


SCOPE OF APPLICATION All Project/Engineering		SHT/SHTS 1 / 40
Responsibility: Classic AUTOSAR Team	AUTOSAR CanTrcv User Manual	DOC. NO
AUTOSAR CanTrcv User Manual		

Document Change Histroy				
Date (YYYY-MM-DD)	Ver.	Editor	Chap	Content (previous revision -> next revision)
2020-12-15	1.0.0	Autoever	All	- Initial version
2022-03-25	1.0.1.0	HieuTM8	4.3 7.2	- Change log - Update validation rules
2022-03-28	1.0.2.0	HieuTM8	4.3	- Change log
2022-04-29	1.0.3.0	HieuTM8	4.2 4.3	- Change module version - Add change log
2022-05-20	1.0.4.0	HieuTM8	4.2 4.3	- Change module version - Add change log
2022-06-28	1.0.4.1	HJ Seong	4.3	- Add change log
2022-08-02	1.0.5.0	HieuTM8	4.2 4.3	- Change module version - Add change log
2022-10-18	1.0.6.0	HieuTM8	4.2 4.3 4.4.3 5.4 8.5	- Change module version - Add change log - Supported Device List - Add CanTrcvPartialNetwork Settings - Add Configure SpiDataWidth
2022-10-31	1.0.7.0	HieuTM8	4.2 4.3 7.2.1	- Change module version - Add change log - Add ERR070028
2022-12-13	1.0.8.0	HieuTM8	4.2 4.3	- Change module version - Add change log
2023-03-03	1.0.9.0	HieuTM8	4.2 4.3	- Change module version - Add change log
2023-06-02	1.0.10.0	HieuTM8	4.2 4.3	- Change module version - Add change log
2024-02-22	1.0.11.0	Yubin Song	4.2 4.3 4.4 5.1 5.2 9.2 9.5 9.6 9.7 9.8	- Change module version - Add change log - Update Limitation TCAN1145 - Update CanTrcvGeneral for R40 - Add Device to Supported Device List - Delete CANTRCV Module Development chapter - Modify Configure SpiDataWidth add TCAN1145 - Add Device to Supported Device List - Add Guide for PartialNetwork

Edition Date: 2024-02-22	File Name CanTrcv_UM.pdf	Creation Yubin Song	Check Junho Cho	Approval Deekjoo Lee
Document Management System		2024/02/22	2024/02/22	2024/02/22

Table of Contents

1	Overview	4
2	Reference	4
3	AUTOSAR System.....	5
3.1	Overview of Software Layers	5
4	Product Release Notes	5
4.1	Overview	5
4.2	Scope of the Release	5
4.3	Change Log	6
4.3.1	Version 1.0.11.0	6
4.3.2	Version 1.0.10.0	6
4.3.3	Version 1.0.9.0	7
4.3.4	Version 1.0.8.0	9
4.3.5	Version 1.0.7.0	9
4.3.6	Version 1.0.6.0	10
4.3.7	Version 1.0.5.0	10
4.3.8	Version 1.0.4.1	11
4.3.9	Version 1.0.4.0	11
4.3.10	Version 1.0.3.0	11
4.3.11	Version 1.0.2.0	12
4.3.12	Version 1.0.1.0	12
4.3.13	Version 1.0.0.0	12
4.4	Limitations.....	13
4.5	Deviations.....	13
5	Configuration Guide.....	14
5.1	CanTrcvGeneral Settings	14
5.2	CanTrcvConfigSet Settings.....	15
5.3	CanTrcvConfigSet-CanTrcvChannel-CanTrcvAccess Settings	17
5.4	CanTrcvConfigSet-CanTrcvChannel-CanTrcvPartialNetwork Settings	18
6	Application Programming Interface (API).....	19
6.1	Type Definitions.....	19
6.2	Macro Constants.....	20
6.3	Functions.....	20
6.3.1	Operation Mode Control.....	20
6.3.2	Read Mode Status	22
6.3.3	Notes	23

7	Generator	23
7.1	Generator Message	23
7.1.1	Error Messages	23
7.1.2	Warning Messages	27
7.1.3	Information Messages	27
8	SWP Error Code	28
8.1	SWP Error Code List	28
9	Appendix.....	28
9.1	CanTrcv_ArisuCan_PowerDownMode, CanTrcv_ArisuCan_ReadStatus, CanTrcv_ArisuCan_ChangeStopMode, CanTrcv_ArisuCan_VbsenseEnable, CanTrcv_ArisuCan_VbsenseDisable Setting Method	28
9.1.1	Copy the Swcd_CanTrcv.arxml file to System > Swcd_Bsw.....	28
9.1.2	Add Swcd_CanTrcv to GenerateRte item in Generate.py	28
9.1.3	Click on Configure ECU and Generate Code	28
9.1.4	Select Service and I/O items.....	28
9.1.5	Add CanTrcv to Sw Component Instance in RTE module	29
9.1.6	Select or create Runables to use ARISU-CAN's API	30
9.1.7	Click on Configure ECU and Generate Code	34
9.1.8	Activate after selecting CanTrcv in Automatic Connection of Service and I/O	34
9.1.9	Platform Build	35
9.1.10	In Rte.c, check if it is generated as follows.....	35
9.2	ARISU-CAN Control Logic	36
9.3	ARISU-CAN H/W Characteristics.....	37
9.4	Configure SpiDataWidth when using TJA1145, TLE9255W,TCAN1145	38
9.5	Supported Device List.....	38
9.6	Notice for undervoltage when using TJA1145 or TCAN1145	38
9.7	Configuration for Partial Networking.....	39

1 Overview

It is written based on Autosar standard SRS / SWS, refer to the reference document below for more detailed functional description.

Category Interpretation related to setting is as follows..

- Changeable (C) : Items that can be set by the user
- Fixed (F): Items that cannot be changed by user
- NotSupported (N) : Unused items

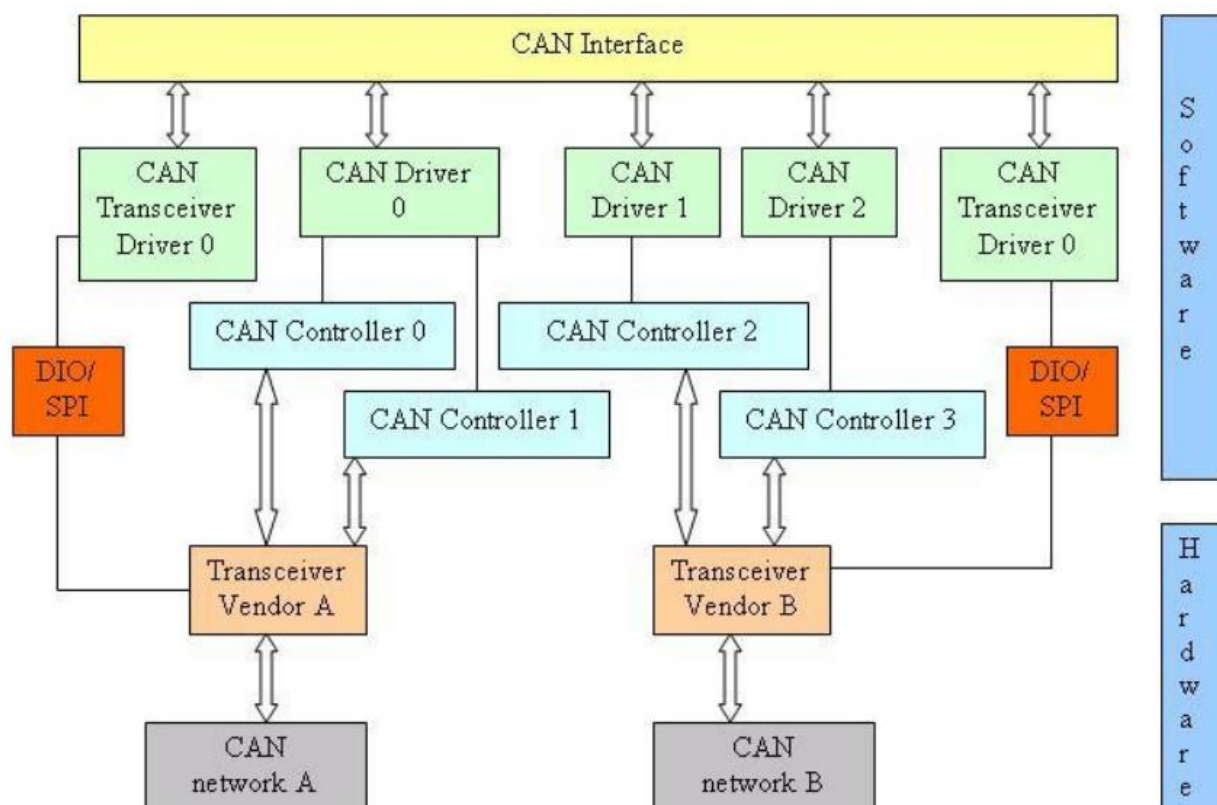
2 Reference

Sl. No.	Title	Version
1	AUTOSAR_SWS_CanTransceiverDriver.pdf	4.4.0
2	ARISU-CAN-TDS_019.pdf	Rev.0.19

3 AUTOSAR System

3.1 Overview of Software Layers

CanTrcv module is a module that controls the Can Transceiver.



4 Product Release Notes

4.1 Overview

The purpose of this chapter is to provide release-related contents for the Hyundai AutoEver CanTrcv module, and to describe specifications and restrictions of the CanTrv Software product release version.

4.2 Scope of the Release

All contents of this document are limited to the following Hyundai AutoEver CanTrcv modules.

Module name	AUTOSAR version	Module version
CanTrcv	4.4.0	1.0.11

※ Module version means the Sw version of each modules's BswModule Description (Bswmd) file.

4.3 Change Log

4.3.1 Version 1.0.11.0

➤ Improvement

■ Support run CanTrcv-R44 on R40 platform

Cause	• R40, R44 module Commonization
Operation effect	None
Setting effect	Add parameter CanTrcv/CanTrcvGeneral/CanTrcvSpiLessAR42 [R40] Scons/Build/Generation/CanTrcv/BswDefines : add "403" [R44] Scons/Build/Generation/CanTrcv/BswDefines : add "440" -Scons/Build/Generation/CanTrcv/AUTOSARR44 : set "true" -Update inputFileList for CanTrcv-R44 -Add CanTrcv.bat file in Build/bat_package for generator
ASW Action	None

➤ Improvement

■ Modify Generator for TCG

Cause	• Modify Generator for TCG
Operation effect	None
Setting effect	None
ASW Action	None

➤ Bug

■ Compile error due to activation of SyserrWakeupSource

Cause	• The SyserrorWakeupSource definition disabled when the PN channel is not used, but invokes the SyserrorWakeupSource inside the function
Operation effect	None
Setting effect	None
ASW Action	None

4.3.2 Version 1.0.10.0

➤ Improvement

■ Improving DIO references to be non-MCU specific

Cause	• CanTrcv DIO references path should be non-MCU specific
Operation effect	None
Setting effect	None

ASW Action	None
------------	------

➤ Improvement

■ Support AR43 DIO for Orin X

Cause	• CanTrcv should support Dio version R4.3.1 for Orin MCU
Operation effect	None
Setting effect	None
ASW Action	None

➤ Improvement

■ Fix compile warning

Cause	• All compile warning should be fixed
Operation effect	None
Setting effect	None
ASW Action	None

4.3.3 Version 1.0.9.0

➤ Bug

■ Change to location that CanTrcv will notify CanIf about the wake up flag has been cleared

Cause	• To change state of CanSM from S_PN_CLEAR_WUF to S_PN_CLEAR_WUF_WAIT, CanTrcv should notify the wake up flag has been cleared after the request to clear wake up flag finish
Operation effect	None
Setting effect	None
ASW Action	None

➤ Bug

■ Missing the logic to check the bit PNFDE for TJA1145

Cause	• When TJA1145 is waiting for the wake up frame, if PNFDE bit is set to 1, the device should be woken up
Operation effect	None
Setting effect	None
ASW Action	None

➤ Improvement

■ Update the value of SPI time out

Cause	• The format value of SPI timeout should be milliseconds
Operation effect	None
Setting effect	None
ASW Action	None

➤ Improvement

■ Improve the logic to get data from PnFrameCanId

Cause	• Only 6 bits should be written into the address 0x29 of TJA1145 in case standard frame format
Operation effect	None
Setting effect	None
ASW Action	None

➤ Bug

■ The logic to clear the wake up flag should be updated

Cause	• All bits that related to wake up status should be cleared when having the request to clear wake up flag by writing 1 to all relevant bits
Operation effect	None
Setting effect	None
ASW Action	None

➤ Bug

■ Update SPI command format to support TJA1145

Cause	• SPI command format should be updated to writing or reading data for TJA1145
Operation effect	None
Setting effect	None
ASW Action	None

➤ Task

■ Improve work products by referring to ASPICE inspection results

Cause	• Improve work products by referring to ASPICE inspection results
Operation effect	None

Setting effect	None
ASW Action	None

➤ Improvement

■ Update CanTrcv to support device TJA1057

Cause	• E-code of CanTrcv should be improved to support TJA1057
Operation effect	None
Setting effect	None
ASW Action	None

➤ Bug

■ The WakeupSource has been generated with wrong value in CanTrcv_CanTrcvNetwork

Cause	• To trigger the wake up event the wakeupsourceid has been generated in CanTrcv should be matched with the wakeupsourceid in EcuM module
Operation effect	None
Setting effect	None
ASW Action	None

4.3.4 Version 1.0.8.0

➤ Improvement

■ Code improvements based on MISRA check results

Cause	• MISRA rules should be improved
Operation effect	None
Setting effect	None
ASW Action	None

4.3.5 Version 1.0.7.0

➤ Improvement

■ Update Tcode to match PostBuild requirements

Cause	• PostBuild feature of CanTrcv should be improved
Operation effect	None
Setting effect	None
ASW Action	None

4.3.6 Version 1.0.6.0

➤ Improvement

■ Update MemMap CanTrcv_PartialNetwork

Cause	• The MemMap section should be corrected
Operation effect	None
Setting effect	None
ASW Action	None

■ Improve code for SPI Data Width

Cause	• CanTrcv SPI communication should be improved
Operation effect	None
Setting effect	None
ASW Action	None

➤ Feature

■ Porting the new SIC transceiver (NXP TJA1463)

Cause	• Porting the new SIC transceiver (NXP TJA1463)
Operation effect	None
Setting effect	None
ASW Action	None

4.3.7 Version 1.0.5.0

➤ Feature

■ Developing for Mcal SPI R440 compatibility

Cause	• Develop to be compatible with Mcal SPI R440
Operation effect	None
Setting effect	None
ASW Action	None

➤ Improvement

■ Fix UNECE violations

Cause	• Security coding rule should be improved based on the R44 RTU
Operation effect	None

Setting effect	None
ASW Action	None

4.3.8 Version 1.0.4.1

➤ Task

■ Editorial Changes of Work Products

Cause	<ul style="list-style-type: none"> • Clarify the copyright of code • Divide 'delivery' folder into 'delivery/src' and 'delivery/inc'
Operation effect	None
Setting effect	None
ASW Action	None

4.3.9 Version 1.0.4.0

➤ Defect

■ Generate CanTrcvSPICommRetries parameter with wrong value

Cause	Generate CanTrcvSPICommRetries parameter with wrong value
Operation effect	None
Setting effect	None
ASW Action	None

■ Apply new MCAL TC3XX_V2_10_0_AS440

Cause	Apply new MCAL TC3XX_V2_10_0_AS440
Operation effect	None
Setting effect	None
ASW Action	None

➤ Change Request

■ Static Code change request as Exclusive Area Macro creation function is added to RTE R44

Cause	Ensure compatibility with SchM_Enter/Exit macro functions
Operation effect	None
Setting effect	None
ASW Action	None

4.3.10 Version 1.0.3.0

➤ Change Request

■ Fix UNECE security coding rule violations

Cause	CanTrcv should follow UNECE security coding rule
Operation effect	None
Setting effect	None
ASW Action	None

■ Fix unreviewed Polyspace Code Metrics

Cause	All code metrics should be review
Operation effect	None
Setting effect	None
ASW Action	None

4.3.11 Version 1.0.2.0

➤ Defect

■ Fix issue compile error - 'Can not open #include file "StandardTypes.h"'

Cause	Modify include from "StandardTypes" to "Std_Types" in CanTrcv_IntTypes.h
Operation effect	None
Setting effect	None
ASW Action	None

4.3.12 Version 1.0.1.0

➤ Defect

■ Fix issue generation tool crash when config TJA1145

Cause	Add validation rules to fix issue crash code when config TJA1145: Modify ERR070002, Add ERR070026, ERR070027
Operation effect	None
Setting effect	None
ASW Action	None

4.3.13 Version 1.0.0.0

➤ Feature

■ Initial Version

Cause	Initial Version
Operation effect	None
Setting effect	None
ASW Action	None

4.4 Limitations

- Transceiver SPI control function not supported
I / O Port and SPI are the methods to control the Transceiver, and the control method using SPI is not supported at present (except ARISU-CAN, TJA1145, UJA1169, TLE9255W, TCAN1145).
- Controls Power Supply not supported
Transceiver functions as ECU power control function.
- Max baudrate related functions are not supported
When setting Max Baudrate in CanTrcv Hardware, this function compares the Max Baudrate of the device and generates an error.
- Only one ARISU-CAN Device can be supported
CanTrcv module can support only one ARISU-CAN Device.
- ARISU-CAN is set to Default Off regardless to CanTrcvInitState item of SRS.

4.5 Deviations

- None

5 Configuration Guide

The setting of CanTrcv in the AUTOSAR platform distributed by Hyundai AutoEver reflects Hyundai AutoEver's policy, so user must consult with Hyundai AutoEver when changing.

If there are restrictions on the use of CanTrcv, user must discuss with Hyundai AutoEver. (Controller characteristics and control order, etc. need considering when controlling CanTrcv.)

5.1 CanTrcvGeneral Settings

Parameter Name	Value	Category
CanTrcvDevErrorDetect	True	F
CanTrcvGetVersionInfo	False	F
CanTrcvSPICommRetries	-	N
CanTrcvSPICommTimeout	-	N
CanTrcvWaitCount	-	F
CanTrcvWakeUpSupport	CANTRCV_WAKEUP_NOT_SUPPORTED	F
ArisuCanPwmAutoSupport	From SRS	C
CanTrcvSpiLessAR42	-	C
[Only for R40] CanTrcvTCAN1043AwaitCount	-	C

- 1) CanTrcvDevErrorDetect
 - DET function On/Off setting.
 - It is basically used as True, and can be set to False by user request and consultation.
- 1) CanTrcvGetVersionInfo
 - Whether to provide version reading API.
- 2) CanTrcvSPICommRetries
 - Number of re-try when setting SPI.
- 3) CanTrcvSPICommTimeout
 - Time to wait for reply when setting SPI.
- 4) CanTrcvWaitCount
 - Time to wait for mode change of Transceiver Hardware.
- 5) CanTrcvWakeUpSupport
 - CANTRCV_WAKEUP_NOT_SUPPORTED : Wake up is not provided by Transceiver Hardware.
 - CANTRCV_WAKEUP_BY_POLLING : Provides wake up function by reading Transceiver's specific register by polling method.

6) ArisuCanPwmAutoSupport

- Support PwmAuto function of ARISU-CAN Device.
- True : PwmAuto is enabled.
- False : PwmAuto is disabled.

7) CanTrcvSpiLessAR42

- Support for spi ar40.
- True: Support SPI MCAL AR4.0,AR4.1 Version, False: Support SPI MCAL AR4.2 or Higher Version .

8) CanTrcvTCAN1043AWaitCount

- This parameter is for R40
- Time to Wait for mode change of TCAN1043A Hardware.
- Calculate and set the CPU clock value to be 20us or higher based on the following equation
- $TCAN1043AWaitCount \geq CPU\ clock(Mhz) * 20$

5.2 CanTrcvConfigSet Settings

Parameter Name	Value	Category
CanTrcvChannelId	-	F
CanTrcvChannelUsed	True	F
CanTrcvControlsPowerSupply	-	N
CanTrcvHwPnSupport	-	N
CanTrcvInitState	From SRS	F
CanTrcvWakeupByBusUsed	-	N
CanTrcvHwDevName	From SRS	F
CanTrcvSleepModeUsed	From SRS	F
[Only for R44]		C
CanTrcvChannelEcucPartitionRef	-	C
[Only for R44]		C
CanTrcvIcuChannelRef	-	C
[Only for R44]		C
CanTrcvPorWakeupSourceRef	-	C
[Only for R44]		C
CanTrcvSyserWakeupSourceRef	-	C

1) CanTrcvChannelId

- Unique identifier of the CAN Transceiver Channel.

2) CanTrcvChannelUsed

- Check if channel is used.

- 3) CanTrcvControlsPowerSupply
 - Function to control the ECU power supply by transceiver (not supported).
- 4) CanTrcvHwPnSupport
 - CanTrcv Hardware provides partial network related functions.
- 5) CanTrcvInitState (ARISU-CAN is set to Default Off regardless to CanTrcvInitState)
 - CANTRCV_OP_MODE_SLEEP : Transceiver Sleep Mode
 - CANTRCV_OP_MODE_STANDBY : Transceiver Standby Mode
- 6) CanTrcvWakeupByBusUsed
 - True if Transceiver's H / W Register (Wake up related) is used, False if.
- 7) CanTrcvHwDevName
 - Supported CanTrcv Device Name
 - Supported Device List
TJA1040, TJA1041, TJA1041A, TJA1042, TJA1043, TJA1044, TJA1050, TJA1051, TJA1054,
TJA1054A, TJA1055, TJA1057, TJA1145, UJA1169, TLE6250G, TLE6251DS, TLE6251G, TLE6251-
3G, TLE6254-2G, TLE6254-3G, TLE7250G, TLE7250LE, TLE9250SJ, TLE9251VSJ, TLE9255W,
ARISU-CAN, NCV7342, TCAN1043A, TCAN1044, TCAN1057, TCAN1145, TJA1059.
- 8) CanTrcvSleepModeUsed (except ARISU-CAN)
 - Decide whether to use Standby or Sleep among Tranceiver functions
 - False : Using Standby
 - True : Using Sleep
 - Standby / Sleep cannot be used at the same time.
- 9) CanTrcvChannelEcucPartitionRef
 - Maps the CAN transceiver channel to zero or one ECUC partitions.
 - The ECUC partition referenced is a subset of the ECUC partitions where the CAN transceiver driver is mapped to.
- 10) CanTrcvIcuChannelRef
 - Reference to the IcuChannel to enable/disable the interrupts
- 11) CanTrcvPorWakeupSourceRef
 - Symbolic name reference to specify the wakeup sources that should be used in the calls to EcuM_SetWakeupEvent.
 - This reference is mandatory if the HW supports POR flags
 - Reference only for TJA1145, UJA1169, TLE9255W, TCAN1145

12) CanTrcvSyserrWakeupSourceRef

- Symbolic name reference to specify the wakeup sources that should be used in the calls to EcuM_SetWakeupEvent.
- This reference is mandatory if the HW supports Syserr flags
- Reference only for TJA1145, UJA1169, TLE9255W, TCAN1145

5.3 CanTrcvConfigSet-CanTrcvChannel-CanTrcvAccess Settings

Parameter Name	Value	Category
Dio Access	From SRS	F
CanTrcvHardwareInterfaceName	From SRS	F
CanTrcvDioSymNameRef	From SRS	F
Spi Access	From SRS	F
CanTrcvSpiAccessSynchronous	From SRS	F
CanTrcvArisucanModeOnNormal	From SRS	F
CanTrcvArisucanModeOnStop	From SRS	F
CanTrcvArisucanModeOnSleep	From SRS	F
CanTrcvSpiSequenceName	From SRS	F
CanTrcvSpiCSGpioNameRef	From SRS	F
[Only for R44] CanTrcvLocalWakeupDirection		C
[Only for R44] CanTrcvXJA11XXCanModeOnNormal		C

1) Dio Access

- Ability to set CanTrcv control to Dio

2) CanTrcvHardwareInterfaceName

- CanTrcv Hardware Interface Name

3) CanTrcvDioSymNameRef

- Dio Port used for CanTrcv control

* CanTrcvHardwareInterfaceName has different setting parameter values depending on the device.

Interface 1 : CanTrcvHardwareInterfaceName contains 'EN'

Interface 2 : CanTrcvHardwareInterfaceName contains 'STB', 'EN'

* For details, refer to the pin map of the relevant transceiver.

4) CanTrcvSpiAccess

- Ability to set CanTrcv control to Spi

5) CanTrcvSpiAccessSynchronous

- CanTrcv control method (Synchronous / Asynchronous) setting.

6) CanTrcvArisucanModeOnNormal(ARISU-CAN only)

- CAN Transceiver mode setting in ARISU-CAN SBC Normal mode.
- 7) CanTrcvArisucanModeOnStop(ARISU-CAN only)
 - CAN Transceiver mode setting in ARISU-CAN SBC Stop mode.
- 8) CanTrcvArisucanModeOnSleep(ARISU-CAN only)
 - CAN Transceiver mode setting in ARISU-CAN SBC Sleep mode.
- 9) CanTrcvSpiSequenceName
 - Spi Sequence used for ARISU-CAN control.
- 10) CanTrcvSpiCSGpioNameRef
 - Dio Port for CS used for ARISU-CAN control.
- 11) CanTrcvLocalWakeupDirection
 - Local wake-up direction.
 - This parameter only valid when CanTrcvHwDevName is TJA1145/UJA1169/TLE9255W/TCAN1145.
- 12) CanTrcvXJA11XXCanModeOnNormal
 - CAN Transceiver mode setting in CAN mode on Normal
 - This parameter only valid when CanTrcvHwDevName is TJA1145/UJA1169/TLE9255W/TCAN1145.

5.4 CanTrcvConfigSet-CanTrcvChannel-CanTrcvPartialNetwork Settings

Parameter Name	Value	Category
CanTrcvBusErrFlag	false	C
CanTrcvPnCanIdsExtended	false	C
CanTrcvPnEnabled	false	C
CanTrcvPowerOnFlag	false	C
CanTrcvBaudRate	-	C
CanTrcvPnFrameCanId	-	C
CanTrcvPnFrameCanIdMask	-	C
CanTrcvPnFrameDlc	-	C
CanTrcvPnDlcMatchingCondition	false	C
CanTrcvPnFrameDataMaskSpec	-	C

1. CanTrcvBusErrFlag

- Indicates if the Bus Error (BUSERR) flag is managed by the BSW

2. CanTrcvPnCanIdsExtended

- Indicates whether extended or standard ID is used.

3. CanTrcvPnEnabled

- Indicates whether the selective wake-up function is enabled or disabled in HW.

4. CanTrcvPowerOnFlag

- Description: Indicates if the Power On Reset (POR) flag is available and is managed by the transceiver.

5. CanTrcvBaudRate

- Indicates the data transfer rate in kbps.

6. CanTrcvPnFrameCanId

- CAN ID of the Wake-up Frame (WUF).

7. CanTrcvPnFrameCanIdMask

- ID Mask for the selective activation of the transceiver.

8. CanTrcvPnFrameDlc

- Data Length of the Wake-up Frame (WUF).

9. CanTrcvPnDlcMatchingCondition

- Enabled or disabled DLC matching condition for wake-up(data length code and data field)

10. CanTrcvPnFrameDataMaskSpec

- Data Mask setting of Wake-up Frame

6 Application Programming Interface (API)

6.1 Type Definitions

None

6.2 Macro Constants

None

6.3 Functions

6.3.1 Operation Mode Control

Function Name	CanTrcv_ArisuCan_PowerDownMode	
Syntax:	FUNC(Std_ReturnType, CANTRCV_CODE) CanTrcv_ArisuCan_PowerDownMode()	
Service ID	N/A	
Sync/Async	Synchronous	
Reentrancy	Reentrant	
Parameters (In)	None	
Parameters (Inout)	None	
Parameters (Out)	None	
Return Value	Std_ReturnType	E_OK: will be returned if the transceiver state change
		E_NOT_OK: will be returned if the transceiver state change has failed
Description	This service sets ARISU-CAN Mode to Sleep Mode(PowerDown)	
Preconditions	The CAN Transceiver Driver must be initialized	

- Return Value must be confirmed.

Function Name	CanTrcv_ArisuCan_ChangeStopMode	
Syntax:	FUNC(Std_ReturnType, CANTRCV_CODE) CanTrcv_ArisuCan_ChangeStopMode(void)	
Service ID	N/A	
Sync/Async	Synchronous	
Reentrancy	Reentrant	
Parameters (In)	None	
Parameters (Inout)	None	
Parameters (Out)	None	
Return Value	Std_ReturnType	E_OK: will be returned if the transceiver SBC Mode change
		E_NOT_OK_CANMODE : will be returned if the transceiver Can mode is not SBC Stop Can mode
		E_NOT_OK_SBCSTOP : will be returned if SBC Mode is not STOP
		E_NOT_OK: will be returned if the transceiver state change has failed
Description	This service sets ARISU-CAN Mode to Stop Mode	
Preconditions	The CAN Transceiver Driver must be initialized	

- Refer to the ARISU-CAN Application Note or Minutes for H / W configuration requirements, voltage judgment, functions and operation.

- Return Value must be confirmed. If it is not E_OK, ARISU-CAN SBC mode cannot be switched to STOP mode. When entering Low Power in this state, problems such as power consumption may occur.
- The API must be called while the channels using ARISU-CAN are No Communication.
- When using the API to return to PFM mode in Low Power mode, etc., all operations must be completed and executed.

(In some cases, the ARISU-CAN device may wake up)

- If the corresponding API is called while the communication mode is Full Communication, the ARISU-CAN SBC mode cannot be converted to the STOP mode (E_NOT_OK_CANMODE). Entering Low Power in this state may cause Power Consumption problems.
- If the ARISU-CAN regulator is not in the normal operating state, H / W problems may occur when the API is called.
- In order to enter the SBC STOP mode, all CAN Transceivers must be changed to the STOP mode, but this occurs when the change has not been made.
- E_NOT_OK_SBCSTOP : After calling the API, ARISU-CAN must be in STOP mode, but when reading the mode, it is not in STOP mode.
- E_NOT_OK : Occurs when normal command is impossible due to MCAL SPI operation error.
- Refer to item 4 of ARISU-CAN H / W characteristic in 9.3.

Function Name	CanTrcv_ArisuCan_VbsenseEnable	
Syntax:	FUNC(Std_ReturnType, CANTRCV_CODE) CanTrcv_ArisuCan_VbsenseEnable(void)	
Service ID	N/A	
Sync/Async	Synchronous	
Reentrancy	Reentrant	
Parameters (In)	None	
Parameters (Inout)	None	
Parameters (Out)	None	
Return Value	Std_ReturnType	E_OK: will be returned if the Vbsense Enable Bit of ARISU-CAN is set '1'
		E_NOT_OK: will be returned if the Vbsense Enable Bit of ARISU-CAN is set '0'
Description	This service sets Vbsense enable bit of ARISU-CAN to Enable Mode	
Preconditions	The CAN Transceiver Driver must be initialized	

- Refer to the ARISU-CAN Application Note or Minutes for H / W configuration requirements, voltage judgment, functions and operation.

- This API turns on the function related to VBSENSE (Battery Voltage Monitoring) of the ARISU-CAN Device. For details about functions and operations, refer to the ARISU-CAN Application Note or Minutes.
- Available only when SBC mode of ARISU-CAN is NORMAL.
- Refer to item 4 of ARISU-CAN H / W characteristic in 9.3.

Function Name	CanTrcv_ArisuCan_VbsenseDisable	
Syntax:	FUNC(Std_ReturnType, CANTRCV_CODE) CanTrcv_ArisuCan_VbsenseDisable(void)	
Service ID	N/A	
Sync/Async	Synchronous	
Reentrancy	Reentrant	
Parameters (In)	None	
Parameters (Inout)	None	
Parameters (Out)	None	
Return Value	Std_ReturnType	E_OK: will be returned if the Vbsense Enable Bit of ARISU-CAN is set '0'
		E_NOT_OK: will be returned if the Vbsense Enable Bit of ARISU-CAN is set '1'
Description	This service sets Vbsense enable bit of ARISU-CAN to Disable Mode	
Preconditions	The CAN Transceiver Driver must be initialized	

- Refer to the ARISU-CAN Application Note or Minutes for H / W configuration requirements, voltage judgment, functions and operation.
- This API turns off the function related to VBSENSE (Battery Voltage Monitoring) of the ARISU-CAN Device. For details about functions and operations, refer to the ARISU-CAN Application Note or Minutes.
- Available only when SBC mode of ARISU-CAN is NORMAL.
- Refer to item 4 of ARISU-CAN H / W characteristic in 9.3.

6.3.2 Read Mode Status

Function Name	CanTrcv_ArisuCan_ReadStatus
Syntax:	FUNC(Std_ReturnType, CANTRCV_CODE) CanTrcv_ArisuCan_ReadStatus (P2VAR(CanTrcv_ArisuCanType, AUTOMATIC, CANTRCV_VAR) Address, P2VAR(CanTrcv_ArisuCanType, AUTOMATIC, CANTRCV_VAR) Data)

Service ID	N/A	
Sync/Async	Synchronous	
Reentrancy	Reentrant	
Parameters (In)	Address	
Parameters (Inout)	None	
Parameters (Out)	Data	
Return Value	Std_ReturnType	E_OK: will be returned if the transceiver state read succeeded
		E_NOT_OK: will be returned if the transceiver state read failed
Description	This service can read Register of ARISU-CAN	
Preconditions	The CAN Transceiver Driver must be initialized	

- Return Value must be confirmed.
- This API provides ARISU-CAN Register Read function.
- Refer to Reference [2] for ARISU-CAN information such as address and data.
- Refer to 8 Appendix for usage examples

6.3.3 Notes

None

7 Generator

7.1 Generator Message

Options	Description
-H/-Help	To display help regarding usage of the tool.
-O/-Output	To generate the output files in the specified directory location.
-V/-Version	To display the copyright information and the tool version.
-L/-Log	To generate \"\$BswConfig::Lis_File_Name\" file.
-D/-DryRun	To execute in validation mode.
-I/-Info	To disable an Information Message(s).
-W/-Warn	To disable Warning Message(s).
-P/-Prefix	To attach Prefix \"DioConf_DioChannel_\".

7.1.1 Error Messages

This section helps to analyze the errors or warnings displayed during the execution of the tool. It ensures conformance of input file(s) with syntax and semantics.

The Generation Tool displays errors or warnings or information when the user has configured incorrect inputs. The format of Error/Warning/Information message is as shown below:

- ERR/WRN/INF<mid> <xxx>: < Error/Warning/Information Message>

Where,

<mid>: 70 – CanTrcv Module Id (70) for user configuration checks.

000 - for command line checks.

<xxx>: 001 - 999 - Message ID.

- File Name : Name of the file in which the error has occurred
- Path : Absolute path of the container in which the parameter is present

'File Name' and 'Path' are optional.

Below section provides the list of module specific error, warning and information messages.

ERR070002: Mandatory module is not present in the input files

This error may occur due to incorrect configuration input files list of module.

ERR070004: The value of the parameter <parameter name> should be unique in the container 'container name'.

This error occurs if CanTrcv channel ids are not unique

ERR070005: The value of the parameter CanTrcvChannelId should start with '<0>' and should be sequential.

This error occurs if The value of the parameter CanTrcvChannelId should start with 0 and should be sequential.

ERR070006: 'device name' in container 'channel name' does not have SleepMode, so parameter CanTrcvSleepModeUsed should be configured FALSE.

This error occurs if 'device name' in container 'channel name' does not have SleepMode, so parameter CanTrcvSleepModeUsed should be configured FALSE

ERR070007: Parameter CanTrcvInitState in container 'channel name' should not be configured CANTRCV_OP_MODE_SLEEP, since value of the parameter CanTrcvSleepModeUsed in container 'channel name' is configured as FALSE.

This error occurs if Parameter CanTrcvInitState in container 'channel name' should not be configured CANTRCV_OP_MODE_SLEEP, since value of the parameter CanTrcvSleepModeUsed in container 'channel name' is configured as FALSE

ERR070008: 'channel name' in container 'channel' does not have SleepMode, so parameter CanTrcvInitState in container 'channel' should not be configured CANTRCV_OP_MODE_SLEEP.

This error will occur, if 'channel name' in container 'channel' does not have SleepMode, so parameter CanTrcvInitState in container 'channel' should not be configured CANTRCV_OP_MODE_SLEEP.

ERR070009: 'HWdevname' in container 'CanTrcv channel' should have 'STB'/'S'/'NSTB'/'INH'/'NEN'

and 'EN'/'ENT' Hardware Interface Name (and 'NERR'/'RXD' Hardware Interface Name when CanTrcvWakeupByBusUsed is configured as true), check Hardware Interface Name.

This error will occur, if 'HWdevname' in container 'CanTrcv channel' should have 'STB'/'S'/'NSTB'/'INH'/'NEN' and 'EN'/'ENT' Hardware Interface Name (and 'NERR'/'RXD' Hardware Interface Name when CanTrcvWakeupByBusUsed is configured as true), check Hardware Interface Name

ERR070010: 'HWdevname' in container 'CanTrcv channel' should have one 'STB'/'S'/'NSTB'/'INH'/'NEN' Hardware Interface Name (and 'NERR'/'RXD' Hardware Interface Name when CanTrcvWakeupByBusUsed is configured as true), check Hardware Interface Name.

This error will occur, if 'HWdevname' in container 'CanTrcv channel' should have one 'STB'/'S'/'NSTB'/'INH'/'NEN' Hardware Interface Name (and 'NERR'/'RXD' Hardware Interface Name when CanTrcvWakeupByBusUsed is configured as true), check Hardware Interface Name.

ERR070011: 'ARISU_CAN0' should be configured Arisucan Mode(Normal/Stop/Sleep).

This error will occur, if 'ARISU_CAN0' is not configured Arisucan Mode(Normal/Stop/Sleep).

ERR070012: 'ARISU_CAN1' should be configured Arisucan Mode(Normal/Stop/Sleep).

This error will occur, if 'ARISU_CAN1' is not configured Arisucan Mode(Normal/Stop/Sleep).

ERR070013: 'ARISU_CAN2' should be configured Arisucan Mode(Normal/Stop/Sleep).

This error will occur, if 'ARISU_CAN2' is not configured Arisucan Mode(Normal/Stop/Sleep).

ERR070014: 'ARISU_CAN3' should be configured Arisucan Mode(Normal/Stop/Sleep).

This error will occur, if 'ARISU_CAN3' is not configured Arisucan Mode(Normal/Stop/Sleep).

ERR070015: Parameter 'CanTrcvSpiSequenceName' should be configured, since value of the parameter 'CanTrcvHwDevName' in container 'CanTrcv channel' is configured as 'Device name'.

This error will occur, if Parameter 'CanTrcvSpiSequenceName' should be configured, since value of the parameter 'CanTrcvHwDevName' in container 'CanTrcv channel' is configured as 'Device name'.

[Only for R44]

ERR070017: The reference path of parameter 'CanTrcvPorWakeupSourceRef' in container 'CanTrcv channel' should not be empty, since value of the parameter 'CanTrcvHwDevName' in container 'CanTrcv channel' is configured as 'Device name'.

This error will occur, if The reference path of parameter 'CanTrcvPorWakeupSourceRef' in container 'CanTrcv channel' should not be empty, since value of the parameter 'CanTrcvHwDevName' in container 'CanTrcv channel' is configured as 'Device name'.

[Only for R44]

ERR070018: The reference path of parameter 'CanTrcvSyserrWakeupSourceRef' in container 'CanTrcv

channel' should not be empty, since value of the parameter 'CanTrcvHwDevName' in container 'CanTrcv channel ' is configured as 'Device name'.

This error will occur, if The reference path of parameter ' CanTrcvSyserrWakeupSourceRef ' in container 'CanTrcv channel' should not be empty, since value of the parameter 'CanTrcvHwDevName' in container 'CanTrcv channel ' is configured as 'Device name'.

[Only for R44]

ERR070019: The reference path of parameter 'CanTrcvWakeupSourceRef' in container 'CanTrcv channel' should not be empty, since value of the parameter 'CanTrcvHwDevName' in container 'CanTrcv channel ' is configured as 'Device name'.

This error will occur, if The reference path of parameter 'CanTrcvWakeupSourceRef' in container 'CanTrcv channel' should not be empty, since value of the parameter 'CanTrcvHwDevName' in container 'CanTrcv channel ' is configured as 'Device name'.

ERR070020: Value of the parameter 'CanTrcvBaudRate' in the container 'CanTrcvPartialNetwork' should be less than or equal to the value of the parameter 'CanTrcvMaxBaudrate' in conatainer 'CanTrcv channel'.

This error will occur, if Value of the parameter 'CanTrcvBaudRate' in the container 'CanTrcvPartialNetwork' should be less than or equal to the value of the parameter 'CanTrcvMaxBaudrate' in conatainer 'CanTrcv channel'.

[Only for R44]

ERR070021: The reference path of parameter 'CANTRCV_E_BUS_ERROR' in container 'CanTrcvDemEventParameterRefs' should not be empty, since value of the parameter 'CanTrcvBusErrFlag' in container 'CanTrcvPartialNetwork' in channel 'channel name' is configured as TRUE.

This error will occur, if The reference path of parameter 'CANTRCV_E_BUS_ERROR' in container 'CanTrcvDemEventParameterRefs' should not be empty, since value of the parameter 'CanTrcvBusErrFlag' in container 'CanTrcvPartialNetwork' in channel 'channel name' is configured as TRUE.

[Only for R44]

ERR070022: 'CanTrcvLocalWakeupDirection' in channel 'channel name' should be configured when CanTrcvHwDevName is configured as 'device name'

This error will occur, if 'CanTrcvLocalWakeupDirection' in channel 'channel name' should be configured when CanTrcvHwDevName is configured as 'device name'

[Only for R44]

ERR070023: 'CanTrcvXJA11XXCanModeOnNormal' in channel 'channel name' should be configured when CanTrcvHwDevName is configured as 'device name'.

This error will occur, if 'CanTrcvLocalWakeupDirection' in channel 'channel name' should be configured when CanTrcvHwDevName is configured as 'device name'

ERR070024: The parameter 'EcucPostBuildVariantRef' should be configured, since value of

ImplementConfigVariant is configured as VARIANT-POST-BUILD-SELECTABLE

This error will occur, if The parameter 'EcucPostBuildVariantRef' should be configured, since value of ImplementConfigVariant is configured as VARIANT-POST-BUILD-SELECTABLE

ERR070025: The number of variants configured for parameter ' CanTrcvPartialNetwork' in container 'channel name' should be equal to number of variant configured in EcucPostBuildVariantRef.

This error will occur, if the number of variants configured for parameter ' CanTrcvPartialNetwork' in container 'channel name' should be equal to number of variant configured in EcucPostBuildVariantRef

ERR070026: The number of CanTrcvSpiSequenceName in Container CanTrcvSpiSequence should be equal one.

This error will occur, if The number of CanTrcvSpiSequenceName in Container CanTrcvSpiSequence is not configured one.

[Only for R44]

ERR070027: Mismatch SYNCHRONOUS/ASYNCHRONOUS between CanTrcvSpiAccessSynchronous of CanTrcv channel and SpiHwUnitSynchronous of SpiJob in Spi module.

This error will occur, if Mismatch SYNCHRONOUS/ASYNCHRONOUS between CanTrcvSpiAccessSynchronous of CanTrcv channel '<CanTrcvchannelname>' and SpiHwUnitSynchronous of SpiJob '<SpiJobname>' in Spi module.

ERR070028: Mismatch Variant between CanTrcv and EcuC.

This error will occur, if the number variant in CanTrcv is difference with the number variant in EcuC.

7.1.2 Warning Messages

WRN070001: 'CanTrcvWakeUpSupport' is configured as CANTRCV_WAKEUP_BY_POLLING but do not have any channels configured CanTrcvWakeupByBusUsed as TRUE.

This WRN message occurs when CanTrcvWakeUpSupport is configured as CANTRCV_WAKEUP_BY_POLLING but do not have any channels configured CanTrcvWakeupByBusUsed as TRUE.

7.1.3 Information Messages

INF070001: Value of the parameter 'CanTrcvWakeupByBusUsed' in the container 'CanTrcv channel' is ignored, since the value of the parameter 'CanTrcvWakeUpSupport' in the container 'CanTrcvGeneral' is configured as CANTRCV_WAKEUP_NOT_SUPPORTED.

This information message occurs when Value of the parameter 'CanTrcvWakeupByBusUsed' in the container 'CanTrcv channel' is ignored, since the value of the parameter 'CanTrcvWakeUpSupport' in the container 'CanTrcvGeneral' is configured as CANTRCV_WAKEUP_NOT_SUPPORTED.

8 SWP Error Code

8.1 SWP Error Code List

None

9 Appendix

- The following settings and are usage examples.

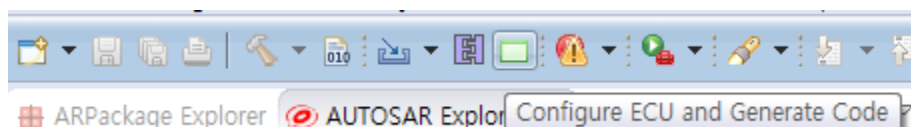
9.1 CanTrcv_ArisuCan_PowerDownMode, CanTrcv_ArisuCan_ReadStatus, CanTrcv_ArisuCan_ChangeStopMode, CanTrcv_ArisuCan_VbsenseEnable, CanTrcv_ArisuCan_VbsenseDisable Setting Method

- Setting RTE to use ARISU-CAN User API

9.1.1 Copy the Swcd_CanTrcv.arxml file to System > Swcd_Bsw

9.1.2 Add Swcd_CanTrcv to GenerateRte item in Generate.py

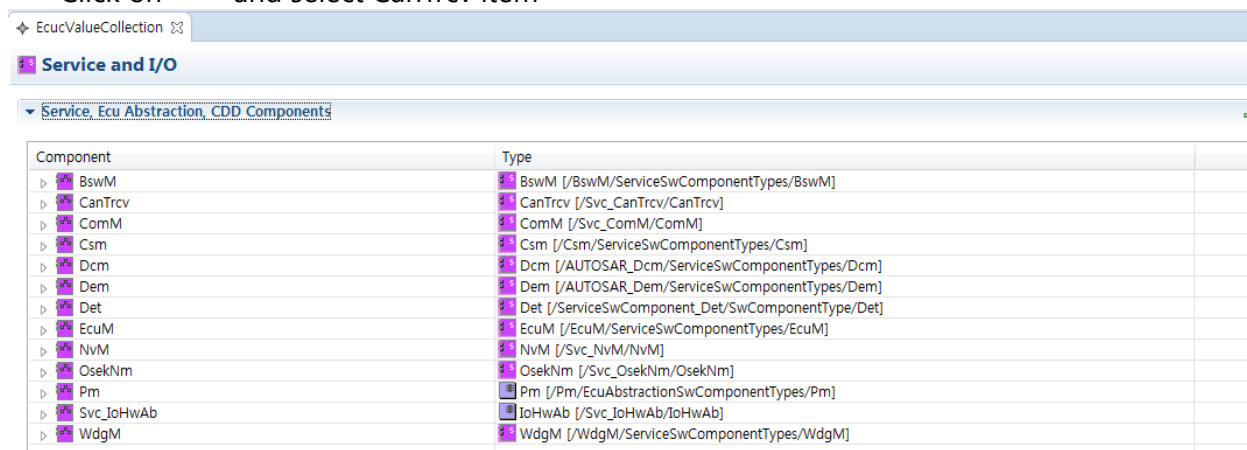
9.1.3 Click on Configure ECU and Generate Code

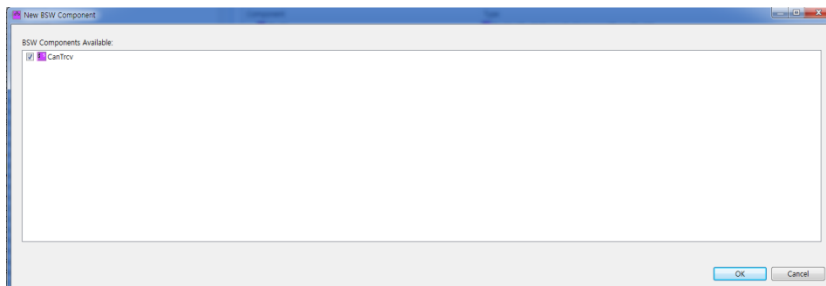


9.1.4 Select Service and I/O items

- Add CanTrcv to Service, Ecu Abstractin, CDD Components

Click on  and select CanTrcv item





9.1.5 Add CanTrcv to Sw Component Instance in RTE module

Rte

Sw Component Instance

Path: Rte [Rte]

Navigator

- SwcInstance_WdgM
- SwcInstance_WdgMTest
- SwcInstance_AppMode
- SwcInstance_BswM
- SwcInstance_DiagnosticTest
- SwcInstance_Csm
- SwcInstance_SWC_ComM
- SwcInstance_SWC_DiagnosticService
- SwcInstance_Pm
- SwcInstance_Svc_IoHwAb
- SwcInstance_ComM
- SwcInstance_Dcm
- SwcInstance_Dem
- SwcInstance_Det
- SwcInstance_EcuM
- SwcInstance_NvM
- SwcInstance_OsekNm
- SwcInstance_CanTrcv

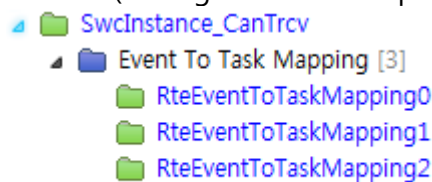
Container Details - RteSwComponentInstance

Index	Short Name	Software Component In...
0	SwcInstance_WdgM	WdgM [/ECU_EXTR...
1	SwcInstance_WdgMTest	SWC_WdgMTest [/E...
2	SwcInstance_AppMode	SWC_AppMode [/E...
3	SwcInstance_BswM	BswM [/ECU_EXTR...
4	SwcInstance_DiagnosticTest	SWC_DiagnosticMo...
5	SwcInstance_Csm	Csm [/ECU_EXTRAC...
6	SwcInstance_SWC_ComM	SWC_ComM [/ECU_...
7	SwcInstance_SWC_Diagnostic...	SWC_DiagnosticSer...
8	SwcInstance_Pm	Pm [/ECU_EXTRACT...
9	SwcInstance_Svc_IoHwAb	Svc_IoHwAb [/ECU_...
10	SwcInstance_ComM	ComM [/ECU_EXTR...
11	SwcInstance_Dcm	Dcm [/ECU_EXTRAC...
12	SwcInstance_Dem	Dem [/ECU_EXTRAC...
13	SwcInstance_Det	Det [/ECU_EXTRACT...
14	SwcInstance_EcuM	EcuM [/ECU_EXTRA...
15	SwcInstance_NvM	NvM [/ECU_EXTRAC...
16	SwcInstance_OsekNm	OsekNm [/ECU_EXT...
17	SwcInstance_CanTrcv	CanTrcv [/ECU_EXTR...

Overview | Bsw Module Instance | Implicit Communication | Initialization Behavior | Os Interaction | Sw Component Instance | Sw Comp

- Add 5 Event To Task Mappings to the added SwInstance_CanTrcv (because there are 5 APIs supported)

(The figure is an example, so 5 is needed)



RteEventToTaskMapping0 : PowerDownMode Related Additions

Container Details - RteEventToTaskMapping



Short Name*: RteEventToTaskMapping0

Edit

Immediate Restart*: ☐ false

Event Ref*: OIE_CanTrcv_ArisuCan_PowerDownMode_CanTrcv_ArisuCan_PowerDownMode_PowerDownMode [/Svc_CanTrcv/CanTrcv/...

Browse...

RteEventToTaskMapping1 : ReadStatus Related Additions

Container Details - RteEventToTaskMapping



Short Name*: RteEventToTaskMapping1

Edit

Immediate Restart*: ☐ false

Event Ref*: OIE_CanTrcv_ArisuCan_ReadStatus_CanTrcv_ArisuCan_ReadStatus_ReadStatus [/Svc_CanTrcv/CanTrcv/SwciB_ComM/OIE_Ca...

Browse...

RteEventToTaskMapping2 : ChangeStop Related Additions

Short Name*: RteEventToTaskMapping2

Edit

Immediate Restart*: ☐ false

Event Ref*: OIE_CanTrcv_ArisuCan_ChangeStopMode_CanTrcv_ArisuCan_ChangeStopMode [/Svc_CanTrcv/CanTrcv/SwciB_C...

Browse...

RteEventToTaskMapping3 : VbsenseEnable Related Additions

RteEventToTaskMapping4 : VbsenseDisable Related Additions

9.1.6 Select or create Runables to use ARISU-CAN's API

(Example: Create R-Port to use API in SWC_AppMode Component)

Ports



All Ports

- ▶ PPort Prototype [1]
 - ▶ modeRequestPort_AppMode [AppModeRequestInterface]
- ▶ RPort Prototype [4]
 - ▶ LowPower_50ms_R [Pm_Trigger_IF-TriggerInterface]
 - ▶ LowPower_NP1_R [Pm_Trigger_IF-TriggerInterface]
 - ▶ Pm_API_R [Pm_API_IF-ClientServerInterface]
 - ▶ CanTrcv_ArisuCan_PowerDownMode [CanTrcv_ArisuCan_PowerDownMode]

Required Interface : CanTrcv_ArisuCan_PowerDownMode Optional
Operations : Select PowerDownMode and set as below.
(Set VbsenseEnable / VbsenseDisable the same way)

Port Details

Properties

Short Name*: ☒ CanTrcv_ArisuCan_PowerDownMode

Required Interface: CanTrcv_ArisuCan_PowerDownMode [/Svc_Car]

Direction

☐ Server (Provided) ☒ Client (Required)

Communication Spec

Operations (Total Count: 1)

Required Com Specs

☒ Enable Required Com Specs

[Client Com Spec](#)

Port API Options

Port API Options

☐ Enable Port API Options

Enable Take Address: ☐ unset

Indirect API*: ☐ unset

[Port API Option](#)

Select CanTrcv_ArisuCan.PowerDownMode.PowerDownMode in Operation / Mode / Trigger Access

Runnables

- EcuModeSwitched
- WakeupEventValidated
- InitCompleted
- Test
- CanSMBorStateSwitched_BCAN
- CanSMBorStateSwitched_DCAN
- CanSMBorStateSwitched_PCAN
- CanSMBorStateSwitched_MMCCAN
- CanSMBorStateSwitched_CCAN
- CanSMBorStateSwitched_ICAN
- ComMMModeSwitched_BCAN
- ComMMModeSwitched_DCAN
- ComMMModeSwitched_PCAN
- ComMMModeSwitched_MMCCAN
- ComMMModeSwitched_CCAN
- ComMMModeSwitched_ICAN

Data / Parameter Access

Operation / Mode / Trigger Access

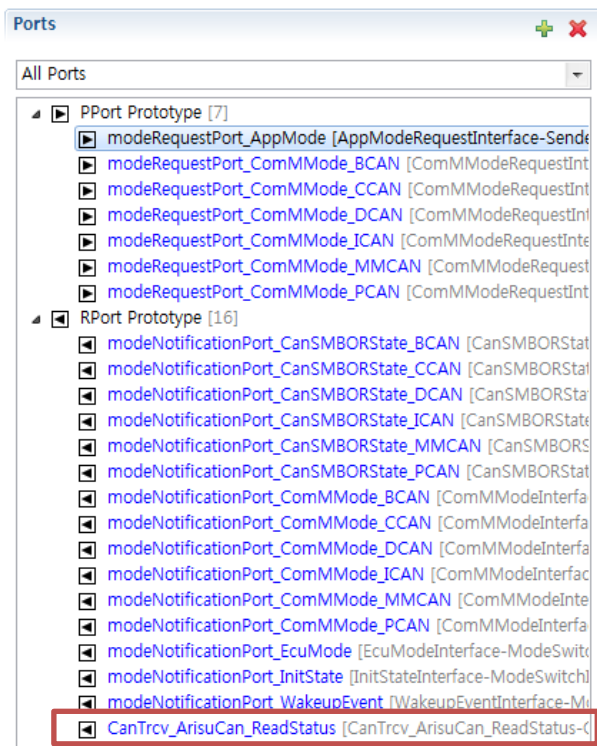
Access Target	Properties
▶ Asynchronous Server Call Points	-
▶ Synchronous Server Call Points	-
▶ <input checked="" type="checkbox"/> CanTrcv_ArisuCan_PowerDownMode.PowerDownMode	Timeout: 0 m
▶ Asynchronous Server Call Result Points	-
▶ Mode Read Access	-
▶ Mode Send Access	-
▶ Mode Switch Points	-
▶ External Triggering Points	-
▶ Internal Triggering Points	-

Select and click Add

Operation / Mode / Trigger Access

Access Target	Properties
▶ Asynchronous Server Call Points	-
▶ Synchronous Server Call Points	-
▶ <input checked="" type="checkbox"/> CanTrcv_ArisuCan_PowerDownMode.PowerDownMode	Timeout: 0 m
▶ Asynchronous Server Call Result Points	-
▶ Mode Read Access	-
▶ Mode Send Access	-
▶ Mode Switch Points	-
▶ External Triggering Points	-
▶ Internal Triggering Points	-

(Example: Create R-Port to use API in SWC_AppMode Component)



Required Interface : CanTrcv_ArisuCan_ReadStatus Optional

Operations : Select ReadStatus and set as below.

Port Details

Properties

Short Name*:

Required Interface:

Direction

☐ Server (Provided) ☒ Client (Required)

Communication Spec

Operations (Total Count: 1)

Required Com Specs

☒ Enable Required Com Specs

[Client Com Spec](#)

Port API Options

Port API Options

☐ Enable Port API Options

Enable Take Address: ☐ unset

Indirect API*: ☐ unset

[Port API Option](#)

Select CanTrcv_ArisuCan.ReadStatus.ReadStatus in Operation / Mode / Trigger Access

Runnables

Runnables

- EcuModeSwitched
- WakeUpEventValidated
- InitCompleted
- Test
- CanSMBorStateSwitched_BCAN
- CanSMBorStateSwitched_DCAN
- CanSMBorStateSwitched_PCAN
- CanSMBorStateSwitched_MMCCAN
- CanSMBorStateSwitched_CCAN
- CanSMBorStateSwitched_ICAN
- ComMModeSwitched_BCAN
- ComMModeSwitched_DCAN
- ComMModeSwitched_PCAN
- ComMModeSwitched_MMCCAN
- ComMModeSwitched_CCAN
- ComMModeSwitched_ICAN

Data / Parameter Access

Operation / Mode / Trigger Access

Access Target	Properties
Asynchronous Server Call Points	-
Synchronous Server Call Points	-
CanTrcv_ArisuCan_ReadStatus.ReadStatus	Timeout: 0 m
Asynchronous Server Call Result Points	-
Mode Read Access	-
Mode Send Access	-
Mode Switch Points	-
External Triggering Points	-
Internal Triggering Points	-

Select and click Add

Data / Parameter Access

Operation / Mode / Trigger Access

Access Target	Properties
Asynchronous Server Call Points	-
Synchronous Server Call Points	-
CanTrcv_ArisuCan_ReadStatus.ReadStatus	Timeout: 0 m
Asynchronous Server Call Result Points	-
Mode Read Access	-
Mode Send Access	-
Mode Switch Points	-
External Triggering Points	-
Internal Triggering Points	-

Add ->

<- Remove

(Example: Create R-Port to use API in SWC_AppMode Component)

- RPort Prototype [18]
- modeNotificationPort_CanSMBORState_BCAN [CanSMBORStateInterface_BCAN-ModeSwitchInterface]
- modeNotificationPort_CanSMBORState_CCAN [CanSMBORStateInterface_CCAN-ModeSwitchInterface]
- modeNotificationPort_CanSMBORState_DCAN [CanSMBORStateInterface_DCAN-ModeSwitchInterface]
- modeNotificationPort_CanSMBORState_ICAN [CanSMBORStateInterface_ICAN-ModeSwitchInterface]
- modeNotificationPort_CanSMBORState_MMCCAN [CanSMBORStateInterface_MMCCAN-ModeSwitchInterface]
- modeNotificationPort_CanSMBORState_PCAN [CanSMBORStateInterface_PCAN-ModeSwitchInterface]
- modeNotificationPort_ComMMode_BCAN [ComMModeInterface_BCAN-ModeSwitchInterface]
- modeNotificationPort_ComMMode_CCAN [ComMModeInterface_CCAN-ModeSwitchInterface]
- modeNotificationPort_ComMMode_DCAN [ComMModeInterface_DCAN-ModeSwitchInterface]
- modeNotificationPort_ComMMode_ICAN [ComMModeInterface_ICAN-ModeSwitchInterface]
- modeNotificationPort_ComMMode_MMCCAN [ComMModeInterface_MMCCAN-ModeSwitchInterface]
- modeNotificationPort_ComMMode_PCAN [ComMModeInterface_PCAN-ModeSwitchInterface]
- modeNotificationPort_EcuMode [EcuModeInterface-ModeSwitchInterface]
- modeNotificationPort_InitState [InitStateInterface-ModeSwitchInterface]
- modeNotificationPort_WakeUpEvent [WakeUpEventInterface-ModeSwitchInterface]
- CanTrcv_ArisuCan_ReadStatus [CanTrcv_ArisuCan_ReadStatus-ClientServerInterface]
- CanTrcv_ArisuCan_ChangeStopMode [CanTrcv_ArisuCan_ChangeStopMode-ClientServerInterface]

Required Interface : CanTrcv_ArisuCan_ChangeStopMode Optional

Operations : Select ChangeStopMode and set as below.

Port Details

Properties

Short Name*:

Required Interface:

Direction

☐ Server (Provided) ☒ Client (Required)

Communication Spec

Operations: (Total Count: 1)

Required Com Specs

☒ Enable Required Com Specs

[Client Com Spec](#)

CanTrcv_ArisuCan_ChangeStopMode in Operation / Mode / Trigger Access. Select ChangeStopMode
Select and click Add

Runnables

- EcuModeSwitched
- WakeupEventValidated
- InitCompleted
- Test
- CanSMBorStateSwitched_BCAN
- CanSMBorStateSwitched_DCAN
- CanSMBorStateSwitched_PCAN
- CanSMBorStateSwitched_MMCCAN
- CanSMBorStateSwitched_CCAN
- CanSMBorStateSwitched_ICAN
- ComMMModeSwitched_BCAN
- ComMMModeSwitched_DCAN
- ComMMModeSwitched_PCAN
- ComMMModeSwitched_MMCCAN
- ComMMModeSwitched_CCAN
- ComMMModeSwitched_ICAN

Runnable Details

Properties

Short Name*:

Symbol:

Can Be Invoked Concurrently: ☐ false

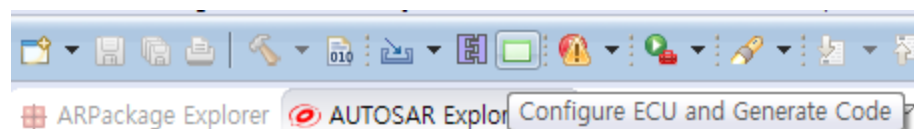
Minimum Start Interval*: msec

Data / Parameter Access


Operation / Mode / Trigger Access

Access Target	Properties
Asynchronous Server Call Points	-
Synchronous Server Call Points	-
<input checked="" type="checkbox"/> CanTrcv_ArisuCan_ChangeStopMode.Chang	Timeout: 0 ms
Asynchronous Server Call Result Points	-
Mode Read Access	-
Mode Send Access	-
Mode Switch Points	-
External Triggering Points	-
Internal Triggering Points	-

9.1.7 Click on Configure ECU and Generate Code



9.1.8 Activate after selecting CanTrcv in Automatic Connection of Service and I/O

Click on  to create R-Port Selection

Service and I/O

Service, Ecu Abstraction, CDD Components

Automatic Connection

Contents	Context Component	Port Interface	Component Type	Connector
BswM	-	-	-	-
CanTrcv	-	-	-	-
CanTrcv_ArisuCan_ChangeStopMode	CanTrcv	CanTrcv_ArisuCan_ChangeStop...	CanTrcv (/Svc_CanTrcv/CanTrc...	-
CanTrcv_ArisuCan_ChangeStopMode	SWC_AppMode	CanTrcv_ArisuCan_ChangeStop...	SWC_AppMode (/AppMode/A...	CanTrcv_ArisuCan_ChangeStopModeO
CanTrcv_ArisuCan_PowerDownMode	CanTrcv	CanTrcv_ArisuCan_PowerDown...	CanTrcv (/Svc_CanTrcv/CanTrc...	-
CanTrcv_ArisuCan_PowerDownMode	SWC_AppMode	CanTrcv_ArisuCan_PowerDown...	SWC_AppMode (/AppMode/A...	CanTrcv_ArisuCan_PowerDownModeO
CanTrcv_ArisuCan_ReadStatus	CanTrcv	CanTrcv_ArisuCan_ReadStatus ...	CanTrcv (/Svc_CanTrcv/CanTrc...	-
CanTrcv_ArisuCan_ReadStatus	SWC_AppMode	CanTrcv_ArisuCan_ReadStatus ...	SWC_AppMode (/AppMode/A...	CanTrcv_ArisuCan_ReadStatusOfCanTr

9.1.9 Platform Build

9.1.10 In Rte.c, check if it is generated as follows

(The API name is generated differently depending on the Runnable used)

Ex1 : Std_ReturnType Rte_Call_<p>_ReadStatus

Ex2 : Std_ReturnType Rte_Call_<p>_PowerDownMode

Ex3 : Std_ReturnType Rte_Call_<p>_ChangeStopMode

Ex4 : Std_ReturnType Rte_Call_<p>_VbSenseEnable

Ex5 : Std_ReturnType Rte_Call_<p>_VbSenseDisable

```
FUNC(Std_ReturnType, RTE_CODE) Rte_Call_SWC_AppMode_CanTrcv_ArisuCan_ReadStatus_ReadStatus(
    IN CanTrcv_ArisuCanType Address,
    OUT P2VAR(CanTrcv_ArisuCanType, AUTOMATIC, RTE_APPL_DATA) Data)
{
    VAR(Std_ReturnType, RTE_DATA) LddRetVal = RTE_E_OK;
    LddRetVal = CanTrcv_ArisuCan_ReadStatus(
        Address,
        Data);
    return LddRetVal;
}
```

```
FUNC(Std_ReturnType, RTE_CODE) Rte_Call_SWC_AppMode_CanTrcv_ArisuCan_PowerDownMode(void)
{
    VAR(Std_ReturnType, RTE_DATA) LddRetVal = RTE_E_OK;
    LddRetVal = CanTrcv_ArisuCan_PowerDownMode();
    return LddRetVal;
}
```

```
FUNC(Std_ReturnType, RTE_CODE) Rte_Call_SWC_AppMode_CanTrcv_ArisuCan_ChangeStopMode_ChangeStopMode(void)
{
    VAR(Std_ReturnType, RTE_DATA) LddRetVal = RTE_E_OK;
    LddRetVal = CanTrcv_ArisuCan_ChangeStopMode();
    return LddRetVal;
}
```

<Example code>

* VbSenseEnable / VbSenseDisable is used in the same way as PoserDownMode

1) CanTrcv_ArisuCan_PowerDownMode

Rte_Call_SWC_AppMode_CanTrcv_ArisuCan_PowerDownMode();

2) CanTrcv_ArisuCan_ChangeStopMode

RetrunVal = Rte_Call_SWC_AppMode_CanTrcv_ArisuCan_ChangeStopMode_ChangeStopMode();
(ReturnVal confirmation required)

3) CanTrcv_ArisuCan_ReadStatus

CanTrcv_ArisuCanType address, Data;

address = 0x7E;

RetrunVal = Rte_Call_SWC_AppMode_CanTrcv_ArisuCan_ReadStatus_ReadStatus(address, &Data);

(In CanTrcv2.4.0 and earlier, &address was used, but address must be used now)

→ Data is 0x48

Refer to Reference [2] for ARISU-CAN information such as address and data

/ *Family and Product Information Register */

FAM_PROD_STAT

Family and Product Identification Register (Address 111 1110_B)

POR / Soft Reset Value: 0011 yyyy_B; Restart Value: 0011 yyyy_B

7	6	5	4	3	2	1	0
FAM_3	FAM_2	FAM_1	FAM_0	PROD_3	PROD_2	PROD_1	PROD_0
r	r	r	r	r	r	r	r

Field	Bits	Type	Description
FAM	7:4	r	SBC Family Identifier (bit4=LSB; bit7=MSB) To be Defined
PROD	3:0	r	SBC Product Identifier (bit0=LSB; bit3=MSB) 1 0 0 0 _B , ARISU-CAN (5V, 4CAN, VEXT, SWK)

9.2 ARISU-CAN Control Logic

[INIT]

All ARISU-CAN communication channels are CAN OFF (BUS_CTRL_0, BUS_CTRL_2, BUS_CTRL_3)

(Optional) PWM On / OFF function setting (HW_CTRL_0)

Activate VBSense function (WK_CTRL_0)

[NORMAL]

ARISU-CAN SBC NORMAL mode request (M_S_CTRL)

Mode request according to ARISU-CAN communication channel SRS (BUS_CTRL_0, BUS_CTRL_2, BUS_CTRL_3)

ARISU-CAN communication channel mode check (BUS_CTRL_0, BUS_CTRL_2, BUS_CTRL_3)

[STANDBY]

Mode request according to ARISU-CAN communication channel SRS (BUS_CTRL_0, BUS_CTRL_2, BUS_CTRL_3)

ARISU-CAN communication channel mode check (BUS_CTRL_0, BUS_CTRL_2, BUS_CTRL_3)

ARISU-CAN Wake Up Clear Request (WK_STAT_0, WK_STAT_2)

[SBC STOP]

Check ARISU-CAN CANTRCV mode (M_S_CTRL)

VBSense function is disabled only when ARISU-CAN SBC mode is Normal (WK_CTRL_0)

ARISU-CAN Wake Up Clear Request (WK_STAT_0, WK_STAT_2)

ARISU-CAN SBC STOP mode request (M_S_CTRL)

[PowerDown]

ARISU-CAN SBC NORMAL mode request (M_S_CTRL)

Mode request according to ARISU-CAN communication channel SRS (BUS_CTRL_0, BUS_CTRL_2, BUS_CTRL_3)

ARISU-CAN Wake Up Clear Request (WK_STAT_0, WK_STAT_2)

ARISU-CAN SBC SLEEP mode request (M_S_CTRL)

9.3 ARISU-CAN H/W Characteristics

1. ARISU-CAN SBC Stop mode can be changed after the power is supplied and the input power is more than 6V.

(See 6.3.1CanTrcv_ArisuCan_ChangeStopMode Description)

2. ARISU-CAN SBC Stop mode should be set to No Comm for all used ARISU-CAN communication channels, and the register value related to Under Voltage should be set to normal value.

(See 6.3.1CanTrcv_ArisuCan_ChangeStopMode Description)

3. When ARISU-CAN is set to Wake Capable, the CANH Line drops to Low after 1 second after changing the CAN mode (does not occur when the CAN is turned OFF).

Arisu Can Transceiver CS
Pin이 High로 전환되자마자
(active Low) B-CAN High가
Low로 떨어지야 하는데 1s의
Delay가 발생

B-CAN
High

Arisu Can
Chip Select
Pin



4. To change from PWM mode to PFM mode, ARISU-CAN need to enter SBC STOP mode.

(Ref. ARISU-CAN_DS_100.pdf)

Buck behavior in SBC Stop Mode

The SBC Stop Mode operation is intended to reduce the total amount of quiescent current while still providing output voltage. In order to achieve this, the Buck regulator changes the modulation from PWM (Pulse Width Modulation) to PFM (Pulse Frequency Modulation) when entering SBC Stop Mode.

In SBC Stop Mode, the Buck modulation can change as follow:

- Buck module always in PFM modulation (default setting);
- automatically change from PFM to PWM (setting **PWM_AUTO**);
- modulation is controlled by the WK pin (setting **PWM_BY_WK**).

5. Wake-up conditions due to INTN in ARISU-CAN are as follows
(Ref. ARISU-CAN_DS_100.pdf)

The following wake-up events will be signaled via INTN:

- all wake-up events stored in the wake status SPI register **WK_STAT_0** and **WK_STAT_2**;
- if the bit CANTO_x is set and if it was not masked out;
- the VBAT (at pin VBSENSE) monitoring threshold is triggered;
- an interrupt is only triggered if the respective function is also enabled as a wake source;
- Automatic transition from PFM to PWM mode in SBC Stop Mode.

9.4 Configure SpiDataWidth when using TJA1145, TLE9255W,TCAN1145

The configuration SpiDataWidth in Spi module must be set to '16'

9.5 Supported Device List

TJA1040, TJA1041, TJA1041A, TJA1042, TJA1043, TJA1463, TJA1044, TJA1050, TJA1051, TJA1054, TJA1054A, TJA1055, TJA1057, TJA1145, UJA1169, TLE6250G, TLE6251DS, TLE6251G, TLE6251-3G, TLE6254-2G, TLE6254-3G, TLE7250G, TLE7250LE, TLE9250SJ, TLE9251VSJ, TLE9255W, ARISU-CAN, NCV7342,TCAN1043A,TCAN1044, TCAN1057,TCAN1145,TJA1059.

Operation is not guaranteed when a device other than the supported device list is used.

CanTrcvHardwareInterfaceName has different setting parameter values depending on the device.

Interface 1 : CanTrcvHardwareInterfaceName contains 'EN'

Interface 2 : CanTrcvHardwareInterfaceName contains 'STB', 'EN'

* For details, refer to the Datasheet Pin Map of the Transceiver used.

* NCV7342 does not support the wake-up function due to the device characteristics (wake-up behavior changes to high when wake-up occurs, then falls back to low).

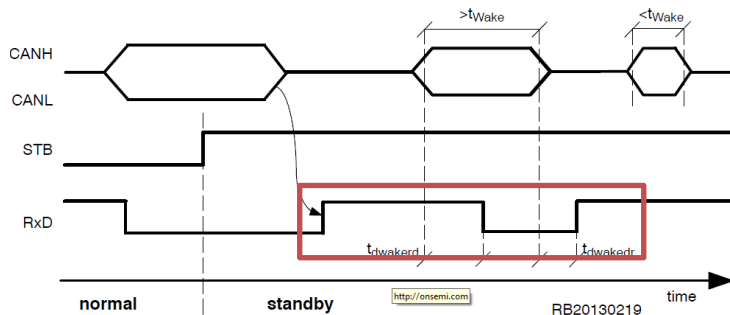


Figure 5. NCV7342 Wake-up behavior

* Only one ARISU-CAN Device can be supported

CanTrcv module can support only one ARISU-CAN Device

9.6 Notice for undervoltage when using TJA1145 or TCAN1145

When entering sleep mode due to undervoltage when using TJA1145 or TCAN1145, If Sleep mode used is 'true', normal operation is possible through the FULL-COM command after NO-COM at normal voltage.

In this case, the forced sleep mode transition due to the undervoltage is determined by checking the 7 bit (FSMS) of the main status register for TJA1145. And for TCAN1145, it is determined by checking the 2-4bits of the INT_2 register are set to 1.

For this function, use sleep mode when using TJA1145 or TCAN1145.

9.7 Configuration for Partial Networking

If you use Partial Networking then,

In EcuD_CanTrcv.arxml :

1. CanTrcvConfigSet > Channel > [Channel Name]

- Hw Pn Support : true

Container Details - CanTrcvChannel

Short Name*:	<input type="text" value="CanTrcvChannel_ICAN"/>	Edit
Id*:	<input type="text" value="1"/>	Convert...
Used*:	<input checked="" type="checkbox"/> true	unset
Controls Power Supply*:	<input type="checkbox"/> false	unset
Hw Pn Support*:	<input checked="" type="checkbox"/> true	unset
Init State*:	<input type="text" value="CANTRCV_OP_MODE_SLEEP"/>	unset
Max Baudrate*:	<input type="text" value="125"/>	Convert...
Wakeup By Bus Used:	<input type="checkbox"/> false	unset
Hw Dev Name*:	<input type="text" value="TJA1145"/>	unset
Sleep Mode Used:	<input checked="" type="checkbox"/> true	unset

2. CanTrcvConfigSet > Channel > [Channel Name] > CanTrcvPartialNetwork

- Pn Enabled : true
- Pn Dlc Matching Condition : true
- Pn Frame Can Id : Wake-Up ID
- Pn Frame Can Id Mask : Wake-Up ID Range Filter
- Pn Frame Dlc : Wake-Up message length

Container Details - CanTrcvPartialNetwork

Short Name*: CanTrcvPartialNetwork Edit

Baud Rate*: 500 Convert... unset

Bus Err Flag*: false unset

Pn Can Id Is Extended*: false unset

Pn Enabled*: true unset

Pn Frame Can Id*: 0x500 Convert... unset

Pn Frame Can Id Mask*: 0x7f Convert... unset

Pn Frame Dlc*: 8 Convert... unset

Power On Flag*: false unset

Pn Dlc Matching Condition*: true unset

Mask is applied to Id as an OR operation. Pn Frame Can Id and Pn Frame Can Id Mask are set by referring to the example below.

ex) In the above case, Mask 0x07f is applied to 0x500 as an OR operation.

In the above case, the part corresponding to 0x07f with 0x500 as the base is x, which is don't care (at 2 bit it set : 0xxx xxxx)

Accordingly, a message suitable for the corresponding Dlc from 0x500 to 0x57f is recognized as a wake-up message.

3. CanTrcvConfigSet > Channel > [Channel Name] > CanTrcvPartialNetwork > Pn Frame Data Mask Spec
CanTrcvPnFrameDataMaskSpec : Set from 4 to each PNC

Navigator

- CanTrcv
 - CanTrcvGeneral
 - CanTrcvConfigSet
 - Channel [1]
 - CanTrcvChannel_MCAN
 - CanTrcvAccess
 - CanTrcvPartialNetwork
 - Pn Frame Data Mask Spec [8]

Container Details - CanTrcvPnFrameDataMaskSpec

Index	Short Name	Pn Frame Data Mask	Pn Frame Data Mask In...
0	CanTrcvPnFrameDataMaskSpec0	0	0
1	CanTrcvPnFrameDataMaskSpec1	0	1
2	CanTrcvPnFrameDataMaskSpec2	0	2
3	CanTrcvPnFrameDataMaskSpec3	0	3
4	CanTrcvPnFrameDataMaskSpec4	33	4
5	CanTrcvPnFrameDataMaskSpec5	0	5
6	CanTrcvPnFrameDataMaskSpec6	0	6
7	CanTrcvPnFrameDataMaskSpec7	0	7

The setting shall be set with reference to the PNC value.

The table below referred to the specification and shall be set according to the values appropriate for the controller.

At this time, PNC_1 starts from DataMaskSpec4, and the bit corresponding to each PNC value must be calculated and put in. (Binary)

That is, in the above case, PNC_1 and PNC_6 are used, so

Bit0 and bit5 should be set in DataMaskSpec4. Therefore, a value of 00100001(2)=33 was set.

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
PNI	PNC_8	PNC_7	PNC_6	PNC_5	PNC_4	PNC_3	PNC_2	PNC_1
	PNC_16	PNC_15	PNC_14	PNC_13	PNC_12	PNC_11	PNC_10	PNC_9
	PNC_24	PNC_23	PNC_22	PNC_21	PNC_20	PNC_19	PNC_18	PNC_17
	PNC_32	PNC_31	PNC_30	PNC_29	PNC_28	PNC_27	PNC_26	PNC_25