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Document Change History			
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Table of Contents

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.

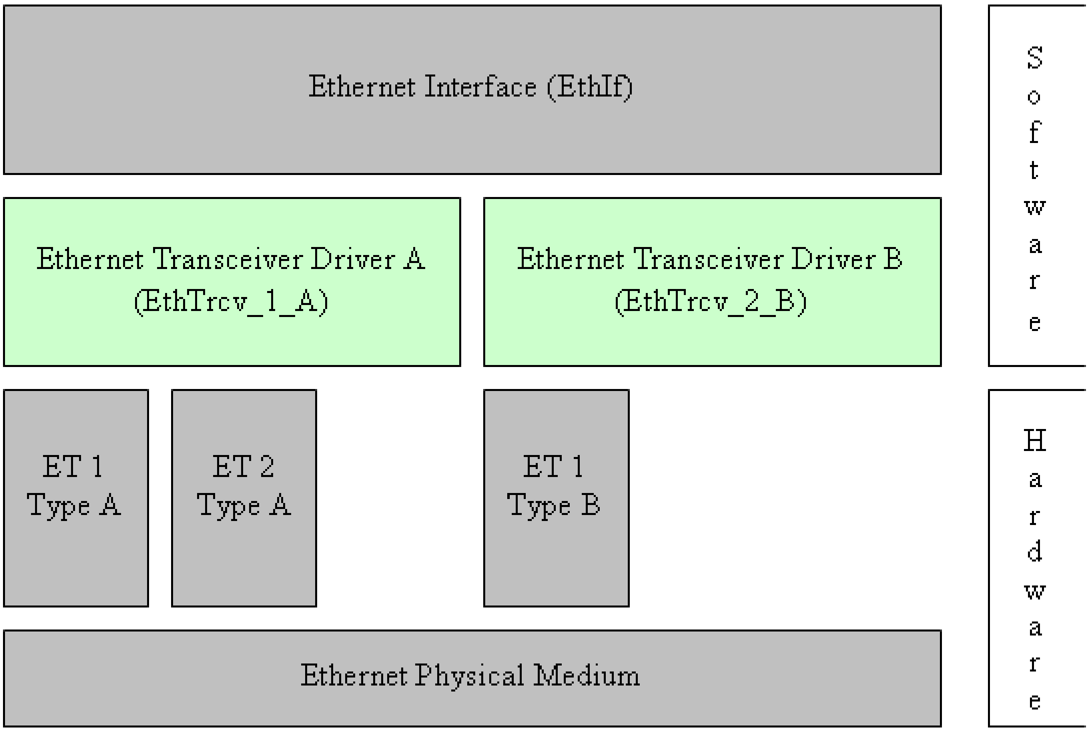
Ethernet Interface (EthIf)
Ethernet Transceiver Driver A (EthTrcv_1_A)
Ethernet Transceiver Driver B (EthTrcv_2_B)
ET 1 Type A
ET 2 Type A
ET 1 Type B
Ethernet Physical Medium
Software
Hardware

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

Abbreviation / Acronym:	***Description:***
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])
PLCA	Physical Layer Collision Avoidance
P2P	Point-to-Point
TO	Transmit Opportunity
OA TC10	Open Alliance TC10 (see [23])

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

[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

[22] IEEE 802.3cg-2019

[23] OPEN ALLIANCE Sleep/Wake-up Specification Version 2.0 (Rel Feb 21, 2017), http://www.opensig.org/Automotive-Ethernet-Specifications/

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.

6 Requirements traceability

Requirement	Description	Satisfied by
SRS_Eth_00039	The Ethernet Transceiver Driver shall provide hardware configuration and intitialization.	SWS_EthTrcv_00029, SWS_EthTrcv_00030, SWS_EthTrcv_00035
SRS_Eth_00040	The Ethernet Transceiver Driver shall provide access to the link state.	SWS_EthTrcv_00062
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, SWS_EthTrcv_00146, SWS_EthTrcv_00185, SWS_EthTrcv_00186, SWS_EthTrcv_91012
SRS_Eth_00108	The Ethernet Transceiver Driver shall be able to wake-up an Ethernet network.	SWS_EthTrcv_00110, SWS_EthTrcv_00114, SWS_EthTrcv_00115, SWS_EthTrcv_00118, SWS_EthTrcv_00183, SWS_EthTrcv_00184, SWS_EthTrcv_00185, SWS_EthTrcv_00191
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
SRS_Eth_00149	The Ethernet Transceiver Driver shall provide 10BASE-T1S support	SWS_EthTrcv_00059, SWS_EthTrcv_00174
SRS_Eth_00151	The Ethernet Transceiver Driver shall support a controlled link shutdown (sleep request)	SWS_EthTrcv_00180, SWS_EthTrcv_00181, SWS_EthTrcv_00182, SWS_EthTrcv_00193
SRS_Eth_00152	The Ethernet Transceiver Driver shall be able to react on sleep request received from the network.	SWS_EthTrcv_00192
SRS_Eth_00154	The Ethernet Transceiver Driver shall provide a possibility to re-trigger	SWS_EthTrcv_00042, SWS_EthTrcv_00184, SWS_EthTrcv_00196

	a wake-up request.	
SRS_Eth_00155	The Ethernet Transceiver Driver shall provide a possibility to re-trigger a sleep request.	SWS_EthTrcv_00194, SWS_EthTrcv_00195
SRS_ModeMgm_09267	-	SWS_EthTrcv_00192

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.

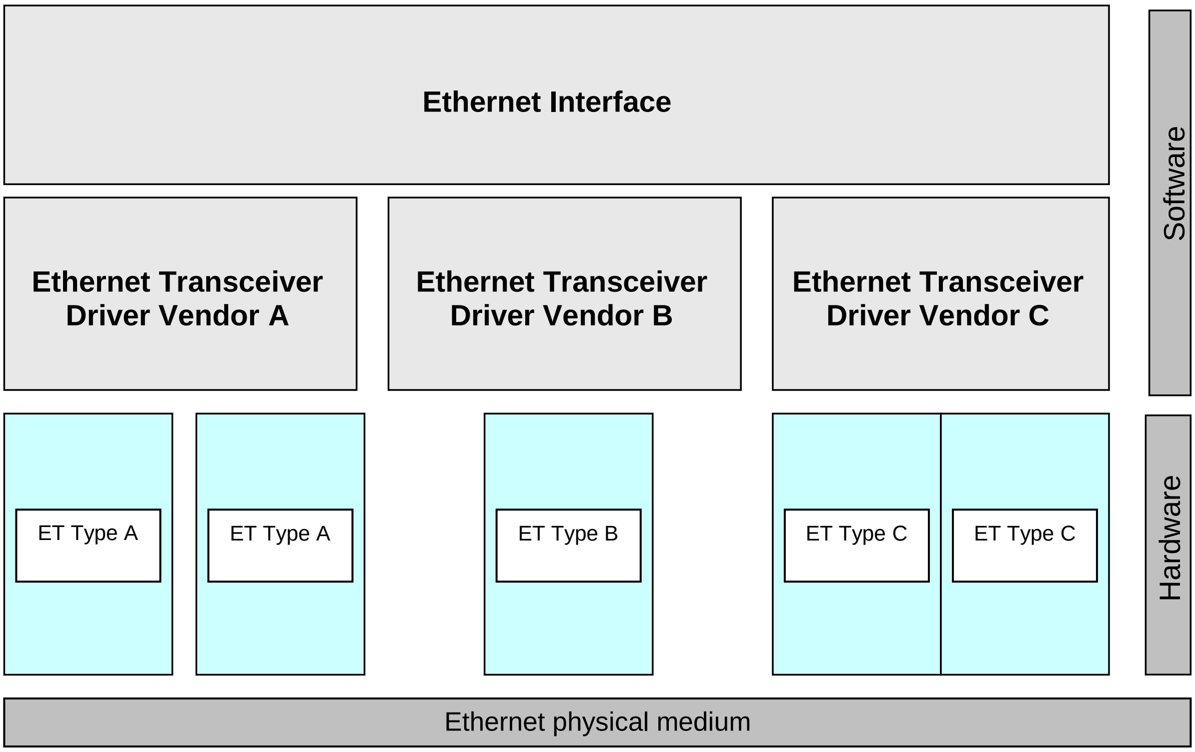
Ethernet Interface
Software
Ethernet Transceiver Driver Vendor A
Ethernet Transceiver Driver Vendor B
Ethernet Transceiver Driver Vendor C
ET Type A
ET Type A
ET Type B
ET Type C
ET Type C
Hardware
Ethernet physical medium

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.

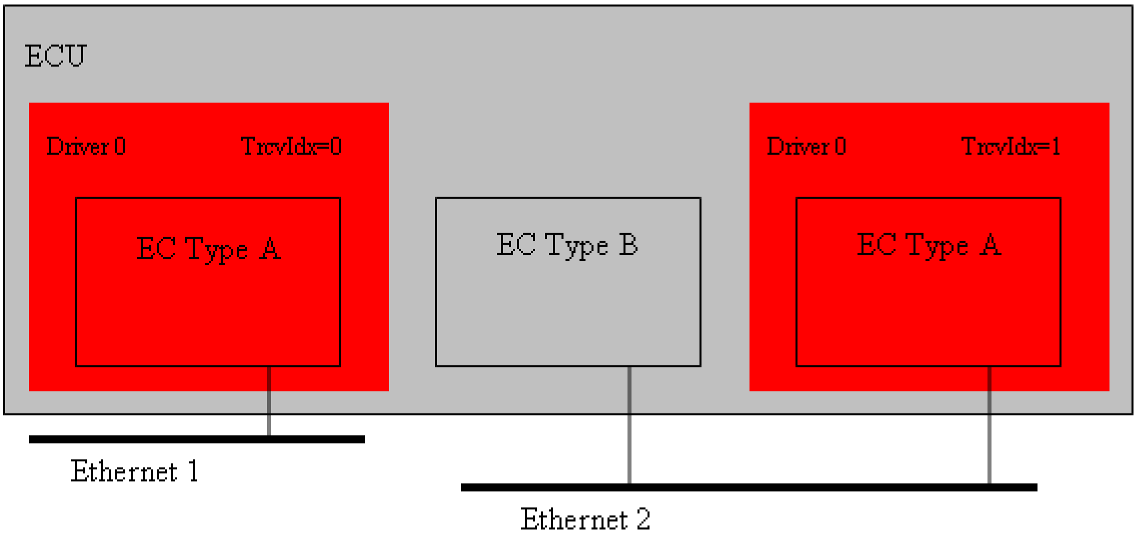

Figure 7.2: Ethernet Transceiver Driver indexing scheme

[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]{DRAFT} ⌈
The Ethernet Transceiver driver shall support wake up detection depending on the configuration parameter EthTrcvWakeUpSupport either not at all (ETHTRCV_WAKEUP_NOT_SUPPORTED) or by interrupt (ETHTRCV_WAKEUP_BY_INTERRUPT) or by asynchronous check (ETHTRCV_WAKEUP_BY_ASYNCHRONOUS_CHECK) or by polling (ETHTRCV_WAKEUP_BY_POLLING). ⌋(SRS_Eth_00108)

Note: If the Ethernet Transceiver driver detects a wakeup it will map the wake-up reason provided by the Ethernet hardware (PHY) to wake-up events defined by EcuM. The Ethernet Transceiver driver will support the following scenarios:
- Sleeping ECU and sleeping network -> wake up detection via EthTrcv_Init (called during Power On)
- Awake ECU and sleeping network -> wake up detection via EthTrcv_MainFunction or wake up interrupt handler (checked by EcuM within CheckWakeup)

[SWS_EthTrcv_00111]{DRAFT} ⌈
If the EthTrcv is requested with ETH_MODE_DOWN (e.g. low power mode), the Ethernet Transceiver driver shall enable the corresponding ICU channel (see EthTrcvIcuChannelRef) by calling Icu_EnableNotification if configured. ⌋()

[SWS_EthTrcv_00112]{DRAFT} ⌈
If the EthTrcv is requested with ETH_MODE_ACTIVE (e.g. normal mode), the Ethernet Transceiver driver shall disable the corresponding ICU channel (see EthTrcvIcuChannelRef) by calling Icu_DisableNotification if configured. ⌋()

[SWS_EthTrcv_00146] ⌈
The wake up interrupt handler (if present) shall clear the interrupt and identify the wake up reason and store it. ⌋(SRS_Eth_00107)

7.1.4.1 Wake-up and Sleep on dataline

AUTOSAR supports OA TC10 compliant Ethernet hardware (PHY) (see [23]). Such PHYs have the capability to transmit wake-up and sleep signals on the dataline. Wake-up on dataline will bring the connected communication partners from a low-power sleep mode to a normal mode. Sleep on dataline will bring the connected communication partners from a normal mode to a low-power mode in a synchronized manner.
The Ethernet Transceiver driver is requested to trigger a wake-up on the network if the upper layer requests ETH_MODE_ACTIVE_WITH_WAKEUP_REQUEST.
The Ethernet transceiver driver is requested to trigger a sleep on the network if the upper layer requests ETH_MODE_DOWN.
A wake-up on the network could be propagated to neighboring PHYs according to the configuration.

Therefore, the configuration contains particular parameter to configure the behaviour regarding the forwarding of a received wake-up:

- Forward a locally received wake-up from a neighboring PHY to the network (EthTrcvWakeupForwardLocalEnabled);
- Forward a received wake-up from the network to the neighboring PHY. (EthTrcvWakeupForwardRemoteEnabled).

Addtionally timing parameters are available to define the timing behaviour of used Ethernet hardware (PHY):

- Define the time when a local wake-up on the used wake-up detection connection (e.g. I/O pins) is evaluated and detected as valid (EthTrcvWakeupLocalDetectionTime). Please note, local wake-up is triggered by a connected neighboring PHY;
- Define the time duration how long a wake-up is present on the used wake-up detection connection (e.g. I/O pins) for the connected neighboring PHYs (EthTrcvWakeupLocalDurationTime).

Note: If using OA TC10 compliant PHYs, then the ECU needs its own control of the power supply and should not rely on the PHY, since the INH will be switched off per specification (see [23] Figure 1: PHY power mode sequence)

7.1.5 PLCA support

Physical Layer Collision Avoidance (PLCA) media access control specified by IEEE (see [22]) allows several nodes to share the same medium.
This media access control mode is meant to be used in half-duplex and requires to be supported by the HW. This feature supported by specific HW (i.e. 10BASE-T1S) can be deactivated and in that case CSMA/CD is used for multidrop topologies. In this case, autonegociation is configured the same way as the others Ethernet PHY types.

7.1.6 Handling of cable diagnostic

Cable diagnostic measurement is triggered by calling EthTrcv_RunCableDiagnostic. The current state of the cable diagnostic measurement is polled by calling EthTrcv_GetCableDiagnosticsResult. If EthTrcv_GetCableDiagnosticsResult return with other value then ETHTRCV_CABLEDIAG_PENDING, then the cable diagnostic has finished.
It is up to the caller to re-trigger cable diagnostic again, if the measurement failed by returning ETHTRCV_CABLEDIAG_ERROR.

[SWS_EthTrcv_00159] ⌈
If EthTrcv_RunPortCableDiagnostic is called, EthTrcv has to ensure that the Ethernet hardware (PHY) is in a state to run the cable diagnostic by considering at least the following points:

- the corresponding Ethernet transceiver is in state ETH_MODE_ACTIVE
- the corresponding Ethernet transceiver is in state ETHTRCV_LINK_STATE_DOWN

If all pre conditions are fullfilled to run the cable diagnostic measurement, EthTrcv shall trigger the cable diagnostic measurement and set the state internally to ETHTRCV_CABLEDIAG_PENDING of the affected Ethernet transceiver. ⌋()

[SWS_EthTrcv_00160] ⌈
If EthTrcv_GetCableDiagnosticsResult is called, the current state of the cable diagnostic measurement of the affected Ethernet transceiver shall be returned and stored per Ethernet transceiver as internal cable diagnostic state. ⌋()

[SWS_EthTrcv_00161] ⌈
As long as the cable diagnostic measurement is running (internal cable diagnostic state is ETHTRCV_CABLEDIAG_PENDING), a mode request (indicated by EthTrcv_SetTransceiverMode) and link request (indicated by EthTrcv_TransceiverLinkStateRequest), respectively, shall be stored and not executed. ⌋()

[SWS_EthTrcv_00162] ⌈
As soon as the cable diagnostic meassurement has finished (internal cable diagnostic state is different from ETHTRCV_CABLEDIAG_PENDING), EthTrcv shall execute the last mode request and link request, respectively, of the affected Ethernet transceiver. ⌋()

Note: Cable diagnostic measurement is triggered by a CDD that maintain the cable diagnostic result. The CDD should use the dedicated APIs of EthIf to execute the cable diagnostic measurement:

- EthIf_RunCableDiagnostic: For a single Ethernet transceiver which is not referenced by an Ethernet switch port;
- EthIf_RunPortCableDiagnostic: For an Ethernet transceiver which is referenced by an Ethernet switch port.

Thus, the upper layer of the EthTrcv is either EthIf or an Ethernet switch.

7.2 Error classification

Section 7.2 "Error Handling" of the document "General Specification of Basic Software Modules" [19] describes the error handling of the Basic Software in detail. Above all, it constitutes a classification scheme consisting of five error types which may occur in BSW modules.

Based on this foundation, the following section specifies particular errors arranged in the respective subsections below.

7.2.1 Development Errors

[SWS_EthTrcv_00017]⌈

Type of error	*Related error code*	*Error value*
Invalid transceiver index	ETHTRCV_E_INV_TRCV_IDX	0x01
EthTrcv module was not initialized	ETHTRCV_E_UNINIT	0x02

Invalid pointer in parameter list	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] ⌈

Error Name:	ETHTRCV_E_ACCESS	
Short Description:	Ethernet Transceiver Access Failure.	
Long Description:	Monitors the access to the Ethernet Transceiver.	
Detection Criteria:	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 succeds the module shall report the extended production error with event status DEM_EVENT_STATUS_PREPASSED to DEM.
Secondary Parameters:	None.	
Time Required:	None.	
Monitor Frequency	None.	

⌋()

8 API specification

8.1 Imported types

This chapter lists all types included from the following modules:

[SWS_EthTrcv_00027]⌈

Module	*Header File*	*Imported Type*
Dem	Rte_Dem_Type.h	Dem_EventIdType
	Rte_Dem_Type.h	Dem_EventStatusType
EcuM	EcuM.h	EcuM_WakeupSourceType
Eth	Eth_GeneralTypes.h	Eth_ModeType
Icu	Icu.h	Icu_ChannelType
Std	Std_Types.h	Std_ReturnType
	Std_Types.h	Std_VersionInfoType

⌋()

8.2 Type definitions

8.2.1 EthTrcv_ConfigType

[SWS_EthTrcv_00098]⌈

Name	EthTrcv_ConfigType
Kind	Structure
Description	Implementation specific structure of the post build configuration
Available via	EthTrcv.h

⌋()

8.2.2 EthTrcv_LinkStateType

[SWS_EthTrcv_00100]⌈

Name	EthTrcv_LinkStateType		
Kind	Enumeration		
Range	ETHTRCV_LINK_STATE_DOWN	0x00	No physical Ethernet connection established

	ETHTRCV_LINK_STATE_ACTIVE	0x01	Physical Ethernet connection established
Description	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)		
Available via	Eth_GeneralTypes.h		

⌋()

8.2.3 EthTrcv_StateType

[SWS_EthTrcv_00101]⌈

Name	EthTrcv_StateType		
Kind	Enumeration		
Range	ETHTRCV_STATE_UNINIT	0x00	Driver is not yet configured
	ETHTRCV_STATE_INIT	0x01	Driver is configured
Description	Status supervision used for Development Error Detection. The state shall be available for debugging.		
Available via	Eth_GeneralTypes.h		

⌋()

8.2.4 EthTrcv_BaudRateType

[SWS_EthTrcv_00102]⌈

Name	EthTrcv_BaudRateType		
Kind	Enumeration		
Range	ETHTRCV_BAUD_RATE_10MBIT	0x00	10MBIT Ethernet connection
	ETHTRCV_BAUD_RATE_100MBIT	0x01	100MBIT Ethernet connection
	ETHTRCV_BAUD_RATE_1000MBIT	0x02	1000MBIT Ethernet connection
	ETHTRCV_BAUD_RATE_2500MBIT	0x03	2500MBIT Ethernet Connection
Description	This type defines the Ethernet baud rate. The baud rate gets either negotiated between the connected transceivers or has to be configured.		
Available via	Eth_GeneralTypes.h		

⌋()

8.2.5 EthTrcv_DuplexModeType

[SWS_EthTrcv_00103]⌈

Name	EthTrcv_DuplexModeType		
Kind	Enumeration		
Range	ETHTRCV_DUPLEX_MODE_HALF	0x00	Half duplex Ethernet connection
	ETHTRCV_DUPLEX_MODE_FULL	0x01	Full duplex Ethernet connection
Description	This type defines the Ethernet duplex mode. The duplex mode gets either negotiated between the connected transceivers or has to be configured.		
Available via	Eth_GeneralTypes.h		

⌋()

8.2.6 EthTrcv_ WakeupModeType

[SWS_EthTrcv_00113]{OBSOLETE} ⌈

Name	EthTrcv_WakeupModeType (obsolete)		
Kind	Enumeration		
Range	ETHTRCV_WUM_DISABLE	0x00	Transceiver wake up disabled
	ETHTRCV_WUM_ENABLE	0x01	Transceiver wake up enabled (default wakeup mode)
	ETHTRCV_WUM_CLEAR	0x02	Transceiver wake up reason cleared.
Description	This type controls the transceiver wake up modes and/or clears the wake-up reason. **Tags:**atp.Status=obsolete		
Available via	Eth_GeneralTypes.h		

⌋()

8.2.7 EthTrcv_ WakeupReasonType

[SWS_EthTrcv_00114]⌈

Name	EthTrcv_WakeupReasonType		
Kind	Enumeration		
Range	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. **Tags:**atp.Status=obsolete
	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.
	ETHTRCV_ WUR_WODL_ WUP	0x08	Wake-up on data line (WUP = wake up pulse) detected while link is down of the corresponding Ethernet hardware (e.g. PHY). Only available if EthTrcvWakeupSleepOnDataline Enabled is set to TRUE. **Tags:**atp.Status=draft
	ETHTRCV_ WUR_WODL_ WUR	0x09	Wake-up on data line (WUR = wake up request) detected while link is active of the used Ethernet hardware (e.g. PHY). Only available if EthTrcvWakeupSleepOnDatalineEnabled is set to TRUE. **Tags:**atp.Status=draft
	ETHTRCV_ WUR_ TRANSFER	0xA	Device internal transfer of wake-up on data line from a neighboring PHY. Only possible if Ethernet hardware is compliant to OA TC10. **Tags:**atp.Status=draft
Description	This type defines the transceiver wake up reasons.		
Available via	Eth_GeneralTypes.h		

⌋(SRS_Eth_00108)

8.2.8 EthTrcv_ PhyTestModeType

[SWS_EthTrcv_91002]⌈

Name	EthTrcv_PhyTestModeType		
Kind	Enumeration		
Range	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
Description	Describes the possible PHY test modes		
Available via	Eth_GeneralTypes.h		

⌋(SRS_Eth_00117)

8.2.9 EthTrcv_ PhyLoopbackModeType

[SWS_EthTrcv_91004]⌈

Name	EthTrcv_PhyLoopbackModeType		
Kind	Enumeration		
Range	ETHTRCV_PHYLOOPBACK_NONE	0x00	normal operation
	ETHTRCV_PHYLOOPBACK_INTERNAL	0x01	internal loopback
	ETHTRCV_PHYLOOPBACK_EXTERNAL	0x02	external loopback
	ETHTRCV_PHYLOOPBACK_REMOTE	0x03	remote loopback
Description	Describes the possible PHY loopback modes		
Available via	Eth_GeneralTypes.h		

⌋(SRS_Eth_00117)

8.2.10 EthTrcv_ PhyTxModeType

[SWS_EthTrcv_91006]⌈

Name	EthTrcv_PhyTxModeType		
Kind	Enumeration		
Range	ETHTRCV_PHYTXMODE_NORMAL	0x00	normal operation
	ETHTRCV_PHYTXMODE_TX_OFF	0x01	transmitter disabled
	ETHTRCV_PHYTXMODE_SCRAMBLER_OFF	0x02	scrambler disabled
Description	Describes the possible PHY transmit modes		
Available via	Eth_GeneralTypes.h		

⌋(SRS_Eth_00117)

8.2.11 EthTrcv_ CableDiagResultType

[SWS_EthTrcv_91008]⌈

Name	EthTrcv_CableDiagResultType		
Kind	Enumeration		
Range	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
	ETHTRCV_CABLEDIAG_PENDING	0x04	cable diagnostic is still running
	ETHTRCV_CABLEDIAG_WRONG_POLARITY	0x05	cable diagnostics has detected wrong polarity of the "Ethernet physical+" or "Ethernet physical-" lines
Description	Describes the results of the cable diagnostics.		
Available via	Eth_GeneralTypes.h		

⌋(SRS_Eth_00117)

8.2.12 EthTrcv_MacMethodType

[SWS_EthTrcv_91013]{DRAFT} ⌈

Name	EthTrcv_MacMethodType (draft)		
Kind	Enumeration		
Range	ETHTRCV_MAC_TYPE_CSMA_CD	0x00	Carrier sence multiple access with collision detection
	ETHTRCV_MAC_TYPE_PLCA	0x01	Physical layer collision avoidance
Description	This type defines the media access control type in half duplex. If ETHTRCV_MAC_TYPE_PLCA is configured, PLCA is supported and the parameters listed in ECUC_EthTrcv_00055 have to be configured. **Tags:**atp.Status=draft		
Available via	Eth_GeneralTypes.h		

⌋()

8.3 Function definitions

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

8.3.1 EthTrcv_Init

[SWS_EthTrcv_00028]⌈

Service Name	EthTrcv_Init	

Syntax	`void EthTrcv_Init (`
	`  const EthTrcv_ConfigType* CfgPtr`
	`)`	

Service ID [hex]	0x01	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	CfgPtr	Points to the implementation specific structure
Parameters (inout)	None	
Parameters (out)	None	
Return value	None	
Description	Initializes the Ethernet Transceiver Driver	
Available via	EthTrcv.h	

⌋()

[SWS_EthTrcv_00029] ⌈
The function shall store the access to the configuration structure for subsequent API calls. ⌋(SRS_Eth_00039)

[SWS_EthTrcv_00035] ⌈

The function shall initialize the Ethernet hardware (PHY) with all available configuration parameters:

- EthTrcvConnNeg (see ECUC_EthTrcv_00025)
- EthTrcvDuplexMode (see ECUC_EthTrcv_00023)
- EthTrcvMacLayerSpeed (see ECUC_EthTrcv_00044)
- EthTrcvMacLayerSubType (see ECUC_EthTrcv_00043)
- EthTrcvMacLayerType (see ECUC_EthTrcv_00035)
- EthTrcvPhysLayerType (see ECUC_EthTrcv_00024)
- EthTrcvSpeed (see ECUC_EthTrcv_00022).

⌋(SRS_Eth_00039)

Note: Only available configuration parameter of Ethernet hardware (PHY) are considered by the EthTcrv initialization. The remaining configuration parameter may be hardware-configured (e.g. pin strapping).

[SWS_EthTrcv_00030] ⌈
The function shall change the state of the component from ETHTRCV_STATE_UNINIT to ETHTRCV_STATE_INIT. ⌋(SRS_Eth_00039)

[SWS_EthTrcv_00115]{DRAFT} ⌈
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. ⌋(SRS_Eth_00108)

[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 otherwise pass the production error ETHTRCV_E_ACCESS. ⌋()

[SWS_EthTrcv_00032] ⌈
Caveat: The API has to be called during initialization. ⌋()

8.3.2 EthTrcv_SetTransceiverMode

[SWS_EthTrcv_00042]⌈

Service Name	EthTrcv_SetTransceiverMode	

Syntax	`Std_ReturnType EthTrcv_SetTransceiverMode (`
	`  uint8 TrcvIdx,`
	`  Eth_ModeType TrcvMode`
	`)`	

Service ID [hex]	0x03	
Sync/Async	Asynchronous	
Reentrancy	Non Reentrant	
Parameters (in)	TrcvIdx	Index of the transceiver within the context of the Ethernet Transceiver Driver
	Trcv Mode	ETH_MODE_DOWN: disable the transceiver ETH_MODE_ACTIVE: enable the transceiver ETH_MODE_ACTIVE_WITH_WAKEUP_ REQUEST: enable the transceiver and request to trigger a wake-up on the network, if the used Ethernet PHY support such a feature. E.g. used for PHYs compliant to OA TC10
Parameters (inout)	None	

Parameters (out)	None	
Return value	Std_-Return-Type	E_OK: Service accepted E_NOT_OK: Service denied
Description	Enables / disables the indexed transceiver	
Available via	EthTrcv.h	

⌋(SRS_Eth_00154)

[SWS_EthTrcv_00163] ⌈
If EthTrcv_SetTransceiverMode() is called and the internal cable diagnostic state is equal to ETHTRCV_CABLEDIAG_PENDING, the Ethernet Transceiver driver shall store the mode request per EthTrcv (TrcvIdx).⌋()

Note: Furhter processing of the mode will be done when cable diagnostic has finished, see SWS_EthTrcv_00162.

[SWS_EthTrcv_00043]{DRAFT} ⌈
The function shall put the indexed transceiver in the specified mode according to the following specified requirements. Each time a new mode is entered which was previously requested by EthTrcv_SetTransceiverMode, EthTrcv shall call EthIf_TrcvModeIndication latest during the next EthTrcv_MainFunction. ⌋()

[SWS_EthTrcv_00179]{DRAFT} ⌈
A new requested EthTrcv mode shall overwrite the last requested EthTrcv mode, except in case the last mode is ETH_MODE_ACTIVE_WITH_WAKEUP_REQUEST and the new mode is ETH_MODE_ACTIVE. ⌋()

Note: The Ethernet Transceiver driver store the requested mode per EthTrcv. The stored mode is used to re-trigger the requested mode in the context of the main function:

- A stored wake-up is repeated according to the available configuration (see EthTrcvWakeupRequestNumberOfRepetitions and EthTrcvWakeUpRequestRepetitionPeriod).
- A stored sleep request is repeated according the available configuration (EthTrcvSleepRequestNumberOfRepetitions and EthTrcvSleepRequestRepetitionPeriod).

8.3.2.1 ETH_MODE_DOWN request

[SWS_EthTrcv_00117]{DRAFT} ⌈
If the function is called with ETH_MODE_DOWN and EthTrcvWakeupSleepOnDatalineEnabled is set to FALSE or not configured, it shall

set the corresponding Ethernet Hardware (PHY) into a mode (e.g. sleep mode) where wakeups can be detected. ⌋()

[SWS_EthTrcv_00180]{DRAFT} ⌈
If the function is called with ETH_MODE_DOWN, EthTrcvWakeupSleepOnDatalineEnabled is set to TRUE, the Ethernet Transceiver driver has detected a pending wake-up and a corresponding delay timer with EthTrcvSleepModeExecutionDelay is not running, the Ethernet Transceiver driver shall start a delay timer with EthTrcvSleepModeExecutionDelay and return with E_OK. ⌋ (SRS_Eth_00151)
⌋()

Note: The further processing of the ETH_MODE_DOWN is done in the main function, see SWS_EthTrcv_00193

Rational for SWS_EthTrcv_00180: The delay of the execution for a sleep (ETH_MODE_DOWN) should avoid the race condition, if a ETH_MODE_DOWN was requested while a wake-up of a neighboring PHY was received via a local wake-up connection (e.g. I/O pin). The EthSM shall be able to finish the shutdown process (transition from ETHSM_STATE_WAIT_OFFLINE to ETHSM_STATE_OFFLINE), but the EthTrcv should delay the sleep processing, because it could be that EthSM request the network with COMM_FULL_COMMUNICATION again, due the pending wake-up, received via a local wake-up connection. An immediate execution of a sleep could bring the Ethernet hardware (PHY) to sleep, while the local wake-up request needs the Ethernet hardware (PHY) in normal state. A local received wake-up is handled as a passive communication request and will not bring the Ethernet hardware back to normal mode.

[SWS_EthTrcv_00181]{DRAFT} ⌈
If the function is called with ETH_MODE_DOWN, EthTrcvWakeupSleepOnDatalineEnabled is set to TRUE, the Ethernet Transceiver driver has detected a pending wake-up and a corresponding delay timer with EthTrcvSleepModeExecutionDelay is running, then the Ethernet Transceiver driver shall return with E_OK. ⌋ (SRS_Eth_00151)

Note: A running delay timer with EthTrcvSleepModeExecutionDelay inidicate that a sleep (ETH_MODE_DOWN) was already requested. Therefor no further handling for the sleep request is needed.

[SWS_EthTrcv_00182]{DRAFT} ⌈
If the function is called with ETH_MODE_DOWN, EthTrcvWakeupSleepOnDatalineEnabled is set to TRUE and the EthTrcv has not detected a pending wake-up (see SWS_EthTrcv_00180), the Ethernet hardware (PHY) is in another mode than sleep mode and has not already triggered a sleep request, the Ethernet Transceiver driver shall trigger a sleep request according to the specification of OA TC10 (see [23]).⌋(SRS_Eth_00151)

Note: The Ethernet Transceiver driver is checking if the Ethernet hardware (PHY) has already entered the sleep mode to avoid to trigger the affected Ethernet hardware (PHY) again with a sleep request. This is needed, because the connected Ethernet ECUs trigger a sleep request may be in a different point in time (e.g. if using Ethernet switch port switching the executing of sleep request is delayed by EthIfSwitchOffPortTimeDelay). The Ethernet ECU which shutdown a bit earlier trigger the sleep request and bring the own Ethernet hardware (PHY) and the Ethernet hardware of the connected Ethernet ECUs to sleep mode. The Ethernet Transceiver driver of the ECU which shutdown a bit later detect that the affected Ethernet hardware (PHY) has already reached sleep mode. In this case, the Ethernet hardware (PHY) shall be left as it is and return from the function call.

8.3.2.2 ETH_MODE_ACTIVE_WITH_WAKEUP_REQUEST or ETH_MODE_ACTIVE request

[SWS_EthTrcv_00118]{DRAFT} ⌈
If EthTrcv_SetTransceiverMode() is called with parameter ETH_MODE_ACTIVE or ETH_MODE_ACTIVE_WITH_WAKEUP_REQUEST, EthTrcvWakeupSleepOnDatalineEnabled set to FALSE or not configured and the internal cable diagnostic state is different from ETHTRCV_CABLEDIAG_PENDING, the Ethernet Transceiver driver shall:

- Check for wake-up reasons when entering the transceiver's active mode;
- If 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_00183]{DRAFT} ⌈
If the function is called with ETH_MODE_ACTIVE, EthTrcvWakeupSleepOnDatalineEnabled is TRUE and the internal cable diagnostic state is different from ETHTRCV_CABLEDIAG_PENDING, the Ethernet Transceiver driver shall:

- Put the Ethernet hardware (PHY) to normal mode, if not already switched automatically by the statemachine of the Ethernet hardware (PHY),
- Invoke the call-out <EthTrcvWakeUpCallout> function if configured.

⌋(SRS_Eth_00108)

Note: A requested mode with ETH_MODE_ACTIVE indicate a passive wake-up. Thus, the Ethernet hardware was remotely woken up by the connected communication partner. In this case no wake-up shall be transmitted on the network. The Ethernet hardware (PHY) should be put to normal mode, due to a received wake-up according to the OA TC10 (see [23]). But to increase the robustness for the communication, the Ethernet Transciever Driver shall check the current mode and bring the Ethernet hardware (PHY) to normal mode, if not done by the statemachine Ethernet hardware (PHY).

[SWS_EthTrcv_00184]{DRAFT} ⌈
If the function is called with ETH_MODE_ACTIVE_WITH_WAKEUP_REQUEST, EthTrcvWakeupSleepOnDatalineEnabled is TRUE, the internal cable diagnostic state is different from ETHTRCV_CABLEDIAG_PENDING and EthTrcv does not currently

perform wakeup repetition algorithm (see SWS_EthTrcv_00196), the Ethernet Transceiver driver shall:

- trigger the Ethernet hardware (PHY) to transmit a wake-up on the network according to the specification of OA TC10 (see [23]),
- invoke the call-out <EthTrcvWakeUpCallout> function if configured.

⌋(SRS_Eth_00108, SRS_Eth_00154)

Note: A requested mode with ETH_MODE_ACTIVE_WITH_WAKEUP_REQUEST indicate an active wake-up. This would result in a trigger of a wake-up on the network and putting the Ethernet hardware (PHY) implicitely to normal mode.

Comment on **[SWS_EthTrcv_00183]** and **[SWS_EthTrcv_00184]**: In case of former requested mode was ETH_MODE_DOWN and new mode is ETH_MODE_ACTIVE or ETH_MODE_ACTIVE_WITH_WAKEUP_REQUEST all actions regarding sleep handling will no longer be processed (refer to SWS_EthTrcv_00193 / SWS_EthTrcv_00194 / SWS_EthTrcv_00195).
Independent of the former mode when ETH_MODE_ACTIVE_WITH_WAKEUP_REQUEST is requested also the number of wakeup repetions will start from beginning (refer to SWS_EthTrcv_00196).

8.3.2.3 Error handling

[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_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). ⌋()

8.3.2.4 Configuration hints

[SWS_EthTrcv_00046] {OBSOLETE}⌈

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

8.3.3 EthTrcv_GetTransceiverMode

[SWS_EthTrcv_00048]⌈

Service Name	EthTrcv_GetTransceiverMode	

Syntax	`Std_ReturnType EthTrcv_GetTransceiverMode (`
	`  uint8 TrcvIdx,`
	`  Eth_ModeType* TrcvModePtr`
	`)`	

Service ID [hex]	0x04	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	TrcvIdx	Index of the transceiver within the context of the Ethernet Transceiver Driver
Parameters (inout)	None	
Parameters (out)	TrcvModePtr	ETH_MODE_DOWN: the transceiver is disabled ETH_MODE_ACTIVE: the transceiver is enable
Return value	Std_ReturnType	E_OK: success E_NOT_OK: transceiver could not be initialized
Description	Obtains the state of the indexed transceiver	
Available via	EthTrcv.h	

⌋()

[SWS_EthTrcv_00049]{DRAFT} ⌈
The function shall read the current transceiver mode of the Ethernet hardware (PHY), whereby ETH_MODE_ACTIVE_WITH_WAKEUP_REQUEST shall always be returned as ETH_MODE_ACTIVE. ⌋()

[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]{OBSOLETE} ⌈
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]{OBSOLETE} ⌈

Service Name	EthTrcv_SetTransceiverWakeupMode (obsolete)	

Syntax	`Std_ReturnType EthTrcv_SetTransceiverWakeupMode (`
	`  uint8 TrcvIdx,`
	`  EthTrcv_WakeupModeType TrcvWakeupMode`
	`)`	

Service ID [hex]	0x0d	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	TrcvIdx	Index of the transceiver within the context of the Ethernet Transceiver Driver
	Trcv Wakeup Mode	ETHTRCV_WUM_DISABLE: disable transceiver wake up ETHTRCV_WUM_ENABLE: enable transceiver wake up ETHTRCV_WUM_CLEAR: clears transceiver wake up reason
Parameters (inout)	None	
Parameters (out)	None	
Return value	Std_-ReturnType	E_OK: transceiver wake up mode has been changed. E_NOT_OK: transceiver wake up mode could not be changed or the wake-up reason could not be cleared.
Description	Enables / disables the wake-up mode or clear the wake-up reason of the indexed transceiver **Tags:**atp.Status=obsolete	
Available via	EthTrcv.h	

⌋()

[SWS_EthTrcv_00128]{OBSOLETE} ⌈
The function EthTrcv_GetTransceiverWakeupMode() shall read the current transceiver wake up mode and provide it into TrcvWakeupModePtr. ⌋()

[SWS_EthTrcv_00129]{OBSOLETE} ⌈
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]{OBSOLETE} ⌈
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]{OBSOLETE} ⌈
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]{OBSOLETE} ⌈
The function EthTrcv_GetTransceiverWakeupMode() shall be only available if EthTrcvGetTransceiverWakeupModeApi is set to TRUE. ⌋()

[SWS_EthTrcv_00133]{OBSOLETE} ⌈
Caveat: The function EthTrcv_GetTransceiverWakeupMode() requires previous transceiver initialization (EthTrcv_Init). ⌋()

8.3.5 EthTrcv_GetTransceiverWakeupMode

[SWS_EthTrcv_00127]{OBSOLETE} ⌈

Service Name	EthTrcv_GetTransceiverWakeupMode (obsolete)	

Syntax	`Std_ReturnType EthTrcv_GetTransceiverWakeupMode (`
	`  uint8 TrcvIdx,`
	`  EthTrcv_WakeupModeType* TrcvWakeupModePtr`
	`)`	

Service ID [hex]	0x0e	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	TrcvIdx	Index of the transceiver within the context of the Ethernet Transceiver Driver

Parameters (inout)	None	
Parameters (out)	TrcvWakeup ModePtr	ETHTRCV_WUM_DISABLE: transceiver wake up is disabled ETHTRCV_WUM_ENABLE: transceiver wake up is enabled
Return value	Std_Return-Type	E_OK: success E_NOT_OK: transceiver wake up mode could not be obtained
Description	Returns the wake up mode of the indexed transceiver **Tags:**atp.Status=obsolete	
Available via	EthTrcv.h	

⌋()

[SWS_EthTrcv_00120]{OBSOLETE} ⌈
If function EthTrcv_SetTransceiverWakeupMode() is called with ETHTRCV_WUM_DISABLE or ETHTRCV_WUM_ENABLE and the internal cable diagnostic state is different from ETHTRCV_CABLEDIAG_PENDING, the Ethernet Transceiver shall put the indexed transceiver in the specified wake up mode. ⌋()

[SWS_EthTrcv_00121]{OBSOLETE} ⌈
If function EthTrcv_SetTransceiverWakeupMode() is called with ETHTRCV_WUM_CLEAR and the internal cable diagnostic state is different from ETHTRCV_CABLEDIAG_PENDING, the Ethernet Transceiver driver shall clear stored wakeup events on the indexed transceiver. ⌋()

[SWS_EthTrcv_00164]{OBSOLETE} ⌈
If the internal cable diagnostic state is ETHTRCV_CABLEDIAG_PENDING, the EthTrcv_SetTransceiverWakeupMode shall return E_NOT_OK. ⌋()

[SWS_EthTrcv_00122]{OBSOLETE} ⌈
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]{OBSOLETE} ⌈
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]{OBSOLETE} ⌈
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]{OBSOLETE} ⌈

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]{OBSOLETE} ⌈
Caveat: The function EthTrcv_SetTransceiverWakeupMode() requires previous transceiver initialization (EthTrcv_Init). ⌋()

8.3.6 EthTrcv_GetBusWuReason

[SWS_EthTrcv_91012]{DRAFT} ⌈

Service Name	EthTrcv_EthTrcv_GetBusWuReason (draft)	

Syntax	`Std_ReturnType EthTrcv_EthTrcv_GetBusWuReason (`
	`  uint8 TrcvIdx,`
	`  EthTrcv_WakeupReasonType* WakeupReasonPtr`
	`)`	

Service ID [hex]	0x17	
Sync/Async	Synchronous	
Reentrancy	Reentrant	
Parameters (in)	TrcvIdx	Index of the transceiver within the context of the Ethernet Transceiver Driver
Parameters (inout)	None	
Parameters (out)	Wakeup ReasonPtr	Pointer to structure of least recent wakeup event, which was detected by the Ethernet PHY
Return value	Std_Return-Type	E_OK: PHY wake up reason request has been accepted. E_NOT_OK: PHY wake up reason request has not been accepted.
Description	This function returns the least recent wakeup reasons. **Tags:**atp.Status=draft	
Available via	EthTrcv.h	

⌋(SRS_Eth_00107)

[SWS_EthTrcv_00186] {DRAFT}⌈
The function EthTrcv_GetBusWuReason shall read the stored wake-up reason and provide the information in WakeupReasonPtr. ⌋(SRS_Eth_00107)

[SWS_EthTrcv_00187]{DRAFT} ⌈
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_00188]{DRAFT} ⌈
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_00189]{DRAFT} ⌈
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_00190]{DRAFT} ⌈
The function shall be pre compile time configurable On/Off by the configuration parameter: EthTrcvGetBusWuReasonApi. ⌋()

8.3.7 EthTrcv_CheckWakeup

[SWS_EthTrcv_00134]⌈

Service Name	EthTrcv_CheckWakeup	

Syntax	`Std_ReturnType EthTrcv_CheckWakeup (`
	`  uint8 TrcvIdx`
	`)`	

Service ID [hex]	0x0f	
Sync/Async	Synchronous	
Reentrancy	Reentrant	
Parameters (in)	TrcvIdx	Index of the transceiver within the context of the Ethernet Transceiver Driver
Parameters (inout)	None	
Parameters (out)	None	
Return value	Std_Return-Type	E_OK: The function has been successfully executed E_NOT_OK: The function could not be successfully executed
Description	Service is called by EthIf in case a wake-up interrupt is detected.	
Available via	EthTrcv.h	

⌋()

[SWS_EthTrcv_00136]{OBSOLETE} ⌈
If the wake-up mode of the corresponding transceiver is not ETHTRCV_WUM_ENABLE, the function EthTrcv_CheckWakeup() shall return E_OK. ⌋()

[SWS_EthTrcv_00135]{DRAFT} ⌈
If EthTrcvWakeUpSupport is set to ETHTRCV_WAKEUP_BY_INTERRUPT, 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_00185]{DRAFT} ⌈
If the function EthTrcv_CheckWakeup() is called and EthTrcvWakeUpSupport is set to ETHTRCV_WAKEUP_BY_ASYNCHRONOUS_CHECK, the Ethernet Transceiver Driver shall store the request to asynchronously check for a wake-up of used Ethernet hardware (e.g. the OA TC10 compliant PHY) in the context of the EthTrcv_MainFunction. ⌋(SRS_Eth_00108, SRS_Eth_00107)

Note: Asychronous check for a wake-up could be used for Ethernet switches, due to the time consumption to read out all Ethernet switch ports of an Ethernet switch. E.g. the Ethernet switch is signaled that an interrupt of one or more of its Ethernet switch ports occurred. The corresponding host ECU (ECU that maintain an Ethernet switch) has to read out all registers of the cooresponding PHYs, to check which PHYs signaled the interrupt and the reason for the interrupt. This could be done in the context of the EthTrcv_MainFunction asynchronously (and NOT synchronously in the context of EthTrcv_CheckWakeup) to support timing constraints regarding runtime of the host ECU.

[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). ⌋()

8.3.8 EthTrcv_StartAutoNegotiation

[SWS_EthTrcv_00055]⌈

Service Name	EthTrcv_StartAutoNegotiation	

Syntax	`Std_ReturnType EthTrcv_StartAutoNegotiation (`
	`  uint8 TrcvIdx`
	`)`	

Service ID [hex]	0x05	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	TrcvIdx	Index of the transceiver within the context of the Ethernet Transceiver Driver
Parameters (inout)	None	
Parameters (out)	None	
Return value	Std_Return-Type	E_OK: success E_NOT_OK: transceiver could not be initialized
Description	Restarts the negotiation of the transmission parameters used by the indexed transceiver	
Available via	EthTrcv.h	

⌋()

[SWS_EthTrcv_00056] ⌈
The function shall restart the automatic negotiation of the transmission parameters used by the indexed transceiver if the internal cable diagnostic state is different from ETHTRCV_CABLEDIAG_PENDING. Otherwise, the API shall return with E_NOT_OK. ⌋()

[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 and EthTrcvEnablePLCA.
⌋(SRS_Eth_00149)

[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. ⌋()

8.3.9 EthTrcv_TransceiverLinkStateRequest

[SWS_EthTrcv_91025]⌈

Service Name	EthTrcv_TransceiverLinkStateRequest	

Syntax	`Std_ReturnType EthTrcv_TransceiverLinkStateRequest (`
	`  uint8 TrcvIdx,`
	`  EthTrcv_LinkStateType LinkState`
	`)`	

Service ID [hex]	0x02	
Sync/Async	Asynchronous	
Reentrancy	Reentrant for different TrcvIdx. Non reentrant for the same TrcvIdx.	
Parameters (in)	TrcvIdx	Index of the transceiver within the context of the Ethernet Transceiver Driver
	LinkState	The Ethernet link state of a physical Ethernet connection.
Parameters (inout)	None	
Parameters (out)	None	
Return value	Std_Return-Type	E_OK: The request has been accepted E_NOT_OK: The request has not been accepted
Description	Request the given link state for the given Ethernet transceiver	
Available via	EthTrcv.h	

⌋()

[SWS_EthTrcv_00151] ⌈
The function shall start link training of the indexed transceiver if:

- the requested link state is ETHTRCV_LINK_STATE_ACTIVE and
- the internal cable diagnostic state is different from ETHTRCV_CABLEDIAG_PENDING and
- EthTrcvConnNeg is set to TRCV_CONN_NEG_MASTER or TRCV_CONN_NEG_AUTO.

If EthTrcvConnNeg is set to TRCV_CONN_NEG_SLAVE, the indexed transceiver shall be put in a state to wait for the link training of the link partner. ⌋()

[SWS_EthTrcv_00165] ⌈

If EthTrcv_TransceiverLinkStateRequest() is called and the internal cable diagnostic state is ETHTRCV_CABLEDIAG_PENDING, the Ethernet Transceiver driver shall store the link state request per Ethernet transceiver and proceed as specified in SWS_EthTrcv_00162. ⌋()

[SWS_EthTrcv_00152] ⌈
The function shall stop link training of the indexed transceiver, if the requested link state is ETHTRCV_LINK_STATE_DOWN and EthTrcvConnNeg is set to TRCV_CONN_NEG_MASTER or TRCV_CONN_NEG_AUTO. ⌋()

[SWS_EthTrcv_00153] ⌈
The function shall put the link down of the indexed transceiver, if the requested link state is ETHTRCV_LINK_STATE_DOWN. ⌋()

[SWS_EthTrcv_00154] ⌈
If the Ethernet transceiver is already in the requested link state, E_OK shall be returned and no development error shall be raised. ⌋()

8.3.10 EthTrcv_GetLinkState

[SWS_EthTrcv_00061]⌈

Service Name	EthTrcv_GetLinkState	

Syntax	`Std_ReturnType EthTrcv_GetLinkState (`
	`  uint8 TrcvIdx,`
	`  EthTrcv_LinkStateType* LinkStatePtr`
	`)`	

Service ID [hex]	0x06	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	TrcvIdx	Index of the transceiver within the context of the Ethernet Transceiver Driver
Parameters (inout)	None	
Parameters (out)	LinkState Ptr	ETHTRCV_LINK_STATE_DOWN: transceiver is disconnected ETHTRCV_LINK_STATE_ACTIVE: transceiver is connected
Return value	Std_-ReturnType	E_OK: success E_NOT_OK: transceiver could not be initialized
Description	Obtains the link state of the indexed transceiver	
Available via	EthTrcv.h	

⌋()

[SWS_EthTrcv_00062]{DRAFT} ⌈

The function shall read the current transceiver link state, expect for the following condition:
If EthTrcvWakeupSleepOnDatalineEnabled set to TRUE and the Ethernet Transceiver Driver detect that a sleep process is performed for the given TrcvIdx, then ETHTRCV_LINK_STATE_DOWN shall be returned. ⌋(SRS_Eth_00040)

Note: OA TC10 compliant Ethernet hardware is not able to transfer data on the date line, if a sleep process is performed. In that case a link down is reported to the upper layer, to indicate that communication is not possible on data line

[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). ⌋()

8.3.11 EthTrcv_GetBaudRate

[SWS_EthTrcv_00068]⌈

Service Name	EthTrcv_GetBaudRate

Syntax	`Std_ReturnType EthTrcv_GetBaudRate (`
	`  uint8 TrcvIdx,`
	`  EthTrcv_BaudRateType* BaudRatePtr`
	`)`

Service ID [hex]	0x07
Sync/Async	Synchronous

Reentrancy	Non Reentrant	
Parameters (in)	TrcvIdx	Index of the transceiver within the context of the Ethernet Transceiver Driver
Parameters (inout)	None	
Parameters (out)	Baud RatePtr	ETHTRCV_BAUD_RATE_10MBIT: 10MBit connection ETHTRCV_BAUD_RATE_100MBIT: 100MBit connection ETHTRCV_BAUD_RATE_1000MBIT: 1000MBit connection ETHTRCV_BAUD_RATE_2500MBIT: 2500MBit connection
Return value	Std_-Return-Type	E_OK: success E_NOT_OK: transceiver could not be initialized
Description	Obtains the baud rate of the indexed transceiver	
Available via	EthTrcv.h	

⌋()

[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. ⌋()

8.3.12 EthTrcv_GetDuplexMode

[SWS_EthTrcv_00075]⌈

Service Name	EthTrcv_GetDuplexMode	

Syntax	`Std_ReturnType EthTrcv_GetDuplexMode (`
	`  uint8 TrcvIdx,`
	`  EthTrcv_DuplexModeType* DuplexModePtr`
	`)`	

Service ID [hex]	0x08	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	TrcvIdx	Index of the transceiver within the context of the Ethernet Transceiver Driver
Parameters (inout)	None	
Parameters (out)	Duplex ModePtr	ETHTRCV_DUPLEX_MODE_HALF: half duplex connections ETHTRCV_DUPLEX_MODE_FULL: full duplex connection
Return value	Std_-ReturnType	E_OK: success E_NOT_OK: transceiver could not be initialized
Description	Obtains the duplex mode of the indexed transceiver	
Available via	EthTrcv.h	

⌋()

[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. ⌋()

8.3.13 EthTrcv_SetPhyTestMode

[SWS_EthTrcv_91003]⌈

Service Name	EthTrcv_SetPhyTestMode	

Syntax	`Std_ReturnType EthTrcv_SetPhyTestMode (`
	`  uint8 TrcvIdx,`
	`  EthTrcv_PhyTestModeType Mode`
	`)`	

Service ID [hex]	0x11	
Sync/Async	Synchronous	
Reentrancy	Reentrant for different TrcvIdx. Non reentrant for the same TrcvIdx.	
Parameters (in)	TrcvIdx	Index of the transceiver within the context of the Ethernet Transceiver Driver
	Mode	Test mode to be activated
Parameters (inout)	None	
Parameters (out)	None	
Return value	Std_Return-Type	E_OK: The request has been accepted E_NOT_OK: The request has not been accepted.
Description	Activates a given test mode.	
Available via	EthTrcv.h	

⌋(SRS_Eth_00117)

[SWS_EthTrcv_00166] ⌈
If the internal cable diagnostic state is ETHTRCV_CABLEDIAG_PENDING, the EthTrcv_SetPhyTestMode shall return E_NOT_OK. ⌋()

[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)

[SWS_EthTrcv_00169] ⌈
The function shall be pre compile time configurable On/Off by the configuration parameter EthTrcvSetPhyTestModeApi (ECUC_EthTrcv_00047). ⌋()

8.3.14 EthTrcv_SetPhyLoopbackMode

[SWS_EthTrcv_91005]⌈

Service Name	EthTrcv_SetPhyLoopbackMode	

Syntax	`Std_ReturnType EthTrcv_SetPhyLoopbackMode (`
	`  uint8 TrcvIdx,`
	`  EthTrcv_PhyLoopbackModeType Mode`
	`)`	

Service ID [hex]	0x12	
Sync/Async	Synchronous	
Reentrancy	Reentrant for different TrcvIdx. Non reentrant for the same TrcvIdx.	
Parameters (in)	TrcvIdx	Index of the transceiver within the context of the Ethernet Transceiver Driver
	Mode	Loopback mode to be activated
Parameters (inout)	None	
Parameters (out)	None	
Return value	Std_Return-Type	E_OK: The request has been accepted E_NOT_OK: The request has not been accepted.
Description	Activates a given loopback mode.	
Available via	EthTrcv.h	

⌋(SRS_Eth_00117)

[SWS_EthTrcv_00167] ⌈
If the internal cable diagnostic state is ETHTRCV_CABLEDIAG_PENDING, the EthTrcv_SetPhyLoopbackMode shall return E_NOT_OK. ⌋()

[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)

8.3.15 EthTrcv_GetPhySignalQuality

[SWS_EthTrcv_91001]⌈

Service Name	EthTrcv_GetPhySignalQuality	

Syntax	`Std_ReturnType EthTrcv_GetPhySignalQuality (`
	`  uint8 TrcvIdx,`
	`  uint32* SignalQualityPtr`
	`)`	

Service ID [hex]	0x10	
Sync/Async	Synchronous	
Reentrancy	Reentrant for different TrcvIdx. Non reentrant for the same TrcvIdx.	
Parameters (in)	TrcvIdx	Index of the transceiver within the context of the Ethernet Transceiver Driver
Parameters (inout)	None	
Parameters (out)	SignalQuality Ptr	Pointer to the memory where the signal quality shall be stored.
Return value	Std_Return-Type	E_OK: The request has been accepted E_NOT_OK: The request has not been accepted.
Description	Obtains the current signal quality of the link of the indexed transceiver	
Available via	EthTrcv.h	

⌋(SRS_Eth_00117)

8.3.16 EthTrcv_SetPhyTxMode

[SWS_EthTrcv_91007]⌈

Service Name	EthTrcv_SetPhyTxMode	

Syntax	`Std_ReturnType EthTrcv_SetPhyTxMode (`
	`  uint8 TrcvIdx,`
	`  EthTrcv_PhyTxModeType Mode`
	`)`	

Service ID [hex]	0x13	
Sync/Async	Synchronous	
Reentrancy	Reentrant for different TrcvIdx. Non reentrant for the same TrcvIdx.	
Parameters (in)	TrcvIdx	Index of the transceiver within the context of the Ethernet Transceiver Driver
	Mode	Transmission mode to be activated

Parameters (inout)	None	
Parameters (out)	None	
Return value	Std_Return-Type	E_OK: The request has been accepted E_NOT_OK: The request has not been accepted
Description	Activates a given transmission mode.	
Available via	EthTrcv.h	

⌋(SRS_Eth_00117)

[SWS_EthTrcv_00168] ⌈
If the internal cable diagnostic state is ETHTRCV_CABLEDIAG_PENDING, the EthTrcv_SetPhyTxMode shall return E_NOT_OK. ⌋()

[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.⌋()

8.3.17 EthTrcv_ RunCableDiagnostic

[SWS_EthTrcv_91011]⌈

Service Name	EthTrcv_RunCableDiagnostic	

Syntax	`Std_ReturnType EthTrcv_RunCableDiagnostic (`
	`  uint8 TrcvIdx`
	`)`	

Service ID [hex]	0x16	
Sync/Async	Asynchronous	
Reentrancy	Reentrant for different TrcvIdx. Non reentrant for the same TrcvIdx.	
Parameters (in)	TrcvIdx	Index of the Ethernet transceiver within the context of the Ethernet Transceiver Driver.
Parameters (inout)	None	
Parameters (out)	None	
Return value	Std_Return-Type	E_OK: The trigger has been accepted. E_NOT_OK: The trigger has not been accepted.
Description	Trigger the cable diagnostics for the given Ethernet transceiver.	
Available via	EthTrcv.h	

⌋()

[SWS_EthTrcv_00170] ⌈
The function shall be pre compile time configurable On/Off by the configuration parameter EthTrcvEnableCableDiagnosticApi (ECUC_EthTrcv_00054).
⌋()

8.3.18 EthTrcv_GetCableDiagnosticsResult

[SWS_EthTrcv_91009]⌈

Service Name	EthTrcv_GetCableDiagnosticsResult	

Syntax	`Std_ReturnType EthTrcv_GetCableDiagnosticsResult (`
	`  uint8 TrcvIdx,`
	`  EthTrcv_CableDiagResultType* ResultPtr`
	`)`	

Service ID [hex]	0x14	
Sync/Async	Synchronous	
Reentrancy	Reentrant for different TrcvIdx. Non reentrant for the same TrcvIdx.	
Parameters (in)	TrcvIdx	Index of the transceiver within the context of the Ethernet Transceiver Driver
Parameters (inout)	None	
Parameters (out)	ResultPtr	Pointer to the location where the cable diagnostics result shall be stored
Return value	Std_Return-Type	E_OK: The request has been accepted E_NOT_OK: The request has not been accepted
Description	Retrieves the cable diagnostics result of a given transceiver.	
Available via	EthTrcv.h	

⌋(SRS_Eth_00117)

[SWS_EthTrcv_00171] ⌈
The function shall be pre compile time configurable On/Off by the configuration parameter EthTrcvEnableCableDiagnosticApi (ECUC_EthTrcv_00054).⌋()

8.3.19 EthTrcv_GetPhyIdentifier

[SWS_EthTrcv_91010]⌈

Service Name	EthTrcv_GetPhyIdentifier

Syntax	`Std_ReturnType EthTrcv_GetPhyIdentifier (`
	`  uint8 TrcvIdx,`
	`  uint32* OrgUniqueIdPtr,`
	`  uint8* ModelNrPtr,`
	`  uint8* RevisionNrPtr`
	`)`

Service ID [hex]	0x15	
Sync/Async	Synchronous	
Reentrancy	Reentrant for different TrcvIdx. Non reentrant for the same TrcvIdx.	
Parameters (in)	TrcvIdx	Index of the transceiver within the context of the Ethernet Transceiver Driver
Parameters (inout)	None	
Parameters (out)	OrgUniqueId Ptr	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.
Return value	Std_Return-Type	E_OK: The request has been accepted E_NOT_OK: The request has not been accepted
Description	Obtains the PHY identifier of the Ethernet Transceiver according to IEEE 802.3-2015 chapter 22.2.4.3.1 PHY Identifer.	
Available via	EthTrcv.h	

⌋(SRS_Eth_00117)

[SWS_EthTrcv_00172] ⌈
The function shall be pre compile time configurable On/Off by the configuration parameter EthTrcvGetPhyIdentifierApi (ECUC_EthTrcv_00046).⌋()

8.3.20 EthTrcv_GetMacMethod

[SWS_EthTrcv_91014]{DRAFT} ⌈

Service Name	EthTrcv_GetMacMethod (draft)	

Syntax	`Std_ReturnType EthTrcv_GetMacMethod (`
	`  uint8* TrcvIdx,`
	`  EthTrcv_MacMethodType* MacModePtr`
	`)`	

Service ID [hex]	0x18	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	TrcvIdx	Index of the transceiver within the context of the Ethernet Transceiver Driver

Parameters (inout)	None	
Parameters (out)	MacModePtr	ETHTRCV_MAC_TYPE_CSMA_CD: Carrier-sense multiple access with collicion detection ETHTRCV_MAC_TYPE_PLCA: Physical layer collision avoidance
Return value	Std_Return-Type	E_OK: success E_NOT_OK: MacType could not be returned
Description	Obtains the media access mode of the transceiver when EthTrcvDuplexMode is configured as ETHTRCV_DUPLEX_MODE_HALF **Tags:**atp.Status=draft	
Available via	EthTrcv.h	

⌋()

[SWS_EthTrcv_00174]{DRAFT} ⌈
If the parameter EthTrcvDuplexMode is set to ETHTRCV_DUPLEX_MODE_HALF the function shall return the current transceiver media access mode. Otherwise, it shall return E_NOT_OK. ⌋(SRS_Eth_00149)

[SWS_EthTrcv_00175]{DRAFT} ⌈
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_00176]{DRAFT} ⌈
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_00177]{DRAFT} ⌈
If development error detection is enabled: the function shall check the parameter MacModePtr 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_00178]{DRAFT} ⌈
Caveat: The function requires previous transceiver initialization (EthTrcv_Init). ⌋()

8.3.21 EthTrcv_GetVersionInfo

[SWS_EthTrcv_00082]⌈

Service Name	EthTrcv_GetVersionInfo
Syntax	`void EthTrcv_GetVersionInfo (`

	`Std_VersionInfoType* VersionInfoPtr`
	`)`	

Service ID [hex]	0x0b	
Sync/Async	Synchronous	
Reentrancy	Reentrant	
Parameters (in)	None	
Parameters (inout)	None	
Parameters (out)	VersionInfoPtr	Version information of this module
Return value	None	
Description	Returns the version information of this module	
Available via	EthTrcv.h	

⌋()

[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. ⌋()

[SWS_EthTrcv_00173] ⌈
The function shall be pre compile time configurable On/Off by the configuration parameter EthTrcvVersionInfoApi (ECUC_EthTrcv_00004). ⌋()

8.4 Callback notifications

8.4.1 EthTrcv_ReadMiiIndication

[SWS_EthTrcv_00108]⌈

Service Name	EthTrcv_ReadMiiIndication

Syntax	`void EthTrcv_ReadMiiIndication (`
	`uint8 CtrlIdx,`
	`uint8 TrcvIdx,`
	`uint8 RegIdx,`
	`uint8 RegVal`
	`)`

Service ID [hex]	0x09
Sync/Async	Synchronous
Reentrancy	Non Reentrant for the same CtrlIdx, reentrant for different

Parameters (in)	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
Parameters (inout)	None	
Parameters (out)	None	
Return value	None	
Description	Called when information has been read out via MII interface. Triggered by previous Eth_ReadMii call. Can directly be called within Eth_ReadMii.	
Available via	EthTrcv.h	

⌋()

8.4.2 EthTrcv_WriteMiiIndication

[SWS_EthTrcv_00109]⌈

Service Name	EthTrcv_WriteMiiIndication	

Syntax	`void EthTrcv_WriteMiiIndication (`
	`  uint8 CtrlIdx,`
	`  uint8 TrcvIdx,`
	`  uint8 RegIdx`
	`)`	

Service ID [hex]	0x0a	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant for the same CtrlIdx, reentrant for different	
Parameters (in)	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
Parameters (inout)	None	
Parameters (out)	None	
Return value	None	
Description	Called when information has been written via MII interface. Triggered by previous Eth_WriteMii call. Can directly be called within Eth_WriteMii.	
Available via	EthTrcv.h	

⌋()

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]⌈

Service Name	EthTrcv_MainFunction

Syntax	`void EthTrcv_MainFunction (`
	`  void`
	`)`

Service ID [hex]	0x0c
Description	Used for polling state changes and wakeup reasons. Calls EthIf_TrcvModeIndication when the transceiver mode changed. Stores wakeup events if EthTrcvWakeUpSupport is set to ETHTRCV_WAKEUP_BY_POLLING.
Available via	SchM_EthTrcv.h

⌋()

[SWS_EthTrcv_00107] ⌈
Used for polling state changes. Calls EthIf_TrcvModeIndication 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_00191]{DRAFT} ⌈
If EthTrcvWakeUpSupport is set to ETHTRCV_WAKEUP_BY_ASYNCHRONOUS_CHECK, the EthTrcv_MainFunction shall check the maintained Ethernet hardware (PHY) for a signaled Wakeup.Indication of those EthTrcvs where the check for wake-up was requested by EthTrcv_CheckWakeup. If a wake-up is detected, the Ethernet Transceiver Driver shall inform the EcuM by calling EcuM_SetWakeupEvent with the corresponding WakeupSource. ⌋(SRS_Eth_00108)

[SWS_EthTrcv_00192]{DRAFT} ⌈

If EthTrcvWakeupSleepOnDatalineEnabled is set to TRUE and EthTrcvActAsSlavePassiveEnabled is set to TRUE, the EthTrcv_MainFunction shall evaluate the maintained Ethernet hardware (PHY) for a signaled Sleep.Indication (see [23]). If a Sleep.Indication is detected, the Ethernet Transceiver Driver shall inform the EthIf by calling EthIf_SleepIndication.⌋(SRS_ModeMgm_09267, SRS_Eth_00152)

[SWS_EthTrcv_00193]{DRAFT} ⌈
If EthTrcvWakeupSleepOnDatalineEnabled is set to TRUE, the EthTrcv_MainFunction shall process running delay timers. If a sleep delay timer exceeds and the requested transceiver mode is still ETH_MODE_DOWN, the Ethernet Transceiver driver shall trigger a sleep request according to the specification of OA TC10 (see [23]). ⌋(SRS_Eth_00151)

The EthTrcv_MainFunction checks all EthTrcvs with EthTrcvWakeupSleepOnDatalineEnabled is set to TRUE where the sleep request was triggered (requested mode ETH_MODE_DOWN): If no SleepFail.Indication was signaled within the configured time period specified by EthTrcvSleepRequestRepetitionPeriod, then the sleep request was confirmed by the connected Ethernet hardware (PHY). Thus, the Ethernet hardware transit to sleep.

The following requirements specify the procedure in case a sleep request was rejected by the counter part of the Ethernet connection.

[SWS_EthTrcv_00194]{DRAFT} ⌈
If EthTrcvWakeupSleepOnDatalineEnabled is set to TRUE, the requested transceiver mode is still ETH_MODE_DOWN and SleepFail.Indication was reported less than EthTrcvSleepRequestNumberOfRepetitions, the Ethernet Transceiver driver shall trigger a sleep request according to the specification of OA TC10 (see [23]) after EthTrcvSleepRequestRepetitionPeriod has been elapsed. ⌋(SRS_Eth_00155)

[SWS_EthTrcv_00195]{DRAFT} ⌈
If EthTrcvWakeupSleepOnDatalineEnabled is set to TRUE, the requested transceiver mode is still ETH_MODE_DOWN and SleepFail.Indication was reported EthTrcvSleepRequestNumberOfRepetitions times, the Ethernet Transceiver driver shall call EthIf_TrcvModeIndication(ETH_MODE_DOWN). If EthTrcvForceSleepEnabled is set to true the Ethernet Transceiver driver shall additionally force the Ehternet hardware (PHY) to go to sleep. ⌋(SRS_Eth_00155)

[SWS_EthTrcv_00196]{DRAFT} ⌈
After each call of EthTrcv_SetTransceiverMode with ETH_MODE_ACTIVE_WITH_WAKEUP_REQUEST for a particular EthTrcv the EthTrcv_MainFunction shall repeat a wake-up request EthTrcvWakeupRequestNumberOfRepetitions times with a delay of EthTrcvWakeUpRequestRepetitionPeriod in between as long as no EthTrcv_SetTransceiverMode with ETH_MODE_DOWN occurs for the same EthTrcv. ⌋(SRS_Eth_00154)

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	***Header File***	***Description***
Dem_SetEventStatus	Dem.h	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. This API will be available only if ({Dem/DemConfigSet/DemEventParameter/DemEventReportingType} == STANDARD_REPORTING)
EthIf_TrcvModeIndication	EthIf.h	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	SchM_<Mip>.h	Invokes the SchM_Enter function to enter a module local exclusive area.
SchM_Exit_EthTrcv	SchM_<Mip>.h	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	***Header File***	***Description***
Det_ReportError	Det.h	Service to report development errors.
EcuM_SetWakeupEvent	EcuM.h	Sets the wakeup event.
Eth_ReadMii	Eth.h	Reads a transceiver register
Eth_WriteMii	Eth.h	Configures a transceiver register or triggers a function offered by the receiver
EthIf_SleepIndication	EthIf.h	This API is called by the corresponding EthTrcv, if a sleep indication was detected on the network. This could be used e.g. for Ethernet hardware which is compliant to the OA TC10. In this case the Ethernet hardware

		(PHY) detect an Sleep.Indication which was triggered by a Sleep.Request of the connected link partner. **Tags:**atp.Status=draft
EthSwt_-ReadTrcv-Register	Eth Swt.h	Generic API for reading the content of a transceiver register
EthSwt_-WriteTrcv-Register	Eth Swt.h	Generic API for writing the content of a transceiver register
Icu_Disable-Notification	Icu.h	This function disables the notification of a channel.
Icu_Enable-Notification	Icu.h	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]{DRAFT} ⌈

Service Name	<EthTrcvWakeUpCallout> (draft)	

Syntax	`void <EthTrcvWakeUpCallout> (`
	`  uint8 TrcvIdx,`
	`  Eth_ModeType TrcvMode`
	`)`	

Service ID [hex]	0x11	
Sync/Async	Asynchronous	
Reentrancy	Non Reentrant Dont care	
Parameters (in)	Trcv Idx	Index of the Ethernet Transceiver
	Trcv Mode	ETH_MODE_ACTIVE: enable the transceiver ETH_MODE_ACTIVE_WITH_WAKEUP_REQUEST: enable the transceiver and request to trigger a wake-up on the network, if the used Ethernet PHY support such a feature. E.g. used for PHYs with a compliant to OA TC10.
Parameters (inout)	None	
Parameters (out)	None	
Return value	None	
Description	Indicates an wake-up request for the specified Ethernet Transceiver. The given Trcv	

	Mode indicates if the request is based on a remote request from the network (ETH_ MODE_ACTIVE) or if the request is based on active user request (ETH_MODE_ ACTIVE_WITH_WAKEUP_REQUEST). The callback function Ccan be used to trigger integrator code that initiates a remote wake-up .(e.g. trigger a wake-up line for an active user request). **Tags:**atp.Status=draft
Available via	EthTrcv_Externals.h

⌋()

[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 17.2.2.

[SWS_EthTrcv_00155] ⌈

The Ethernet Transceiver Driver module shall reject configurations with partition mappings which are not supported by the implementation. ⌋()

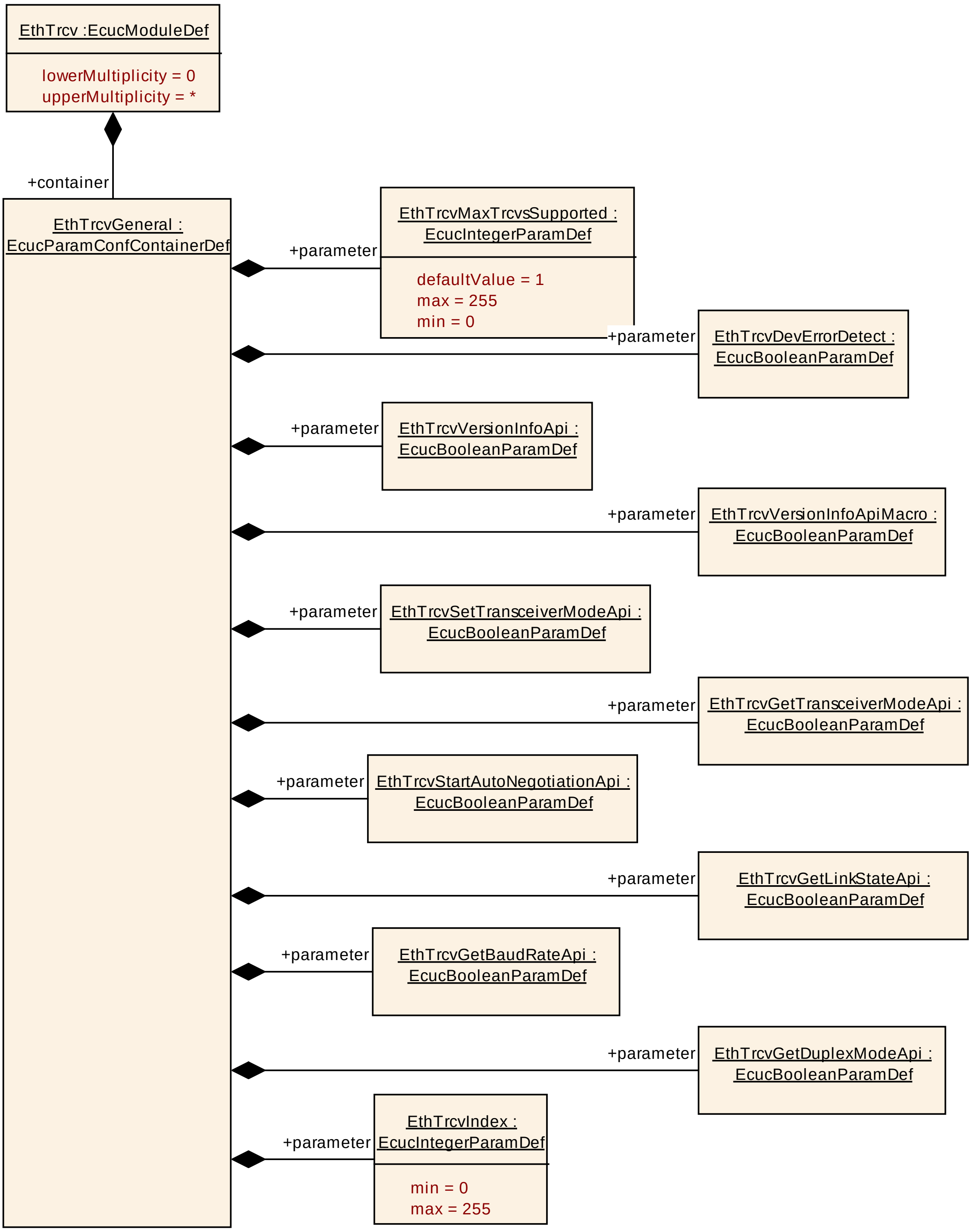

Figure 10.1: Ethernet Transceiver Driver configuration structure

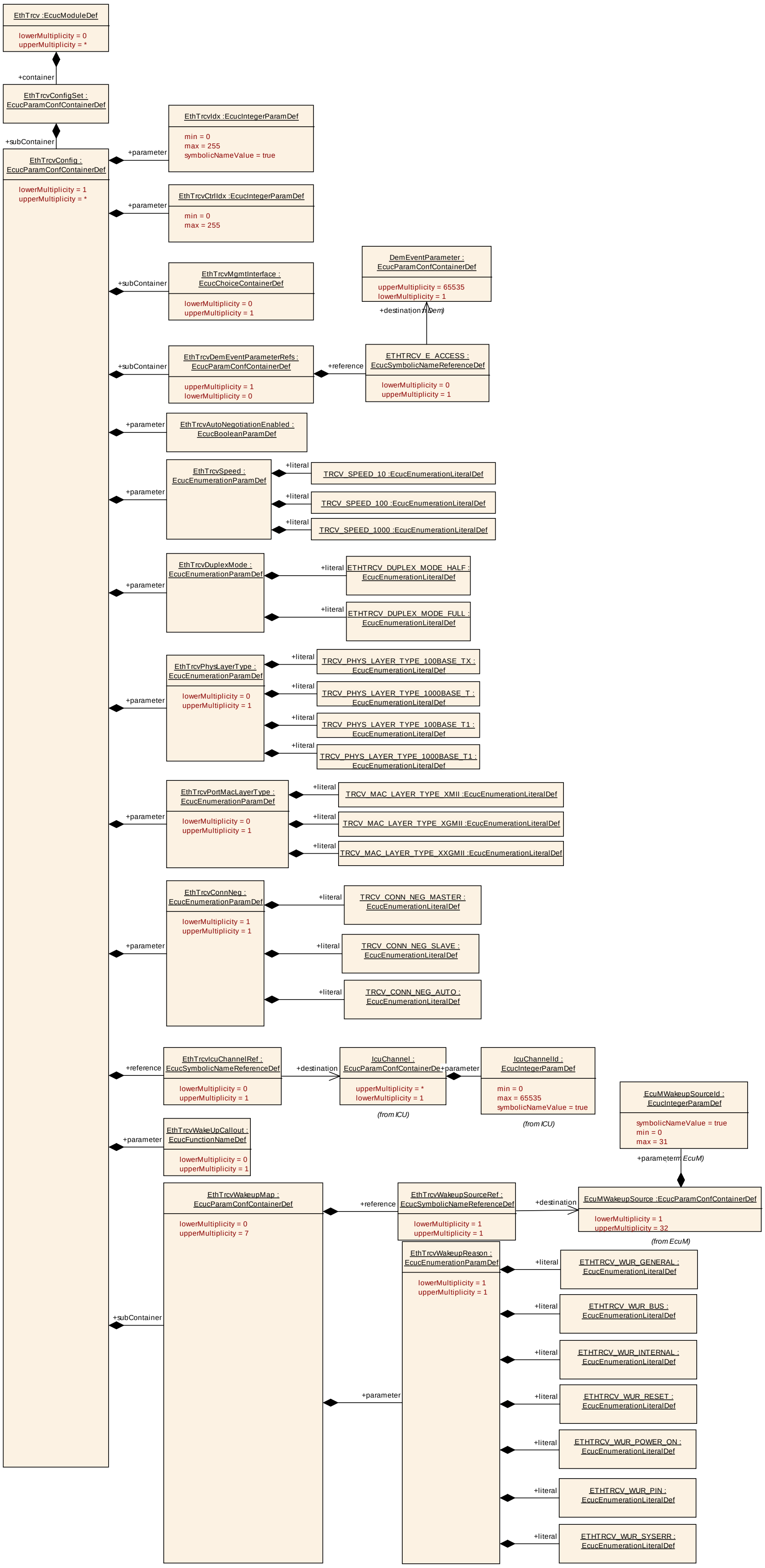
EthTrcv :EcucModuleDef
lowerMultiplicity = 0
upperMultiplicity = *
+container
EthTrcvConfigSet : EcucParamConfContainerDef
+subContainer
EthTrcvConfig : EcucParamConfContainerDef
lowerMultiplicity = 1
upperMultiplicity = *
+parameter
EthTrcvIdx :EcucIntegerParamDef
min = 0
max = 255
symbolicNameValue = true
+parameter
EthTrcvCtrlIdx :EcucIntegerParamDef
min = 0
max = 255
DemEventParameter : EcucParamConfContainerDef
upperMultiplicity = 65535
lowerMultiplicity = 1
+destination
(from Dem)
+subContainer
EthTrcvMgmtInterface : EcucChoiceContainerDef
lowerMultiplicity = 0
upperMultiplicity = 1
+subContainer
EthTrcvDemEventParameterRefs : EcucParamConfContainerDef
upperMultiplicity = 1
lowerMultiplicity = 0
+reference
ETHTRCV_E_ACCESS : EcucSymbolicNameReferenceDef
lowerMultiplicity = 0
upperMultiplicity = 1
+parameter
EthTrcvAutoNegotiationEnabled : EcucBooleanParamDef
+parameter
EthTrcvSpeed : EcucEnumerationParamDef
+literal
TRCV_SPEED_10 :EcucEnumerationLiteralDef
+literal
TRCV_SPEED_100 :EcucEnumerationLiteralDef
+literal
TRCV_SPEED_1000 :EcucEnumerationLiteralDef
+parameter
EthTrcvDuplexMode : EcucEnumerationParamDef
+literal
ETHTRCV_DUPLEX_MODE_HALF : EcucEnumerationLiteralDef
+literal
ETHTRCV_DUPLEX_MODE_FULL : EcucEnumerationLiteralDef
+parameter
EthTrcvPhysLayerType : EcucEnumerationParamDef
lowerMultiplicity = 0
upperMultiplicity = 1
+literal
TRCV_PHYS_LAYER_TYPE_100BASE_TX : EcucEnumerationLiteralDef
+literal
TRCV_PHYS_LAYER_TYPE_1000BASE_T : EcucEnumerationLiteralDef
+literal
TRCV_PHYS_LAYER_TYPE_100BASE_T1 : EcucEnumerationLiteralDef
+literal
TRCV_PHYS_LAYER_TYPE_1000BASE_T1 : EcucEnumerationLiteralDef
+parameter
EthTrcvPortMacLayerType : EcucEnumerationParamDef
lowerMultiplicity = 0
upperMultiplicity = 1
+literal
TRCV_MAC_LAYER_TYPE_XMII :EcucEnumerationLiteralDef
+literal
TRCV_MAC_LAYER_TYPE_XGMII :EcucEnumerationLiteralDef
+literal
TRCV_MAC_LAYER_TYPE_XXGMII :EcucEnumerationLiteralDef
+parameter
EthTrcvConnNeg : EcucEnumerationParamDef
lowerMultiplicity = 1
upperMultiplicity = 1
+literal
TRCV_CONN_NEG_MASTER : EcucEnumerationLiteralDef
+literal
TRCV_CONN_NEG_SLAVE : EcucEnumerationLiteralDef
+literal
TRCV_CONN_NEG_AUTO : EcucEnumerationLiteralDef
+reference
EthTrcvIcuChannelRef : EcucSymbolicNameReferenceDef
lowerMultiplicity = 0
upperMultiplicity = 1
+destination
IcuChannel : EcucParamConfContainerDe
upperMultiplicity = *
lowerMultiplicity = 1
(from ICU)
+parameter
IcuChannelId : EcucIntegerParamDef
min = 0
max = 65535
symbolicNameValue = true
(from ICU)
EcuMWakeupSourceId : EcucIntegerParamDef
symbolicNameValue = true
min = 0
max = 31
+parameter
(from EcuM)
+parameter
EthTrcvWakeUpCallout : EcucFunctionNameDef
lowerMultiplicity = 0
upperMultiplicity = 1
+subContainer
EthTrcvWakeupMap : EcucParamConfContainerDef
lowerMultiplicity = 0
upperMultiplicity = 7
+reference
EthTrcvWakeupSourceRef : EcucSymbolicNameReferenceDef
lowerMultiplicity = 1
upperMultiplicity = 1
+destination
EcuMWakeupSource :EcucParamConfContainerDef
lowerMultiplicity = 1
upperMultiplicity = 32
(from EcuM)
+parameter
EthTrcvWakeupReason : EcucEnumerationParamDef
lowerMultiplicity = 1
upperMultiplicity = 1
+literal
ETHTRCV_WUR_GENERAL : EcucEnumerationLiteralDef
+literal
ETHTRCV_WUR_BUS : EcucEnumerationLiteralDef
+literal
ETHTRCV_WUR_INTERNAL : EcucEnumerationLiteralDef
+literal
ETHTRCV_WUR_RESET : EcucEnumerationLiteralDef
+literal
ETHTRCV_WUR_POWER_ON : EcucEnumerationLiteralDef
+literal
ETHTRCV_WUR_PIN : EcucEnumerationLiteralDef
+literal
ETHTRCV_WUR_SYSERR : EcucEnumerationLiteralDef

Figure 10.2: Ethernet Transceiver Driver Transceiver configuration structure

10.1.1 EthTrcv

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

Included Containers		
Container Name	***Multiplicity***	***Scope / Dependency***
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

SWS Item	**ECUC_EthTrcv_00016 :**
Container Name	EthTrcvConfigSet
Parent Container	EthTrcv
Description	This container contains the configuration parameters and sub containers of the AUTOSAR EthTrcv module.
Configuration Parameters	

Included Containers		
Container Name	***Multiplicity***	***Scope / Dependency***
EthTrcvConfig	1..*	Configuration of the individual transceiver

10.1.3 EthTrcvConfig

SWS Item	**ECUC_EthTrcv_00012 :**
Container Name	EthTrcvConfig
Parent Container	EthTrcvConfigSet
Description	Configuration of the individual transceiver
Configuration Parameters	

SWS Item	**ECUC_EthTrcv_00071 :**
Name	EthTrcvActAsSlavePassiveEnabled
Parent Container	EthTrcvConfig
Description	Specifies if the ECU is acting as a passive communication slave on the corresponding ComM channel (corresponding ComM channel has ComMNMVariant set to SLAVE_PASSIVE). If the parameter is set to TRUE, the Ethernet transceiver driver shall poll the maintained Ethernet hardware for a signaled Sleep.Indication (according to OA TC10) in the context of the EthTrcv_MainFunction. **Tags:** atp.Status=draft
Multiplicity	0..1
Type	EcucBooleanParamDef
Default value	--
Post-Build Variant Multiplicity	false

Post-Build Variant Value	false		
Multiplicity Configuration Class	***Pre-compile time***	X	All Variants
	Link time	--	
	Post-build time	--	
Value Configuration Class	***Pre-compile time***	X	All Variants
	Link time	--	
	Post-build time	--	
Scope / Dependency	scope: local dependency: This parameter is only valid, if EthTrcvWakeupSleepOnDatalineEnabled is set to TRUE and the corresponding ComM channel has set ComMNMVariant to SLAVE_PASSIVE.		

SWS Item	**ECUC_EthTrcv_00025 :**		
Name	EthTrcvConnNeg		
Parent Container	EthTrcvConfig		
Description	Specifies the connection negotiation of the Ethernet transceiver link.		
Multiplicity	1		
Type	EcucEnumerationParamDef		
Range	TRCV_CONN_NEG_AUTO	Automatic Negotiation	
	TRCV_CONN_NEG_MASTER	Master	
	TRCV_CONN_NEG_NONE	PLCA	
	TRCV_CONN_NEG_SLAVE	Slave	
Post-Build Variant Value	true		
Value Configuration Class	***Pre-compile time***	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local dependency: If EthTrcvEnablePLCA is TRUE this parameter shall be set to TRCV_CONN_NEG_NONE. If EthTrcvEnablePLCA is FALSE and EthTrcvPhysLayerType is set to TRCV_PHYS_LAYER_TYPE_10BASE_T1S this parameter shall be configured (master or slave). Note: 10BASE-T1S can be used with PLCA or CSMA/CD media access.		

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

SWS Item	**ECUC_EthTrcv_00074 :**
Name	EthTrcvForceSleepEnabled
Parent Container	EthTrcvConfig

Description	Specifies if the Ethernet hardware (PHY) support to go to sleep without the confirmation of the Ethernet hardware (PHY) of the linked Ethernet communication partner according to the OA TC10. If the parameter is set to TRUE, the Ethernet hardware (PHY) support to force its hardware state to the sleep state. This is used, if the Ethernet communication partner do not accept the Sleep.Request after the specified repetitions on Sleep.Request (see EthTrcvSleepRequestNumberOfRepetitions). If EthTrcvSleepRequestNumberOfRepetitions is not available, the EthTransceiver driver shall force the Ethernet hardware (PHY) to sleep state after the first unsuccessful Sleep.Request. **Tags:** atp.Status=draft		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	--		
Post-Build Variant Multiplicity	false		
Post-Build Variant Value	false		
Value Configuration Class	***Pre-compile time***	X	All Variants
	Link time	--	
	Post-build time	--	
Scope / Dependency	scope: local dependency: This parameter is only valid, if EthTrcvWakeupSleepOnDatalineEnabled is set to TRUE.		

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

SWS Item	**ECUC_EthTrcv_00044 :**		
Name	EthTrcvMacLayerSpeed		
Parent Container	EthTrcvConfig		
Description	Defines the baud rate of the MAC layer.		
Multiplicity	0..1		
Type	EcucEnumerationParamDef		
Range	ETH_MAC_LAYER_SPEED_100M	--	
	ETH_MAC_LAYER_SPEED_10G	--	
	ETH_MAC_LAYER_SPEED_10M	--	
	ETH_MAC_LAYER_SPEED_1G	--	
	ETH_MAC_LAYER_SPEED_2500M	--	
Post-Build Variant Multiplicity	true		
Post-Build Variant Value	true		
Multiplicity Configuration	***Pre-compile time***	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME, VARIANT-

Class			POST-BUILD
	Post-build time	--	
Value Configuration Class	***Pre-compile time***	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME, VARIANT-POST-BUILD
	Post-build time	--	
Scope / Dependency	scope: ECU		

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

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

Value Configuration Class	***Pre-compile time***	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: ECU		

SWS Item	**ECUC_EthTrcv_00056 :**		
Name	EthTrcvPhysLayerPlcaLocalNodeId		
Parent Container	EthTrcvConfig		
Description	Configuration parameter for the transceiver node ID when the PLCA mode for 10BASE-T1S is used. **Tags:** atp.Status=draft		
Multiplicity	0..1		
Type	EcucIntegerParamDef		
Range	0 .. 255		
Default value	255		
Post-Build Variant Value	false		
Multiplicity Configuration Class	***Pre-compile time***	X	All Variants
	Link time	--	
	Post-build time	--	
Value Configuration Class	***Pre-compile time***	X	All Variants
	Link time	--	
	Post-build time	--	
Scope / Dependency	scope: local dependency: This parameter is only relevant in case that EthTrcvEnablePLCA is set to true. If the value is set to 0, the transceiver is configured as head-node. Note: Within a PLCA cluster the head-node ID shall be unique. A head-node schedules the transmission cycles and the node ID at the client level defines the transmission order.		

SWS Item	**ECUC_EthTrcv_00059 :**		
Name	EthTrcvPhysLayerPlcaMaxBurstCount		
Parent Container	EthTrcvConfig		
Description	Defines maximum packets allowed to be transmitted within a TO. The maximum burst count could differ per ECU within a PLCA mixed segment. **Tags:** atp.Status=draft		
Multiplicity	0..1		
Type	EcucIntegerParamDef		
Range	0 .. 255		
Default value	--		
Post-Build Variant Value	false		
Value Configuration Class	***Pre-compile time***	X	All Variants
	Link time	--	
	Post-build time	--	
Scope / Dependency	scope: local dependency: This parameter is only relevant in case that EthTrcvEnablePLCA is set to true. If EthTrcvPhysLayerPlcaMaxBurstCount is set to 0 (default value), only one ethernet frame per TO shall be transmitted.		

SWS Item	**ECUC_EthTrcv_00060 :**
Name	EthTrcvPhysLayerPlcaMaxBurstTimer
Parent Container	EthTrcvConfig
Description	Limits the burst frames in bit time. The maximum burst time could differ per

	ECU within a PLCA mixed segment. **Tags:** atp.Status=draft		
Multiplicity	0..1		
Type	EcucIntegerParamDef		
Range	0 .. 255		
Default value	128		
Post-Build Variant Value	false		
Value Configuration Class	***Pre-compile time***	X	All Variants
	Link time	--	
	Post-build time	--	
Scope / Dependency	scope: local dependency: This parameter is only relevant in case that EthTrcvEnablePLCA is set to true. Note: For PLCA burst mode to work properly this time should be set greater than one IPG.		

SWS Item	**ECUC_EthTrcv_00058 :**		
Name	EthTrcvPhysLayerPlcaNodeCount		
Parent Container	EthTrcvConfig		
Description	Defines the number of communication participants on the mixed segment. This value is relevant for the head-node transceiver (EthTrcvPhysLayerNodeID = 0) in order to know when the BEACON has to be transmitted. **Tags:** atp.Status=draft		
Multiplicity	0..1		
Type	EcucIntegerParamDef		
Range	0 .. 255		
Default value	8		
Post-Build Variant Value	false		
Multiplicity Configuration Class	***Pre-compile time***	X	All Variants
	Link time	--	
	Post-build time	--	
Value Configuration Class	***Pre-compile time***	X	All Variants
	Link time	--	
	Post-build time	--	
Scope / Dependency	scope: local dependency: This parameter is only relevant in case that EthTrcvEnablePLCA is set to true.		

SWS Item	**ECUC_EthTrcv_00057 :**		
Name	EthTrcvPhysLayerPlcaTransmitOpportunityTimer		
Parent Container	EthTrcvConfig		
Description	Timer for the transmission in bit time to evaluate if a Transmission Opportunity is yield or not. **Tags:** atp.Status=draft		
Multiplicity	0..1		
Type	EcucIntegerParamDef		
Range	1 .. 255		
Default value	32		
Post-Build Variant Value	false		
Multiplicity Configuration Class	***Pre-compile time***	X	All Variants
	Link time	--	
	Post-build time	--	
Value Configuration Class	***Pre-compile time***	X	All Variants

	Link time	--	
	Post-build time	--	
Scope / Dependency	scope: local dependency: This parameter is only relevant in case that EthTrcvEnablePLCA is set to true. This parameter shall be set identical within a PLCA cluster.		

SWS Item	**ECUC_EthTrcv_00024 :**		
Name	EthTrcvPhysLayerType		
Parent Container	EthTrcvConfig		
Description	Specifies the physical layer type of the Ethernet transceiver link.		
Multiplicity	0..1		
Type	EcucEnumerationParamDef		
Range	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.	
	TRCV_PHYS_LAYER_TYPE_10BASE_-T1S	Physical layer interface 10BASE-T1S (10Mbit/s, 2 pairs). Used for automotive.	
Post-Build Variant Multiplicity	true		
Post-Build Variant Value	true		
Multiplicity Configuration Class	***Pre-compile time***	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Value Configuration Class	***Pre-compile time***	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

SWS Item	**ECUC_EthTrcv_00063 :**		
Name	EthTrcvSleepModeExecutionDelay		
Parent Container	EthTrcvConfig		
Description	Specifies the time delay in seconds to execute a sleep (see OA TC10) for a Ethernet hardware (PHY), if a pending wake-up was detected while a ETH_MODE_DOWN was requested. The value shall be an integral multiple of EthTrcvMainFunctionPeriod. **Tags:** atp.Status=draft		
Multiplicity	0..1		
Type	EcucFloatParamDef		
Range	]0 .. INF[		
Default value	--		
Post-Build Variant Multiplicity	false		
Post-Build Variant Value	false		
Multiplicity Configuration Class	***Pre-compile time***	X	All Variants
	Link time	--	
	Post-build time	--	

Value Configuration Class	***Pre-compile time***	X	All Variants
	Link time	--	
	Post-build time	--	
Scope / Dependency	scope: local dependency: This parameter is only valid, if EthTrcvWakeupSleepOnDatalineEnabled is set to TRUE.		

SWS Item	**ECUC_EthTrcv_00072 :**		
Name	EthTrcvSleepRequestNumberOfRepetitions		
Parent Container	EthTrcvConfig		
Description	Specifies the repetitions to trigger a Sleep.Request (according to OA TC10) if a release of the communication channel was triggered by the upper layer (ETH_MODE_DOWN) and a SleepFail.Indication was signaled. Thus, the Ethernet hardware (PHY) of the connected communication partner did not accept the Sleep.Request. **Tags:** atp.Status=draft		
Multiplicity	1		
Type	EcucIntegerParamDef		
Range	0 .. 255		
Default value	0		
Post-Build Variant Value	false		
Value Configuration Class	***Pre-compile time***	X	All Variants
	Link time	--	
	Post-build time	--	
Scope / Dependency	scope: local dependency: This parameter is only valid, if EthTrcvWakeupSleepOnDatalineEnabled is set to TRUE.		

SWS Item	**ECUC_EthTrcv_00073 :**		
Name	EthTrcvSleepRequestRepetitionPeriod		
Parent Container	EthTrcvConfig		
Description	Specifies the repetition period in seconds of repetitions for a Sleep Request (according to OA TC10). The value shall be a integral multiple of EthTrcvMainFunctionPeriod. **Tags:** atp.Status=draft		
Multiplicity	1		
Type	EcucFloatParamDef		
Range	]0 .. INF[		
Default value	--		
Post-Build Variant Value	false		
Value Configuration Class	***Pre-compile time***	X	All Variants
	Link time	--	
	Post-build time	--	
Scope / Dependency	scope: local dependency: This parameter is only valid, if EthTrcvWakeupSleepOnDatalineEnabled is set to TRUE and EthTrcvSleepRequestNumberOfRepetitions is set greater than 0.		

SWS Item	**ECUC_EthTrcv_00022 :**
Name	EthTrcvSpeed
Parent Container	EthTrcvConfig
Description	Specifies the speed of the Ethernet transceiver link in [MBit/s]. If AutoNegotiation is enabled (EthTrcvConnNeg=TRCV_CONN_NEG_AUTO) this is the maximum speed advertised for Auto-Negotiation.
Multiplicity	1

Type	EcucEnumerationParamDef		
Range	TRCV_SPEED_10	10 MBit/s	
	TRCV_SPEED_100	100 MBit/s	
	TRCV_SPEED_1000	1000 MBit/s	
Post-Build Variant Value	true		
Value Configuration Class	***Pre-compile time***	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local dependency: EthTrcvConnNeg=TRCV_CONN_NEG_AUTO		

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

SWS Item	**ECUC_EthTrcv_00067 :**		
Name	EthTrcvWakeupForwardLocalEnabled		
Parent Container	EthTrcvConfig		
Description	Specifies if remote wake up forwarding is enabled (TRUE) or disabled (FALSE) for OA TC10 compliant Ethernet Transceiver. If the parameter is set to TRUE, the Ethernet hardware (PHY) activate a local wake up (e.g. via I/O pin), if a remote wake-up on data line (e.g. 100Base-T1) was received (either WUP or WUR). **Tags:** atp.Status=draft		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	--		
Post-Build Variant Value	false		
Value Configuration Class	***Pre-compile time***	X	All Variants
	Link time	--	
	Post-build time	--	
Scope / Dependency	scope: local dependency: This parameter is only valid, if EthTrcvWakeupSleepOnDatalineEnabled is set to TRUE and if EthTrcvWakeupLocalEnabled is set to TRUE.		

SWS Item	**ECUC_EthTrcv_00068 :**		
Name	EthTrcvWakeupForwardRemoteEnabled		
Parent Container	EthTrcvConfig		
Description	Specifies if local wake up forwarding is enabled (TRUE) or disabled (FALSE) for OA TC10 compliant Ethernet Transceiver. If the parameter is set to TRUE, the Ethernet hardware (PHY) transmit a wake-up (WUP or WUR on the data line (e.g. 100Base-T1), when a local wake-up occurred (e.g. via I/O pin), which was triggered by neighboring Ethernet hardware (PHY). **Tags:** atp.Status=draft		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	--		
Post-Build Variant Value	false		
Value Configuration Class	***Pre-compile time***	X	All Variants
	Link time	--	
	Post-build time	--	
Scope / Dependency	scope: local dependency: This parameter is only valid, if EthTrcvWakeupSleepOnDatalineEnabled is set to TRUE and if EthTrcvWakeupRemoteEnabled set to TRUE.		

SWS Item	**ECUC_EthTrcv_00069 :**		
Name	EthTrcvWakeupLocalDetectionTime		
Parent Container	EthTrcvConfig		
Description	Defines the time in seconds when a local wake-up (e.g. via I/O pin) triggered by a neighboring PHY is evalutated as a valid wake-up. **Tags:** atp.Status=draft		
Multiplicity	0..1		
Type	EcucFloatParamDef		
Range	[1E-6 .. 0.1]		
Default value	--		
Post-Build Variant Multiplicity	false		
Post-Build Variant Value	false		
Multiplicity Configuration Class	***Pre-compile time***	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME, VARIANT-POST-BUILD
	Post-build time	--	
Value Configuration Class	***Pre-compile time***	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME, VARIANT-POST-BUILD
	Post-build time	--	
Scope / Dependency	scope: local dependency: This parameter is only valid, if EthTrcvWakeupSleepOnDatalineEnabled is set to TRUE.		

SWS Item	**ECUC_EthTrcv_00070 :**
Name	EthTrcvWakeupLocalDurationTime
Parent Container	EthTrcvConfig
Description	Defines the duration time in seconds how long a local wake-up should be present on the local wake-up connection (e.g. via I/O pin) to indicate the neighboring PHYs about a wake-up. **Tags:** atp.Status=draft

Multiplicity	0..1		
Type	EcucFloatParamDef		
Range	[1E-6 .. 0.1]		
Default value	--		
Post-Build Variant Multiplicity	false		
Post-Build Variant Value	false		
Multiplicity Configuration Class	***Pre-compile time***	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME, VARIANT-POST-BUILD
	Post-build time	--	
Value Configuration Class	***Pre-compile time***	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME, VARIANT-POST-BUILD
	Post-build time	--	
Scope / Dependency	scope: local dependency: This parameter is only valid, if EthTrcvWakeupSleepOnDatalineEnabled is set to TRUE.		

SWS Item	**ECUC_EthTrcv_00065 :**		
Name	EthTrcvWakeupLocalEnabled		
Parent Container	EthTrcvConfig		
Description	Specifies if local wake-up is enabled (TRUE) or disabled (FALSE) for OA TC10 compliant Ethernet hardware (PHY). If the parameter is set to TRUE, the Ethernet hardware (PHY) is able to detect and react on a wake-up received by a neighboring PHY (e.g. via I/O pin). **Tags:** atp.Status=draft		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	--		
Post-Build Variant Value	false		
Value Configuration Class	***Pre-compile time***	X	All Variants
	Link time	--	
	Post-build time	--	
Scope / Dependency	scope: local dependency: This parameter is only valid, if EthTrcvWakeupSleepOnDatalineEnabled is set to TRUE.		

SWS Item	**ECUC_EthTrcv_00066 :**		
Name	EthTrcvWakeupRemoteEnabled		
Parent Container	EthTrcvConfig		
Description	Specifies if remote wake-up is enabled (TRUE) or disabled (FALSE) for OA TC10 compliant Ethernet hardware (PHY). If the parameter is set to TRUE, the Ethernet hardware (PHY) wake up when receiving a remote wake-up (e.g. via 100Base-T1 data line) triggered by the connected communication partner. **Tags:** atp.Status=draft		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	--		
Post-Build Variant Value	false		
Value Configuration Class	***Pre-compile time***	X	All Variants
	Link time	--	
	Post-build time	--	

Scope / Dependency	scope: local dependency: This parameter is only valid, if EthTrcvWakeupSleepOnDatalineEnabled is set to TRUE.

SWS Item	**ECUC_EthTrcv_00075 :**		
Name	EthTrcvWakeupRequestNumberOfRepetitions		
Parent Container	EthTrcvConfig		
Description	Specifies the repetitions to trigger a wake-up request (according to OA TC10), if an active communication request (ETH_MODE_ACTIVE_WITH_WAKEUP_REQUEST) was triggered by the upperlayer. **Tags:** atp.Status=draft		
Multiplicity	1		
Type	EcucIntegerParamDef		
Range	0 .. 255		
Default value	0		
Post-Build Variant Value	false		
Value Configuration Class	***Pre-compile time***	X	All Variants
	Link time	--	
	Post-build time	--	
Scope / Dependency	scope: local dependency: This parameter is only valid, if EthTrcvWakeupSleepOnDatalineEnabled is set to TRUE.		

SWS Item	**ECUC_EthTrcv_00062 :**		
Name	EthTrcvWakeUpRequestRepetitionPeriod		
Parent Container	EthTrcvConfig		
Description	Specifies the repetition period in seconds of a wake-up request, if an active communication request (ETH_MODE_ACTIVE_WITH_WAKEUP_REQUEST) was triggered by the upperlayer. The value shall be an integral multiple of EthTrcvMainFunctionPeriod. **Tags:** atp.Status=draft		
Multiplicity	0..1		
Type	EcucFloatParamDef		
Range	]0 .. INF[		
Default value	--		
Post-Build Variant Multiplicity	false		
Post-Build Variant Value	false		
Multiplicity Configuration Class	***Pre-compile time***	X	All Variants
	Link time	--	
	Post-build time	--	
Value Configuration Class	***Pre-compile time***	X	All Variants
	Link time	--	
	Post-build time	--	
Scope / Dependency	scope: local dependency: This parameter is only valid, if EthTrcvWakeupSleepOnDatalineEnabled is set to TRUE and EthTrcvSleepRequestNumberOfRepetitions is set greater than 0.		

SWS Item	**ECUC_EthTrcv_00064 :**
Name	EthTrcvWakeupSleepOnDatalineEnabled
Parent Container	EthTrcvConfig
Description	Specifies if wake-up on data line according to OA TC10 is supported by

	the used Ethernet hardware (PHY). If the parameter is set to TRUE, wake-up on data line is supported according to OA TC10. **Tags:** atp.Status=draft		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	--		
Post-Build Variant Value	false		
Value Configuration Class	***Pre-compile time***	X	All Variants
	Link time	--	
	Post-build time	--	
Scope / Dependency	scope: local		

SWS Item	**ECUC_EthTrcv_00051 :**		
Name	EthTrcvConfigEcucPartitionRef		
Parent Container	EthTrcvConfig		
Description	Maps the Ethernet transceiver configuration to zero or one ECUC partitions. The ECUC partition referenced is a subset of the ECUC partitions where the Ethernet transceiver driver is mapped to.		
Multiplicity	0..1		
Type	Reference to [EcucPartition]		
Post-Build Variant Multiplicity	true		
Post-Build Variant Value	true		
Multiplicity Configuration Class	***Pre-compile time***	X	All Variants
	Link time	--	
	Post-build time	--	
Value Configuration Class	***Pre-compile time***	X	All Variants
	Link time	--	
	Post-build time	--	
Scope / Dependency	scope: ECU		

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

Included Containers		
Container Name	***Multiplicity***	***Scope / Dependency***
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.

[SWS_EthTrcv_00157] ⌈
The ECUC partitions referenced by EthTrcvConfigEcucPartitionRef shall be a subset of the ECUC partitions referenced by EthTrcvEcucPartitionRef.⌋()

[SWS_EthTrcv_00158] ⌈
EthTrcvConfig, EthCtrlConfig and EthSwtConfig (if existent in configuration) of one communication channel shall all reference the same ECUC partition.⌋()

[SWS_EthTrcv_CONSTR_00001] ⌈
If EthTrcvEcucPartitionRef references one or more ECUC partitions, EthTrcvConfigEcucPartitionRef shall have a multiplicity of one and reference one of these ECUC partitions as well. ⌋()

10.1.4 EthTrcvDemEventParameterRefs

SWS Item	**ECUC_EthTrcv_00017 :**
Container Name	EthTrcvDemEventParameterRefs
Parent Container	EthTrcvConfig
Description	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.
Configuration Parameters	

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

	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

No Included Containers

10.1.5 EthTrcvMgmtInterface

SWS Item	**ECUC_EthTrcv_00036 :**		
Choice container Name	EthTrcvMgmtInterface		
Parent Container	EthTrcvConfig		
Description	The choice container allow to configure either the EthTrcv is accessed by a MII interface or Switch interface.		
Post-Build Variant Multiplicity	false		
Multiplicity Configuration Class	***Pre-compile time***	X	All Variants
	Link time	--	
	Post-build time	--	

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 transceiver.

10.1.6 EthTrcvMiiInterface

SWS Item	**ECUC_EthTrcv_00037 :**		
Container Name	EthTrcvMiiInterface		
Parent Container	EthTrcvMgmtInterface		
Description	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.		
Post-Build Variant Multiplicity	false		
Multiplicity Configuration Class	***Pre-compile time***	X	All Variants
	Link time	--	
	Post-build time	--	
Configuration Parameters			

SWS Item	**ECUC_EthTrcv_00014 :**	
Name	EthTrcvCtrlIdx	
Parent Container	EthTrcvMiiInterface	
Description	Specifies the controller used for MII access to the transceiver	
Multiplicity	1	
Type	EcucIntegerParamDef	
Range	0 .. 255	
Default value	--	

Post-Build Variant Value	true		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

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

No Included Containers

10.1.7 EthTrcvSwitchInterface

SWS Item	ECUC_EthTrcv_00040 :		
Container Name	EthTrcvSwitchInterface		
Parent Container	EthTrcvMgmtInterface		
Description	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.		
Post-Build Variant Multiplicity	false		
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	--	
	Post-build time	--	
Configuration Parameters			

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

SWS Item	ECUC_EthTrcv_00041 :
Name	EthTrcvSwitchRef
Parent Container	EthTrcvSwitchInterface

Description	Reference to a switch configuration container.		
Multiplicity	1		
Type	Symbolic name reference to [EthSwtConfig]		
Post-Build Variant Value	false		
Value Configuration Class	***Pre-compile time***	X	All Variants
	Link time	--	
	Post-build time	--	
Scope / Dependency	scope: local		

No Included Containers

10.1.8 EthTrcvGeneral

SWS Item	**ECUC_EthTrcv_00001 :**
Container Name	EthTrcvGeneral
Parent Container	EthTrcv
Description	General configuration of Ethernet Transceiver Driver module
Configuration Parameters	

SWS Item	**ECUC_EthTrcv_00003 :**		
Name	EthTrcvDevErrorDetect		
Parent Container	EthTrcvGeneral		
Description	Switches the development error detection and notification on or off. • true: detection and notification is enabled. • false: detection and notification is disabled.		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	false		
Post-Build Variant Value	false		
Value Configuration Class	***Pre-compile time***	X	All Variants
	Link time	--	
	Post-build time	--	
Scope / Dependency	scope: local		

SWS Item	**ECUC_EthTrcv_00054 :**		
Name	EthTrcvEnableCableDiagnosticApi		
Parent Container	EthTrcvGeneral		
Description	Enable/disable the APIs for cable diagnostic: EthTrcv_RunCableDiagnostic, EthTrcv_GetCableDiagnosticsResult		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	--		
Post-Build Variant Value	false		
Value Configuration Class	***Pre-compile time***	X	All Variants
	Link time	--	
	Post-build time	--	
Scope / Dependency	scope: local		

SWS Item	**ECUC_EthTrcv_00055 :**
Name	EthTrcvEnablePLCA
Parent Container	EthTrcvGeneral
Description	Enables the transmission with PLCA (Physical Layer Collision Avoidance)

	TRUE: PLCA enabled FALSE: PLCA disabled **Tags:** atp.Status=draft		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	false		
Post-Build Variant Value	false		
Value Configuration Class	***Pre-compile time***	X	All Variants
	Link time	--	
	Post-build time	--	
Scope / Dependency	scope: local dependency: This parameter is relevant in case that EthTrcvPhysLayerType = TRCV_PHYS_LAYER_TYPE_10BASE_T1S. If PLCA mode is enabled via the parameter EthTrcvEnablePLCA the following parameter must be configured: • EthTrcvPhysLayerPlcaLocalNodeID, • EthTrcvPhysLayerPlcaTransmitOpportunityTime, • EthTrcvPhysLayerPlcaNodeCount, • EthTrcvPhysLayerPlcaMaxBurstTime, • EthTrcvPhysLayerPlcaMaxBurstCount.		

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

SWS Item	**ECUC_EthTrcv_00061 :**		
Name	EthTrcvGetBusWuReasonApi		
Parent Container	EthTrcvGeneral		
Description	Enables / Disables API to obtain the recent wake-up reason detected by the used Ethernet hardware (e.g. PHY). **Tags:** atp.Status=draft		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	false		
Post-Build Variant Value	false		
Value Configuration Class	***Pre-compile time***	X	All Variants
	Link time	--	
	Post-build time	--	
Scope / Dependency	scope: local		

SWS Item	**ECUC_EthTrcv_00011 :**
Name	EthTrcvGetDuplexModeApi
Parent Container	EthTrcvGeneral
Description	Enables / Disables EthTrcv_GetDuplexMode API
Multiplicity	1
Type	EcucBooleanParamDef

Default value	--		
Post-Build Variant Value	false		
Value Configuration Class	***Pre-compile time***	X	All Variants
	Link time	--	
	Post-build time	--	
Scope / Dependency	scope: local		

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

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

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

	ETHTRCV_WAKEUP_NOT_SUPPORTED		

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

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

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

SWS Item	**ECUC_EthTrcv_00047 :**
Name	EthTrcvSetPhyTestModeApi
Parent Container	EthTrcvGeneral
Description	Enables / Disables EthTrcv_SetPhyTestMode API.
Multiplicity	1
Type	EcucBooleanParamDef

Default value	--		
Post-Build Variant Multiplicity	false		
Post-Build Variant Value	false		
Multiplicity Configuration Class	***Pre-compile time***	X	All Variants
	Link time	--	
	Post-build time	--	
Value Configuration Class	***Pre-compile time***	X	All Variants
	Link time	--	
	Post-build time	--	
Scope / Dependency	scope: local		

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

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

SWS Item	**ECUC_EthTrcv_00005 :**		
Name	EthTrcvVersionInfoApiMacro		
Parent Container	EthTrcvGeneral		
Description	Enables / Disables version info API macro implementation		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	false		
Post-Build Variant Value	false		
Value Configuration Class	***Pre-compile time***	X	All Variants
	Link time	--	
	Post-build time	--	
Scope / Dependency	scope: local		

SWS Item	**ECUC_EthTrcv_00030 :**
Name	EthTrcvWakeUpSupport
Parent Container	EthTrcvGeneral
Description	Configures how to detect a signaled wake-up by hardware: polling, asychronous check via signal, interrupt or to not used/not supported. In case detection of a wake-

	up is not support (e.g. wake-up detection not needed or Ethernet hardware does not support wake-up detection), the BSWMD pre-configuration shall be set to ETHTRCV_WAKEUP_NOT_SUPPORTED.		
Multiplicity	1		
Type	EcucEnumerationParamDef		
Range	ETHTRCV_WAKEUP_BY_ASYNCHRONOUS_CHECK	Wake-up detection is done within the main function. Polling of the Ethernet hardware is only done, if a wake-up was signaled. Otherwise the Ethernet hardware is not checked for wake-up.Used e.g. if Ethernet hardware is OA TC10 compliant and the ECU maintain an Ethernet switch.	
	ETHTRCV_WAKEUP_BY_INTERRUPT	Wake-up detection is signaled by interrupt	
	ETHTRCV_WAKEUP_BY_POLLING	Wake-up detection is done by polling continuouslly within the main function	
	ETHTRCV_WAKEUP_NOT_SUPPORTED	Wake up is not supported	
Post-Build Variant Value	false		
Value Configuration Class	***Pre-compile time***	X	All Variants
	Link time	--	
	Post-build time	--	
Scope / Dependency	scope: local		

SWS Item	**ECUC_EthTrcv_00050 :**		
Name	EthTrcvEcucPartitionRef		
Parent Container	EthTrcvGeneral		
Description	Maps the Ethernet transceiver driver to zero or multiple ECUC partitions to make the modules API available in this partition. The Ethernet transceiver driver will operate as an independent instance in each of the partitions.		
Multiplicity	0..*		
Type	Reference to [EcucPartition]		
Post-Build Variant Multiplicity	true		
Post-Build Variant Value	true		
Multiplicity Configuration Class	***Pre-compile time***	X	All Variants
	Link time	--	
	Post-build time	--	
Value Configuration Class	***Pre-compile time***	X	All Variants
	Link time	--	
	Post-build time	--	
Scope / Dependency	scope: ECU		

No Included Containers

[SWS_EthTrcv_00156]⌈
The module will operate as an independent instance in each of the partitions, means the called API will only target the partition it is called in.⌋()

11 Not applicable requirements

[SWS_EthTrcv_00999]
These requirements are not applicable to this specification (BSW00170).