Document Change History				
Date (YYYY -MM -DD)	Ver.	Editor	Chap	Change Description
2021-08-05	1.0.0.0	HieuTM8	All	• Initialization
2021-08-25	1.0.0.1	HieuTM8	4.3 5	• Add Change Log • Update Default value for parameters
2022-03-30	1.0.1.0	HieuTM8	4.2 4.3 7.2.1	• Update module version • Add change Log • Update validation rule ERR0350008
2022-04-29	1.0.2.0	HieuTM8	4.2 4.3	• Update module version • Add change log
2022-06-10	1.0.3.0	HieuTM8	4.2 4.3	• Update module version • Add change log
2022-06-22	1.0.3.1	SMKwon	4.3	• Add change log
2022-07-22	1.0.4.0	HieuTM8	4.2 4.3 5.3 5.8 7.2.1 7.2.2	• Update module version • Add change log • Change default value of CanTpNbr • Change default value of CanTpNcs • Add ERR350007 • Remove WRN35001
2022-08-02	1.0.4.1	HieuTM8	4.3	• Add change log
2022-08-16	1.0.5.0	HieuTM8	4.2 4.3	• Update module version • Add change log
2022-09-16	1.0.6.0	HieuTM8	4.2 4.3 7.2.1	• Update module version • Add change log • Add ERR350031
2022-11-01	1.0.7.0	HieuTM8	4.2 4.3 7.2.1	• Update module version • Add change log • Update ERR0350029
2022-11-25	1.0.8.0	HieuTM8	4.2 4.3	• Update module version • Add change log
2022-12-15	1.0.9.0	HieuTM8	4.2 4.3	• Update module version • Add change log

2023-04-20	1.0.10.0	HieuTM8	4.2 4.3	• Update module version • Add change log
2023-06-13	1.0.11.0	HieuTM8	4.2 4.3	• Update module version • Add change log
2023-08-01	1.0.12.0	MJ Kim	4.2 4.3 4.4	• Update module version • Add change log • Add limitations
2024-01-11	1.1.0.0	YB Song	4.2 4.3 4.4	• Update module version • Add change log • Update limitations

Table of Contents

1 Overview

CanTp_UM.docx is written based on Autosar standard SRS / SWS / ISO / ES, and if more detailed functional description is needed when using the module, refer to the reference document below.

The interpretation of the category 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): Items that is not supported.

2 Reference

Sl. No.	Title	Version
1	AUTOSAR_SWS_CanTransportLayer.pdf	4.4.0
2	ISO15675-2-2016, ISO15675-4-2016	N/A

3   AUTOSAR System

3.1   Overview of Software Layers

The CanTp module is a module that performs large-data communication via CAN protocol.
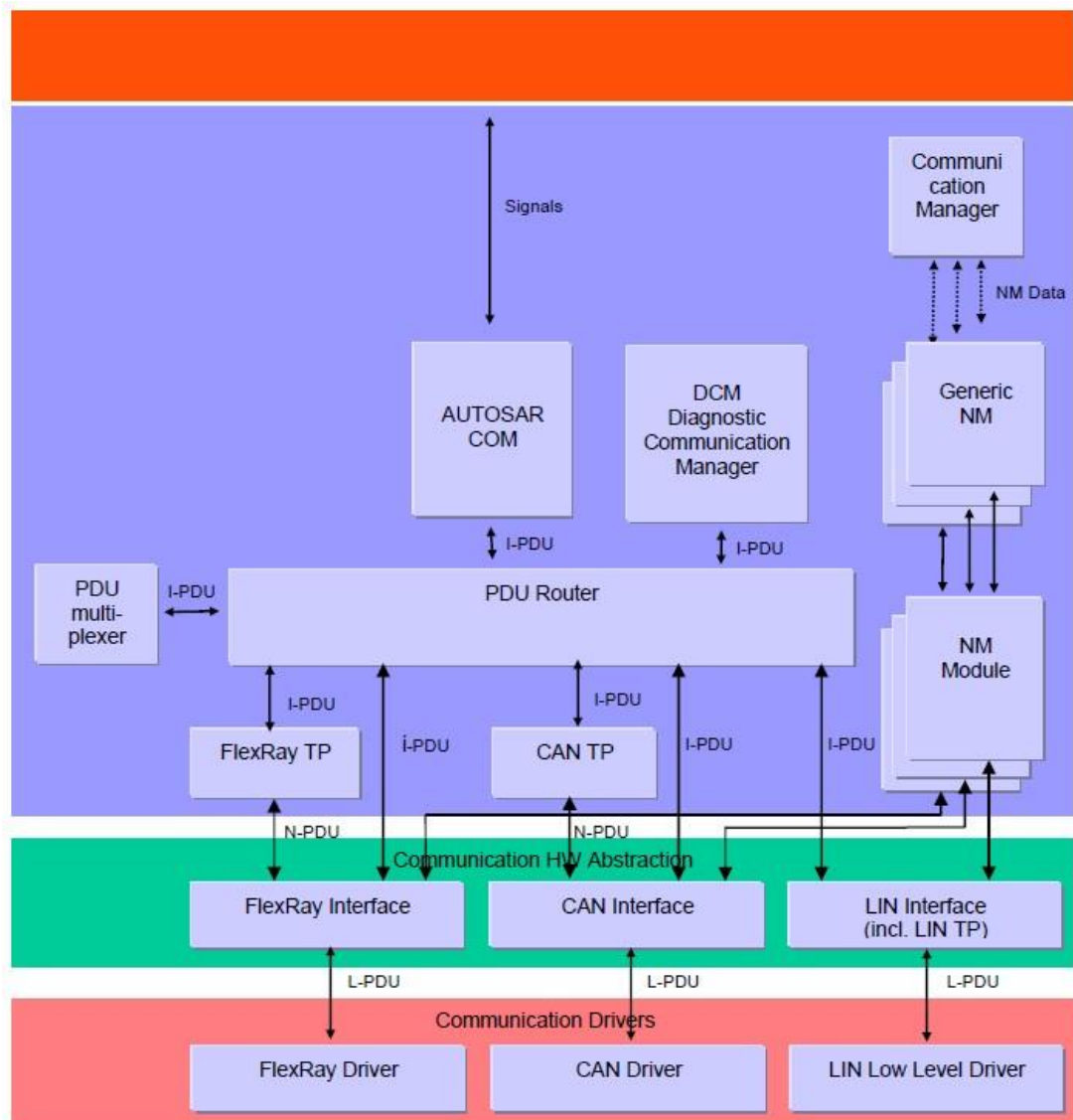
4   Product Release Notes

4.1   Overview

In this chapter, the purpose is to provide release related contents for the Hyundai Autoever CanTp module, and describes restrictions and specifics for the CanTp software product release version.

4.2 Scope of the Release

All contents of this document are limited to the following Hyundai Autoever CanTp module.

Module name	AUTOSAR version	Module version
CanTp	4.4.0	1.1.0

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

4.3 Change Log

4.3.1 Version 1.1.0.0

➢ Feature
- Support full-duplex communicaion

Cause	full-duplex communication should be supported
Operation effect	None
Setting effect	None
ASW Action	None

➢ Task
- Update UM chapter 6 - Application Programming Interface (API)

Cause	The chapter 6(API) in UM should be updated
Operation effect	None
Setting effect	None
ASW Action	None

➢ Bug
  When the buffer status of StartOfReception is E_NOT_OK, unnecessary indication is delivered to upper layer

Cause	According to SWS_CanTp_00081, when the function PduR_CanTpStartOfReception returns E_NOT_OK, CanTp should not call function PduR_CanTpRxIndication
Operation effect	None
Setting effect	None
ASW Action	None

➢ Bug
- CanTp does not abort reception in case of wrong Sequence Number received

Cause	CanTp does not abort reception because CanTp internal variable (channel state) is not changed in case of wrong Sequence Number received

Operation effect	None
Setting effect	None
ASW Action	None

➢ Bug
  • The transmission is aborted instead of reception when there is an issue with Flow Control transmission.

Cause	When the reception need to be aborted, CanTp calls PduR_CanTpTxConfirmation instead of PduR_CanTpRxIndication().
Operation effect	None
Setting effect	None
ASW Action	None

➢ Bug
  • Unintended BS change while receiving large data

Cause	Overflow during BS calculation
Operation effect	None
Setting effect	None
ASW Action	None

4.3.2 Version 1.0.12.0

➢ Bug
  • Dcm stuck due to new SF or FF reception when segment transmission is in progress

Cause	When a new SF or FF is received while segment transmission is in progress, Tx was canceled and stuck in Dcm, but now we continue with Tx even if a new PDU comes in.
Operation effect	Only support half duplex
Setting effect	None
ASW Action	None

4.3.3 Version 1.0.11.0

➢ Bug

  • Wrong handle SF reception when segmented reception is in progress

Cause	To start a new reception of a SF while segmented reception is in progress, CanTp should notify the upper layer with the correct

	function name but now CanTp notifies to the upper layer with the wrong function
Operation effect	None
Setting effect	None
ASW Action	None

4.3.4 Version 1.0.10.0

➢ Improvement

- Fix ASPICE final inspection findings

Cause	All remaining A-SPICE final inspection findings should be fixed
Operation effect	None
Setting effect	None
ASW Action	None

4.3.5 Version 1.0.9.0

➢ Improvement

- Fix UNECE and ES95411-00 violations in tc39x RTU

Cause	UNECE violation rules should be improved
Operation effect	None
Setting effect	None
ASW Action	None

4.3.6 Version 1.0.8.0

➢ Bug

- Consecutive Frame transmission is stopped when large byte of TP Message needs to be transmitted

Cause	CanTp should support transmit large data of TP Message
Operation effect	None
Setting effect	None
ASW Action	None

➢ Task

- Update the work products for improving the traceability to ES95486-02E

Cause	Reference, ID of requirements related to ES95486-02E_SWP should follow the latest version of ES95486-02E_SWP.
Operation effect	None
Setting effect	None
ASW Action	None

4.3.7   Version 1.0.7.0

➢ Bug

- Fix the problem that CanTp causes generation error when VARIANT-POSTBUILD-SELECTABLE is selected

Cause	PDF of CanTp should support configure VARIANT-POSTBUILD-SELECTABLE for PostBuild
Operation effect	None
Setting effect	None
ASW Action	None

➢ Bug

- Fix issue generating wrong UpConfirmationSduId when CanTp support PostBuild

Cause	The issue generate wrong UpConfirmationSduId should be fixed
Operation effect	None
Setting effect	None
ASW Action	None

➢ Improvement

- Update T-code to match PostBuild requirements

Cause	The name of PostBuild configuration of CanTp should be improved according to TPS_ECUC_08011
Operation effect	None
Setting effect	None
ASW Action	None

➢ Task

- Reference, ID of requirements related to ES95486-02E should follow the latest version of ES95486-02E

Cause	Reference, ID of requirements related to ES95486-02E should follow the latest version of ES95486-02E.
Operation effect	None
Setting effect	None
ASW Action	None

4.3.8 Version 1.0.6.0

➢ Improvement

- Add validation rule in T-Code

Cause	When two NPdu refer to the same Pdu, the PduId of them should be the same value
Operation effect	None
Setting effect	None
ASW Action	None

➢ Improvement

- Fix remaining A-SPICE final Inspection findings

Cause	All remaining A-SPICE final inspection findings should be fixed.
Operation effect	None
Setting effect	None
ASW Action	None

4.3.9 Version 1.0.5.0

➢ Improvement

- Fix UNECE violations

Cause	UNECE violation should be fixed for the target tc33x, tc36x, tc38x, tc39x.
Operation effect	None
Setting effect	None
ASW Action	None

4.3.10 Version 1.0.4.1

➢ Task

- Update UNECE Report format to the latest one

Cause	The UNECE report format should be latest
Operation effect	None
Setting effect	None
ASW Action	None

4.3.11 Version 1.0.4.0

➢ Improvement

• Fix UNECE violations

Cause	UNECE violation should be fixed for the target tc33x, tc36x, tc38x, tc39x.
Operation effect	None
Setting effect	None
ASW Action	None

➢ Improvement

• Fix remaining A-SPICE final Inspection findings

Cause	All remaining A-SPICE final inspection findings should be fixed
Operation effect	None
Setting effect	None
ASW Action	None

4.3.12 Version 1.0.3.1

➢ Task

• Editorial Change in Work Products

Cause	Add copyright comment in the source code, restructure source folder, update DeliveryBoxHistory document to the latest template
Operation effect	None
Setting effect	None
ASW Action	None

4.3.13 Version 1.0.3.0

➢ Defect

• When FF_DL is 0x100~0xF00 is considered as greater than 0xFFF, so CanTp get invalid FF_DL value

Cause	+ When FF_DL is 0x100~0xF00 is considered as greater than 0xFFF, so CanTp get invalid FF_DL value
Operation effect	None
Setting effect	None
ASW Action	None

4.3.14 Version 1.0.2.0

➢ Change Request

• Generation error should be occurred when Timeout Parameter are configured to 0

Cause	+ Timeout parameters should not be set to '0'
Operation effect	None
Setting effect	None
ASW Action	None

➢ Change Request

• Fix UNECE security coding rule violations

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

➢ Defect

• Flow Control Bs should be transmitted as configured value, and Flow Control frame should not be sent when Bs is transmitted as '0'

Cause	+Flow Control Bs as '0' is transmitted when it is configured as '255'. And Flow Control message is sent after receiving 255 Consecutive frames even though Bs is transmitted to 0.
Operation effect	None
Setting effect	None
ASW Action	None

➢ Change Request

• Request update Sequence diagram in EA

Cause	+[SUD] Add sequence diagram for all APIs under 4.2.1. Initialization; 4.2.2. Parameter; 4.2.5. Main Function

Operation effect	None
Setting effect	None
ASW Action	None

➢ Change Request

- Update Global variables, Section type code in EA

Cause	+ [SUD] Add tags values into every element in Global variables folder 2.3.1. Global Variables + [SUD] Modify Section Type CODE (4.2.1. Section Type CODE) follow the template
Operation effect	None
Setting effect	None
ASW Action	None

4.3.15 Version 1.0.1.0

➢ Change Request

- Migrate CanTp from R44 to R40

Cause	The latest codes were in R44, so it should be migrated to R40 repository
Operation effect	None
Setting effect	None
ASW Action	None

➢ Change Request

- ASPICE Compliance update

Cause	All work products should follow the ASPICE process
Operation effect	None
Setting effect	None
ASW Action	None

➢ Defect

- Fix defect generation error when timeout parameter set to 0

Cause	CanTp_R44 did not support timeouts configuration are set to 0
Operation effect	None
Setting effect	None

ASW Action	None

4.3.16 Version 1.0.0.1

➢ Change Request

• Update default value of parameter R44 PDF to same as R40 UM

Cause	+ update default value for parameters in R44 PDF to be the same value as R40 UM + add default value for parameters
Operation effect	None
Setting effect	None
ASW Action	None

➢ Change Request

• Update default value of parameter R44 UM to same as R40 UM

Cause	+ update default value for parameters in R44 UM to be the same value as R40 UM + add default value for parameters
Operation effect	None
Setting effect	None
ASW Action	None

4.3.17 Version 1.0.0.0
➢ New version

• New CanTp module development

Cause	+ Support features following SWS version 4.4.0 + Remove limitations in old implementation (AR4.0.3).
Operation effect	None
Setting effect	None
ASW Action	None

4.4 Limitations

None

4.5 Deviations

None

5 Configuration Guide

The setting of CanTp of the AUTOSAR Platform distributed by Hyundai Autoever is a setting that reflects Hyundai Autoever's policy, so you must consult with Hyundai Autoever when changing.

5.1 CanTpGeneral

Parameter Name	Value	Category
CanTpDevErrorDetect	True	C
CanTpChangeParameterApi	True	C
CanTpVersionInfoApi	False	C
CanTpPaddingByte	0xAA	C
CanTpReadParameterApi	False	C
CanTpFlexibleDataRateSupport	-	C
CanTpDynIdSupport	False	C
CanTpGenericConnectionSupport	False	C

1) CanTpDevErrorDetect
   - True: DET function is ON
   - False: DET function is OFF

   DET function should be enable for debug and release purpose as well.

2) CanTpChangeParameterApi
   - Enable function, the CanTp can change BS and STmin value during communication.

3) CanTpVersionInfoApi
   - Provides the ability to read a version by using reading API

4) CanTpPaddingByte

   - Parameter that inputs the value to fill the remaining bytes with a specific value when transmitting data that does not fit the data length (DL) for transmission.

     DL = 8, 12 , 16, 20, 24, 32, 48, 64.

   Note: Data length of transmission frame shall be flexible chosen depend on configured length of reference Pdu.

5) CanTpReadParameterApi
   - Provides the ability to read the value of the communication whether Stmin or BS

6) CanTpFlexibleDataRateSupport

- CAN-FD support (if you want to transfer large data using CAN-FD Protocol)

7) CanTpDynIdSupport

- Enable the ability to support Dynamic ID (If you enable the Dynamic Id function, either you must enable the GenericConnectionSupport or you have to configure Sdu(s) with NORMAL_FIXED_ADDRESSING/ MIXED29BIT_ADDRESSING mode).

8) CanTpGenericConnectionSupport

- CanTp shall provides the GenericConnection function. It's allow user can change the N_AI for each Sdu(s) in concurrent connection (Highest security).

- Dependency:

→ CanTpDynIdSupport must enable.

→ Dependency module should be configured with GenericConnectionSupport function.

5.2 CanTpChannel

Parameter Name	Value	Category
CanTpMainFunctionPeriod	0.005	C

1) CanTpMainFunctionPeriod
   - To set the execution cycle (uint: second) of the cycle function. It is set to 5ms by default, and can be adjusted to 10ms when optimization is required due to the use of the Gateway function on the platform. When adjusting, the setting related to the execution of the corresponding MainFunction must also be changed.
   - Since the CanTp module and Dcm module or (CanTp and Com module) are modules that operate in conjunction with each other, they must be mapped to the same OS task.

5.3 CanTpConfig-CanTpChannel-CanTpRxNSdu

Parameter Name	Value	Category
CanTpBs	0	C
CanTpNar	1	C
CanTpNbr	0.005	C
CanTpNcr	1	C
CanTpRxAddressingFormat	CANTP_STANDARD	C
CanTpRxNSduId	Automated	F
CanTpRxPaddingActivation	CANTP_ON	F
CanTpRxTaType	Automated	C
CanTpRxWftMax	0	C

CanTpSTmin	0.005	C
CanTpRxNSduRef	Automated	F

1) CanTpBs
   - Flow Control Message: The absolute number of CF N_PDUs per block.
   - Default Value: 0 (refer to ES95400-30E)

2) CanTpNar
   - Time for transmission of the CAN frame (any N_PDU) on the receiver side.
   - Default Value: 1s (ISO15765-2)

3) CanTpNbr
   - Time until transmission of the next FlowControl N_PDU.
   - Default Value: 0.005
   - In ISO15765-2, the default value of this parameter is N/A, but it has Performance Requirement as below. The value of CanTpNbr should satisfy below requirement.
   $(N\_Br + N\_Ar) < (0.9 \times N\_Bs$ timeout$)$

4) CanTpNcr
   - Time until transmission of the next Consecutive Frame N_PDU.
   - Default Value: 1s (ISO15765-2) 5)

5) CanTpRxAddressingFormat
   - CANTP_STANDARD : to use normal addressing format
   - CANTP_EXTENDED : to use extended addressing format.
   - CANTP_MIXED : to use mixed 11 bit addressing format.
   - CANTP_NORMALFIXED: to use normal fixed addressing format.
   - CANTP_MIXED29BIT: to use mixed 29 bit addressing format.

   Note: For addressing mode which has not mentioned about size of addressing format. Default that applied for 11 and 29 bit addressing.

6) CanTpRxNSduId
   - RxNsdu ID.

7) CanTpRxPaddingActivation
   - Padding Byte: to use for pad to unused bytes in CAN frame. Purpose to make sure the Can buffer payload already initialized.

8) CanTpRxTaType
   - CANTP_PHYSICAL : Functional request type.
   - CANTP_FUNCTIONAL : Physical request type.

9) CanTpRxWftMax
   - The maximum number of times to send the Wait Flow Control Frame, the communication is stopped when the number is exceeded. (Unit: number)

- Default Value : ES95400-30E

10) CanTpSTmin

- The minimum time the sender is to wait between transmission of two CF N_PDUs.

- Default Value : ES95400-30E

11) CanTpRxNSduRef

- Sdu Reference to Pdu in Com stack.

5.4 CanTpConfig- CanTpChannel-CanTpRxNSdu-CanTpTxFcNPdu

Parameter Name	Value	Category
CanTpTxFcNPduConfirmationPduId	Automated	F
CanTpTxFcNPduRef	Automated	F

1) CanTpTxFcNPduConfirmationPduId

- ID which is used by CanIf for Confirmation on FcTxNPdu.

2) CanTpTxFcNPduRef

- Reference Pdu in Com stack.

5.5 CanTpConfig-CanTpChannel-CanTpRxNSdu-CanTpRxNPdu

Parameter Name	Value	Category
CanTpRxNPduId	Automated	F
CanTpRxNPduRef	Automated	F

1) CanTpRxNPduId

- Pdu Id which use for RxIndication proceed.

2) CanTpRxNPdu

- Ref Reference Pdu in Com stack.

5.6 CanTpConfig-CanTpChannel-CanTpRxNSdu-CanTpNSa

Parameter Name	Value	Category
CanTpNSa	-	N

1) CanTpNSa

- Network Source address used in extended format.

  It also used in normalfixed and mixed29bit with DynId support and Pdu configured with metadata (CAN_ID_32).

5.7 CanTpConfig-CanTpChannel-CanTpRxNSdu-CanTpNTa

Parameter Name	Value	Category
CanTpNTa	-	N

1) CanTpNTa

HYUNDAI
AutoEver
AUTOSAR CanTp User Manual

DOCUMENT NUMBER (1)

SHT/SHTS
20 / 39

- Network Target address.

5.8 CanTpConfig-CanTpChannel-CanTpTxNSdu

Parameter Name	Value	Category
CanTpNas	1	C
CanTpNbs	1	C
CanTpNcs	0.005	C
CanTpTc	True	F
CanTpTxAddressingFormat	CANTP_STANDARD	F
CanTpTxNSduId	Automated	F
CanTpTxPaddingActivation	CANTP_ON	F
CanTpTxTaType	Automated	C
CanTpTxNSduRef	Automated	F

1) CanTpNas

   - Time for transmission of the CAN frame (any N_PDU) on the sender side.

   - Default Value: 1s (ISO15765-2-2016).

2) CanTpNbs

   - Time until reception of the next FlowControl N_PDU.

   - Default Value: 1s (ISO15765-2-2016)

3) CanTpNcs

   - Time until transmission of the next ConsecutiveFrame N_PDU.

   - Default Value: 0.005.

   - In ISO15765-2, the default value of this parameter is N/A, but it has Performance Requirement as below. The value of CanTpNcs should satisfy below requirement. (N_Cs + N_As) < (0.9 x N_Cr timeout)

4) CanTpTc

   - Transmit Cancellation. Only support to configure True when Ta_Type is PHYSICAL.

5) CanTpTxAddressingFormat

   - CANTP_STANDARD : to use normal addressing format

   - CANTP_EXTENDED : to use extended addressing format.

   - CANTP_MIXED : to use mixed 11 bit addressing format.

   - CANTP_NORMALFIXED: to use normal fixed addressing format.

   - CANTP_MIXED29BIT: to use mixed 29 bit addressing format.

Note: For addressing mode which has not mentioned about size of addressing format. Default that applied for 11 and 29 bit addressing.

6) CanTpTxNSduId

   - TxNsdu ID

7) CanTpTxPaddingActivation

   - Padding Byte

8) CanTpTxTaType

   - CANTP_PHYSICAL : Functional request type.

   - CANTP_FUNCTIONAL : Physical request type.

9) CanTpTxNSduRef

   - Sdu Reference

5.9 CanTpConfig-CanTpChannel-CanTpTxNSdu-CanTpRxFcNPdu

Parameter Name	Value	Category
CanTpRxFcNPduId	Automated	F
CanTpRxFcNPduRef	Automated	F

1) CanTpRxFcNPduId

   - Id has used to indication for RxFcNpdu from CanIf.

2) CanTpRxFcNPduRef

   - Reference Pdu in Com stack.

5.10 CanTpConfig-CanTpChannel-CanTpTxNSdu-CanTpTxNPdu

Parameter Name	Value	Category
CanTpTxNPduConfirmationId	Automated	F
CanTpTxNPduRef	Automated	F

1) CanTpTxNPduConfirmationId

   - Id used to confirmation call back from CanIf.

2) CanTpTxNPdu

   - Ref Reference Pdu in Com stack.

6   Application Programming Interface (API)

6.1 Type Definitions

Name	CanTp_ConfigType
Type	Structure
Range	Implementation specific.
Description	Data structure type for the post-build configuration parameters.
Available via	CanTp.h

6.2 Macro Constants

None

6.3 Functions

Function Name	CanTp_Init	
Syntax	void CanTp_Init (const CanTp_ConfigType* CfgPtr)	
Service ID [Hex]	0x01	
Sync/Async	Synchronous	
Reentrancy	Non-Reentrant	
Parameters (In)	CfgPtr	Pointer to the CanTp post-build configuration data.
Parameters (Inout)	None	
Parameters (Out)	None	
Return Value	None	
Description	This function initializes the CanTp module.	
Preconditions	None	
Configuration Dependency	None	
Available via	CanTp.h	

Function Name	CanTp_Shutdown
Syntax	void CanTp_Shutdown(void)
Service ID [Hex]	0x02
Sync/Async	Synchronous

Reentrancy	Non-Reentrant
Parameters (In)	None
Parameters (Inout)	None
Parameters (Out)	None
Return Value	None
Description	This function is called to shutdown the CanTp module.
Preconditions	None
Configuration Dependency	None
Available via	CanTp.h

Function Name	CanTp_GetVersionInfo	
Syntax	void CanTp_GetVersionInfo(Std_VersionInfoType* versioninfo)	
Service ID [Hex]	0x07	
Sync/Async	Synchronous	
Reentrancy	Reentrant	
Parameters (In)	None	
Parameters (Inout)	None	
Parameters (Out)	versioninfo	Indicator as to where to store the version information of this module.
Return Value	None	
Description	This function returns the version information of the CanTp module.	
Preconditions	None	
Configuration Dependency	None	
Available via	CanTp.h	

Function Name	CanTp_Transmit
Syntax	Std_ReturnType CanTp_Transmit(PduIdType TxPduId, const PduInfoType* PduInfoPtr

	)
Service ID [Hex]	0x49
Sync/Async	Synchronous
Reentrancy	Reentrant for different PduIds. Non reentrant for the same PduId.

Parameters (In)	TxPduId	Identifier of the PDU to be transmitted
	PduInfoPtr	Length of and pointer to the PDU data and pointer to MetaData.
Parameters (Inout)	None	
Parameters (Out)	None	
Return Value	Std_ReturnType	E_OK: Transmit request has been accepted. E_NOT_OK: Transmit request has not been accepted.
Description	Requests transmission of a PDU.	
Preconditions	None	
Configuration Dependency	None	
Available via	CanTp.h	

Function Name	CanTp_CancelTransmit	
Syntax	Std_ReturnType CanTp_CancelTransmit(PduIdType TxPduId)	
Service ID [Hex]	0x4a	
Sync/Async	Synchronous	
Reentrancy	Reentrant for different PduIds. Non reentrant for the same PduId.	
Parameters (In)	TxPduId	Identifier of the PDU to be transmitted
Parameters (Inout)	None	
Parameters (Out)	None	

Return Value	Std_ReturnType	E_OK: Cancellation was executed successfully by the destination module.
		E_NOT_OK: Cancellation was rejected by the destination module.
Description	Requests cancellation of an ongoing transmission of a PDU in a lower layer communication module.	
Preconditions	None	
Configuration Dependency	None	
Available via	CanTp.h	

Function Name	CanTp_CancelReceive	
Syntax	Std_ReturnType CanTp_CancelReceive (PduIdType RxPduId)	
Service ID [Hex]	0x4c	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (In)	RxPduId	Identifier of the PDU to be cancelled.
Parameters (Inout)	None	
Parameters (Out)	None	
Return Value	Std_ReturnType	E_OK: Cancellation was executed successfully by the destination module.
		E_NOT_OK: Cancellation was rejected by the destination module.
Description	Requests cancellation of an ongoing reception of a PDU in a lower layer transport protocol module.	
Preconditions	None	
Configuration Dependency	None	
Available via	CanTp.h	

Function Name	CanTp_ChangeParameter	
Syntax	Std_ReturnType CanTp_ChangeParameter(PduIdType id, TPParameterType parameter, uint16 value)	
Service ID [Hex]	0x4b	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (In)	id	ID of the parameter that shall be changed.
	parameter	ID of the parameter that shall be changed.
	value	The new value of the parameter.
Parameters (Inout)	None	
Parameters (Out)	None	
Return Value	Std_ReturnType	E_OK: The parameter was changed successfully. E_NOT_OK: The parameter change was rejected.
Description	Request to change a specific transport protocol parameter (e.g. block size).	
Preconditions	None	
Configuration Dependency	None	
Available via	CanTp.h	

Function Name	CanTp_ReadParameter
Syntax	Std_ReturnType CanTp_ReadParameter(PduIdType id, TPParameterType parameter, uint16* value

	)
Service ID [Hex]	0x0b
Sync/Async	Synchronous
Reentrancy	Non Reentrant
Parameters (In)	id	Identifier of the received N-SDU on which the reception parameter are read.
	parameter	Specify the parameter to which the value has to be read (BS or STmin).
Parameters (Inout)	None	
Parameters (Out)	value	Pointer where the parameter value will be provided.
Return Value	Std_ReturnType	E_OK: request is accepted. E_NOT_OK: request is not accepted.
Description	This service is used to read the current value of reception parameters BS and STmin for a specified N-SDU.	
Preconditions	None	
Configuration Dependency	None	
Available via	CanTp.h	

Function Name	CanTp_MainFunction
Syntax	void CanTp_MainFunction(void)
Service ID [Hex]	0x06
Description	The main function for scheduling the CAN TP.
Preconditions	None
Configuration Dependency	None
Available via	SchM_CanTp.h

Function Name	CanTp_RxIndication
Syntax	void CanTp_RxIndication(

	PduIdType RxPduId,
	const PduInfoType* PduInfoPtr
	)

Service ID [Hex]	0x42	
Sync/Async	Synchronous	
Reentrancy	Reentrant for different PduIds. Non reentrant for the same PduId.	
Parameters (In)	RxPduId	ID of the received PDU.
	PduInfoPtr	Contains the length (SduLength) of the received PDU, a pointer to a buffer (SduDataPtr) containing the PDU, and the MetaData related to this PDU.
Parameters (Inout)	None	
Parameters (Out)	None	
Return Value	None	
Description	Indication of a received PDU from a lower layer communication interface module.	
Preconditions	None	
Configuration Dependency	None	
Available via	CanTp.h	

Function Name	CanTp_TxConfirmation	
Syntax	void CanTp_TxConfirmation(	
	PduIdType TxPduId,	
	Std_ReturnType result	
	)	
Service ID [Hex]	0x40	
Sync/Async	Synchronous	
Reentrancy	Reentrant for different PduIds. Non reentrant for the same PduId.	
Parameters (In)	TxPduId	ID of the PDU that has been transmitted.
	result	E_OK: The PDU was transmitted.

		E_NOT_OK: Transmission of the PDU failed.
Parameters (Inout)	None	
Parameters (Out)	None	
Return Value	None	
Description	The lower layer communication interface module confirms the transmission of a PDU, or the failure to transmit a PDU.	
Preconditions	None	
Configuration Dependency	None	
Available via	CanTp.h	

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).
-411	To Support AUTOSAR version 4.1 for PduR_StartOfReception() function

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><xx>: < Error/Warning/Information Message>
  Where,
  <mid>: 35 – CanTp Module Id (35) for user configuration checks.
      00 - for command line checks.
  <xx>: 51 - 99 - 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.

ERR350008: The parameter <Parameter Name> in the container <Container Name> is configured with invalid value. The calculated number of ticks for any of the below parameters divided by CanTpMainFunctionPeriod should be greater than zero.

This error occurs, if the below parameters is smaller than CanTpMainFunctionPeriod. (Parameter / CanTpMainFunctionPeriod == 0)

Parameter Name	Container Name
CanTpNar	CanTpRxNSdu
CanTpNbr	
CanTpNcr	
CanTpNas	CanTpTxNSdu
CanTpNbs	
CanTpNcs	

ERR350005: The parameter 'Parameter Name' in the container 'Container Name' should be configured.

This error occurs, if value of any of the mandatory parameters mentioned in the below table are not configured.

Parameter Name	Container Name
CanTpDevErrorDetect	CanTpGeneral
CanTpVersionInfoApi	
CanTpChangeParameterRequestApi	
CanTpPaddingByte	
CanTpReadParameterApi	
CanTpChannelMode	CanTpChannel
CanTpMainFunctionPeriod	CanTpConfig
CanTpRxAddressingFormat	CanTpRxNSdu
CanTpRxPaddingActivation	

CanTpRxTaType	
CanTpNbr	
CanTpTxAddressingFormat	CanTpTxNSdu
CanTpTxPaddingActivation	
CanTpTxTaType	
CanTpNas	
CanTpTxNSduId	
CanTpTc	
CanTpRxNPduId	CanTpRxNPdu
CanTpTxNPduConfirmationPduId	CanTpTxNPdu

ERR350006: The value configured for the parameter 'AR-RELEASE-VERSION' in the container 'BSWIMPLEMENTATION' should follow the pattern: <4.[0-9]+.[0-9]+>.

This error occurs, when AR-RELEASE-VERSION in BSW-IMPLEMENTATION does not follow the pattern: <4.[0-9]+.[0-9]+>)

ERR350009: The value of the reference parameter 'Parameter Name' in the N-SDU <Container Short Name> does not have an equivalent N-SDU in the upper layer <PduR>.

This error occurs, if value of the below mentioned reference parameters does not have an equivalent NSDU in the upper layer 'PduR'.

Parameter Name	Container Name
CanTpRxNSduRef	CanTpRxNSdu
CanTpTxNSduRef	CanTpTxNSdu

ERR350010: The value of the reference parameter 'Parameter Name' in the N-PDU <Container Short Name> does not have an equivalent N-PDU in the lower layer <CanIf>.

This error occurs, if value of the below mentioned reference parameters does not have an equivalent NPDU in the lower layer 'CanIf'.

Parameter Name	Container Name
CanTpTxFcNPduRef	CanTpTxFcNPdu
CanTpTxNPduRef	CanTpTxNPdu

ERR0350011: The container 'Dependent Container Name' should be configured when the 'Parameter Name' is configured as <Addressing Mode> in the container 'Container Name1'.

This error occurs, if any of the below mentioned dependent containers are not configured when the parameter is configured with addressing modes given below.

Parameter Name	Dependent Container Name	Parameter Name1	Value Parameter 1	Parameter Name2	Value Parameter 2	Parameter Name3	Value Parameter 3	Container Name1	Addressing Mode
CanTpRxAddressingFormat	CanTpNSa					RxTatype	CANTP_PHYSICAL	CanTpRxNSdu	CANTP_EXTENDED
CanTpTxAddressingFormat	CanTpNSa							CanTpTxNSdu	CANTP_EXTENDED
CanTpRxAddressingFormat	CanTpNAe							CanTpRxNSdu	CANTP_MIXED/CANTP_MIXED29BIT
CanTpTxAddressingFormat	CanTpNAe							CanTpTxNSdu	CANTP_MIXED/CANTP_MIXED29BIT
CanTpRxAddressingFormat	CanTpNTa							CanTpRxNSdu	CANTP_EXTENDED
CanTpTxAddressingFormat	CanTpNTa							CanTpTxNSdu	CANTP_EXTENDED
CanTpRxAddressingFormat	CanTpNSa	CanTpDynIdSupport	1	CanTpGenericConnectionSupport	0	RxTatype	CANTP_PHYSICAL	CanTpRxNSdu	CANTP_EXTENDED/CANTP_NORMALFIXED/CANTP_MIXED29BIT

CanTpTxAddressingFormat	CanTpNSa	CanTpDynIdSupport	1					CanTpTxNSdu	CANTP_EXTENDED/CANTP_NORMALFIXED/CANTP_MIXED29BIT
CanTpRxAddressingFormat	CanTpNTa	CanTpDynIdSupport	1					CanTpRxNSdu	CANTP_EXTENDED/CANTP_NORMALFIXED/CANTP_MIXED29BIT
CanTpTxAddressingFormat	CanTpNTa	CanTpDynIdSupport	1	CanTpGenericConnectionSupport	0			CanTpTxNSdu	CANTP_EXTENDED/CANTP_NORMALFIXED/CANTP_MIXED29BIT

ERR350012: Parameters 'Parameter Name' should be configured in container 'CanTpRxNSdu' since the container 'CanTpTxFcNPdu' is configured.

Parameter Name
CanTpSTmin
CanTpRxWftMax

This error occurs, if the parameters CanTpSTmin and CanTpRxWftMax are not configured, when container CanTpTxFcNPdu is configured.

ERR350013: The value of the parameter 'Dependent Parameter Name' is not configured when container 'Dependent Container Name' is configured and 'Parameter Name' is configured as <Addressing Mode> in the container 'Container Name1'.

This error occurs, if any of the below dependent parameters are not configured when the dependent containers are configured and the parameters are configured with the addressing modes given below.

Dependent Parameter Name	Parameter Name	Dependent Container Name	Container Name1	Addressing Mode
CanTpNSa	CanTpRxAddressingFormat	CanTpNSa	CanTpRxNSdu	CANTP_EXTENDED/ CANTP_NORMALFIXED/ CANTP_MIXED29BIT

CanTpNSa	CanTpTxAddressingFormat	CanTpNSa	CanTpTxNSdu	CANTP_EXTENDED/ CANTP_NORMALFIXED/ CANTP_MIXED29BIT
CanTpNAe	CanTpRxAddressingFormat	CanTpNAe	CanTpRxNSdu	CANTP_MIXED/ CANTP_MIXED29BIT
CanTpNAe	CanTpTxAddressingFormat	CanTpNAe	CanTpTxNSdu	CANTP_MIXED/ CANTP_MIXED29BIT
CanTpNTa	CanTpRxAddressingFormat	CanTpNTa	CanTpRxNSdu	CANTP_EXTENDED/ CANTP_NORMALFIXED/ CANTP_MIXED29BIT
CanTpNTa	CanTpTxAddressingFormat	CanTpNTa	CanTpTxNSdu	CANTP_EXTENDED/ CANTP_NORMALFIXED/ CANTP_MIXED29BIT

ERR350014: The containers 'CanTpRxFcNPdu' and 'CanTpRxNPdu' should have the same group of addressing format as they have same Pdu Ids. CanTpRxNPdu: <RxNPdu Short Name> CanTpRxFcNPdu: <RxFcNPdu Short Name>.

This error occurs, if containers CanTpRxFcNPdu and CanTpRxNPdu have same Pdu Ids when they have configured for different group addressing format.

Group 1		Group 2		
CANTP_STANDARD	CANTP_NORMALFIXED	CANTP_MIXED	CANTP_MIXED29BIT	CANTP_EXTENDED

ERR350015: The value of the parameter 'Parameter Name' is not unique for the same values of the parameter 'CanTpRxNPduId' when the addressing format is configured as <value of the parameter CanTpRxAddressingFormat> in the container 'CanTpRxNSdu'.

This error occurs, if the value of the parameter CanTpNSa is unique for the same CanTpRxNPduId values if the addressing format is CANTP_EXTENDED in the container CanTpRxNSdu. This error also occurs if the value of the parameter CanTpNAe is unique for the same CanTpRxNPduId values if the addressing format is CANTP_MIXED in the container CanTpRxNSdu.

Parameter Name	CanTpRxAddressingFormat
CanTpNSa	CANTP_EXTENDED / CANTP_NORMALFIXED/ CANTP_MIXED29BIT
CanTpNAe	CANTP_MIXED / CANTP_MIXED29BIT

ERR350016: Value of the parameter 'Parameter Name' <Parameter id value> is repeated in the container 'Container Name'. 'Parameter Name' should be unique.

This error occurs, if the value of parameters of the container is not unique within each config set.
Please refer below table for list of parameters and its container

Parameter Name	Container Name
CanTpRxNSduId	CanTpRxNSdu
CanTpTxNSduId	CanTpTxNSdu
CanTpTxNPduConfirmationPduId	CanTpTxNPdu
CanTpTxFcNPduConfirmationPduId	CanTpTxFcNPdu

ERR350017: Value of the parameter 'Parameter Name' in the container 'Container Name' should start with <0> and sequential.

This error occurs, if value of the parameter does not start with 0 or not sequential within the configuration set

Parameter Name	Container Name
CanTpRxNSduId	CanTpRxNSdu
CanTpRxNPduId	CanTpRxNPdu
CanTpRxFcNPduId	CanTpRxFcNPdu
CanTpTxNSduId	CanTpTxNSdu
CanTpTxNPduConfirmationPduId	CanTpTxNPdu
CanTpTxFcNPduConfirmationPduId	CanTpTxFcNPdu

ERR350018: The value of the parameter 'CanTpRxNPduId' in the container 'CanTpRxNPdu' is not unique as the addressing format is <CANTP_STANDARD> in the container 'CanTpRxNSdu'.

This error occurs, if values of the parameter CanTpRxNPduId in the container CanTpRxNPdu are not unique when addressing format is configured as CANTP_STANDARD.

ERR350019: The container 'Container Name 1' should not be configured when the corresponding 'Container Name 1' is configured for the functional request type.

This error occurs, if container CanTpRxNSdu or CanTpTxNSdu is configured for CANTP_FUNCTIONAL then container CanTpTxFcNPdu or CanTpRxFcNPdu should not be configured respectively.

Container Name 1	Container Name 2
CanTpTxFcNPdu	CanTpRxNSdu
CanTpRxFcNPdu	CanTpTxNSdu

ERR350022: CanTp operates in Full Duplex mode only, So at least one CanTpTxNSdu and one CanTpRxNSdu is mandantory.

This error occurs, if do not exist at least one <CanTpTxNSdu> and one <CanTpRxNSdu> are not configured.

ERR350023: The dependent parameter 'Dependent Parameter' should not be configured when the original parameter 'Original parameter' is not configured.

This error occurs, if value of any of the parameters mentioned in the below table are not configured as original value when, value of the dependent parameters are configured as dependent value.

Original Parameter Name	Original Value	Dependent Parameter	Dependent Value
CanTpDynIdSupport	Not be configured	CanTpGenericConnectionSupport	0/1

ERR350024: Value of the parameter <CanTpTxTaType> in the container 'CanTpTxNSdu' should not be configured as CANTP_FUNCTIONAL, since value of the parameter 'CanTpTc' in the container 'CanTpTc' is configured as True.

This error occurs, if in the container "CanTpTxNSdu' is configured as CANTP_FUNCTIONAL, since value of the parameter 'CanTpTc' in the container 'CanTpTc' is configured as True.

ERR350027: In the container CanTpRxNSdu. The value of the parameter 'Parameter Name' is not unique for the same values of the parameter 'CanTpRxNPduId' when the addressing format is configured the same

Parameter Name	Container Name
CanTpNSa	CANTP_EXTENDED/CANTP_NORMALFIXED/CANTP_MIXED29BIT

CanTpNAe	CANTP_MIXED/CANTP_MIXED29BIT

ERR350028: The ID of the parameter "Short_name_parameter" in the container "Short_name_conatiner" belong to the variant "Short_name_variant" shall must be started with 0 and sequential when switch the different variant select.

When CanTp module is configured with support PostBuild then the IDs of the containers shall must be started with 0 and sequential . This rule shall be applied when switch the different variant select.

Parameter Name	Container Name
CanTpRxNSduId	CanTpRxNSdu
CanTpRxNPduId	CanTpRxNPdu
CanTpRxFcNPduId	CanTpRxFcNPdu
CanTpTxNSduId	CanTpTxNSdu
CanTpTxNPduConfirmationPduId	CanTpTxNPdu
CanTpTxFcNPduConfirmationPduId	CanTpTxFcNPdu

ERR0350029: Mismatch variant between CanTp and EcuC

When CanTp module is configured with support PostBuild then the number of Variant between EcuC and CanTp module configuration are not suitable.
All variants that have been configured in EcuC must exist in CanTp.

ERR350030: The parameter "Parameter_Name" in the container "ShortName-ContainerName" of the variant "Short_name_variant" can not change value because this parameter get Post-Build Variant Value is False.

If CanTp module is supported PostBuild but some parameters have Post-Build Variant Value = False. However, User config with the different value.

Parameter Name	Container Name
CanTpRxAddressingFormat	CanTpRxNSdu
CanTpRxNSduId	
CanTpRxTaType	
CanTpRxNPduId	CanTpRxNPdu

CanTpTxFcNPduConfirmationPduId	CanTpTxFcNPdu
CanTpTc	CanTpTxNSdu
CanTpTxAddressingFormat	
CanTpTxNSduId	
CanTpTxTaType	
CanTpTxNPduConfirmationPduId	CanTpTxNPdu
CanTpRxFcNPduId	CanTpRxFcNPdu
CanTpNTa	CanTpNTa
CanTpNSa	CanTpNSa
CanTpNae	CanTpNae

ERR350007: The parameter "Parameter Name" in container "ShortName-ContainerName" should be configured. When CanTpRxTaType/CanTpTxTaType is configured "PHYSICAL".

This error occurs, if container CanTpRxTaType of CanTpRxNSdu is configured for CANTP_PHYSICAL and CanTpNar/CanTpNbr/CanTpNcr/CanTpSTmin is not configured. If container CanTpTxTaType of CanTpTxNSdu is configured for CANTP_PHYSICAL and CanTpNbs/CanTpNcs is not configured

Parameter Name	Container Name
CanTpNar	CanTpRxNSdu
CanTpNbr	
CanTpNcr	
CanTpSTmin	CanTpTxNSdu
CanTpNbs	
CanTpNcs	

ERR350031: PduId of {Container name 1}(Parameter value 1) and {Container name 2}(Parameter value 2) should be the same value when they refer to the same PDU .

This error occurs, if in one channel CanTpRxNPduRef/CanTpTxNPduRef and CanTpRxFcNPduRef/CanTpTxFcNPduRef refer to the same Pdu but the PduId of CanTpRxNPduId/CanTpTxNPduConfirmationPduId and CanTpRxFcNPduId/CanTpTxFcNPduConfirmationPduId are not the same value

Parameter Name	Container Name
CanTpRxNPduRef	CanTpRxNPdu
CanTpRxNPduId	
CanTpRxFcNPduRef	CanTpRxFcNPdu
CanTpRxFcNPduId	
CanTpTxNPduRef	CanTpTxNPdu
CanTpTxNPduConfirmationPduId	
CanTpTxFcNPduRef	CanTpTxFcNPdu

CanTpTxFcNPduConfirmationPduId	

7.1.2 Warning Messages

WRN3500: The container 'Dependent Container Name' should be configured when the corresponding 'Container Name' is configured for the physical request type.

This error occurs, if container CanTpRxNSdu or CanTpTxNSdu is configured for CANTP_PHYSICAL then container CanTpTxFcNPdu or CanTpRxFcNPdu is (are) not configured.

Dependent Container Name	Container Name
CanTpTxFcNPdu	CanTpRxNSdu
CanTpRxFcNPdu	CanTpTxNSdu

7.1.3 Information Messages

INF063015: AUTOSAR Release version 'AR-RELEASE-VERSION' configured for the parameter 'ARRELEASE-VERSION' in provided MDT file is not correct. AUTOSAR Release version should be one of the following: 4.4.0

This information occurs, if AR-RELEASE-VERSION in BSW-IMPLEMENTATION is not configured as 4.4.0

8 SWP Error Code

8.1 SWP Error Code List

None

9 Appendix

None