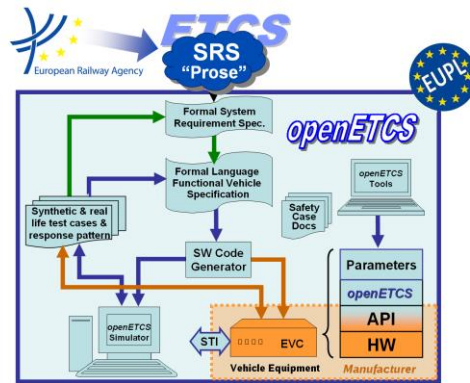


opensource

Mode Management Function

Scade model description



Funded by:



Summary:

Generated documentation from the Scade model of Mode Management Function.

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Reference: openETCS - WP3

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1. General Project Description

<description>

2. Software Architecture

2.1. Project Architecture

This section displays the package hierarchy of projects.

Project Modes

- Conditions
- Interfaces
- Librairies
- PriorityManagement
- Procedures

2.2. Call Graph

This Call Graph displays the dependency tree of model operators.

1. ManageModes

1.1. ComputeModesConditions

- 1.1.1. Conditions::ToFullSupervision
- 1.1.2. Conditions::ToIsolate
- 1.1.3. Conditions::ToNonLeading
- 1.1.4. Conditions::ToNoPower
- 1.1.5. Conditions::ToPassiveShunting
- 1.1.6. Conditions::ToShunting
 - 1.1.6.1. Procedures::Procedure_SH_Initiated_By_Driver
 - 1.1.6.1.1. Procedures::SH_Initiated_By_Driver_On
 - 1.1.6.2. Procedures::Procedure_SH_Ordered_By_Track
 - 1.1.6.2.1. Procedures::Procedure_With_Mode_Profile
 - 1.1.6.2.1.1. Librairies::Mode_Profile_Calculations
 - 1.1.6.2.1.1.1. Librairies::Position_In_Ack_Area
 - 1.1.6.2.1.1.2. Librairies::Position_In_Area
 - 1.1.6.2.1.2. pwlinear::Counter
- 1.1.7. Conditions::ToSleeping
- 1.1.8. Conditions::ToStaffResponsible
- 1.1.9. Conditions::ToStandBy
- 1.1.10. Conditions::ToSystemFailure
- 1.1.11. Conditions::ToSystemNational
- 1.1.12. Conditions::ToTrip
- 1.1.13. Conditions::ToUnfitted
- 1.1.14. Merge_Conditions
- 1.1.15. Procedures::Procedure_LimitedSupervision
 - 1.1.15.1. Librairies::Mode_Profile_Calculations
 - 1.1.15.1.1. Librairies::Position_In_Ack_Area
 - 1.1.15.1.2. Librairies::Position_In_Area
 - 1.1.15.2. Procedures::Procedure_With_Mode_Profile
 - 1.1.15.2.1. Librairies::Mode_Profile_Calculations
 - 1.1.15.2.1.1. Librairies::Position_In_Ack_Area
 - 1.1.15.2.1.2. Librairies::Position_In_Area
 - 1.1.15.2.2. pwlinear::Counter
- 1.1.16. Procedures::Procedure_OnSight

- 1.1.16.1. Librairies::Mode_Profile_Calculations
 - 1.1.16.1.1. Librairies::Position_In_Ack_Area
 - 1.1.16.1.2. Librairies::Position_In_Area
- 1.1.16.2. Procedures::Procedure_With_Mode_Profile
 - 1.1.16.2.1. Librairies::Mode_Profile_Calculations
 - 1.1.16.2.1.1. Librairies::Position_In_Ack_Area
 - 1.1.16.2.1.2. Librairies::Position_In_Area
 - 1.1.16.2.2. pwlinear::Counter
- 1.1.17. Procedures::Procedure_StartOfMission
 - 1.1.17.1. Procedures::Procedure_Start_L1_L2_L3
 - 1.1.17.2. Procedures::SH_Initiated_By_Driver_On
- 1.1.18. Procedures::Procedure_Train_Reversing
 - 1.1.18.1. Librairies::Reversing_Calculations
 - 1.1.18.1.1. Librairies::Position_In_Area
- 1.1.19. Procedures::Procedure_Train_Trip
 - 1.1.19.1. Procedures::Procedure_Start_L1_L2_L3
 - 1.1.19.2. Procedures::SH_Initiated_By_Driver_On
- 1.2. Interfaces::InputDMI
- 1.3. Interfaces::InputF2Functions
- 1.4. Interfaces::InputLocalisation
- 1.5. Interfaces::InputSpeedAndSupervision
- 1.6. Interfaces::InputSTM
- 1.7. Interfaces::InputTIUManagement
- 1.8. Interfaces::InputTrackManagement
- 1.9. Interfaces::OutputManagement
 - 1.9.1. Interfaces::Output_To_BG_Management
 - 1.9.2. Interfaces::Output_To_DMI
- 1.10. SwitchModes
 - 1.10.1. PriorityManagement::From_FS
 - 1.10.2. PriorityManagement::From_LS
 - 1.10.3. PriorityManagement::From_NL
 - 1.10.4. PriorityManagement::From_NP
 - 1.10.5. PriorityManagement::From_OS
 - 1.10.6. PriorityManagement::From_PS
 - 1.10.7. PriorityManagement::From_PT
 - 1.10.8. PriorityManagement::From_RV
 - 1.10.9. PriorityManagement::From_SB
 - 1.10.10. PriorityManagement::From_SF
 - 1.10.11. PriorityManagement::From_SH
 - 1.10.12. PriorityManagement::From_SL
 - 1.10.13. PriorityManagement::From_SN
 - 1.10.14. PriorityManagement::From_SR
 - 1.10.15. PriorityManagement::From_TR
 - 1.10.16. PriorityManagement::From_UN

3. Modes Project

3.1. Root Elements

3.1.1. Open Packages

- TrainPosition_Types_Pck

3.1.2. ComputeModesConditions Operator

Declared as **public node**

3.1.2.1. Interface

Table 1: Inputs of ComputeModesConditions

Name	Type	Properties		Comments and Information
Current_Level	M_LEVEL	last	M_LEVEL_Level_0	
Current_Mode	Level_And_Mode_Types_Pkg::T_Mode			
Train_Permitted_NL	bool			
Train_Permitted_PS	bool			
Train_Req_SL	bool			
All_Desks_Closed	bool			
Desk_Open	bool			
OnBoard_Powered	bool			
Valid_Train_Data_Stored	bool			
Driver_Ack_LS	bool			
Driver_Ack_OS	bool			
Driver_Ack_RV	bool			
Driver_Ack_SH	bool			
Driver_Ack_SN	bool			
Driver_Ack_SR	bool			
Driver_Ack_TR	bool			
Driver_Ack_UN	bool			
Driver_Req_Exit_SH	bool			
Driver_Req_NL	bool			
Driver_Req_Override	bool			
Driver_Req_SH	bool			
Driver_Req_Start	bool			
ETCS_Isolated	bool			
MA_SSP_Gradient_Available	bool			
Mode_Profile_On_Board	Level_And_Mode_Types_Pkg::T_Mode_Profile			

Name	Type	Properties		Comments and Information
Shunting_Granted_By_RBC	bool			
Trip_Order_Given_By_Balise	bool			
List_BG_Related_To_SR_Empty	bool			
Stop_If_In_Shunting	bool			
Stop_If_In_SR	bool			
RBC_Ack_And_EB_Revoked	bool			
RBC_Authorized_SR	bool			
Reversing_Data	Level_And_Mode_Types_Pkg::T_Reversing_Data			
Emergency_Stop_Message_Received	bool			
Estimated_Front_End_Overpass_SR_Distance	bool			
Estimated_Front_End_Rear_Location_SSP_Or_Gradient	bool			
Override_Function_Active	bool	last	false	
Train_Overpass_EOA_Antenna	bool	last	false	
Train_Overpass_EOA_Front_End	bool			
Train_Speed_Under_Override_Limit	bool			
BG_In_Expected_List_In_SR	bool			
BG_In_Expected_List_In_SH	bool			
Linked_BG_Pased_In_Wrong_Direction	bool			
Train_Position	TrainPosition_Types_Pkg::trainPosition_T			
Train_Speed	Obu_BasicTypes_Pkg::Speed_T			
Train_Standstill	bool			
Interface_To_National_System	bool			
National_Trip_Order	bool			
T_NVCONTACT_Overpass	bool			
Error_BG_System_Version	bool			
Failure_Occured	bool	last	false	
Continue_Shunting_Function_Active	bool			
Stop_Shunting_Stored	bool			
Linking_Reaction_To_Trip	bool			

Name	Type	Properties	Comments and Information
TripModeFromLevel	bool		

Table 2: Outputs of ComputeModesConditions

Name	Type	Properties	Comments and Information
Condition1	bool		
Condition2	bool		
Condition3	bool		
Condition4	bool		
Condition5	bool		
Condition6	bool		
Condition7	bool		
Condition8	bool		
Condition10	bool		
Condition13	bool		
Condition14	bool		
Condition15	bool		
Condition19	bool		
Condition21	bool		
Condition22	bool		
Condition23	bool		
Condition25	bool		
Condition26	bool		
Condition27	bool		
Condition28	bool		
Condition29	bool		
Condition30	bool		
Condition31	bool		
Condition32	bool		
Condition34	bool		
Condition37	bool		
Condition40	bool		
Condition44	bool		
Condition45	bool		
Condition46	bool		
Condition47	bool		
Condition50	bool		
Condition51	bool		
Condition56	bool		
Condition58	bool		
Condition59	bool		

Name	Type	Properties		Comments and Information
Condition60	bool			
Condition61	bool			
Condition62	bool			
Condition63	bool			
Condition68	bool			
Condition70	bool			
Condition71	bool			
Condition72	bool			
Condition73	bool			
Condition74	bool			
Condition_Trip	bool			
Ack_LS_Req_To_Driver	bool			
Ack_OS_Req_To_Driver	bool			
Ack_RV_Req_To_Driver	bool			
Ack_SH_Req_To_Driver	bool			
Ack_SN_Req_To_Driver	bool			
Ack_SR_Req_To_Driver	bool			
Ack_TR_Req_To_Driver	bool			
Ack_UN_Req_To_Driver	bool			
Clean_BG_List_SH_Area	bool			
EB_Requested	bool			
End_Of_Mission_Procedure_Req	bool	last	true	
MA_Req_To_RBC	bool			
Request_For_SH_To_RBC	bool			
Service_Brake_Command	bool			
SH_Refused_By_RBC_To_DMI	bool			

3.1.2.2. Locals

Table 3: Locals of ComputeModesConditions

Name	Type	Properties		Comments and Information
Condition_to_Trip	bool			
Loc_Ack_LS_Req_To_Driver_LS	bool			
Loc_Ack_LS_Req_To_Driver_SoM	bool			

Name	Type	Properties	Comments and Information
Loc_Ack_LS_Req_To_Driver_TR	bool		
Loc_Ack_OS_Req_To_Driver_OS	bool		
Loc_Ack_OS_Req_To_Driver_SoM	bool		
Loc_Ack_OS_Req_To_Driver_TR	bool		
Loc_Ack_SH_Req_To_Driver_SH	bool		
Loc_Ack_SH_Req_To_Driver_SoM	bool		
Loc_Ack_SH_Req_To_Driver_TR	bool		
Loc_Ack_SR_Req_To_Driver_SoM	bool		
Loc_Ack_SR_Req_To_Driver_TR	bool		
Loc_Clean_BG_List_Of_SoM	bool		
Loc_Clean_BG_List_SH_Area_SH	bool		
Loc_Clean_BG_List_SH_Area_TR	bool		
Loc_Cond_15_OS	bool		
Loc_Cond_15_SoM	bool		
Loc_Cond_15_TR	bool		
Loc_Cond_31_FS	bool		
Loc_Cond_31_TR	bool		
Loc_Cond_46_NL	bool		
Loc_Cond_46_SoM	bool		
Loc_Cond_50_SH	bool		
Loc_Cond_50_SoM	bool		
Loc_Cond_50_TR	bool		
Loc_Cond_5_SH	bool		
Loc_Cond_5_SoM	bool		
Loc_Cond_5_TR	bool		
Loc_Cond_6_SH	bool		
Loc_Cond_6_SoM	bool		
Loc_Cond_6_TR	bool		
Loc_Cond_70_LS	bool		
Loc_Cond_70_SoM	bool		
Loc_Cond_70_TR	bool		
Loc_Cond_8_SoM	bool		
Loc_Cond_8_TR	bool		
Loc_End_Of_Mission_Procedure_Req_SB	bool		

Name	Type	Properties		Comments and Information
Loc_End_Of_Mission_Procedure_Req_SH	bool			
Loc_End_Of_Mission_Procedure_Req_SoM	bool			
Loc_End_Of_Mission_Procedure_Req_TR	bool			
Loc_MA_Req_To_RBC_SoM	bool			
Loc_MA_Req_To_RBC_TR	bool			
Loc_Request_For_SH_To_RBC_SH	bool			
Loc_Request_For_SH_To_RBC_SoM	bool			
Loc_Request_For_SH_To_RBC_TR	bool			
Loc_Service_Brake_Command_LS	bool			
Loc_Service_Brake_Command_OS	bool			
Loc_Service_Brake_Command_SH	bool			
Loc_SH_Refused_By_RBC_To_DMI_SH	bool			
Loc_SH_Refused_By_RBC_To_DMI_SoM	bool			
Loc_SH_Refused_By_RBC_To_DMI_TR	bool			
On_Going_Mission	bool	last	false	

3.1.2.3. Operator Hierarchy

diagram : diagram_ComputeModesConditions_1

3.1.2.4. Graphical and Textual Diagrams

3.1.2.4.1. View of diagram_ComputeModesConditions_1 (ComputeModesConditions)

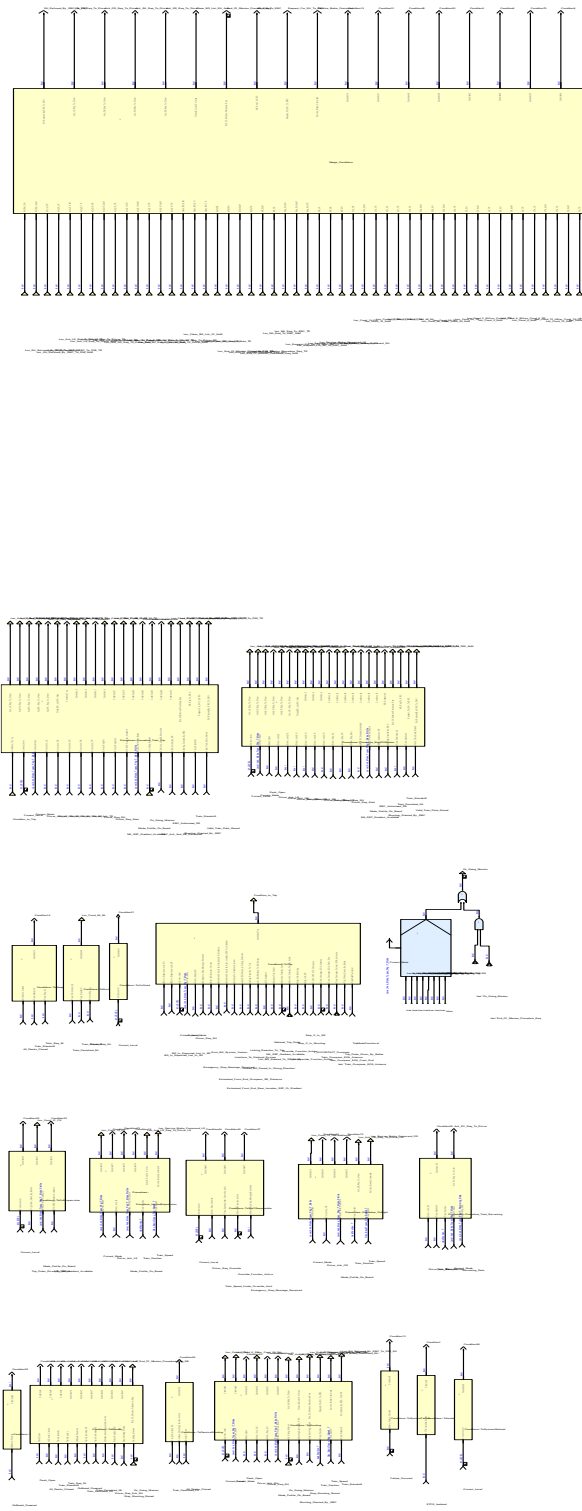


Figure 1: View of diagram_ComputeModesConditions_1 (ComputeModesConditions)

3.1.3. ManageModes Operator

Declared as **public node**

Mode Management Function

3.1.3.1. Comments and Information

ManageModes Comments:

Root operator shared in for parts :

- the inputs management
- Computation of Mode conditions: this part covers the computation of conditions according to subset 26 §4.6.3 and procedure related to mode management in § 5. Computation of conditions are organized by procedure and mode to reach (by line of of table in §4.6.2)
- SwitchMode: this part selects the new mode according conditions and priorities given in §4.6.2 : from each mode, the new mode is calculated (by column of table 4.6.2).
- the outputs management

3.1.3.2. Interface

Table 4: Inputs of ManageModes

Name	Type	Comments and Information
Current_Level	M_LEVEL	
Cab	TIU_Types_Pkg::cab_ID_T	
Data_From_DMI	Level_And_Mode_Types_Pkg::T_Data_From_DMI	
Data_From_F2_Functions	Level_And_Mode_Types_Pkg::T_Data_From_F2_functions	
Data_From_Localisation	Level_And_Mode_Types_Pkg::T_Data_From_Localisation	
Data_From_Speed_and_Supervision	Level_And_Mode_Types_Pkg::T_Data_From_Speed_Supervision	
Data_From_STM	Level_And_Mode_Types_Pkg::T_Data_From_STM	
Data_From_TIU	TIU_Types_Pkg::Message_Train_Interface_to_EVC_T	
Data_From_Track	Level_And_Mode_Types_Pkg::T_Data_From_Track_To_Mode	
TripModeFromLevel	bool	

Table 5: Outputs of ManageModes

Name	Type	Properties	Comments and Information
currentMode	Level_And_Mode_Types_Pkg::T_Mode	default	Level_And_Mode_Types_Pkg::SB
		last	Level_And_Mode_Types_Pkg::SB
EB_Requested	bool		

Name	Type	Properties	Comments and Information
Service_Brake_Command	bool		
Data_To_DMI	Level_And_Mode_Types_Pkg::T_Data_To_DMI		
Data_To_BG_Management	Level_And_Mode_Types_Pkg::T_Data_To_BG_Management		

3.1.3.3. Operator Hierarchy

diagram : diagram_ManageModes_1

3.1.3.4. Graphical and Textual Diagrams

3.1.3.4.1. View of diagram_ManageModes_1 (ManageModes)

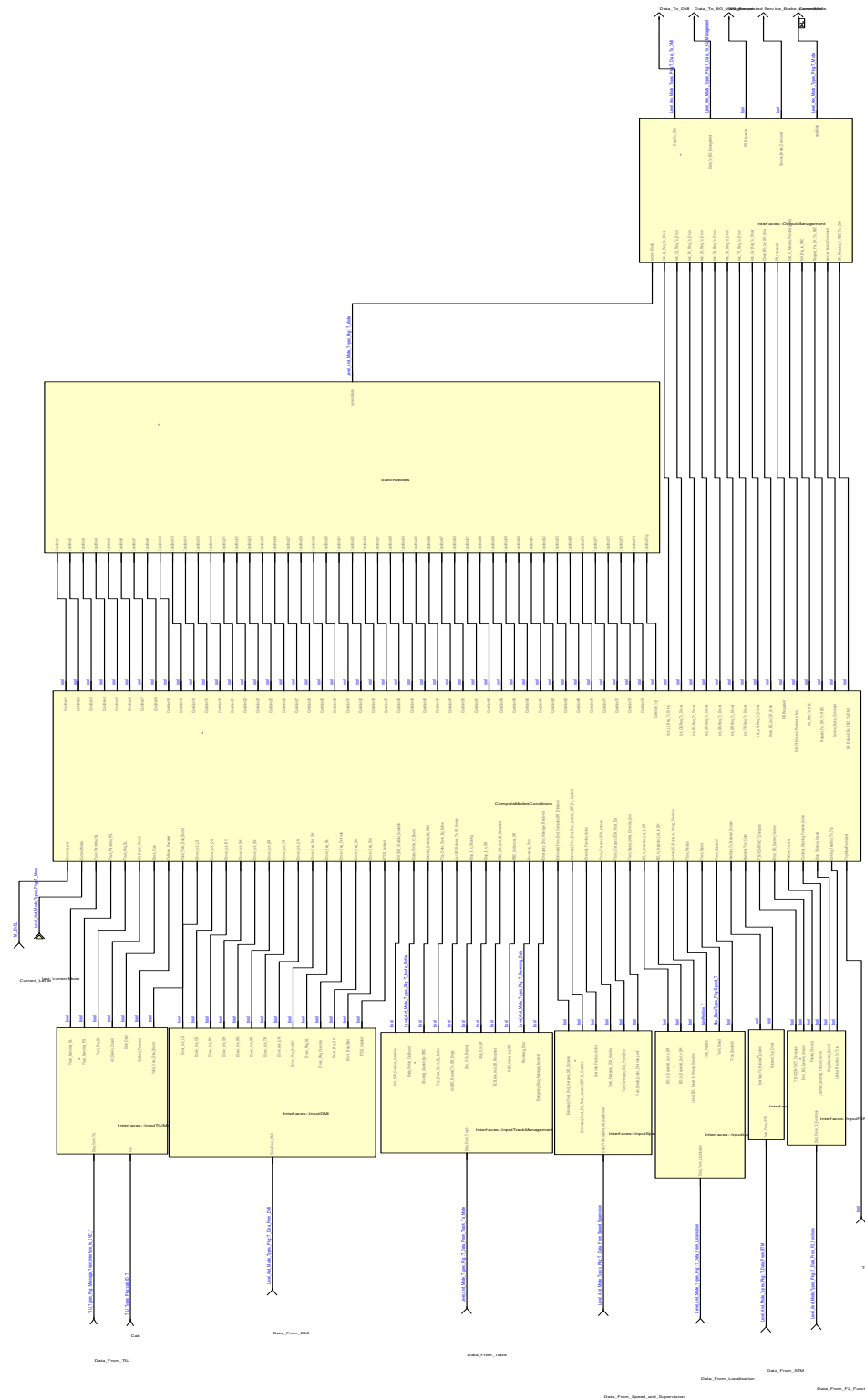


Figure 2: View of diagram_ManageModes_1 (ManageModes)

3.1.4. Merge_Conditions Operator

Declared as **public function**

3.1.4.1. Interface

Table 6: Inputs of Merge_Conditions

Name	Type	Comments and Information
SH_Ref_SH	bool	
SH_Ref_SoM	bool	
SH_ref_TR	bool	
Ack_LS_LS	bool	
Ack_LS_SoM	bool	
Ack_LS_TR	bool	
Ack_OS_OS	bool	
Ack_OS_SoM	bool	
Ack_OS_TR	bool	
Ack_SH_SH	bool	
Ack_SH_SoM	bool	
Ack_SH_TR	bool	
Ack_SR_SoM	bool	
Ack_SR_TR	bool	
Clean_BG_SoM	bool	
Clean_BG_SH	bool	
Clean_BG_TR	bool	
EoM_SB	bool	
EoM_SH	bool	
EoM_SoM	bool	
EoM_TR	bool	
MA_SoM	bool	
MA_TR	bool	
Req_SH_SH	bool	
Req_SH_SoM	bool	
Req_SH_TR	bool	
SB_LS	bool	
SB_OS	bool	
SB_SH	bool	
C15_OS	bool	
C15_SoM	bool	
C15_TR	bool	
C31_FS	bool	
C31_TR	bool	
C46_NL	bool	

Name	Type	Comments and Information
C46_SoM	bool	
C50_SH	bool	
C50_SoM	bool	
C50_TR	bool	
C5_SH	bool	
C5_SoM	bool	
C5_TR	bool	
C6_SH	bool	
C6_SoM	bool	
C6_TR	bool	
C70_LS	bool	
C70_SoM	bool	
C70_TR	bool	
C8_SoM	bool	
C8_TR	bool	

Table 7: Outputs of Merge_Conditions

Name	Type	Comments and Information
SH_Refused_By_RBC_To_DMI	bool	
Ack_LS_Req_To_Driver	bool	
Ack_OS_Req_To_Driver	bool	
Ack_SH_Req_To_Driver	bool	
Ack_SR_Req_To_Driver	bool	
Clean_BG_List_SH_Area	bool	
End_Of_Mission_Procedure_Req	bool	
MA_Req_To_RBC	bool	
Request_For_SH_To_RBC	bool	
Service_Brake_Command	bool	
Condition15	bool	
Condition31	bool	
Condition46	bool	
Condition50	bool	
Condition5	bool	
Condition6	bool	
Condition70	bool	
Condition8	bool	

3.1.4.2. Operator Hierarchy
diagram : diagram_Operator44_1

3.1.4.3. Graphical and Textual Diagrams

3.1.4.3.1. View of diagram_Operator44_1 (Merge_Conditions)

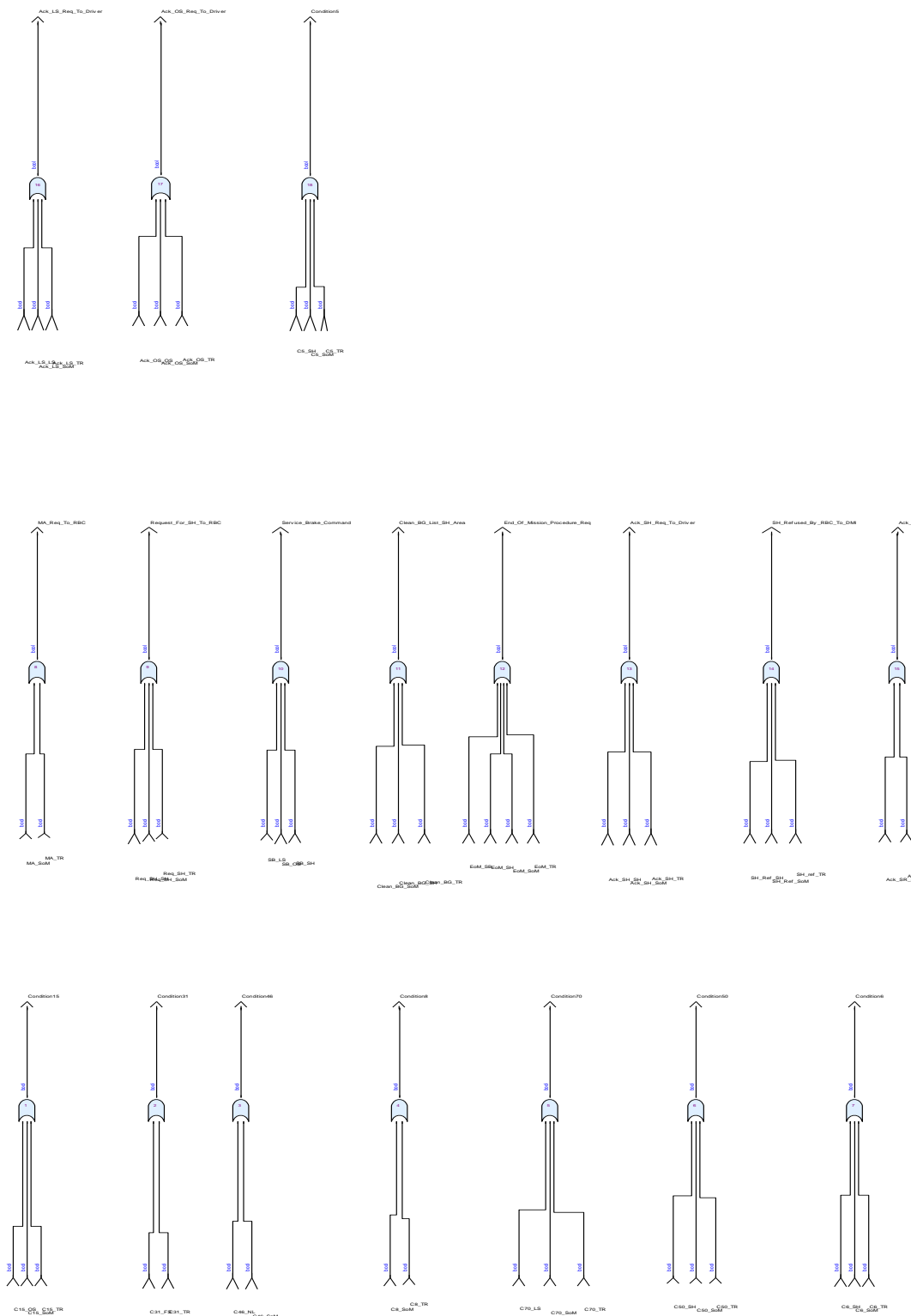


Figure 3: View of diagram_Operator44_1 (Merge_Conditions)

3.1.5. SwitchModes Operator

Declared as **public node**

3.1.5.1. Interface

Table 8: Inputs of SwitchModes

Name	Type	Comments and Information
Condition1	bool	
Condition2	bool	
Condition3	bool	
Condition4	bool	
Condition5	bool	
Condition6	bool	
Condition7	bool	
Condition8	bool	
Condition10	bool	
Condition13	bool	
Condition14	bool	
Condition15	bool	
Condition19	bool	
Condition21	bool	
Condition22	bool	
Condition23	bool	
Condition25	bool	
Condition26	bool	
Condition27	bool	
Condition28	bool	
Condition29	bool	
Condition30	bool	
Condition31	bool	
Condition32	bool	
Condition34	bool	
Condition37	bool	
Condition40	bool	
Condition44	bool	
Condition45	bool	
Condition46	bool	
Condition47	bool	
Condition50	bool	
Condition51	bool	
Condition56	bool	
Condition58	bool	

Name	Type	Comments and Information
Condition59	bool	
Condition60	bool	
Condition61	bool	
Condition62	bool	
Condition63	bool	
Condition68	bool	
Condition70	bool	
Condition71	bool	
Condition72	bool	
Condition73	bool	
Condition74	bool	
ConditionTrip	bool	

Table 9: Outputs of SwitchModes

Name	Type	Properties	Comments and Information
currentMode	Level_And_Mode_Type s_Pkg::T_Mode	default	Level_And_Mode_Types_Pkg::SB
		last	Level_And_Mode_Types_Pkg::SB

3.1.5.2. Locals

Table 10: Locals of SwitchModes

Name	Type	Properties	Comments and Information
FromFS	Level_And_Mode_Type s_Pkg::T_Mode		
FromLS	Level_And_Mode_Type s_Pkg::T_Mode		
FromNL	Level_And_Mode_Type s_Pkg::T_Mode		
FromNP	Level_And_Mode_Type s_Pkg::T_Mode		
FromOS	Level_And_Mode_Type s_Pkg::T_Mode		
FromPS	Level_And_Mode_Type s_Pkg::T_Mode		
FromPT	Level_And_Mode_Type s_Pkg::T_Mode		
FromRV	Level_And_Mode_Type s_Pkg::T_Mode		
FromSB	Level_And_Mode_Type s_Pkg::T_Mode		
FromSF	Level_And_Mode_Type s_Pkg::T_Mode		
FromSH	Level_And_Mode_Type s_Pkg::T_Mode		

Name	Type	Properties		Comments and Information
FromSL	Level_And_Mode_Type s_Pkg::T_Mode			
FromSN	Level_And_Mode_Type s_Pkg::T_Mode			
FromSR	Level_And_Mode_Type s_Pkg::T_Mode			
FromTR	Level_And_Mode_Type s_Pkg::T_Mode			
FromUN	Level_And_Mode_Type s_Pkg::T_Mode			
previousMode_Loc	Level_And_Mode_Type s_Pkg::T_Mode	default	Level_And_Mode_Types_Pkg::SB	

3.1.5.3. Operator Hierarchy

diagram : diagram_SwitchModes_1

3.1.5.4. Graphical and Textual Diagrams

3.1.5.4.1. View of diagram_SwitchModes_1 (SwitchModes)

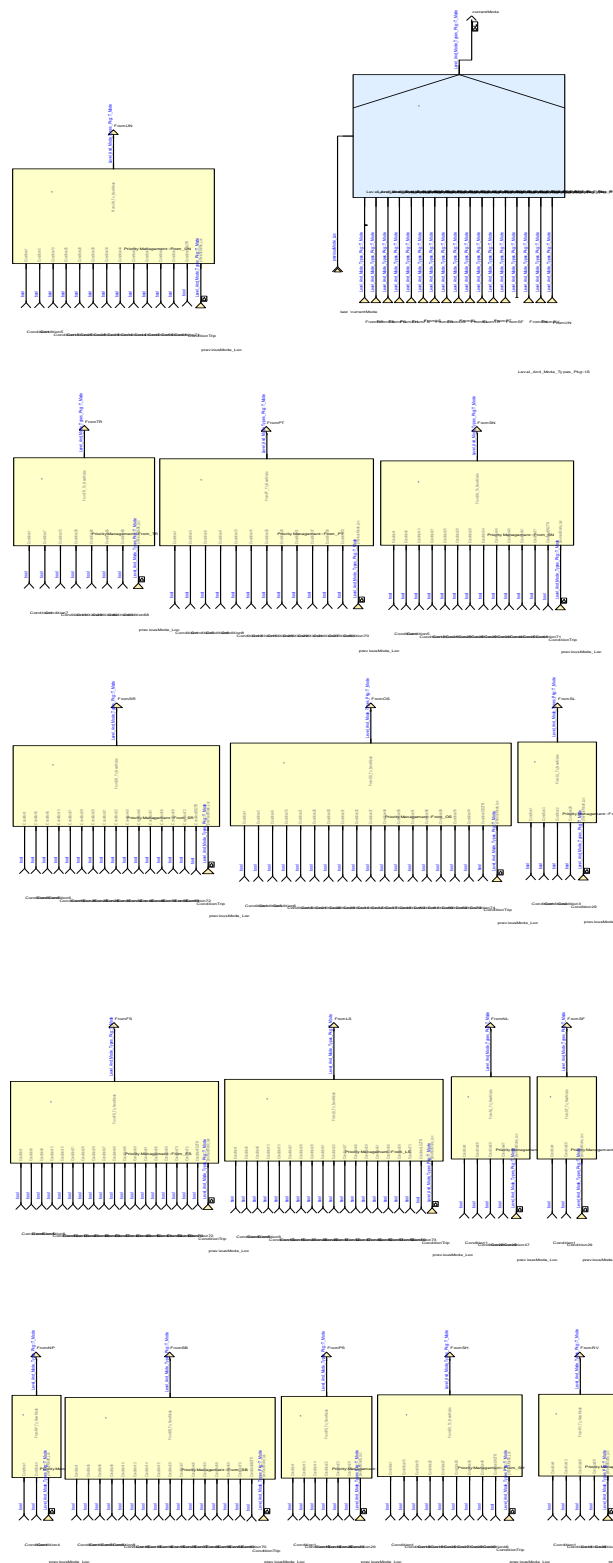


Figure 4: View of diagram_SwitchModes_1 (SwitchModes)

3.2. Conditions Package

3.2.1. ToFullSupervision Operator

Declared as **public node**

3.2.1.1. Comments and Information

ToFullSupervision Comments:

SRS-26 §4.6.3 C25 : "(ERTMS/ETCS level switches to 1,2 or 3) AND (MA+SSP+gradient are on-board) AND (no specific mode is required by a Mode Profile)"

SRS-26 §4.6.3 C31 : "(MA+SSP+gradient are on-board) AND (no specific mode is required by a Mode Profile) AND (ERTMS/ETCS level is 2 or 3)"

SRS-26 §4.6.3 C32 : "(MA+SSP+gradient are on-board) AND (no specific mode is required by a Mode Profile) AND (ERTMS/ETCS level is 1) AND (no trip order is given by balise)"

3.2.1.2. Interface

Table 11: Inputs of ToFullSupervision

Name	Type	Properties		Comments and Information
Current_Level	M_LEVEL	last	M_LEVEL_Level_0	
Trip_Order_Given_By_Balise	bool			
Mode_Profile_On_Board	Level_And_Mode_Type s_Pkg::T_Mode_Profile			
MA_SSP_Gradient_Available	bool			

Table 12: Outputs of ToFullSupervision

Name	Type	Comments and Information
Condition25	bool	
Condition31	bool	
Condition32	bool	

3.2.1.3. Locals

Table 13: Locals of ToFullSupervision

Name	Type	Comments and Information
FS_Data_Condition	bool	

3.2.1.4. Operator Hierarchy

diagram : diagram_ToFullSupervision_1

3.2.1.5. Graphical and Textual Diagrams

3.2.1.5.1. View of diagram_ToFullSupervision_1 (ToFullSupervision)

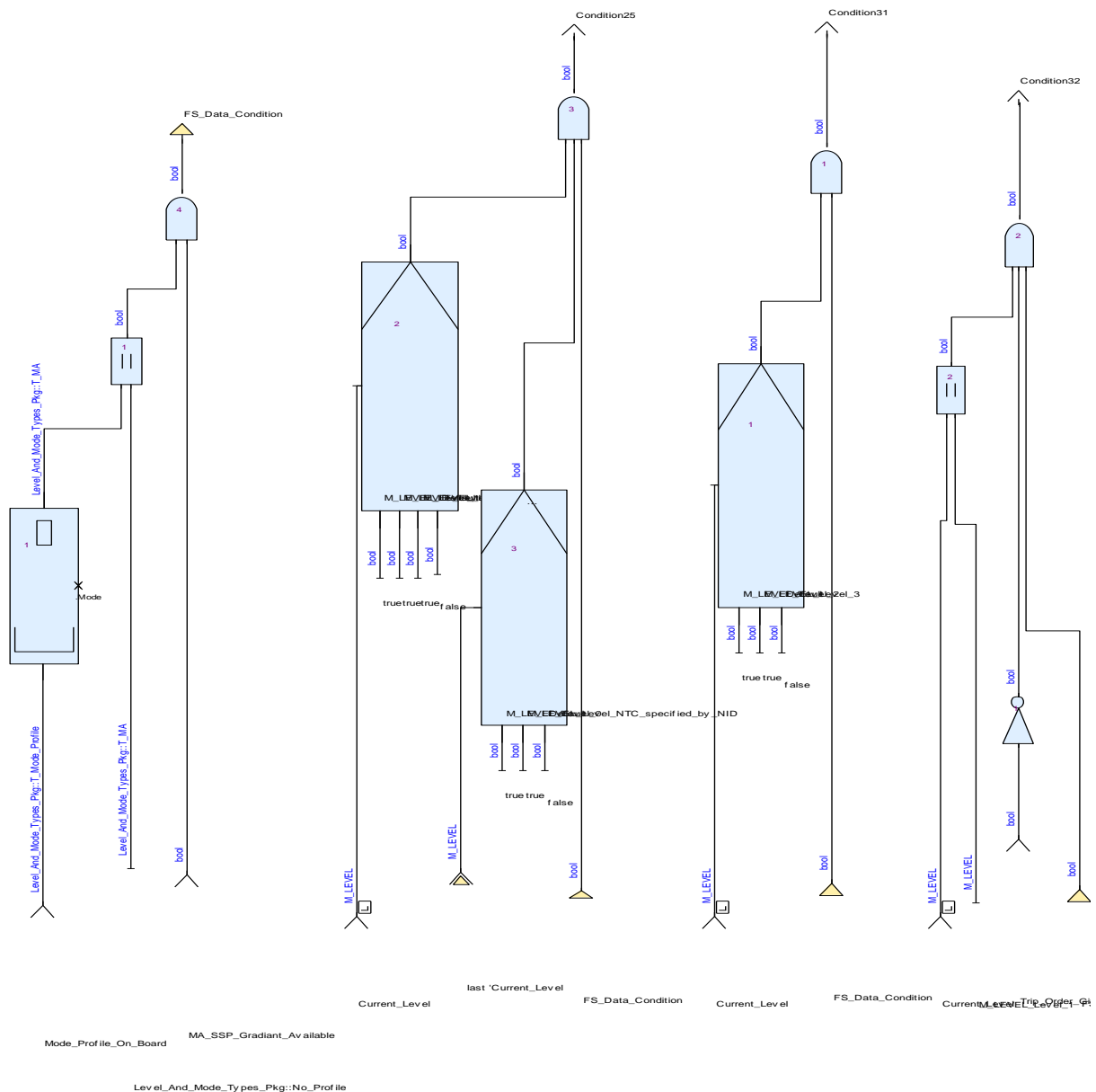


Figure 5: View of diagram_ToFullSupervision_1 (ToFullSupervision)

3.2.2. ToIsolate Operator

Declared as **public function**

3.2.2.1. Comments and Information

ToIsolate Comments:

§4.6.3 : Condition 1 : "The driver isolates the ERTMS/ETCS on-board equipment".

3.2.2.2. Interface

Table 14: Inputs of ToIsolate

Name	Type	Comments and Information
ETCS_Isolation_Status	bool	

Table 15: Outputs of ToIsolate

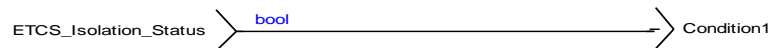
Name	Type	Comments and Information
Condition1	bool	

3.2.2.3. Operator Hierarchy

diagram : diagram_ToIsolate_1

3.2.2.4. Graphical and Textual Diagrams

3.2.2.4.1. View of diagram_ToIsolate_1 (ToIsolate)

**Figure 6: View of diagram_ToIsolate_1 (ToIsolate)**

3.2.3. ToNonLeading Operator

Declared as **public function**

3.2.3.1. Comments and Information

ToNonLeading Comments:

§4.6.3 : Condition 46 " Driver selects non-leading AND train is at standstill AND non-leading input signal received

3.2.3.2. Interface

Table 16: Inputs of ToNonLeading

Name	Type	Comments and Information
Train_Permitted_NL	bool	
Train_Standstill	bool	
Driver_Req_NL	bool	

Table 17: Outputs of ToNonLeading

Name	Type	Comments and Information
Condition46	bool	

3.2.3.3. Operator Hierarchy

diagram : diagram_ToNonLeading_1

3.2.3.4. Graphical and Textual Diagrams

3.2.3.4.1. View of diagram_ToNonLeading_1 (ToNonLeading)

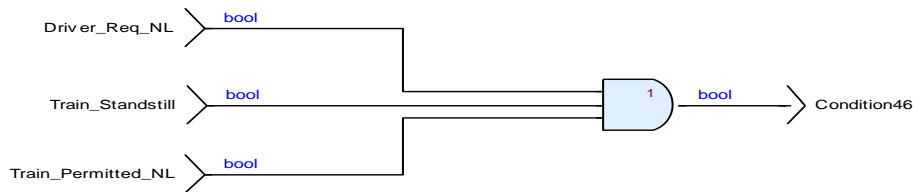


Figure 7: View of diagram_ToNonLeading_1 (ToNonLeading)

3.2.4. ToNoPower Operator

Declared as **public function**

3.2.4.1. Comments and Information

ToNoPower Comments:

§4.6.3 : Condition 29 : "The ERTMS/ETCS on -board equipment is not powered".

3.2.4.2. Interface

Table 18: Inputs of ToNoPower

Name	Type	Comments and Information
OnBoard_Powered	bool	

Table 19: Outputs of ToNoPower

Name	Type	Comments and Information
Condition29	bool	

3.2.4.3. Operator Hierarchy

diagram : diagram_ToNoPower_1

3.2.4.4. Graphical and Textual Diagrams

3.2.4.4.1. View of diagram_ToNoPower_1 (ToNoPower)

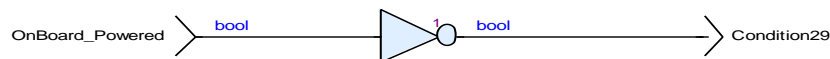


Figure 8: View of diagram_ToNoPower_1 (ToNoPower)

3.2.5. ToPassiveShunting Operator

Declared as **public function**

3.2.5.1. Comments and Information

ToPassiveShunting Comments:

§4.6.3 : Condition 26 : "desks are closed AND "continue shunting on desk closure" function is active AND the "passive shunting" input signal is active"

3.2.5.2. Interface

Table 20: Inputs of ToPassiveShunting

Name	Type	Comments and Information
Train_Permitted_PS	bool	
Continue_Shunting_Function_Active	bool	
Desks_Closed	bool	

Table 21: Outputs of ToPassiveShunting

Name	Type	Comments and Information
Condition26	bool	

3.2.5.3. Operator Hierarchy

diagram : diagram_ToPassiveShunting_1

3.2.5.4. Graphical and Textual Diagrams

3.2.5.4.1. View of diagram_ToPassiveShunting_1 (ToPassiveShunting)

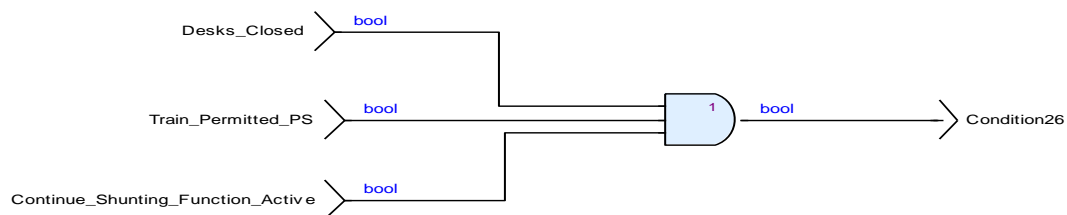


Figure 9: View of diagram_ToPassiveShunting_1 (ToPassiveShunting)

3.2.6. ToShunting Operator

Declared as **public node**

3.2.6.1. Interface

Table 22: Inputs of ToShunting

Name	Type	Comments and Information
Current_Level	M_LEVEL	
Current_Mode	Level_And_Mode_Type s_Pkg::T_Mode	
Desk_Open	bool	
Driver_Ack_SH	bool	
Driver_Req_SH	bool	
Mode_Profile_On_Board	Level_And_Mode_Type s_Pkg::T_Mode_Profile	
On_Going_Mission	bool	
Shunting_Granted_By_RBC	bool	

Name	Type	Comments and Information
Stop_Shunting_Stored	bool	
Train_Position	TrainPosition_Types_Pkg::trainPosition_T	
Train_Speed	Obu_BasicTypes_Pkg::Speed_T	
Train_Standstill	bool	

Table 23: Outputs of ToShunting

Name	Type	Comments and Information
Condition5	bool	
Condition6	bool	
Condition23	bool	
Condition50	bool	
Condition51	bool	
Condition61	bool	
Ack_SH_Req_To_Driver	bool	
Clean_BG_List_SH_Area	bool	
End_Of_Mission_Procedure_Req	bool	
Request_For_SH_To_RBC	bool	
Service_Brake_Command	bool	
SH_refused_By_RBC_To_DMI	bool	

3.2.6.2. Operator Hierarchy

diagram : diagram_ToShunting_1

3.2.6.3. Graphical and Textual Diagrams

3.2.6.3.1. View of diagram_ToShunting_1 (ToShunting)

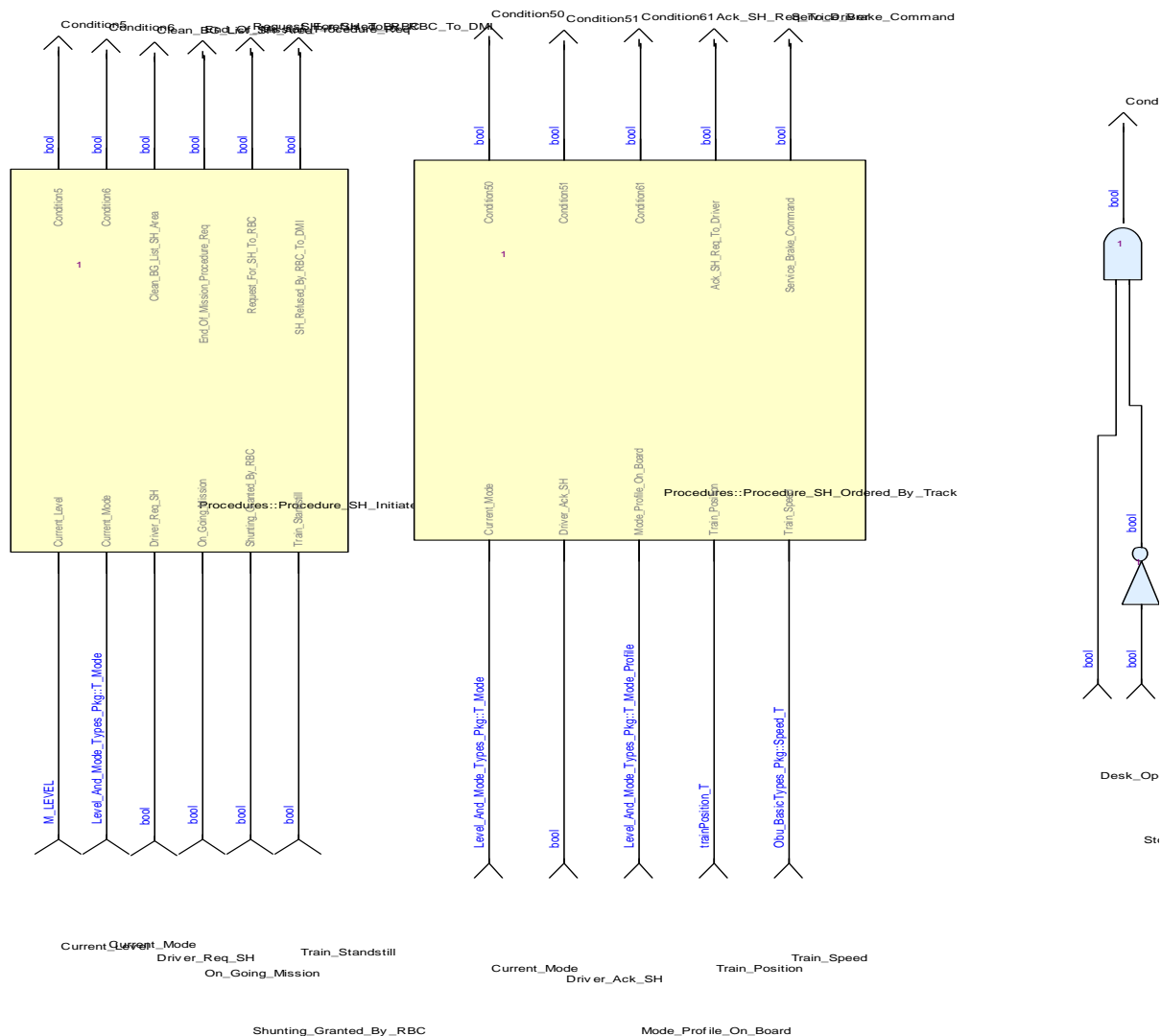


Figure 10: View of diagram_ToShunting_1 (ToShunting)

3.2.7. ToSleeping Operator

Declared as **public function**

3.2.7.1. Comments and Information

ToSleeping Comments:

§4.6.3 : Condition 14 : "The sleeping input signal is received AND train is at standstill AND all desks connected to the ERTMS/ETCS on-board equipment are closed

3.2.7.2. Interface

Table 24: Inputs of ToSleeping

Name	Type	Comments and Information
All_Desks_Closed	bool	
Train_Standstill	bool	
Train_Req_SL	bool	

Table 25: Outputs of ToSleeping

Name	Type	Comments and Information
Condition14	bool	

3.2.7.3. Operator Hierarchy

diagram : diagram_ToSleeping_1

3.2.7.4. Graphical and Textual Diagrams

3.2.7.4.1. View of diagram_ToSleeping_1 (ToSleeping)

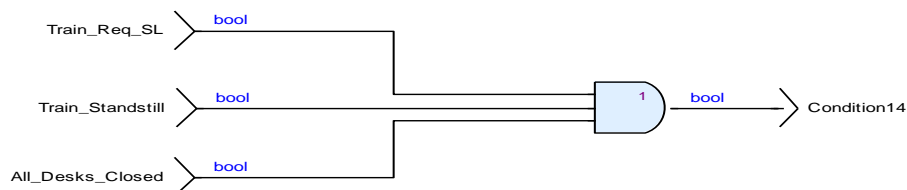


Figure 11: View of diagram_ToSleeping_1 (ToSleeping)

3.2.8. ToStaffResponsible Operator

Declared as **public node**

3.2.8.1. Interface

Table 26: Inputs of ToStaffResponsible

Name	Type	Properties		Comments and Information
Current_Level	M_LEVEL	last	M_LEVEL_Level_0	
Driver_Req_Override	bool			
Train_Speed_Under_Override_Limit	bool			
Override_Function_Active	bool			
Emergency_Stop_Message_Received	bool			

Table 27: Outputs of ToStaffResponsible

Name	Type	Comments and Information
Condition44	bool	
Condition45	bool	
Condition37	bool	

3.2.8.2. Locals

Table 28: Locals of ToStaffResponsible

Name	Type	Comments and Information
Level_L1	bool	
Level_L2_L3	bool	
Level_prev_L0_LNTC	bool	

3.2.8.3. Operator Hierarchy

diagram : diagram_ToOnSight1_1

3.2.8.4. Graphical and Textual Diagrams

3.2.8.4.1. View of diagram_ToOnSight1_1 (ToStaffResponsible)

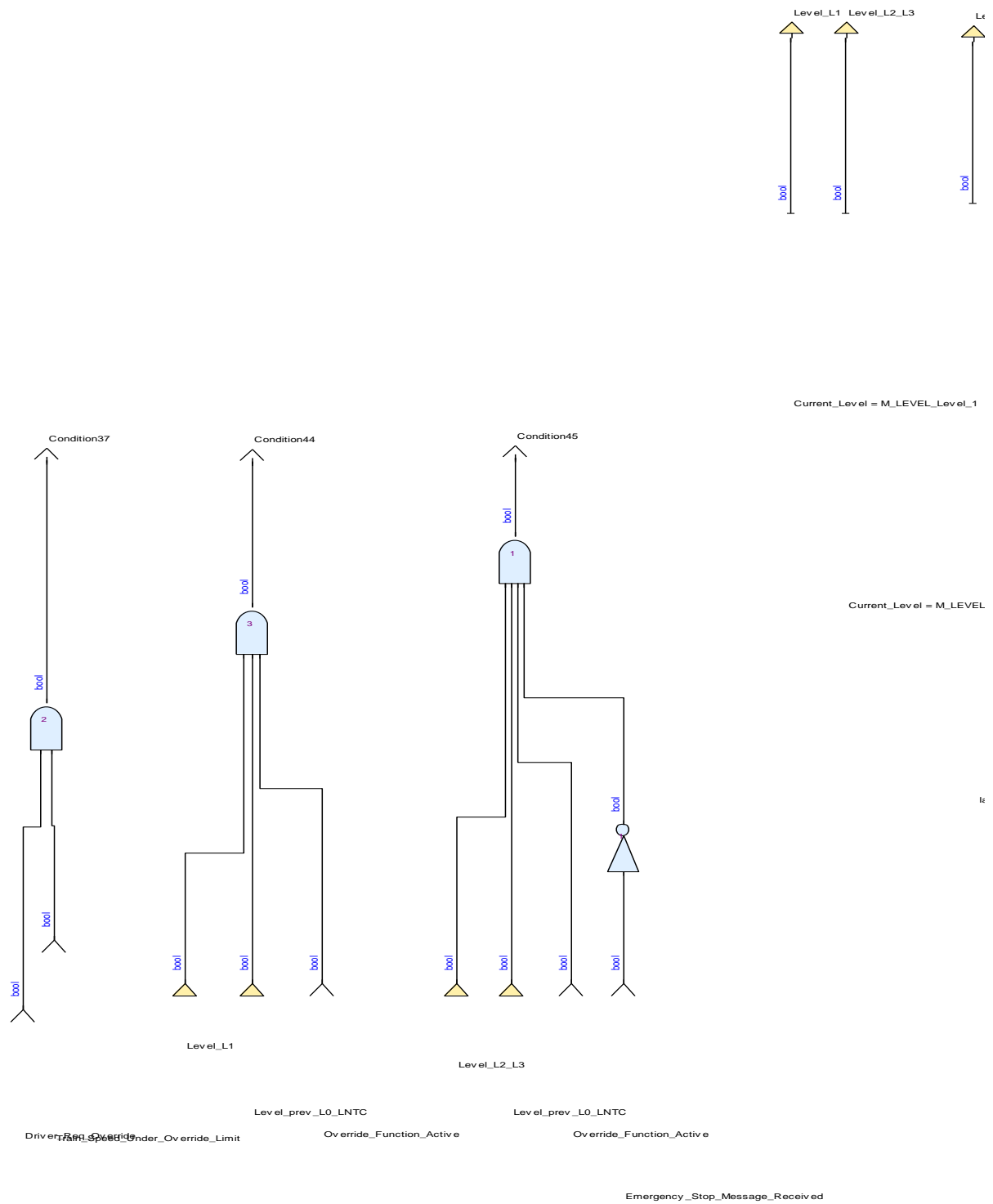


Figure 12: View of diagram_ToOnSight1_1 (ToStaffResponsible)

3.2.9. ToStandBy Operator

Declared as **public function**

3.2.9.1. Comments and Information

ToStandBy Comments:

SRS-026 § 4.6.2 : C2 "(a desk is open)"

SRS-026 § 4.6.2 : C3 "(no "go sleeping" input signal is received any more) AND (train is at standstill)"

SRS-026 § 4.6.2 : C4 "The ERTMS/ETCS on-board equipment is powered."

SRS-026 § 4.6.2 : C19 "(driver selects "exit Shunting") AND (train is at standstill)."

SRS-026 § 4.6.2 : C22 "(a desk is open) AND ("Stop Shunting on desk opening" information is stored onboard)"

SRS-026 § 4.6.2 : C27 "(desks are closed) AND ("Continue Shunting on desk closure" function is not active)"

SRS-026 § 4.6.2 : C28 "(desks are closed) "

SRS-026 § 4.6.2 : C30 "(desks are closed) AND (no "passive shunting" input signal is received)"

SRS-026 § 4.6.2 : C47 "(no "non leading" input signal is received any more) AND (train is at standstill)"

3.2.9.2. Interface

Table 29: Inputs of ToStandBy

Name	Type	Comments and Information
Desk_Open	bool	
All_Desks_Closed	bool	
Train_Standstill	bool	
Train_Req_SL	bool	
OnBoard_Powered	bool	
Train_Permitted_PS	bool	
Train_Permitted_NL	bool	
Continue_Shunting_function_Active	bool	
Driver_Req_Exit_SH	bool	
Stop_Shunting_Stored	bool	
On_Going_Mission	bool	

Table 30: Outputs of ToStandBy

Name	Type	Properties	Comments and Information
Condition2	bool		
Condition3	bool		
Condition4	bool		
Condition19	bool		
Condition22	bool		

Name	Type	Properties		Comments and Information
Condition27	bool			
Condition28	bool			
Condition30	bool			
Condition47	bool			
End_Of_Mission_Procedure_Req	bool	default	false	

3.2.9.3. Operator Hierarchy

diagram : diagram_ToStandBy_1

3.2.9.4. Graphical and Textual Diagrams

3.2.9.4.1. View of diagram_ToStandBy_1 (ToStandBy)

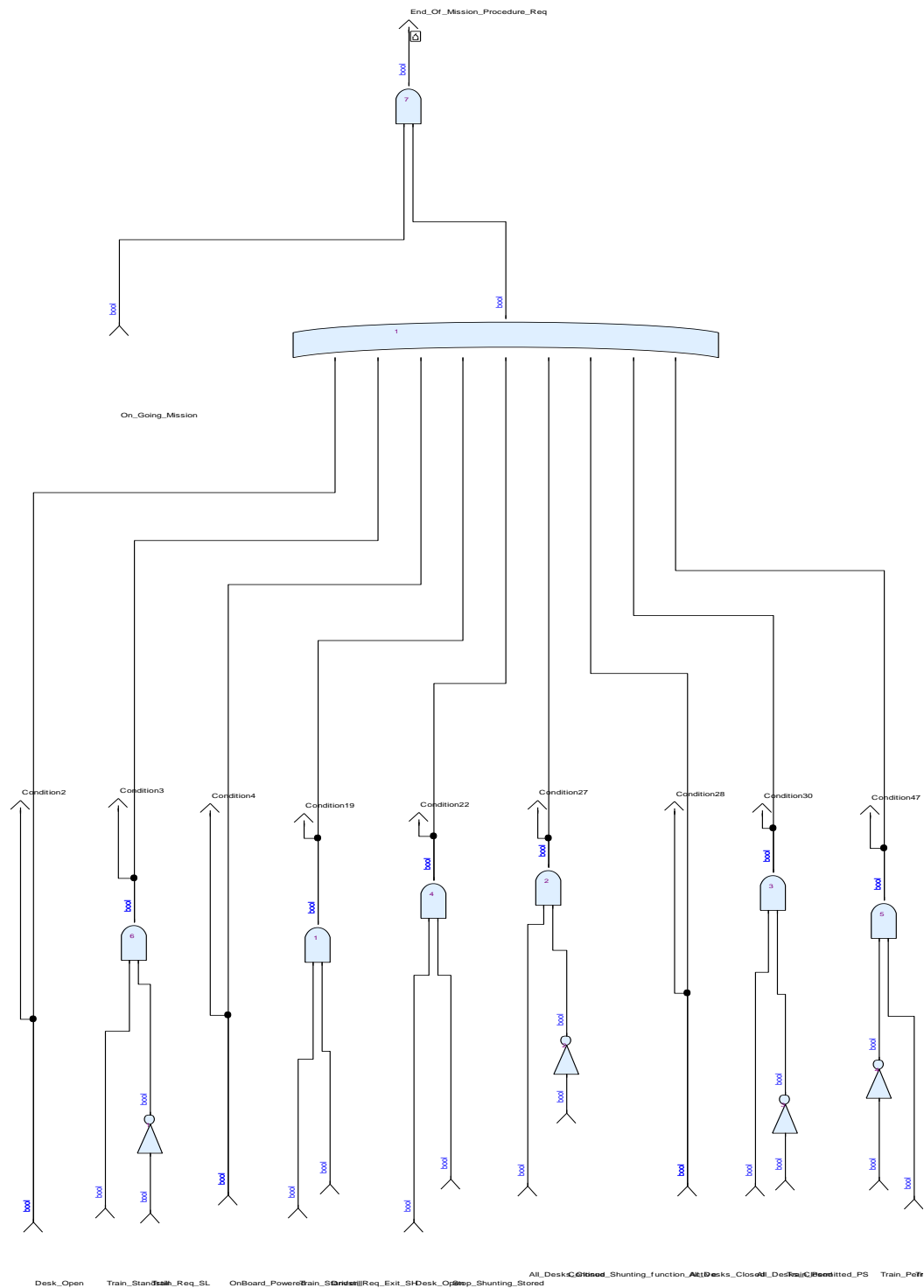


Figure 13: View of diagram_ToStandBy_1 (ToStandBy)

3.2.10. ToSystemFailure Operator

Declared as **public function**

3.2.10.1. Comments and Information

ToSystemFailure Comments:

§4.6.3 : Condition 13 : "The ERTMS/ETCS on-board equipment detects a fault that affects safety".

3.2.10.2. Interface

Table 31: Inputs of ToSystemFailure

Name	Type	Comments and Information
Safety_Failure_Occured	bool	

Table 32: Outputs of ToSystemFailure

Name	Type	Comments and Information
Condition13	bool	

3.2.10.3. Operator Hierarchy

diagram : diagram_ToSystemFailure_1

3.2.10.4. Graphical and Textual Diagrams

3.2.10.4.1. View of diagram_ToSystemFailure_1 (ToSystemFailure)



Figure 14: View of diagram_ToSystemFailure_1 (ToSystemFailure)

3.2.11. ToSystemNational Operator

Declared as **public node**

3.2.11.1. Comments and Information

ToSystemNational Comments:

SRS-026 § 4.6.2 : C56 "(the ERTMS/ETCS level switches to "NTC")"

3.2.11.2. Interface

Table 33: Inputs of ToSystemNational

Name	Type	Properties		Comments and Information
Current_Level	M_LEVEL	last	M_LEVEL_Level_0	

Table 34: Outputs of ToSystemNational

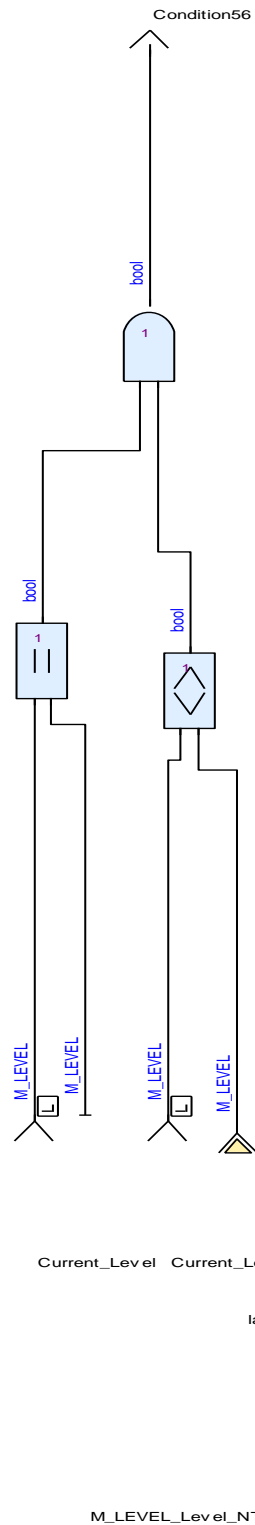
Name	Type	Comments and Information
Condition56	bool	

3.2.11.3. Operator Hierarchy

diagram : diagram_ToSystemNational1_1

3.2.11.4. Graphical and Textual Diagrams

3.2.11.4.1. View of diagram_ToSystemNational1_1 (ToSystemNational)

**Figure 15: View of diagram_ToSystemNational1_1 (ToSystemNational)**

3.2.12. ToTrip Operator

Declared as **public node**

3.2.12.1. Interface

Table 35: Inputs of ToTrip

Name	Type	Properties		Comments and Information
BG_In_Expected_List_In_SH	bool			
BG_In_Expected_List_In_SR	bool			
Current_Level	M_LEVEL	last	M_LEVEL_Level_0	
Current_Mode	Level_And_Mode_Types_Pkg::T_Mode			
Driver_Select_SH	bool			
Emergency_Stop_Message_Received	bool			
Error_BG_System_Version	bool			
Estimated_Front_End_Overpass_SR_Distance	bool			
Estimated_Front_End_Rear_Location_SSP_Or_Gradient	bool			
Interface_To_National_System	bool			
Linked_BG_Pased_In_Wrong_Direction	bool			
Linking_Reaction_To_Trip	bool			
List_BG_Related_To_SR_Empty	bool			
MA_Available	bool			
National_Trip_Order	bool			
Override_Function_Active	bool			
Override_Function_Former_Active	bool			
Stop_If_In_Shunting	bool			
Stop_If_In_SR	bool			
T_NVCONTACT_Overpass	bool			
Train_Overpass_EOA_Antenna	bool			
Train_Overpass_EOA_Front_End	bool			
Train_Overpass_Former_EOA_Antenna	bool			
Trip_Order_Given_By_Balise	bool			
TripModeFromLevel	bool			

Table 36: Outputs of ToTrip

Name	Type	Comments and Information
Condition2Trip	bool	

3.2.12.2. Locals

Table 37: Locals of ToTrip

Name	Type	Comments and Information
Condition12	bool	
Condition16	bool	
Condition17	bool	
Condition18	bool	
Condition20	bool	
Condition35	bool	
Condition36	bool	
Condition38	bool	
Condition39	bool	
Condition41	bool	
Condition42	bool	
Condition43	bool	
Condition49	bool	
Condition52	bool	
Condition54	bool	
Condition65	bool	
Condition66	bool	
Condition67	bool	
Condition69	bool	
Level_L1	bool	
Level_L1_L2_L3	bool	
Level_L2_L3	bool	
Level_LNTC	bool	
Level_prev_L0_LNTC	bool	
Level_prev_L1	bool	
Mode_FS_LS_OS	bool	
Mode_SH	bool	
Mode_SN	bool	
Mode_SR	bool	
Mode_UN	bool	

3.2.12.3. Operator Hierarchy

diagram : diagram_ToTrip_1

3.2.12.4. Graphical and Textual Diagrams

3.2.12.4.1. View of diagram_ToTrip_1 (ToTrip)

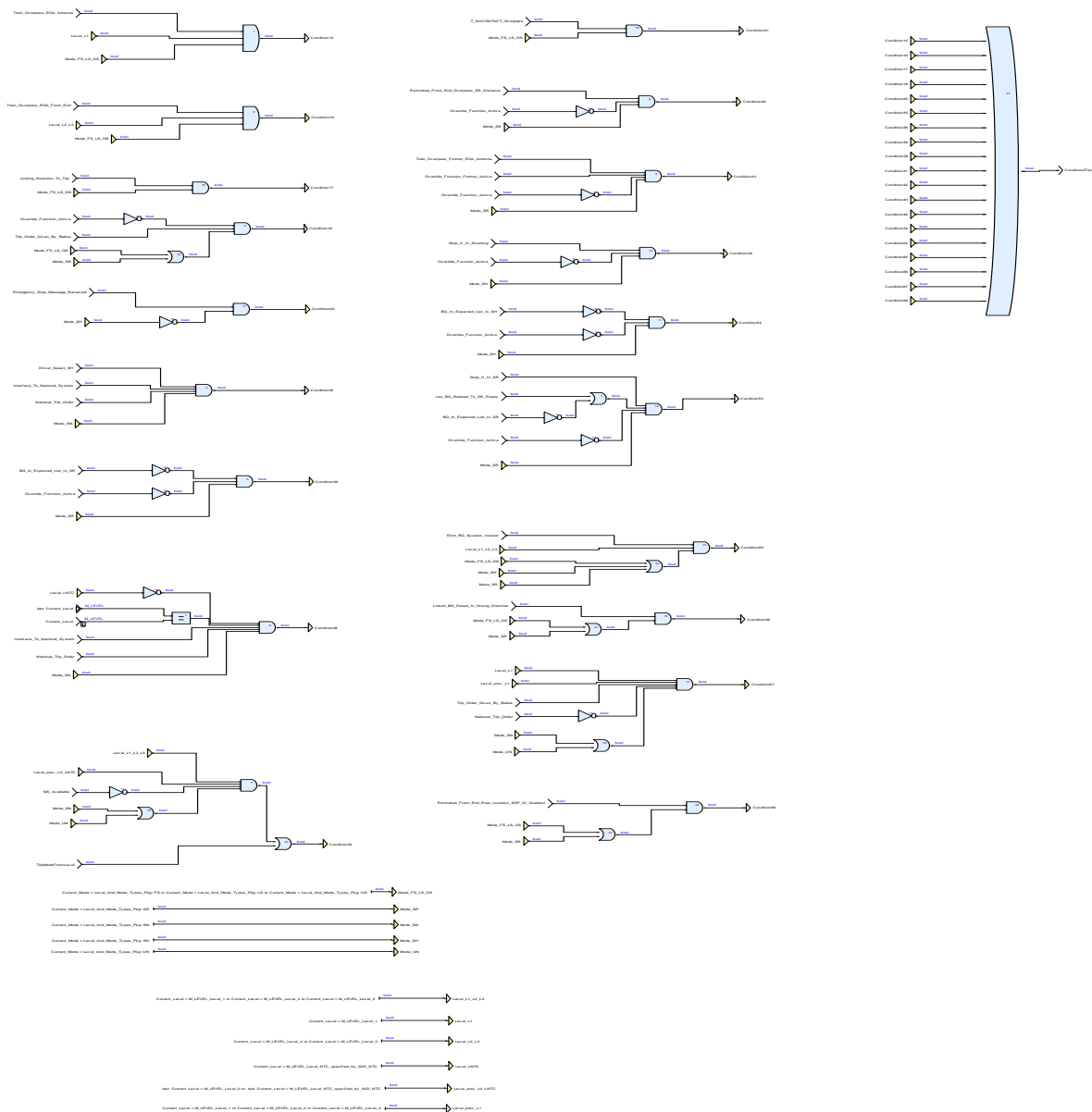


Figure 16: View of diagram_ToTrip_1 (ToTrip)

3.2.13. ToUnfitted Operator

Declared as **public node**

3.2.13.1. Comments and Information

ToUnfitted Comments:

SRS-026 § 4.6.2 : C21 "(the ERTMS/ETCS level switches to 0"

3.2.13.2. Interface

Table 38: Inputs of ToUnfitted

Name	Type	Properties		Comments and Information
Current_Level	M_LEVEL	last	M_LEVEL_Level_0	

Table 39: Outputs of ToUnfitted

Name	Type	Comments and Information
Condition21	bool	

3.2.13.3. Operator Hierarchy

diagram : diagram_ToUnfitted_1

3.2.13.4. Graphical and Textual Diagrams

3.2.13.4.1. View of diagram_ToUnfitted_1 (ToUnfitted)

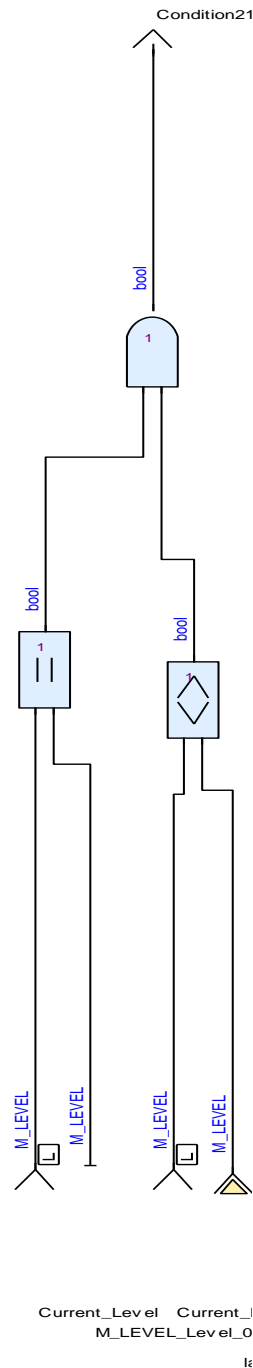


Figure 17: View of diagram_ToUnfitted_1 (ToUnfitted)

3.3. Interfaces Package

3.3.1. InputDMI Operator

Declared as **public function**

3.3.1.1. Interface

Table 40: Inputs of InputDMI

Name	Type	Comments and Information
Data_From_DMI	Level_And_Mode_Type s_Pkg::T_Data_From_DMI	

Table 41: Outputs of InputDMI

Name	Type	Comments and Information
Driver_Ack_LS	bool	
Driver_Ack_OS	bool	
Driver_Ack_RV	bool	
Driver_Ack_SH	bool	
Driver_Ack_SN	bool	
Driver_Ack_SR	bool	
Driver_Ack_TR	bool	
Driver_Ack_UN	bool	
Driver_Req_Exit_SH	bool	
Driver_Req_NL	bool	
Driver_Req_Override	bool	
Driver_Req_SH	bool	
Driver_Req_Start	bool	
ETCS_Isolated	bool	

3.3.1.2. Operator Hierarchy

diagram : diagram_Operator5_1

3.3.1.3. Graphical and Textual Diagrams

3.3.1.3.1. View of diagram_Operator5_1 (InputDMI)

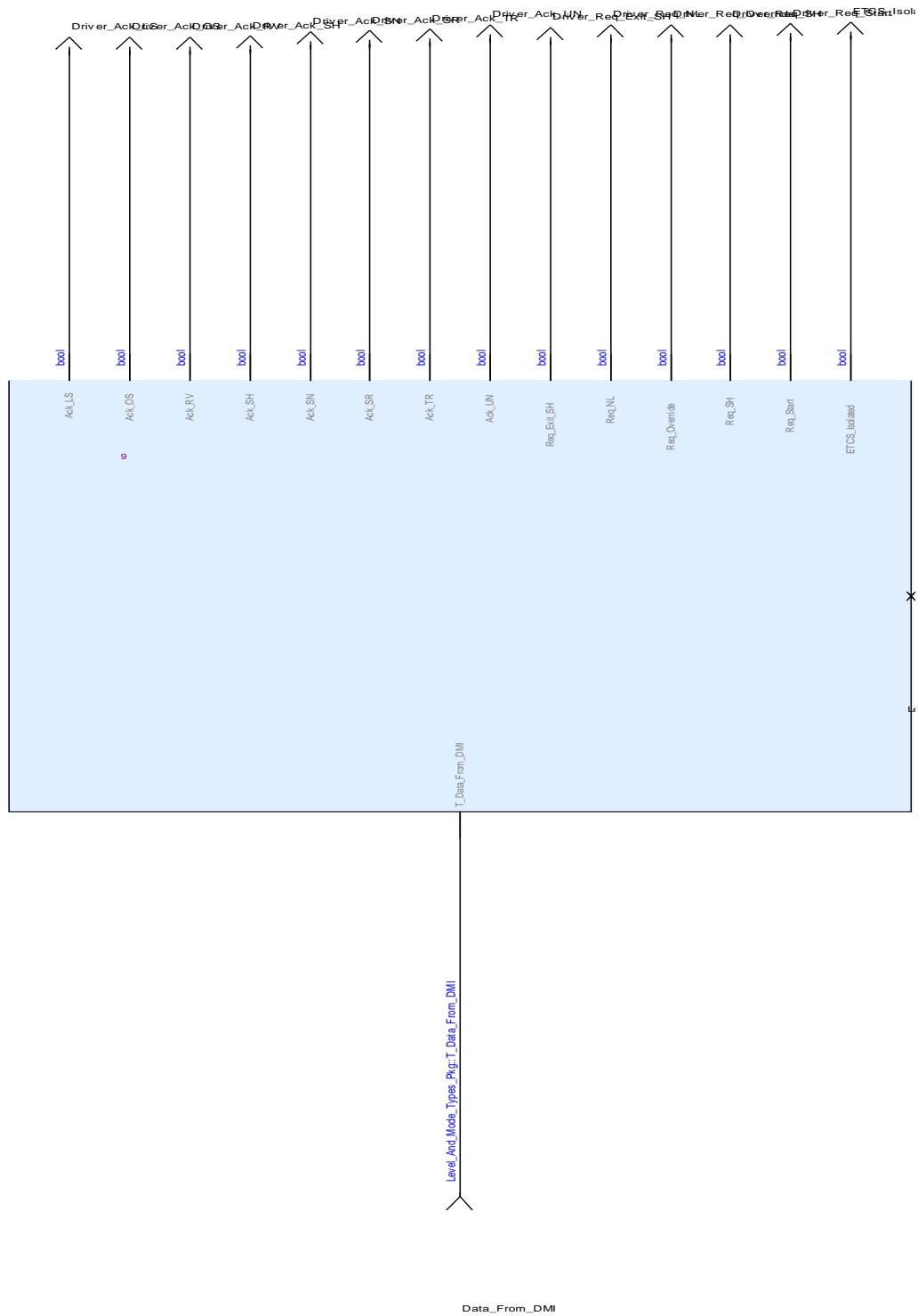


Figure 18: View of diagram_Operator5_1 (InputDMI)

3.3.2. InputF2Functions Operator

Declared as **public function**

3.3.2.1. Interface

Table 42: Inputs of InputF2Functions

Name	Type	Comments and Information
Data_From_F2_Functions	Level_And_Mode_Types_Pkg::T_Data_From_F2_functions	

Table 43: Outputs of InputF2Functions

Name	Type	Comments and Information
T_NVCONTACT_Overpass	bool	
Error_BG_System_Version	bool	
Failure_Occured	bool	
Continue_Shunting_Function_Active	bool	
Stop_Shunting_Stored	bool	
Linking_Reaction_To_Trip	bool	

3.3.2.2. Operator Hierarchy

diagram : diagram_InputF2Functions_1

3.3.2.3. Graphical and Textual Diagrams

3.3.2.3.1. View of diagram_InputF2Functions_1 (InputF2Functions)

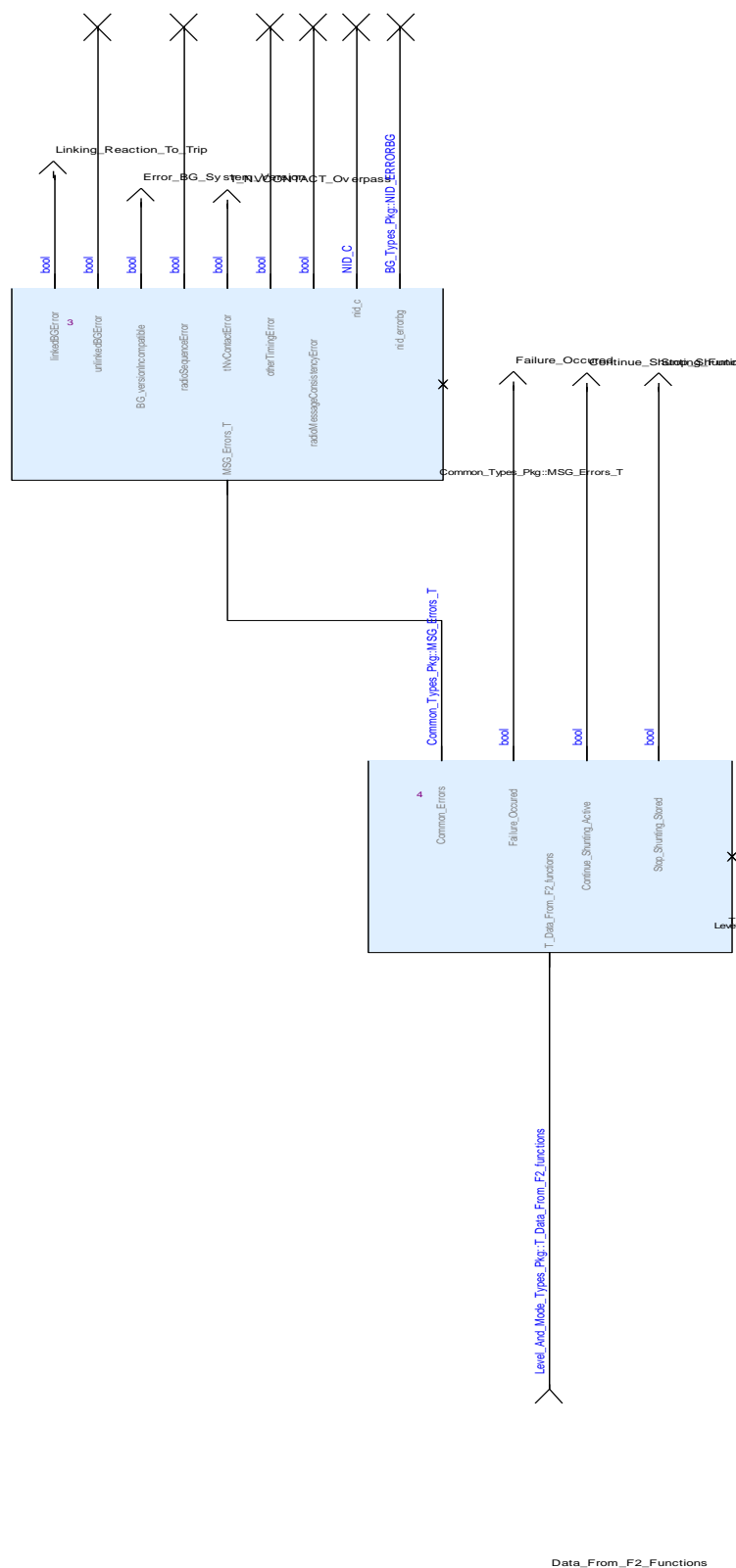


Figure 19: View of diagram_InputF2Functions_1 (InputF2Functions)

3.3.3. InputLocalisation Operator

Declared as **public function**

3.3.3.1. Interface

Table 44: Inputs of InputLocalisation

Name	Type	Comments and Information
Data_From_Localisation	Level_And_Mode_Types_Pkg::T_Data_From_Localisation	

Table 45: Outputs of InputLocalisation

Name	Type	Comments and Information
BG_In_Expected_List_In_SR	bool	
BG_In_Expected_List_In_SH	bool	
Linked_BG_Pased_In_Wrong_Direction	bool	
Train_Position	TrainPosition_Types_Pkg::trainPosition_T	
Train_Speed	Obu_BasicTypes_Pkg::Speed_T	
Train_Standstill	bool	

3.3.3.2. Operator Hierarchy

diagram : diagram_InputSpeedAndSupervision1_1

3.3.3.3. Graphical and Textual Diagrams

3.3.3.3.1. View of diagram_InputSpeedAndSupervision1_1 (InputLocalisation)

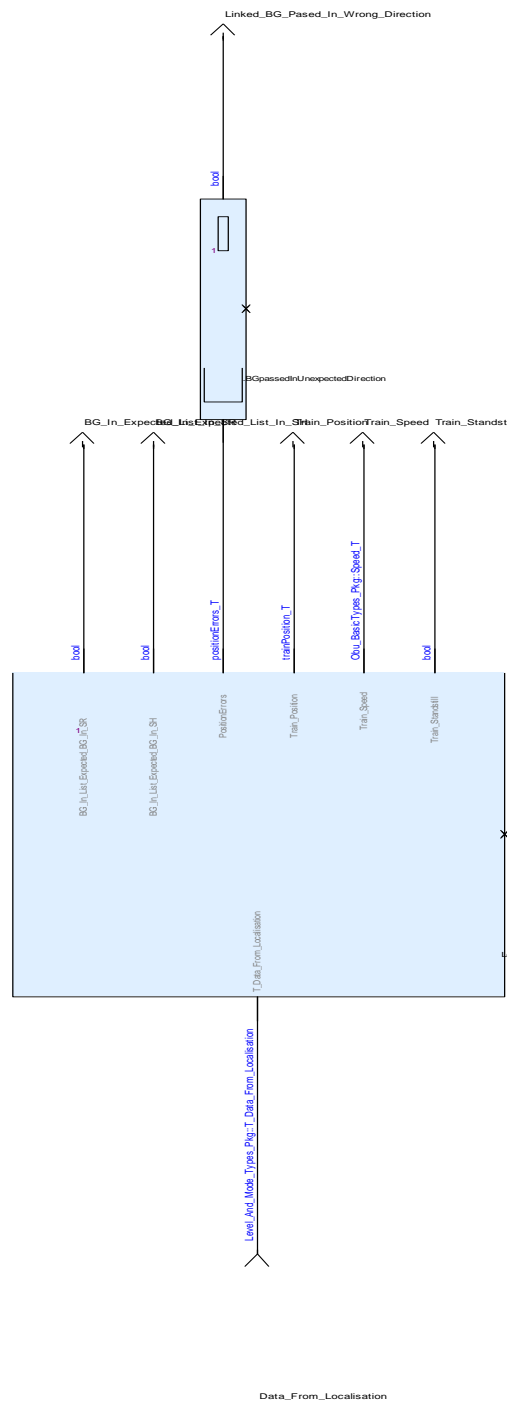


Figure 20: View of diagram_InputSpeedAndSupervision1_1 (InputLocalisation)

3.3.4. InputSpeedAndSupervision Operator

Declared as **public function**

3.3.4.1. Interface

Table 46: Inputs of InputSpeedAndSupervision

Name	Type	Comments and Information
Data_From_Speed_and_Supervision	Level_And_Mode_Type s_Pkg::T_Data_From_Speed_Supervision	

Table 47: Outputs of InputSpeedAndSupervision

Name	Type	Comments and Information
Estimated_Front_End_Overpass_SR_Distance	bool	
Estimated_Front_End_Rear_Location_SSP_Or_Gradient	bool	
Override_Function_Active	bool	
Train_Overpass_EOA_Antenna	bool	
Train_Overpass_EOA_Front_End	bool	
Train_Speed_Under_Override_Limit	bool	

3.3.4.2. Operator Hierarchy

diagram : diagram_InputSpeedAndSupervision_1

3.3.4.3. Graphical and Textual Diagrams

3.3.4.3.1. View of diagram_InputSpeedAndSupervision_1 (InputSpeedAndSupervision)

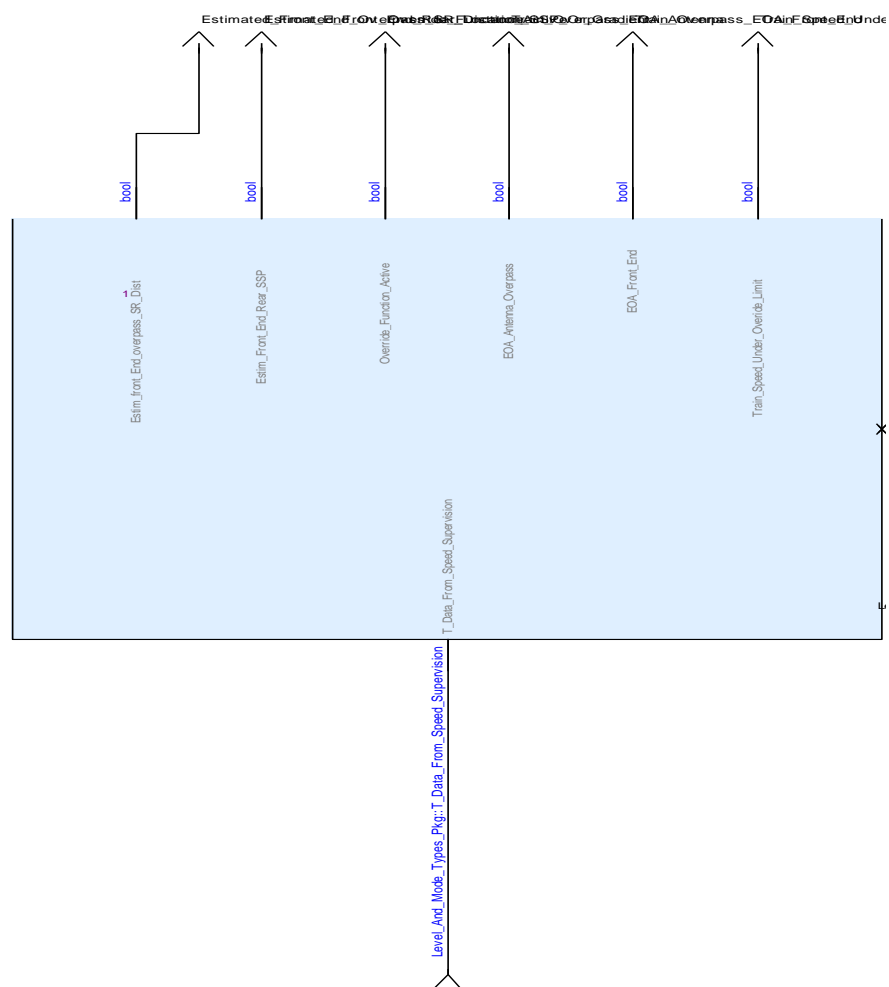


Figure 21: View of diagram_InputSpeedAndSupervision_1 (InputSpeedAndSupervision)

3.3.5. InputSTM Operator

Declared as **public function**

3.3.5.1. Interface

Table 48: Inputs of InputSTM

Name	Type	Comments and Information
Data_From_STM	Level_And_Mode_Type s_Pkg::T_Data_From_ STM	

Table 49: Outputs of InputSTM

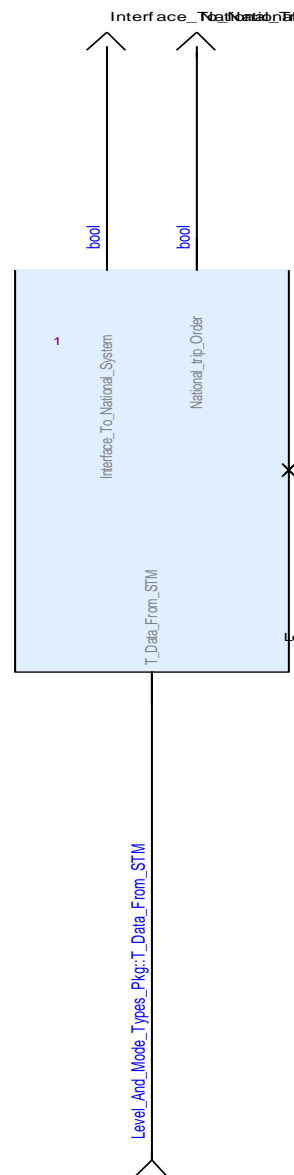
Name	Type	Comments and Information
Interface_To_National_ System	bool	
National_Trip_Order	bool	

3.3.5.2. Operator Hierarchy

diagram : diagram_InputSTM_1

3.3.5.3. Graphical and Textual Diagrams

3.3.5.3.1. View of diagram_InputSTM_1 (InputSTM)



Data_From_STM

Figure 22: View of diagram_InputSTM_1 (InputSTM)

3.3.6. InputTIUManagement Operator

Declared as **public function**

3.3.6.1. Comments and Information

InputTIUManagement Comments:

What are the default values for the location if the train position is not valid ?
Do we use the last value or a default value ?

Requirement traceability on SRS :

§4.4.6.1.5

3.3.6.2. Interface

Table 50: Inputs of InputTIUManagement

Name	Type	Comments and Information
Data_from_TIU	TIU_Types_Pkg::Message_Train_Interface_to_EVC_T	
Cab	TIU_Types_Pkg::cab_ID_T	

Table 51: Outputs of InputTIUManagement

Name	Type	Comments and Information
Train_Permitted_NL	bool	
Train_Permitted_PS	bool	
Train_Req_SL	bool	
All_Desks_Closed	bool	
Desk_Open	bool	
OnBoard_Powered	bool	
Valid_Train_Data_Stored	bool	

3.3.6.3. Locals

Table 52: Locals of InputTIUManagement

Name	Type	Comments and Information
Loc_Cab_ST	TIU_Types_Pkg::M_cab_signal_status_T	
Loc_NL_ST	TIU_Types_Pkg::M_noleading_signal_status_T	
Loc_PS_ST	TIU_Types_Pkg::M_passiveshunting_signal_status_T	
Loc_Sleeping_ST	TIU_Types_Pkg::M_sleeping_signal_status_T	

3.3.6.4. Operator Hierarchy

diagram : diagram_InputTIUManagement_1

3.3.6.5. Graphical and Textual Diagrams

3.3.6.5.1. View of diagram_InputTIUManagement_1 (InputTIUManagement)

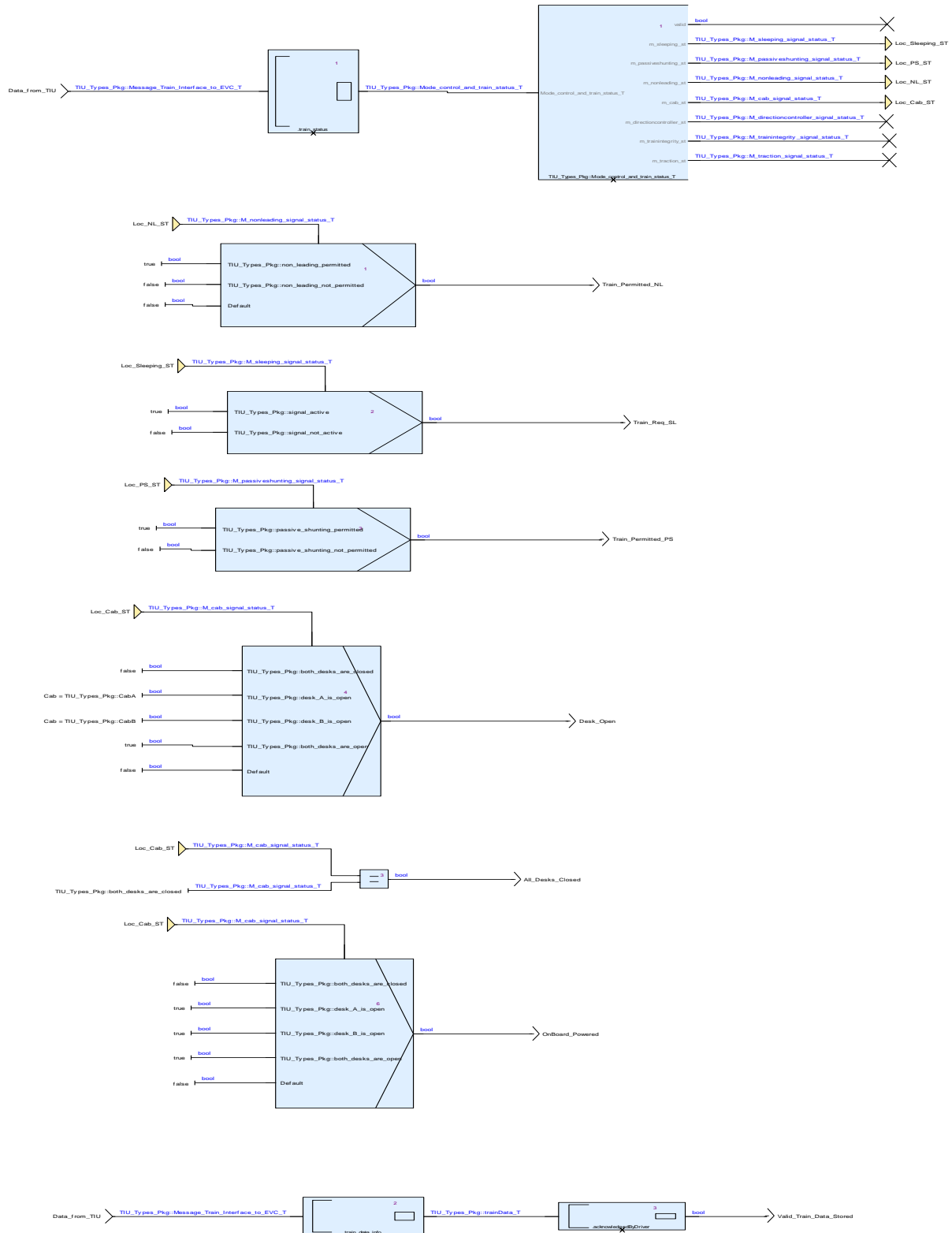


Figure 23: View of diagram_InputTIUManagement_1 (InputTIUManagement)

3.3.7. InputTrackManagement Operator

Declared as **public function**

Mode Management Function

3.3.7.1. Interface

Table 53: Inputs of InputTrackManagement

Name	Type	Comments and Information
Data_From_Track	Level_And_Mode_Type s_Pkg::T_Data_From_Track_To_Mode	

Table 54: Outputs of InputTrackManagement

Name	Type	Comments and Information
MA_SSP_Gradient_Available	bool	
Mode_Profile_On_Board	Level_And_Mode_Type s_Pkg::T_Mode_Profile	
Shunting_Granted_By_RBC	bool	
Trip_Order_Given_By_Balise	bool	
List_BG_Related_To_SR_Empty	bool	
Stop_If_In_Shunting	bool	
Stop_If_In_SR	bool	
RCB_Ack_And_EB_Revoked	bool	
RBC_Authorized_SR	bool	
Reversing_Data	Level_And_Mode_Type s_Pkg::T_Reversing_Data	
Emergency_Stop_Message_Received	bool	

3.3.7.2. Operator Hierarchy

diagram : diagram_InputTrackManagement_1

3.3.7.3. Graphical and Textual Diagrams

3.3.7.3.1. View of diagram_InputTrackManagement_1 (InputTrackManagement)

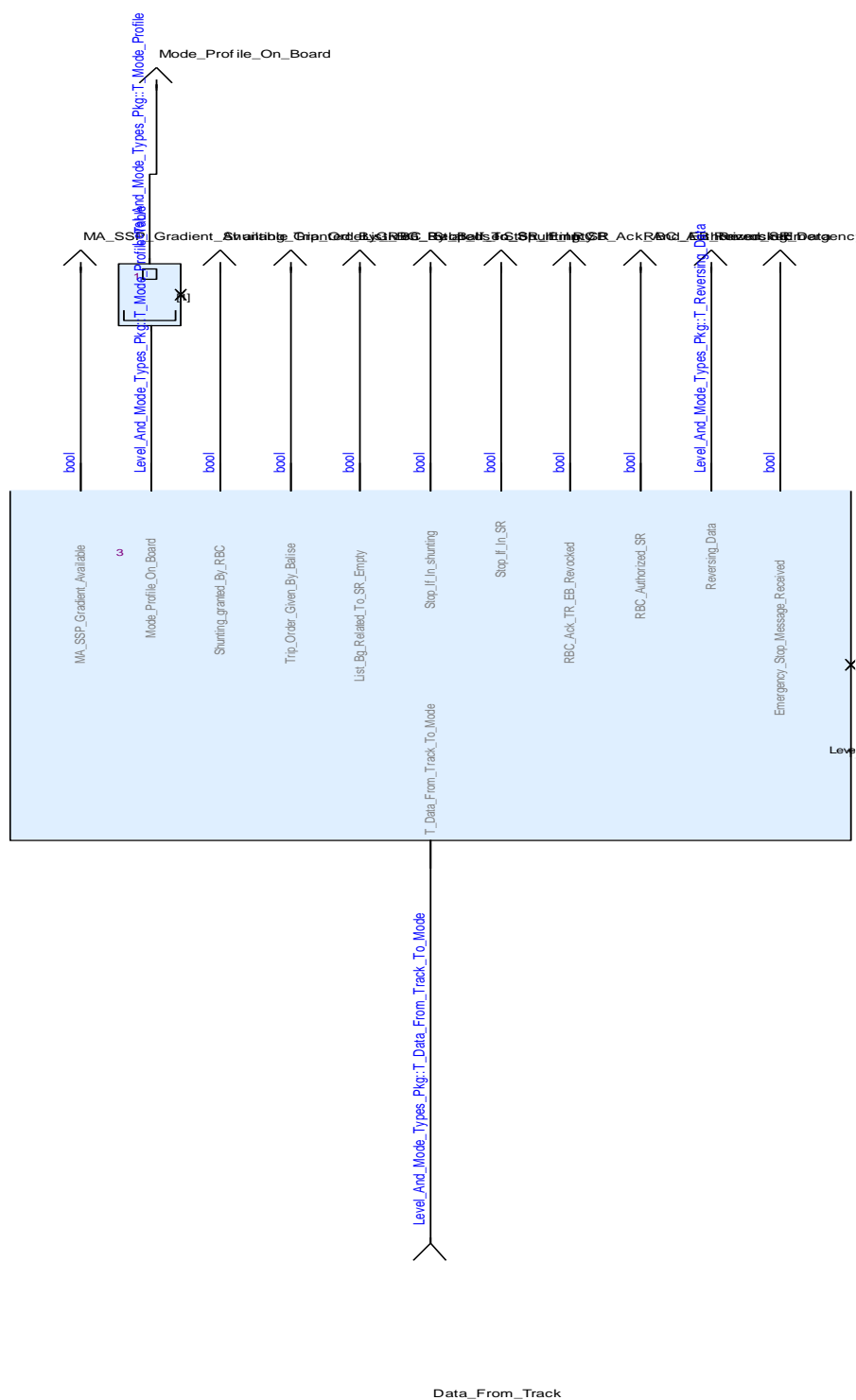


Figure 24: View of diagram_InputTrackManagement_1 (InputTrackManagement)

3.3.8. Output_To_BG_Management Operator

Declared as **public function**

3.3.8.1. Interface

Table 55: Inputs of Output_To_BG_Management

Name	Type	Comments and Information
End_Of_Mission_Procedure_Req	bool	
Clean_BG_List_SH_Area	bool	
MA_Req_To_RBC	bool	
Request_For_SH_To_RBC	bool	

Table 56: Outputs of Output_To_BG_Management

Name	Type	Comments and Information
Data_To_BG_Management	Level_And_Mode_Types_Pkg::T_Data_To_BG_Management	

3.3.8.2. Operator Hierarchy

diagram : diagram_Output_To_BG_Management_1

3.3.8.3. Graphical and Textual Diagrams

3.3.8.3.1. View of diagram_Output_To_BG_Management_1 (Output_To_BG_Management)

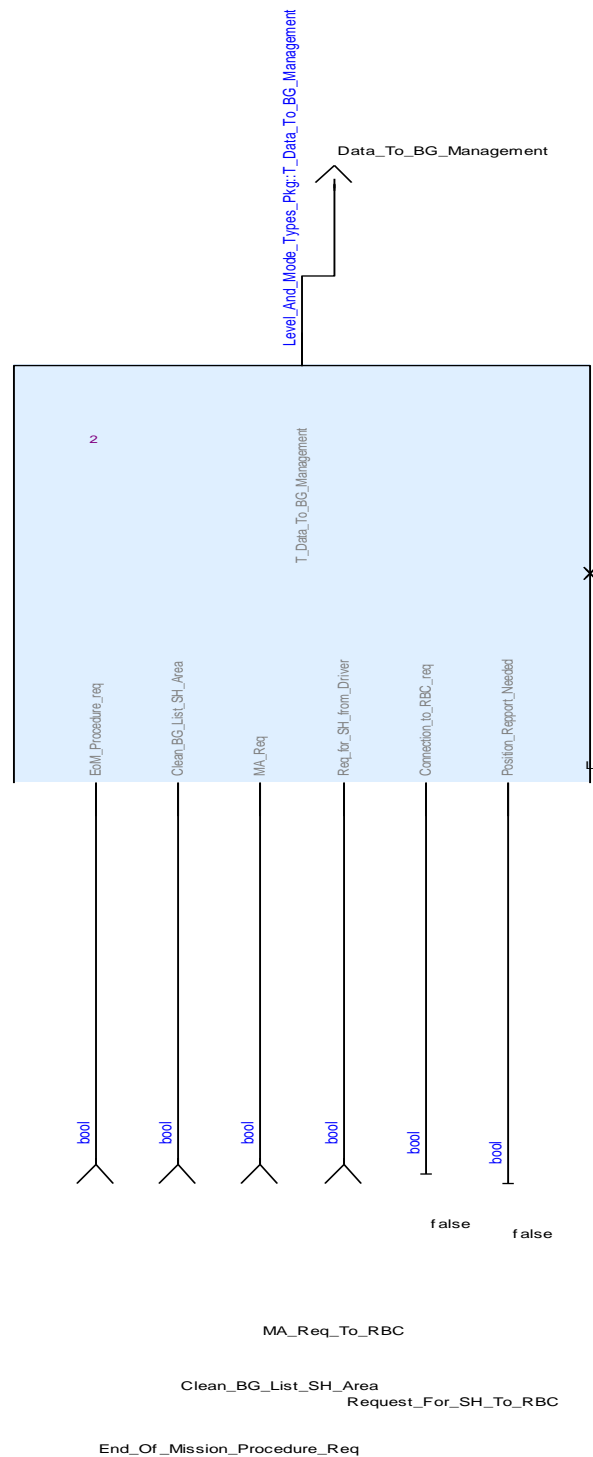


Figure 25: View of diagram_Output_To_BG_Management_1 (Output_To_BG_Management)

3.3.9. Output_To_DMI Operator

Declared as **public function**

3.3.9.1. Interface

Table 57: Inputs of Output_To_DMI

Name	Type	Comments and Information
Ack_LS_Req_To_Driver	bool	
Ack_OS_Req_To_Driver	bool	
Ack_RV_Req_To_Driver	bool	
Ack_SH_Req_To_Driver	bool	
Ack_SN_Req_To_Driver	bool	
Ack_SR_Req_To_Driver	bool	
Ack_TR_Req_To_Driver	bool	
Ack_UN_Req_To_Driver	bool	
SH_Refused_By_RBC_To_DMI	bool	

Table 58: Outputs of Output_To_DMI

Name	Type	Comments and Information
Data_To_DMI	Level_And_Mode_Type s_Pkg::T_Data_To_DMI	

3.3.9.2. Operator Hierarchy

diagram : diagram_Output_To_DMI_1

3.3.9.3. Graphical and Textual Diagrams

3.3.9.3.1. View of diagram_Output_To_DMI_1 (Output_To_DMI)

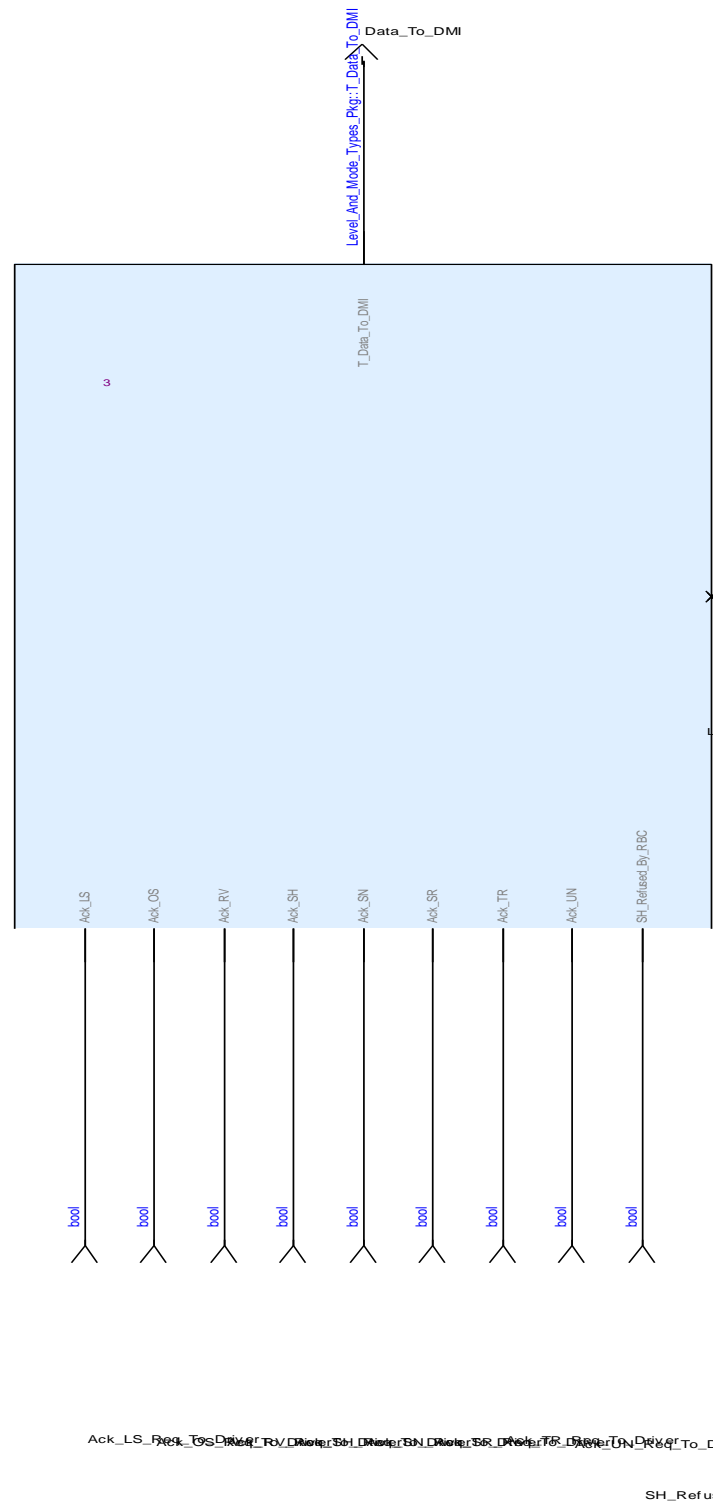


Figure 26: View of diagram_Output_To_DMI_1 (Output_To_DMI)

3.3.10. OutputManagement Operator

Declared as **public function**

3.3.10.1. Interface

Table 59: Inputs of OutputManagement

Name	Type	Comments and Information
current_Mode	Level_And_Mode_Type s_Pkg::T_Mode	
Ack_LS_Req_To_Driver	bool	
Ack_OS_Req_To_Driver	bool	
Ack_RV_Req_To_Driver	bool	
Ack_SH_Req_To_Driver	bool	
Ack_SN_Req_To_Driver	bool	
Ack_SR_Req_To_Driver	bool	
Ack_TR_Req_To_Driver	bool	
Ack_UN_Req_To_Driver	bool	
Clean_BG_List_SH_Area	bool	
EB_requested	bool	
End_Of_Mission_Procedure_Req	bool	
MA_Req_to_RBC	bool	
Request_For_SH_To_RBC	bool	
service_brake_Command	bool	
SH_Refused_by_RBC_To_DMI	bool	

Table 60: Outputs of OutputManagement

Name	Type	Comments and Information
Data_To_DMI	Level_And_Mode_Type s_Pkg::T_Data_To_DMI	
Data_To_BG_Management	Level_And_Mode_Type s_Pkg::T_Data_To_BG_Management	
EB_Requested	bool	
Service_Brake_Command	bool	
newMode	Level_And_Mode_Type s_Pkg::T_Mode	

3.3.10.2. Operator Hierarchy
diagram : diagram_Operator48_1

3.3.10.3. Graphical and Textual Diagrams

3.3.10.3.1. View of diagram_Operator48_1 (OutputManagement)

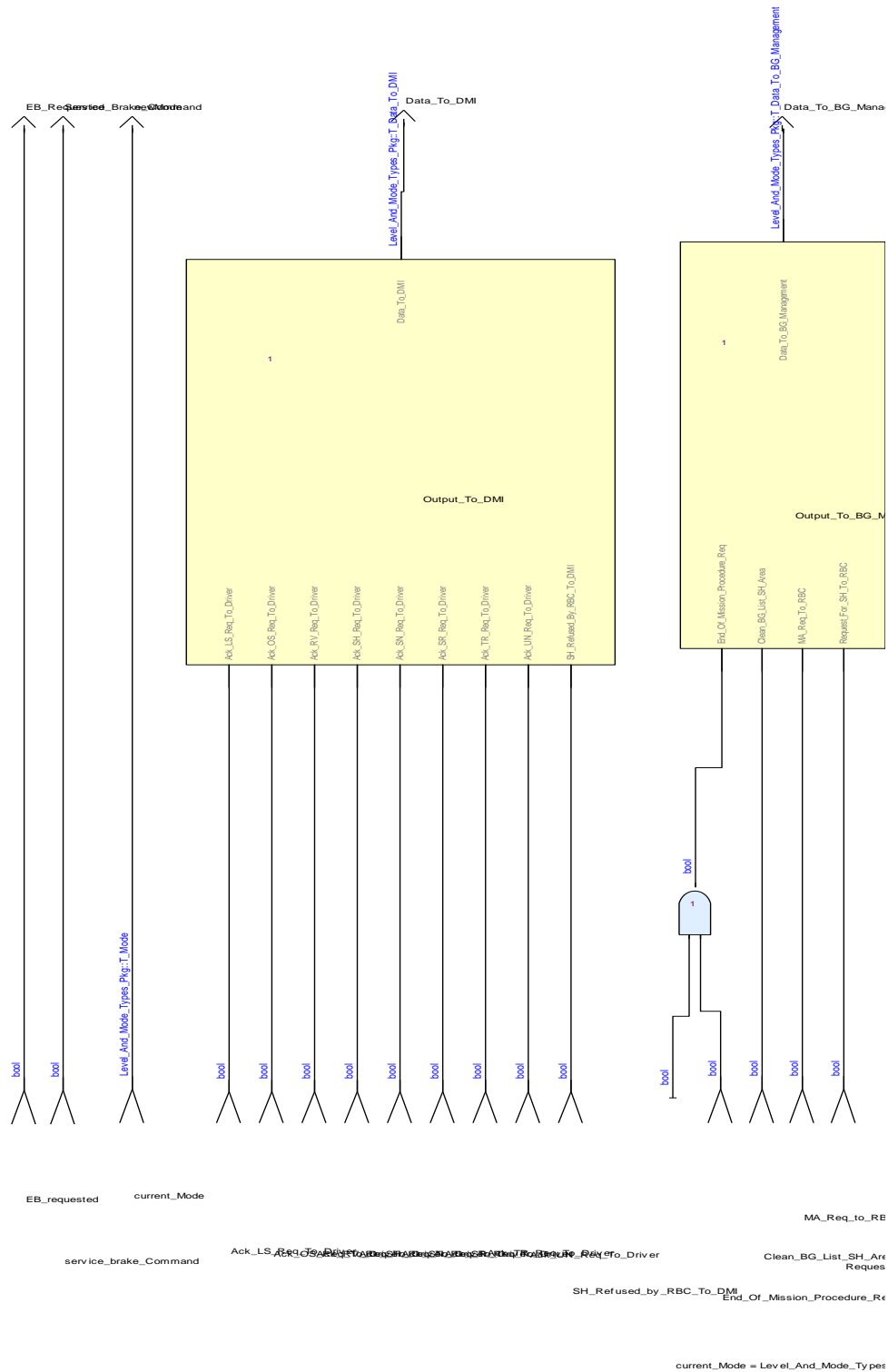


Figure 27: View of diagram_Operator48_1 (OutputManagement)

3.4. Libraries Package

3.4.1. Mode_Profile_Calculations Operator

Declared as **public function**

3.4.1.1. Interface

Table 61: Inputs of Mode_Profile_Calculations

Name	Type	Comments and Information
Selected_Mode	Level_And_Mode_Type s_Pkg::T_Mode	
Mode_Profile_On_Board	Level_And_Mode_Type s_Pkg::T_Mode_Profile	
Profile_Mode	Level_And_Mode_Type s_Pkg::T_MA	
Train_Speed	Obu_BasicTypes_Pkg:: Speed_T	
Train_Position	TrainPosition_Types_Pc k::trainPosition_T	

Table 62: Outputs of Mode_Profile_Calculations

Name	Type	Comments and Information
Max_Safe_Front_In_Mode_Profile	bool	
Supervision_Condition_In_Mode_Profile	bool	
Awaited_Mode_Profile	bool	
Estimated_front_End_In_Ack_Area	bool	

3.4.1.2. Locals

Table 63: Locals of Mode_Profile_Calculations

Name	Type	Comments and Information
Condition_Loc	bool	
Condition_Ok	bool	
Estimated_Front_End	Obu_BasicTypes_Pkg:: Location_T	
Loc_MP_Distance	Obu_BasicTypes_Pkg:: Location_T	
Loc_MP_Length	Obu_BasicTypes_Pkg:: Location_T	
Loc_MP_Length_Ack	Obu_BasicTypes_Pkg:: Location_T	
Loc_MP_Mode	Level_And_Mode_Type s_Pkg::T_MA	
Loc_MP_Speed	Obu_BasicTypes_Pkg:: Speed_T	
Max_Safe_Front_End	Obu_BasicTypes_Pkg:: Location_T	
Valid_Train_Position	bool	

3.4.1.3. Operator Hierarchy

diagram : diagram_Operator7_1

activate if : IfBlock2

 branch : then

 branch : else

 branch : then

 branch : else

 branch : then

 branch : else

3.4.1.4. Graphical and Textual Diagrams

3.4.1.4.1. View of diagram_Operator7_1 (Mode_Profile_Calculations)

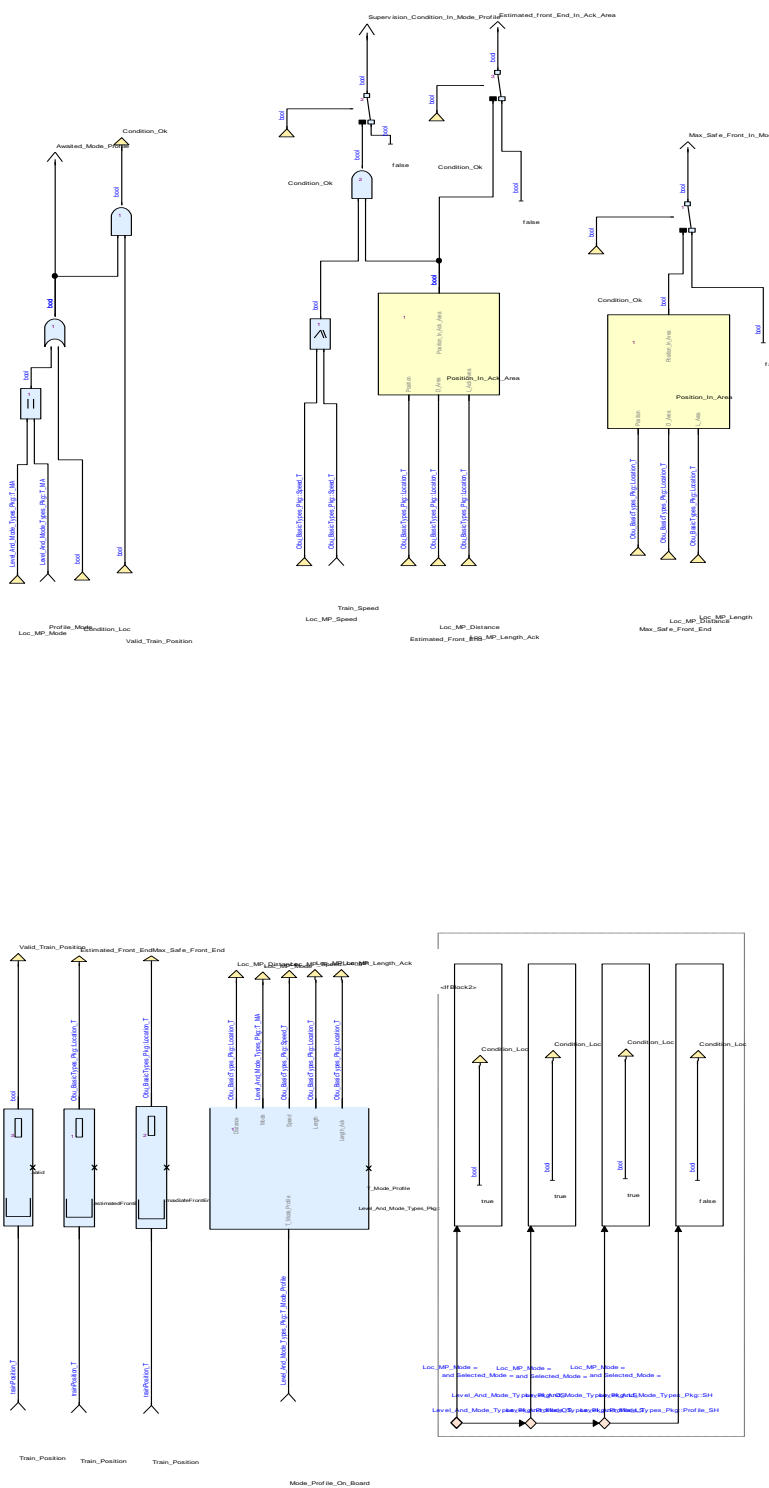


Figure 28: View of diagram_Operator7_1 (Mode_Profile_Calculations)

Table 64: Conditional Blocks of diagram_Operator7_1

Conditional Block	Comments and Information
IfBlock2	

Table 65: Actions of diagram_Operator7_1

Conditional Block Action	Comments and Information
IfBlock2:then	
IfBlock2:else:then	
IfBlock2:else:else:then	
IfBlock2:else:else:else	

3.4.2. Position_In_Ack_Area Operator

Declared as **public function**

3.4.2.1. Interface

Table 66: Inputs of Position_In_Ack_Area

Name	Type	Comments and Information
Position	Obu_BasicTypes_Pkg::Location_T	
D_Area	Obu_BasicTypes_Pkg::Location_T	
L_Ack_Area	Obu_BasicTypes_Pkg::Location_T	

Table 67: Outputs of Position_In_Ack_Area

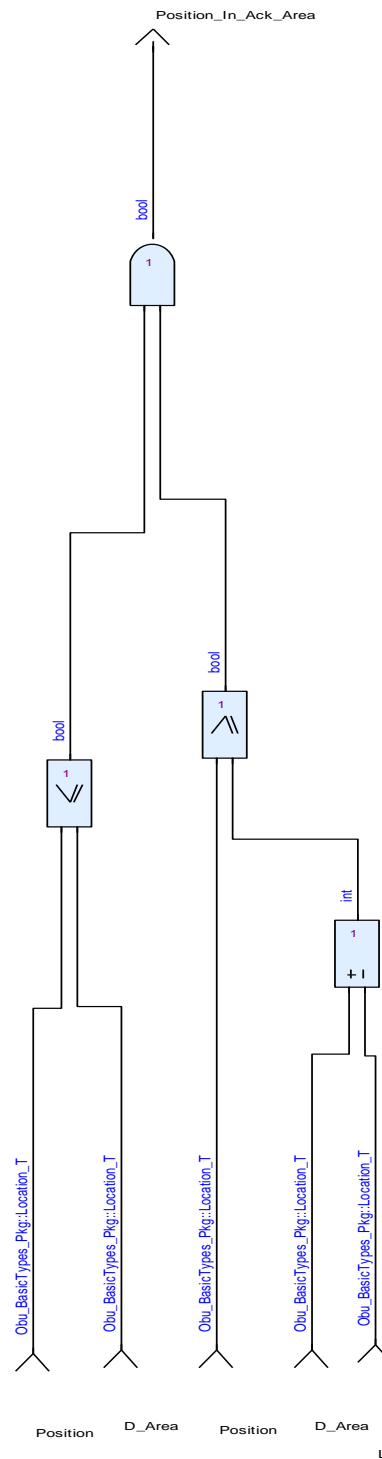
Name	Type	Comments and Information
Position_In_Ack_Area	bool	

3.4.2.2. Operator Hierarchy

diagram : diagram_Position_In_Ack_Area_1

3.4.2.3. Graphical and Textual Diagrams

3.4.2.3.1. View of diagram_Position_In_Ack_Area_1 (Position_In_Ack_Area)

**Figure 29: View of diagram_Position_In_Ack_Area_1 (Position_In_Ack_Area)**

3.4.3. Position_In_Area Operator

Declared as **public function**

3.4.3.1. Interface

Table 68: Inputs of Position_In_Area

Name	Type	Comments and Information
Position	Obu_BasicTypes_Pkg::Location_T	
D_Area	Obu_BasicTypes_Pkg::Location_T	
L_Area	Obu_BasicTypes_Pkg::Location_T	

Table 69: Outputs of Position_In_Area

Name	Type	Comments and Information
Position_In_Area	bool	

3.4.3.2. Operator Hierarchy

diagram : diagram_Position_In_Area_1

3.4.3.3. Graphical and Textual Diagrams

3.4.3.3.1. View of diagram_Position_In_Area_1 (Position_In_Area)

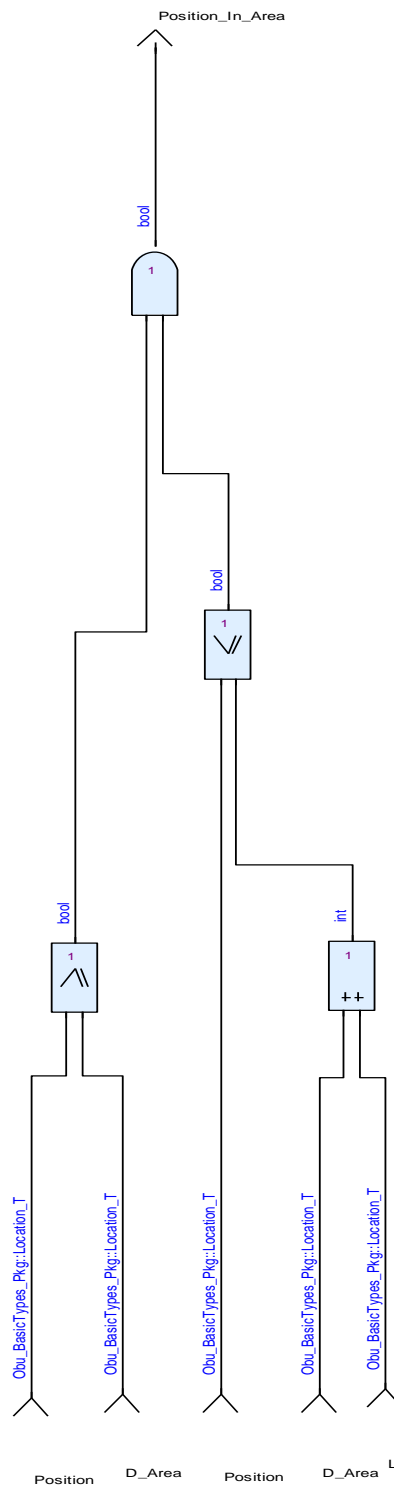


Figure 30: View of diagram_Position_In_Area_1 (Position_In_Area)

3.4.4. Reversing_Calculations Operator

Declared as **public function**

3.4.4.1. Interface

Table 70: Inputs of Reversing_Calculations

Name	Type	Comments and Information
Reversing_Data	Level_And_Mode_Type s_Pkg::T_Reversing_Data	
Train_Position	TrainPosition_Types_Pc k::trainPosition_T	

Table 71: Outputs of Reversing_Calculations

Name	Type	Comments and Information
Max_Safe_Front_In_Reverse_Area	bool	
RV_Data_Available	bool	

3.4.4.2. Locals

Table 72: Locals of Reversing_Calculations

Name	Type	Comments and Information
Loc_RV_Available	bool	
Loc_RV_Dist_Start	Obu_BasicTypes_Pkg::Location_T	
Loc_RV_Length	Obu_BasicTypes_Pkg::Location_T	
Max_Safe_Front_End	Obu_BasicTypes_Pkg::Location_T	
Valid_Train_Position	bool	

3.4.4.3. Operator Hierarchy

diagram : diagram_Operator7_1

3.4.4.4. Graphical and Textual Diagrams

3.4.4.4.1. View of diagram_Operator7_1 (Reversing_Calculations)

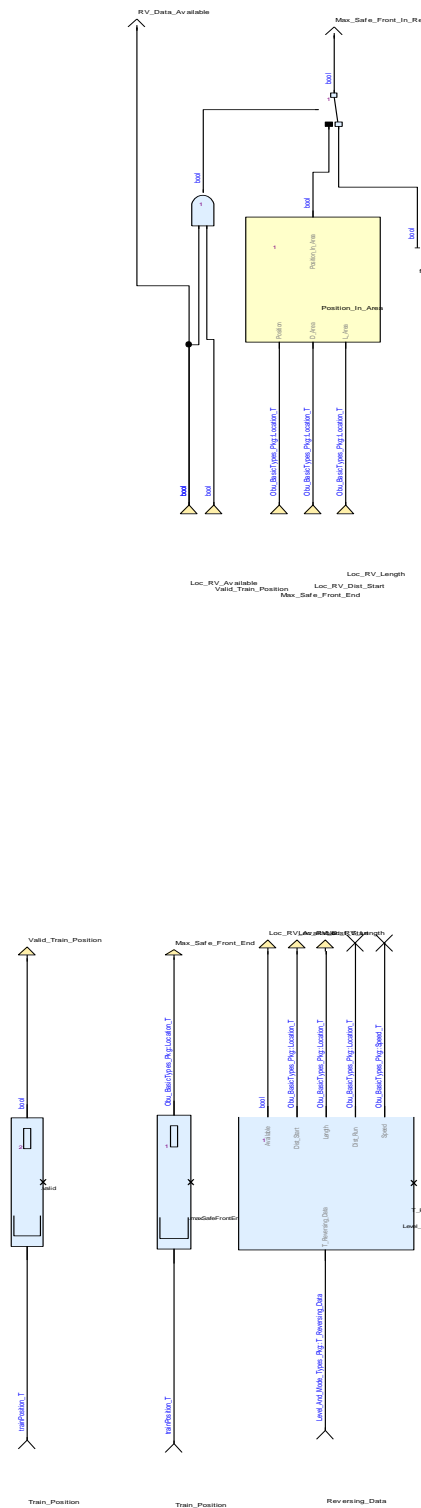


Figure 31: View of diagram_Operator7_1 (Reversing_Calculations)

3.5. PriorityManagement Package

3.5.1. From_FS Operator

Declared as **public function**

3.5.1.1. Interface

Table 73: Inputs of From_FS

Name	Type	Comments and Information
Condition1	bool	
Condition5	bool	
Condition6	bool	
Condition13	bool	
Condition15	bool	
Condition21	bool	
Condition28	bool	
Condition29	bool	
Condition37	bool	
Condition40	bool	
Condition46	bool	
Condition50	bool	
Condition51	bool	
Condition56	bool	
Condition59	bool	
Condition70	bool	
Condition72	bool	
ConditionFS2TR	bool	
previousMode_Loc	Level_And_Mode_Type s_Pkg::T_Mode	

Table 74: Outputs of From_FS

Name	Type	Comments and Information
FromFS_To_NewMode	Level_And_Mode_Type s_Pkg::T_Mode	

3.5.1.2. Locals

Table 75: Locals of From_FS

Name	Type	Comments and Information
Condition2LS	bool	
Condition2OS	bool	
Condition2SH	bool	

3.5.1.3. Operator Hierarchy

diagram : diagram_From_FS*activate if* : IfBlock1

branch : then

branch : else

branch : then

branch : else

branch : then

branch : else

branch : then

branch : else

branch : then

branch : else

branch : then

branch : else

branch : then

branch : else

branch : then

branch : else

branch : then

branch : else

branch : then

branch : else

branch :

then

else

branch : then

branch : else

branch : then

branch : else

3.5.1.4. Graphical and Textual Diagrams

3.5.1.4.1. View of diagram_From_FS (From_FS)

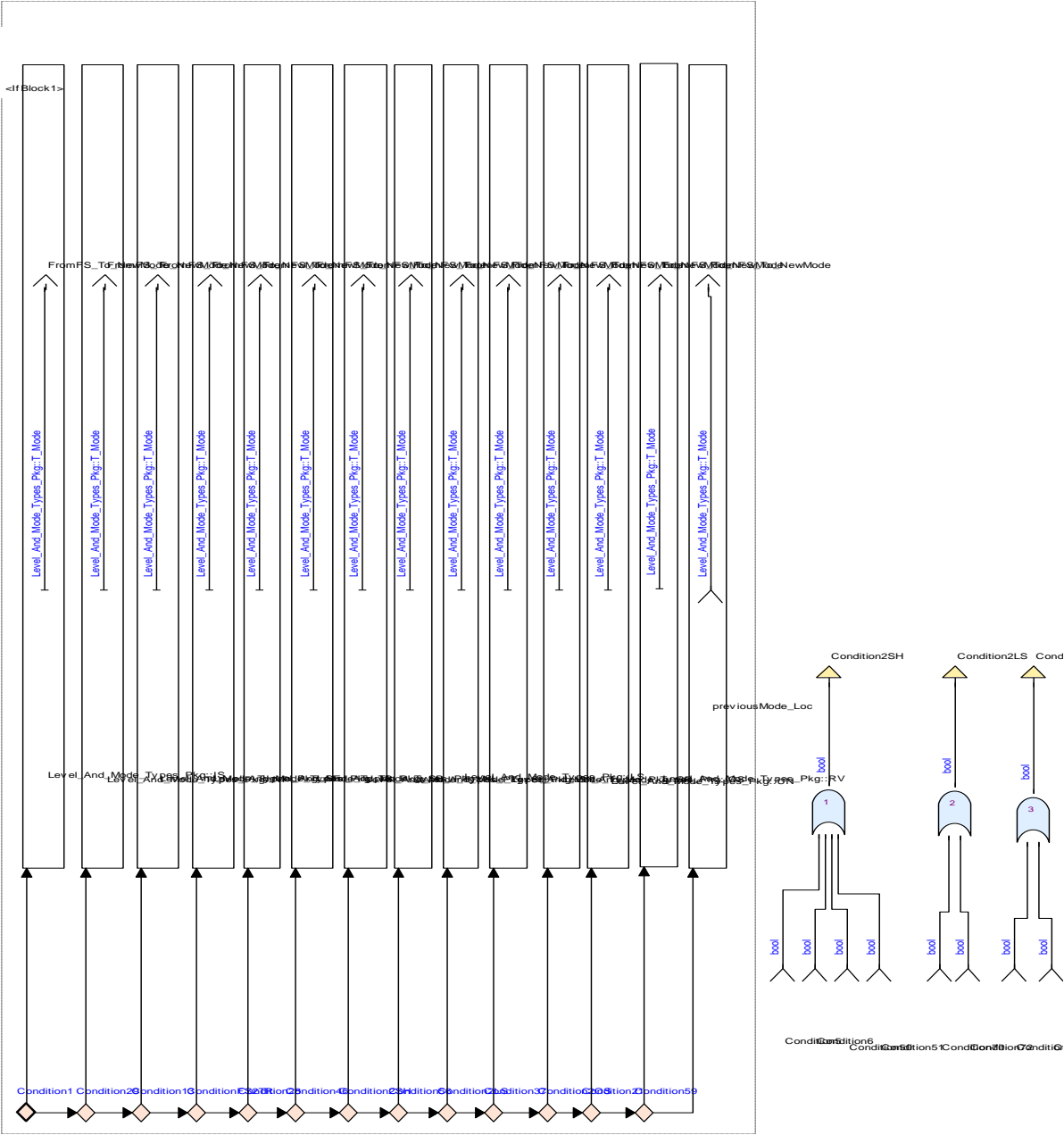


Figure 32: View of diagram_From_FS (From_FS)

Table 76: Conditional Blocks of diagram_From_FS

Conditional Block	Comments and Information
IfBlock1	

Table 77: Actions of diagram_From_FS

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

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

3.5.2. From_LS Operator

Declared as **public function**

3.5.2.1. Interface

Table 78: Inputs of From_LS

Name	Type	Comments and Information
Condition1	bool	
Condition5	bool	
Condition6	bool	
Condition13	bool	
Condition15	bool	
Condition21	bool	
Condition28	bool	
Condition29	bool	
Condition31	bool	
Condition32	bool	
Condition37	bool	
Condition46	bool	
Condition50	bool	
Condition51	bool	
Condition56	bool	
Condition59	bool	
Condition73	bool	
ConditionLS2TR	bool	

Name	Type	Comments and Information
previousMode_Loc	Level_And_Mode_Type s_Pkg::T_Mode	

Table 79: Outputs of From_LS

Name	Type	Comments and Information
FromLS_To_NewMode	Level_And_Mode_Type s_Pkg::T_Mode	

3.5.2.2. Locals

Table 80: Locals of From_LS

Name	Type	Comments and Information
Condition2FS	bool	
Condition2OS	bool	
Condition2SH	bool	

3.5.2.3. Operator Hierarchy

diagram : diagram_From_LS

activate if : IfBlock1

 branch : then

 branch : else

 branch : then

 branch : else

 branch : then

 branch : else

 branch : then

 branch : else

 branch : then

 branch : else

 branch : then

 branch : else

 branch : then

 branch : else

 branch : then

 branch : else

 branch : then

 branch : else

 branch : then

 branch : else

 branch :

then

branch :

else

branch : then

branch : else

branch : then

branch : else

3.5.2.4. Graphical and Textual Diagrams

3.5.2.4.1. View of diagram_From_LS (From_LS)

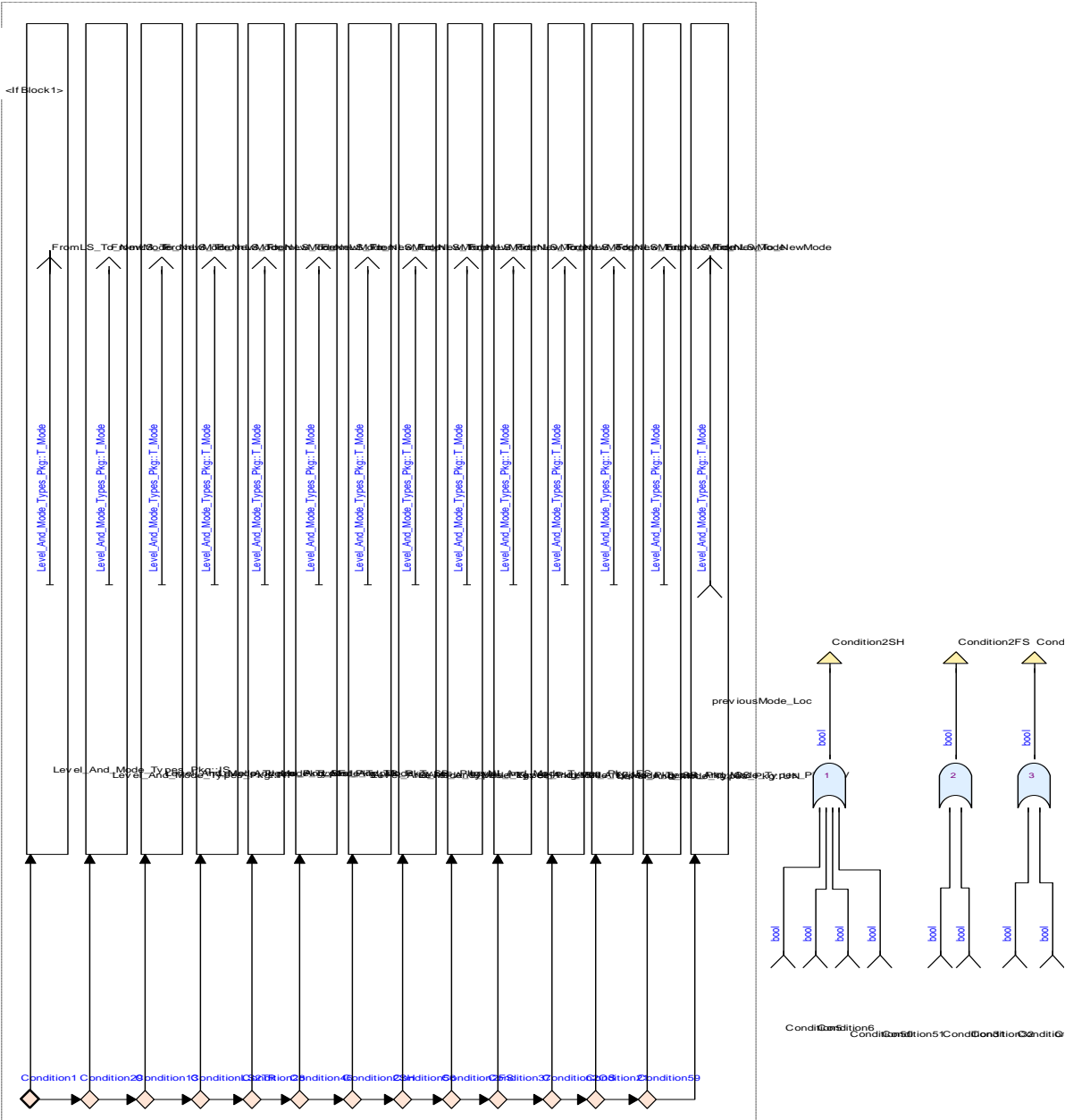


Figure 33: View of diagram_From_LS (From_LS)

Table 81: Conditional Blocks of diagram_From_LS

Conditional Block	Comments and Information
IfBlock1	

Table 82: Actions of diagram_From_LS

Conditional Block Action	Comments and Information
IfBlock1:then	

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

3.5.3. From_NL Operator

Declared as **public function**

3.5.3.1. Interface

Table 83: Inputs of From_NL

Name	Type	Comments and Information
Condition1	bool	
Condition28	bool	
Condition29	bool	
Condition47	bool	
previousMode_Loc	Level_And_Mode_Type s_Pkg::T_Mode	

Table 84: Outputs of From_NL

Name	Type	Comments and Information
FromNL_To_NewMode	Level_And_Mode_Type s_Pkg::T_Mode	

3.5.3.2. Operator Hierarchy

diagram : diagram_From_NL

activate if : IfBlock1

 branch : then

 branch : else

 branch : then

```
branch : else  
    branch : then  
    branch : else
```

3.5.3.3. Graphical and Textual Diagrams

3.5.3.3.1. View of diagram_From_NL (From_NL)

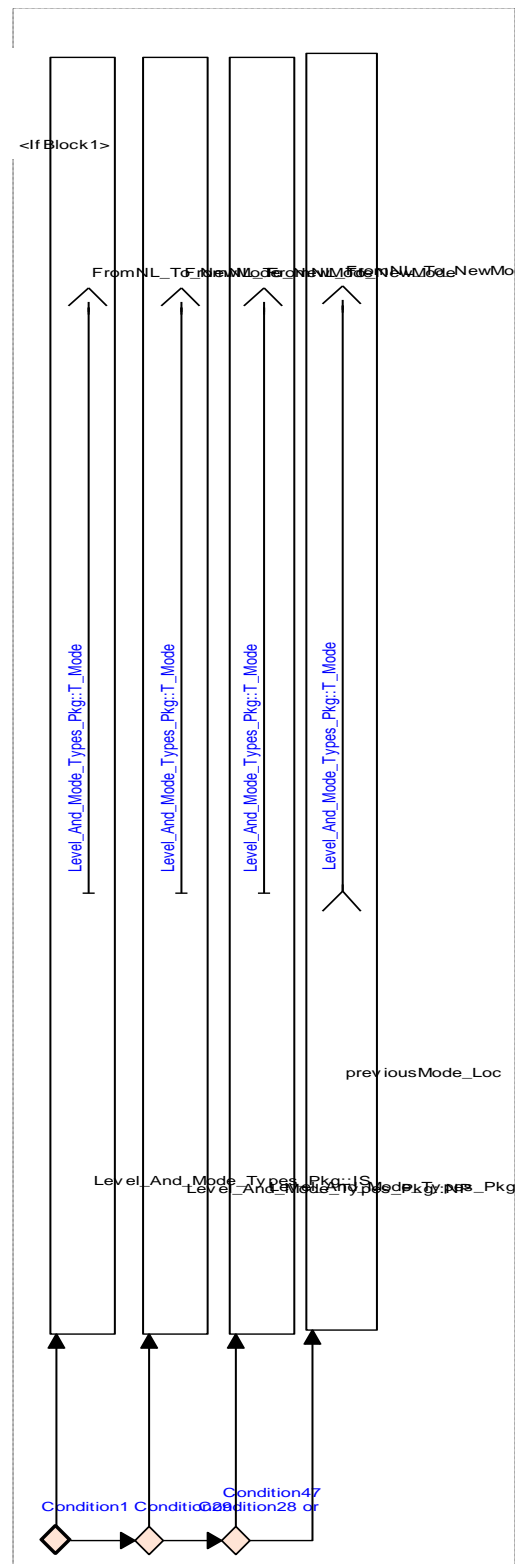


Figure 34: View of diagram_From_NL (From_NL)

Table 85: Conditional Blocks of diagram_From_NL

Conditional Block	Comments and Information
IfBlock1	

Table 86: Actions of diagram_From_NL

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

3.5.4. From_NP Operator

Declared as **public function**

3.5.4.1. Interface

Table 87: Inputs of From_NP

Name	Type	Comments and Information
Condition1	bool	
Condition4	bool	
previousMode_Loc	Level_And_Mode_Type s_Pkg::T_Mode	

Table 88: Outputs of From_NP

Name	Type	Comments and Information
FromNP_To_NewMode	Level_And_Mode_Type s_Pkg::T_Mode	

3.5.4.2. Operator Hierarchy

diagram : diagram_From_NP

activate if : IfBlock1

 branch : then

 branch : else

 branch : then

 branch : else

3.5.4.3. Graphical and Textual Diagrams

3.5.4.3.1. View of diagram_From_NP (From_NP)

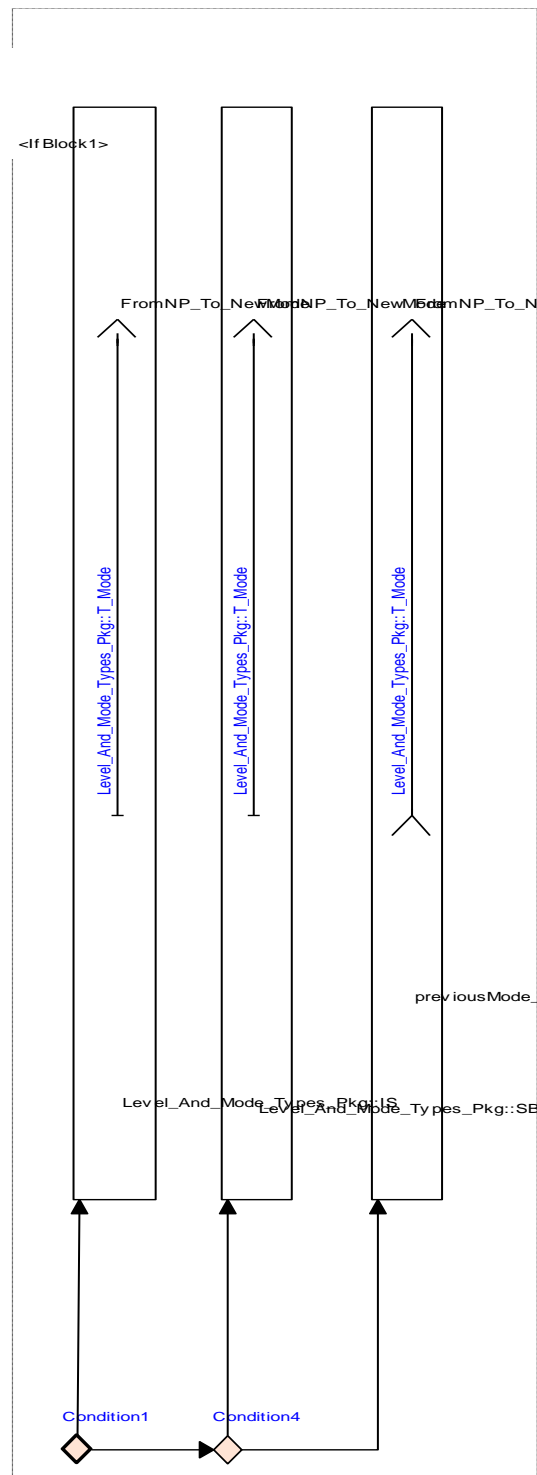


Figure 35: View of diagram_From_NP (From_NP)

Table 89: Conditional Blocks of diagram_From_NP

Conditional Block	Comments and Information
IfBlock1	

Table 90: Actions of diagram_From_NP

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

3.5.5. From_OS Operator

Declared as **public function**

3.5.5.1. Interface

Table 91: Inputs of From_OS

Name	Type	Comments and Information
Condition1	bool	
Condition5	bool	
Condition6	bool	
Condition13	bool	
Condition21	bool	
Condition28	bool	
Condition29	bool	
Condition31	bool	
Condition32	bool	
Condition37	bool	
Condition46	bool	
Condition50	bool	
Condition51	bool	
Condition56	bool	
Condition59	bool	
Condition70	bool	
Condition74	bool	
ConditionOS2TR	bool	
previousMode_Loc	Level_And_Mode_Type s_Pkg::T_Mode	

Table 92: Outputs of From_OS

Name	Type	Comments and Information
FromOS_To_NewMode	Level_And_Mode_Type s_Pkg::T_Mode	

3.5.5.2. Locals

Table 93: Locals of From_OS

Name	Type	Comments and Information
Condition2FS	bool	

Name	Type	Comments and Information
Condition2LS	bool	
Condition2SH	bool	

3.5.5.3. Operator Hierarchy

diagram : diagram_From_OS

activate if : IfBlock1

 branch : then

 branch : else

 branch : then

 branch : else

 branch : then

 branch : else

 branch : then

 branch : else

 branch : then

 branch : else

 branch : then

 branch : else

 branch : then

 branch : else

 branch : then

 branch : else

 branch : then

 branch : else

 branch : then

 branch : else

 branch :

then

branch :

else

branch : then

branch : else

branch : then

branch : else

3.5.5.4. Graphical and Textual Diagrams

3.5.5.4.1. View of diagram_From_OS (From_OS)

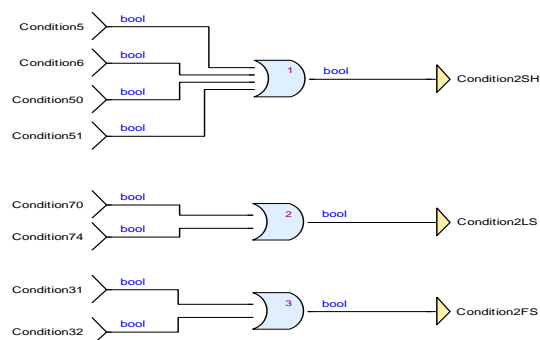
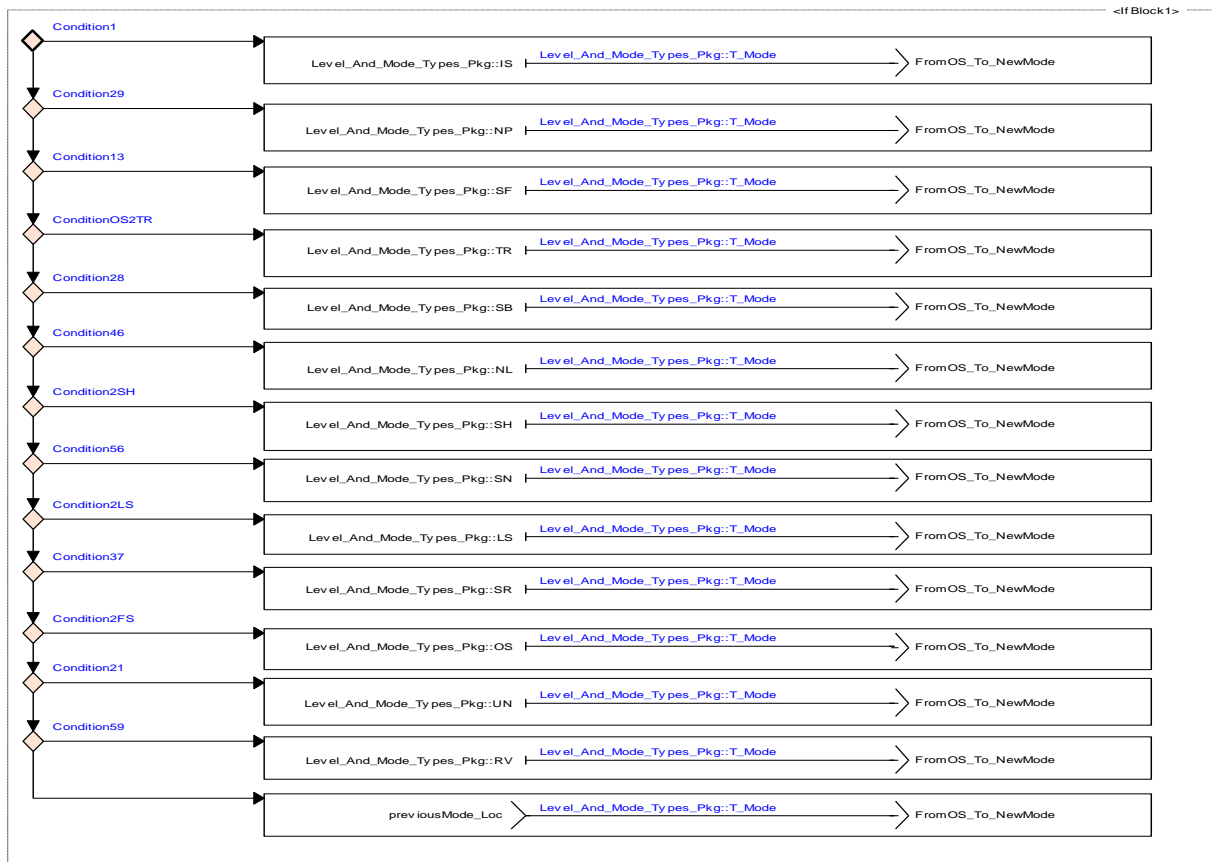


Figure 36: View of diagram_From_OS (From_OS)

Table 94: Conditional Blocks of diagram_From_OS

Conditional Block	Comments and Information
IfBlock1	

Table 95: Actions of diagram_From_OS

Conditional Block Action	Comments and Information
IfBlock1:then	

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

3.5.6. From_PS Operator

Declared as **public function**

3.5.6.1. Interface

Table 96: Inputs of From_PS

Name	Type	Comments and Information
Condition1	bool	
Condition13	bool	
Condition14	bool	
Condition22	bool	
Condition23	bool	
Condition29	bool	
previousMode_Loc	Level_And_Mode_Type s_Pkg::T_Mode	

Table 97: Outputs of From_PS

Name	Type	Comments and Information
FromPS_To_NewMode	Level_And_Mode_Type s_Pkg::T_Mode	

3.5.6.2. Operator Hierarchy

diagram : diagram_From_PS

activate if : IfBlock1

 branch : then

```
branch : else
  branch : then
  branch : else
    branch : then
    branch : else
      branch : then
      branch : else
        branch : then
        branch : else
```

3.5.6.3. Graphical and Textual Diagrams

3.5.6.3.1. View of diagram_From_PS (From_PS)

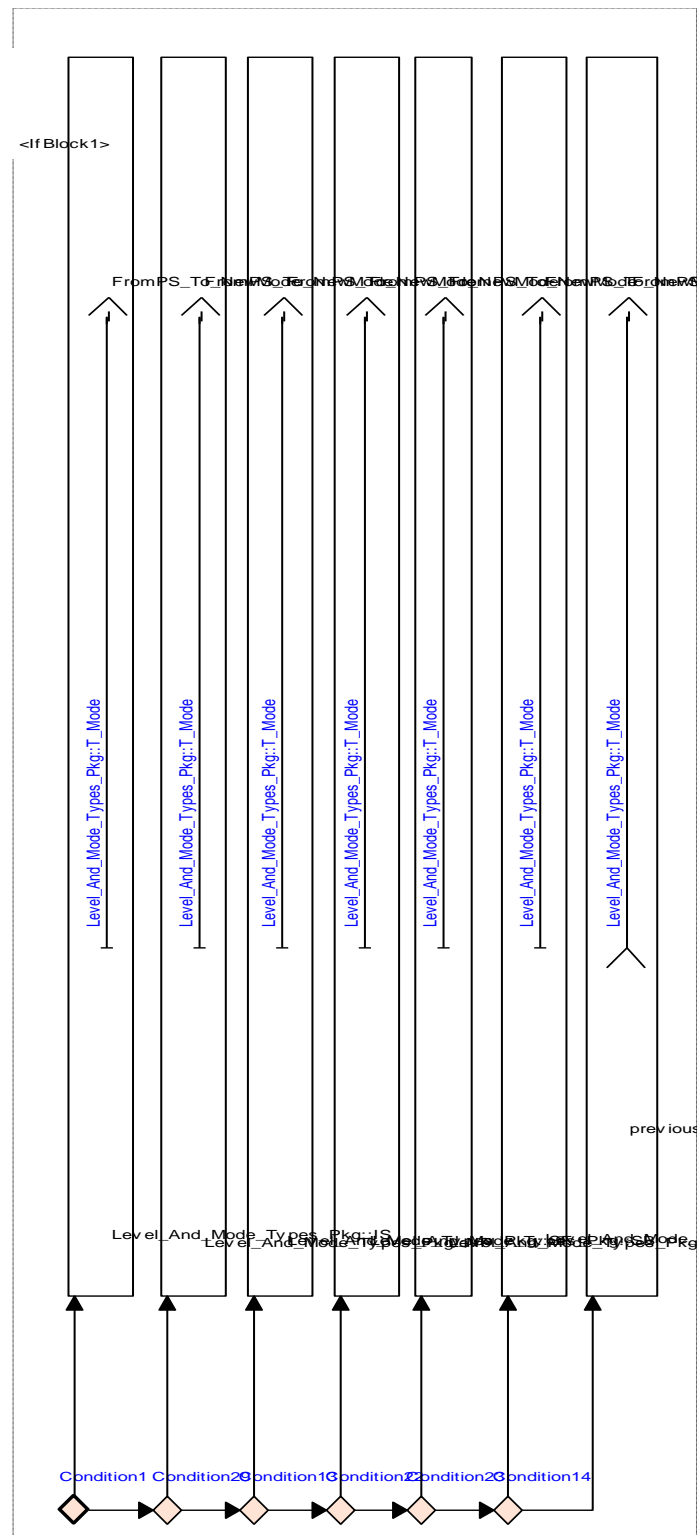


Figure 37: View of diagram_From_PS (From_PS)

Table 98: Conditional Blocks of diagram_From_PS

Conditional Block	Comments and Information
IfBlock1	

Table 99: Actions of diagram_From_PS

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

3.5.7. From_PT Operator

Declared as **public function**

3.5.7.1. Comments and Information

From_PT Comments:

§4.4.14.1.4 covered here.

3.5.7.2. Interface

Table 100: Inputs of From_PT

Name	Type	Comments and Information
Condition1	bool	
Condition5	bool	
Condition6	bool	
Condition8	bool	
Condition13	bool	
Condition15	bool	
Condition28	bool	
Condition29	bool	
Condition31	bool	
Condition37	bool	
Condition50	bool	
Condition70	bool	
previousMode_Loc	Level_And_Mode_Type s_Pkg::T_Mode	

Table 101: Outputs of From_PT

Name	Type	Comments and Information
FromPT_To_NewMode	Level_And_Mode_Type s_Pkg::T_Mode	

3.5.7.3. Locals

Table 102: Locals of From_PT

Name	Type	Comments and Information
Condition2SH	bool	
Condition2SR	bool	

3.5.7.4. Operator Hierarchy

diagram : diagram_From_PT

activate if : IfBlock1

 branch : then

 branch : else

 branch : then

 branch : else

 branch : then

 branch : else

 branch : then

 branch : else

 branch : then

 branch : else

 branch : then

 branch : else

 branch : then

 branch : else

 branch : then

 branch : else

 branch : then

 branch : else

3.5.7.5. Graphical and Textual Diagrams

3.5.7.5.1. View of diagram_From_PT (From_PT)

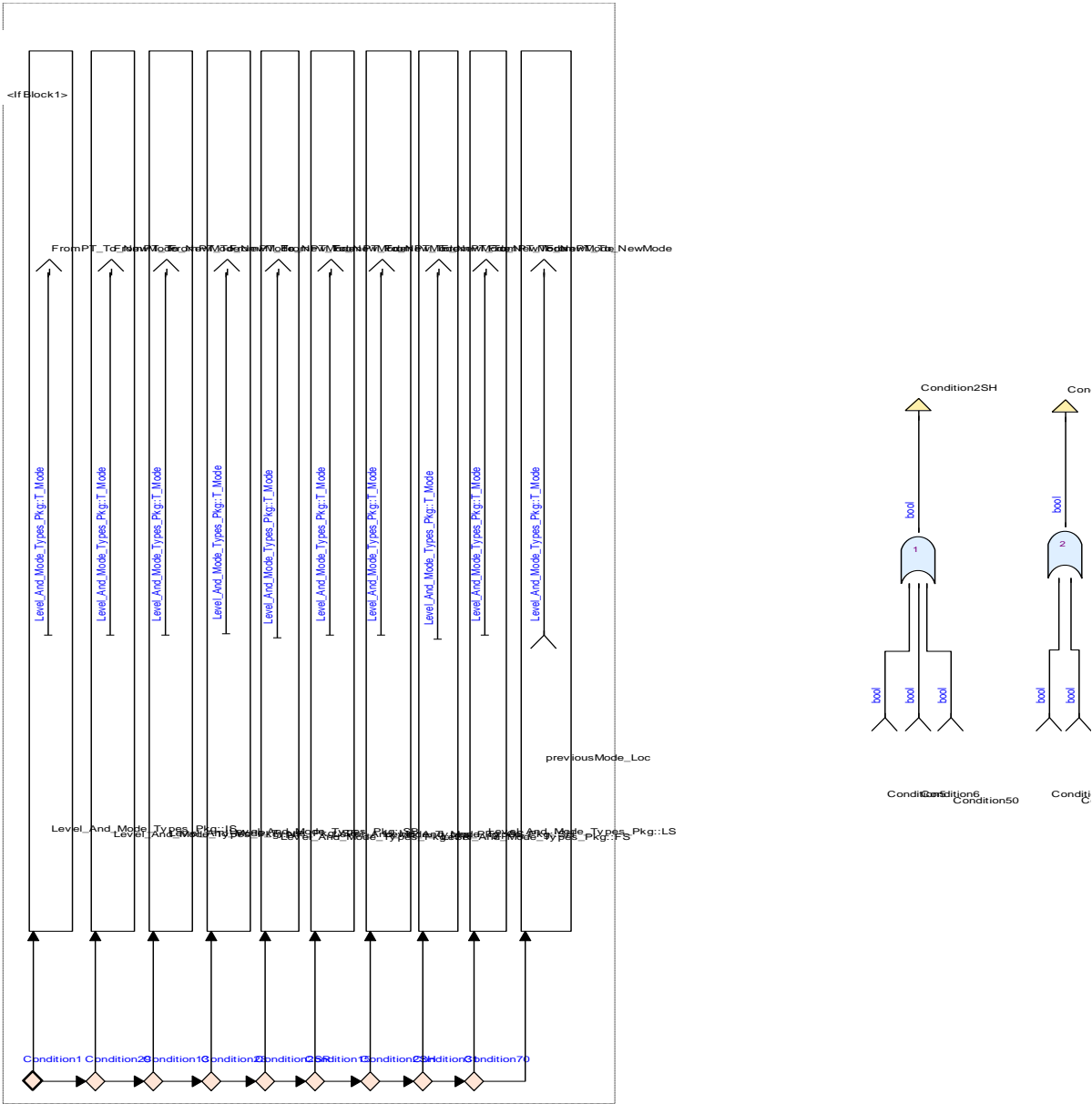


Figure 38: View of diagram_From_PT (From_PT)

Table 103: Conditional Blocks of diagram_From_PT

Conditional Block	Comments and Information
IfBlock1	

Table 104: Actions of diagram_From_PT

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

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

3.5.8. From_RV Operator

Declared as **public function**

3.5.8.1. Interface

Table 105: Inputs of From_RV

Name	Type	Comments and Information
Condition1	bool	
Condition13	bool	
Condition28	bool	
Condition29	bool	
previousMode_Loc	Level_And_Mode_Type s_Pkg::T_Mode	

Table 106: Outputs of From_RV

Name	Type	Comments and Information
FromRV_To_NewMode	Level_And_Mode_Type s_Pkg::T_Mode	

3.5.8.2. Operator Hierarchy

diagram : diagram_From_RV

```

    activate if : IfBlock1
      branch : then
      branch : else
        branch : then
        branch : else
          branch : then
          branch : else
            branch : then
            branch : else

```

3.5.8.3. Graphical and Textual Diagrams

3.5.8.3.1. View of diagram_From_RV (From_RV)

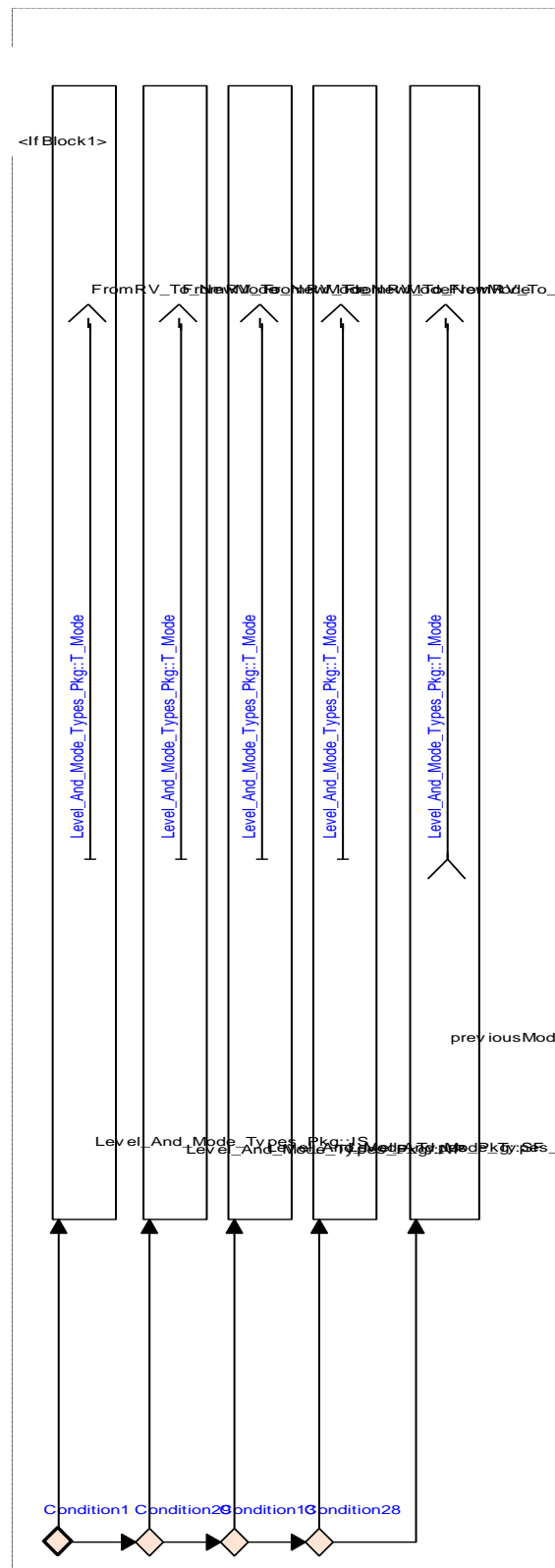


Figure 39: View of diagram_From_RV (From_RV)

Table 107: Conditional Blocks of diagram_From_RV

Conditional Block	Comments and Information
IfBlock1	

Table 108: Actions of diagram_From_RV

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

3.5.9. From_SB Operator

Declared as **public function**

3.5.9.1. Interface

Table 109: Inputs of From_SB

Name	Type	Comments and Information
Condition1	bool	
Condition5	bool	
Condition6	bool	
Condition8	bool	
Condition10	bool	
Condition13	bool	
Condition14	bool	
Condition15	bool	
Condition29	bool	
Condition37	bool	
Condition46	bool	
Condition50	bool	
Condition58	bool	
Condition60	bool	
Condition70	bool	
ConditionSB2TR	bool	
previousMode_Loc	Level_And_Mode_Type s_Pkg::T_Mode	

Table 110: Outputs of From_SB

Name	Type	Comments and Information
FromSB_To_NewMode	Level_And_Mode_Type s_Pkg::T_Mode	

3.5.9.2. Locals

Table 111: Locals of From_SB

Name	Type	Comments and Information
Condition2SH	bool	
Condition2SR	bool	

3.5.9.3. Operator Hierarchy

diagram : diagram_From_SB

activate if : IfBlock1

 branch : then

 branch : else

 branch : then

 branch : else

 branch : then

 branch : else

 branch : then

 branch : else

 branch : then

 branch : else

 branch : then

 branch : else

 branch : then

 branch : else

 branch : then

 branch : else

 branch : then

 branch : else

 branch : then

 branch : else

 branch :

then

branch :

else

branch : then

branch : else

branch : then

branch : else

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

3.5.10. From_SF Operator

Declared as **public function**

3.5.10.1. Interface

Table 114: Inputs of From_SF

Name	Type	Comments and Information
Condition1	bool	
Condition29	bool	
previousMode_Loc	Level_And_Mode_Type s_Pkg::T_Mode	

Table 115: Outputs of From_SF

Name	Type	Comments and Information
FromSF_To_NewMode	Level_And_Mode_Type s_Pkg::T_Mode	

3.5.10.2. Operator Hierarchy

diagram : diagram_From_SF

```

activate if : IfBlock1
  branch : then
  branch : else
    branch : then
    branch : else

```

3.5.10.3. Graphical and Textual Diagrams

3.5.10.3.1. View of diagram_From_SF (From_SF)

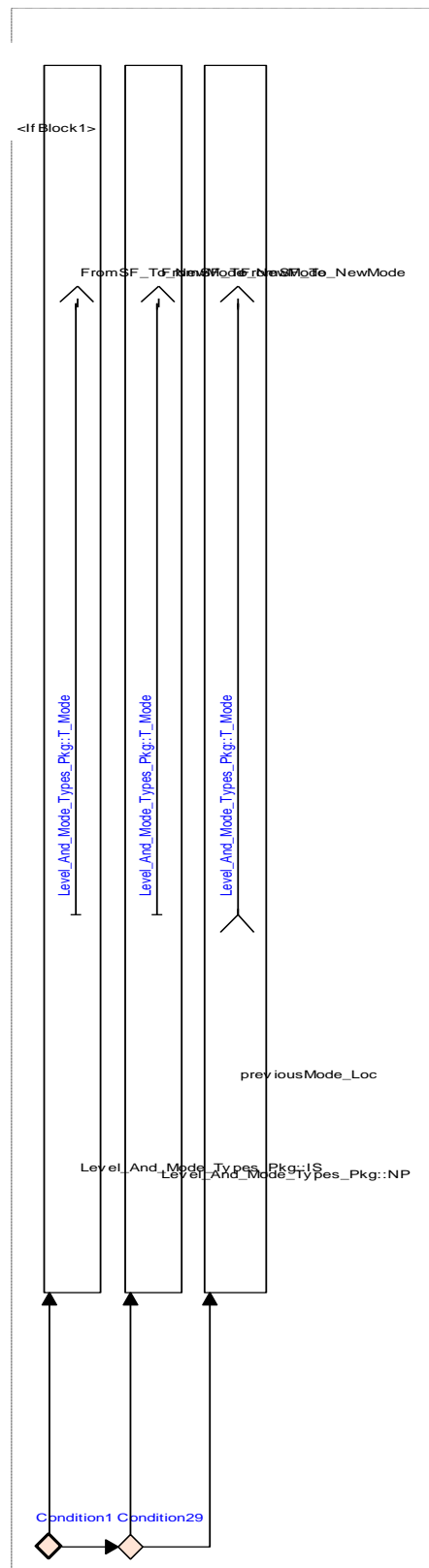


Figure 41: View of diagram_From_SF (From_SF)

Table 116: Conditional Blocks of diagram_From_SF

Conditional Block	Comments and Information
IfBlock1	

Table 117: Actions of diagram_From_SF

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

3.5.11. From_SH Operator

Declared as **public function**

3.5.11.1. Interface

Table 118: Inputs of From_SH

Name	Type	Comments and Information
Condition1	bool	
Condition13	bool	
Condition19	bool	
Condition26	bool	
Condition27	bool	
Condition29	bool	
Condition30	bool	
Condition46	bool	
ConditionSH2TR	bool	
previousMode_Loc	Level_And_Mode_Type s_Pkg::T_Mode	

Table 119: Outputs of From_SH

Name	Type	Comments and Information
FromSH_To_NewMode	Level_And_Mode_Type s_Pkg::T_Mode	

3.5.11.2. Locals

Table 120: Locals of From_SH

Name	Type	Comments and Information
Condition2SB	bool	

3.5.11.3. Operator Hierarchy

diagram : diagram_From_SH

activate if : IfBlock1

 branch : then

 branch : else

```
branch : then
branch : else
  branch : then
  branch : else
    branch : then
    branch : else
      branch : then
      branch : else
        branch : then
        branch : else
```

3.5.11.4. Graphical and Textual Diagrams

3.5.11.4.1. View of diagram_From_SH (From_SH)

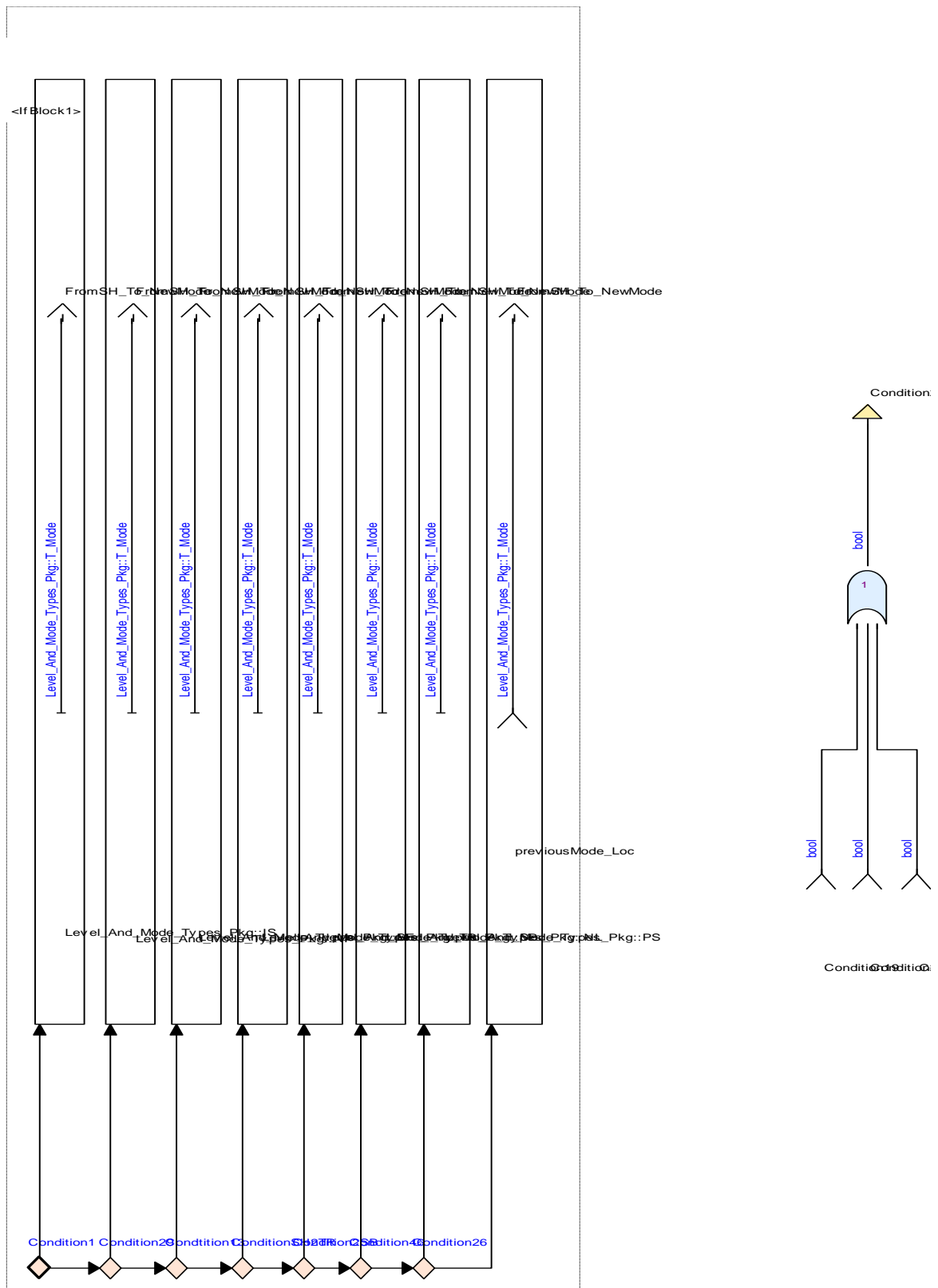


Figure 42: View of diagram_From_SH (From_SH)

Table 121: Conditional Blocks of diagram_From_SH

Conditional Block	Comments and Information
IfBlock1	

Table 122: Actions of diagram_From_SH

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

3.5.12. From_SL Operator

Declared as **public function**

3.5.12.1. Interface

Table 123: Inputs of From_SL

Name	Type	Comments and Information
Condition1	bool	
Condition3	bool	
Condition2	bool	
Condition29	bool	
previousMode_Loc	Level_And_Mode_Type s_Pkg::T_Mode	

Table 124: Outputs of From_SL

Name	Type	Comments and Information
FromSL_To_NewMode	Level_And_Mode_Type s_Pkg::T_Mode	

3.5.12.2. Operator Hierarchy

diagram : diagram_From_SL

activate if : IfBlock1

 branch : then

 branch : else

 branch : then

 branch : else

 branch : then

 branch : else

 branch : then

 branch : else

3.5.12.3. Graphical and Textual Diagrams

3.5.12.3.1. View of diagram_From_SL (From_SL)

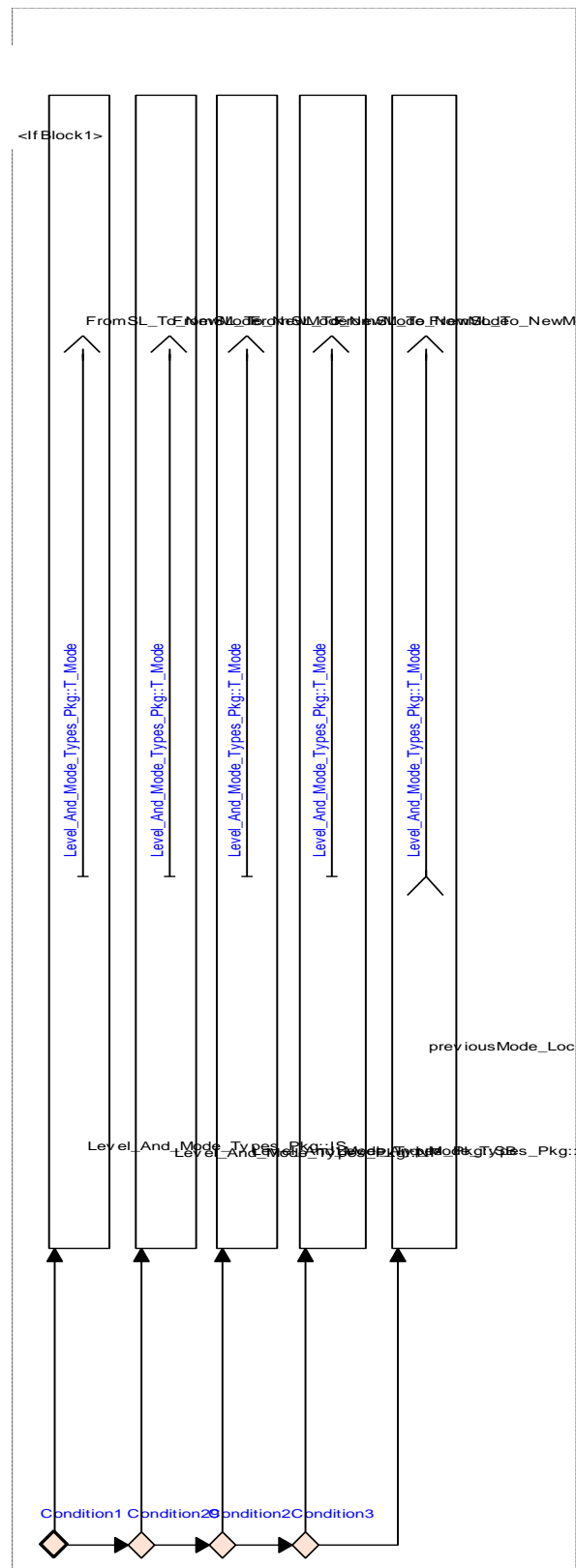


Figure 43: View of diagram_From_SL (From_SL)

Table 125: Conditional Blocks of diagram_From_SL

Conditional Block	Comments and Information
IfBlock1	

Table 126: Actions of diagram_From_SL

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

3.5.13. From_SN Operator

Declared as **public function**

3.5.13.1. Interface

Table 127: Inputs of From_SN

Name	Type	Comments and Information
Condition1	bool	
Condition5	bool	
Condition13	bool	
Condition21	bool	
Condition25	bool	
Condition28	bool	
Condition29	bool	
Condition34	bool	
Condition44	bool	
Condition45	bool	
Condition61	bool	
Condition71	bool	
ConditionSN2TR	bool	
previousMode_Loc	Level_And_Mode_Type s_Pkg::T_Mode	

Table 128: Outputs of From_SN

Name	Type	Comments and Information
FromSN_To_NewMode	Level_And_Mode_Type s_Pkg::T_Mode	

3.5.13.2. Locals

Table 129: Locals of From_SN

Name	Type	Comments and Information
Condition2SH	bool	
Condition2SR	bool	

3.5.13.3. Operator Hierarchy

diagram : diagram_From_SN

activate if : IfBlock1

 branch : then

 branch : else

 branch : then

 branch : else

 branch : then

 branch : else

 branch : then

 branch : else

 branch : then

 branch : else

 branch : then

 branch : else

 branch : then

 branch : else

 branch : then

 branch : else

 branch : then

 branch : else

 branch : then

 branch : else

 branch :

then

branch :

else

3.5.13.4. Graphical and Textual Diagrams

3.5.13.4.1. View of diagram_From_SN (From_SN)

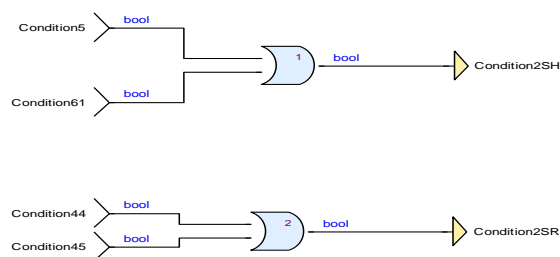


Figure 44: View of diagram_From_SN (From_SN)

Table 130: Conditional Blocks of diagram_From_SN

Conditional Block	Comments and Information
IfBlock1	

Table 131: Actions of diagram_From_SN

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

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

3.5.14. From_SR Operator

Declared as **public function**

3.5.14.1. Interface

Table 132: Inputs of From_SR

Name	Type	Comments and Information
Condition1	bool	
Condition5	bool	
Condition6	bool	
Condition13	bool	
Condition21	bool	
Condition28	bool	
Condition29	bool	
Condition31	bool	
Condition32	bool	
Condition40	bool	
Condition46	bool	
Condition51	bool	
Condition56	bool	
Condition59	bool	
Condition72	bool	
ConditionSR2TR	bool	
previousMode_Loc	Level_And_Mode_Type s_Pkg::T_Mode	

Table 133: Outputs of From_SR

Name	Type	Comments and Information
FromSR_To_NewMode	Level_And_Mode_Type s_Pkg::T_Mode	

3.5.14.2. Locals

Table 134: Locals of From_SR

Name	Type	Comments and Information
Condition2FS	bool	
Condition2SH	bool	

3.5.14.3. Operator Hierarchy

diagram : diagram_From_SR

activate if : IfBlock1

 branch : then

 branch : else

 branch : then

 branch : else

 branch : then

 branch : else

 branch : then

 branch : else

 branch : then

 branch : else

 branch : then

 branch : else

 branch : then

 branch : else

 branch : then

 branch : else

 branch : then

 branch : else

 branch : then

 branch : else

 branch :

then

branch :

else

branch : then

branch : else

branch : then

branch : else

3.5.14.4. Graphical and Textual Diagrams

3.5.14.4.1. View of diagram_From_SR (From_SR)

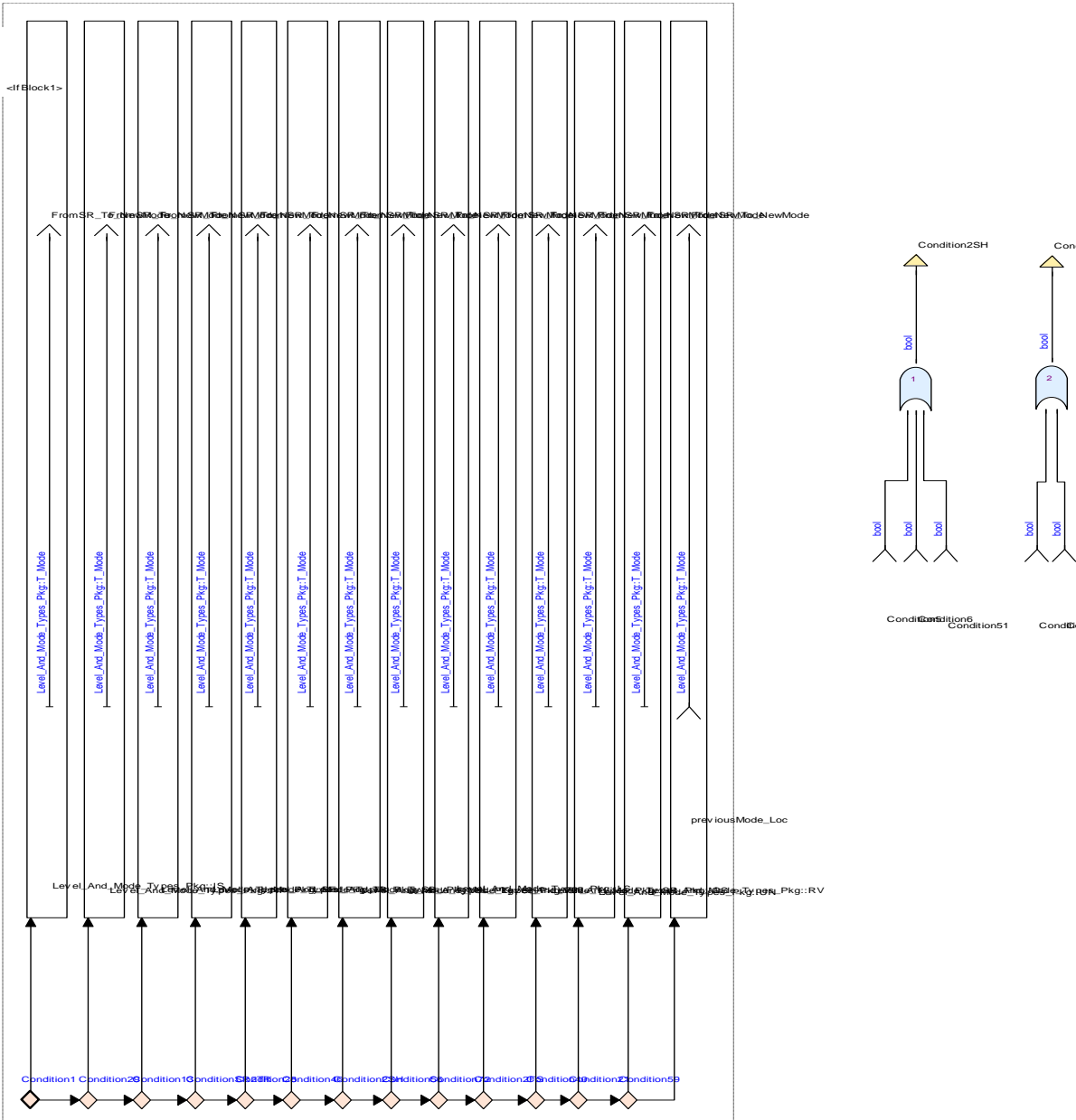


Figure 45: View of diagram_From_SR (From_SR)

Table 135: Conditional Blocks of diagram_From_SR

Conditional Block	Comments and Information
IfBlock1	

Table 136: Actions of diagram_From_SR

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

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

3.5.15. From_TR Operator

Declared as **public function**

3.5.15.1. Interface

Table 137: Inputs of From_TR

Name	Type	Comments and Information
Condition1	bool	
Condition7	bool	
Condition13	bool	
Condition29	bool	
Condition62	bool	
Condition63	bool	
Condition68	bool	
previousMode_Loc	Level_And_Mode_Type s_Pkg::T_Mode	

Table 138: Outputs of From_TR

Name	Type	Comments and Information
FromTR_To_NewMode	Level_And_Mode_Type s_Pkg::T_Mode	

3.5.15.2. Operator Hierarchy

diagram : diagram_From_TR

activate if : IfBlock1

 branch : then

 branch : else

 branch : then

```
branch : else
  branch : then
  branch : else
    branch : then
    branch : else
      branch : then
      branch : else
        branch : then
        branch : else
```

3.5.15.3. Graphical and Textual Diagrams

3.5.15.3.1. View of diagram_From_TR (From_TR)

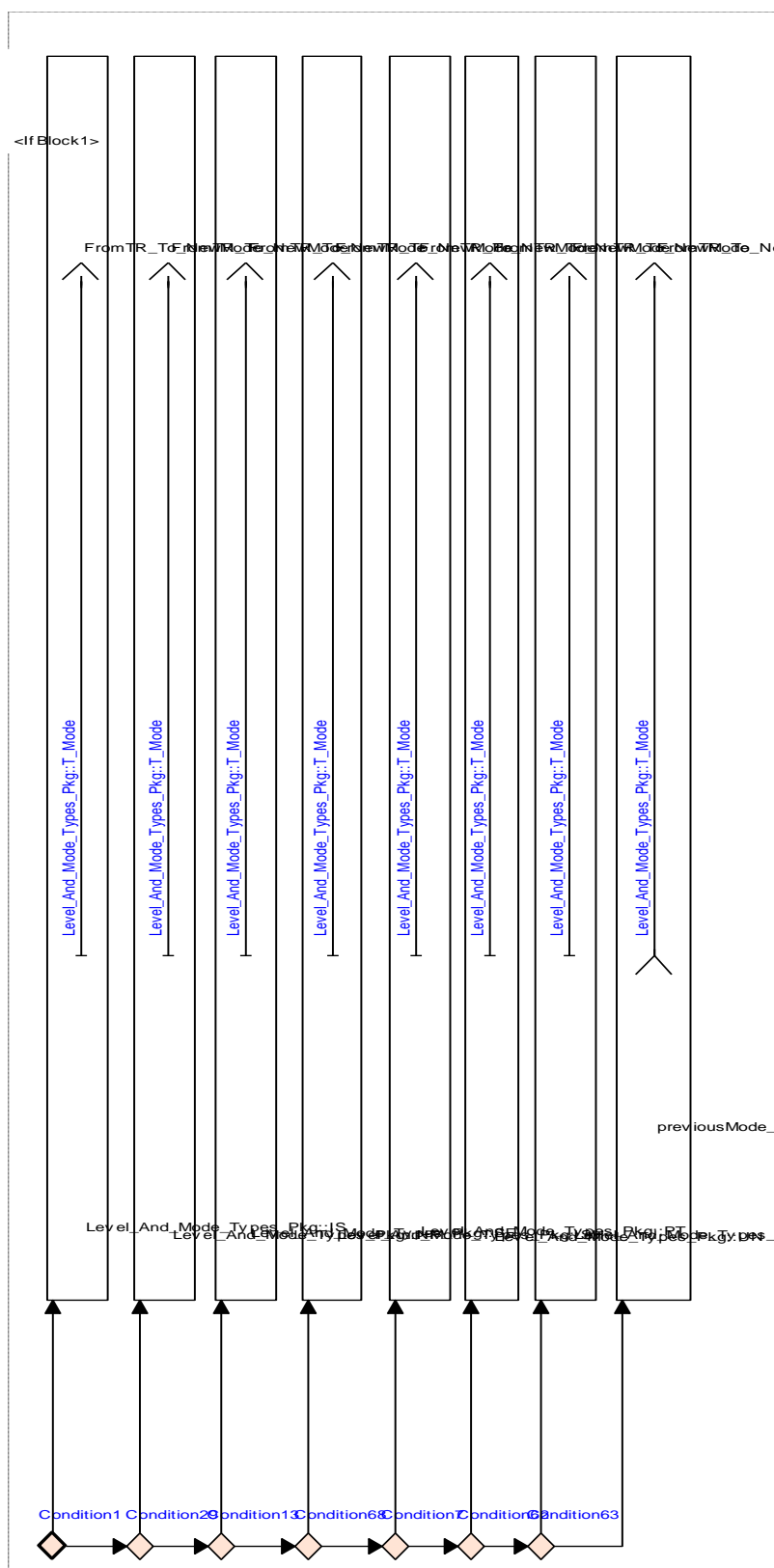


Figure 46: View of diagram_From_TR (From_TR)

Table 139: Conditional Blocks of diagram_From_TR

Conditional Block	Comments and Information
IfBlock1	

Table 140: Actions of diagram_From_TR

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

3.5.16. From_UN Operator

Declared as **public function**

3.5.16.1. Interface

Table 141: Inputs of From_UN

Name	Type	Comments and Information
Condition1	bool	
Condition5	bool	
Condition13	bool	
Condition25	bool	
Condition28	bool	
Condition29	bool	
Condition34	bool	
Condition44	bool	
Condition45	bool	
Condition56	bool	
Condition61	bool	
Condition71	bool	
ConditionUN2TR	bool	
previousMode_Loc	Level_And_Mode_Type s_Pkg::T_Mode	

Table 142: Outputs of From_UN

Name	Type	Comments and Information
FromUN_To_NewMode	Level_And_Mode_Type s_Pkg::T_Mode	

3.5.16.2. Locals

Table 143: Locals of From_UN

Name	Type	Comments and Information
Condition2SH	bool	
Condition2SR	bool	

3.5.16.3. Operator Hierarchy

diagram : diagram_From_UN

activate if : IfBlock1

 branch : then

 branch : else

 branch : then

 branch : else

 branch : then

 branch : else

 branch : then

 branch : else

 branch : then

 branch : else

 branch : then

 branch : else

 branch : then

 branch : else

 branch : then

 branch : else

 branch : then

 branch : else

 branch : then

 branch : else

 branch :

then

branch :

else

3.5.16.4. Graphical and Textual Diagrams

3.5.16.4.1. View of diagram_From_UN (From_UN)

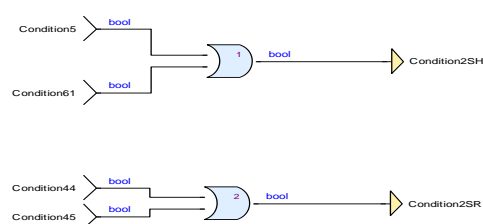
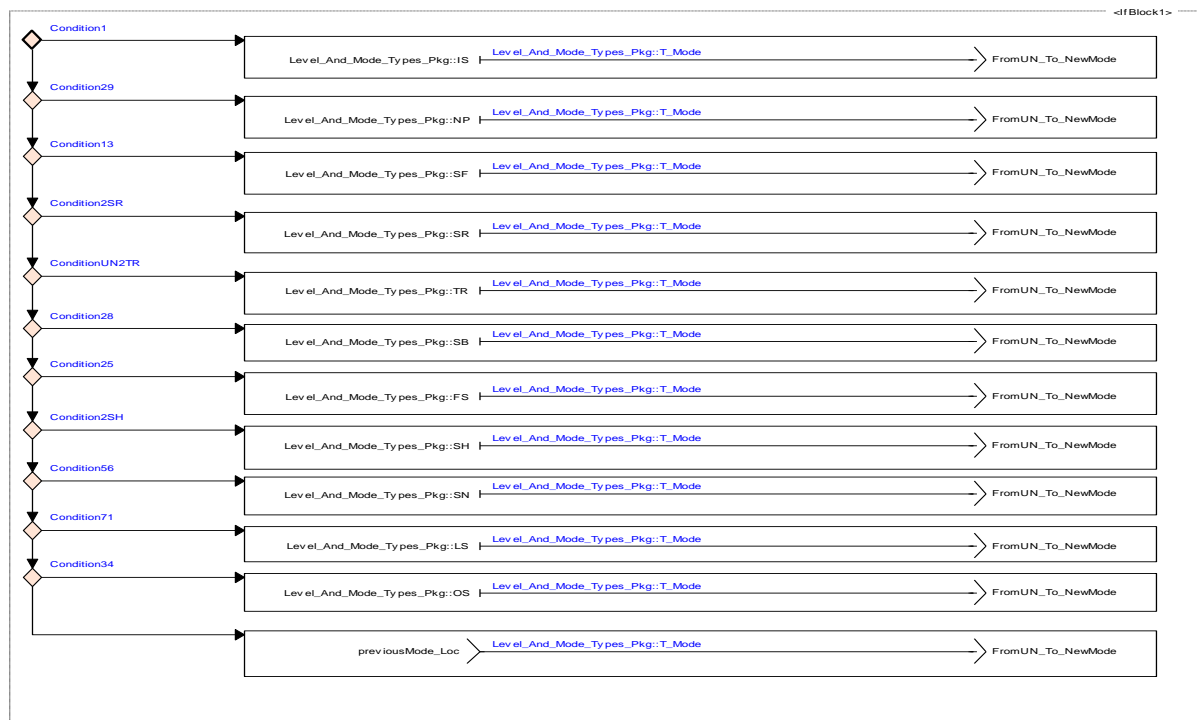


Figure 47: View of diagram_From_UN (From_UN)

Table 144: Conditional Blocks of diagram_From_UN

Conditional Block	Comments and Information
IfBlock1	

Table 145: Actions of diagram_From_UN

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

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

3.6. Procedures Package

3.6.1. Procedure_LimitedSupervision Operator

Declared as **public node**

3.6.1.1. Comments and Information

Procedure_LimitedSupervision Comments:

Case of starting mode is SB or PT is covered by the start of mission procedure and the train-trip procedure.

3.6.1.2. Interface

Table 146: Inputs of Procedure_LimitedSupervision

Name	Type	Comments and Information
Current_Mode	Level_And_Mode_Type s_Pkg::T_Mode	
Driver_Ack_LS	bool	
Mode_Profile_On_Board	Level_And_Mode_Type s_Pkg::T_Mode_Profile	
Train_Position	TrainPosition_Types_Pc k::trainPosition_T	
Train_Speed	Obu_BasicTypes_Pkg:: Speed_T	

Table 147: Outputs of Procedure_LimitedSupervision

Name	Type	Comments and Information
Condition70	bool	
Condition71	bool	
Condition72	bool	

Name	Type	Comments and Information
Condition74	bool	Comments: §4.6.3 : Condition 74 : "(A Mode Profile defining a Limited Supervision area is on-board) AND (The max safe front end of the train is inside the Limited Supervision area) AND (The estimated front end of the train is not inside an OS acknowledgement area)"
Ack_LS_Req_To_Driver	bool	
Service_Brake_Command	bool	

3.6.1.3. Locals

Table 148: Locals of Procedure_LimitedSupervision

Name	Type	Comments and Information
Loc_Condition_74	bool	
Loc_Procedure_Possible	bool	
Loc_Supervision_Mode	bool	

3.6.1.4. Operator Hierarchy

diagram : diagram_Procedure_LimitedSupervision_1

3.6.1.5. Graphical and Textual Diagrams

3.6.1.5.1. View of diagram_Procedure_LimitedSupervision_1 (Procedure_LimitedSupervision)

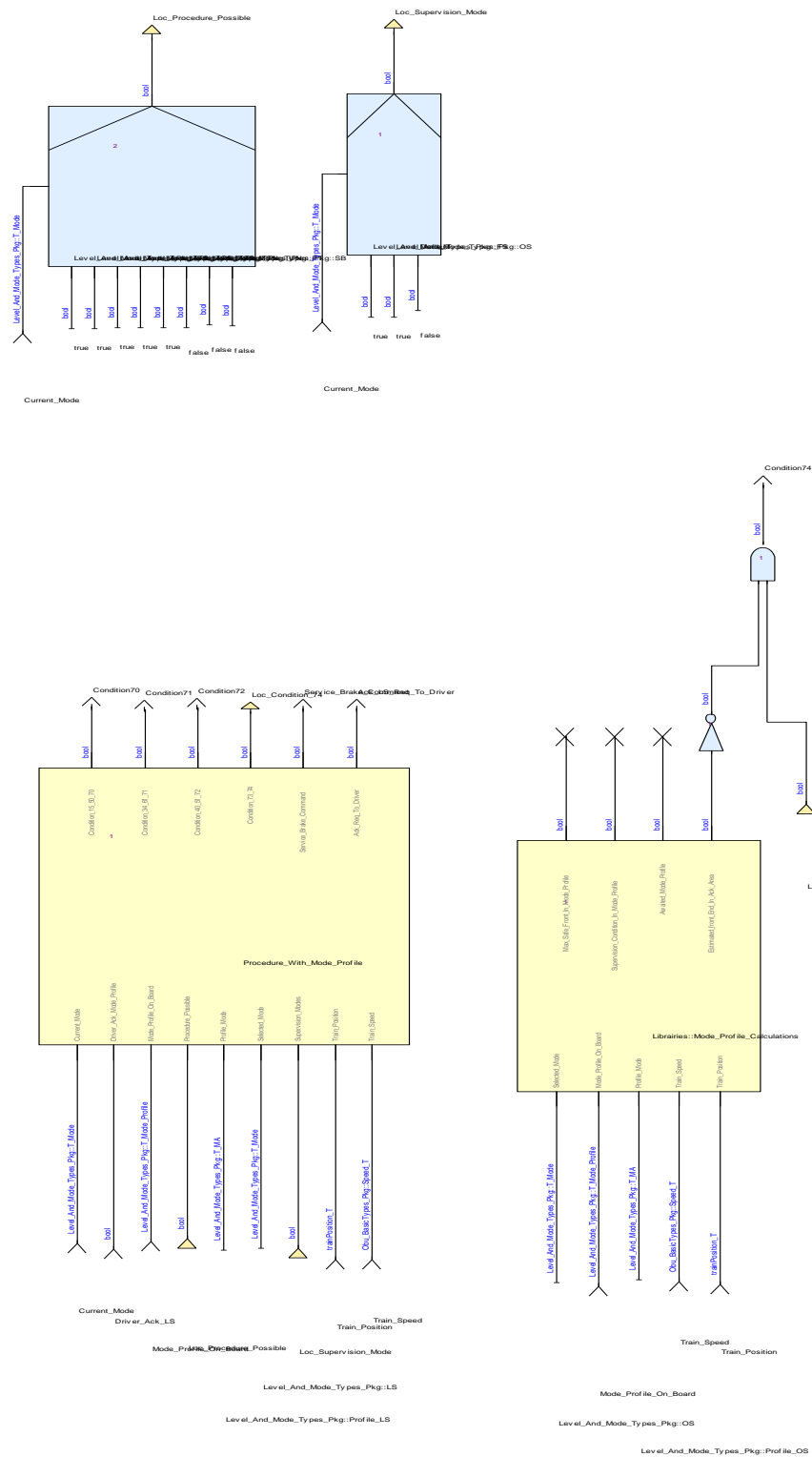


Figure 48: View of diagram_Procedure_LimitedSupervision_1 (Procedure_LimitedSupervision)

3.6.2. Procedure_OnSight Operator

Declared as **public node**

3.6.2.1. Interface

Table 149: Inputs of Procedure_OnSight

Name	Type	Comments and Information
Current_Mode	Level_And_Mode_Types_Pkg::T_Mode	
Driver_Ack_OS	bool	
Mode_Profile_On_Board	Level_And_Mode_Types_Pkg::T_Mode_Profile	
Train_Position	TrainPosition_Types_Pkg::trainPosition_T	
Train_Speed	Obu_BasicTypes_Pkg::Speed_T	

Table 150: Outputs of Procedure_OnSight

Name	Type	Comments and Information
Condition15	bool	
Condition34	bool	
Condition40	bool	
Condition73	bool	
Ack_OS_Req_To_Driver	bool	
Service_Brake_Command	bool	

3.6.2.2. Locals

Table 151: Locals of Procedure_OnSight

Name	Type	Comments and Information
Loc_Condition_73	bool	
Loc_Procedure_Possible	bool	
Loc_Supervision_Mode	bool	

3.6.2.3. Operator Hierarchy

diagram : diagram_Procedure_OnSight_1

3.6.2.4. Graphical and Textual Diagrams

3.6.2.4.1. View of diagram_Procedure_OnSight_1 (Procedure_OnSight)

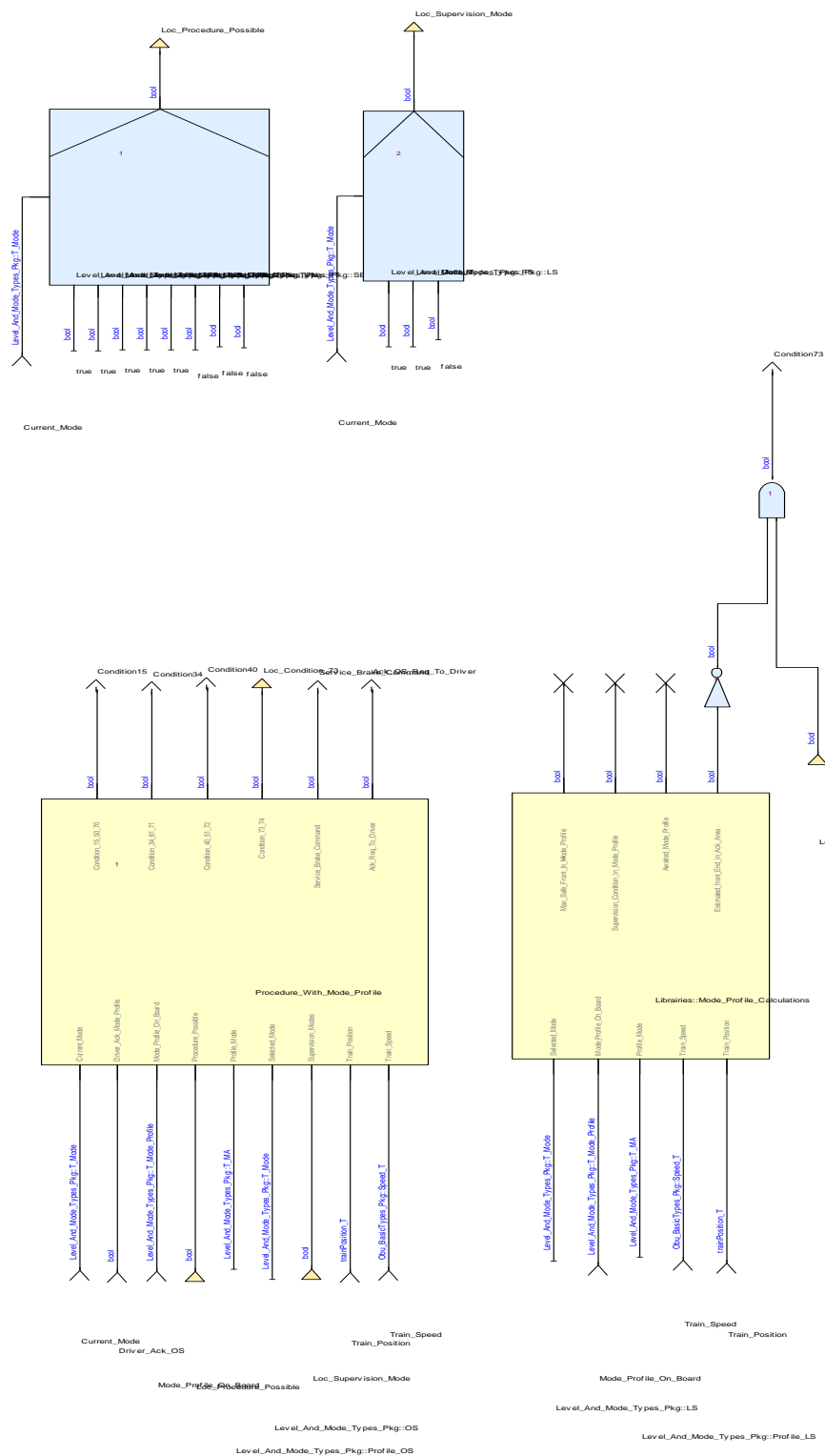


Figure 49: View of diagram_Procedure_OnSight_1 (Procedure_OnSight)

3.6.3. Procedure_SH_Initiated_By_Driver Operator

Declared as **public node**

3.6.3.1. Comments and Information

Procedure_SH_Initiated_By_Driver Comments:

From SRS-026 v3.3.0, §5.6 Shunting Initiated by Driver.

Assumptions:

- A030 and National Trip occurrence is covered by Trip conditions and procedures with higher priority.
- Communication with RBC is out of the scope of this function (repetition of message to RBC, waiting for acknowledgement,...)

3.6.3.2. Interface

Table 152: Inputs of Procedure_SH_Initiated_By_Driver

Name	Type	Comments and Information
Current_Level	M_LEVEL	
Current_Mode	Level_And_Mode_Types_Pkg::T_Mode	
Driver_Req_SH	bool	
On_Going_Mission	bool	
Shunting_Granted_By_RBC	bool	
Train_Standstill	bool	

Table 153: Outputs of Procedure_SH_Initiated_By_Driver

Name	Type	Properties		Comments and Information
Condition5	bool	default	false	
Condition6	bool	default	false	
Clean_BG_List_SH_Area	bool	default	false	
End_Of_Mission_Procedure_Req	bool	default	false	
Request_For_SH_To_RBC	bool	default	false	
SH_Refused_By_RBC_To_DMI	bool	default	false	

3.6.3.3. Locals

Table 154: Locals of Procedure_SH_Initiated_By_Driver

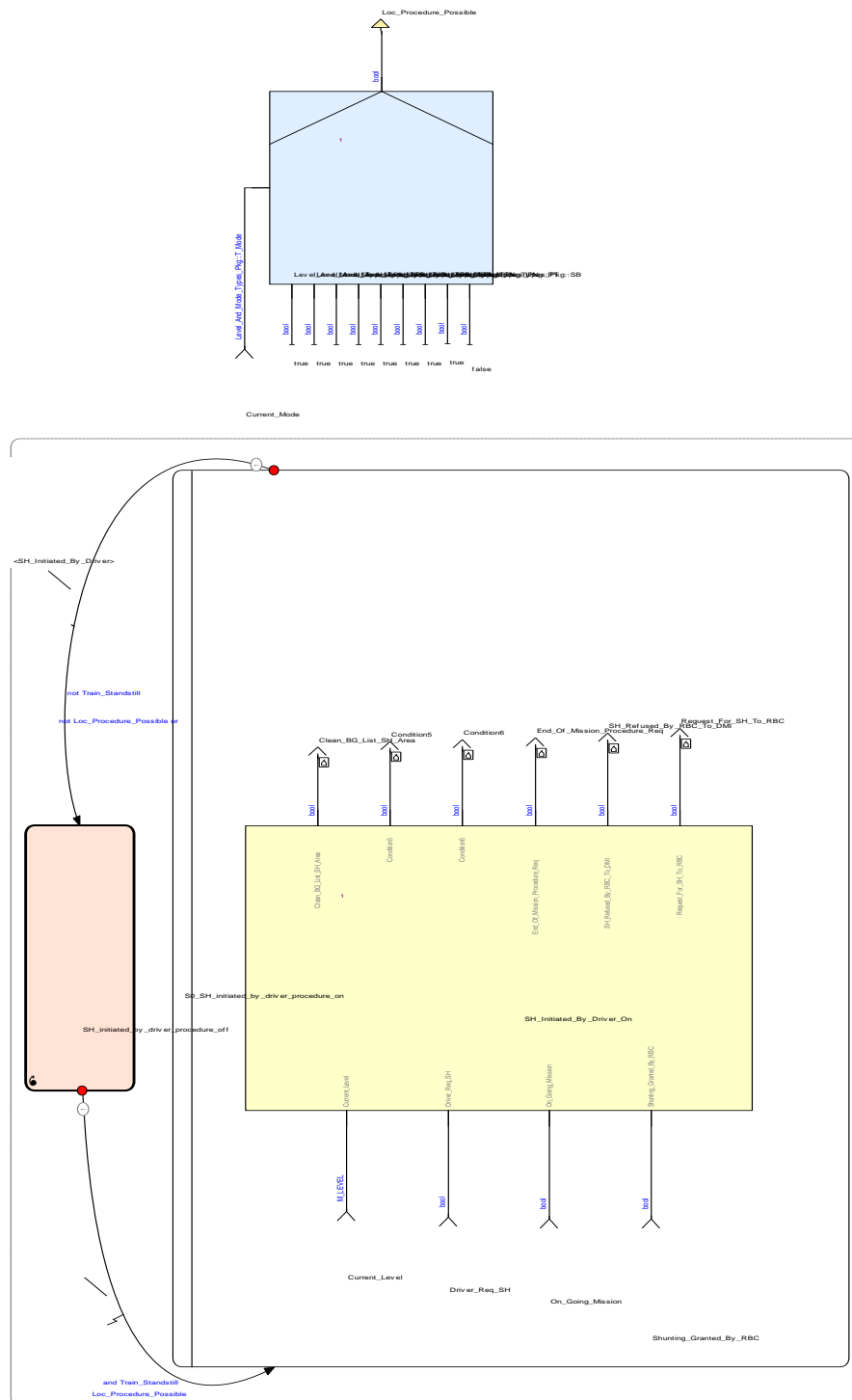
Name	Type	Comments and Information
Loc_Procedure_Possible	bool	

3.6.3.4. Operator Hierarchy

diagram : diagram_Procedure_SH_Initiated_By_Driver_1
 state-machine : SH_Initiated_By_Driver
 state : S0_SH_initiated_by_driver_procedure_on
 state : SH_initiated_by_driver_procedure_off

3.6.3.5. Graphical and Textual Diagrams

3.6.3.5.1. View of diagram_Procedure_SH_Initiated_By_Driver_1 (Procedure_SH_Initiated_By_Driver)



**Figure 50: View of diagram_Procedure_SH_Initiated_By_Driver_1
(Procedure_SH_Initiated_By_Driver)**

Table 155: State Machines of diagram_Procedure_SH_Initiated_By_Driver_1

State Machine	Comments and Information
SH_Initiated_By_Driver	

Table 156: States of diagram_Procedure_SH_Initiated_By_Driver_1

State	Comments and Information
SH_Initiated_By_Driver:S0_SH_initiated_by_driver_procedure_on	Comments: SRS § 5.6 state S0
SH_Initiated_By_Driver:SH_initiated_by_driver_procedure_off	

Table 157: Transitions of diagram_Procedure_SH_Initiated_By_Driver_1

Source/Target	#	Conditions/Actions	Comments and Information
Source: SH_Initiated_By_Driver:S0_SH_initiated_by_driver_procedure_on Target: SH_Initiated_By_Driver:SH_initiated_by_driver_procedure_off	1	Condition: not Loc_Procedure_Possible or not Train_Standstill Actions:	Comments: Condition to manage the procedure are no more available : train is moving or mode change (for example to Trip mode)
Source: SH_Initiated_By_Driver:SH_initiated_by_driver_procedure_off Target: SH_Initiated_By_Driver:S0_SH_initiated_by_driver_procedure_on	1	Condition: Loc_Procedure_Possible and Train_Standstill Actions:	Comments: S0 : start of procedure is possible

3.6.4. Procedure_SH_Ordered_By_Track Operator

Declared as **public node**

3.6.4.1. Comments and Information

Procedure_SH_Ordered_By_Track Comments:

From SRS-026 v3.3.0, §5.7 Shunting Order from trackside

Assumptions:

- Driver acknowledgement not possible in mode SR, UN and SN see table 4.7.2.1.4 and tables 4.6.2 and 4.6.3 condition 51 and 61

-

3.6.4.2. Interface

Table 158: Inputs of Procedure_SH_Ordered_By_Track

Name	Type	Comments and Information
Current_Mode	Level_And_Mode_Types_Pkg::T_Mode	
Driver_Ack_SH	bool	
Mode_Profile_On_Board	Level_And_Mode_Types_Pkg::T_Mode_Profile	
Train_Position	TrainPosition_Types_Pkg::trainPosition_T	

Name	Type	Comments and Information
Train_Speed	Obu_BasicTypes_Pkg::Speed_T	

Table 159: Outputs of Procedure_SH_Ordered_By_Track

Name	Type	Comments and Information
Condition50	bool	
Condition51	bool	
Condition61	bool	
Ack_SH_Req_To_Driver	bool	
Service_Brake_Command	bool	

3.6.4.3. Locals

Table 160: Locals of Procedure_SH_Ordered_By_Track

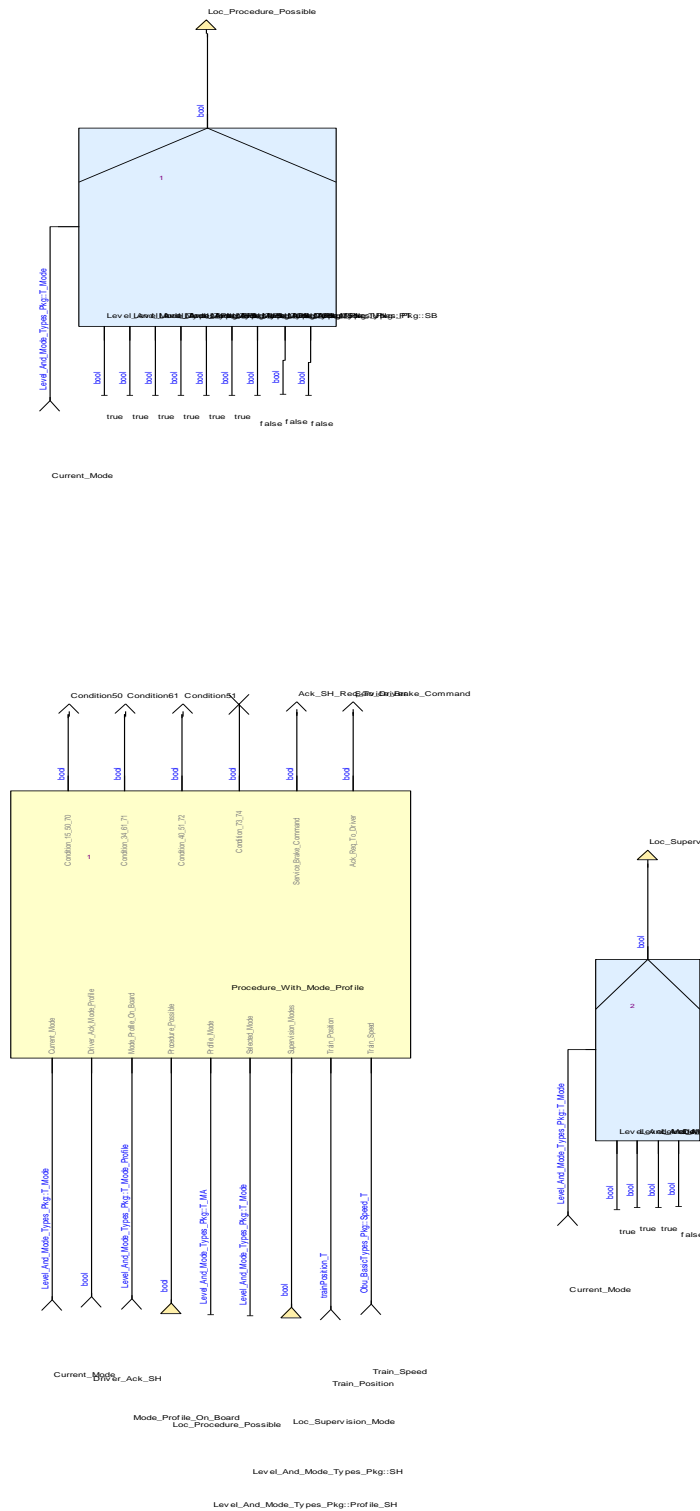
Name	Type	Comments and Information
Loc_Procedure_Possible	bool	
Loc_Supervision_Mode	bool	

3.6.4.4. Operator Hierarchy

diagram : diagram_Procedure_SH_Ordered_By_Track_1

3.6.4.5. Graphical and Textual Diagrams

3.6.4.5.1. View of diagram_Procedure_SH_Ordered_By_Track_1 (Procedure_SH_Ordered_By_Track)



3.6.5. Procedure_Start_L1_L2_L3 Operator

Declared as **public node**

3.6.5.1. Interface

Table 161: Inputs of Procedure_Start_L1_L2_L3

Name	Type	Comments and Information
Current_Level	M_LEVEL	
Driver_Ack_LS	bool	
Driver_Ack_OS	bool	
Driver_Ack_SH	bool	
Driver_Ack_SR	bool	
Driver_Req_Start	bool	
MA_SSP_Gradient_Available	bool	
Mode_Profile_On_Board	Level_And_Mode_Types_Pkg::T_Mode_Profile	
RBC_Authorizes_SR	bool	

Table 162: Outputs of Procedure_Start_L1_L2_L3

Name	Type	Properties	Comments and Information
Ack_LS_Req_To_Driver	bool	default false	
Ack_OS_Req_To_Driver	bool	default false	
Ack_SH_Req_To_Driver	bool	default false	
Ack_SR_Req_To_Driver	bool	default false	
Condition_8	bool	default false	
Condition_10_31	bool	default false	
Condition_15	bool	default false	
Condition_50	bool	default false	
Condition_70	bool	default false	
MA_Req_To_RBC	bool	default false	

3.6.5.2. Locals

Table 163: Locals of Procedure_Start_L1_L2_L3

Name	Type	Comments and Information
Loc_Mode_Profile	Level_And_Mode_Types_Pkg::T_MA	

3.6.5.3. Operator Hierarchy

diagram : diagram_Procedure_Start_L1_L2_L3_1

state-machine : SM_Start_L1_L2_L3

state : FS_Mode

state : Level_1
state : Level_2_3
state : LS_Mode
state : OS_Mode
state : SH_Mode
state : SR_Mode
state : Wait_For_LS
state : Wait_For_OS
state : Wait_For_SH
state : Waiting_Driver_Starting_Command

3.6.5.4. Graphical and Textual Diagrams

3.6.5.4.1. View of diagram_Procedure_Start_L1_L2_L3_1 (Procedure_Start_L1_L2_L3)

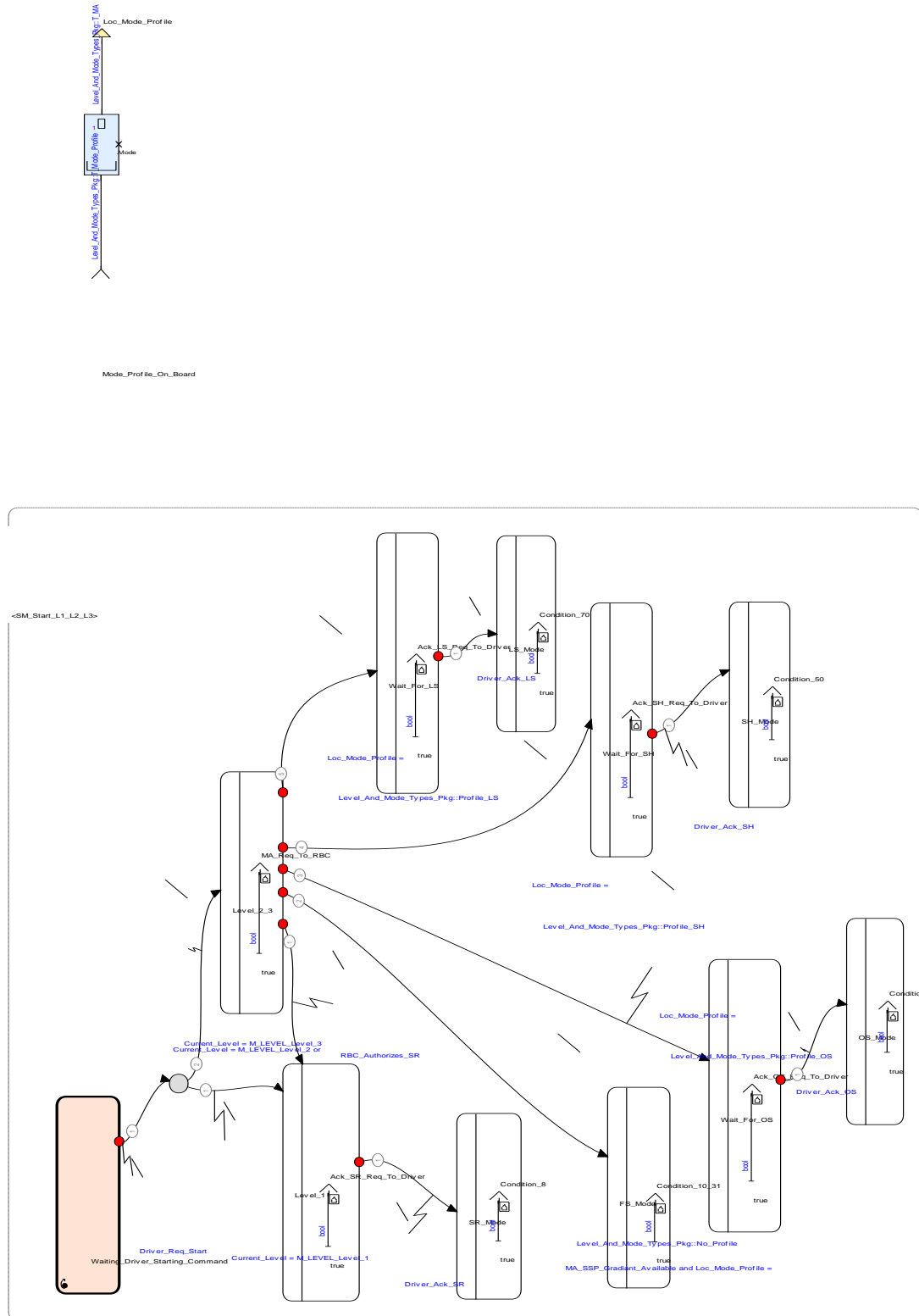


Figure 52: View of diagram_Procedure_Start_L1_L2_L3_1 (Procedure_Start_L1_L2_L3)

Table 164: State Machines of diagram_Procedure_Start_L1_L2_L3_1

State Machine	Comments and Information
SM_Start_L1_L2_L3	

Table 165: States of diagram_Procedure_Start_L1_L2_L3_1

State	Comments and Information
SM_Start_L1_L2_L3:FS_Mode	Comments: SRS § 4.6.3 C10:“(valid Train Data is stored on board) AND (MA + SSP +gradient are on-board) AND (no specific mode is required by a Mode Profile)” SRS § 4.6.3 C31: “(MA+SSP+gradient are on-board) AND (no specific mode is required by a Mode Profile) AND (ERTMS/ETCS level is 2 or 3)”
SM_Start_L1_L2_L3:Level_1	Comments: SRS § 5.4 state S24 SRS § 5.11 state S160
SM_Start_L1_L2_L3:Level_2_3	Comments: SRS § 5.4 state S21 SRS § 5.11 state S150
SM_Start_L1_L2_L3:LS_Mode	Comments: SRS § 4.6.3 C70 : “(An ackn. request for Limited Supervision is displayed to the driver) AND (the driver acknowledges) ” {7} The request to acknowledge Limited Supervision is displayed to the driver only if certain conditions are fulfilled. These conditions are not specified here. See the “Limited Supervision” procedure” of SRS-§5 (for transitions from FS/OS/UN to LS) and the “Start of mission” procedure (for transition from SB to LS).
SM_Start_L1_L2_L3:OS_Mode	Comments: SRS § 4.6.3 C15:“(An ackn. request for On Sight is displayed to the driver) AND (the driver acknowledges) ” {1} The request to acknowledge On Sight is displayed to the driver only if certain conditions are fulfilled. These conditions are not specified here. See the “On Sight” procedure” of SRS-§5 (for transitions from FS/LS/UN to OS) and the “Start of mission” procedure (for transition from SB to OS).
SM_Start_L1_L2_L3:SH_Mode	Comments: SRS § 4.6.3 C50:“(An ackn. request for Shunting is displayed to the driver) AND (the driver acknowledges) ” {5} The request to acknowledge Shunting is displayed to the driver only if certain conditions are fulfilled. These conditions are not specified here. See the “Entry in Shunting” procedure and the “Start Of Mission” procedure of SRS-§5.
SM_Start_L1_L2_L3:SR_Mode	Comments: SRS § 4.6.3 C8 “StaffResponsible Mode is proposed o the driver AND the driver acknowledges”
SM_Start_L1_L2_L3:Wait_For_LS	Comments: SRS § 5.4 state S25 SRS § 5.11 state S170
SM_Start_L1_L2_L3:Wait_For_OS	Comments: SRS § 5.4 state S25 SRS § 5.11 state S170

State	Comments and Information
SM_Start_L1_L2_L3:Wait_For_SH	Comments: SRS § 5.4 state S25 SRS § 5.11 state S170
SM_Start_L1_L2_L3:Waiting_Driver_Start ing_Command	Comments: SRS § 5.4 state S20 SRS § 5.11 state S140

Table 166: Transitions of diagram_Procedure_Start_L1_L2_L3_1

Source/Target	#	Conditions/Actions	Comments and Information
Source: SM_Start_L1_L2_L3:Level_1 Target: SM_Start_L1_L2_L3:SR_Mode	1	Condition: Driver_Ack_SR	Comments: SRS § 5.4 state E32 SRS § 5.11 state E160
Source: SM_Start_L1_L2_L3:Level_2_3 Target: SM_Start_L1_L2_L3:Level_1	1	Condition: RBC_Authorizes_SR	Comments: SRS § 5.4 state E26 SRS § 5.11 state E26
Source: SM_Start_L1_L2_L3:Level_2_3 Target: SM_Start_L1_L2_L3:FS_Mode	2	Condition: MA_SSP_Gradient_Ava ilable and Loc_Mode_Profile = Level_And_Mode_Type s_Pkg::No_Profile	Comments: SRS § 5.4 state E29 SRS § 5.11 state E170
Source: SM_Start_L1_L2_L3:Level_2_3 Target: SM_Start_L1_L2_L3:Wait_For_OS	3	Condition: Loc_Mode_Profile = Level_And_Mode_Type s_Pkg::Profile_OS Actions:	Comments: SRS § 5.4 state E27 SRS § 5.11 state E175
Source: SM_Start_L1_L2_L3:Level_2_3 Target: SM_Start_L1_L2_L3:Wait_For_SH	4	Condition: Loc_Mode_Profile = Level_And_Mode_Type s_Pkg::Profile_SH Actions:	Comments: SRS § 5.4 state E27 SRS § 5.11 state E175
Source: SM_Start_L1_L2_L3:Level_2_3 Target: SM_Start_L1_L2_L3:Wait_For_LS	5	Condition: Loc_Mode_Profile = Level_And_Mode_Type s_Pkg::Profile_LS Actions:	Comments: SRS § 5.4 state E27 SRS § 5.11 state E175
Source: SM_Start_L1_L2_L3:Wait_For_LS Target: SM_Start_L1_L2_L3:LS_Mode	1	Condition: Driver_Ack_LS	Comments: SRS § 5.4 state E33 SRS § 5.11 state E185
Source: SM_Start_L1_L2_L3:Wait_For_OS Target: SM_Start_L1_L2_L3:OS_Mode	1	Condition: Driver_Ack_OS	Comments: SRS § 5.4 state E33 SRS § 5.11 state E185
Source: SM_Start_L1_L2_L3:Wait_For_SH Target: SM_Start_L1_L2_L3:SH_Mode	1	Condition: Driver_Ack_SH	Comments: SRS § 5.4 state E33 SRS § 5.11 state E185
Source: SM_Start_L1_L2_L3:Waiting_Driver	1	Condition: Driver_Req_Start	

Source/Target	#	Conditions/ Actions	Comments and Information
_Starting_Command Target: SM_Start_L1_L2_L3:Level_1	1	Condition: Current_Level = M_LEVEL_Level_1 Actions:	Comments: SRS § 5.4 state E22 SRS § 5.11 state E150
Source: SM_Start_L1_L2_L3:Waiting_Driver _Starting_Command Target: SM_Start_L1_L2_L3:Level_2_3	1	Condition: Driver_Req_Start	
	2	Condition: Current_Level = M_LEVEL_Level_2 or Current_Level = M_LEVEL_Level_3 Actions:	Comments: SRS § 5.4 state E24 SRS § 5.11 state E155

3.6.6. Procedure_StartOfMission Operator

Declared as **public node**

3.6.6.1. Interface

Table 167: Inputs of Procedure_StartOfMission

Name	Type	Comments and Information
Current_Level	M_LEVEL	
Current_Mode	Level_And_Mode_Type s_Pkg::T_Mode	
Desk_Open	bool	
Driver_Ack_LS	bool	
Driver_Ack_OS	bool	
Driver_Ack_SH	bool	
Driver_Ack_SN	bool	
Driver_Ack_SR	bool	
Driver_Ack_UN	bool	
Driver_Req_NL	bool	
Driver_Req_SH	bool	
Driver_Req_Start	bool	
MA_SSP_Gradient_Available	bool	
Mode_Profile_On_Board	Level_And_Mode_Type s_Pkg::T_Mode_Profile	
RBC_Authorizes_SR	bool	
Shunting_Granted_By_RBC	bool	
Train_Permitted_NL	bool	
Train_Standstill	bool	
Valid_Train_Data_Stored	bool	

Table 168: Outputs of Procedure_StartOfMission

Name	Type	Properties		Comments and Information
Ack_LS_Req_To_Driver	bool	default	false	
Ack_OS_Req_To_Driver	bool	default	false	
Ack_SH_Req_To_Driver	bool	default	false	
Ack_SN_Req_To_Driver	bool	default	false	
Ack_SR_Req_To_Driver	bool	default	false	
Ack_UN_Req_To_Driver	bool	default	false	
Clean_BG_List_SH_Area	bool	default	false	
Condition_5	bool	default	false	
Condition_6	bool	default	false	
Condition_8	bool	default	false	
Condition_10	bool	default	false	
Condition_15	bool	default	false	
Condition_46	bool	default	false	
Condition_50	bool	default	false	
Condition_58	bool	default	false	
Condition_60	bool	default	false	
Condition_70	bool	default	false	
EB_Requested	bool	default	false	
End_Of_Mission_Procedure_Req	bool	default	false	
MA_Req_To_RBC	bool	default	false	
Request_For_SH_To_RBC	bool	default	false	
SH_Refused_By_RBC_To_DMI	bool	default	false	

3.6.6.2. Operator Hierarchy

diagram : diagram_Procedure_StartOfMission_1

state-machine : SM_StartOfMissionProcedure

state : EB_Requested

state : Procedure_Off

state : Procedure_On

state-machine : SM_SoM_On

state : Level_0

state : Level_NTC

state : NL_Mode

state : Procedure_SH_Initiated_By_Driver

state : SN_Mode

state : UN_Mode

state : Waiting_Driver_Command

state : Waiting_Driver_Selection
state : Waiting_Driver_Strating_Command

3.6.6.3. Graphical and Textual Diagrams

3.6.6.3.1. View of diagram_Procedure_StartOfMission_1 (Procedure_StartOfMission)

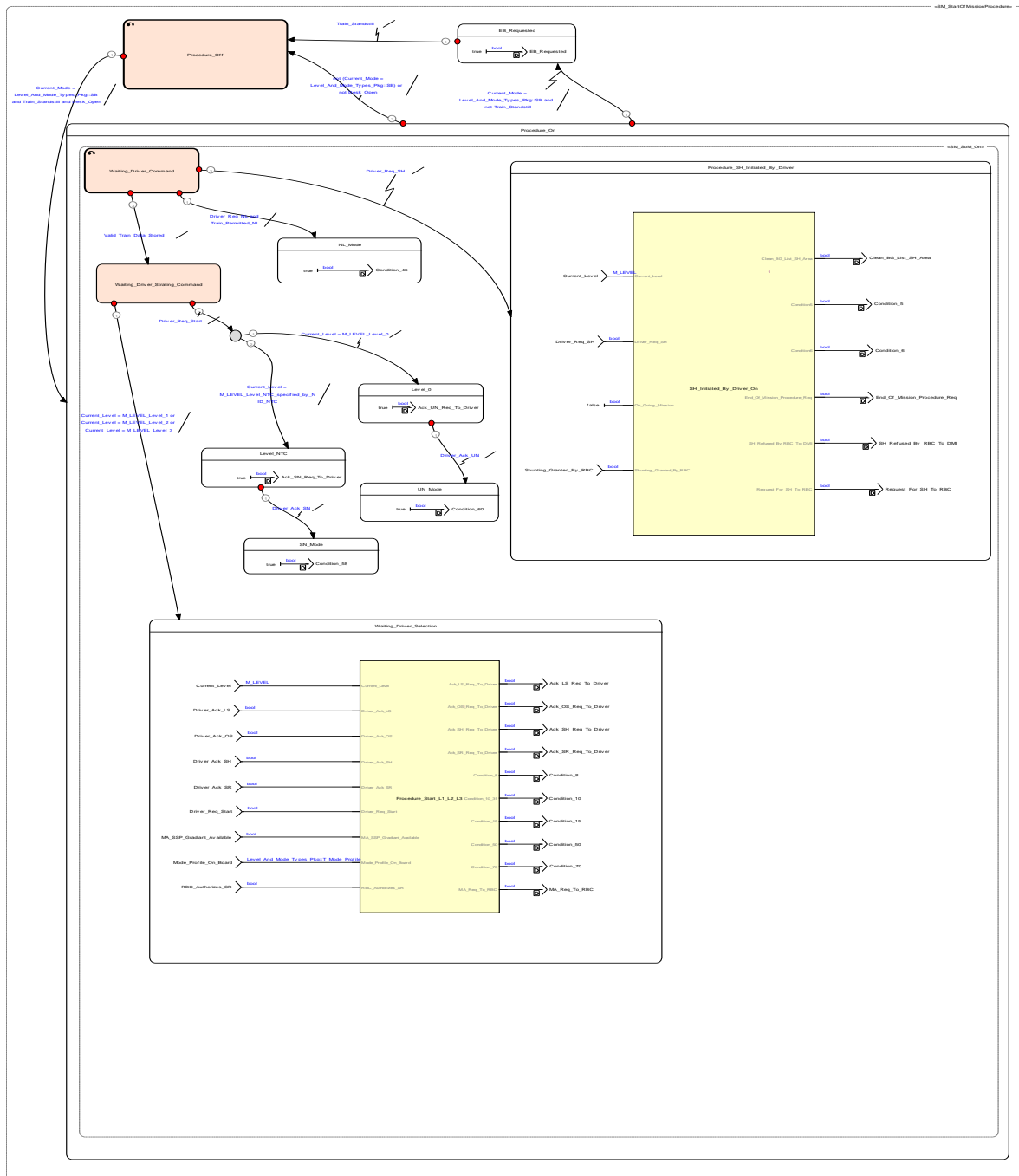


Figure 53: View of diagram_Procedure_StartOfMission_1 (Procedure_StartOfMission)

Table 169: State Machines of diagram_Procedure_StartOfMission_1

State Machine	Comments and Information
SM_StartOfMissionProcedure	

State Machine	Comments and Information
SM_StartOfMissionProcedure: Procedure_On:SM_SoM_On	

Table 170: States of diagram_Procedure_StartOfMission_1

State	Comments and Information
SM_StartOfMissionProcedure:EB_Requested	
SM_StartOfMissionProcedure:Procedure_Off	Comments: SRS § 5.4 state S0
SM_StartOfMissionProcedure:Procedure_On	
SM_StartOfMissionProcedure:Procedure_On:SM_SoM_On:Level_0	Comments: SRS § 5.4 state S23
SM_StartOfMissionProcedure:Procedure_On:SM_SoM_On:Level_NTC	Comments: SRS § 5.4 state S22
SM_StartOfMissionProcedure:Procedure_On:SM_SoM_On:NL_Mode	Comments: SRS § 4.6.3 C46 : "(Driver selects NON LEADING) AND (train is at standstill) AND (The "non leading" input signal is received)"
SM_StartOfMissionProcedure:Procedure_On:SM_SoM_On:Procedure_SH_Initiated_By_Driver	
SM_StartOfMissionProcedure:Procedure_On:SM_SoM_On:SN_Mode	Comments: SRS § 4.6.3 C58 : "(the ERTMS/ETCS level is "NTC") AND (an acknowledgement request for SN mode is displayed to the driver) AND (the driver acknowledges) "
SM_StartOfMissionProcedure:Procedure_On:SM_SoM_On:UN_Mode	Comments: SRS § 4.6.3 C60 : " (an acknowledgement request for UN mode is displayed to the driver) AND (the driver acknowledges)"
SM_StartOfMissionProcedure:Procedure_On:SM_SoM_On:Waiting_Driver_Command	Comments: SRS § 5.4 state S11
SM_StartOfMissionProcedure:Procedure_On:SM_SoM_On:Waiting_Driver_Selection	Comments: SRS § 5.4 state S20
SM_StartOfMissionProcedure:Procedure_On:SM_SoM_On:Waiting_Driver_Strating_Command	Comments: SRS § 5.4 state S20

Table 171: Transitions of diagram_Procedure_StartOfMission_1

Source/Target	#	Conditions/ Actions	Comments and Information
Source: SM_StartOfMissionProcedure:EB_Requested Target: SM_StartOfMissionProcedure:Procedure_Off	1	Condition: Train_Standstill	
Source: SM_StartOfMissionProcedure:Procedure_Off Target: SM_StartOfMissionProcedure:Procedure_On	1	Condition: Current_Mode = Level_And_Mode_Types_Pkg::SB and Train_Standstill and Desk_Open	

Source/Target	#	Conditions/ Actions	Comments and Information
Source: SM_StartOfMissionProcedure:Proce dure_On Target: SM_StartOfMissionProcedure:EB_R equested	1	Condition: Current_Mode = Level_And_Mode_Type s_Pkg::SB and not Train_Standstill Actions:	
Source: SM_StartOfMissionProcedure:Proce dure_On Target: SM_StartOfMissionProcedure:Proce dure_Off	2	Condition: not (Current_Mode = Level_And_Mode_Type s_Pkg::SB) or not Desk_Open	
Source: SM_StartOfMissionProcedure:Proce dure_On:SM_SoM_On:Level_0 Target: SM_StartOfMissionProcedure:Proce dure_On:SM_SoM_On:UN_Mode	1	Condition: Driver_Ack_UN	Comments: SRS § 5.4 state E31
Source: SM_StartOfMissionProcedure:Proce dure_On:SM_SoM_On:Level_NTC Target: SM_StartOfMissionProcedure:Proce dure_On:SM_SoM_On:SN_Mode	1	Condition: Driver_Ack_SN	Comments: SRS § 5.4 state E30
Source: SM_StartOfMissionProcedure:Proce dure_On:SM_SoM_On:Waiting_Driv er_Command Target: SM_StartOfMissionProcedure:Proce dure_On:SM_SoM_On:NL_Mode	1	Condition: Driver_Req_NL and Train_Permitted_NL	Comments: SRS § 5.4 state E10
Source: SM_StartOfMissionProcedure:Proce dure_On:SM_SoM_On:Waiting_Driv er_Command Target: SM_StartOfMissionProcedure:Proce dure_On:SM_SoM_On:Procedure_S H_Initiated_By_Driver	2	Condition: Driver_Req_SH	Comments: SRS § 5.4 state E12
Source: SM_StartOfMissionProcedure:Proce dure_On:SM_SoM_On:Waiting_Driv er_Command Target: SM_StartOfMissionProcedure:Proce dure_On:SM_SoM_On:Waiting_Driv er_Strating_Command	3	Condition: Valid_Train_Data_Stor ed	Comments: SRS § 5.4 state E14
Source: SM_StartOfMissionProcedure:Proce dure_On:SM_SoM_On:Waiting_Driv er_Strating_Command Target: SM_StartOfMissionProcedure:Proce dure_On:SM_SoM_On:Waiting_Driv er_Selection	1	Condition: Current_Level = M_LEVEL_Level_1 or Current_Level = M_LEVEL_Level_2 or Current_Level = M_LEVEL_Level_3	
Source: SM_StartOfMissionProcedure:Proce	2	Condition: Driver_Req_Start	

Source/Target	#	Conditions/ Actions	Comments and Information
dure_On:SM_SoM_On:Waiting_Driver_Strating_Command Target: SM_StartOfMissionProcedure:Proce dure_On:SM_SoM_On:Level_0	1	Condition: Current_Level = M_LEVEL_Level_0 Actions:	Comments: SRS § 5.4 state E21
Source: SM_StartOfMissionProcedure:Proce dure_On:SM_SoM_On:Waiting_Driver_Strating_Command Target: SM_StartOfMissionProcedure:Proce dure_On:SM_SoM_On:Level_NTC	2	Condition: Driver_Req_Start	
	2	Condition: Current_Level = M_LEVEL_Level_NTC_s pecified_by_NID_NTC Actions:	Comments: SRS § 5.4 state E20

3.6.7. Procedure_Train_Reversing Operator

Declared as **public node**

3.6.7.1. Interface

Table 172: Inputs of Procedure_Train_Reversing

Name	Type	Comments and Information
Driver_Ack_RV	bool	
Train_Standstill	bool	
Train_Position	TrainPosition_Types_Pck::trainPosition_T	
Current_Mode	Level_And_Mode_Types_Pkg::T_Mode	
Reversing_Data	Level_And_Mode_Types_Pkg::T_Reversing_Data	

Table 173: Outputs of Procedure_Train_Reversing

Name	Type	Properties	Comments and Information
Condition_59	bool	default false	
Ack_RV_Req_To_Driver	bool	default false	

3.6.7.2. Locals

Table 174: Locals of Procedure_Train_Reversing

Name	Type	Comments and Information
Loc_Cond_Procedure_On	bool	
Loc_Max_Safe_Front_In_RV_Area	bool	
Loc_RV_Data_Available	bool	

3.6.7.3. Operator Hierarchy

diagram : diagram_Procedure_Train_Reversing_1

state-machine : SM_Train_Reversing

state : Reversing_Condition

state : Reversing_Data_Available

state : Reversing_Procedure_Off

state : RV_Mode

3.6.7.4. Graphical and Textual Diagrams

3.6.7.4.1. View of diagram_Procedure_Train_Reversing_1
(Procedure_Train_Reversing)

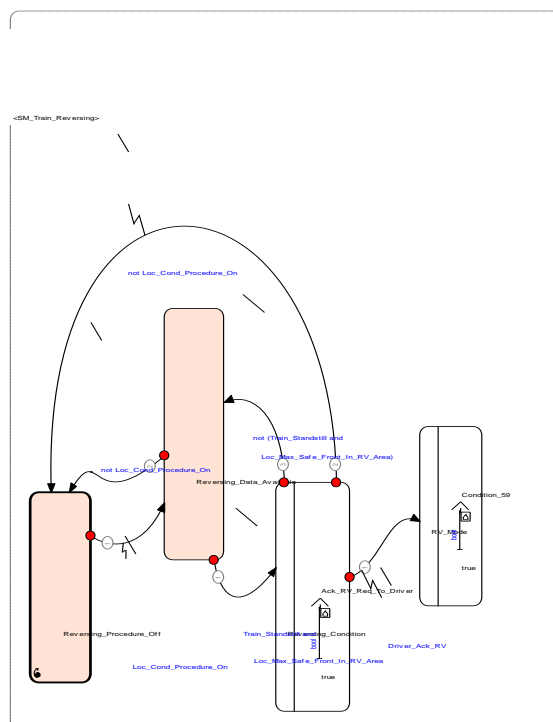
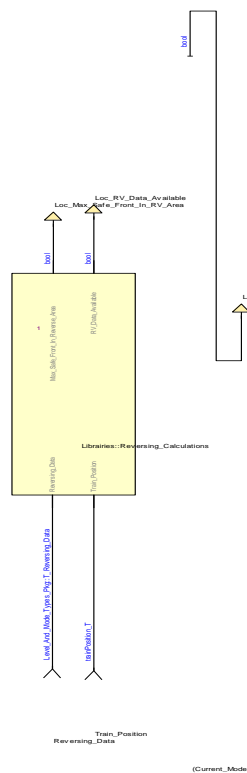


Figure 54: View of diagram_Procedure_Train_Reversing_1 (Procedure_Train_Reversing)

Table 175: State Machines of diagram_Procedure_Train_Reversing_1

State Machine	Comments and Information
SM_Train_Reversing	

Table 176: States of diagram_Procedure_Train_Reversing_1

State	Comments and Information
SM_Train_Reversing:Reversing_Condition	Comments: SRS § 5.4 state S24 SRS § 5.11 state S160
SM_Train_Reversing:Reversing_Data_Available	Comments: SRS § 5.4 state S25 SRS § 5.11 state S170
SM_Train_Reversing:Reversing_Procedure_Off	Comments: SRS § 5.4 state S20 SRS § 5.11 state S140
SM_Train_Reversing:RV_Mode	Comments: SRS § 4.6.3 C8 "StaffResponsible Mode is proposed o the driver AND the driver acknowledges"

Table 177: Transitions of diagram_Procedure_Train_Reversing_1

Source/Target	#	Conditions/Actions	Comments and Information
Source: SM_Train_Reversing:Reversing_Condition Target: SM_Train_Reversing:RV_Mode	1	Condition: Driver_Ack_RV	Comments: SRS § 5.4 state E32 SRS § 5.11 state E160
Source: SM_Train_Reversing:Reversing_Condition Target: SM_Train_Reversing:Reversing_Procedure_Off	2	Condition: not Loc_Cond_Procedure_On	
Source: SM_Train_Reversing:Reversing_Condition Target: SM_Train_Reversing:Reversing_Data_Available	3	Condition: not (Train_Standstill and Loc_Max_Safe_Front_In_RV_Area)	
Source: SM_Train_Reversing:Reversing_Data_Available Target: SM_Train_Reversing:Reversing_Condition	1	Condition: Train_Standstill and Loc_Max_Safe_Front_In_RV_Area	
Source: SM_Train_Reversing:Reversing_Data_Available Target: SM_Train_Reversing:Reversing_Procedure_Off	2	Condition: not Loc_Cond_Procedure_On	
Source: SM_Train_Reversing:Reversing_Procedure_Off Target: SM_Train_Reversing:Reversing_Data_Available	1	Condition: Loc_Cond_Procedure_On	

3.6.8. Procedure_Train_Trip Operator

Declared as **public node**

3.6.8.1. Comments and Information

Procedure_Train_Trip Comments:

SRS-026 §4.6.3 C7 :“(the driver acknowledges the train trip) AND (the train is at standstill) AND (the ERTMS/ETCS level is different from 0, NTC)”

SRS-026 §4.6.3 C62 :“(the driver acknowledges the train trip) AND (the train is at standstill) AND (the ERTMS/ETCS level is 0) AND (valid Train Data is on-board)”

SRS-026 §4.6.3 C63:“(the driver acknowledges the train trip) AND (the train is at standstill) AND (the ERTMS/ETCS level is NTC) AND (valid Train Data is on-board)”

SRS-026 §4.6.3 C68 :“(the driver acknowledges the train trip) AND (the train is at standstill) AND (the ERTMS/ETCS level is 0 or NTC) AND (no valid Train Data is on-board)”

3.6.8.2. Interface

Table 178: Inputs of Procedure_Train_Trip

Name	Type	Comments and Information
Condition_To_Trip	bool	
Current_Level	M_LEVEL	
Current_Mode	Level_And_Mode_Type s_Pkg::T_Mode	
Driver_Ack_LS	bool	
Driver_Ack_OS	bool	
Driver_Ack_SH	bool	
Driver_Ack_SR	bool	
Driver_Ack_TR	bool	
Driver_Req_SH	bool	
Driver_Req_Start	bool	
MA_SSP_Gradient_Available	bool	
Mode_Profile_On_Board	Level_And_Mode_Type s_Pkg::T_Mode_Profile	
On_Going_Mission	bool	
RCB_Ack_And_EB_Revoked	bool	
RBC_Authorizes_SR	bool	
Shunting_Granted_By_RBC	bool	
Train_Standstill	bool	
Valid_Train_Data_Stored	bool	

Table 179: Outputs of Procedure_Train_Trip

Name	Type	Properties		Comments and Information
Ack_LS_Req_To_Driver	bool	default	false	
Ack_OS_Req_To_Driver	bool	default	false	
Ack_SH_Req_To_Driver	bool	default	false	
Ack_SR_Req_To_Driver	bool	default	false	
Ack_TR_Req_To_Driver	bool	default	false	
Clean_BG_List_SH_Area	bool	default	false	
Condition_Trip	bool	default	false	
Condition_5	bool	default	false	
Condition_6	bool	default	false	
Condition_7	bool	default	false	
Condition_8	bool	default	false	
Condition_31	bool	default	false	
Condition_15	bool	default	false	
Condition_50	bool	default	false	
Condition_62	bool	default	false	
Condition_63	bool	default	false	
Condition_68	bool	default	false	
Condition_70	bool	default	false	
End_Of_Mission_Procedure_Req	bool	default	false	
MA_Req_To_RBC	bool	default	false	
Request_For_SH_To_RBC	bool	default	false	
SH_Refused_By_RBC_To_DMI	bool	default	false	

3.6.8.3. Locals

Table 180: Locals of Procedure_Train_Trip

Name	Type	Comments and Information
Loc_Procedure_Possible	bool	

3.6.8.4. Operator Hierarchy

diagram : diagram_Procedure_Train_Trip_1

state-machine : SM_Train_Trip

state : Post_Trip_Mode

state : Procedure_SH_Initiated_By_Driver

state : SH_Mode

state : SN_Mode

state : Train_Trip_procedure_off

state : Trip_Mode
state : Trip_Mode_Waiting_Ack
state : UN_Mode
state : Wait_RBC_Ack
state : Waiting_Driver_Selection

3.6.8.5. Graphical and Textual Diagrams

3.6.8.5.1. View of diagram_Procedure_Train_Trip_1 (Procedure_Train_Trip)

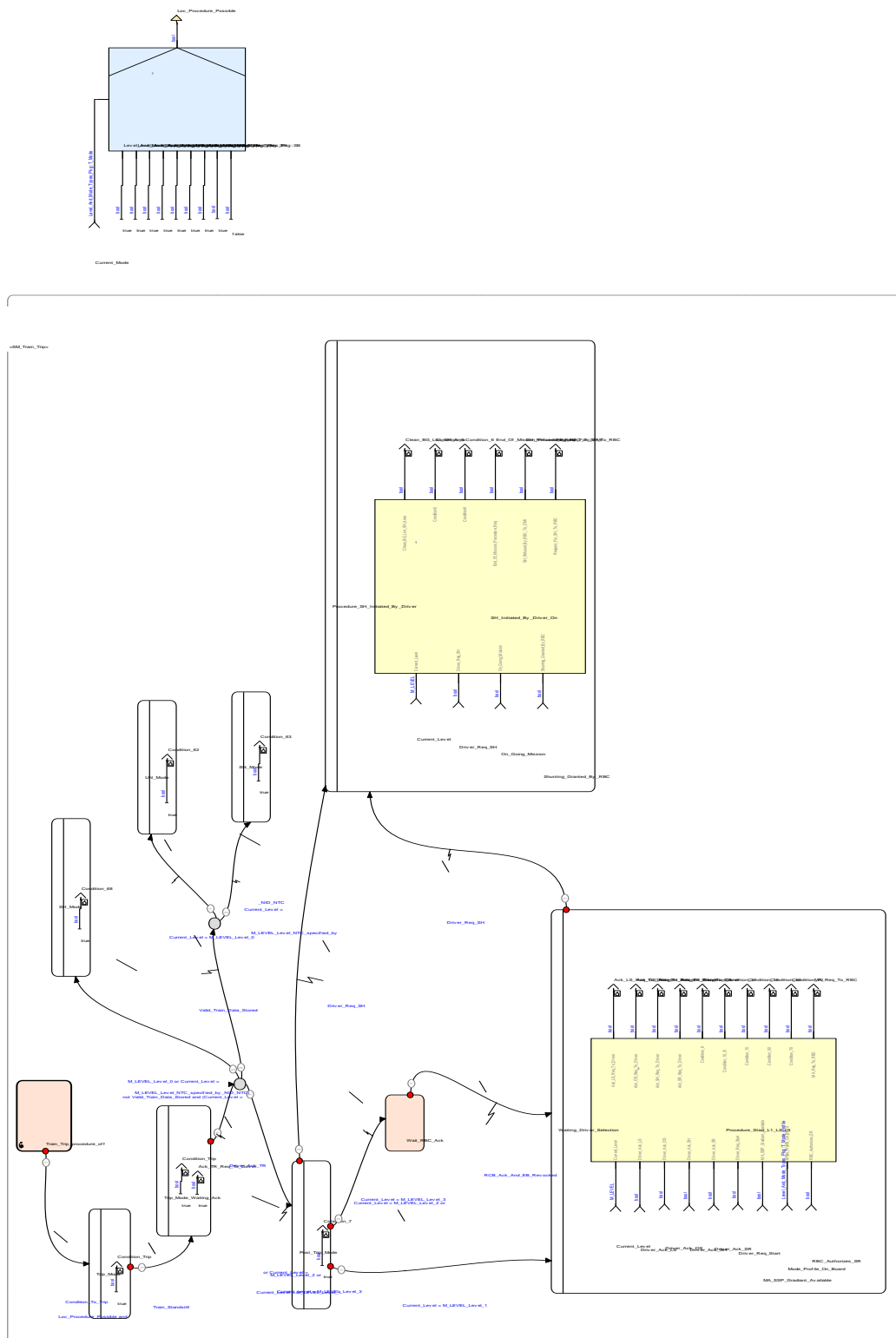


Figure 55: View of diagram_Procedure_Train_Trip_1 (Procedure_Train_Trip)

Table 181: State Machines of diagram_Procedure_Train_Trip_1

State Machine	Comments and Information
SM_Train_Trip	

Table 182: States of diagram_Procedure_Train_Trip_1

State	Comments and Information
SM_Train_Trip:Post_Trip_Mode	
SM_Train_Trip:Procedure_SH_Initiated_By_Driver	
SM_Train_Trip:SH_Mode	
SM_Train_Trip:SN_Mode	
SM_Train_Trip:Train_Trip_procedure_off	
SM_Train_Trip:Trip_Mode	
SM_Train_Trip:Trip_Mode_Waiting_Ack	
SM_Train_Trip:UN_Mode	
SM_Train_Trip:Wait_RBC_Ack	
SM_Train_Trip:Waiting_Driver_Selection	

Table 183: Transitions of diagram_Procedure_Train_Trip_1

Source/Target	#	Conditions/Actions	Comments and Information
Source: SM_Train_Trip:Post_Trip_Mode Target: SM_Train_Trip:Waiting_Driver_Selection	1	Condition: Current_Level = M_LEVEL_Level_1	
Source: SM_Train_Trip:Post_Trip_Mode Target: SM_Train_Trip:Wait_RBC_Ack	2	Condition: Current_Level = M_LEVEL_Level_2 or Current_Level = M_LEVEL_Level_3	
Source: SM_Train_Trip:Post_Trip_Mode Target: SM_Train_Trip:Procedure_SH_Initiated_By_Driver	3	Condition: Driver_Req_SH	
Source: SM_Train_Trip:Train_Trip_procedure_off Target: SM_Train_Trip:Trip_Mode	1	Condition: Loc_Procedure_Possible and Condition_To_Trip Actions:	Comments: S0 : start of procedure is possible
Source: SM_Train_Trip:Trip_Mode Target: SM_Train_Trip:Trip_Mode_Waiting_Ack	1	Condition: Train_Standstill Actions:	
Source: SM_Train_Trip:Trip_Mode_Waiting_Ack	1	Condition: Driver_Ack_TR	

Source/Target	#	Conditions/ Actions	Comments and Information
Ack Target: SM_Train_Trip:Post_Trip_Mode	1	Condition: Current_Level = M_LEVEL_Level_1 or Current_Level = M_LEVEL_Level_2 or Current_Level = M_LEVEL_Level_3	
Source: SM_Train_Trip:Trip_Mode_Waiting_Ack Target: SM_Train_Trip:SH_Mode	1	Condition: Driver_Ack_TR	
	2	Condition: not Valid_Train_Data_Stored and (Current_Level = M_LEVEL_Level_0 or Current_Level = M_LEVEL_Level_NTC_specified_by_NID_NTC)	
Source: SM_Train_Trip:Trip_Mode_Waiting_Ack Target: SM_Train_Trip:UN_Mode	1	Condition: Driver_Ack_TR	
	3	Condition: Valid_Train_Data_Stored Actions:	
	1	Condition: Current_Level = M_LEVEL_Level_0 Actions:	
Source: SM_Train_Trip:Trip_Mode_Waiting_Ack Target: SM_Train_Trip:SN_Mode	1	Condition: Driver_Ack_TR	
	3	Condition: Valid_Train_Data_Stored Actions:	
	2	Condition: Current_Level = M_LEVEL_Level_NTC_specified_by_NID_NTC Actions:	
Source: SM_Train_Trip:Wait_RBC_Ack Target: SM_Train_Trip:Waiting_Driver_Selection	1	Condition: RCB_Ack_And_EB_Revoked	
Source: SM_Train_Trip:Waiting_Driver_Selection Target: SM_Train_Trip:Procedure_SH_Initiated_By_Driver	1	Condition: Driver_Req_SH Actions:	

3.6.9. Procedure_With_Mode_Profile Operator

Declared as **public node**

3.6.9.1. Interface

Table 184: Inputs of Procedure_With_Mode_Profile

Name	Type	Comments and Information
Current_Mode	Level_And_Mode_Type s_Pkg::T_Mode	
Driver_Ack_Mode_Profile	bool	
Mode_Profile_On_Board	Level_And_Mode_Type s_Pkg::T_Mode_Profile	
Procedure_Possible	bool	
Profile_Mode	Level_And_Mode_Type s_Pkg::T_MA	
Selected_Mode	Level_And_Mode_Type s_Pkg::T_Mode	
Supervision_Modes	bool	
Train_Position	TrainPosition_Types_Pc k::trainPosition_T	
Train_Speed	Obu_BasicTypes_Pkg:: Speed_T	

Table 185: Outputs of Procedure_With_Mode_Profile

Name	Type	Properties		Comments and Information
Condition_15_50_70	bool	default	false	
Condition_34_61_71	bool	default	false	
Condition_40_51_72	bool	default	false	
Condition_73_74	bool	default	false	
Service_Brake_Command	bool	default	false	
Ack_Req_To_Driver	bool			

3.6.9.2. Locals

Table 186: Locals of Procedure_With_Mode_Profile

Name	Type	Properties		Comments and Information
Loc_Confirmation	bool	default	true	
		last	true	
Loc_Mode_Available	bool			
Loc_Mode_Profile_Condition	bool			
Loc_Supervision_Condition_Covered	bool			
Loc_Timer	int	default	0	
		last	0	

Table 187: Signals of Procedure_With_Mode_Profile

Name	Comments and Information
Loc_Ack_Req_To_Driver	

3.6.9.3. Operator Hierarchy

```

diagram : diagram_Procedure_With_Mode_Profile_1
  state-machine : SM_Mode_Profile_By_Trackside
    state : Current_Location
      state-machine : SM_Current_Location
        state : Ack_Not_Received
        state : Req_Current_Location
        state : Switch_Autorized_Waiting_Ack
        activate if : IfBlock1
          branch : then
          branch : else
            branch : then
            branch : else
        state : Switch_Mode_Confirmed
        state : Waiting_Ack
    state : Futher_location
      state-machine : SM_Futher_Location
        state : Req_Futher_Location
        state : Start_Supervision
        state : Switch_Mode_Confirmed
        state : Waiting_Ack
  state : Procedure_Off

```

3.6.9.4. Graphical and Textual Diagrams

3.6.9.4.1. View of diagram_Procedure_With_Mode_Profile_1 (Procedure_With_Mode_Profile)

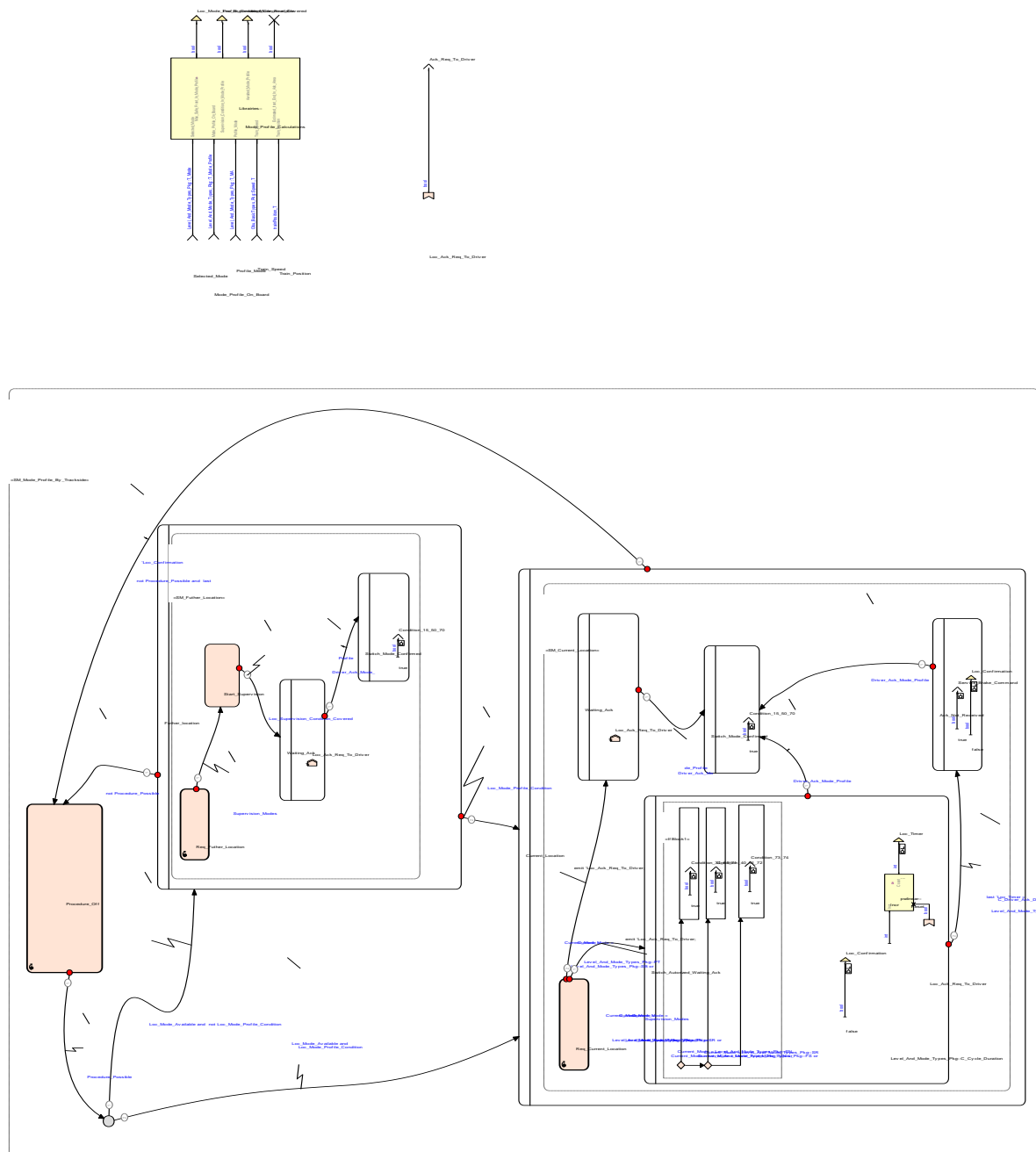


Figure 56: View of diagram_Procedure_With_Mode_Profile_1 (Procedure_With_Mode_Profile)

Table 188: Counter (#8) hidden inputs assignment of diagram_Procedure_With_Mode_Profile_1

Rank	Name	Value
1	Reset	wired (_L4)

Table 189: State Machines of diagram_Procedure_With_Mode_Profile_1

State Machine	Comments and Information
SM_Mode_Profile_By_Tracksi de	
SM_Mode_Profile_By_Tracksi de:Current_Location:SM_Cur rent_Location	
SM_Mode_Profile_By_Tracksi de:Futher_location:SM_Futhe r_Location	

Table 190: States of diagram_Procedure_With_Mode_Profile_1

State	Comments and Information
SM_Mode_Profile_By_Tracksi de:Current_Location	
SM_Mode_Profile_By_Tracksi de:Current_Location:SM_Cur rent_Location:Ack_Not_Received	Comments: SRS § 5.7.2.4, 5.9.2.4, 5.19.2.4 SRS § 5.7.3.7, 5.9.3.8, 5.19.3.8
SM_Mode_Profile_By_Tracksi de:Current_Location:SM_Cur rent_Location:Req_Curre nt_Location	
SM_Mode_Profile_By_Tracksi de:Current_Location:SM_Cur rent_Location:Switch_Au torized_Waiting_Ack	Comments: SRS § 5.7.2.3, 5.9.2.3, 5.19.2.3 §4.6.3 : Condition 34 : "(An ackn. request for On Sight is displayed to the driver) AND (the driver acknowledges) see {1} here under" §4.6.3 : Condition 61 : "(An ackn. request for Shunting is displayed to the driver) AND (the driver acknowledges) see {5} here under" §4.6.3 : Condition 71 : "(A Mode Profile defining a Limited Supervision area is on-board) AND (The max safe front end of the train is inside the Limited Supervision area) AND (The ERTMS/ETCS level switches to 1,2 or 3)" §4.6.3 : Condition 40 : "(An ackn. request for On Sight is displayed to the driver) AND (the driver acknowledges) see {1} here under" §4.6.3 : Condition 51 : "((A Mode Profile defining the entry of a Shunting area is used on-board) AND (The max safe front end of the train is inside the Shunting area))" §4.6.3 : Condition 72 : "(A Mode Profile defining a Limited Supervision area is on-board) AND (The max safe front end of the train is inside the Limited Supervision area)." §4.6.3 : Condition 73 : "(A Mode Profile defining an On Sight area is on-board) AND (The max safe front end of the train is inside the On Sight area) AND (The estimated front end of the train is not inside an LS acknowledgement area)" §4.6.3 : Condition 74 : "((A Mode Profile defining a Limited Supervision area is on-board) AND (The max safe front end of the train is inside the Limited Supervision area) AND (The estimated front end of the train is not inside an OS acknowledgement area))"

State	Comments and Information
SM_Mode_Profile_By_Trackside:Current_Location:SM_Current_Location:Switch_Mode_Confirmed	Comments: §4.6.3 : Condition 15 : "(An ackn. request for On Sight is displayed to the driver) AND (the driver acknowledges) see {1} here under" §4.6.3 : Condition 50 : "(An ackn. request for Shunting is displayed to the driver) AND (the driver acknowledges) see {5} here under" §4.6.3 : Condition 70 : "(An ackn. request for Limited Supervision is displayed to the driver) AND (the driver acknowledges) see {7} here under"
SM_Mode_Profile_By_Trackside:Current_Location:SM_Current_Location:Waiting_Ack	Comments: SRS § 5.7.4.1, 5.9.5.1, 5.19.5.1
SM_Mode_Profile_By_Trackside:Futher_location	
SM_Mode_Profile_By_Trackside:Futher_location:SM_Futher_Location:Req_Futher_Location	
SM_Mode_Profile_By_Trackside:Futher_location:SM_Futher_Location:Start_Supervision	
SM_Mode_Profile_By_Trackside:Futher_location:SM_Futher_Location:Switch_Mode_Confirmed	Comments: SRS § 5.7.3.5, 5.9.3.6, 5.19.3.6 §4.6.3 : Condition 15 : "(An ackn. request for On Sight is displayed to the driver) AND (the driver acknowledges) see {1} here under" §4.6.3 : Condition 50 : "(An ackn. request for Shunting is displayed to the driver) AND (the driver acknowledges) see {5} here under" §4.6.3 : Condition 70 : "(An ackn. request for Limited Supervision is displayed to the driver) AND (the driver acknowledges) see {7} here under"
SM_Mode_Profile_By_Trackside:Futher_location:SM_Futher_Location:Waiting_Ack	Comments: SRS § 5.7.3.3,, 5.9.3.5, 5.19.3.5
SM_Mode_Profile_By_Trackside:Procedure_Off	

Table 191: Transitions of diagram_Procedure_With_Mode_Profile_1

Source/Target	#	Conditions/Actions	Comments and Information
Source: SM_Mode_Profile_By_Trackside:Current_Location Target: SM_Mode_Profile_By_Trackside:Procedure_Off	1	Condition: not Procedure_Possible and last 'Loc_Confirmation	
Source: SM_Mode_Profile_By_Trackside:Current_Location:SM_Current_Location:Ack_Not_Received Target: SM_Mode_Profile_By_Trackside:Current_Location:SM_Current_Location:Switch_Mode_Confirmed	1	Condition: Driver_Ack_Mode_Profile Actions:	

Source/Target	#	Conditions/ Actions	Comments and Information
Source: SM_Mode_Profile_By_Trackside:Current_Location:SM_Current_Location:Req_Current_Location Target: SM_Mode_Profile_By_Trackside:Current_Location:SM_Current_Location:Switch_Autorized_Waiting_Ack	1	Condition: Current_Mode = Level_And_Mode_Type s_Pkg::UN or Current_Mode = Level_And_Mode_Type s_Pkg::SN or Current_Mode = Level_And_Mode_Type s_Pkg::SR or Supervision_Modes Actions: emit 'Loc_Ack_Req_To_Driver;	
Source: SM_Mode_Profile_By_Trackside:Current_Location:SM_Current_Location:Req_Current_Location Target: SM_Mode_Profile_By_Trackside:Current_Location:SM_Current_Location:Waiting_Ack	2	Condition: Current_Mode = Level_And_Mode_Type s_Pkg::SB or Current_Mode = Level_And_Mode_Type s_Pkg::PT Actions: emit 'Loc_Ack_Req_To_Driver;	
Source: SM_Mode_Profile_By_Trackside:Current_Location:SM_Current_Location:Switch_Autorized_Waiting_Ack Target: SM_Mode_Profile_By_Trackside:Current_Location:SM_Current_Location:Switch_Mode_Confirmed	1	Condition: Driver_Ack_Mode_Profile Actions:	
Source: SM_Mode_Profile_By_Trackside:Current_Location:SM_Current_Location:Switch_Autorized_Waiting_Ack Target: SM_Mode_Profile_By_Trackside:Current_Location:SM_Current_Location:Ack_Not_Received	2	Condition: last 'Loc_Timer > Level_And_Mode_Type s_Pkg::C_Driver_Ack_Delay Actions:	
Source: SM_Mode_Profile_By_Trackside:Current_Location:SM_Current_Location:Waiting_Ack Target: SM_Mode_Profile_By_Trackside:Current_Location:SM_Current_Location:Switch_Mode_Confirmed	1	Condition: Driver_Ack_Mode_Profile Actions:	Comments: SRS § 5.7.4.2, 5.9.5.2, 5.19.5.2
Source: SM_Mode_Profile_By_Trackside:Fut her_location Target: SM_Mode_Profile_By_Trackside:Pro cedure_Off	1	Condition: not Procedure_Possible Actions:	

Source/Target	#	Conditions/ Actions	Comments and Information
Source: SM_Mode_Profile_By_Trackside:Fut her_location Target: SM_Mode_Profile_By_Trackside:Cur rent_Location	2	Condition: Loc_Mode_Profile_Con dition	Comments: SRS § 5.7.3.6,, 5.9.3.7, 5.19.3.7
Source: SM_Mode_Profile_By_Trackside:Fut her_location:SM_Futher_Location:R eq_Futher_Location Target: SM_Mode_Profile_By_Trackside:Fut her_location:SM_Futher_Location:S tart_Supervision	1	Condition: Supervision_Modes Actions:	Comments: SRS § 5.7.3.2,, 5.9.3.2, 5.19.3.2
Source: SM_Mode_Profile_By_Trackside:Fut her_location:SM_Futher_Location:S tart_Supervision Target: SM_Mode_Profile_By_Trackside:Fut her_location:SM_Futher_Location: Waiting_Ack	1	Condition: Loc_Supervision_Con dition_Covered Actions:	Comments: SRS § 5.7.3.2,, 5.9.3.2, 5.19.3.2
Source: SM_Mode_Profile_By_Trackside:Fut her_location:SM_Futher_Location: Waiting_Ack Target: SM_Mode_Profile_By_Trackside:Fut her_location:SM_Futher_Location:S witch_Mode_Confirmed	1	Condition: Driver_Ack_Mode_Profi le Actions:	
Source: SM_Mode_Profile_By_Trackside:Pro cedure_Off Target: SM_Mode_Profile_By_Trackside:Fut her_location	1	Condition: Procedure_Possible Actions:	
	1	Condition: Loc_Mode_Available and not Loc_Mode_Profile_Con dition	
Source: SM_Mode_Profile_By_Trackside:Pro cedure_Off Target: SM_Mode_Profile_By_Trackside:Cur rent_Location	1	Condition: Procedure_Possible Actions:	
	2	Condition: Loc_Mode_Available and Loc_Mode_Profile_Con dition	

Table 192: Conditional Blocks of diagram_Procedure_With_Mode_Profile_1

Conditional Block	Comments and Information
SM_Mode_Profile_By_Tracksi de:Current_Location:SM_Cur rent_Location:Switch_Autoriz ed_Waiting_Ack:IfBlock1	

Table 193: Actions of diagram_Procedure_With_Mode_Profile_1

Conditional Block Action	Comments and Information
SM_Mode_Profile_By_Trackside:Current_Location:SM_Current_Location:Switch_Authorized_Waiting_Ack:IfBlock1:then	
SM_Mode_Profile_By_Trackside:Current_Location:SM_Current_Location:Switch_Authorized_Waiting_Ack:IfBlock1:else:then	
SM_Mode_Profile_By_Trackside:Current_Location:SM_Current_Location:Switch_Authorized_Waiting_Ack:IfBlock1:else:else	

3.6.10. SH_Initiated_By_Driver_On Operator

Declared as **public node**

3.6.10.1. Interface

Table 194: Inputs of SH_Initiated_By_Driver_On

Name	Type	Comments and Information
Current_Level	M_LEVEL	
Driver_Req_SH	bool	
On_Going_Mission	bool	
Shunting_Granted_By_RBC	bool	

Table 195: Outputs of SH_Initiated_By_Driver_On

Name	Type	Properties		Comments and Information
Clean_BG_List_SH_Area	bool	default	false	
Condition5	bool	default	false	
Condition6	bool	default	false	
End_Of_Mission_Procedure_Req	bool	default	false	
SH_Refused_By_RBC_To_DMI	bool	default	false	
Request_For_SH_To_RBC	bool	default	false	

3.6.10.2. Locals

Table 196: Locals of SH_Initiated_By_Driver_On

Name	Type	Comments and Information
Loc_Level_2_3	bool	

3.6.10.3. Operator Hierarchy

diagram : diagram_SH_Initiated_By_Driver_On_1
state-machine : SM_SH_Initiated_By_Driver
state : Issue_SH_Request_L2_L3

state : SH_Authorized_L0_L1_LNTC
state : SH_Authorized_L2_L3
state : SH_procedure_possible

3.6.10.4. Graphical and Textual Diagrams

3.6.10.4.1. View of diagram_SH_Initiated_By_Driver_On_1 (SH_Initiated_By_Driver_On)

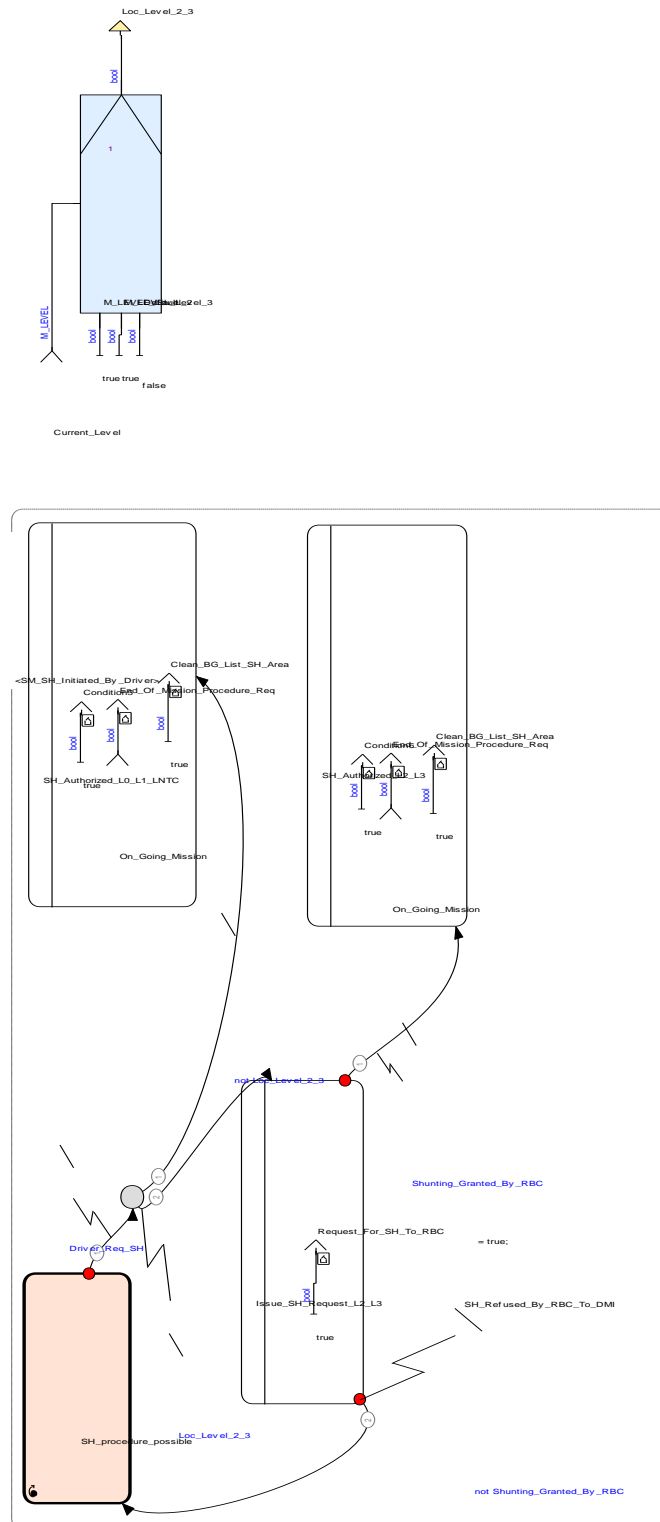


Figure 57: View of diagram_SH_Initiated_By_Driver_On_1 (SH_Initiated_By_Driver_On)

Table 197: State Machines of diagram_SH_Initiated_By_Driver_On_1

State Machine	Comments and Information
SM_SH_Initiated_By_Driver	

Table 198: States of diagram_SH_Initiated_By_Driver_On_1

State	Comments and Information
SM_SH_Initiated_By_Driver:Issue_SH_Request_L2_L3	Comments: SRS § 5.6 state A045 : Issue SH request
SM_SH_Initiated_By_Driver:SH_Authorized_L0_L1_LNTC	Comments: SRS § 5.6 state A050: Transition to SH SRS § 5.5.2.3 : Entry in SH mode as End Of Mission §4.6.3 : Condition 5 : "Train is at standstill AND ERTMS/ETCS level is 0 or NTC or 1 AND driver selects Shunting Mode"
SM_SH_Initiated_By_Driver:SH_Authorized_L2_L3	Comments: SRS § 5.6 state A050: Transition to SH SRS § 5.6 state D040: On going Mission SRS § 5.5.2.3 : Entry in SH mode as End Of Mission §4.6.3 : Condition 6 : "Train is at standstill AND ERTMS/ETCS level is 2 or 3 AND reception of the information "Shunting granted by RBC", due to a shunting request from the driver"
SM_SH_Initiated_By_Driver:SH_procedure_possible	Comments: SRS § 5.6 state S0

Table 199: Transitions of diagram_SH_Initiated_By_Driver_On_1

Source/Target	#	Conditions/Actions	Comments and Information
Source: SM_SH_Initiated_By_Driver:Issue_SH_Request_L2_L3 Target: SM_SH_Initiated_By_Driver:SH_Authorized_L2_L3	1	Condition: Shunting_Granted_By_RBC Actions:	Comments: SRS § 5.6 state E09 : SH Authorized
Source: SM_SH_Initiated_By_Driver:Issue_SH_Request_L2_L3 Target: SM_SH_Initiated_By_Driver:SH_procedure_possible	2	Condition: not Shunting_Granted_By_RBC Actions: SH_Refused_By_RBC_To_DMI = true;	Comments: SRS § 5.6 state E215 : transition SH refused
Source: SM_SH_Initiated_By_Driver:SH_procedure_possible Target: SM_SH_Initiated_By_Driver:SH_Authorized_L0_L1_LNTC	1	Condition: Driver_Req_SH Actions:	Comments: SRS § 5.6 state E015 transition : Driver selects shunting
	1	Condition: not Loc_Level_2_3 Actions:	
Source: SM_SH_Initiated_By_Driver:SH_procedure_possible Target: SM_SH_Initiated_By_Driver:Issue_SH_Request_L2_L3	1	Condition: Driver_Req_SH Actions:	Comments: SRS § 5.6 state E015 transition : Driver selects shunting
	2	Condition: Loc_Level_2_3 Actions:	Comments: D020 : Level 2 or 3

End of document.