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openSource

Modes and Levels Management Function

Scade model description

Summary:

Generated documentation from the Scade model of Modes and Levels Management Header Function.

Company: Systerel

Authors: Marielle Petit-Doche

Date: 16/10/2015

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1. General Project Description

empty section

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2. Software Architecture

2.1. Project Architecture

This section displays the package hierarchy of projects.

Project ModesAndLevels InputManagement OutputManagement

2.2. Call Graph

This Call Graph displays the dependency tree of model operators.

- 1. ManageLevelAndMode
 - 1.1. CheckLevelAndMode
 - 1.2. Input
 - 1.2.1. InputManagement::InputDMI
 - 1.2.2. InputManagement::InputLocalisation
 - 1.2.3. InputManagement::InputSpeedAndSupervision
 - 1.2.4. InputManagement::InputTrackManagement
 - 1.2.4.1. InputManagement::Input_Level_Transition
 - $1.2.4.1.1.\ Input Management:: Condition nal Transition$
 - 1.2.4.1.1.1 InputManagement::LevelTR2Level
 - 1.2.4.1.2. InputManagement::NormalTransition
 - 1.2.4.1.2.1. InputManagement::LevelTR2Level

1.2.4.1.2.2.

InputManagement::scaledDistance 2 distance [2]

- 1.2.4.2. InputManagement::Input MA SSP Gradient
- 1.2.4.3. InputManagement::Input Messages
- 1.2.4.4. InputManagement::Input_Modes
 - 1.2.4.4.1. InputManagement::Input ModeProfiles
 - 1.2.4.4.2. InputManagement::Input Reversing Mode
 - 1.2.4.4.3. InputManagement::Input_Staff_Responsible
- 1.3. ManageLevels
- 1.4. ManageModes
- 1.5. Output
 - 1.5.1. OutputManagement::Output Mode Level To Use
 - 1.5.2. OutputManagement::Output_To_BG_Management
 - 1.5.3. OutputManagement::Output_To_DMI

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3. ModesAndLevels Project

3.1. Root Elements

3.1.1. CheckLevelAndMode Operator

Declared as public function

3.1.1.1. Interface

Table 1: Inputs of CheckLevelAndMode

Name	Туре	Comments and Information
Level	M_LEVEL	
Mode	Level_And_Mode_Type s_Pkg::T_Mode	

Table 2: Outputs of CheckLevelAndMode

Name	Туре	Comments and Information
Level_Mode_Compatible	bool	

3.1.1.2. Operator Hierarchy

 $\underline{\text{diagram}}: \text{diagram_CheckLevelAndMode_1}$

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3.1.1.3. Graphical and Textual Diagrams

3.1.1.3.1. View of diagram_CheckLevelAndMode_1 (CheckLevelAndMode)

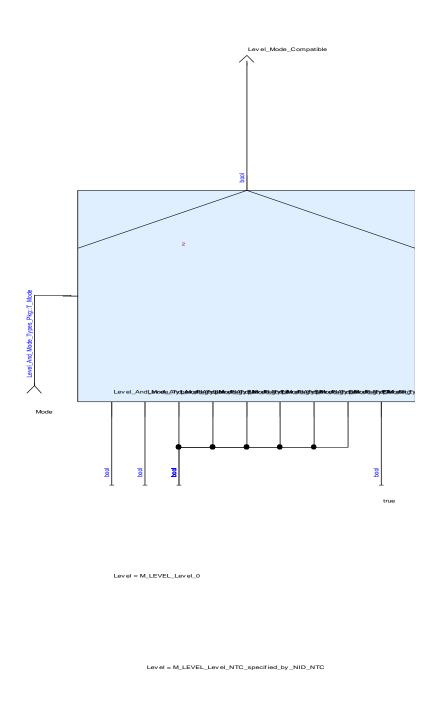


Figure 1: View of diagram_CheckLevelAndMode_1 (CheckLevelAndMode)

Level = $M_LEVEL_Level_1$ or Level = $M_LEVEL_Level_2$ or Level = M_L

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3.1.2. Input Operator

Declared as public function

3.1.2.1. Interface

Table 3: Inputs of Input

Name	Туре	Comments and Information
Data_From_DMI	DMI_Types_Pkg::DMI_ To_Modes_T	
Data_From_TIU	TIU_Types_Pkg::Messa ge_Train_Interface_to_ EVC_T	
Data_From_Track_Mes sages	Level_And_Mode_Type s_Pkg::T_Data_From_ Track_Mess	
Data_From_Track_Pac kets	Level_And_Mode_Type s_Pkg::T_Data_From_ Track_Packet	
Data_From_STM	Level_And_Mode_Type s_Pkg::T_Data_From_ STM	
Data_From_Localisatio n	Level_And_Mode_Type s_Pkg::T_Data_From_ Localisation	
Data_From_Speed_and _Supervision	Level_And_Mode_Type s_Pkg::T_Data_From_ Speed_Supervision	
Data_From_F2_Functions	Level_And_Mode_Type s_Pkg::T_Data_From_ F2_functions	
Cab_In	TIU_Types_Pkg::cab_I D_T	
driver_level_transition _In	Level_And_Mode_Type s_Pkg::T_LevelTransiti on	
ERTMS_capabilities_In	Level_And_Mode_Type s_Pkg::T_ERTMS_capa bilities	
Data_From_Track_MAS SPGradient	Level_And_Mode_Type s_Pkg::T_Data_From_ Track_MASSPGradient_ Available	
MemorizedLevelIn	M_LEVEL	

Table 4: Outputs of Input

Name	Туре	Comments and Information
train_standstill	bool	
driver_level_transition	Level_And_Mode_Type s_Pkg::T_LevelTransiti on	
levelAck	bool	
trainPosition	TrainPosition_Types_Pck::trainPosition_T	

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Name	Туре	Comments and Information
ERTMS_capabilities	Level_And_Mode_Type s_Pkg::T_ERTMS_capa bilities	
Data_From_Track_to_L evel	Level_And_Mode_Type s_Pkg::T_Data_From_ Track_To_Level	
MemorizedLevel	M_LEVEL	
Cab	TIU_Types_Pkg::cab_I D_T	
Data_From_DMI_To_M ode	Level_And_Mode_Type s_Pkg::T_Data_From_ DMI	
Data_From_F2_Functio ns_to_Mode	Level_And_Mode_Type s_Pkg::T_Data_From_ F2_functions	
Data_From_Localisatio n_To_Mode	Level_And_Mode_Type s_Pkg::T_Data_From_ Localisation	
Data_From_Speed_and _Supervision_To_Mode	Level_And_Mode_Type s_Pkg::T_Data_From_ Speed_Supervision	
Data_From_STM_to_M ode	Level_And_Mode_Type s_Pkg::T_Data_From_ STM	
Data_From_TIU_To_M ode	TIU_Types_Pkg::Messa ge_Train_Interface_to_ EVC_T	
Data_From_Track_To_ Mode	Level_And_Mode_Type s_Pkg::T_Data_From_ Track_To_Mode	

3.1.2.2. Operator Hierarchy

 $\underline{\text{diagram}}: \text{diagram_Input_1}$

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3.1.2.3. Graphical and Textual Diagrams

3.1.2.3.1. View of diagram_Input_1 (Input)

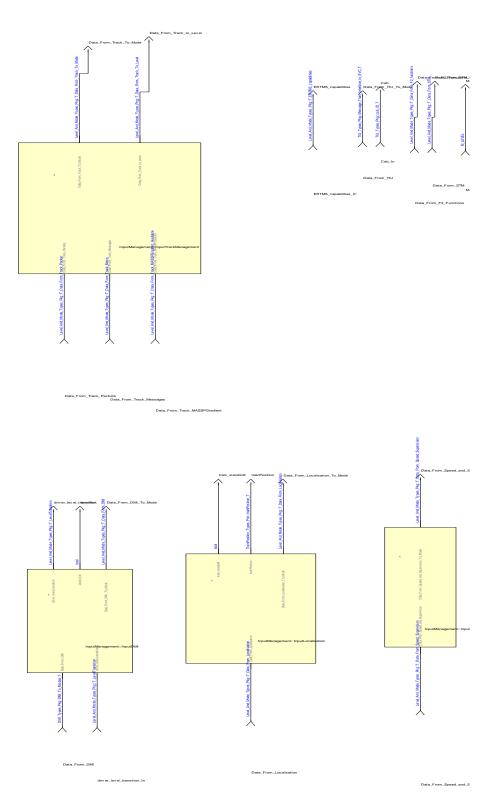


Figure 2: View of diagram_Input_1 (Input)

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3.1.3. ManageLevelAndMode Operator

Declared as public node

3.1.3.1. Interface

Table 5: Inputs of ManageLevelAndMode

Name	Туре	Comments and Information
Data_From_DMI	DMI_Types_Pkg::DMI_ To_Modes_T	
Data_From_Localisatio n	Level_And_Mode_Type s_Pkg::T_Data_From_ Localisation	
Data_From_TIU	TIU_Types_Pkg::Messa ge_Train_Interface_to_ EVC_T	
Data_From_Track_Mes sages	Level_And_Mode_Type s_Pkg::T_Data_From_ Track_Mess	
Data_From_Track_Pac kets	Level_And_Mode_Type s_Pkg::T_Data_From_ Track_Packet	
Data_From_Speed_and _Supervision	Level_And_Mode_Type s_Pkg::T_Data_From_ Speed_Supervision	
Cab_In	TIU_Types_Pkg::cab_I D_T	
driver_level_transition _In	Level_And_Mode_Type s_Pkg::T_LevelTransiti on	
ERTMS_capabilities_In	Level_And_Mode_Type s_Pkg::T_ERTMS_capa bilities	
Data_from_Track_MAS SPGradient	Level_And_Mode_Type s_Pkg::T_Data_From_ Track_MASSPGradient_ Available	
Data_From_F2_Functions	Level_And_Mode_Type s_Pkg::T_Data_From_ F2_functions	
Data_From_STM	Level_And_Mode_Type s_Pkg::T_Data_From_ STM	
MemorizedLevelIn	M_LEVEL	_

Table 6: Outputs of ManageLevelAndMode

Name	Туре	Comments and Information
Compatible_Mode_And _Level	Level_And_Mode_Type s_Pkg::T_Mode_Level	
Data_To_BG_Managem ent	Level_And_Mode_Type s_Pkg::T_Data_To_BG _Management	
Service_Brake_Comma nd	bool	
EB_Requested	bool	

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Name	Туре	Comments and Information
announcedLevel	Level_And_Mode_Type s_Pkg::T_AnnouncedLe vel	
Data_To_DMI_Ack	Level_And_Mode_Type s_Pkg::T_Acknoledgem entRequest	

3.1.3.2. Locals

Table 7: Locals of ManageLevelAndMode

Name	Туре	Comments and Information
Loc_Level_To_Apply	M_LEVEL	
Loc_Mode_To_Apply	Level_And_Mode_Type s_Pkg::T_Mode	
Loc_TripFromLevel	bool	

3.1.3.3. Operator Hierarchy

 $\underline{\text{diagram}}: \text{diagram_ManageLevelAndMode_1}$

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3.1.3.4. Graphical and Textual Diagrams

3.1.3.4.1. View of diagram_ManageLevelAndMode_1 (ManageLevelAndMode)

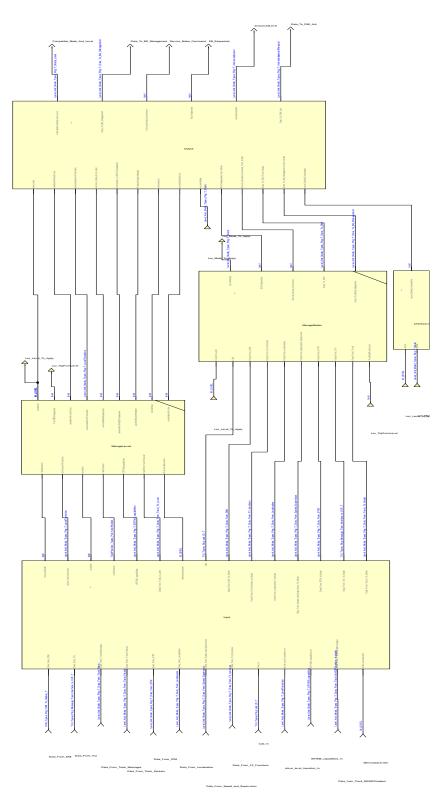


Figure 3: View of diagram_ManageLevelAndMode_1 (ManageLevelAndMode)

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3.1.4. Output Operator

Declared as public node

3.1.4.1. Interface

Table 8: Inputs of Output

Name	Туре	Comments and Information
next_level	M_LEVEL	
needsAckFromDriver	bool	
announcedLevelTransiti on	Level_And_Mode_Type s_Pkg::T_LevelTransiti on	
service_brake_from_le vel	bool	
Connection_to_RBC_R equested	bool	
PositionReportNeeded	bool	
isNewLevel	bool	Comments: The requested transition was not successfull, e.g., because of missing confirmation by the driver.
isAvailableForUse	bool	
currentMode	Level_And_Mode_Type s_Pkg::T_Mode	
EB_Requested_From_ Mode	bool	
Service_Brake_Comma nd_From_Mode	bool	
Data_To_DMI_From_M ode	Level_And_Mode_Type s_Pkg::T_Data_To_DM I	
Data_To_BG_Managem ent_From_Mode	Level_And_Mode_Type s_Pkg::T_Data_To_BG _Management	
Level_Mode_Compatible	bool	

Table 9: Outputs of Output

Name	Туре	Comments and Information
Compatible_Mode_And _Level	Level_And_Mode_Type s_Pkg::T_Mode_Level	
Data_To_BG_Managem ent	Level_And_Mode_Type s_Pkg::T_Data_To_BG _Management	
Service_Brake_Comma nd	bool	
EB_Requested	bool	
announcedLevel	Level_And_Mode_Type s_Pkg::T_AnnouncedLe vel	
Data_To_DMI_Ack	Level_And_Mode_Type s_Pkg::T_Acknoledgem entRequest	

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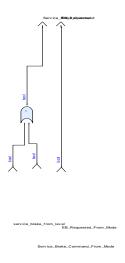
3.1.4.2. Operator Hierarchy

diagram : diagram_Output_1

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3.1.4.3. Graphical and Textual Diagrams

3.1.4.3.1. View of diagram_Output_1 (Output)



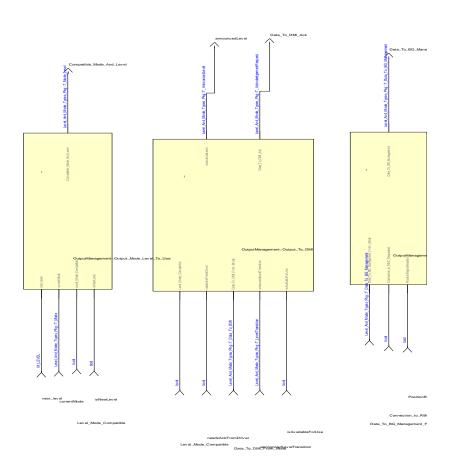


Figure 4: View of diagram_Output_1 (Output)

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3.2. InputManagement Package

3.2.1. Constants

Table 10: Public Constants of InputManagement

Name	Туре	Value	Comments and Information
cImmediateAck_Distan ce	D_LEVELTR	32767	

3.2.2. ConditionnalTransition Operator

Declared as public function

3.2.2.1. Interface

Table 11: Inputs of ConditionnalTransition

Name	Туре	Comments and Information
LRBG	NID_LRBG	
referenceLocation	Obu_BasicTypes_Pkg:: L_internal_Type	
Packet_46_One_Iter	Packet_Types_Pkg::P4 6_ConditionalLevelTran sitionOrder_T	

Table 12: Outputs of ConditionnalTransition

Name	Туре	Comments and Information
One_Transition	Level_And_Mode_Type s_Pkg::T_LevelTransiti on	

3.2.2.2. Locals

Table 13: Locals of ConditionnalTransition

Name	Туре	Comments and Information
Loc_Level_Transition	M_LEVELTR	
Loc_Req_Level	M_LEVEL	

3.2.2.3. Operator Hierarchy

diagram : diagram_ConditionnalTransition_1

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3.2.2.4. Graphical and Textual Diagrams

3.2.2.4.1. View of diagram_ConditionnalTransition_1 (ConditionnalTransition)

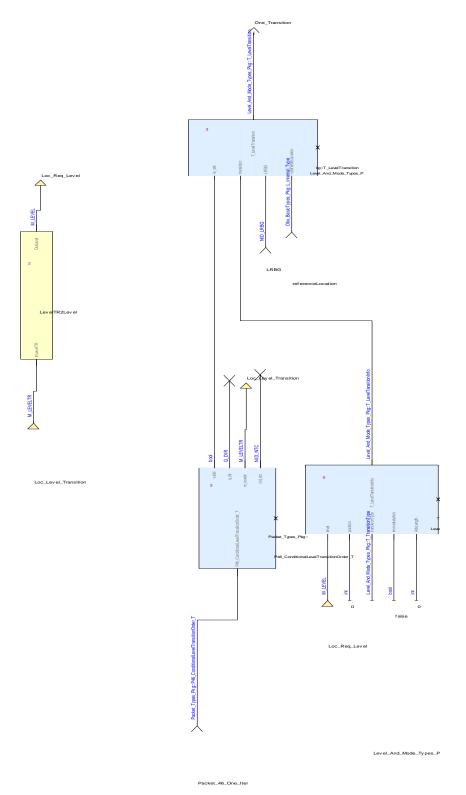


Figure 5: View of diagram_ConditionnalTransition_1 (ConditionnalTransition)

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3.2.3. Input_Level_Transition Operator

Declared as public function

3.2.3.1. Interface

Table 14: Inputs of Input_Level_Transition

Name	Туре	Comments and Information
Data_From_Track_Pac kets	Level_And_Mode_Type s_Pkg::T_Data_From_ Track_Packet	

Table 15: Outputs of Input_Level_Transition

Name	Туре	Comments and Information
conditional_transition	Level_And_Mode_Type s_Pkg::T_LevelTransiti on_PriorityTable	
level_transition_priorit y_table	Level_And_Mode_Type s_Pkg::T_LevelTransiti on_PriorityTable	

3.2.3.2. Operator Hierarchy

diagram : diagram_Input_Level_Transition_1

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3.2.3.3. Graphical and Textual Diagrams

3.2.3.3.1. View of diagram_Input_Level_Transition_1 (Input_Level_Transition)

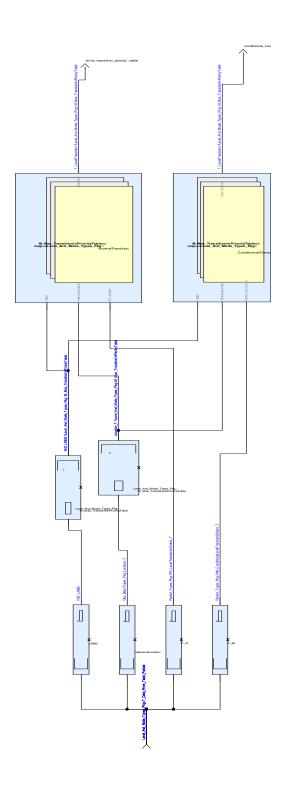


Figure 6: View of diagram_Input_Level_Transition_1 (Input_Level_Transition)

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3.2.4. Input_MA_SSP_Gradient Operator

Declared as public function

3.2.4.1. Interface

Table 16: Inputs of Input_MA_SSP_Gradient

Name	Туре	Comments and Information
Data_From_Track_MAS SPGradient	Level_And_Mode_Type s_Pkg::T_Data_From_ Track_MASSPGradient_ Available	

Table 17: Outputs of Input_MA_SSP_Gradient

Name	Туре	Comments and Information
received_L2_L3_MA	bool	
received_L1_MA	bool	
MA_SSP_Gradient_Ava ilable	bool	

3.2.4.2. Operator Hierarchy

diagram : diagram_Input_MA_SSP_Gradient_1

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3.2.4.3. Graphical and Textual Diagrams

3.2.4.3.1. View of diagram_Input_MA_SSP_Gradient_1 (Input_MA_SSP_Gradient)

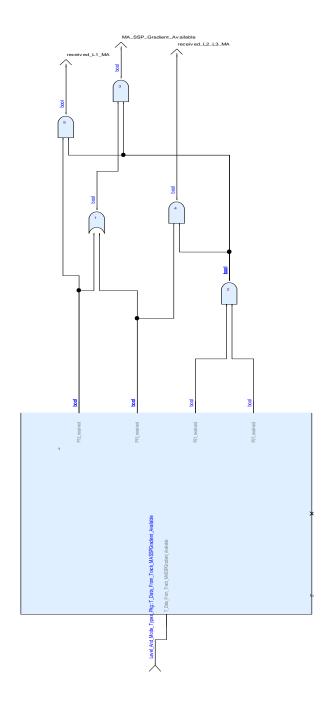


Figure 7: View of diagram_Input_MA_SSP_Gradient_1 (Input_MA_SSP_Gradient)

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3.2.5. Input_Messages Operator

Declared as public function

3.2.5.1. Interface

Table 18: Inputs of Input_Messages

Name	Туре	Comments and Information
Data_From_Track_Mes sages	Level_And_Mode_Type s_Pkg::T_Data_From_ Track_Mess	

Table 19: Outputs of Input_Messages

Name	Туре	Comments and Information
Emergency_Stop_Mess age_Received	D001	
Shunting_Granted_By_ RBC	bool	
RCB_Ack_And_EB_Rev ocked	bool	
RBC_Authorized_SR	bool	

3.2.5.2. Locals

Table 20: Locals of Input_Messages

Name	Туре	Comments and Information
Loc_Mess_15	bool	
Loc_Mess_16	bool	
Loc_Mess_2	bool	
Loc_Mess_27	bool	
Loc_Mess_28	bool	
Loc_Mess_6	bool	

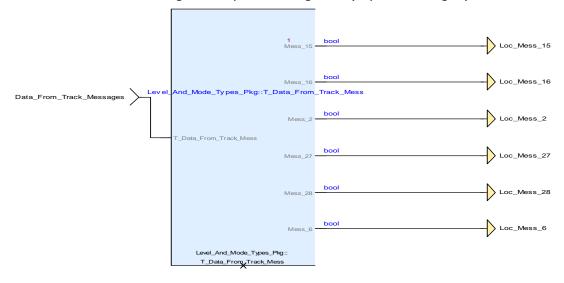
3.2.5.3. Operator Hierarchy

diagram : diagram_Input_Messages_1

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3.2.5.4. Graphical and Textual Diagrams

3.2.5.4.1. View of diagram_Input_Messages_1 (Input_Messages)



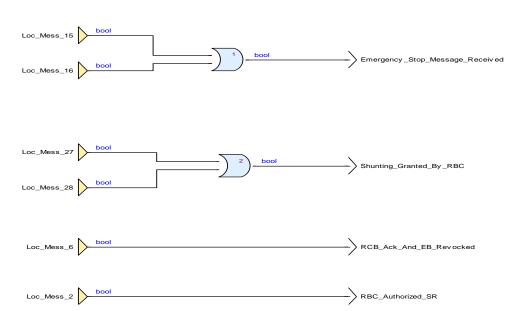


Figure 8: View of diagram_Input_Messages_1 (Input_Messages)

3.2.6. Input_ModeProfiles Operator

Declared as public function

3.2.6.1. Comments and Information

Input_ModeProfiles Comments:

Distances are given in regards of a balise in P_80 and in regards of the start of mission in Mode Profile On Board.

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3.2.6.2. Interface

Table 21: Inputs of Input_ModeProfiles

Name	Туре	Comments and Information
P_80_One_Iter	Packet_Types_Pkg::P8 0_ModeProfile_T	
referenceLocation	Obu_BasicTypes_Pkg:: L_internal_Type	

Table 22: Outputs of Input_ModeProfiles

Name	Туре	Comments and Information
Mode_Profile_On_Bora	Level_And_Mode_Type	
d	s_Pkg::T_Mode_Profile	

3.2.6.3. Locals

Table 23: Locals of Input_ModeProfiles

Name	Туре	Comments and Information
Loc_MAMode	M_MAMODE	
Loc_MO_Profile_Availa ble	bool	
Loc_Mode_Profile	Level_And_Mode_Type s_Pkg::T_MA	

3.2.6.4. Operator Hierarchy

diagram : diagram_Input_ModeProfiles_1

activate if: IfBlock1 branch: then branch: else **Created:** 16/10/2015 **Page:** 30/59

3.2.6.5. Graphical and Textual Diagrams

3.2.6.5.1. View of diagram_Input_ModeProfiles_1 (Input_ModeProfiles)

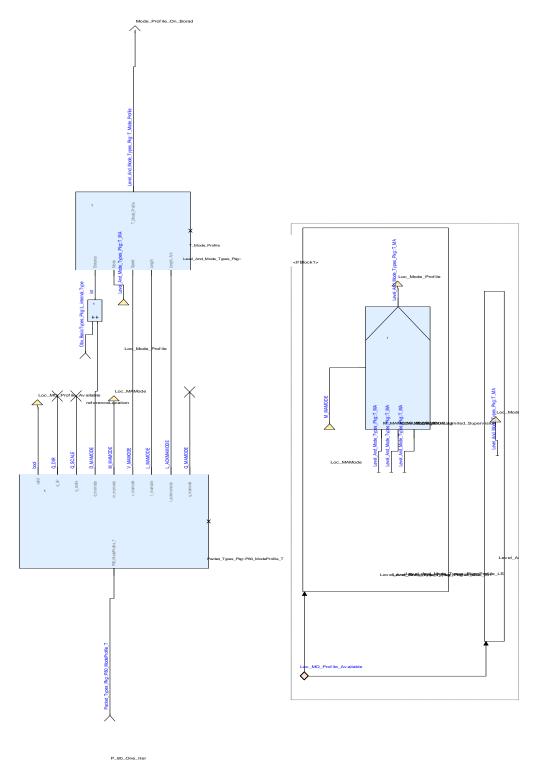


Figure 9: View of diagram_Input_ModeProfiles_1 (Input_ModeProfiles)

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Table 24: Conditional Blocks of diagram_Input_ModeProfiles_1

Conditional Block	Comments and Information
IfBlock1	

Table 25: Actions of diagram_Input_ModeProfiles_1

Conditional Block Action	Comments and Information
IfBlock1:then	
IfBlock1:else	

3.2.7. Input_Modes Operator

Declared as public function

3.2.7.1. Interface

Table 26: Inputs of Input_Modes

Name	Туре	Comments and Information
Data_From_Track_Pac kets	Level_And_Mode_Type s_Pkg::T_Data_From_ Track_Packet	

Table 27: Outputs of Input_Modes

Name	Туре	Comments and Information
Stop_If_In_SH	bool	
Stop_if_In_SR	bool	
Reversing_Data	Level_And_Mode_Type s_Pkg::T_Reversing_D ata	
Mode_Profile_On_Bora d	Level_And_Mode_Type s_Pkg::T_Mode_Profile _Table	
List_BG_Related_SR_E mpty	bool	
Trip_Order_givrn_By_B alise	bool	

3.2.7.2. Locals

Table 28: Locals of Input_Modes

Name	Туре	Comments and Information
Loc_Packet_12	Packet_Types_Pkg::P1 2_Level1MovementAut horities_T	
Loc_Packet_135	Packet_Types_Pkg::P1 35_StopShuntingOnDe skOpening_T	
Loc_Packet_137	Packet_Types_Pkg::P1 37_StopIfInStaffRespo nsible_T	

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Name	Туре	Comments and Information
Loc_Packet_138	Packet_Types_Pkg::P1 38_ReversingAreaInfor mation_T	
Loc_Packet_139	Packet_Types_Pkg::P1 39_ReversingSupervisi onInformation_T	
Loc_Packet_63	Packet_Types_Pkg::P6 3_ListofBalisesinSRAut hority_T	
Loc_Packet_80	Packet_Types_Pkg::P8 0_ModeProfiles_T	
Loc_referenceLocation	Obu_BasicTypes_Pkg:: Location_T	

3.2.7.3. Operator Hierarchy

diagram : diagram_Input_Modes_1

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3.2.7.4. Graphical and Textual Diagrams

3.2.7.4.1. View of diagram_Input_Modes_1 (Input_Modes)

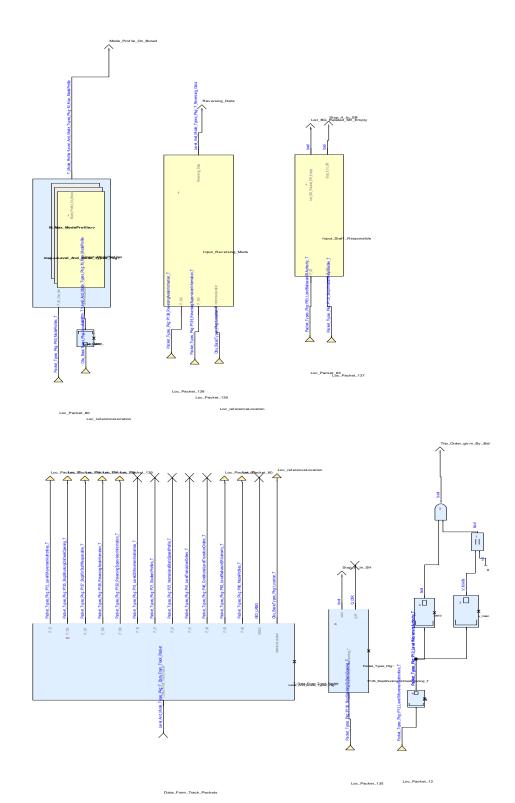


Figure 10: View of diagram_Input_Modes_1 (Input_Modes)

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3.2.8. Input_Reversing_Mode Operator

Declared as public function

3.2.8.1. Comments and Information

Input_Reversing_Mode Comments:

Distances are given in regards of a balise in P_138 and P_139 and in regards of the start of mission in Reversing_Data.

3.2.8.2. Interface

Table 29: Inputs of Input_Reversing_Mode

Name	Туре	Comments and Information
P_138	Packet_Types_Pkg::P1 38_ReversingAreaInfor mation_T	
P_139	Packet_Types_Pkg::P1 39_ReversingSupervisi onInformation_T	
referenceLocation	Obu_BasicTypes_Pkg:: L_internal_Type	

Table 30: Outputs of Input_Reversing_Mode

Name	Туре	Comments and Information
Reversing_Data	Level_And_Mode_Type s_Pkg::T_Reversing_D ata	

3.2.8.3. Operator Hierarchy

diagram : diagram_Input_Reversing_Mode_1

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3.2.8.4. Graphical and Textual Diagrams

3.2.8.4.1. View of diagram_Input_Reversing_Mode_1 (Input_Reversing_Mode)

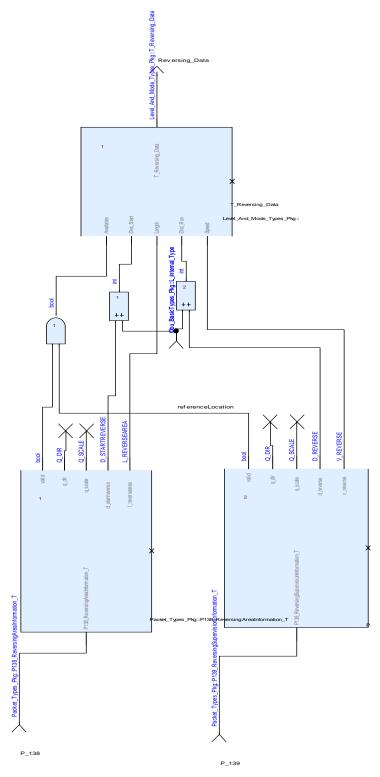


Figure 11: View of diagram_Input_Reversing_Mode_1 (Input_Reversing_Mode)

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3.2.9. Input_Staff_Responsible Operator

Declared as public function

3.2.9.1. Interface

Table 31: Inputs of Input_Staff_Responsible

Name	Туре	Comments and Information
P_63	Packet_Types_Pkg::P6 3_ListofBalisesinSRAut hority_T	
P_137	Packet_Types_Pkg::P1 37_StopIfInStaffRespo nsible_T	

Table 32: Outputs of Input_Staff_Responsible

Name	Туре	Comments and Information
List_BG_Related_SR_E mpty	bool	
Stop_if_In_SR	bool	

3.2.9.2. Operator Hierarchy

diagram : diagram_Input_Staff_Responsible_1

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3.2.9.3. Graphical and Textual Diagrams

3.2.9.3.1. View of diagram_Input_Staff_Responsible_1 (Input_Staff_Responsible)

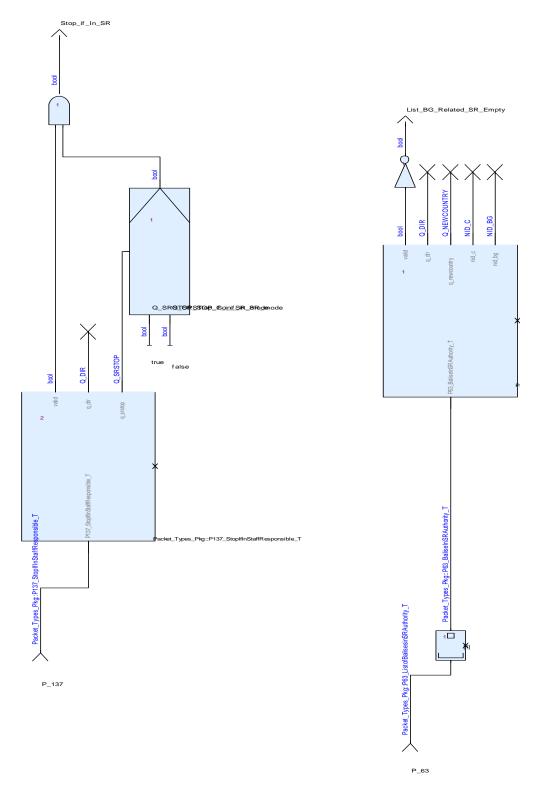


Figure 12: View of diagram_Input_Staff_Responsible_1 (Input_Staff_Responsible)

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3.2.10. InputDMI Operator

Declared as public function

3.2.10.1. Interface

Table 33: Inputs of InputDMI

Name	Туре	Comments and Information
Data_From_DMI	DMI_Types_Pkg::DMI_ To_Modes_T	
driver_level_transition	Level_And_Mode_Type s_Pkg::T_LevelTransiti on	

Table 34: Outputs of InputDMI

Name	Туре	Comments and Information
driver_level_transition	Level_And_Mode_Type s_Pkg::T_LevelTransiti on	
Level_Ack	bool	
Data_From_DMI_To_M ode	Level_And_Mode_Type s_Pkg::T_Data_From_ DMI	

3.2.10.2. Locals

Table 35: Locals of InputDMI

Name	Туре	Comments and Information
Loc_Ack_Mode_Valid	bool	
Loc_Acked_Mode	M_MODE	
Loc_DMI_Msg_Valid	bool	
Loc_DMI_Req_Valid	bool	
Loc_Driver_Ack_LS	bool	
Loc_Driver_Ack_OS	bool	
Loc_Driver_Ack_RV	bool	
Loc_Driver_Ack_SH	bool	
Loc_Driver_Ack_SN	bool	
Loc_Driver_Ack_SR	bool	
Loc_Driver_Ack_TR	bool	
Loc_Driver_Ack_UN	bool	
Loc_Driver_Req_Exit_S H	bool	
Loc_Driver_Req_NL	bool	
Loc_Driver_Req_Overri de	bool	
Loc_Driver_Req_SH	bool	
Loc_Driver_Req_Start	bool	
Loc_ETCS_Isolated	bool	

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3.2.10.3. Operator Hierarchy

diagram : diagram_Operator5_1

3.2.10.4. Graphical and Textual Diagrams

3.2.10.4.1. View of diagram_Operator5_1 (InputDMI)

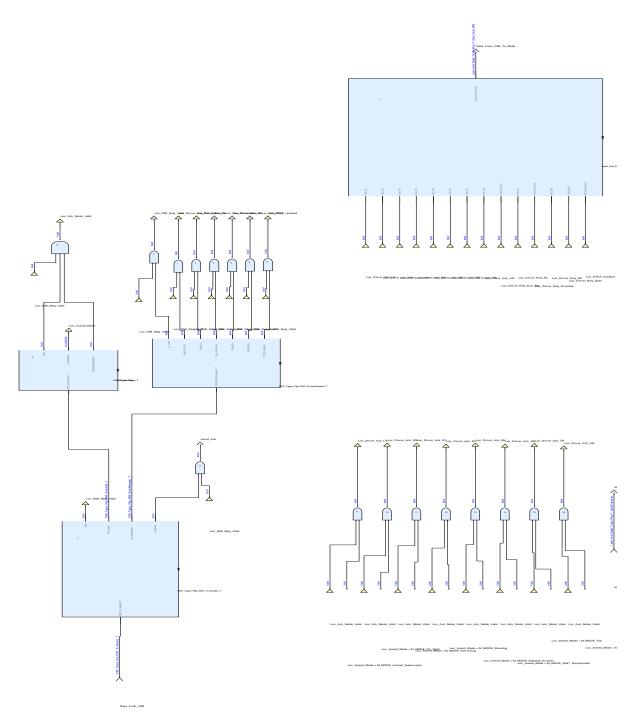


Figure 13: View of diagram_Operator5_1 (InputDMI)

3.2.11. InputLocalisation Operator

Declared as public function

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3.2.11.1. Interface

Table 36: Inputs of InputLocalisation

Name	Туре	Comments and Information
Data_From_Localisatio n	Level_And_Mode_Type s_Pkg::T_Data_From_ Localisation	

Table 37: Outputs of InputLocalisation

Name	Туре	Comments and Information
train_standstill	bool	
trainPosition	TrainPosition_Types_Pc k::trainPosition_T	
Data_From_Localisatio n_To_Mode	Level_And_Mode_Type s_Pkg::T_Data_From_ Localisation	

3.2.11.2. Locals

Table 38: Locals of InputLocalisation

Name	Туре	Comments and Information
Loc_BG_In_Expected_ List_In_SH	bool	
Loc_BG_In_Expected_ List_In_SR	bool	
Loc_PositionErrors	TrainPosition_Types_Pc k::positionErrors_T	
Loc_Train_Position	TrainPosition_Types_Pck::trainPosition_T	
Loc_Train_Speed	Obu_BasicTypes_Pkg:: Speed_T	
Loc_Train_Standstill	bool	

3.2.11.3. Operator Hierarchy

 $\underline{\text{diagram}}: \text{diagram_InputSpeedAndSupervision1_1}$

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3.2.11.4. Graphical and Textual Diagrams

3.2.11.4.1. View of diagram_InputSpeedAndSupervision1_1 (InputLocalisation)

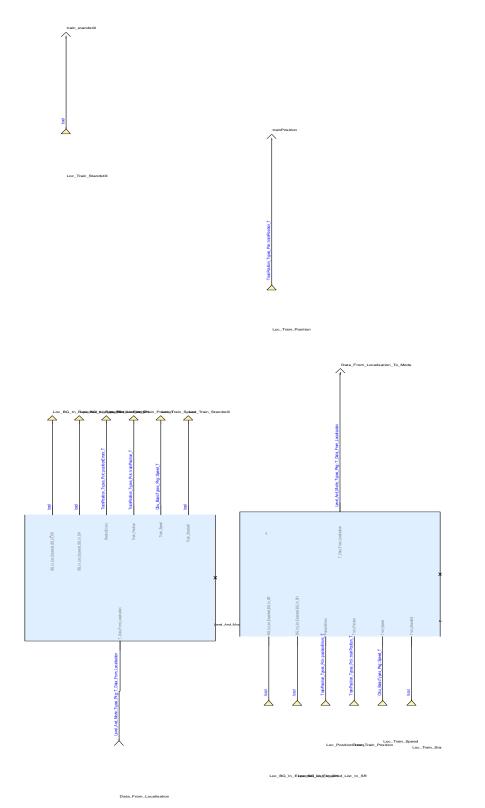


Figure 14: View of diagram_InputSpeedAndSupervision1_1 (InputLocalisation)

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3.2.12. InputSpeedAndSupervision Operator

Declared as public function

3.2.12.1. Interface

Table 39: Inputs of InputSpeedAndSupervision

Name	Туре	Comments and Information
Data_From_Speed_and _Supervision	Level_And_Mode_Type s_Pkg::T_Data_From_ Speed_Supervision	

Table 40: Outputs of InputSpeedAndSupervision

Name	Туре	Comments and Information
Data_From_Speed_and _Supervision_To_Mode	Level_And_Mode_Type s_Pkg::T_Data_From_ Speed_Supervision	

3.2.12.2. Locals

Table 41: Locals of InputSpeedAndSupervision

Name	Туре	Comments and Information
Loc_Estimated_Front_ End_Overpass_SR_Dist ance	bool	
Loc_Estimated_Front_ End_Rear_Location_SS P_Or_Gradientl	bool	
Loc_Override_Function _Active	bool	
Loc_Train_Overpass_E OA_Antenna	bool	
Loc_Train_Overpass_E OA_Front_End	bool	
Loc_Train_Speed_Unde r_Override_Limit	bool	

3.2.12.3. Operator Hierarchy

diagram : diagram_InputSpeedAndSupervision_1

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3.2.12.4. Graphical and Textual Diagrams

3.2.12.4.1. View of diagram_InputSpeedAndSupervision_1 (InputSpeedAndSupervision)

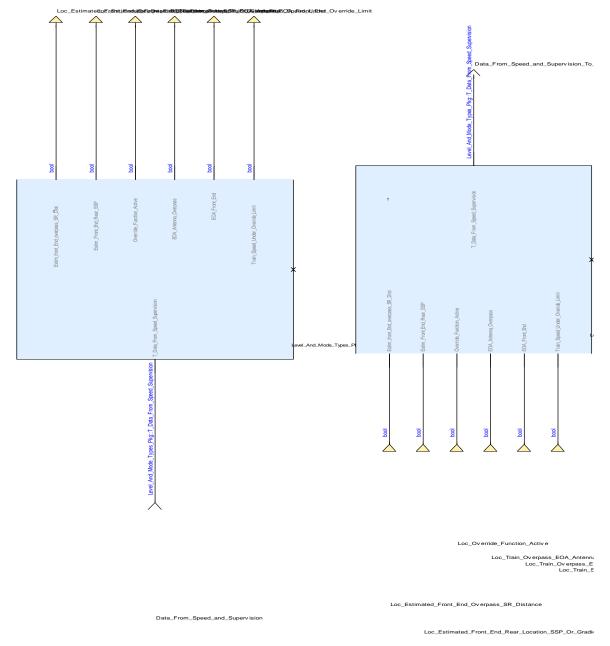


Figure 15: View of diagram_InputSpeedAndSupervision_1 (InputSpeedAndSupervision)

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3.2.13. InputTrackManagement Operator

Declared as public function

3.2.13.1. Interface

Table 42: Inputs of InputTrackManagement

Name	Туре	Comments and Information
Data_From_Track_Pac kets	Level_And_Mode_Type s_Pkg::T_Data_From_ Track_Packet	
Data_From_Track_Mes sages	Level_And_Mode_Type s_Pkg::T_Data_From_ Track_Mess	
Data_From_Track_MAS SPGradient	Level_And_Mode_Type s_Pkg::T_Data_From_ Track_MASSPGradient_ Available	

Table 43: Outputs of InputTrackManagement

Name	Туре	Comments and Information
Data_From_Track_To_ Mode	Level_And_Mode_Type s_Pkg::T_Data_From_ Track_To_Mode	
Data_From_Track_to_L evel	Level_And_Mode_Type s_Pkg::T_Data_From_ Track_To_Level	

3.2.13.2. Locals

Table 44: Locals of InputTrackManagement

Name	Туре	Comments and Information
Loc_conditionalTransiti ons	Level_And_Mode_Type s_Pkg::T_LevelTransiti on_PriorityTable	
Loc_Emergency_Stop_ Message_Received	bool	
Loc_levelTransitions	Level_And_Mode_Type s_Pkg::T_LevelTransiti on_PriorityTable	
Loc_List_BG_Related_T o_SR_Empty	bool	
Loc_MA_SSP_Gradient _Available	bool	
Loc_Mode_Profile_On_ Board	Level_And_Mode_Type s_Pkg::T_Mode_Profile _Table	
Loc_RBC_Authorized_S R	bool	
Loc_RCB_Ack_And_EB _Revocked	bool	
Loc_received_L1MA	bool	
Loc_received_L2L3MA	bool	

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Name	Туре	Comments and Information
Loc_Reversing_Data	Level_And_Mode_Type s_Pkg::T_Reversing_D ata	
Loc_Shunting_Granted _By_RBC	bool	
Loc_Stop_If_In_Shunti	bool	
Loc_Stop_If_In_SR	bool	
Loc_Trip_Order_Given _By_Balise	bool	

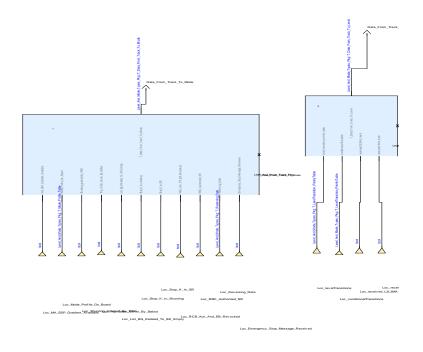
3.2.13.3. Operator Hierarchy

 $\underline{\text{diagram}}: \text{diagram_InputTrackManagement_1}$

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3.2.13.4. Graphical and Textual Diagrams

3.2.13.4.1. View of diagram_InputTrackManagement_1 (InputTrackManagement)



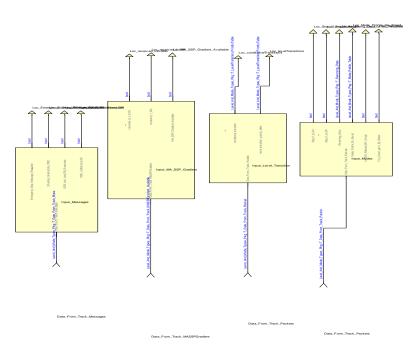


Figure 16: View of diagram_InputTrackManagement_1 (InputTrackManagement)

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3.2.14. LevelTR2Level Operator

Declared as public function

3.2.14.1. Interface

Table 45: Inputs of LevelTR2Level

Name	Туре	Comments and Information
InLevelTR	M_LEVELTR	

Table 46: Outputs of LevelTR2Level

Name	Туре	Comments and Information
OutLevel	M_LEVEL	

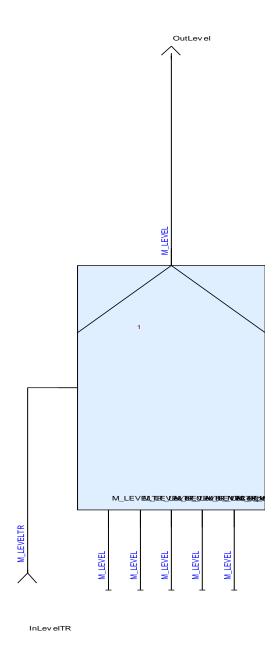
3.2.14.2. Operator Hierarchy

 $\underline{\text{diagram}}: \text{diagram_LevelTR2Level_1}$

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3.2.14.3. Graphical and Textual Diagrams

3.2.14.3.1. View of diagram_LevelTR2Level_1 (LevelTR2Level)



M_LEVEL_LeveN_0LEVENL_UEeVENL_1LEeV

M_LEVEL_Level_NTC_specif

Figure 17: View of diagram_LevelTR2Level_1 (LevelTR2Level)

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3.2.15. NormalTransition Operator

Declared as public function

3.2.15.1. Comments and Information

NormalTransition Comments:

Distances are given in regards of a balise in P_41 and in regards of the start of mission in One_Iter.

3.2.15.2. Interface

Table 47: Inputs of NormalTransition

Name	Туре	Comments and Information
LRBG	NID_LRBG	
referenceLocation	Obu_BasicTypes_Pkg:: L_internal_Type	
P41_OneIter	Packet_Types_Pkg::P4 1_LevelTransitionOrder _T	

Table 48: Outputs of NormalTransition

Name	Туре	Comments and Information
One_Iter	Level_And_Mode_Type s_Pkg::T_LevelTransiti on	

3.2.15.3. Locals

Table 49: Locals of NormalTransition

Name	Туре	Comments and Information
Loc_Ack_Length	Obu_BasicTypes_Pkg:: L_internal_Type	
Loc_ImmediateAck	bool	
Loc_Level_Transition	M_LEVELTR	
Loc_Req_Level	M_LEVEL	

3.2.15.4. Operator Hierarchy

diagram : diagram_NormalTransition_1

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3.2.15.5. Graphical and Textual Diagrams

3.2.15.5.1. View of diagram_NormalTransition_1 (NormalTransition)

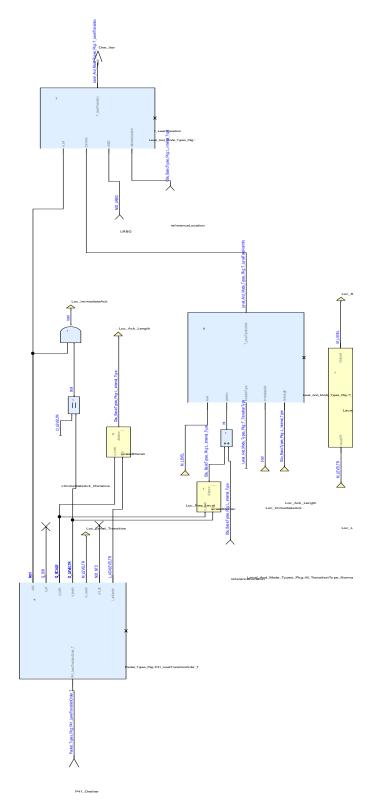


Figure 18: View of diagram_NormalTransition_1 (NormalTransition)

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3.2.16. scaledDistance_2_distance Operator

Declared as public function

3.2.16.1. Comments and Information

scaledDistance_2_distance Comments:

Convertsa distance variables into scaled distance

3.2.16.2. Interface

Table 50: Inputs of scaledDistance_2_distance

Name	Туре	Comments and Information
q_scale	Q_SCALE	
d_in	int	Comments: Distance taken from a package with q_scale attribute.

Table 51: Outputs of scaledDistance_2_distance

Name	Туре	Comments and Information
distance	Obu_BasicTypes_Pkg:: L_internal_Type	

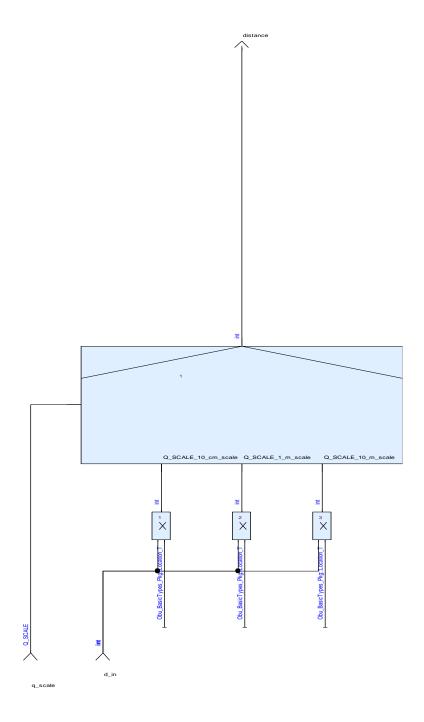
3.2.16.3. Operator Hierarchy

diagram : diagram_scaledDistance_2_distance_1

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3.2.16.4. Graphical and Textual Diagrams

3.2.16.4.1. View of diagram_scaledDistance_2_distance_1 (scaledDistance_2_distance)



TrainPosition_Types_Pck::cO_SCALE_1_m_resolut
TrainPosition_Types_Pck::cO_SCALE_10_cm_resolution
Types_Pck::cO_SCALE_10_cm_resolution

Figure 19: View of diagram_scaledDistance_2_distance_1 (scaledDistance_2_distance)

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3.3. OutputManagement Package

3.3.1. Output_Mode_Level_To_Use Operator

Declared as public node

3.3.1.1. Interface

Table 52: Inputs of Output_Mode_Level_To_Use

Name	Туре	Properties		Comments and Information
next_level	M_LEVEL			
currentMode	Level_And_Mode_Type s_Pkg::T_Mode	last	Level_And_M ode_Types_P kg::SB	
Level_Mode_Compatible	bool			
isNewLevel	bool			Comments: The requested transition was not successfull, e.g., because of missing confirmation by the driver.

Table 53: Outputs of Output_Mode_Level_To_Use

Name	Туре	Comments and Information
Compatible_Mode_And	Level_And_Mode_Type	
_Level	s_Pkg::T_Mode_Level	

3.3.1.2. Operator Hierarchy

diagram : diagram_Output_Mode_Level_To_Use_1

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3.3.1.3. Graphical and Textual Diagrams

3.3.1.3.1. View of diagram_Output_Mode_Level_To_Use_1 (Output_Mode_Level_To_Use)

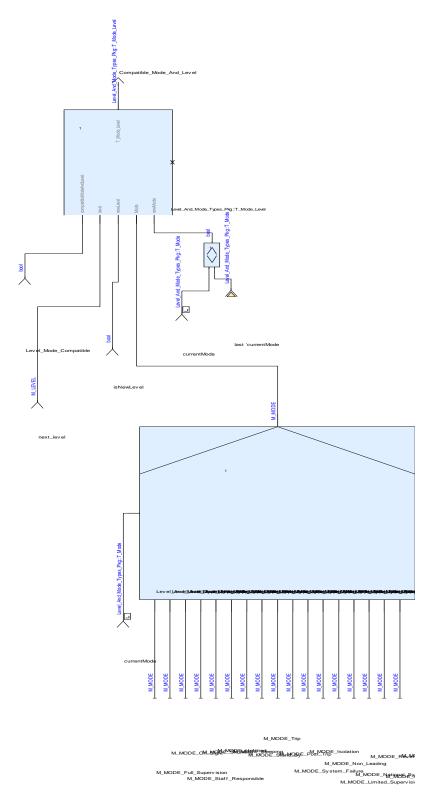


Figure 20: View of diagram_Output_Mode_Level_To_Use_1 (Output_Mode_Level_To_Use)

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3.3.2. Output_To_BG_Management Operator

Declared as public function

3.3.2.1. Interface

Table 54: Inputs of Output_To_BG_Management

Name	Туре	Comments and Information
Data_To_BG_Managem ent_From_Mode	Level_And_Mode_Type s_Pkg::T_Data_To_BG _Management	
Connection_to_RBC_R equested	bool	
PositionReportNeeded	bool	

Table 55: Outputs of Output_To_BG_Management

Name	Туре	Comments and Information
Data_To_BG_Managem ent	Level_And_Mode_Type s_Pkg::T_Data_To_BG _Management	

3.3.2.2. Operator Hierarchy

diagram : diagram_Output_To_BG_Management_1

3.3.2.3. Graphical and Textual Diagrams

3.3.2.3.1. View of diagram_Output_To_BG_Management_1 (Output_To_BG_Management)





Figure 21: View of diagram_Output_To_BG_Management_1 (Output_To_BG_Management)

3.3.3. Output_To_DMI Operator

Declared as public node

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3.3.3.1. Interface

Table 56: Inputs of Output_To_DMI

Name	Туре	Properties		Comments and Information
Level_Mode_Compatible	bool			
needsAckFromDriver	bool	last	false	
Data_To_DMI_From_M ode	Level_And_Mode_Type s_Pkg::T_Data_To_DM I			
announcedLevelTransiti on	Level_And_Mode_Type s_Pkg::T_LevelTransiti on			
isAvailableForUse	bool			

Table 57: Outputs of Output_To_DMI

Name	Туре	Comments and Information
announcedLevel	Level_And_Mode_Type s_Pkg::T_AnnouncedLe vel	
Data_To_DMI_Ack	Level_And_Mode_Type s_Pkg::T_Acknoledgem entRequest	

3.3.3.2. Locals

Table 58: Locals of Output_To_DMI

Name	Туре	Comments and Information
Loc_Ack_LS_Req_To_D river	bool	
Loc_Ack_OS_Req_To_ Driver	bool	
Loc_Ack_RV_Req_To_ Driver	bool	
Loc_Ack_SH_Req_To_ Driver	bool	
Loc_Ack_SN_Req_To_ Driver	bool	
Loc_Ack_SR_Req_To_ Driver	bool	
Loc_Ack_TR_Req_To_ Driver	bool	
Loc_Ack_UN_Req_To_ Driver	bool	
Loc_Selected_Mode_Fo r_Ack	M_MODE	
Loc_SH_Refused_By_R BC_To_DMI	bool	
Loc_Valid	bool	

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3.3.3. Operator Hierarchy

 $\underline{\text{diagram}}: \text{diagram_Output_To_DMI_1}$

activate if: IfBlock1 branch: then branch: else

branch : then branch : else

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3.3.3.4. Graphical and Textual Diagrams

3.3.3.4.1. View of diagram_Output_To_DMI_1 (Output_To_DMI)

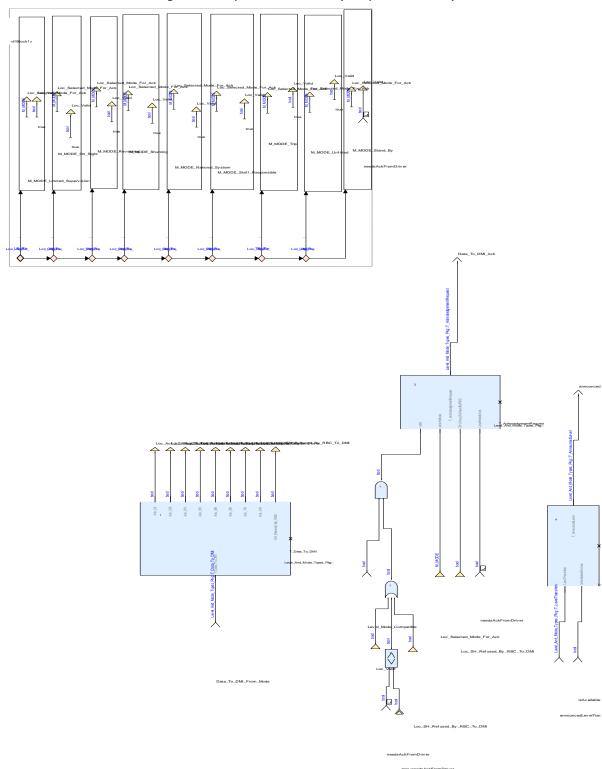


Figure 22: View of diagram_Output_To_DMI_1 (Output_To_DMI)

Table 59: Conditional Blocks of diagram_Output_To_DMI_1

Conditional Block	Comments and Information
IfBlock1	

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Table 60: Actions of diagram_Output_To_DMI_1

Conditional Block Action	Comments and Information
IfBlock1:then	
IfBlock1:else:then	
IfBlock1:else:else:then	
IfBlock1:else:else:then	
IfBlock1:else:else:else:then	
IfBlock1:else:else:else:else:then	
IfBlock1:else:else:else:else:else:the n	
IfBlock1:else:else:else:else:else:else :then	
IfBlock1:else:else:else:else:else:else :else	

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