---|---|----|--------------|
| <b>SWS Item</b>                         | <b>ECUC_EthTrcv_00046 :</b>                       |    |              |
| <b>Name</b>                             | EthTrcvGetPhylIdentifierApi                       |    |              |
| <b>Parent Container</b>                 | EthTrcvGeneral                                    |    |              |
| <b>Description</b>                      | Enables / Disables EthTrcv_GetPhylIdentifier API. |    |              |
| <b>Multiplicity</b>                     | 1   |    |              |
| <b>Type</b>                             | EcucBooleanParamDef                               |    |              |
| <b>Default value</b>                    | --  |    |              |
| <b>Post-Build Variant Multiplicity</b>  | false   |    |              |
| <b>Post-Build Variant Value</b>         | false   |    |              |
| <b>Multiplicity Configuration Class</b> | <b>Pre-compile time</b>                           | X  | All Variants |
|   | <b>Link time</b>                                  | -- |              |
|   | <b>Post-build time</b>                            | -- |              |
| <b>Value Configuration Class</b>        | <b>Pre-compile time</b>                           | X  | All Variants |
|   | <b>Link time</b>                                  | -- |              |
|   | <b>Post-build time</b>                            | -- |              |
| <b>Scope / Dependency</b>               | scope: local                                      |    |              |

|  |   |  |  |
|--|---|--|--|
| <b>SWS Item</b>                        | <b>ECUC_EthTrcv_00045 :</b>                         |  |  |
| <b>Name</b>                            | EthTrcvGetPhySignalQualityApi                       |  |  |
| <b>Parent Container</b>                | EthTrcvGeneral                                      |  |  |
| <b>Description</b>                     | Enables / Disables EthTrcv_GetPhySignalQuality API. |  |  |
| <b>Multiplicity</b>                    | 1   |  |  |
| <b>Type</b>                            | EcucBooleanParamDef                                 |  |  |
| <b>Default value</b>                   | --  |  |  |
| <b>Post-Build Variant Multiplicity</b> | false   |  |  |
| <b>Post-Build Variant Value</b>        | false   |  |  |

|   |                         |    |              |
|---|-------------------------|----|--------------|
| <b>Multiplicity Configuration Class</b> | <b>Pre-compile time</b> | X  | All Variants |
|   | <b>Link time</b>        | -- |              |
|   | <b>Post-build time</b>  | -- |              |
| <b>Value Configuration Class</b>        | <b>Pre-compile time</b> | X  | All Variants |
|   | <b>Link time</b>        | -- |              |
|   | <b>Post-build time</b>  | -- |              |
| <b>Scope / Dependency</b>               | scope: local            |    |              |

|                                  |   |    |              |
|----------------------------------|---|----|--------------|
| <b>SWS Item</b>                  | <b>ECUC_EthTrcv_00007 :</b>                       |    |              |
| <b>Name</b>                      | EthTrcvGetTransceiverModeApi                      |    |              |
| <b>Parent Container</b>          | EthTrcvGeneral                                    |    |              |
| <b>Description</b>               | Enables / Disables EthTrcv_GetTransceiverMode API |    |              |
| <b>Multiplicity</b>              | 1   |    |              |
| <b>Type</b>                      | EcucBooleanParamDef                               |    |              |
| <b>Default value</b>             | --  |    |              |
| <b>Post-Build Variant Value</b>  | false   |    |              |
| <b>Value Configuration Class</b> | <b>Pre-compile time</b>                           | X  | All Variants |
|                                  | <b>Link time</b>                                  | -- |              |
|                                  | <b>Post-build time</b>                            | -- |              |
| <b>Scope / Dependency</b>        | scope: local                                      |    |              |

|   |  |    |              |
|---|--|----|--------------|
| <b>SWS Item</b>                         | <b>ECUC_EthTrcv_00031 :</b>  |    |              |
| <b>Name</b>                             | EthTrcvGetTransceiverWakeupModeApi   |    |              |
| <b>Parent Container</b>                 | EthTrcvGeneral   |    |              |
| <b>Description</b>                      | Enables / Disables EthTrcv_GetTransceiverWakeupMode API  |    |              |
| <b>Multiplicity</b>                     | 0..1   |    |              |
| <b>Type</b>                             | EcucBooleanParamDef  |    |              |
| <b>Default value</b>                    | --   |    |              |
| <b>Post-Build Variant Multiplicity</b>  | false  |    |              |
| <b>Post-Build Variant Value</b>         | false  |    |              |
| <b>Multiplicity Configuration Class</b> | <b>Pre-compile time</b>  | X  | All Variants |
|   | <b>Link time</b>   | -- |              |
|   | <b>Post-build time</b>   | -- |              |
| <b>Value Configuration Class</b>        | <b>Pre-compile time</b>  | X  | All Variants |
|   | <b>Link time</b>   | -- |              |
|   | <b>Post-build time</b>   | -- |              |
| <b>Scope / Dependency</b>               | scope: local<br>dependency: Only valid if EthTrcvWakeUpSupport is not ETHTRCV_WAKEUP_NOT_SUPPORTED |    |              |

|                                  |   |    |              |
|----------------------------------|---|----|--------------|
| <b>SWS Item</b>                  | <b>ECUC_EthTrcv_00020 :</b>   |    |              |
| <b>Name</b>                      | EthTrcvIndex  |    |              |
| <b>Parent Container</b>          | EthTrcvGeneral  |    |              |
| <b>Description</b>               | Specifies the InstanceId of this module instance. If only one instance is present it shall have the Id 0. |    |              |
| <b>Multiplicity</b>              | 1   |    |              |
| <b>Type</b>                      | EcucIntegerParamDef   |    |              |
| <b>Range</b>                     | 0 .. 255  |    |              |
| <b>Default value</b>             | --  |    |              |
| <b>Post-Build Variant Value</b>  | false   |    |              |
| <b>Value Configuration Class</b> | <b>Pre-compile time</b>   | X  | All Variants |
|                                  | <b>Link time</b>  | -- |              |
|                                  | <b>Post-build time</b>  | -- |              |
| <b>Scope / Dependency</b>        | scope: local  |    |              |



|   |  |    |              |
|---|--|----|--------------|
| <b>SWS Item</b>                         | <b>ECUC_EthTrcv_00032 :</b>  |    |              |
| <b>Name</b>                             | EthTrcvMainFunctionPeriod  |    |              |
| <b>Parent Container</b>                 | EthTrcvGeneral   |    |              |
| <b>Description</b>                      | Specifies the period of main function EthTrcv_MainFunction in seconds. |    |              |
| <b>Multiplicity</b>                     | 0..1   |    |              |
| <b>Type</b>                             | EcucFloatParamDef  |    |              |
| <b>Range</b>                            | 0 .. INF[  |    |              |
| <b>Default value</b>                    | --   |    |              |
| <b>Post-Build Variant Multiplicity</b>  | false  |    |              |
| <b>Post-Build Variant Value</b>         | false  |    |              |
| <b>Multiplicity Configuration Class</b> | <b>Pre-compile time</b>  | X  | All Variants |
|   | <b>Link time</b>   | -- |              |
|   | <b>Post-build time</b>   | -- |              |
| <b>Value Configuration Class</b>        | <b>Pre-compile time</b>  | X  | All Variants |
|   | <b>Link time</b>   | -- |              |
|   | <b>Post-build time</b>   | -- |              |
| <b>Scope / Dependency</b>               | scope: local   |    |              |

|                                  |                             |    |              |
|----------------------------------|-----------------------------|----|--------------|
| <b>SWS Item</b>                  | <b>ECUC_EthTrcv_00002 :</b> |    |              |
| <b>Name</b>                      | EthTrcvMaxTrcvsSupported    |    |              |
| <b>Parent Container</b>          | EthTrcvGeneral              |    |              |
| <b>Description</b>               | --                          |    |              |
| <b>Multiplicity</b>              | 1                           |    |              |
| <b>Type</b>                      | EcucIntegerParamDef         |    |              |
| <b>Range</b>                     | 0 .. 255                    |    |              |
| <b>Default value</b>             | 1                           |    |              |
| <b>Post-Build Variant Value</b>  | false                       |    |              |
| <b>Value Configuration Class</b> | <b>Pre-compile time</b>     | X  | All Variants |
|                                  | <b>Link time</b>            | -- |              |
|                                  | <b>Post-build time</b>      | -- |              |
| <b>Scope / Dependency</b>        | scope: local                |    |              |

|   |  |    |              |
|---|--|----|--------------|
| <b>SWS Item</b>                         | <b>ECUC_EthTrcv_00047 :</b>                    |    |              |
| <b>Name</b>                             | EthTrcvSetPhyTestModeApi                       |    |              |
| <b>Parent Container</b>                 | EthTrcvGeneral                                 |    |              |
| <b>Description</b>                      | Enables / Disables EthTrcv_SetPhyTestMode API. |    |              |
| <b>Multiplicity</b>                     | 1  |    |              |
| <b>Type</b>                             | EcucBooleanParamDef                            |    |              |
| <b>Default value</b>                    | --   |    |              |
| <b>Post-Build Variant Multiplicity</b>  | false  |    |              |
| <b>Post-Build Variant Value</b>         | false  |    |              |
| <b>Multiplicity Configuration Class</b> | <b>Pre-compile time</b>                        | X  | All Variants |
|   | <b>Link time</b>                               | -- |              |
|   | <b>Post-build time</b>                         | -- |              |
| <b>Value Configuration Class</b>        | <b>Pre-compile time</b>                        | X  | All Variants |
|   | <b>Link time</b>                               | -- |              |
|   | <b>Post-build time</b>                         | -- |              |
| <b>Scope / Dependency</b>               | scope: local                                   |    |              |

|                         |  |  |  |
|-------------------------|--|--|--|
| <b>SWS Item</b>         | <b>ECUC_EthTrcv_00048 :</b>                  |  |  |
| <b>Name</b>             | EthTrcvSetPhyTxModeApi                       |  |  |
| <b>Parent Container</b> | EthTrcvGeneral                               |  |  |
| <b>Description</b>      | Enables / Disables EthTrcv_SetPhyTxMode API. |  |  |
| <b>Multiplicity</b>     | 1  |  |  |

|   |                         |    |              |
|---|-------------------------|----|--------------|
| <b>Type</b>                             | EcucBooleanParamDef     |    |              |
| <b>Default value</b>                    | --                      |    |              |
| <b>Post-Build Variant Multiplicity</b>  | false                   |    |              |
| <b>Post-Build Variant Value</b>         | false                   |    |              |
| <b>Multiplicity Configuration Class</b> | <b>Pre-compile time</b> | X  | All Variants |
|   | <b>Link time</b>        | -- |              |
|   | <b>Post-build time</b>  | -- |              |
| <b>Value Configuration Class</b>        | <b>Pre-compile time</b> | X  | All Variants |
|   | <b>Link time</b>        | -- |              |
|   | <b>Post-build time</b>  | -- |              |
| <b>Scope / Dependency</b>               | scope: local            |    |              |

|                                  |   |    |              |
|----------------------------------|---|----|--------------|
| <b>SWS Item</b>                  | <b>ECUC_EthTrcv_00006 :</b>                       |    |              |
| <b>Name</b>                      | EthTrcvSetTransceiverModeApi                      |    |              |
| <b>Parent Container</b>          | EthTrcvGeneral                                    |    |              |
| <b>Description</b>               | Enables / Disables EthTrcv_SetTransceiverMode API |    |              |
| <b>Multiplicity</b>              | 1   |    |              |
| <b>Type</b>                      | EcucBooleanParamDef                               |    |              |
| <b>Default value</b>             | --  |    |              |
| <b>Post-Build Variant Value</b>  | false   |    |              |
| <b>Value Configuration Class</b> | <b>Pre-compile time</b>                           | X  | All Variants |
|                                  | <b>Link time</b>                                  | -- |              |
|                                  | <b>Post-build time</b>                            | -- |              |
| <b>Scope / Dependency</b>        | scope: local                                      |    |              |

|                                  |   |    |              |
|----------------------------------|---|----|--------------|
| <b>SWS Item</b>                  | <b>ECUC_EthTrcv_00008 :</b>                         |    |              |
| <b>Name</b>                      | EthTrcvStartAutoNegotiationApi                      |    |              |
| <b>Parent Container</b>          | EthTrcvGeneral                                      |    |              |
| <b>Description</b>               | Enables / Disables EthTrcv_StartAutoNegotiation API |    |              |
| <b>Multiplicity</b>              | 1   |    |              |
| <b>Type</b>                      | EcucBooleanParamDef                                 |    |              |
| <b>Default value</b>             | --  |    |              |
| <b>Post-Build Variant Value</b>  | false   |    |              |
| <b>Value Configuration Class</b> | <b>Pre-compile time</b>                             | X  | All Variants |
|                                  | <b>Link time</b>                                    | -- |              |
|                                  | <b>Post-build time</b>                              | -- |              |
| <b>Scope / Dependency</b>        | scope: local  |    |              |

|                                  |                                     |    |              |
|----------------------------------|-------------------------------------|----|--------------|
| <b>SWS Item</b>                  | <b>ECUC_EthTrcv_00004 :</b>         |    |              |
| <b>Name</b>                      | EthTrcvVersionInfoApi               |    |              |
| <b>Parent Container</b>          | EthTrcvGeneral                      |    |              |
| <b>Description</b>               | Enables / Disables version info API |    |              |
| <b>Multiplicity</b>              | 1                                   |    |              |
| <b>Type</b>                      | EcucBooleanParamDef                 |    |              |
| <b>Default value</b>             | false                               |    |              |
| <b>Post-Build Variant Value</b>  | false                               |    |              |
| <b>Value Configuration Class</b> | <b>Pre-compile time</b>             | X  | All Variants |
|                                  | <b>Link time</b>                    | -- |              |
|                                  | <b>Post-build time</b>              | -- |              |
| <b>Scope / Dependency</b>        | scope: local                        |    |              |

|                         |                             |  |  |
|-------------------------|-----------------------------|--|--|
| <b>SWS Item</b>         | <b>ECUC_EthTrcv_00005 :</b> |  |  |
| <b>Name</b>             | EthTrcvVersionInfoApiMacro  |  |  |
| <b>Parent Container</b> | EthTrcvGeneral              |  |  |

|                                  |  |    |              |
|----------------------------------|--|----|--------------|
| <b>Description</b>               | Enables / Disables version info API macro implementation |    |              |
| <b>Multiplicity</b>              | 1  |    |              |
| <b>Type</b>                      | EcucBooleanParamDef                                      |    |              |
| <b>Default value</b>             | false  |    |              |
| <b>Post-Build Variant Value</b>  | false  |    |              |
| <b>Value Configuration Class</b> | <b>Pre-compile time</b>                                  | X  | All Variants |
|                                  | <b>Link time</b>   | -- |              |
|                                  | <b>Post-build time</b>                                   | -- |              |
| <b>Scope / Dependency</b>        | scope: local   |    |              |

|                                  |   |                          |              |
|----------------------------------|---|--------------------------|--------------|
| <b>SWS Item</b>                  | <b>ECUC_EthTrcv_00030 :</b>   |                          |              |
| <b>Name</b>                      | EthTrcvWakeUpSupport  |                          |              |
| <b>Parent Container</b>          | EthTrcvGeneral  |                          |              |
| <b>Description</b>               | Configures wake-up to polling or interrupt or to not used/not supported. In case no wake up is supported by the hardware, the BSWMD pre-configuration shall be set to ETHTRCV_WAKEUP_NOT_SUPPORTED. |                          |              |
| <b>Multiplicity</b>              | 1   |                          |              |
| <b>Type</b>                      | EcucEnumerationParamDef   |                          |              |
| <b>Range</b>                     | ETHTRCV_WAKEUP_BY_INTERRUPT   | Wake up by interrupt     |              |
|                                  | ETHTRCV_WAKEUP_BY_POLLING   | Wake up by polling       |              |
|                                  | ETHTRCV_WAKEUP_NOT_SUPPORTED  | Wake up is not supported |              |
| <b>Post-Build Variant Value</b>  | false   |                          |              |
| <b>Value Configuration Class</b> | <b>Pre-compile time</b>   | X                        | All Variants |
|                                  | <b>Link time</b>  | --                       |              |
|                                  | <b>Post-build time</b>  | --                       |              |
| <b>Scope / Dependency</b>        | scope: local  |                          |              |

**No Included Containers**

## 11 Not applicable requirements

### [SWS\_EthTrcv\_00999]

These requirements are not applicable to this specification (BSW00170).