Research & Vehicle Technology
"Infotainment Systems Product Development"

Feature – Vehicle Settings

APIM Infotainment Subsystem Part Specific Specification (SPSS)

Version 1.19

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Version Date: October 30, 2019

FORD CONFIDENTIAL

Revision History

Date	Version	Notes	
May 30, 2013	**1.0**	**Initial Release**	
October 24, 2013	**1.1**		
	VS-GREQ-304479-Network connection password failure (HMI)		bjohns69 - New Requirement
	VS-GREQ-304480-Network connection using WPS-push button (HMI)		bjohns69 - New Requirement
	VS-GREQ-304481-Network connection using WPS-PIN (HMI)		bjohns69 - New Requirement
	VS-GREQ-304482-Wi-Fi direct feature control (functional)		bjohns69 - New Requirement
	VS-GREQ-304483-Wi-Fi direct configuration parameters (functional)		bjohns69 - New Requirement
	VS-GREQ-304484-Wi-Fi direct connection options (HMI)		bjohns69 - New Requirement
	VS-GREQ-304485-Wi-Fi direct outgoing (HMI)		bjohns69 - New Requirement
	VS-GREQ-304486-Wi-Fi direct incoming (HMI)		bjohns69 - New Requirement
	VS-GREQ-304487-Wi-Fi network availability notification (functional)		bjohns69 - New Requirement
	VS-GREQ-304488-Wi-Fi network availability notification (HMI)		bjohns69 - New Requirement
	VS-GREQ-304489-Wi-Fi Network connectivity status (HMI)		bjohns69 - New Requirement
	VS-GREQ-304490-WEP/WPA Security Keys/Passwords		bjohns69 - New Requirement
	VS-GREQ-304491-Security keys (HMI)		bjohns69 - New Requirement
March 14, 2014	**1.2**		
	AS-GREQ-050371- Automatic Software Update		bjohns69 - New Requirement
	VS-GREQ025326-Wi-Fi network availability notification (HMI)		bjohns69 – Revise Requirement
	VS-GUC-291869 - Configure Automatic Software Update		bjohns69 - New Use Case
	VS-UC-REQ-025261/B-The user would like to search/rescan/refresh the list of Wi-Fi direct compatible device(TcSE ROIN-291844)		bjohns69 - Revise Use Case
	VS-FUR-REQ-052061/A-Automatic Software Update, trigger 1		bjohns69 - New Requirement
	VS-FUR-REQ-052062/A-Automatic Software Update, trigger 2		bjohns69 - New Requirement
	VS-FUR-REQ-052063/A-Automatic Software Update, trigger 3		bjohns69 - New Requirement
	VS-FUR-REQ-052064/A-Automatic Software Update, trigger 4		bjohns69 - New Requirement
	VS-FUR-REQ-052065/A-Wi-Fi Signal Strength Presentation		bjohns69 - New Requirement
	VS-FUR-REQ-025294/B-Wi-Fi chip power state requirements(TcSE ROIN-296184-1)		bjohns69 - New Requirement
	VS-FUR-REQ-052066/A-Wi-Fi Keep last Wi-Fi mode after ignition		bjohns69 - New Requirement
	VS-FUR-REQ-025326/B-Wi-Fi network availability notification (HMI)(		bjohns69 – Revise Requirement
May 9, 2014	**1.3**		
	MD-REQ-023414/B-CntrStk_D_RqAssoc (TcSE ROIN-284870-1)		bjohns69 – Added new literal for Cancel Keypad Code.
	VS-SD-REQ-086469/A-Cancel Keypad Code Edit		bjohns69 – Initial Release - Added new sequence diagram for Cancel Keypad Code
	VS-UC-REQ-025253/B-User would like to see a list of Wi-Fi network(s) within range of their current location (TcSE ROIN-291836)		bjohns69 – Modified Use Case
	VS-UC-REQ-025282/B-User ignores the Network availability notification (TcSE ROIN-291865)		bjohns69 – Revised scenario description and post-condition for trigger. Added “conditions that triggered it change.”
	VS-FUR-REQ-025326/B-Wi-Fi network availability notification (HMI) (TcSE ROIN-304488)		bjohns69 – Revised to focus on trigger conditions are met and icon display on screen. Two minute time out was changed.

	VS-UC-REQ-025264/B-User Wi-Fi network(s) availability notification based on analytics X (TcSE ROIN-291847)	bjohns69 - Changed the scenario description and post conditions. Revised psot condition, "The user may act on this notification by searching and selecting a network to connect to. "
	VS-UC-REQ-025283/A-User dismiss/ deletes the Network availability notification (TcSE ROIN-291866)	bjohns69 - removed Use Case
	VS-FUR-REQ-086700/A-Wi-Fi network availability notification Default Setting (functional)	bjohns69 - Added a requirement to clarify the trigger for "network availability notification" feature
	VS-FUR-REQ-086699/A-Wi-Fi Network Availability Notification trigger (Functional)	bjohns69 - Added a requirement to clarify the default setting for the "network availability notification" feature
	VS-FRD-REQ-025441/B-Vehicle Settings (CGEA) (TcSE ROIN-293313-1)	bjohns69 - New release for changes to
August 18, 2014	**1.4**	
	VS-UC-REQ-025259/B-User would like to find more information about the Wi-Fi network currently connected (TcSE ROIN-291842)	bjohns69 - Modified Use Case text
	VS-UC-REQ-025267/B-User would like to know his/her current Wi-Fi network connectivity status while away from the Wi-Fi settings HMI (TcSE ROIN-291850)	bjohns69 - Revise Use Case
	VS-FUR-REQ-052061/A-Automatic Software Update, trigger 1	bjohns69 - Added new Use Case
	VS-FUR-REQ-025325/B-Wi-Fi network availability notification (functional) (TcSE ROIN-304487)	bjohns69 - Added to requirement. "The option is only available when the Wi-Fi feature is ON."
	VS-FUN-REQ-093981/A-Charge Port Cable Unlock	bjohns69 - Added new function.
	VS-UC-REQ-093980/A-Unlock Charge Port Cord	bjohns69 - New use case to add unlock charge port cable connector.
	VS-ACT-REQ-093982/A-Unlock Charge Port Cord	bjohns69 - Added new Activity Diagram.
	VS-SD-REQ-093983/A-Unlock Charge Port Cord	bjohns69 - Added new sequence Diagram.
	VS-SD-REQ-023442/B-Set Keypad Code for current user (TcSE ROIN-129661-2)	bjohns69 - Modified diagram to clarify signal literals.
	VS-SD-REQ-023443/B-Erase Keypad Code from current user (TcSE ROIN-129691-1)	bjohns69 - Modified diagram to clarify signal literals.
November 12, 2014	**1.5**	**Updates for 12/24, added Valet Mode and Charge Port Cable Unlock**
	VS-FUN-REQ-096818/A-Set Valet Mode	bjohns69 - New Function for Valet Mode
	VS-UC-REQ-096810/A-Set Valet Mode	bjohns69 - New use case to activate valet mode.
	VS-ACT-REQ-096820/A-Set Valet Mode	bjohns69 - Added new activity diagram for Valet Mode
	VS-SD-REQ-097279/A-Set Valet Mode	bjohns69 - Sequence Diagram for Valet Mode
	VS-FUN-REQ-025228/B-Ambient Lighting- Set Intensity (TcSE ROIN-292320-1)	BJOHNS69 - Added new requirement to explain HMI interface.
	VS-HMI-REQ-097951/A-Ambient Lighting Intensity	BJOHNS69 - Added new requirement to explain HMI interface.
	VS-FUN-REQ-025239/B-Set 12/24 hour mode setting (TcSE ROIN-292339-1)	rpaquet2 - Added new requirements to clarify how to implement 12/24 hour mode setting.
	VS-SR-REQ-099559/A-12/24 Hour Status Storage	rpaquet2 - Added new requirement to cover what some modules are doing and provide direction to remaining modules on how to handle error.
	VS-SR-REQ-099560/A-12/24 Hour Default Setting	rpaquet2 - Added new requirement to cover what some modules are doing and provide direction to remaining modules on how to handle error.
	VS-SR-REQ-099558/A-12/24 Hour Mode Error Handling	rpaquet2 - Added new requirement to cover what some modules are doing and provide direction to remaining modules on how to handle error.
	VS-SD-REQ-023442/B-Set Keypad Code for current user (TcSE ROIN-129661-2)	bjohns69 - Modified diagram to clarify correct signal literals.
	VS-SD-REQ-023443/B-Erase Keypad Code from current user (TcSE ROIN-129691-1)	bjohns69 - Modified diagram to clarify correct signal literals.
	VS-FUN-REQ-093981/A-Charge Port Cable Unlock	bjohns69 - Added new function.
	VS-UC-REQ-093980/A-Unlock Charge Port Cord	bjohns69 - New use case to add unlock charge port cable connector.
	VS-ACT-REQ-093982/A-Unlock Charge Port Cord	bjohns69 - Added new Activity Diagram.
	VS-SD-REQ-093983/A-Unlock Charge Port Cord	bjohns69 - Added new sequence Diagram.
	VS-FUR-REQ-104343/A-Valet Mode Infotainment Operation	<jmyslin2 / Karensa Ruffin> New requirement for Valet Mode
December 9, 2014	**1.6**	

	VS-FUR-REQ-115767/A-Manual Disconnection	<Hanan Ahmed> New requirement for Manual Disconnecting
December 16, 2014	**1.7**	
January 16, 2015	**1.8**	**Implementation of fixes for ambient lighting**
	VS-SR-REQ-117709/A-Turning ON and OFF Ambient Lighting	<jmyslin2 / aaldalla> Updated ambient lighting requirement for how to turning ON and OFF ambient lighting
	MD-REQ-025388/B-LightAmbColor_No_Rq (TcSE ROIN-297407)	<jmyslin2> Updated so that 0x00 is Invalid / NoDataExits from OFF so this doesn't cause a reset to OFF at start-up with the init value 0x0
	MD-REQ-025389/B-LightAmbIntsty_No_Rq (TcSE ROIN-297420)	<jmyslin2> Update requirement to match what is already in production where 0x0 0% intensity also means Ambient Lighting OFF
	MD-REQ-025388/B-LightAmbColor_No_Rq (TcSE ROIN-297407)	<jmyslin2> Updated so that 0x00 is Invalid / NoDataExits from OFF so this doesn't cause a reset to OFF at start-up with the init value 0x0
	MD-REQ-025389/B-LightAmbIntsty_No_Rq (TcSE ROIN-297420)	<jmyslin2> Update requirement to match what is already in production where 0x0 0% intensity also means Ambient Lighting OFF
	VS-SR-REQ-117709/C-Turning ON and OFF Ambient Lighting	<jmyslin2> Updated strategy for Turning ON and OFF Ambient Lighting
	VS-FUR-REQ-104343/B-Valet Mode Infotainment Operation	<KRuffin / Jmyslin2> added additional clarifications to the valet mode requirement regarding maintaining its valet mode state
January 30, 2015	**1.9**	
	VS-FUR-REQ-052065/B-Wi-Fi Signal Strength Presentation	<Hanan Ahmed> Updated Requirement
March 17, 2015	**1.10**	
	VS-UC-REQ-025207/B-Set Language (TcSE ROIN-290599)	<jmyslin2> Clarified language use case
	VS-UC-REQ-025208/B-Selected Language not available on both Displays (TcSE ROIN-290600)	<jmyslin2> Updated the Language Use Case
	VS-SR-REQ-025209/B-Language Truth Table (TcSE ROIN-141542-3)	<jmyslin2> added clarifications to the requirement
	VS-FUR-REQ-052065/B-Wi-Fi Signal Strength Presentation	<Hanan Ahmed> Updated Requirement
	VSv2-FUN-REQ-131582/A-Charge Cord Unlock	<Karensa Ruffin / Jason Myslinski> Updated Charge Cord Unlock. New Function
	VS-UC-REQ-130593/A-Unlock Charge Cord from Centerstack	<K. Ruffin / Ryan Skaff / J. Myslinski> New Charge Cord Unlock Use Case
	VS-UC-REQ-130595/A-User tries to access Centerstack Charge Car Unlock HMI when Not in Run	<K. Ruffin / Ryan Skaff / J. Myslinski> New Charge Cord Unlock Use Case
	VS-UC-REQ-130596/A-Charge Cord Centerstack HMI when Ignition changes out of Run to OFF or Accessory	<K. Ruffin / Ryan Skaff / J. Myslinski> New Charge Cord Unlock Use Case
	VS-UC-REQ-130598/A-User tries to Unlock from the Centerstack but Charge Cord is Not Unlocked	<K. Ruffin / Ryan Skaff / J. Myslinski> New Charge Cord Unlock Use Case
	VS-UC-REQ-130653/A-Charging Completes	<K. Ruffin / Ryan Skaff / J. Myslinski> New Charge Cord Unlock Use Case
	VS-UC-REQ-130654/A-Charge Cord is Not Connected	<K. Ruffin / Ryan Skaff / J. Myslinski> New Charge Cord Unlock Use Case
	VS-UC-REQ-130656/A-User selects Unlock from Hard Button	<K. Ruffin / Ryan Skaff / J. Myslinski> New Charge Cord Unlock Use Case
	VS-SR-REQ-135143/A-Language following a B+ reset to Language Servers	<jmyslin2> added requirement on B+ reset to modules
	VS-FUR-REQ-136296/A-Master Reset Language	<jmyslin2> New requirement for Master Reset and Language
	VS-UC-REQ-025254/C-User would like to find out more information about a Wi-Fi network (TcSE ROIN-291837)+	<Hanan Ahmed> removed WEP and added Fair for signal strength description.
	VS-UC-REQ-025257/B-User would like to connect to a Wi-Fi Network using Wi-Fi Protected Setup (WPS) using the router's WPS Push-Button-Method (TcSE ROIN-291840)	<Hanan Ahmed> Editorial changes; wps should be wi-fi protected setup
	VS-UC-REQ-025259/C-User would like to find more information about the Wi-Fi network currently connected (TcSE ROIN-291842)+	<Hanan Ahmed> deleted WEP and added "Fair" option for signal strength description
	VS-UC-REQ-025260/B-User would like to see a list of Wi-Fi direct devices within range of their current location (TcSE ROIN-291843)+	<Hanan Ahmed> deleted use case "to list wifi direct devices"

	VS-UC-REQ-025261/C-The user would like to search/rescan/refresh the list of Wi-Fi direct compatible device (TcSE ROIN-291844)	<Hanan Ahmed> deleted refresh for wifi direct devices
	VS-UC-REQ-025262/B-The user would like to connect to a Wi-Fi direct compatible device (outgoing) (TcSE ROIN-291845)	<Hanan Ahmed> deleted wifi direct related use case
	VS-UC-REQ-025263/B-The user would like to accept/decline to connect to a Wi-Fi direct compatible device (incoming) (TcSE ROIN-291846)	<Hanan Ahmed> deleted wifi direct use case
	VS-UC-REQ-025274/B-WPS association time expires (TcSE ROIN-291857)	<Hanan Ahmed> editorial; changed wifi protected security to wifi protected setup
	VS-UC-REQ-025275/B-System's WPS Random PIN message expires (TcSE ROIN-291858)	<Hanan Ahmed> editorial; changed wifi protected security to wifi protected setup
	VS-UC-REQ-025277/B-No Wi-Fi Direct capable devices available (TcSE ROIN-291860)	<Hanan Ahmed> deleted wifi direct related use case
	VS-UC-REQ-025278/B-No New Wi-Fi Direct capable devices available after refresh (TcSE ROIN-291861)	<Hanan Ahmed> deleted wifi direct related use case
	VS-FUR-REQ-025291/B-GPS location accuracy (TcSE ROIN-296181-1)	<Hanan Ahmed> removed the requirement
	VS-FUR-REQ-025300/B-Wi-Fi client configuration parameters (TcSE ROIN-296190-1)+	<Hanan Ahmed> deleted WEP
	VS-FUR-REQ-025303/B-Wireless network(s) information APIs (TcSE ROIN-296193-1)	<Hanan Ahmed> deleted GPS coordinates from the requirement
	VS-FUR-REQ-025306/B-Wireless network Functionality (TcSE ROIN-296196-1)	<Hanan Ahmed> deleted WEP and power configuration. made the requirements specific to plant provisioning
	VS-FUR-REQ-025312/B-Security Keys/Password support (TcSE ROIN-296202-1)+	<Hanan Ahmed> removed WEP
	VS-FUR-REQ-025314/B-Wi-Fi alliance security profiles & WPS certification (TcSE ROIN-296204-1)+	<Hanan Ahmed> deleted WEP
	VS-FUR-REQ-025314/C-Wi-Fi alliance security profiles & WPS certification (TcSE ROIN-296204-1)	<Hanan Ahmed> WEP security support is limited to client mode, AP mode does not support WEP security
	VS-FUR-REQ-025321/B-Wi-Fi direct configuration parameters (functional) (TcSE ROIN-304483)	<Hanan Ahmed> deleted wifi direct requirement
	VS-FUR-REQ-025322/B-Wi-Fi direct connection options (HMI) (TcSE ROIN-304484)	<Hanan Ahmed> deleted wifi direct interface requirement
	VS-FUR-REQ-134635/A-AAAA	<Hanan Ahmed>new requirement
	VS-FUR-REQ-025327/B-Wi-Fi Network connectivity status (HMI) (TcSE ROIN-304489)	<Hanan Ahmed> deleted requirement part on icon for different wifi modes
	VS-FUR-REQ-025328/B-WEP/WPA Security Keys/Passwords (TcSE ROIN-304490)+	<Hanan Ahmed> deleted WEP security
	VS-FUR-REQ-025329/B-Security keys (HMI) (TcSE ROIN-304491)	<Hanan Ahmed> deleted HMI requirements for AP mode
December 9, 2015	**1.11**	
	VS-SR-REQ-193890/A-Enhanced Memory - Language for Active Personality Profile	<jmyslin2> New requirement to support Enhanced Memory for Languages
	ENMEM-REQ-105569/B-Driver Profiles Deleted During Master Reset+	<jmyslin2> Master Reset requirement for when there is enhanced memory.
	ENMEM-REQ-105569/C-Driver Profiles Deleted During Master Reset	cwu3: Rephrased to clarify confusion. Deleted repeated statements of other requirement to make this requirement unique.
	VSv2-FUN-REQ-192195/A-Ambient Lighting - Variant 2	<jmyslin2> Updated Ambient Lighting Variant 2 which would be used whenever Enhanced Memory is supported it would be configured ON. It could be used when enhanced memory is not on a vehicle too if supplier is configured for it (only if BCM on vehicle supports too).
April 12, 2016	**1.12**	
	MD-REQ-025377/B-Disp_LangSel.Rq (TcSE ROIN-297357)+	<jmyslin2> Updated to add Thai and Indian English
	MD-REQ-025450/B-Disp_LangSel.St (TcSE ROIN-297360)+	<jmyslin2> updated to add Indian English and Thai
	MD-REQ-025450/B-Disp_LangSel.St (TcSE ROIN-297360)+	<jmyslin2> updated to add Indian English and Thai
	MD-REQ-025377/B-Disp_LangSel.Rq (TcSE ROIN-297357)+	<jmyslin2> Updated to add Thai and Indian English

	VS-UC-REQ-025349/B-Master Reset (TcSE ROIN-296294)	<jmyslin2> No impact to SYNC Gen 3 but updating use case since AHU will now use SDARS_FactoryReset_Rq signal to also setting the audio settings to the default settings
	VS-SR-REQ-015044/C-Master Reset request to the infotainment components (TcSE ROIN-174375-1)+	<jmyslin2> There is no change to SYNC Gen 3 so update for clarification only since SYNC Gen 3 sends FactoryReset_Rq = RestoreFactoryDefaults whenever a master reset is initiated. The AHU will now also reset the Audio Settings (ex Bass, Treble, Balance etc.) when FactoryReset_Rq = RestoreFactoryDefaults in addition to resetting SDARS.
	VS-SR-REQ-213252/B-Master Reset request to the TCU (Telematic Control Unit)	<jmyslin2 / aaldalla> Updated for master reset and sending the factory reset signal to the TCU
May 6, 2016	**1.13**	
	MD-REQ-025377/D-Disp_LangSel.Rq (TcSE ROIN-297357)+	<JM> Updated so support new strategy for language request signals since the old CAN signals maxed out on size
	MD-REQ-025377/J-Disp_LangSel.Rq (TcSE ROIN-297357)	<jmyslin2> <jmyslin2> language strategy updates with two signals
	MD-REQ-025450/D-Disp_LangSel.St (TcSE ROIN-297360)+	<JM> Updated the Language Status signal strategy
	MD-REQ-025450/K-Disp_LangSel.St (TcSE ROIN-297360)	<jmyslin2> language strategy updates with two signals
	MD-REQ-025450/D-Disp_LangSel.St (TcSE ROIN-297360)+	<JM> Updated the Language Status signal strategy
	MD-REQ-025450/K-Disp_LangSel.St (TcSE ROIN-297360)	<jmyslin2> language strategy updates with two signals
	MD-REQ-025377/D-Disp_LangSel.Rq (TcSE ROIN-297357)+	<JM> Updated so support new strategy for language request signals since the old CAN signals maxed out on size
	MD-REQ-025377/J-Disp_LangSel.Rq (TcSE ROIN-297357)	<jmyslin2> <jmyslin2> language strategy updates with two signals
October 5, 2016	**1.14**	
	VS-FUN-REQ-025246/D-Charge Port Light Ring (TcSE ROIN-292385-1)	<Karensa Harkins / jmyslin2> Updated Charge Port Light Ring with Variant 2 CAN signal so SYNC can send the right signal depending on what Variant it is configured for
	VS-SR-REQ-238151/A-ChargePortLightRing_St signal	<Karensa Harkins / jmyslin2> New requirement for Charge Port Light Ring since the Client will now have two different CAN signals it can send depending on the vehicle
	ENMEM-REQ-105569/D-Driver Profiles Deleted During Master Reset	MBORREL4: Updated to include PaaK
	VS-FUR-REQ-104343/C-Valet Mode Infotainment Operation+	<Jmyslin2> Updated for Valet Mode for receivers of the Valet Mode CAN signal
February 2, 2017	**1.15**	
	VS-SR-REQ-025225/E-Ambient Lighting - Color Change Request Latency (TcSE ROIN-141572-1)	<jmyslin2> Clarification to Ambient Lighting requirement
	VS-SR-REQ-025230/D-Ambient Lighting - Intensity Change Request Latency (TcSE ROIN-141573-1)	<jmyslin2> Clarification to Ambient Lighting requirement
November 16, 2018	**1.16**	
	VS-FRD-REQ-025441/D-Vehicle Settings (CGEA) (TcSE ROIN-293313-1)	<jmyslin2> added General Requirement which would be needed for APIM 4.2 if the Cluster is integrated in the APIM
	MD-REQ-243934/B-Disp_Miles_Kilometers.St	<jmyslin2> Clarification only
	MD-REQ-025516/C-DISP_Miles_Kilometers_Rq (TcSE ROIN-273811)	sberg15: editorial changes only. No content change.
	MD-REQ-276458/A-Vehicle_Speed.St+	<jmyslin2> created MD
	MD-REQ-276458/B-Vehicle_Speed.St	<jmyslin2> MD clarification
	MD-REQ-276459/A-Vehicle_Speed_QF	<jmyslin2> created MD
	MD-REQ-213361/C-FactoryReset_Rq	<jmyslin2> Clarification only, no change to modules
	MD-REQ-222036/B-FactoryReset.St	<jmyslin2> Updated MD with clarification only - no change that would cause a module change
	MD-REQ-025377/M-Disp_LangSel.Rq (TcSE ROIN-297357)+	<jmyslin2> Clarified requirement for error condition on what to do with receiving two language requests when should not be
	MD-REQ-025377/N-Disp_LangSel.Rq (TcSE ROIN-297357)	<jmyslin2> clarification on sending the same language twice
	MD-REQ-025452/B-LanguageUpdate.Rsp (TcSE ROIN-297376)	<jmyslin2> grammar update only. No content change
	MD-REQ-025379/B-Bezel_Beeps.Rq (TcSE ROIN-297362)	<jmyslin2> added clarificatin to signal MD. No content change
	MD-REQ-025385/B-Bezel_Beeps.St (TcSE ROIN-297423)	<jmyslin2> Clarification only to signal MD. No content change to MD

MD-REQ-025386/B-Bezel_Beeps_Supported.St (TcSE ROIN-297429)	<jmyslin2> added clarification to signal MD. No content change
MD-REQ-025381/B-TimeAdjust.Rq (TcSE ROIN-297370)	<jmyslin2> updated grammer. No content change
MD-REQ-025462/B-VehTimeFormat.St (TcSE ROIN-297375)	<jmyslin2> Grammar update only. No content change
MD-REQ-097285/C-ValetMode_St	<jmyslin2> grammer update. No content change
MD-REQ-025380/B-Disp_Temperature.Rq (TcSE ROIN-297369)	<jmyslin2> Gammar updates. No content change
MD-REQ-025453/B-Disp_Temperature.St (TcSE ROIN-297374)	<jmyslin2> Grammar updates only. No content change
MD-REQ-025388/C-LightAmbColor_No_Rq (TcSE ROIN-297407)	<jmyslin2> Grammar change only. No content change
MD-REQ-025389/C-LightAmbIntsty_No_Rq (TcSE ROIN-297420)	<jmyslin2> Grammar updates. No content change
MD-REQ-025456/D-LightAmbColor_No_Actl (TcSE ROIN-297421)	<jmyslin2> Grammar updates. No content change
MD-REQ-025457/D-LightAmbIntsty_No_Actl (TcSE ROIN-297422)	<jmyslin2> grammar updates. No content change
MD-REQ-192193/C-LightAmbColor_No_Actl - Variant 2	<jmyslin2> Grammar updates. No content change
MD-REQ-192194/C-LightAmbIntsty_No_Actl - Variant 2	<jmyslin2> Grammar updates. No content change
MD-REQ-192189/B-LightAmbColor_No_Rq - Variant 2	<jmyslin2> Grammar updates. No content change
MD-REQ-192190/B-LightAmbIntsty_No_Rq - Variant 2	<jmyslin2> Grammar updates only. No content change
MD-REQ-023414/C-CntrStk_D_RqAssoc (TcSE ROIN-284870-1)	<jmyslin2> added clarifications. No content change
MD-REQ-023415/B-CntrStkKeycodeActl (TcSE ROIN-284871-1)	<jmyslin2> Updated with code BCM uses to decode the signal
MD-REQ-023425/B-AssocConfirm_D_Actl (TcSE ROIN-284863-1)	<jmyslin2> update text. No content change
MD-REQ-093985/B-ChargePortUnlock_Rq	<jmyslin2> grammar updates. No content change
MD-REQ-132658/B-ChrgCrdLck_D_Stat	<jmyslin2> Change signal type to MD. No content change
VS-IIR-REQ-276699/A-Logical Signal mapping to CMDB - Vehicle Settings / Settings in Centerstack+	<jmyslin2> Power Management logical signal mapping table r
VS-IIR-REQ-276699/B-Logical Signal mapping to CMDB - Vehicle Settings / Settings in Centerstack+	<jmyslin2> Work in Progress
VS-IIR-REQ-276699/C-Logical to Physical CAN signal mapping - Vehicle Settings / Settings in Centerstack+	<jmyslin2> Work in Progress
VS-IIR-REQ-276699/D-Logical to Physical CAN signal mapping - Vehicle Settings / Settings in Centerstack+	<Jmyslin2> added VDM FBMP signals
VS-IIR-REQ-276699/E-Logical to Physical CAN signal mapping - Vehicle Settings	<jmyslin2> added VDM and CCM Feature.St signals
VS-CLD-REQ-025448/D-Keypad Server / External Personalization Function (TcSE ROIN-293526-1)	<jmyslin2> updated name, no content change
VS-CLD-REQ-025447/D-Keypad Client / Personalization Client (TcSE ROIN-293524-1)	<jmyslin2> Updated name, no content change
VS-CLD-REQ-025442/B-Vehicle Settings Client (TcSE ROIN-141546-2)	<jmyslin2> Removed deleted requirement 025432. No content change
VS-CLD-REQ-025443/B-Vehicle Settings Server (TcSE ROIN-141547-2)	<jmyslin2> Moved 025434 to Distance function
STR-076407/C-Functional Definition (TcSE ROIN-293395)	<jmyslin2> No content change. Grouped Ambient Lighting to make more clear
VS-FUN-REQ-025206/C-Set Language (TcSE ROIN-292323-1)	<jmyslin2> added signal MD's to function
VS-SR-REQ-193890/B-Enhanced Memory - Language for Active Personality Profile	<jmyslin2> Added clarification for B+ resets
VS-FUN-REQ-025213/C-Set Distance Units (TcSE ROIN-292327-1)	<jmyslin2> added Distance interface MD's - no content change
VS-FUN-REQ-025218/C-Set Temperature Units (TcSE ROIN-292331-1)	<jmyslin2> added MD's in interface Requirement for Temperature
VSv2-FUN-REQ-025223/C-Ambient Lighting- Set Color (TcSE ROIN-292314-1)	<jmyslin2> added MD's, no content change
VSv2-FUN-REQ-025228/C-Ambient Lighting- Set Intensity (TcSE ROIN-292320-1)	<jmyslin2> added MD's, no content change
VS-FUN-REQ-025233/C-Touch Panel Beeps Settings (TcSE ROIN-292335-1)	<jmyslin2> added MD's, no content change
VS-FUN-REQ-025239/C-Set 12/24 hour mode setting (TcSE ROIN-292339-1)	<jmyslin2> added MD, no content change
VS-FUN-REQ-025246/E-Charge Port Light Ring (TcSE ROIN-292385-1)	<jmyslin2>moved MD, no content change
VSv2-FUN-REQ-131582/B-Charge Cord Unlock	<jmyslin2> Charge Cord Unlock

	VS-SD-REQ-132666/B-Unlock Charge Port from Infotainment HMI	<jmyslin2> updated sequence diagram to use the correct name for the request signal. No content change
	VS-FUN-REQ-023435/C-Edit Keypad Code (TcSE ROIN-284424-1)	<jmyslin2> Added MD, no content change
	VSv2-FUN-REQ-331323/A-Edit Keypad Code - Variant 2	<jmyslin2>Updated KeyPad interface. Needed for 7 button press keypads and supports 5 digit keypad
	MD-REQ-331324/A-CntrStk2_D_RqAssoc	<jmyslin2> added clarifications. No content change
	MD-REQ-330676/A-KeyPadCodeDgtX_D_Stat	<jmyslin2> New requirement, supports 7 button press keypad
	VS-UC-REQ-331327/A-Set Keypad Code for Current User	<jmyslin2> New use case for Keypad variant 2
	VS-UC-REQ-331328/A-Erase Keypad Code from Current User	<jmyslin2> New use case for Keypad variant 2
	VS-UC-REQ-331329/A-Invalid Keypad Code Entry	<jmyslin2> New use case for Keypad variant 2
	VS-UC-REQ-331330/A-Invalid Duplicate Keypad Code Entry	<jmyslin2> New use case for Keypad variant 2
	VS-UC-REQ-331331/A-Cancel Keypad Set Process	<jmyslin2> New use case for Keypad variant 2
	VS-SR-REQ-331337/A-Keypad Client supporting both Variant 1 and Variant 2 request signals at the same time	<jmyslin2> new keypad requirement
	VS-SR-REQ-331338/A-Number of digits in Keycode	<jmyslin2> New requirement for Keypad Variant 2
	VS-SD-REQ-331333/A-Set Keypad Code for current user	<jmyslin2> New sequence diagram for Keypad variant 2
	VS-SD-REQ-331334/A-Erase Keypad Code from current user	<jmyslin2> New sequence diagram for Keypad variant 2
	VS-SD-REQ-331335/A-Cancel Keypad Code Edit	<jmyslin2> New sequence diagram for Keypad variant 2
	VS-FUN-REQ-025341/D-Master Reset to Factory Defaults - APIM (TcSE ROIN-296290-1)	<jmyslin2> added MD's, no content change
	VS-FUN-REQ-096818/D-Set Valet Mode	<jmyslin2> added MD's, no content change
	STR-076408/B-Appendix: Reference Documents (TcSE ROIN-293422)	<jmyslin2> added reference specs. No content change
February 1, 2019	**1.17**	
	STR-180687/E-Interface Requirements	<jmyslin2> added MD's for new functions
	MD-REQ-338982/A-LongTermReset_B2_Rq	<jmyslin2> New MD for Long Term Reset setting
	MD-REQ-341180/A-BattTracLoThres_D_Stat	<jmyslin2> New MD for Low Battery Alert status signal
	MD-REQ-341183/A-BattTracLoThres_D_Rq	<jmyslin2> New MD for Low Battery Alert request signal
	MD-REQ-341190/A-SpeedoMajorUnit_D_Confg	<jmyslin2> New MD for Low Battery Alert status signal
	MD-REQ-339666/A-PrplSnd_D_Rq	<jmyslin2> New MD for Propulsion Sound request setting
	MD-REQ-339747/A-PrplSnd_D_Stat	<jmyslin2> New MD for Propulsion Sound status signal
	MD-REQ-339730/A-LghtAmbDrvMde_D_Rq	<jmyslin2> New MD for Ambient Lighting Auto/Manual Drive Mode request
	MD-REQ-340538/A-LghtAmbDrvMde_B_Stat	<jmyslin2> New MD for Ambient Lighting Auto/Manual Drive Mode status
	VS-IIR-REQ-276699/F-Logical to Physical CAN signal mapping - Vehicle Settings	<jmyslin2> added new signals
	VS-FUN-REQ-334503/A-Drive History Reset	<jmyslin2> New Function for Drive History setting
	VS-CLD-REQ-339750/A-Drive History Client	<jmyslin2> New Class Description for Drive History Client
	VS-CLD-REQ-342947/A-Drive History Server	<jmyslin2> New class description for Drive History Server
	VS-SR-REQ-334504/A-Drive History Reset	<jmyslin2> New requirement for Drive History
	VS-CLD-REQ-341184/A-Low Battery Alert Client	<jmyslin2> New class description for Low Battery Alert Client
	VS-CLD-REQ-341185/A-Low Battery Alert Server	<jmyslin2> new class description for low battery alert server
	VS-REQ-341338/A-Low Battery Alert Server functional requirement	<jmyslin2> New Low Battery Alert Server requirement
	VS-REQ-341290/A-Low Battery Alert Client functional requirement	<jmyslin2> New Low Battery Alert Client functional requirement
	VS-HMI-REQ-342159/A-HMI display options for Low Battery Alert - Low Battery Alert Client	<jmyslin2> HMI requirement for display options
	VS-SR-REQ-341887/A-Selecting a Low Battery Alert Setting via the HMI	<jmyslin2> New requirement for setting Low Battery Alert via the HMI
	VS-SR-REQ-341178/A-Mapping Table - Speedometer Major Units	<jmyslin2> Added requirement for Cluster speedometer major units
	VS-SD-REQ-341844/A-Low Battery Alert Setting Selection	<jmyslin2> new sequence diagram for selecting a Low Battery Alert setting
	VS-FUN-REQ-339665/A-Propulsion Sound	<jmyslin2> New Function for propulsion sound setting
	VS-CLD-REQ-339751/A-Propulsion Sound Client	<jmyslin2> New class description for propulsion sound client
	VS-CLD-REQ-339752/A-Propulsion Mode Server	<jmyslin2> new class description for the propulsion mode server
	VS-UC-REQ-340217/A-User Enables Propulsion Sound Setting	<jmyslin2> new use case for enabling propulsion sound

	VS-UC-REQ-340218/A-User Disables Propulsion Sound Setting	<jmyslin2> use case for disabling propulsion sound
	VS-SR-REQ-339667/A-Propulsion Sound Client requesting change to propulsion sound	<jmyslin2> New requirement for Propulsion Sound
	VS-TMR-REQ-339748/A-T_PrplSnd_Rsp	<jmyslin2> added timing for propulsion sound setting request and response
	VS-SD-REQ-340180/A-Propulsion Sound set to Enabled via the HMI	<jmyslin2> Propulsion Sound Enabled sequence diagram
	VS-SD-REQ-340184/A-Propulsion Sound set to Disabled via the HMI	jmyslin2: New Propulsion Sound Disabled sequence diagram
	VS-FUN-REQ-339729/A-Drive Mode Auto/Manual Ambient Lighting setting	<jmyslin2> New Function for Drive Mode Auto/Manual Ambient Lighting setting
	VS-CLD-REQ-340540/A-Ambient Lighting Drive Mode Client	<jmyslin2> New class description for Ambient Lighting Drive Mode Client
	VS-CLD-REQ-340542/A-Ambient Lighting Drive Mode Server	<jmyslin2> New Ambient Lighting Drive Mode Server class description
	VS-UC-REQ-340546/A-User Enables Auto Ambient Lighting via HMI Setting	<jmyslin2> New use case for the user enabling Auto Ambient Lighting via the HMI setting
	VS-UC-REQ-340547/A-User Disables Auto Ambient Lighting via HMI Setting	<jmyslin2> New use case for user disabling Auto Ambient Lighting via the HMI setting
	VS-UC-REQ-340548/A-User changes color while in Auto Ambient Lighting	<jmyslin2> New use case for the user changing color while in Auto Ambient Lighting
	VS-UC-REQ-340551/A-User changes color while in Manual Ambient Lighting	<jmyslins2> New use case for when the user changes color while in manual ambient lighting
	VS-UC-REQ-340569/A-Drive Mode change while in Auto Ambient Lighting mode	New use case for Drive Mode change while in Auto Ambient Lighting mode
	VS-SR-REQ-341024/A-Ambient Lighting Strategy required to be used when supporting Automatic/Manual Ambient Lighting Drive Mode	<jmyslin2> New requirement for supporting Ambient Lighting strategy variant 2 when supporting the Auto/Manual Ambient Lighting setting
	VS-REQ-341020/A-Ambient Lighting Drive Mode Server functional requirement	<jmyslin2> New requirement for Ambient Lighting Drive Mode Servers supporting Auto/Manual mode
	VS-REQ-341017/A-Ambient Lighting Drive Mode Client functional requirement	<jmyslin2> new requirement for Ambient Lighting Drive Mode Client
	VS-SR-REQ-341018/A-Enabling/Disabling Ambient Lighting Auto/Manual setting via the HMI	<jmyslin2> New requirement for Enable / Disabling Ambient Lightings Auto/Manual setting
	VS-TMR-REQ-340545/A-T_LghtAmbDrvMde_Rsp	<jmyslin2> added timing for ambient lighting drive mode setting request and response
	VS-SD-REQ-341028/A-Ambient Lighting Drive Mode set to Automatic via the HMI	<jmyslin2> New sequence diagram for Ambient Lighting Drive Mode set to Manual via the HMI
	VS-SD-REQ-341027/A-Ambient Lighting Drive Mode set to Manual via the HMI	<jmyslin2> New sequence diagram for setting Ambient Lighting Drive Mode to Manual
	VS-SD-REQ-341050/A-User changes ambient lighting color while in auto mode	<jmyslin2> New sequence diagram for user changing color in auto mode
May 20, 2019	**1.18**	
	VS-IIR-REQ-276699/G-Logical to Physical CAN signal mapping - Vehicle Settings	<jmyslin2> added LongTermReset_B_RqMnu
	MD-REQ-025450/M-Disp_LangSel.St (TcSE ROIN-297360)	asimukhi: revised to update the Logical-Physical Mapping Attachement I
	MD-REQ-338982/B-LongTermReset_B_RqMnu	<jmyslin2> updated name. No content change
	MD-REQ-341180/B-BattTracLoThres_D_Stat	<jmyslin2> Clarification only. KPH to Km/h
	MD-REQ-341183/B-BattTracLoThres_D_Rq	<jmyslin2> Clarification only. KPH to Km/h
	MD-REQ-347056/A-EcoIdl_D_Rq	<jmyslin2> New MD for Eco-Idle signal request
	MD-REQ-347057/A-EcoIdl_D_Stat	<jmyslin2> New MD for Eco-Idle status signal
	VS-CLD-REQ-347054/A-Eco-Idle Client	<jmyslin2> New Class Description for Eco-Idle Client
	VS-CLD-REQ-347055/A-Eco-Idle Server	<jmyslin2> New Class description for Eco-Idle Server
	ENMEM-REQ-105569/E-Driver Profiles Deleted During Master Reset	MBORREL4: Updated for DSM Decouple
	VS-SR-REQ-334504/B-Drive History Reset	<jmyslin2> updated signal name only. No content change
	VS-SR-REQ-341178/B-Mapping Table - Speedometer Major Units	<jmyslin2> Clarification only. Changed KPH to Km/h
	VS-FUN-REQ-347046/A-Eco-Idle	<jmyslin2> New function for Eco-Idle
	VS-UC-REQ-347814/A-User Enables Eco-Idle Setting	<jmyslin2> new Eco-Idle use case
	VS-UC-REQ-347815/A-User Disables Eco-Idle Setting	<jmyslin2> New Eco-Idle use case
	VS-SR-REQ-347812/A-Eco-Idle Setting change	<jmyslin2> new requirement for Eco-Idle setting
	VS-TMR-REQ-347813/A-T_EcoIdle_Rsp	<jmyslin2> New Eco-Idle timing requirement
	VS-SD-REQ-347816/A-Eco-Idle set to Enabled via the HMI	<jmyslin2> New Eco-Idle sequence diagram
	VS-SD-REQ-347817/A-Eco-Idle set to Disabled via the HMI	<jmyslin2> New Eco-Idle sequence diagram

October 30, 2019	**1.19**	
	VS-IIR-REQ-276699/H-Logical to Physical CAN signal mapping - Vehicle Settings	<jmyslin2> added Eco-Idle signal mapping
	MD-REQ-365621/A-EngExhMdeHrEnbl_D_Rq	<jmyslin2> New quiet time MD
	MD-REQ-365620/A-EngExhMdeHrEnbl_D_Stat	<jmyslin2> New quiet time MD
	MD-REQ-365623/A-EngExhMdeHrStrt_D_Rq	<jmyslin2> New quiet time MD
	MD-REQ-365626/A-EngExhMdeHrStrt_D_Stat	<jmyslin2> New Quiet Time MD
	MD-REQ-365627/A-EngExhMdeHrEnd_D_Rq	<jmyslin2> New Quiet Time End MD request signal
	MD-REQ-365628/A-EngExhMdeHrEnd_D_Stat	<jmyslin2> New Quiet Time End MD status signal
	VS-CLD-REQ-339752/B-Propulsion Sound Server	<jmyslin2> corrected typo in title name. Changed name from Propulsion Mode Server to Propulsion Sound Server. No content change, clarification only.
	VS-CLD-REQ-362990/A-Quiet Time Client	<jmyslin2> New class description for Quiet Time Client
	VS-CLD-REQ-362991/A-Quiet Time Server	<jmyslin2> New Class Description for the Quiet Time Server
	STR-076407/F-Functional Definition (TcSE ROIN-293395)	<jmyslin2> added new Quiet Time for exhaust mode function
	VS-FUN-REQ-362897/A-Quiet Time for Exhaust Mode	<jmyslin2> New Quiet Time function
	VS-UC-REQ-365616/A-User Enabled Quiet Time Setting	<jmyslin2> New Quiet Time use case
	VS-UC-REQ-365617/A-User Disabled Quiet Time Setting	<jmyslin2> New use case for disabling quiet time
	VS-UC-REQ-365618/A-User changes Quiet Time start and end times	<jmyslin2> New use case Quiet Time start and end times
	VS-SR-REQ-365809/A-Quiet Time Enable/Disable Setting change	<jmyslin2> New Quiet Time setting requirement
	VS-SR-REQ-365811/A-Quiet Time Start and End time Setting change	<jmyslin2> New Quiet Time start and end time setting change requirement
	VS-TMR-REQ-365810/A-T_QuietTime_Rsp	<jmyslin2> New Quiet Time timing requirement
	VS-SR-REQ-365642/A-HMI Speed Limited	<jmyslin2> New Quiet Time speed limited requirement
	VS-SD-REQ-365814/A-Quiet Time set to Enabled via the HMI	<jmyslin2> New sequence diagram for setting Quiet Time to Enabled
	VS-SD-REQ-365815/A-Quiet Time set to Disabled via the HMI	<jmyslin2> New sequence diagram for setting Quiet Time to Disabled
	VS-SD-REQ-365816/A-Quiet Start Time set via the HMI	<jmyslin2> New sequence diagram to set the Quiet Time Start Time via the HMI
	VS-SD-REQ-365820/A-Quiet End Time set via the HMI	<jmyslin2> New sequence diagram to set the End Time via the HMI

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1 Architectural Design

1.1 Interface Requirements

1.1.1 VS-IIR-REQ-276699/H-Logical to Physical CAN signal mapping - Vehicle Settings

This Vehicle Settings & Settings in Centerstack deployment table maps the Settings logical signals to the physical CAN signals.

Note: This is for reference only. If there is a conflict between the name in the CAN signal name column and what is found in the actual CAN dB then the CAN dB takes precedent. Please bring to Ford's attention if there is a conflict.

Logical Signal Name	CAN signal name
ChrgCrdLck_D_Stat	ChrgCordLck_D_Stat
ChargePortUnlock_Rq	ChrgCordUnlock_B_Rq
AssocConfirm_D_Actl	AssocConfirm_D_Actl
CntrStkKeycodeActl	CntrStkKeycodeActl
Cntrstk_D_RqAssoc	Cntrstk_D_RqAssoc
ChargePortLightRing_St	CenterStackRing_D_Actl – Variant 1 ChrgStatDsply_D_Rq – Variant 2
LightAmbIntsty_No_Actl	LightAmbIntsty_No_Actl
LightAmbColor_No_Actl	LightAmbColor_No_Actl
LightAmbIntsty_No_Rq	LightAmbIntsty_No_Rq
LightAmbColor_No_Rq	LightAmbColor_No_Rq
Disp_Temperature.St	Mc_VehUnitTempUsrSel_St
Disp_Temperature.Rq	Disp_VehUnitTempUsrSel
ValetMode_St	ValetMode_D_Stat
TimeAdjust.Rq	SetTimeFormat
VehTimeFormat.St	Mc_VehFormatUsrSel_St
Bezel_Beeps_Supported.St	Bezel_Beeps_Supported
Bezel_Beeps.Rq	Bezel_Beeps_Rq
Bezel_Beeps.st	Bezel_Beep_St
LanguageUpdate.Rsp	LangUpdate_Rsp – Cluster Disp_LangUpdate_Rsp – Infotainment System Master (ex APIM, CHR…)
DISP_LangSel.St	Disp_LangSel_St – Infotainment (APIM, CHR, CTR..) Disp_LangSel2_St – Infotainment (APIM, CHR, CTR..) Mc_VehLangUsrSel_St - Cluster
DISP_LangSel.Rq	Disp_LangSel_Rq – Infotainment (APIM, CHR, CTR..) Disp_LangSel2_Rq - Infotainment (APIM, CHR, CTR..) Mc_LangSel_Rq - Cluster McLangSel2_Rq - Cluster
FactoryReset.St	FactoryReset_St – TCU SDARS_Factory_Reset_St - AHU
FactoryReset_Rq	FactoryReset_Rq – TCU SDARS_FactoryReset_Rq – AHU / DSP_AMP (more than just SDARS – See SPSS)
Vehicle_Speed.St	Veh_V_ActlEng
Vehicle_Speed_QF	VehVActlEng_D_Qf
DISP_Mile_Kilometers.Rq	Disp_VehUntTripCoUsrSel (pre Settings in the Centerstack)
Disp_Miles_Kilometers.St	Mc_VehUntTrpCoUsrSel_St
HMIAudioMode	HMI_HMIMode_St
KeyPadCodeDgtX_D_Stat	KeyPadCodeDgtX_D_Stat (were X represents 1 – 7 for the 7 signals)
CntrStk2_D_RqAssoc	CntrStk2_D_RqAssoc
LongTermReset_B_RqMnu	LongTermReset_B_RqMnu (older SPSS specifications have the logical signal as LongTermReset_B2_Rq)

BattTracLoThres_D_Stat	BattTracLoThres_D_Stat
BattTracLoThres_D_Rq	BattTracLoThres_D_Rq
SpeedoMajorUnit_D_Confg	SpeedoMajorUnit_D_Confg
PrplSnd_D_Rq	PrplSnd_D_Rq
PrplSnd_D_Stat	PrplSnd_D_Stat
LghtAmbDrvMde_D_Rq	LghtAmbDrvMde_D_Rq
LghtAmbDrvMde_B_Stat	LghtAmbDrvMde_B_Stat
EcoIdl_D_Rq	EcoIdl_D_Rq
EcoIdl_D_Stat	EcoIdl_D_Stat
EngExhMdeHrEnbl_D_Rq	EngExhMdeHrEnbl_D_Rq
EngExhMdeHrEnbl_D_Stat	EngExhMdeHrEnbl_D_Stat
EngExhMdeHrStrt_D_Rq	EngExhMdeHrStrt_D_Rq
EngExhMdeHrStrt_D_Stat	EngExhMdeHrStrt_D_Stat
EngExhMdeHrEnd_D_Rq	EngExhMdeHrEnd_D_Rq
EngExhMdeHrEnd_D_Stat	EngExhMdeHrEnd_D_Stat

1.1.2 MD-REQ-243934/B-Disp_Miles_Kilometers.St

Message Type: Status

Signal from the Vehicle Settings Server stating what the setting is for Distance units.

Logical Signal Name	Literals	Value	Description
Disp_Miles_Kilometers.St	Metric (kilometers)	0x0	
	Imperial (miles)	0x1	

1.1.3 MD-REQ-025516/C-DISP_Miles_Kilometers_Rq (TcSE ROIN-273811)

Message Type: Request

This method is used to request a status change of Distance Unit.

Name	Literals	Value	Description
Mode	-	-	
	Metric	0x0	The parameter "Metric" is used to request the distance unit kilometers.
	Imperial	0x1	The parameter "Imperial" is used to request the distance unit miles.
	Inactive	0x3	

1.1.4 MD-REQ-276458/B-Vehicle_Speed.St

Message Type: Status

Signal with the current status of the Vehicle Speed

Logical Signal Name	Literals	Value	Description
Vehicle_Speed.St	See info-CAN database for signal details	See info-CAN database for signal details	

1.1.5 MD-REQ-276459/A-Vehicle_Speed_QF

Message Type: Status

Signal with the Vehicle Speed Quality Factor

Logical Signal Name	Literals	Value	Description
Vehicle_Speed_QF	Faulty	0x0	
	No_Data_Exists	0x1	
	Not_Within_Specifications	0x2	
	OK	0x3	

1.1.6 MD-REQ-213361/C-FactoryReset_Rq

Message Type: Request

Signal sent by the Master Reset Client to initiate a Master Reset

Logical Signal Name	Literals	Value	Description
FactoryReset_Rq	Inactive	0x0	
	ResetFactoryDefaults	0x1	

1.1.7 MD-REQ-222036/B-FactoryReset.St

Message Type: Status

Signal sent by the Master Reset Server indicating that the master reset default settings were restored for a master reset event

Logical Signal Name	Literals	Value	Description
FactoryReset.St	Inactive	0x0	
	FactoryDefaultsRestored	0x1	
	Reserved	0x2	
	Reserved	0x3	

1.1.8 MD-REQ-025377/N-Disp_LangSel.Rq (TcSE ROIN-297357)

Message Type: Request

This Signal requests the change of the Language displayed.

Name	Value	Description
Disp_LangSel.Rq	-	
	int *Language* 0x00 Invalid 0x01 Unknown 0x02 UK English 0x03 NA English 0x04 German 0x05 Italian 0x06 EU French 0x07 Cana French 0x08 EU Spanish 0x09 Mex Spanish 0x0A Turkish 0x0B Russian 0x0C Dutch 0x0D Flemish 0x0E Polish 0x0F Czech 0x10 Greek 0x11 Hungarian 0x12 Swedish 0x13 Danish 0x14 Norwegian	Request from Vehicle Settings Client to update Language displayed.

	0x15 Finish 0x16 EU Portuguese 0x17 Braz Portuguese 0x18 Japanese 0x19 AU_English 0x1A Korean 0x1B Mandarin Chinese 0x1C Taiwanese 0x1D Arabic 0x1E Slovak 0x1F Thai 0x20 Indian English	

Note:
For HS3 Language Request signals 0x191 Disp_LangSel.Rq (ex. APIM/CHR) and 0x193 McLangSel.Rq (ex. Cluster) they are 5 bit signals and maxed out with 0x1F Thai. The new Language Request signals created Disp_LangSel2.Rq and McLangSel2.Rq are bigger in size (7 bits) to allow for more encodings but still include all the encodings the 5 bit signals had.

If the transmitter of the Infotainment language request signal supports one common CAN dB then infotainment language request client for a language request will send both language request signals 0x191 Disp_LangSel.Rq 5 bit signal and Disp_LangSel2.Rq 7 bit signal set to the language requested.

- If a language request is needed for an encoding that is supported by Disp_LangSel2.Rq but not Disp_LangSel.Rq (ex Indian English) then only Disp_LangSel2.Rq would request the language.

If the transmitter of the infotainment language request signals has a CAN dB that only supports one Language request signal then only that language request signal would be supported (either support just the 5 bit Disp_LangSel.Rq or 7 bit Disp_LangSel2.Rq signal).

The receiver of the infotainment language request signal (ex Cluster) will have its CAN dB set-up so only one language request signal is received in its CAN dB for a particular program (will only receive the 5 bit Disp_LangSel.Rq signal or 7 bit Disp_LangSel2.Rq signal).

- Exception: If the Ford D&R for the receiver of the infotainment language request signal has explicitly asked for a CAN dB with both infotainment language request signals to support common software across multiple programs (0x191 Disp_LangSel.Rq 5 bit signal and Disp_LangSel2.Rq 7 bit signal) then the receiver of those signals will need to have a configuration bit such that only one of the signals can be used at a time (ex. program X only uses Disp_LangSel2.Rq while program Y only uses Disp_LangSel.Rq).

The Cluster transmitter of the language request signal will support only one language request signal in its CAN dB for a particular program (will only send the 5 bit McLangSel.Rq or 7 bit McLangSel2.Rq signal). The other language signal not used would be set to 0x0 Inactive/Invalid.

- Exception: If the Ford D&R for the transmitter of the Cluster language request signals (McLangSel.Rq 5 bit signal and McLangSel2.Rq 7 bit signal) has explicitly asked for a CAN dB with both cluster language request signals to support common software across multiple programs then the Cluster will need to have a configuration bit such that only one of the signals can be used at a time.

If in an error condition the receiving module gets both language request signals from the same module at the same time then the last language request signal received set to a language would be supported.

- The Cluster Ford D&R or supplier needs to bring to the CAN dB teams attention if their module is receiving both language request signals if they are only supposed to be receiving one language request signal so this can be corrected in their CAN dB.
- The Cluster is only supposed to send one language request at a time and that is what receiver would expect. If the receiver of 0x193 McLangSel.Rq or McLangSel2.Rq gets both signal set to a language at the same time then bring the issue to the Cluster D&R's attention so this could be corrected.

Reference the CAN dB for the latest and in case any conflict in signal names the CAN dB takes precedent.

1.1.9 MD-REQ-025450/M-Disp_LangSel.St (TcSE ROIN-297360)

Message Type: Status

This Signal gives status of the Language displayed.

Name	Value	Description
Disp_LangSel.St	-	
	int *Language* 0x00 Invalid 0x01 Unknown 0x02 UK English 0x03 NA English 0x04 German 0x05 Italian 0x06 EU French 0x07 Cana French 0x08 EU Spanish 0x09 Mex Spanish 0x0A Turkish 0x0B Russian 0x0C Dutch 0x0D Flemish 0x0E Polish 0x0F Czech 0x10 Greek 0x11 Hungarian 0x12 Swedish 0x13 Danish 0x14 Norwegian 0x15 Finish 0x16 EU Portuguese 0x17 Braz Portuguese 0x18 Japanese 0x19 AU_English 0x1A Korean 0x1B Mandarin Chinese 0x1C Taiwanese 0x1D Arabic 0x1E Slovak 0x1F Thai 0x20 Indian English	Status update from the Vehicle Language settings server stating what the current language setting is for the Vehicle Language Server which sends out the status message.

Note:
The Infotainment Language status HS3 signal 0x229 Disp_LangSel.St (ex APIM, CHR, MFD…) is a 5 bit signal and maxed out with 0x1F Thai. The new Infotainment Language Status HS3 signal is Disp_LangSel2.St and is bigger in size (7 bits) to allow for more encodings but still include all the encodings the 5 bit signals had.

If the transmitter of the Infotainment Language status signal supports one common CAN dB then the transmitter of the infotainment language status signal will have to support sending both language status signals Disp_LangSel.St 5 bit signal and Disp_LangSel2.St 7 bit signal with both status signals set to the active language.

- If Disp_LangSel2.St is set to a language that Disp_LangSel.St does not have an encoding for then Disp_LangSel.St would be set to 0x0 Inactive (ex. if Indian English was the active language).

If the transmitter of the Infotainment Language status signal has a CAN dB that only supports one language status signal then only that language status signal would be supported (either support just the 5 bit Disp_LangSel.St or 7 bit Disp_LangSel2.St).

The receiver of the infotainment language status signals (Disp_LangSel.St 5 bit signal and Disp_LangSel2.St 7 bit signal) should only receive one of the language status signals in their CAN dB.

- If the Ford D&R or supplier of a module receiving the infotainment language status message notices that both infotainment language status signals Disp_LangSel.St 5 bit signal and Disp_LangSel2 7 bit signal in their CAN dB bring to Ford's attention as the CAN dB would need to be corrected.
  - Exception: If the Ford D&R for the receiver of the infotainment language signal has explicitly asked for a CAN dB with both infotainment language signals to support common software across multiple programs (Disp_LangSel.St 5 bit signal and Disp_LangSel2.St 7 bit signal) then the receiver of those signals will need to have a configuration bit such that only one of the signals is can be used at a time (ex. program X only uses Disp_LangSel2.st and program Y only uses Disp_LangSel.St).

The Cluster language status HS3 signal 0x2FD Mc_VehLangUsrSel.St is a 6 bit signal and is not currently maxed out so there is only one Cluster language status signal at the time this was written.

As a general practice if the receiving module just needs to receive one language status signal in a vehicle to know what language to be used then the Cluster Mc_VehLangUsrSel.St signal should be used.

Reference the CAN dB for the latest and in case any conflict in signal names the CAN dB takes precedent.

1.1.10 MD-REQ-025452/B-LanguageUpdate.Rsp (TcSE ROIN-297376)

Message Type: Response

Response signal from Vehicle settings Language server to the Vehicle settings Client in response to the Disp_LangSel.Rq method. Signal informs the Client if the Language that was requested to change is supported by that server or not. This signal allows the Client to take an action if the language is not supported by the server.

Logical Signal Name	Literals	Value	Description
LanguageUpdate.Rsp	Inactive	0x0	
	Language_Updated	0x1	
	Language_Not_Supported	0x2	

1.1.11 MD-REQ-025379/B-Bezel_Beeps.Rq (TcSE ROIN-297362)

Message Type: Request

This signal requests to change the Bezel Beeps settings.

Logical Signal Name	Literals	Value	Description
Bezel_Beeps.Rq	Inactive	0x0	
	Enabled	0x1	
	Disabled	0x2	

1.1.12 MD-REQ-025385/B-Bezel_Beeps.St (TcSE ROIN-297423)

Message Type: Status

This signal provides the status of Bezel Beeps settings (Enabled/ Disabled).

Logical Signal Name	Literals	Value	Description
Bezel_Beeps.St	Invalid	0x0	
	Enabled	0x1	
	Disabled	0x2	

1.1.13 MD-REQ-025386/B-Bezel_Beeps_Supported.St (TcSE ROIN-297429)

Message Type: Status

Signal from the Vehicle Settings Beep Server telling the Vehicle Settings Beep Client if Bezel Beeps are supported or not supported

Logical Signal Name	Literals	Value	Description
Bezel_Beeps_Supported.St	Invalid	0x0	
	Supported	0x1	
	Not Supported	0x2	

1.1.14 MD-REQ-025381/B-TimeAdjust.Rq (TcSE ROIN-297370)

Message Type: Request

This signal requests to change the setting for 12/24 hour mode.

Logical Signal Name	Literals	Value	Description
TimeAdjust.Rq	Inactive	0x0	
	12h_mode	0x1	
	24h_mode	0x2	

1.1.15 MD-REQ-025462/B-VehTimeFormat.St (TcSE ROIN-297375)

Message Type: Status

Signal by the Vehicle Settings Server to provide the status of the 12/24 hour time mode setting.

Logical Signal Name	Literals	Value	Description
VehTimeFormat.St	Invalid	0x0	
	12h_mode	0x1	
	24h_mode	0x2	

1.1.16 MD-REQ-097285/C-ValetMode_St

Message Type: Status

Signal used to indicate the Valet Mode Status.

Logical Signal Name	Literals	Value	Description
ValetMode_St	Invalid / Null	0x0	
	OFF	0x1	
	ON	0x2	
	Not Used	0x3	

1.1.17 MD-REQ-025380/B-Disp_Temperature.Rq (TcSE ROIN-297369)

Message Type: Request

This signal requests to change the temperature units displayed.

Logical Signal Name	Literals	Value	Description
DISP_Temperature.Rq	Celsius	0x0	
	Fahrenheit	0x1	
	Inactive	0x3	

1.1.18 MD-REQ-025453/B-Disp_Temperature.St (TcSE ROIN-297374)

Message Type: Status

Signal from the Vehicle Settings Server stating what the setting is for temperature units.

Logical Signal Name	Literals	Value	Description
DISP_Temperature.St	Celsius	0x0	
	Fahrenheit	0x1	

1.1.19 MD-REQ-025388/C-LightAmbColor_No_Rq (TcSE ROIN-297407)

Message Type: Request

This signal requests selection of color for ambient lighting.

Logical Signal Name	Literals	Value	Description
LightAmbColor_No_Rq	Invalid / No Data Exits	0x00	
	Color ID1	0x01	
	Color ID2	0x02	
	Color ID3	0x03	
	Color ID4	0x04	
	Color ID5	0x05	
	Color ID6	0x06	
	Color ID7	0x07	
	Color ID8	0x08	
	Color ID9	0x09	
	Color ID10	0x0A	
	Color ID11	0x0B	
	Color ID12	0x0C	
	Color ID13	0x0D	
	Color ID14	0x0E	
	Color ID15	0x0F	
	Color ID16	0x10	

	Reserved	0x11 to 0xFF	

1.1.20 MD-REQ-025389/C-LightAmbIntsty_No_Rq (TcSE ROIN-297420)

Message Type: Request

This signal requests selection of intensity for ambient lighting.

Logical Signal Name	Literals	Value	Description
LightAmbIntsty_No_Rq	0% Intensity / Ambient Lighting OFF	0x0	
	1% Intensity	0x1	
	2% Intensity	0x2	
	cont.		
	100% Intensity	0x64	
	Reserved	0xFF	

1.1.21 MD-REQ-025456/D-LightAmbColor_No_Actl (TcSE ROIN-297421)

Message Type: Status

This signal from Ext Vehicle Settings Function to the Vehicle Settings Client gives the status of the ambient lighting color.

Logical Signal Name	Literals	Value	Description
LightAmbColor_No_Actl	OFF / Inactive / No Data Exists	0x00	
	Color ID1	0x01	
	Color ID2	0x02	
	Color ID3	0x03	
	Cont	0x04 – 0xFF	separate document defines what the Color ID's are

1.1.22 MD-REQ-025457/D-LightAmbIntsty_No_Actl (TcSE ROIN-297422)

Message Type: Status

This signal from the Ext Vehicle Settings Function to the Vehicle Settings Client gives the status of Ambient Lighting Intensity

Logical Signal Name	Literals	Value	Description
LightAmbIntsty_No_Actl	0% Intensity / Ambient Lighting OFF	0x00	
	1% intensity	0x01	
	2% intensity	0x02	
	cont		
	100% intensity	0x64	
	Reserved	0x65 – 0xFF	

1.1.23 MD-REQ-192193/C-LightAmbColor_No_Actl - Variant 2

Message Type: Status

This signal gives status of ambient lighting color (variant 2) status.

Logical Signal Name	Literals	Value	Description
LightAmbColor_No_Actl – Variant 2	Inactive	0x00	
	Color ID1	0x01	
	Color ID2	0x02	
	Color ID3	0x03	
	Cont.	0x04 – 0xFF	Reference separate document with the ambient light Colors and Color ID's used

1.1.24 MD-REQ-192194/C-LightAmbIntsty_No_Actl - Variant 2

Message Type: Status

This signal gives the status of Ambient Lighting Intensity.

Logical Signal Name	Literals	Value	Description
LightAmbIntsty_No_Actl – Variant 2	0% Intensity / Ambient Lighting OFF	0x00	
	1% Intensity / Ambient Lighting ON	0x01	
	2% Intensity / Ambient Lighting ON	0x02	
	3% Intensity / Ambient Lighting ON	0x03	
	cont.		
	100% Intensity / Ambient Lighting ON	0x64	

1.1.25 MD-REQ-192189/B-LightAmbColor_No_Rq - Variant 2

Message Type: Request

The Ambient Lighting Client uses this signal to request the color selection for ambient lighting from the Ambient Lighting Server.

Logical Signal Name	Literals	Value	Description
LightAmbColor_No_Rq – Variant 2	Inactive	0x00	
	Color ID1	0x01	
	Color ID2	0x02	
	Color ID3	0x03	
	Color ID4	0x04	
	Color ID5	0x05	
	Color ID6	0x06	
	Color ID7	0x07	
	Color ID8	0x08	
	Color ID9	0x09	
	Color ID10	0x0A	
	Color ID11	0x0B	
	Color ID12	0x0C	
	Color ID13	0x0D	
	Color ID14	0x0E	
	Color ID15	0x0F	
	Color ID16	0x10	
	Reserved	0x11 to 0xFF	

1.1.26 MD-REQ-192190/B-LightAmbIntsty_No_Rq - Variant 2

Message Type: Request

This signal requests the selection of intensity for ambient lighting.

Logical Signal Name	Literals	Value	Description
LightAmbIntsty_No_Rq – Variant 2	Inactive / No Data Exits	0x00	
	0% Intensity / Ambient Lighting OFF	0x01	
	1% Intensity	0x02	
	2% Intensity	0x03	
	3% Intensity	0x04	
	cont.	…	
	100% Intensity	0x65	
	Ambient Lighting Turn ON	0x66	

1.1.27 MD-REQ-025392/C-ChargePortLightRing_St (TcSE ROIN-270412)

If the CharePortLightRingClient supports both variants of the Charge Port Light Ring signals below then when selecting Charge Port Light Ring HMI the signal that will get updated will depend on what variant Charge Port Light Ring is configured for.

Variant 1 of ChargePortLightRing_St:
CAN Signal Name: CenterStackRing_D_Actl

Value	Equal
0x0	Null
0x1	Off
0x2	On
0x3	LimitedOn

Variant 2of ChargePortLightRing_St:
CAN Signal Name: ChrgStatDsply_D_Rq

Value	Equal
0x0	Off
0x1	On (default)
0x2	NotUsed_1
0x3	NotUsed_2

1.1.28 MD-REQ-023414/C-CntrStk_D_RqAssoc (TcSE ROIN-284870-1)

Message Type: Request

Note: Request signal from the Keypad Client / Personality Client to the Keypad Server with the keycode operation requested to be performed.

Logical Signal Name	Literals	Value	Description
	CHECK_KEYCODE	0x0	
	ERASE_KEYCODE	0x1	

CntrStk_D_RqAssoc	KEY	0x2	
	NULL	0x3	
	RKE	0x4	
	SET_KEYCODE	0x5	
	Cancel	0x6	
	Not Used	0x7	

1.1.29 MD-REQ-023415/B-CntrStkKeycodeActl (TcSE ROIN-284871-1)

Message Type: Request

Note: Keycode signal from the Keypad Client / Personality Client to the Keypad Server / PersonalizationFunction Server to be used for verifying factory keycode or for changing current keycode.

Logical Signal Name	Literals	Value	Description
CntrStkKeycodeActl	Keycode	0x0000 – 0xFFFF	See table below for decoding

CntrStkKeycodeActl Note: The Keycode entered from the center stack to the personalization. This is a bit encoded CAN signal. 001 = 1/2 button pressed 010 = 3/4 button pressed 011 = 5/6 button pressed 100 = 7/8 button pressed 101 = 9/0 button pressed 000, 110, 111 are Invalid entries.	CntrStkKeycodeActl Note: Bit 15 is ignored Bits 14 - 12 : First button pressed Bits 11 - 9 : Second button pressed Bits 8 - 6 : Third button pressed Bits 5 - 3 : Fourth button pressed Bits 2 - 0 : Fifth button pressed Where, bit 0 is the right most bit of this CAN signal. Example of decoding the Keycode from the CAN signal: CAN Signal Value: 0x58D1 Bit 15 Bit 14 Bit 13 Bit 12 Bit 11 Bit 10 Bit 9 Bit 8 0 1 0 1 1 0 0 0 Bit 7 Bit 6 Bit 5 Bit 4 Bit 3 Bit 2 Bit 1 Bit 0 1 1 0 1 0 0 0 1 Bit 15 is ignored. Bits 14 – 12: (9/0) First Button Pressed Bits 11 - 9 :(7/8) Second button pressed Bits 8 - 6 :(5/6) Third button pressed Bits 5 - 3 :(3/4) Fourth button pressed Bits 2 - 0 :(1/0) Fifth button pressed

1.1.30 MD-REQ-023425/B-AssocConfirm_D_Actl (TcSE ROIN-284863-1)

Message Type: Status

Note: Keypad Server / PersonalizationFunction Server communicates the state of the requested keycode association

Logical Signal Name	Literals	Value	Description
AssocConfirm_D_Actl	None	0x0	
	DISASSOCIATE	0x1	
	DUPLICATE	0x2	
	ERASE	0x3	
	IN_PROGRESS	0x4	
	KEYCODE_ACCEPTED	0x5	
	KEYCODE_REJECTED	0x6	
	ASSOCIATE	0x7	

1.1.31 MD-REQ-093985/B-ChargePortUnlock_Rq

Message Type: Request

This signal is requested by the Charge Port Unlock Client for the Charge Port Unlock Server to unlock the charge port connector.

Logical Signal Name	Literals	Value	Description
ChargePortUnlock_Rq	No_Request	0x0	
	Unlock Request	0x1	

1.1.32 MD-REQ-132658/B-ChrgCrdLck_D_Stat

Message Type: Response and Status

This signal reports the status of the Charge Port Unlock Server

Literals	Value	Description
Inactive / Retain	0x0	Retain treat same as Inactive
Unlocked	0x1	
Locked	0x2	
UnlockInProgress	0x3	
Unlocked / LockInProgress	0x4	This will say when the Lock is in Progress but to be treated as Unlocked by the Charge Port Unlock Client
Locked / Unlock_Fail	0x5	Unlock_Fail is treated the same as status set to Locked for the Charge Port Unlock Client
Unlocked / Lock_Fail	0x6	Lock_Fail is treated the same as status set to Unlocked for the Charge Port Unlock Client
Locked / Faulty	0x7	Faulty is treated the same as status set to Locked for the Charge Port Unlock Client

1.1.33 MD-REQ-338982/B-LongTermReset_B_RqMnu

Message Type: Request

Note: Request signal from the Drive History Client to the Drive History Server to reset the long term drive history information

Logical Signal Name	Literals	Value	Description
LongTermReset_B_RqMnu	OFF	0x0	
	ON	0x1	

Note: init value in the CAN dB for this signal should be 0x0 OFF

1.1.34 MD-REQ-341180/B-BattTracLoThres_D_Stat

Message Type: Status

Note: Status signal from the Low Battery Alert Server with the status of the Low Battery Alert function

Logical Signal Name	Literals	Value	Description
BattTracLoThres_D_Stat	Null	0x0	
	20 mi / 32 km	0x1	Cluster speedometer major speed scale units MPH
	30 mi / 48 km	0x2	
	50 mi / 80 km	0x3	
	30 km / 18 mi	0x4	Cluster speedometer major speed scale units Km/h
	50 km / 31 mi	0x5	
	80 km / 50 mi	0x6	
	Not Used	0x7	

1.1.35 MD-REQ-341183/B-BattTracLoThres_D_Rq

Message Type: Request

Note: Request signal from the Low Battery Alert Client to the Low Battery Alert Server to set the feature

Logical Signal Name	Literals	Value	Description
BattTracLoThres_D_Rq	Null	0x0	
	20 mi / 32 km	0x1	Cluster speedometer major speed scale units MPH
	30 mi / 48 km	0x2	
	50 mi / 80 km	0x3	
	30 km / 18 mi	0x4	Cluster speedometer major speed scale units Km/h
	50 km / 31 mi	0x5	
	80 km / 50 mi	0x6	
	Not Used	0x7	

1.1.36 MD-REQ-341190/A-SpeedoMajorUnit_D_Confg

Message Type: Status

Note: Status signal from the Low Battery Alert Client with the status of the speedometer speed scale units

Logical Signal Name	Literals	Value	Description
SpeedoMajorUnit_D_Confg	Null	0x0	
	MPH	0x1	
	KPH	0x2	
	Not Used	0x3	

1.1.37 MD-REQ-339666/A-PrplSnd_D_Rq

Message Type: Request

Note: Request signal from the Propulsion Sound Client to the Propulsion Sound Server to enable or disable the feature

Logical Signal Name	Literals	Value	Description
PrplSnd_D_Rq	Null	0x0	
	Disabled	0x1	
	Enabled	0x2	

1.1.38 MD-REQ-339747/A-PrplSnd_D_Stat

Message Type: Status

Note: Status signal from the Propulsion Sound Server with the status of Propulsion Sound feature

Logical Signal Name	Literals	Value	Description
PrplSnd_D_Stat	Null	0x0	
	Disabled	0x1	
	Enabled	0x2	

1.1.39 MD-REQ-339730/A-LghtAmbDrvMde_D_Rq

Message Type: Request

Note: Request signal from the Ambient Lighting Drive Mode Client to the Ambient Lighting Drive Mode Server to select if Ambient Lighting is tied to Drive Mode or not.

Logical Signal Name	Literals	Value	Description
LghtAmbDrvMde_D_Rq	Null	0x0	
	Manual	0x1	
	Automatic	0x2	

1.1.40 MD-REQ-340538/A-LghtAmbDrvMde_B_Stat

Message Type: Status

Note: Status signal from the Ambient Lighting Drive Mode Server with the status of whether Ambient Lighting is tied to Drive Mode or not.

Logical Signal Name	Literals	Value	Description
LghtAmbDrvMde_B_Stat	Manual	0x0	
	Automatic	0x1	

1.1.41 MD-REQ-347056/A-EcoIdl_D_Rq

Message Type: Request

Note: Request signal from the Eco-Idle Client to the Eco-Idle Server to enable or disable the feature

Logical Signal Name	Literals	Value	Description
EcoIdl_D_Rq	Null	0x0	
	Disabled	0x1	
	Enabled	0x2	

1.1.42 MD-REQ-347057/A-EcoIdl_D_Stat

Message Type: Status

Note: Status signal from the Eco-Idle Server with the status of Eco-Idle feature

Logical Signal Name	Literals	Value	Description
EcoIdl_D_Stat	Null	0x0	
	Disabled	0x1	
	Enabled	0x2	

1.1.43 MD-REQ-365621/A-EngExhMdeHrEnbl_D_Rq

Message Type: Request

Request signal from Quiet Time Client to the Quite Time Server to enable or disable the feature

Logical Signal Name	Literals	Value	Description
EngExhMdeHrEnbl_D_Rq	Null	0x0	
	Disabled	0x1	
	Enabled	0x2	
	Menu Not Configured	0x3	

1.1.44 MD-REQ-365620/A-EngExhMdeHrEnbl_D_Stat

Message Type: Status

Status signal from the Quiet Time Server with the status of the Quiet Time setting

Logical Signal Name	Literals	Value	Description
EngExhMdeHrEnbl_D_Stat	Null	0x0	HMI setting treated as unknown (ex HMI greyed out, setting not shown as selected…)
	Disabled	0x1	
	Enabled	0x2	

1.1.45 MD-REQ-365623/A-EngExhMdeHrStrt_D_Rq

Message Type: Request

Request signal from Quiet Time Client to the Quite Time Server to request the Quiet Time start hour

Logical Signal Name	Literals	Value	Description
EngExhMdeHrStrt_D_Rq	Null	0x0	
	Hour 0 (12 am)	0x1	
	Hour 1 (1 am)	0x2	
	Hour 2 (2 am)	0x3	
	Hour 3 (3 am)	0x4	
	…	…	
	Hour 21 (9 pm)	0x16	
	Hour 22 (10 pm)	0x17	
	Hour 23 (11 pm)	0x18	

Note: Whether time is displayed in 12 or 24 mode depends what HMI setting is set for 12/24 hour mode.
Reference function "VS-FUN-REQ-025239-Set 12/24 hour mode setting" in the Vehicle Setting SPSS for details.

1.1.46 MD-REQ-365626/A-EngExhMdeHrStrt_D_Stat

Message Type: Status

Status signal from Quiet Time Server with the value the Quiet Time Start Hour is set to

Logical Signal Name	Literals	Value	Description
EngExhMdeHrStrt_D_Stat	Null	0x0	
	Hour 0 (12 am)	0x1	
	Hour 1 (1 am)	0x2	
	Hour 2 (2 am)	0x3	
	Hour 3 (3 am)	0x4	
	…	…	
	Hour 21 (9 pm)	0x16	
	Hour 22 (10 pm)	0x17	
	Hour 23 (11 pm)	0x18	

Note: Whether time is displayed in 12 or 24 mode depends what HMI setting is set for 12/24 hour mode.
Reference function "VS-FUN-REQ-025239-Set 12/24 hour mode setting" in the Vehicle Setting SPSS for details.

1.1.47 MD-REQ-365627/A-EngExhMdeHrEnd_D_Rq

Message Type: Request

Request signal from Quiet Time Client to the Quite Time Server to request the Quiet Time end hour

Logical Signal Name	Literals	Value	Description
EngExhMdeHrEnd_D_Rq	Null	0x0	
	Hour 0 (12 am)	0x1	
	Hour 1 (1 am)	0x2	
	Hour 2 (2 am)	0x3	
	Hour 3 (3 am)	0x4	
	…	…	
	Hour 21 (9 pm)	0x16	
	Hour 22 (10 pm)	0x17	
	Hour 23 (11 pm)	0x18	

Note: Whether time is displayed in 12 or 24 mode depends what HMI setting is set for 12/24 hour mode.
Reference function "VS-FUN-REQ-025239-Set 12/24 hour mode setting" in the Vehicle Setting SPSS for details.

1.1.48 MD-REQ-365628/A-EngExhMdeHrEnd_D_Stat

Message Type: Status

Status signal from Quiet Time Server with the value the Quiet Time End Hour is set to

Logical Signal Name	Literals	Value	Description
EngExhMdeHrEnd_D_Stat	Null	0x0	
	Hour 0 (12 am)	0x1	
	Hour 1 (1 am)	0x2	
	Hour 2 (2 am)	0x3	
	Hour 3 (3 am)	0x4	
	…	…	
	Hour 21 (9 pm)	0x16	
	Hour 22 (10 pm)	0x17	
	Hour 23 (11 pm)	0x18	

Note: Whether time is displayed in 12 or 24 mode depends what HMI setting is set for 12/24 hour mode.
Reference function "VS-FUN-REQ-025239-Set 12/24 hour mode setting" in the Vehicle Setting SPSS for details.

1.2 VS-CLD-REQ-133255/A-Vehicle Language Setting Client

1.3 VS-CLD-REQ-025444/A-Vehicle Language Settings Server (TcSE ROIN-150813-1)

Responsibility : The vehicle language settings server provides status of vehicle language settings status to the vehicle settings client.

1.4 VS-CLD-REQ-025445/B-Ambient Lighting / Vehicle Settings Client (TcSE ROIN-159910-1)

Responsibility : The Ambient Lighting Settings Client makes requests to the external vehicle settings function to change Ambient lighting color or intensity as requested by the user.

1.5 VS-CLD-REQ-133269/B-Ambient Lighting / Vehicle Setting Server

1.6 VS-CLD-REQ-025446/A-Charge Port Light Ring Client (TcSE ROIN-270413)

The charge port light ring client is a vehicle settings display. It shows the current light ring style and also allows a user to select a different style. The charge port light ring client transmits the current style setting to the charge port light ring server.

1.7 VS-CLD-REQ-093987/A-Charge Port Unlock Client

The charge port unlock client is a vehicle settings display. It shows the current lock status and also allows a user to select unlock the cord. The charge port unlock client transmits the unlock command to the charge port unlock server.

1.8 VS-CLD-REQ-133260/A-Charge Port Unlock Server

1.9 VS-CLD-REQ-133257/A-Vehicle Settings Temperature Units Client

1.10 VS-CLD-REQ-133258/A-Vehicle Settings Temperature Units Server

1.11 VS-CLD-REQ-133261/A-Vehicle Settings 12/24 Hour Mode Client

1.12 VS-CLD-REQ-133259/A-Vehicle Settings 12/24 Hour Mode Server

1.13 VS-CLD-REQ-133262/A-Vehicle Settings Distance Units Client

1.14 VS-CLD-REQ-133263/A-Vehicle Settings Distance Units Server

1.15 VS-CLD-REQ-025448/D-Keypad Server / External Personalization Function (TcSE ROIN-293526-1)

1.16 VS-CLD-REQ-025447/D-Keypad Client / Personalization Client (TcSE ROIN-293524-1)

1.17 VS-CLD-REQ-025497/A-Vehicle Settings Beep Server (TcSE ROIN-141569-1)

Responsibility : The vehicle settings beep server provides status of the touch panel beeps setting.

1.18 VS-CLD-REQ-133637/B-Vehicle Settings Beep Client

1.19 VS-CLD-REQ-025442/B-Vehicle Settings Client (TcSE ROIN-141546-2)

Responsibility: The Vehicle Settings Client controls all vehicle settings change requests from the user, to various servers depending upon the functionality of the setting.

1.20 VS-CLD-REQ-025443/B-Vehicle Settings Server (TcSE ROIN-141547-2)

Responsibility : The vehicle settings server provides status of vehicle settings status to the vehicle settings client.

1.21 VS-CLD-REQ-347054/A-Eco-Idle Client

The Eco-Idle Client interfaces with the user via the HMI and is responsible for sending the Eco-Idle Setting request to the Eco-Idle Server.

1.22 VS-CLD-REQ-347055/A-Eco-Idle Server

The Eco-Idle Server is responsible for the control of the Eco-Idle function and interfaces with the Eco-Idle Client.

1.23 VS-CLD-REQ-340540/A-Ambient Lighting Drive Mode Client

The Ambient Lighting Drive Mode Client interfaces with the user via HMI and is responsible for sending the Ambient Lighting Drive Mode setting request to the Ambient Lighting Drive Mode Server.

1.24 VS-CLD-REQ-340542/A-Ambient Lighting Drive Mode Server

The Ambient Lighting Drive Mode Server is responsible for the ambient lighting drive mode function and interfaces with the Ambient Lighting Drive Mode Client.

1.25 VS-CLD-REQ-339751/A-Propulsion Sound Client

The Propulsion Sound Client interfaces with the user via HMI and is responsible for sending the propulsion sound setting request to the propulsion sound server.

1.26 VS-CLD-REQ-339752/B-Propulsion Sound Server

The Propulsion Sound Server is responsible for control of the propulsion sound function and interfaces with the Propulsion Sound Client.

1.27 VS-CLD-REQ-341184/A-Low Battery Alert Client

The Low Battery Alert Client interfaces with the user via HMI and is responsible for sending the Low Battery setting request to the Low Battery Server.

1.28 VS-CLD-REQ-341185/A-Low Battery Alert Server

The Low Battery Alert Server is responsible for control of the Low Battery Alert function and interfaces with the Low Battery Alert Server

1.29 VS-CLD-REQ-339750/A-Drive History Client

The Drive History Client is responsible for requesting the Long Term Drive History Reset to the Drive History Server

1.30 VS-CLD-REQ-342947/A-Drive History Server

1.31 VS-CLD-REQ-362990/A-Quiet Time Client

The Quiet Time Client interfaces with the user via the HMI and is responsible for interfacing with the Quiet Time Server. This includes sending the quiet time requests and receiving the quiet time responses from the Quiet Time Server. See SPSS requirements for details

1.32 VS-CLD-REQ-362991/A-Quiet Time Server

The Quiet Time Server is responsible for the control of the Quiet Time function and interfaces with the Quiet Time Client.

2 General Requirements

2.1 VS-SR-REQ-134608/B-Cluster Vehicle Settings when Ignition is not in Run

When HMIAudioMode (ie HMI_HMIMode_St) = ON then the Cluster shall be able to support Vehicle Settings functions (ex Language, Temp units, 12/24 hour mode, Distance units…) regardless if the Cluster HMI is active or not.

Ex. Change Language

- Pre-Condition:
  - Ignition_Status = OFF
  - HMIAudioMode = ON (ie infotainment system is ON)
  - Cluster HMI is OFF
  - Language equals English
- Event:
  - The Centerstack Vehicle Settings Client sends a request message to the Cluster Vehicle Settings Server to change the language from English to Spanish
- Post-Condition:
  - The Cluster updates its Language Status message to Spanish.
  - Next time the Cluster ignition_status goes to Run the Cluster HMI would be in Spanish and would be in harmony with the Centerstack language

2.2 IFS-MMCAN-FUR-REQ-015114/D-Sending of Request and Response (TcSE ROIN-66252-1)

Unless noted otherwise request and response signals shall only be sent once and when they have been sent it is important that they are set to inactive/null again. The signals should be set back to inactive/null as soon as FNOS has reported that the signal has been transmitted unless noted otherwise.

- Example of an exception: an event-periodic signal going across network gateway and encoding value may need to be held until other bus wakes up. Reference the feature specs for exceptions.

For event based signals this has to be done in order to keep FNOS from accidentally sending out the signal twice when another signal in the same frame is to be transmitted, either by a change of another signal or by a periodic transmission.

3 Functional Definition

3.1 VS-FUN-REQ-025206/C-Set Language (TcSE ROIN-292323-1)

3.1.1 Interface Requirement - Language

3.1.1.1 MD-REQ-025377/N-Disp_LangSel.Rq (TcSE ROIN-297357)

Message Type: Request

This Signal requests the change of the Language displayed.

Name	Value	Description
Disp_LangSel.Rq	-	
	int *Language* 0x00 Invalid 0x01 Unknown 0x02 UK English 0x03 NA English 0x04 German 0x05 Italian 0x06 EU French 0x07 Cana French 0x08 EU Spanish 0x09 Mex Spanish 0x0A Turkish 0x0B Russian 0x0C Dutch 0x0D Flemish 0x0E Polish 0x0F Czech 0x10 Greek 0x11 Hungarian 0x12 Swedish 0x13 Danish 0x14 Norwegian 0x15 Finish 0x16 EU Portuguese 0x17 Braz Portuguese 0x18 Japanese 0x19 AU_English 0x1A Korean 0x1B Mandarin Chinese 0x1C Taiwanese 0x1D Arabic 0x1E Slovak 0x1F Thai 0x20 Indian English	Request from Vehicle Settings Client to update Language displayed.

Note:
For HS3 Language Request signals 0x191 Disp_LangSel.Rq (ex. APIM/CHR) and 0x193 McLangSel.Rq (ex. Cluster) they are 5 bit signals and maxed out with 0x1F Thai. The new Language Request signals created Disp_LangSel2.Rq and McLangSel2.Rq are bigger in size (7 bits) to allow for more encodings but still include all the encodings the 5 bit signals had.

If the transmitter of the Infotainment language request signal supports one common CAN dB then infotainment language request client for a language request will send both language request signals 0x191 Disp_LangSel.Rq 5 bit signal and Disp_LangSel2.Rq 7 bit signal set to the language requested.

- If a language request is needed for an encoding that is supported by Disp_LangSel2.Rq but not Disp_LangSel.Rq (ex Indian English) then only Disp_LangSel2.Rq would request the language.

If the transmitter of the infotainment language request signals has a CAN dB that only supports one Language request signal then only that language request signal would be supported (either support just the 5 bit Disp_LangSel.Rq or 7 bit Disp_LangSel2.Rq signal).

The receiver of the infotainment language request signal (ex Cluster) will have its CAN dB set-up so only one language request signal is received in its CAN dB for a particular program (will only receive the 5 bit Disp_LangSel.Rq signal or 7 bit Disp_LangSel2.Rq signal).

- Exception: If the Ford D&R for the receiver of the infotainment language request signal has explicitly asked for a CAN dB with both infotainment language request signals to support common software across multiple programs (0x191 Disp_LangSel.Rq 5 bit signal and Disp_LangSel2.Rq 7 bit signal) then the receiver of those signals will need to have a configuration bit such that only one of the signals can be used at a time (ex. program X only uses Disp_LangSel2.Rq while program Y only uses Disp_LangSel.Rq).

The Cluster transmitter of the language request signal will support only one language request signal in its CAN dB for a particular program (will only send the 5 bit McLangSel.Rq or 7 bit McLangSel2.Rq signal). The other language signal not used would be set to 0x0 Inactive/Invalid.

- Exception: If the Ford D&R for the transmitter of the Cluster language request signals (McLangSel.Rq 5 bit signal and McLangSel2.Rq 7 bit signal) has explicitly asked for a CAN dB with both cluster language request signals to support common software across multiple programs then the Cluster will need to have a configuration bit such that only one of the signals can be used at a time.

If in an error condition the receiving module gets both language request signals from the same module at the same time then the last language request signal received set to a language would be supported.

- The Cluster Ford D&R or supplier needs to bring to the CAN dB teams attention if their module is receiving both language request signals if they are only supposed to be receiving one language request signal so this can be corrected in their CAN dB.
- The Cluster is only supposed to send one language request at a time and that is what receiver would expect. If the receiver of 0x193 McLangSel.Rq or McLangSel2.Rq gets both signal set to a language at the same time then bring the issue to the Cluster D&R's attention so this could be corrected.

Reference the CAN dB for the latest and in case any conflict in signal names the CAN dB takes precedent.

3.1.1.2 MD-REQ-025452/B-LanguageUpdate.Rsp (TcSE ROIN-297376)

Message Type: Response

Response signal from Vehicle settings Language server to the Vehicle settings Client in response to the Disp_LangSel.Rq method. Signal informs the Client if the Language that was requested to change is supported by that server or not. This signal allows the Client to take an action if the language is not supported by the server.

Logical Signal Name	Literals	Value	Description
LanguageUpdate.Rsp	Inactive	0x0	
	Language_Updated	0x1	
	Language_Not_Supported	0x2	

3.1.1.3 MD-REQ-025450/M-Disp_LangSel.St (TcSE ROIN-297360)

Message Type: Status

This Signal gives status of the Language displayed.

Name	Value	Description
Disp_LangSel.St	-	
	int *Language* 0x00 Invalid 0x01 Unknown 0x02 UK English 0x03 NA English 0x04 German 0x05 Italian 0x06 EU French 0x07 Cana French 0x08 EU Spanish 0x09 Mex Spanish 0x0A Turkish 0x0B Russian 0x0C Dutch 0x0D Flemish 0x0E Polish 0x0F Czech 0x10 Greek 0x11 Hungarian 0x12 Swedish 0x13 Danish 0x14 Norwegian 0x15 Finish 0x16 EU Portuguese 0x17 Braz Portuguese 0x18 Japanese 0x19 AU_English 0x1A Korean 0x1B Mandarin Chinese 0x1C Taiwanese 0x1D Arabic 0x1E Slovak 0x1F Thai 0x20 Indian English	Status update from the Vehicle Language settings server stating what the current language setting is for the Vehicle Language Server which sends out the status message.

Note:
The Infotainment Language status HS3 signal 0x229 Disp_LangSel.St (ex APIM, CHR, MFD…) is a 5 bit signal and maxed out with 0x1F Thai. The new Infotainment Language Status HS3 signal is Disp_LangSel2.St and is bigger in size (7 bits) to allow for more encodings but still include all the encodings the 5 bit signals had.

If the transmitter of the Infotainment Language status signal supports one common CAN dB then the transmitter of the infotainment language status signal will have to support sending both language status signals Disp_LangSel.St 5 bit signal and Disp_LangSel2.St 7 bit signal with both status signals set to the active language.

- If Disp_LangSel2.St is set to a language that Disp_LangSel.St does not have an encoding for then Disp_LangSel.St would be set to 0x0 Inactive (ex. if Indian English was the active language).

If the transmitter of the Infotainment Language status signal has a CAN dB that only supports one language status signal then only that language status signal would be supported (either support just the 5 bit Disp_LangSel.St or 7 bit Disp_LangSel2.St).

The receiver of the infotainment language status signals (Disp_LangSel.St 5 bit signal and Disp_LangSel2.St 7 bit signal) should only receive one of the language status signals in their CAN dB.

- If the Ford D&R or supplier of a module receiving the infotainment language status message notices that both infotainment language status signals Disp_LangSel.St 5 bit signal and Disp_LangSel2 7 bit signal in their CAN dB bring to Ford's attention as the CAN dB would need to be corrected.
  - Exception: If the Ford D&R for the receiver of the infotainment language signal has explicitly asked for a CAN dB with both infotainment language signals to support common software across multiple programs (Disp_LangSel.St 5 bit signal and Disp_LangSel2.St 7 bit signal) then the receiver of those signals will need to have a configuration bit such that only one of the signals is can be used at a time (ex. program X only uses Disp_LangSel2.st and program Y only uses Disp_LangSel.St).

The Cluster language status HS3 signal 0x2FD Mc_VehLangUsrSel.St is a 6 bit signal and is not currently maxed out so there is only one Cluster language status signal at the time this was written.

As a general practice if the receiving module just needs to receive one language status signal in a vehicle to know what language to be used then the Cluster Mc_VehLangUsrSel.St signal should be used.

Reference the CAN dB for the latest and in case any conflict in signal names the CAN dB takes precedent.

3.1.2 Use Cases

3.1.2.1 VS-UC-REQ-025207/B-Set Language (TcSE ROIN-290599)

Actors	Vehicle Occupant
Pre-conditions	Infotainment System is On. ~~Language Setting is not currently set to {Language X}.~~ Vehicle Setting Client A (ex Cluster display) can support Language Y. Vehicle Setting Client B (ex Centerstack display) can support Language Y. Language X is active on both Vehicle Setting Client A and Vehicle Setting Client B displays.
Scenario Description	~~User selects {Language X}.via the HMI.~~ User selects {Language Y} via the Vehicle Setting Client A HMI • the Vehicle Settings Client A requests Language Y from the Vehicle Language Server B (ex. Centerstack display)
Post-conditions	~~HMI is updated to {Language X}.~~ Vehicle Setting Client A {updates display A HMI to Language Y} Vehicle Setting Client B {updates display B HMI to Language Y}
List of Exception Use Cases	E1- VS-GUC-290600-Selected Language not available on both Displays
Interfaces	G-HMI; SWC; CBI

3.1.2.2 VS-UC-REQ-025208/B-Selected Language not available on both Displays (TcSE ROIN-290600)

Actors	Vehicle Occupant
Pre-conditions	Infotainment System is On. ~~Language Setting is not currently set to {Language X}~~ Vehicle Setting Client A (ex Cluster display) can NOT support Language Y. Vehicle Setting Client B (ex Centerstack display) can support Language Y. Language X is active on both Vehicle Setting Client A and Vehicle Setting Client B displays.
Scenario Description	~~The selected language is not available on the other display unit.~~ ~~The selected language is not updated on the other display unit.~~ ~~The selected language is {updated on display where change was requested} via HMI.~~ ~~The HMI displays {other display not Supported Message}~~ User selects {Language Y} via the Vehicle Setting Client B HMI • the Vehicle Settings Client B requests Language Y from the Vehicle Language Server A (ex. Cluster display)
Post-conditions	~~HMI does not reflect user Selected Language not available on both displays~~ Vehicle Setting Client B {updates display B to Language Y} Vehicle Setting Client A does not update Display A to Language Y and remains at Language X. .
Comments	Note: just used the Cluster and Centerstack as examples above. The pre-conditions could have been reversed for who was Vehicle Setting Client A and Vehicle Setting B. Also this is not limited to only those modules used as examples.
Interfaces	G-HMI

3.1.3 Functional Requirements

3.1.3.1 VS-SR-REQ-025209/B-Language Truth Table (TcSE ROIN-141542-3)

Table describes the output response of the HMI based upon user input to change language setting at the Vehicle Settings Client 1 or Vehicle Settings Client 2, and availability of language in each display.

Language Update Request Made By	~~VS Client~~ Vehicle Settings Language Server 1 LanguageUpdate.Rsp	~~VS Client 2~~ Vehicle Settings Language Server 2 LanguageUpdate.Rsp	HMI Update
VS Client 1	Language_Updated*	Language_Updated	Languages Updated on both VS Client 1 and VS Client 2 HMI
VS Client 2	Language_Updated	Language_Updated*	Languages Updated on both VS Client 1 and VS Client 2 HMI
VS Client 1	Language_Updated*	Language_Not_Supported	VS Client 1 HMI Updated, HMI Message on VS Client 1 that VS Client 2 not supported.
VS Client 2	Language_Not_Supported	Language_Updated*	VS Client 2 HMI Updated,

			HMI Message on VS Client 2 that VS Client 1 not supported.
No active Request	Inactive	Inactive	None

* Note: this might be an internal logical signal to a module instead of an actual network signal

3.1.3.2 VS-SR-REQ-025210/A-Language Status Update Timing (TcSE ROIN-141543-3)

The Vehicle Language settings servers shall respond to a Disp_LangSel.Rq via a LanguageUpdate.Rsp signal within T_Language_Response of receiving the request, and update the Disp_LangSel.St signal with the status of the server's language.

3.1.3.3 VS-TMR-REQ-025211/B-T_Language_Response (TcSE ROIN-146553-2)

Name	Description	Units	Range	Resolution	Default
T_Language_Response	Maximum time allowed between sending a Disp_LangSel.Rq language change message, and receiving a response message from the display modules. Use default value	msec	0-1000	10	250

3.1.3.4 VS-SR-REQ-135143/B-Language following a B+ reset to Language Servers

The Cluster shall store the current language such that upon a loss of B+ to the Cluster the Cluster shall remember the current language. Upon B+ re-applied to the Cluster the Cluster shall use the language that was used before loss of B+. The Cluster shall update the language status signal with the correct language within 500 msec of network bus wake-up.

Upon a loss of B+ to Non-Cluster Vehicle Language Servers (ex APIM, MFD, CHR…) when B+ is re-applied to the Non-Cluster Vehicle Language Servers they shall use the language in the Cluster language status signal at start-up. After the Non-Cluster Vehicle Language Servers get the current language to use the other language requirements apply such that a language request is needed to change languages.

Note: Crank events are normal vehicle operations and vehicle language shall not be lost by the language servers for crank events. Worst case cold crank events are defined in the EMC specification and in the Stations Management SPSS.

Ex. The user disconnects the battery to the vehicle and later reconnects the battery

- Pre-condition:
  1. Language X is active in the Cluster and Centerstack Display module (ex. SYNC, MFD…)
- Event:
  1. B+ is removed from the vehicle (disconnect battery from the vehicle)
  2. After 30 minutes the battery is re-connected to the vehicle (could be any time but 30 min used for this example).
- Post-condition:
  1. The network bus wakes up when B+ is re-applied
  2. The Cluster may initially set the language status to Inactive/Invalid (usually the initialization value) until the Cluster language status message is updated with Language X. The Cluster has to publish the language in the status message within 500 msec of network bus wake-up
  3. Then Non-Cluster Vehicle Language Servers (ex APIM, MFD, CHR…) update their language to the Language X in the Cluster Language Status message.

3.1.3.5 VS-SR-REQ-193890/B-Enhanced Memory - Language for Active Personality Profile

All Vehicle Language Servers that support enhanced memory shall store the language for each personality profile (ex Vehicle, Per1, Per2, Per3, Per4) between power mode changes, bus asleep / awake and between B+ resets.

The Cluster and Non-Cluster Vehicle Language Servers (ex APIM, MFD, CHR…) do not normally listen to each other's language status information to update language unless the Client request a language update (exceptions for things like B+ resets). For enhanced memory though when the active personality profile changes (ex Pers_1 to Per_3) then the Non-Cluster Vehicle Language Servers (ex APIM, MFD, CHR…) shall monitor the Cluster Language Status message after the active personality change and update the language to what is in the Cluster status message for the new personality profile.

- The Non-Cluster Vehicle Language Servers shall wait 1.5 second (hysteresis protection) from the time the Personality Profile changes until the time they update to the language indicated in the Cluster status message.
- Exception 1: If the Language indicated in the Cluster language status message the Non-Cluster Language Server does not support then the Language Server shall go to the stored language for that active personality profile and ignore the Cluster language statue message.
- Exception 2: If for the new personality profile the stored language is one the Non-Cluster Vehicle Language Client previously requested a language that the Cluster responded it did not support then the Non-Cluster Vehicle Language Server shall go to the stored language for the new personality profile and ignore the Cluster language status message.

Network bus start-up:
At network bus start-up the Active Personality may be different than the last active personality. Modules initializing from network bus start-up shall look at the Active Personality signal at start-up so they can load the right language without adding delays to the start-up.

From a network bus asleep state the Non-Cluster Vehicle Language Servers shall use what language is stored for the personality profile and shall not use the Cluster language status message (exception B+ resets).

3.1.4 Sequence Diagrams

3.1.4.1 VS-SD-REQ-025212/A-Set Language (TcSE ROIN-118736-4)

Linked Elements
VS-UC-REQ-025370/A-Set Language to English (TcSE ROIN-121358-3)

Scenarios

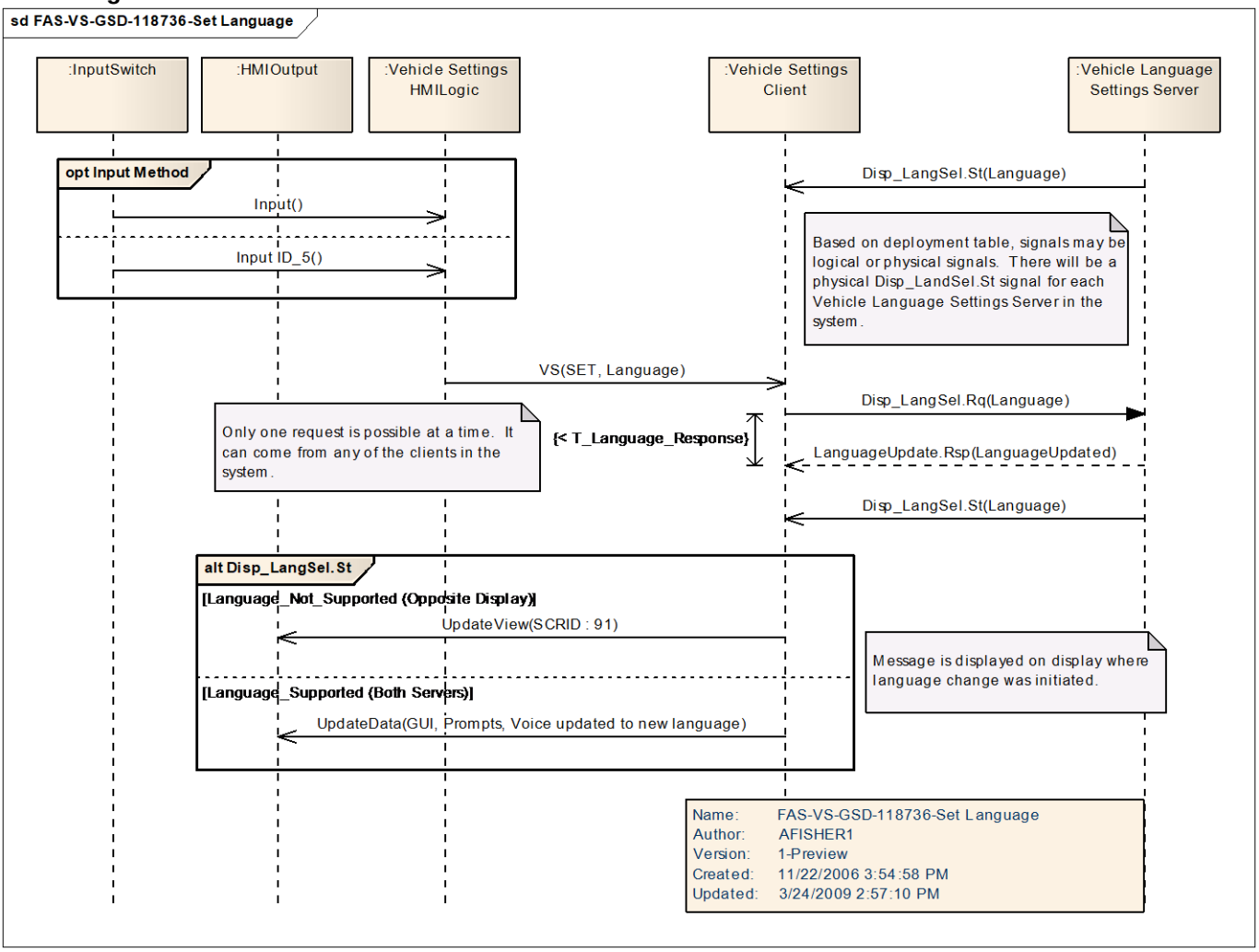
Normal Usage
The user selects <Language units change> via the HMI.

Constraints

Pre-condition
Center Stack Display is On, Settings units menu is active.

Post-condition
{Language units are updated to newly selected setting} via the HMI.

Sequence Diagram



3.2 VS-FUN-REQ-025213/C-Set Distance Units (TcSE ROIN-292327-1)

Note: The set operation for Imperial or Metric in this function will be superseded by the Settings in the Centerstack SPSS Measure Unit function (VS-FUN-REQ234037-Measure Units) when DI settings move from the Cluster to Centerstack HMI.

3.2.1 Interface Requirements - Distance

3.2.1.1 MD-REQ-025516/C-DISP_Miles_Kilometers_Rq (TcSE ROIN-273811)

Message Type: Request

This method is used to request a status change of Distance Unit.

Name	Literals	Value	Description
Mode	-	-	
	Metric	0x0	The parameter "Metric" is used to request the distance unit kilometers.
	Imperial	0x1	The parameter "Imperial" is used to request the distance unit miles.
	Inactive	0x3	

3.2.1.2 MD-REQ-243934/B-Disp_Miles_Kilometers.St

Message Type: Status

Signal from the Vehicle Settings Server stating what the setting is for Distance units.

Logical Signal Name	Literals	Value	Description
Disp_Miles_Kilometers.St	Metric (kilometers)	0x0	
	Imperial (miles)	0x1	

3.2.2 Use Cases

3.2.2.1 VS-UC-REQ-025214/A-Set Distance Units (TcSE ROIN-290601)

Actors	Vehicle Occupant
Pre-conditions	Infotainment System is On. Distance Setting is set to {Unit X}
Scenario Description	User selects {Unit Y}via the HMI
Post-conditions	HMI is updated to {Unit Y}
List of Exception Use Cases	NA
Interfaces	G-HMI SWC CBI

3.2.3 Functional Requirements

3.2.3.1 VS-SR-REQ-025215/A-Change Distance Units Status update timing (TcSE ROIN-149492-1)

The vehicle settings server shall respond to a Disp_Miles_Kilometers.Rq via the Disp_Miles_Kilometers.St signal within T_Dist_Response of receiving the request.

3.2.3.2 VS-SR-REQ-025434/A-Multiple Disp_Miles_Kilometers.Rq signals (TcSE ROIN-150819-1)

The vehicle settings server shall ignore all new Disp_Miles_Kilometers.Rq signals for T_Dist_Response after receiving the initial Disp_Miles_Kilometers.Rq signal.

3.2.3.3 VS-TMR-REQ-025216/B-T_Disp_Response (TcSE ROIN-149488-2)

Name	Description	Units	Range	Resolution	Default
T_Disp_Response	Maximum time allowed between sending a Disp_Miles_Kilometers.Rq distance change message, and receiving a response message from the display modules. Use default value	msec	0-1000	10	250

3.2.4 Sequence Diagrams

3.2.4.1 VS-SD-REQ-025217/A-Set Distance Units (TcSE ROIN-118743-3)

Linked Elements
VS-UC-REQ-025372/A-Set Distance Units (TcSE ROIN-121364-2)

Scenarios

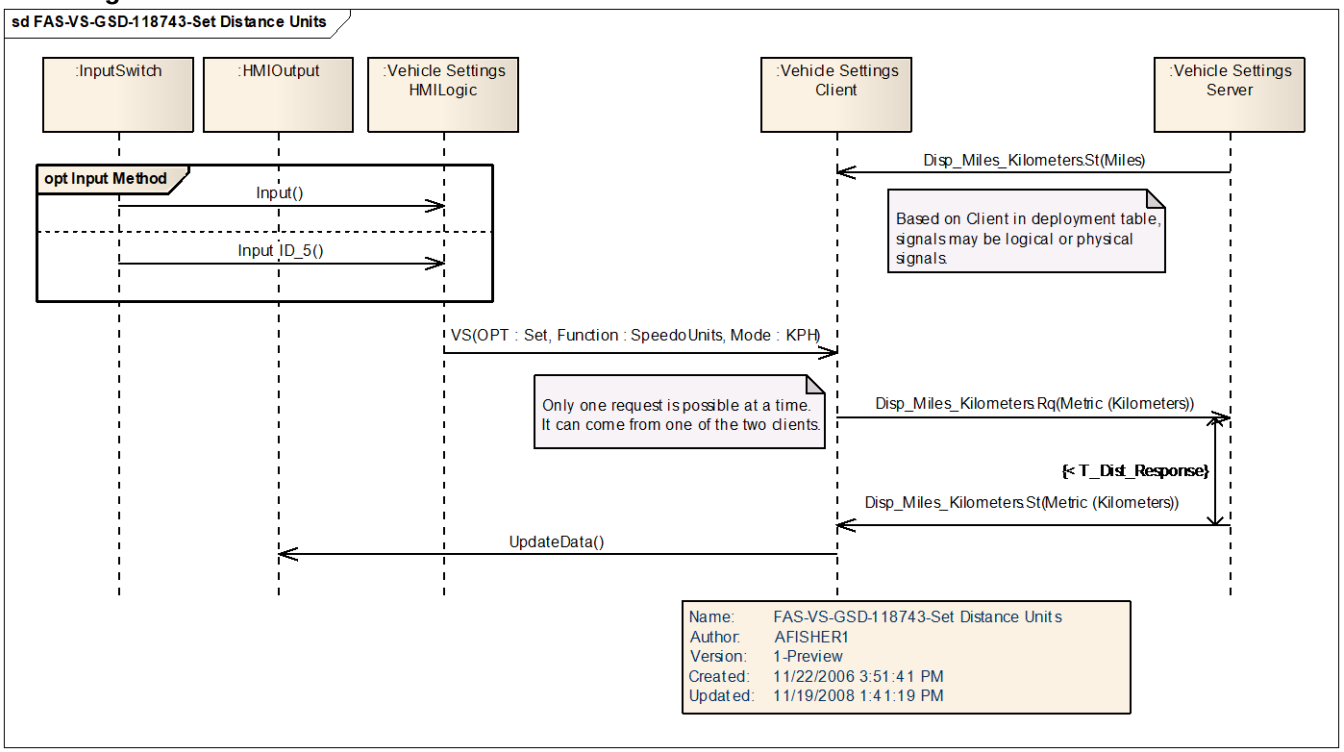
Normal Usage
The user selects <Kilometers units> via the HMI.

Constraints

Pre-condition
Center Stack Display is On, Settings units menu is active. Distance units are currently set to miles.

Post-condition
{Distance units are updated to kilometers on the HMI}

Sequence Diagram



3.3 VS-FUN-REQ-025218/C-Set Temperature Units (TcSE ROIN-292331-1)

3.3.1 Interface Requirement - Temperature

3.3.1.1 MD-REQ-025380/B-Disp_Temperature.Rq (TcSE ROIN-297369)

Message Type: Request

This signal requests to change the temperature units displayed.

Logical Signal Name	Literals	Value	Description
DISP_Temperature.Rq	Celsius	0x0	
	Fahrenheit	0x1	
	Inactive	0x3	

3.3.1.2 MD-REQ-025453/B-Disp_Temperature.St (TcSE ROIN-297374)

Message Type: Status

Signal from the Vehicle Settings Server stating what the setting is for temperature units.

Logical Signal Name	Literals	Value	Description
DISP_Temperature.St	Celsius	0x0	
	Fahrenheit	0x1	

3.3.2 Use Cases

3.3.2.1 VS-UC-REQ-025219/A-Set Temperature Units (TcSE ROIN-290602)

Actors	Vehicle Occupant
Pre-conditions	Infotainment System is On Current Unit is {Unit X}
Scenario Description	User selects {Unit Y} via the HMI.
Post-conditions	HMI is updated to {Unit Y}
List of Exception Use Cases	NA
Interfaces	G-HMI

3.3.3 Functional Requirements

3.3.3.1 VS-SR-REQ-025220/A-Change Temperature Units Status update timing (TcSE ROIN-149493-1)

The vehicle settings server shall respond to a Disp_Temperature.Rq via the Disp_Temperature.St signal within T_Temp_Response of receiving the request.

3.3.3.2 VS-SR-REQ-025433/A-Multiple Disp_Temperature.Rq signals (TcSE ROIN-150818-1)

The vehicle settings server shall ignore all new Disp_Temperature.Rq signals for T_Temp_Response after receiving the initial Disp_Temperature.Rq signal.

3.3.3.3 VS-TMR-REQ-025221/B-T_Temp_Response (TcSE ROIN-149489-2)

Name	Description	Units	Range	Resolution	Default
T_Temp_Response	Maximum time allowed between sending a Disp_Temperature.Rq temperature units change message, and receiving a response message from the display modules. Use default value	msec	0-1000	10	250

3.3.4 Sequence Diagrams

3.3.4.1 VS-SD-REQ-025222/A-Set Temperature Units (TcSE ROIN-118750-3)

Linked Elements
VS-UC-REQ-025374/A-Set Temperature Units to Fahrenheit (TcSE ROIN-121370-2)

Scenarios

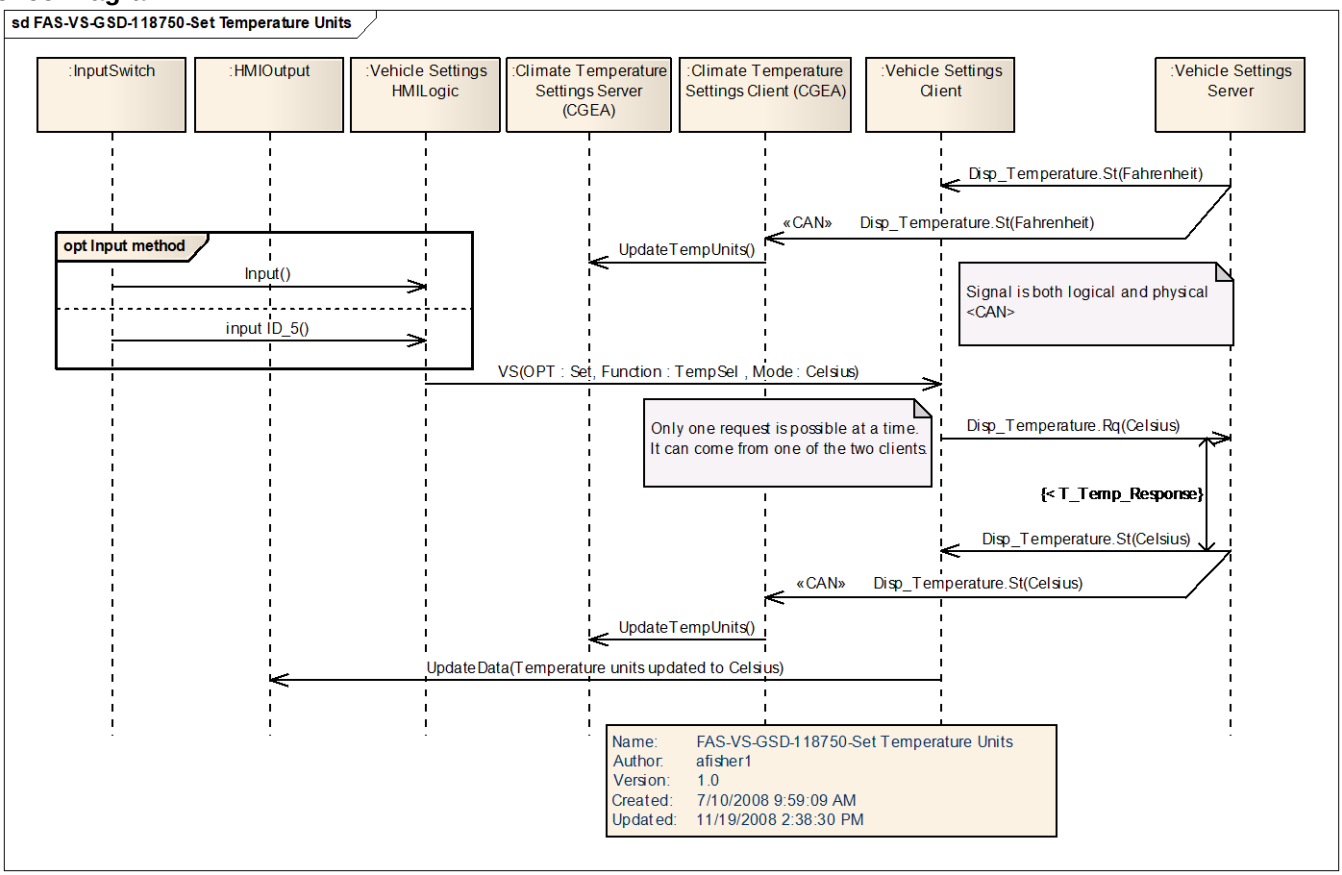
Normal Usage
The user selects <Celsius units> via the HMI.

Constraints

Pre-condition
Center Stack Display is On, Settings units menu is active. Temperature units are currently set to Fahrenheit.

Post-condition
{Temperature units are updated to Celsius on the HMI}

Sequence Diagram



3.4 Ambient Lighting - Variant 1

3.4.1 VSv2-FUN-REQ-025223/C-Ambient Lighting- Set Color (TcSE ROIN-292314-1)

3.4.1.1 Interface Requirements

3.4.1.1.1 MD-REQ-025388/C-LightAmbColor_No_Rq (TcSE ROIN-297407)

Message Type: Request

This signal requests selection of color for ambient lighting.

Logical Signal Name	Literals	Value	Description
LightAmbColor_No_Rq	Invalid / No Data Exits	0x00	
	Color ID1	0x01	
	Color ID2	0x02	
	Color ID3	0x03	
	Color ID4	0x04	
	Color ID5	0x05	
	Color ID6	0x06	
	Color ID7	0x07	
	Color ID8	0x08	
	Color ID9	0x09	
	Color ID10	0x0A	
	Color ID11	0x0B	
	Color ID12	0x0C	
	Color ID13	0x0D	
	Color ID14	0x0E	
	Color ID15	0x0F	
	Color ID16	0x10	
	Reserved	0x11 to 0xFF	

3.4.1.1.2 MD-REQ-025456/D-LightAmbColor_No_Actl (TcSE ROIN-297421)

Message Type: Status

This signal from Ext Vehicle Settings Function to the Vehicle Settings Client gives the status of the ambient lighting color.

Logical Signal Name	Literals	Value	Description
LightAmbColor_No_Actl	OFF / Inactive / No Data Exists	0x00	
	Color ID1	0x01	
	Color ID2	0x02	
	Color ID3	0x03	
	Cont	0x04 – 0xFF	separate document defines what the Color ID's are

3.4.1.2 Use Cases

3.4.1.2.1 VS-UC-REQ-025224/A-Ambient Lighting- Set Color (TcSE ROIN-290603)

Actors	Vehicle Occupant
Pre-conditions	Infotainment System is On
Scenario Description	The user selects <updated Ambient Lighting color setting> via the HMI
Post-conditions	The vehicle HMI indicates {Updated status of Ambient Lighting Color setting}
List of Exception Use Cases	NA
Interfaces	G-HMI CBI

3.4.1.3 Requirements

3.4.1.3.1 VS-SR-REQ-025225/E-Ambient Lighting - Color Change Request Latency (TcSE ROIN-141572-1)

The Vehicle Settings Client shall ignore the LightAmbColor_No_Actl status message for T_Response_light_color after sending a LightAmbColor_No_Rq to the Ext Vehicle Settings Function to allow for Latency on the response back from the Vehicle Setting Server (don't want to act on a periodic status message from Vehicle Setting Server that wasn't yet updated). All other times the Vehicle Settings Client shall update based on the LightAmbColor_No_Actl.St signal including updating its LightAmbColor_No_Rq signal to match.

After T_Response_Light_Color the Vehicle Settings Client shall use the last state received in the LightAmbColor_No_Actl signal.

Note: Since the LightAmbColor_No_Rq is event-periodic and some Vehicle Settings Client modules keep the last state the Vehicle Setting Server if it updates its status message to a new value may want to implement a similar strategy has above (don't want to act on a periodic status message from Vehicle Setting Client that wasn't yet updated).

3.4.1.3.2 VS-TMR-REQ-025226/C-T_Response_light_color (TcSE ROIN-146542-2)

Name	Description	Units	Range	Resolution	Default
T_Response_light_color	Minimum amount of time between LightAmbColor_No_Rq color change and acting upon a LightAmbColor_No_Actl signal by the vehicle settings client. Use the default value	msec	0-1000	10	500

3.4.1.3.3 VS-SR-REQ-117709/D-Turning ON and OFF Ambient Lighting

Turning OFF ambient lighting the Ambient Lighting:
When turning OFF ambient lighting from the Vehicle Setting Client the Vehicle Settings Client shall send:
LightAmbIntsty_No_Rq = 0x0 0% Intensity / Ambient Lighting OFF, AND
LightAmbColor_No_Rq shall stay at the currently selected value (equal to input LightAmbColor_No_Actl_St).

When the Ambient Lighting Vehicle Setting Server receives LightAmbIntsty_No_Rq = "0x0 0% Intensity" then the Vehicle Settings Server shall turn OFF Ambient Lighting.

The Ambient Lighting Vehicle Setting Server shall not respond to LightAmbColor_No_Rq requests that are 0x0 Inactive / No Data Exists and shall treat those requests as don't cares (ex can continue to use the last valid value for color and send this in signal LightAmbColor_No_Actl_St).

If LightAmbColor_No_Actl_St = 0x0 OFF / Inactive / No Data Exists then the Vehicle Settings Client shall set LightAmbColor_No_Rq to 0x0 Inactive / No Data Exists and turn the Ambient Lighting HMI OFF.
Note: only the CGEA 1.2 Vehicle Settings Server uses the OFF state in LightAmbColor_No_Actl_St. C1MCA and CGEA 1.3 architectures use LightAmbColor_No_Actl_St = 0x0 as Inactive / No Data Exists.

When the Ambient Lighting Vehicle Setting Client receives LightAmbIntsty_No_Actl_St = “0x0 0% Intensity” then the Vehicle Settings Client shall turn OFF Ambient Lighting on the HMI (after T_Response_Light_Intensity from the request to turn OFF Ambient Lighting if requested Ambient Lighting OFF).

Bus Start-Up or Module reset and avoiding 0x0 init values turning OFF Ambient Lighting when it is ON:
When the network bus starts-up the Vehicle Settings Client / Server modules may send 0x0 init values before sending the actual values. The Vehicle Settings Client and Server shall not let the init values sent on bus start-up turn OFF ambient lighting if it is still on (ie LightAmbIntsty_No_Rq = 0x0 0% Intensity, LightAmbIntsty_No_Actl_St = “0x0 0% Intensity”, or LightAmbColor_No_Actl_St = 0x0 OFF).

At network bus start-up:

1. the Ambient Lighting Vehicle Setting Server can implement a blanking period so that if at bus wakes up the Vehicle Setting Server receives ‘LightAmbIntsty_No_Rq = 0x0 0% Intensity’ (ie if 0x0 is default init CAN value) then Vehicle Settings Server can ignore these values at start-up so the current Ambient Lighting Intensity value is not reset to OFF.
2. the Ambient Lighting Vehicle Setting Client can implement a blanking period so that if at bus wakes up the Vehicle Setting Client receives LightAmbIntsty_No_Actl_St = “0x0 0% Intensity”, OR LightAmbColor_No_Actl_St = 0x0 OFF (ie if 0x0 is default init CAN value) then Vehicle Settings Client can ignore these values at start-up so the current Ambient Lighting value are not reset to OFF.
3. Since the Ambient Lighting Intensity Request and Status signals (LightAmbIntsty_Rq / LightAmbIntsty_No_Actl) don’t have a “0x0 No Data Exists / Inactive” state for network bus wake-up when the network bus wakes up it is preferred if the Vehicle Settings Client / Server publish the last signal state/encoding of their respective signal. This would mean not publishing the network init value at network bus wake-up unless that was the last state before the network bus went to sleep.

If the Ambient Lighting Vehicle Setting Client has a reset (ex B+) while the Vehicle Setting Server stays active on network bus (ex SYNC module resets causing it’s CAN signals to be re-initialized while BCM stays active on CAN bus):

1. Since the Vehicle Settings Client request signals are in the same message to avoid the case where a Vehicle Setting Client module resets results in turning OFF Ambient Lighting from an ON state to OFF the Vehicle Setting Server could implement the following:
    a. If both “LightAmbIntsty_No_Rq / LightAmbColor_No_Rq” equal 0x0 then the Vehicle Setting Server could treat 0x0 encodings as a don’t cares so ambient lighting is not turned OFF.

Turning ON Ambient Lighting:
If the user turns back ON Ambient Lighting from an OFF condition then the Vehicle Setting Client shall use the last Intensity value before Ambient Lighting was turned OFF.

Exception: If there was a B+ reset to the Vehicle Setting Client then after the reset the Vehicle Setting Client shall use 100% intensity for LightAmbIntsty_No_Rq after the user selects a color ID.

3.4.1.4 Sequence Diagrams

3.4.1.4.1 VS-SD-REQ-025227/A-Ambient Lighting- Set Color (TcSE ROIN-118722-2)

Linked Elements
VS-FUN-REQ-025367/A-Ambient Lighting- Set Color (TcSE ROIN-119875-1)
VSv2-FUN-REQ-025223/C-Ambient Lighting- Set Color (TcSE ROIN-292314-1)

Scenarios

Normal Usage

The user selects <updated Ambient Lighting color setting> via the HMI

Constraints

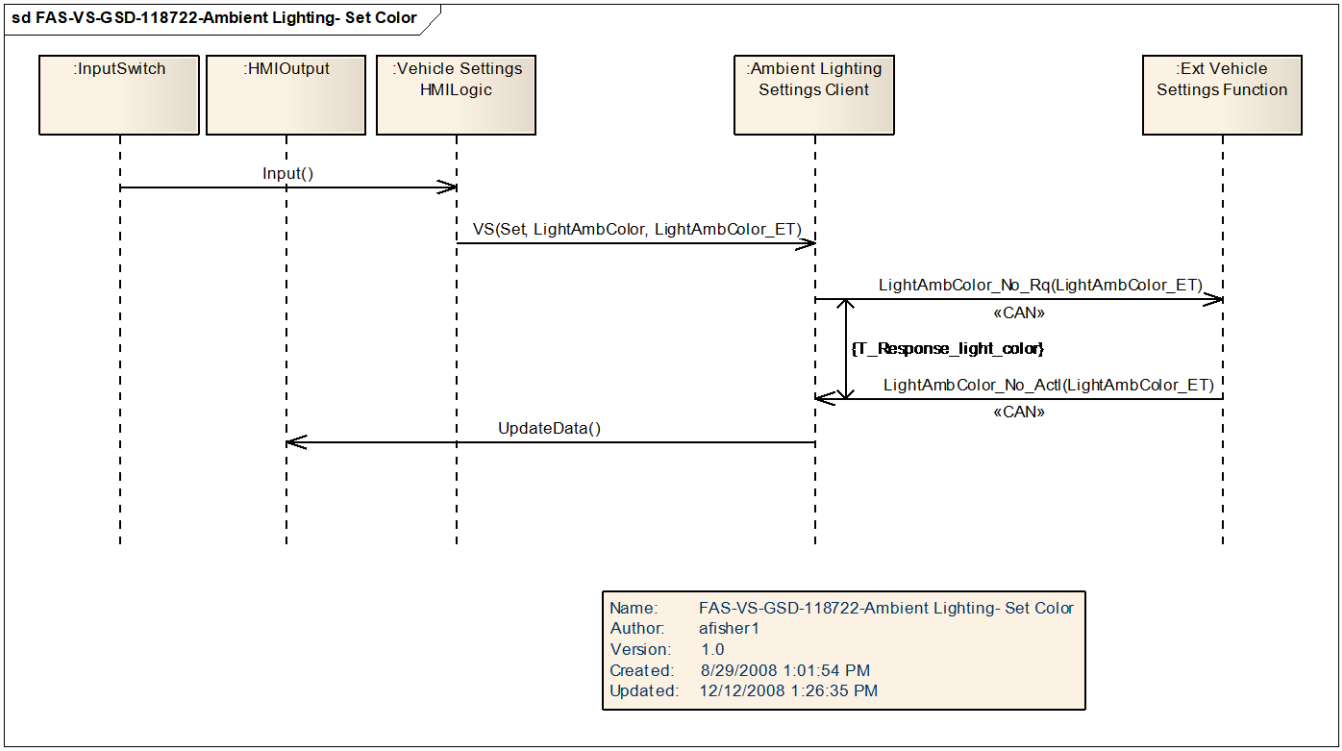
Pre-condition

Center Stack Display is On, Settings units menu is active.

Post-condition

The vehicle HMI indicates {Updated status of Ambient Lighting Color setting}

Sequence Diagram



3.4.2 VSv2-FUN-REQ-025228/C-Ambient Lighting- Set Intensity (TcSE ROIN-292320-1)

3.4.2.1 Interface Requirements

3.4.2.1.1 MD-REQ-025389/C-LightAmbIntsty_No_Rq (TcSE ROIN-297420)

Message Type: Request

This signal requests selection of intensity for ambient lighting.

Logical Signal Name	Literals	Value	Description
LightAmbIntsty_No_Rq	0% Intensity / Ambient Lighting OFF	0x0	
	1% Intensity	0x1	
	2% Intensity	0x2	
	cont.		
	100% Intensity	0x64	
	Reserved	0xFF	

3.4.2.1.2 MD-REQ-025457/D-LightAmbIntsty_No_Actl (TcSE ROIN-297422)

Message Type: Status

This signal from the Ext Vehicle Settings Function to the Vehicle Settings Client gives the status of Ambient Lighting Intensity

Logical Signal Name	Literals	Value	Description
LightAmbIntsty_No_Actl	0% Intensity / Ambient Lighting OFF	0x00	
	1% intensity	0x01	
	2% intensity	0x02	
	cont		
	100% intensity	0x64	
	Reserved	0x65 – 0xFF	

3.4.2.2 Use Cases

3.4.2.2.1 VS-UC-REQ-025229/A- Ambient Lighting- Set Intensity (TcSE ROIN-290604)

Actors	Vehicle Occupant
Pre-conditions	Infotainment System is On
Scenario Description	The user selects <updated Ambient Lighting Intensity setting> via the HMI
Post-conditions	The vehicle HMI indicates {Updated status of Ambient Lighting Intensity setting}
List of Exception Use Cases	NA
Interfaces	G-HMI CBI

3.4.2.3 Requirements

3.4.2.3.1 VS-SR-REQ-025230/D-Ambient Lighting - Intensity Change Request Latency (TcSE ROIN-141573-1)

The Vehicle settings client shall ignore the LightAmbIntsty_No_Actl status message for T_Response_light_intensity after sending a LightAmbIntsty_No_Rq to the Ext Vehicle Settings Function to allow for Latency on the response back from the Ambient Lighting Vehicle Setting Server (don't want to act on a periodic status message from the Vehicle Setting Server that wasn't yet updated). All other times the Vehicle Settings Client shall update based on the LightAmbIntsty_No_Actl.St signal including updating its LightAmbIntsty_No_Rq signal to match.

After T_Response_Light_Intensity the Vehicle Setting Client shall use the last state received in the LightAmbInsty_No_Actl signal.

Note: Since the LightAmbIntsty_No_Rq is event-periodic and some Vehicle Settings Client modules keep the last state the Vehicle Setting Server if it updates its status message to a new value may want to implement a similar strategy has above (don't want to act on a periodic status message from Vehicle Setting Client that wasn't yet updated).

3.4.2.3.2 VS-TMR-REQ-025231/B-T_Response_light_intensity (TcSE ROIN-146541-2)

Name	Description	Units	Range	Resolution	Default
T_Response_light_intensity	Minimum amount of time between LightAmbIntsty_No_Rq color change and acting upon a LightAmbIntsty_No_Actl signal by the vehicle settings client. Use the default value	msec	0-1000	10	500

3.4.2.3.3 VS-HMI-REQ-097951/A-Ambient Lighting Intensity

Reference HMI vehicle specific documents for screen flow. If HMI and this requirement contradict follow the HMI specification.

Ambient Lighting Intensity signal values will be adjusted per HMI in the following increments:

For CGEA1.3 /C1MCA (Please verify for particular module with HMI team):

Name	Literals	Value	Description
Mode	-	-	
	Inactive	int *LightAmbIntsty_ET* 0x00 0% Intensity 0x01 1% Intensity ... 0x64 100% Intensity 0xFF Reserved	Ambient Lighting Intensity Selection from Vehicle Settings Client to Ext Vehicle Settings Function

For CGEA 1.2 (Please verify for particular module with HMI team)::

Value	Description
0x00	0% Intensity
0x14	20% Intensity
0x28	40% Intensity
0x3C	60% Intensity
0x50	80% Intensity
0x64	100% Intensity

3.4.2.4 Sequence Diagrams

3.4.2.4.1 VS-SD-REQ-025232/A-Ambient Lighting- Set Intensity (TcSE ROIN-118729-2)

Linked Elements
VS-FUN-REQ-025368/A-Ambient Lighting- Set Intensity (TcSE ROIN-119880-1)
VSv2-FUN-REQ-025228/C-Ambient Lighting- Set Intensity (TcSE ROIN-292320-1)

Scenarios

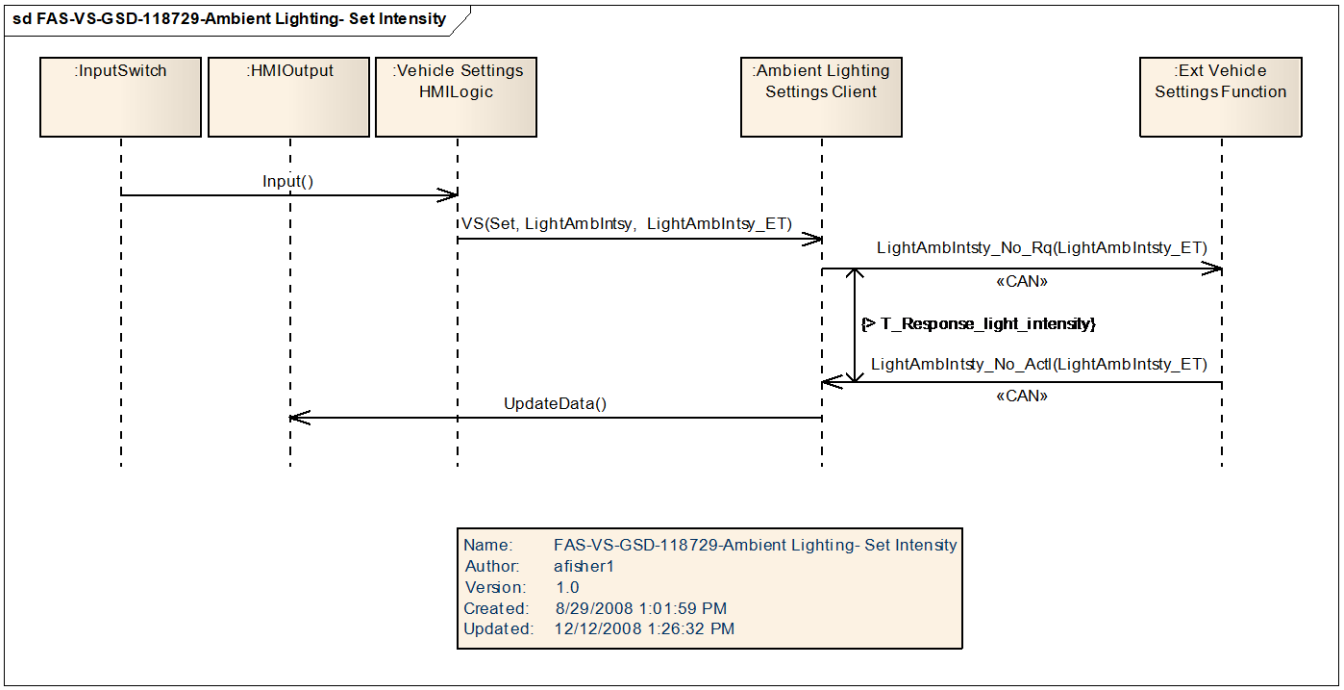
Normal Usage
The user selects <updated Ambient Lighting Intensity setting> via the HMI

Constraints

Pre-condition
Center Stack Display is On, Settings units menu is active.

Post-condition
The vehicle HMI indicates {Updated status of Ambient Lighting Intensity setting}

Sequence Diagram



3.5 VSv2-FUN-REQ-192195/A-Ambient Lighting - Variant 2

3.5.1 VSv2-IIR-REQ-192188/A-Ambient Lighting Settings Client_Tx - Variant 2

Note: Regardless what is in the CAN dB the logical encodings for the signals listed in the in the Ambient Lighting – Variant 2 SPSS interface descriptions shall be used

3.5.1.1 MD-REQ-192189/B-LightAmbColor_No_Rq - Variant 2

Message Type: Request

The Ambient Lighting Client uses this signal to request the color selection for ambient lighting from the Ambient Lighting Server.

Logical Signal Name	Literals	Value	Description
LightAmbColor_No_Rq – Variant 2	Inactive	0x00	
	Color ID1	0x01	
	Color ID2	0x02	
	Color ID3	0x03	
	Color ID4	0x04	
	Color ID5	0x05	
	Color ID6	0x06	
	Color ID7	0x07	
	Color ID8	0x08	
	Color ID9	0x09	
	Color ID10	0x0A	
	Color ID11	0x0B	
	Color ID12	0x0C	
	Color ID13	0x0D	
	Color ID14	0x0E	
	Color ID15	0x0F	
	Color ID16	0x10	
	Reserved	0x11 to 0xFF	

3.5.1.2 MD-REQ-192190/B-LightAmbIntsty_No_Rq - Variant 2

Message Type: Request

This signal requests the selection of intensity for ambient lighting.

Logical Signal Name	Literals	Value	Description
LightAmbIntsty_No_Rq – Variant 2	Inactive / No Data Exits	0x00	
	0% Intensity / Ambient Lighting OFF	0x01	
	1% Intensity	0x02	
	2% Intensity	0x03	
	3% Intensity	0x04	
	cont.	…	
	100% Intensity	0x65	
	Ambient Lighting Turn ON	0x66	

3.5.2 VSv2-IIR-REQ-192192/A-Ambient Lighting Settings Client_Rx - Variant 2

3.5.2.1 MD-REQ-192193/C-LightAmbColor_No_Actl - Variant 2

Message Type: Status

This signal gives status of ambient lighting color (variant 2) status.

Logical Signal Name	Literals	Value	Description
LightAmbColor_No_Actl – Variant 2	Inactive	0x00	
	Color ID1	0x01	
	Color ID2	0x02	
	Color ID3	0x03	
	Cont.	0x04 – 0xFF	Reference separate document with the ambient light Colors and Color ID's used

3.5.2.2 MD-REQ-192194/C-LightAmbIntsty_No_Actl - Variant 2

Message Type: Status

This signal gives the status of Ambient Lighting Intensity.

Logical Signal Name	Literals	Value	Description
LightAmbIntsty_No_Actl – Variant 2	0% Intensity / Ambient Lighting OFF	0x00	
	1% Intensity / Ambient Lighting ON	0x01	
	2% Intensity / Ambient Lighting ON	0x02	
	3% Intensity / Ambient Lighting ON	0x03	
	cont.		
	100% Intensity / Ambient Lighting ON	0x64	

3.5.3 Use Cases

3.5.3.1 VS-UC-REQ-192241/A-Changing Ambient Lighting Color

Actors	Vehicle Occupant
Pre-conditions	Ambient Lighting is turned ON Infotainment System is powered ON Color X is active in the vehicle Intensity Y is active in the vehicle Ambient Lighting HMI is active
Scenario Description	The user select Color Y via the HMI
Post-conditions	Color Y ambient lighting is turned on in the vehicle Ambient lighting remains at Intensity Y in the vehicle The HMI shows Color Y active and Intensity Y
Interfaces	Vehicle Interface, G-HMI

3.5.3.2 VS-UC-REQ-192242/A-Changing Ambient Lighting Intensity

Actors	Vehicle Occupant
Pre-conditions	Ambient Lighting is turned ON Infotainment System is powered ON Color X is active in the vehicle Intensity X is active in the vehicle Ambient Lighting HMI is active
Scenario Description	The user select Intensity Y via the HMI
Post-conditions	Intensity Y is active in the vehicle The HMI shows intensity Y is active
Interfaces	Vehicle Interface, G-HMI

3.5.3.3 VS-UC-REQ-192243/A-Turning ON Ambient Lighting by selecting a color

Actors	Vehicle Occupant
Pre-conditions	Ambient Lighting is turned OFF with the previous Intensity value of Y used before ambient lighting was turned OFF. Infotainment System is powered ON. Ambient Lighting HMI is active.
Scenario Description	The user selects Color X via the HMI to turn ON ambient lighting
Post-conditions	Ambient Lighting Color X turns on in the vehicle. The Ambient Lighting Intensity value Y becomes active in the vehicle The HMI shows Color X and Intensity Y
Interfaces	Vehicle Interface, G-HMI

3.5.3.4 VS-UC-REQ-192244/A-Turning ON Ambient Lighting via ON/OFF HMI selection

Actors	Vehicle Occupant
Pre-conditions	Ambient Lighting is turned OFF with the previous intensity value of X and color of Y used before ambient lighting was turned off. Infotainment System is powered ON Ambient Lighting HMI is active.
Scenario Description	The user selects Ambient Lighting ON via the HMI
Post-conditions	Ambient Lighting turned ON with intensity X and color Y active in the vehicle The HMI shows ambient lighting on with intensity X and color Y
Interfaces	Vehicle Interface, G-HMI

3.5.3.5 VS-UC-REQ-192245/A-Turning OFF Ambient Lighting

Actors	Vehicle Occupant
Pre-conditions	Ambient Lighting is ON in the vehicle Ambient Lighting HMI is active Infotainment System is powered ON
Scenario Description	The user select Ambient Lighting OFF via the HMI
Post-conditions	The Ambient Lighting is turned OFF in the vehicle The HMI shows Ambient Lighting turned OFF
Interfaces	Vehicle Interface, G-HMI

3.5.3.6 VS-UC-REQ-192246/A-Enhanced Memory - Recall new personality profile with Ambient Lighting active

Actors	Vehicle Occupant
Pre-conditions	Infotainment System is Powered ON Enhanced Memory is turned ON The Active Personality profile is Profile 1 with Color A and Intensity B Ambient Lighting HMI is active Personality profile 3 is NOT active but when it was last active Color X and Intensity Y were active for ambient lighting
Scenario Description	The user select Profile 3 to be the active personality profile from the memory seat button (would apply for any enhanced memory recall method)
Post-conditions	Personality 3 becomes the active personality profile Ambient Lighting is active in the vehicle with Color X and Intensity Y The HMI shows Color X and Intensity Y
Interfaces	Vehicle Interface, G-HMI

3.5.3.7 VS-UC-REQ-192247/A-Enhanced Memory - New Profile at Network Wake-up

Actors	Vehicle Occupant
Pre-conditions	Network Bus is asleep Before network was asleep enhanced memory active personality profile was profile 2 Profile 3 is NOT active (profile 3 was last set to Color X, Intensity Y) Ambient Lighting is OFF

	Ignition Status is OFF, Delayed Accessory is OFF Infotainment System is powered OFF
Scenario Description	1. The user enters the vehicle with a keyfob associated to profile 3 2. Network bus wakes up and indicates that profile 3 is active 3. User keys to run from Ignition OFF
Post-conditions	Ambient Lighting becomes active for Profile 3 with Color X and Intensity Y active in the vehicle. If the user goes to the ambient lighting HMI it shows Color X and Intensity Y
Interfaces	Vehicle Interface, G-HMI

3.5.4 Requirements

3.5.4.1 VS-SR-REQ-192228/A-Ambient Lighting Server handling of "Inactive" in the Request signals

The Ambient Lighting Server shall treat LightAmbColor_No_Rq = Inactive and LightAmbIntsty_No_Rq = Inactive as don't cares and shall not update the LightAmbColor_No_Actl and LightAmbIntsty_No_Actl status signals based on the request signals set to Inactive.

3.5.4.2 VS-SR-REQ-192229/A-Bus Start-up

At network bus start-up the Ambient Lighting Server shall only publish the actual ambient lighting values of LightAmbColor_No_Actl and LightAmbIntsty_No_Actl and shall not publish the network init values.

At network bus start-up the Ambient Lighting Client shall set the request signals to Inactive.

3.5.4.3 VS-HMI-REQ-192230/B-Ambient Lighting HMI

The Ambient Lighting Client shall only display, on the ambient lighting HMI, the values indicated in the LightAmbColor_No_Actl and LightAmbIntsty_No_Actl status signals from the Ambient Lighting Server.

If the Ambient Lighting HMI is being displayed, a change in the ambient lighting status signal shall update the HMI.

If the Ambient Lighting Server sends LightAmbIntsty_No_Actl = "0% Intensity / Ambient Lighting OFF" then the Ambient Lighting Client HMI shall set Ambient Lighting HMI OFF. Note this is regardless of what is in the LightAmbColor_No_Actl status signal.

3.5.4.4 VS-SR-REQ-192238/B-Ambient Lighting Request and Response signals

The Ambient Lighting Client, when requesting an Ambient Lighting Color or Ambient Lighting Intensity value, shall set the color or intensity being requested and then set the request signal back to inactive.

- When setting the request signal back to inactive the Ambient Lighting Client shall set to Inactive within 50 msec of making the request.
- When setting the request signal back to inactive the Ambient Lighting Client shall set to Inactive no sooner than 20 msec after making the request.

If the Ambient Lighting Client has not received the Color or Intensity values requested in the LightAmbColor_No_Actl and LightAmbIntsty_No_Actl status signals within 200 msec of the request then the Ambient Lighting Client shall re-request signal within 250 msec after making the first request (only one retry should be performed).

- Note: this protects for the case if the Ambient Lighting Server was on another bus that was asleep and the first message was lost.

The Ambient Lighting Server shall respond back to the LightAmbColor_No_Rq and LightAmbIntsty_No_Rq request signals within 150 msec of receiving the ambient lighting request.

Ex.

1. User selects a new ambient lighting color from the HMI
2. Ambient Lighting Client sets LightAmbIntsty_No_Rq = Color X and then 35 msec later sets LightAmbIntsty_No_Rq = Inactive.
3. The Ambient Lighting Server responds back within 150 msec of receiving LightAmbIntsty_No_Rq = Color X with LightAmbColor_No_Actl = Color X.
4. The Ambient Lighting Client updates the Ambient Lighting HMI based on the LightAmbColor_No_Actl status signal.

3.5.4.5 VS-SR-REQ-192239/A-Turning ON and OFF Ambient Lighting

The Ambient Lighting Client can request the Ambient Lighting is turned ON using LightAmbIntsty_No_Rq = “Ambient Lighting Turn ON” or Ambient Lighting is turned OFF using “0% Intensity / Ambient Lighting Turn OFF”.

The Ambient Lighting Server is responsible for remembering the Color and Intensity values between Power Mode / Ignition cycles, network bus wake-ups, and B+ resets.

If Ambient Lighting is turned OFF the Ambient Lighting Server shall remember the color and intensity values before ambient lighting was turned OFF.

If Ambient Lighting is turned off (ie LightAmbIntsty_No_Actl = 0% Intensity / Ambient Lighting OFF) and if the Ambient Lighting Server receives LightAmbIntsty_No_Rq = “Ambient Lighting Turn ON” then the Ambient Lighting Server shall be responsible for publishing the Color and Intensity values to be used when turned ON.

- The Ambient Lighting Client could request Ambient Lighting ON with a particular Color set, OR
- The Ambient Lighting Client could request Ambient Lighting ON with the Color and Intensity set to Inactive

3.5.4.6 VS-SR-REQ-192240/A-Enhanced Memory - Ambient Lighting

If Enhanced Memory is configured ON in the Ambient Lighting Client than this “Ambient Lighting – Variant 2” strategy shall be used.

If Enhanced Memory is configured ON in the Ambient Lighting Server than this “Ambient Lighting – Variant 2” strategy shall be used.

The Ambient Lighting Server shall update the LightAmbColor_No_Actl and LightAmbIntsty_No_Actl status signals when changing to new enhanced memory profiles (ie when the active personality profile changes).

- If the Ambient Lighting Server is turned OFF the Ambient Lighting Server shall remember what all the personality profiles where before they were turned off (in case turned back on).

If the Ambient Lighting Client HMI is active the Ambient Lighting Client HMI will automatically update to whatever the new Color and Intensity values are when there is a new active personality since the Ambient Lighting Client will use the LightAmbColor_No_Actl and LightAmbIntsty_No_Actl status signals when they are updated.

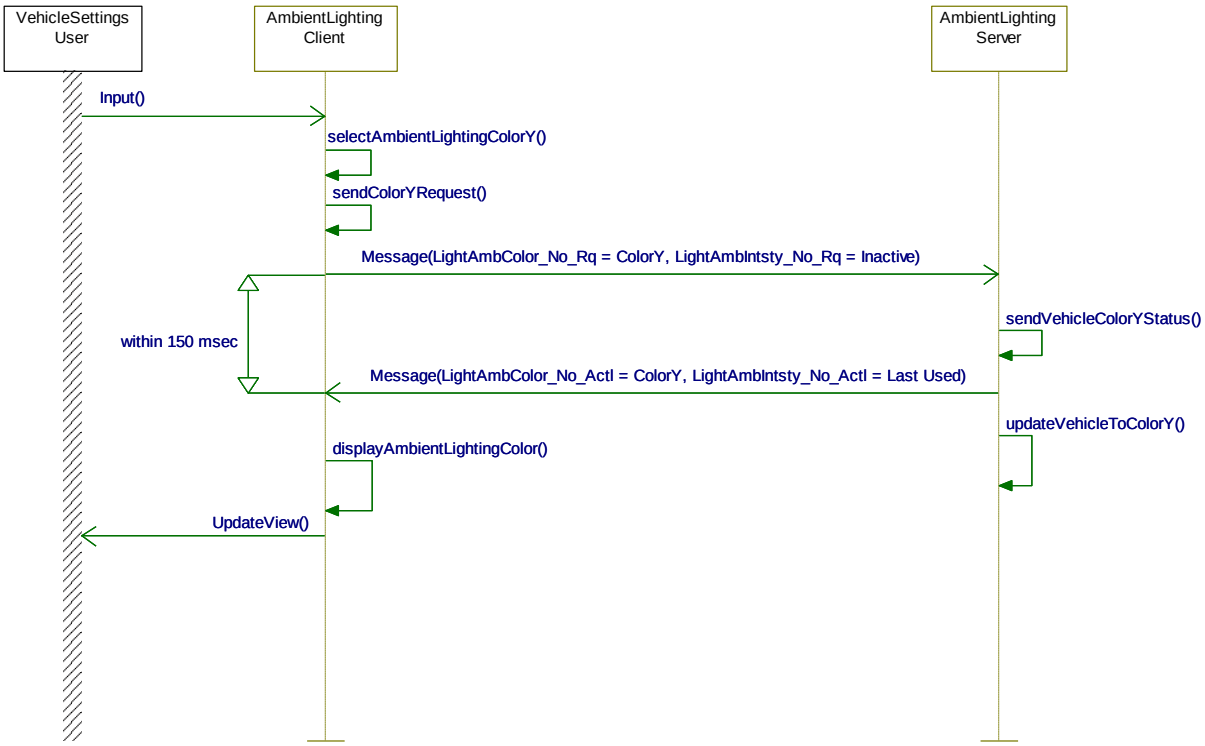
3.5.5 Sequence Diagrams

3.5.5.1 VS-SD-REQ-193188/A-Changing Ambient Lighting Color

Pre-condition:
Color Y is not the active color

Event:
User selects color Y

Post-condition:
Color Y is active on the HMI and the vehicle

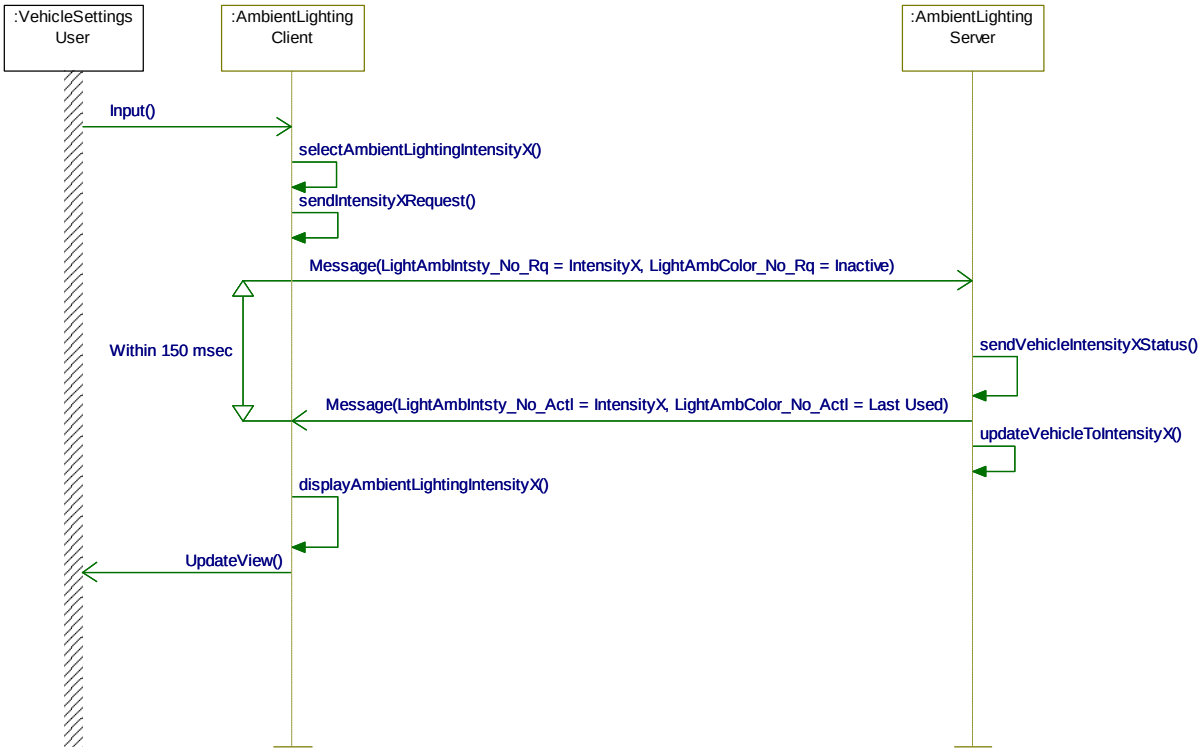


3.5.5.2 VS-SD-REQ-193207/A-Changing Ambient Lighting Intensity

Pre-condition:
Intensity X is not the active intensity

Event:
User selects intensity X

Post-Condition:
Intensity X is shown on the HMI and Intensity X is active in the vehicle

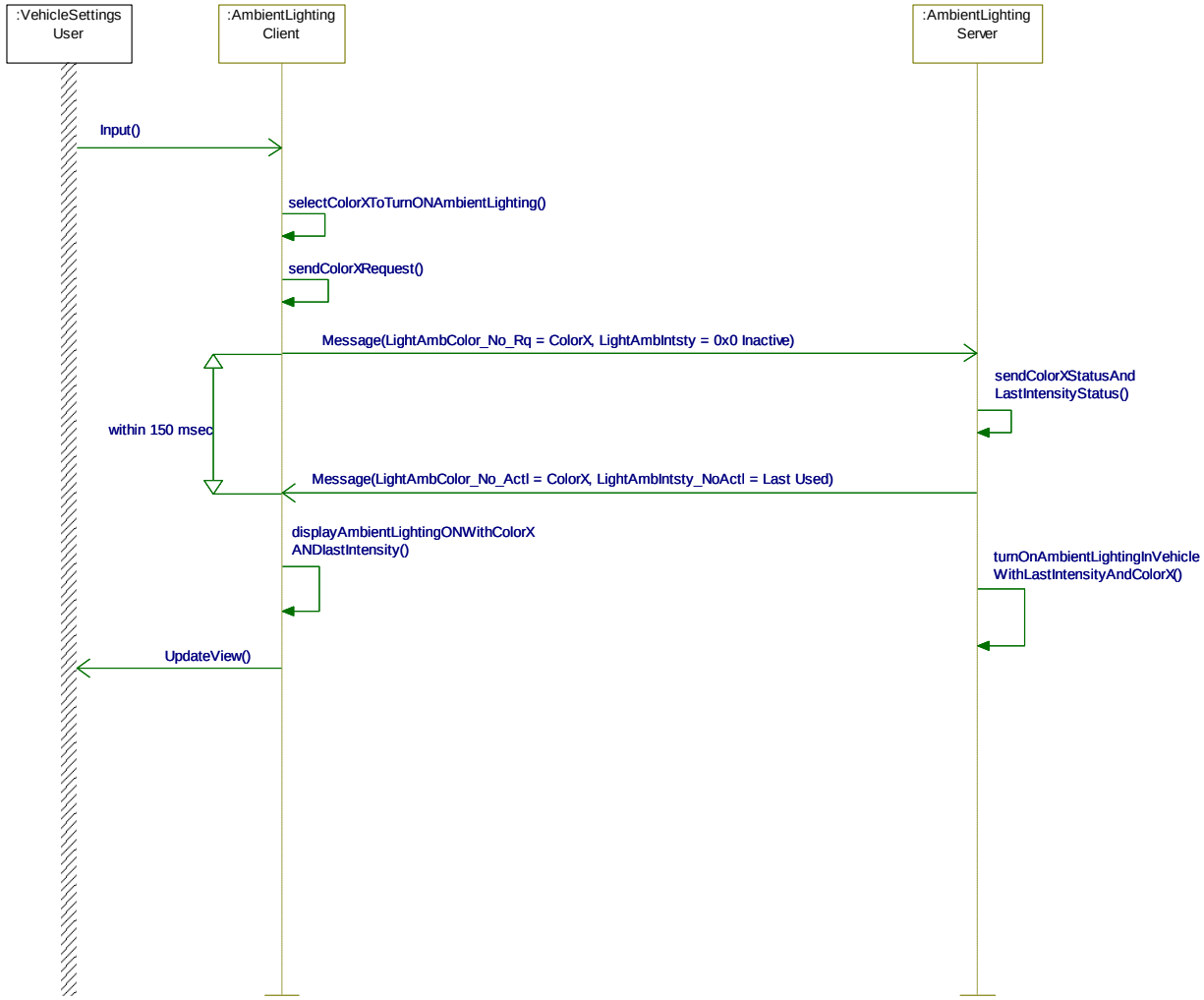


3.5.5.3 VS-SD-REQ-193443/B-Turning ON Ambient Lighting by selecting a Color

Pre-Condition:
Ambient Lighting was previously turned OFF via the HMI
Ambient Lighting in the vehicle is OFF

Event:
User selects colorX to turn ON ambient lighting

Post-Condition:
Ambient Lighting HMI is shown with ColorX active
Ambient Lighting Intensity is shown with last Intensity before turned back ON
Ambient Lighting is turned ON in the vehicle



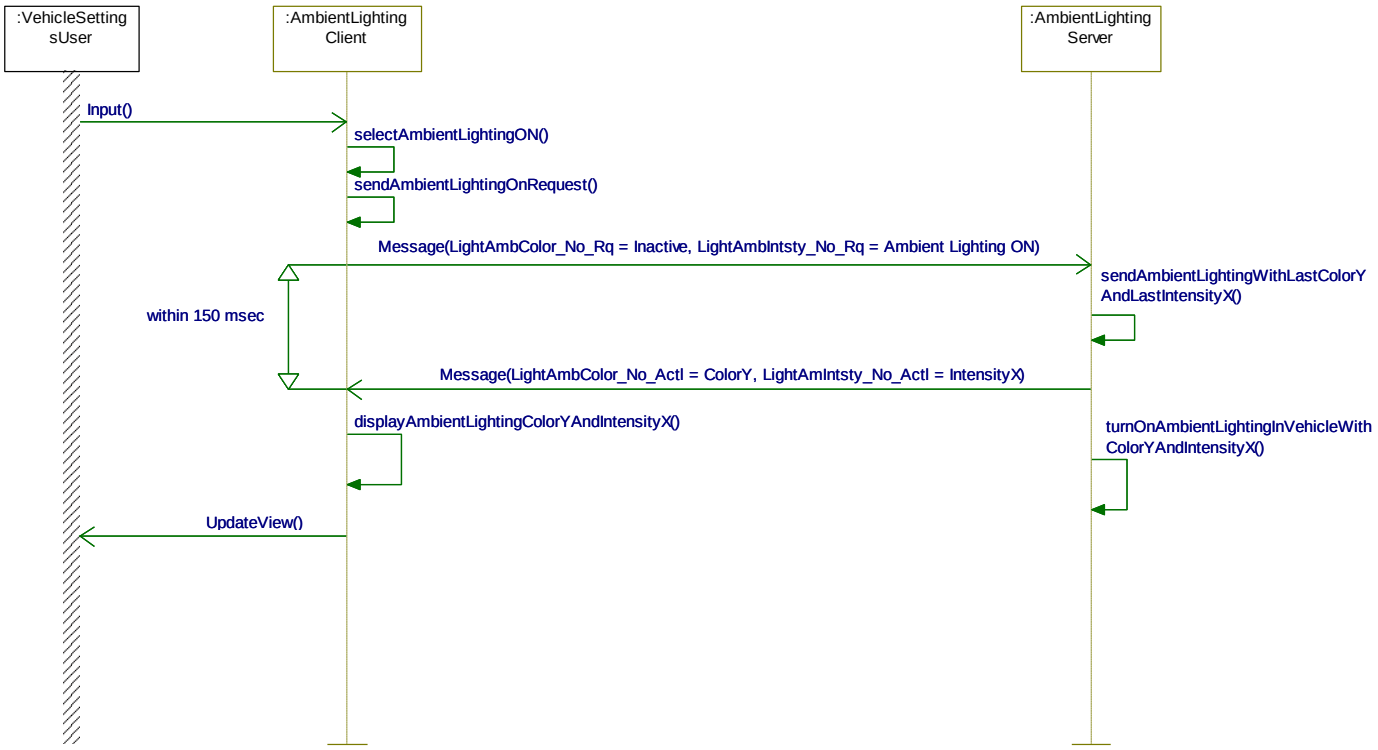
Note: if enhanced memory is turned on then in the sequence diagram for network signal LightAmbIntsty_No_Actl = 'Last Used' is referring to the last used Intensity for the personality profile being turned on.

3.5.5.4 VS-SD-REQ-193446/A-Turning ON Ambient Lighting via ON/OFF HMI Selection

Pre-Condition:
Ambient Lighting turned OFF with the previous Color when last ON set to ColorY
Ambient Lighting turned OFF with the previous Intensity when last ON set to IntensityX

Event:
The user selects Ambient Lighting ON via the HMI

Post-Condition:
Ambient Lighting HMI shows Ambient Lighting ON with ColorY and IntensityX
Ambient Lighting is turned ON in the vehicle with ColorY and IntensityX

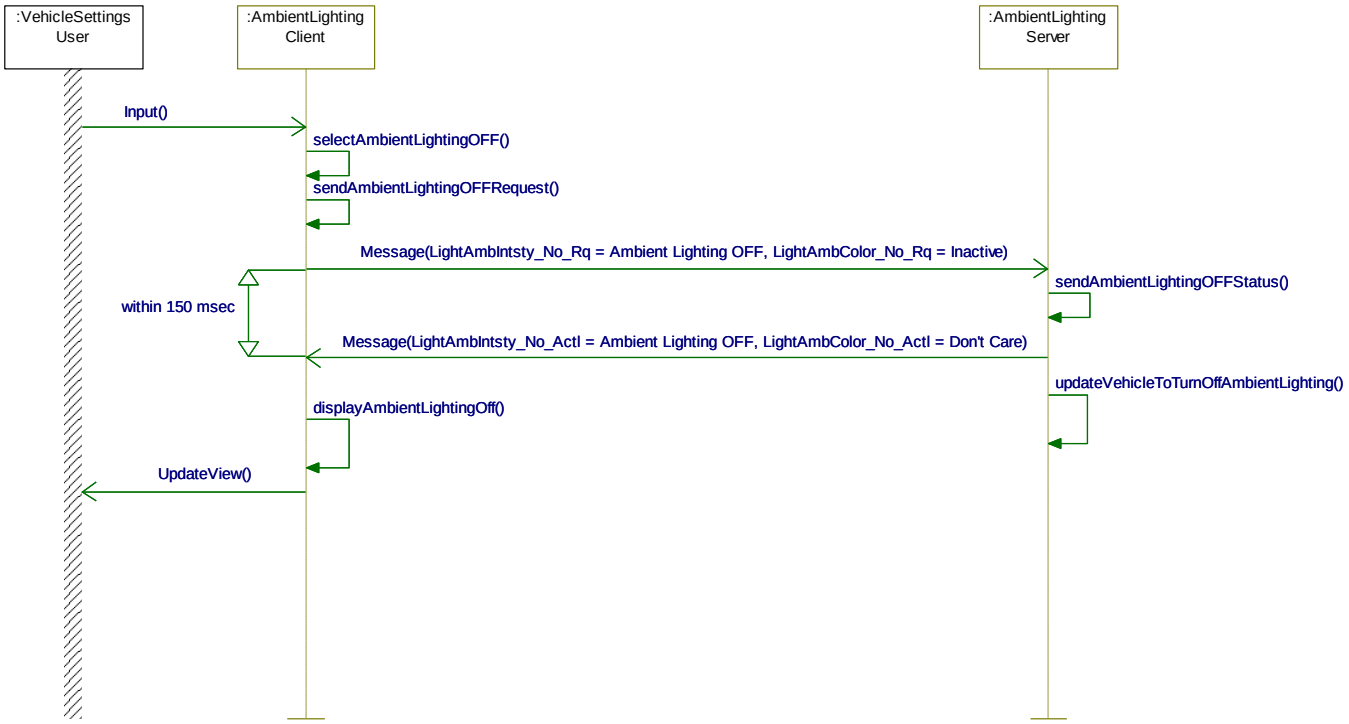


3.5.5.5 VS-SD-REQ-193447/A-Turning OFF Ambient Lighting

Pre-Condition:
Ambient Lighting HMI is active showing Ambient Lighting is ON

Event:
The user selects Ambient Lighting OFF via the HMI

Post-Condition:
The HMI shows Ambient Lighting turned OFF
Ambient Lighting is OFF in the vehicle

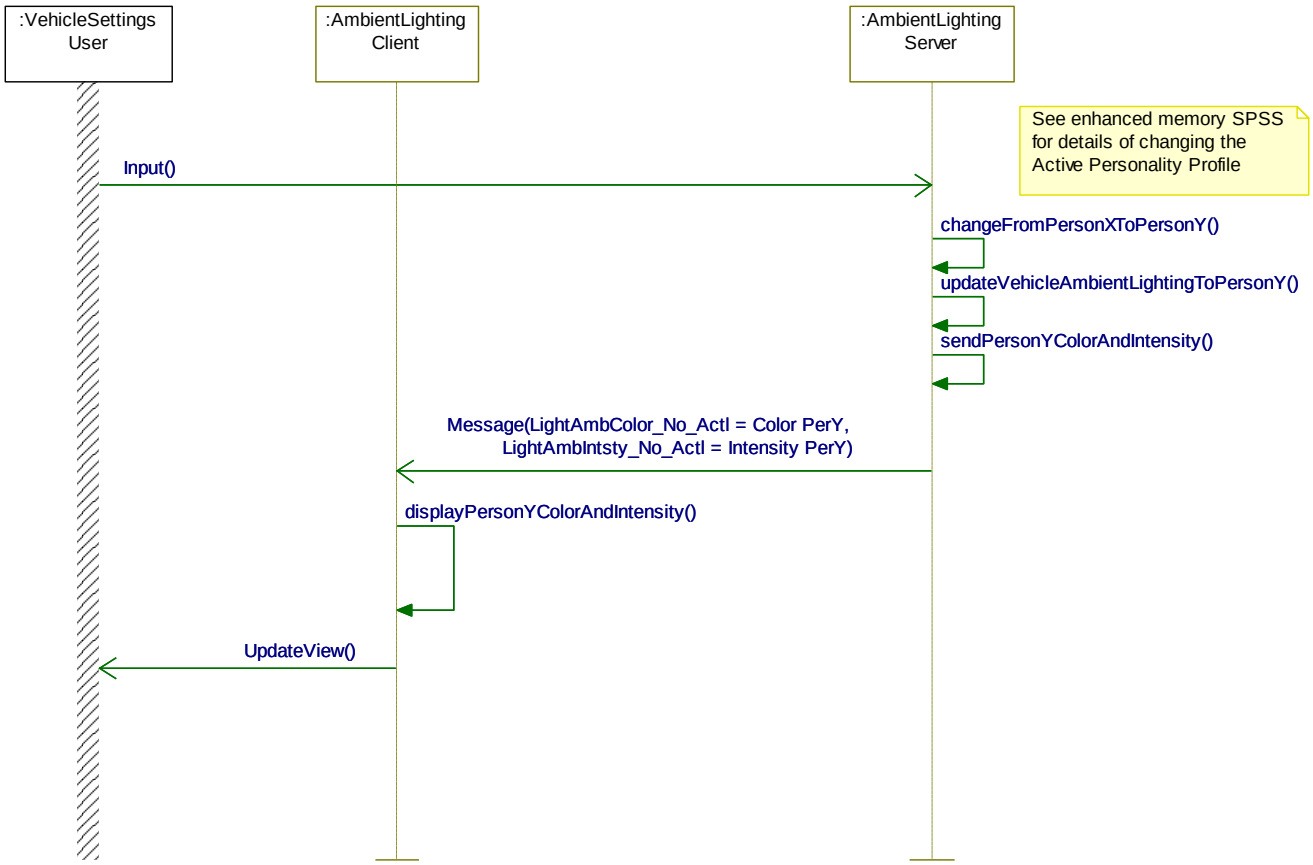


3.5.5.6 VS-SD-REQ-193487/B-Enhanced Memory - Recall new personality profile with Ambient Lighting active

Pre-Condition:
Ambient Lighting HMI is active for PersonX

Event:
User changes from PersonX to PersonY

Post-Condition:
Ambient Lighting HMI is active for PersonY

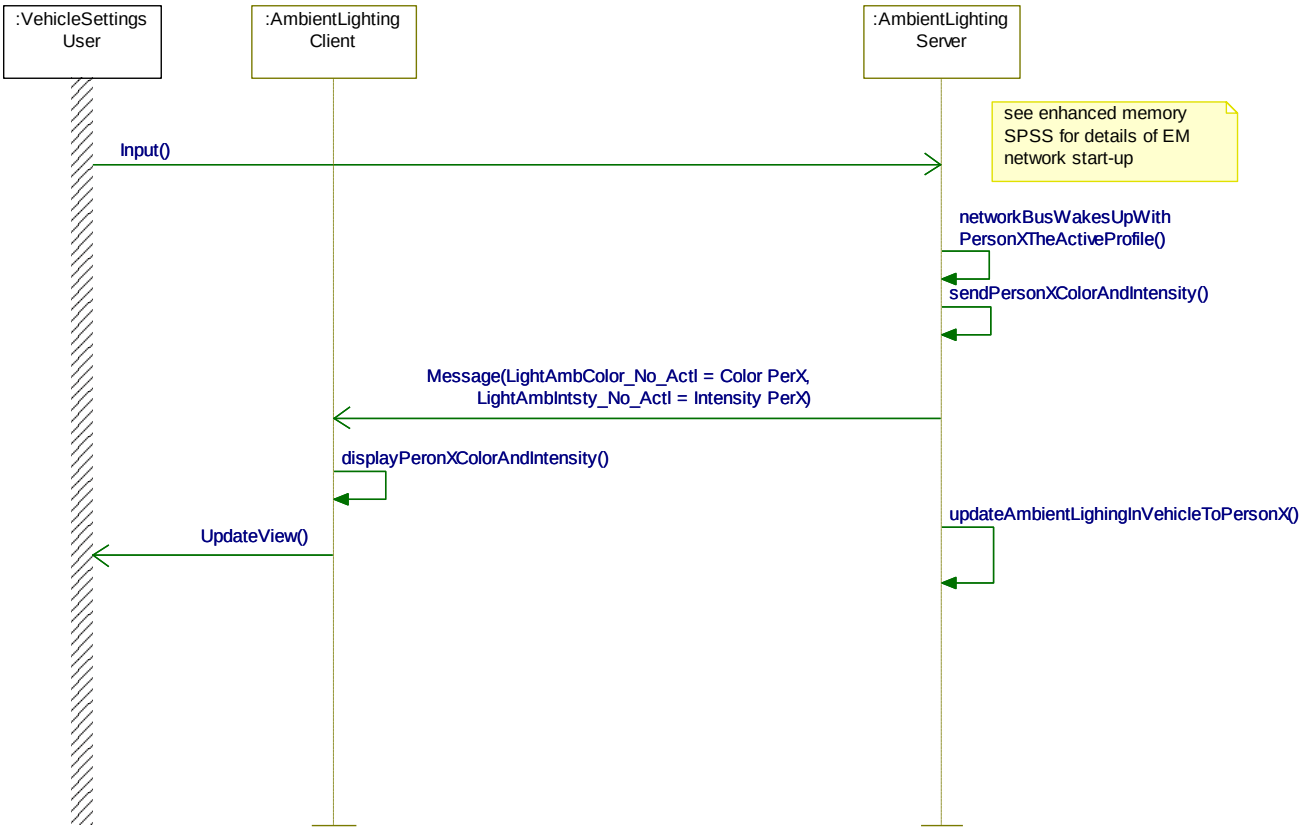


3.5.5.7 VS-SD-REQ-193489/A-Enhanced Memory - New Profile at Network Wake-up

Pre-Condition:
Network bus is asleep
When Network bus last awake Person Z was the active profile

Event:
1. Network bus wakes up
2. The Active Profile is Person X
3. The Ambient Lighting HMI screen is selected

Post-Condition:
Ambient Lighting HMI is active for Person X


:VehicleSettings User
:AmbientLighting Client
:AmbientLighting Server
see enhanced memory SPSS for details of EM network start-up
Input()
networkBusWakesUpWith PersonXTheActiveProfile()
sendPersonXColorAndIntensity()
Message(LightAmbColor_No_Actl = Color PerX, LightAmbIntsty_No_Actl = Intensity PerX)
displayPeronXColorAndIntensity()
updateAmbientLighingInVehicleToPersonX()
UpdateView()

3.6 VS-FUN-REQ-025233/C-Touch Panel Beeps Settings (TcSE ROIN-292335-1)

3.6.1 Interface Requirements - Beeps

3.6.1.1 MD-REQ-025379/B-Bezel_Beeps.Rq (TcSE ROIN-297362)

Message Type: Request

This signal requests to change the Bezel Beeps settings.

Logical Signal Name	Literals	Value	Description
Bezel_Beeps.Rq	Inactive	0x0	
	Enabled	0x1	
	Disabled	0x2	

3.6.1.2 MD-REQ-025385/B-Bezel_Beeps.St (TcSE ROIN-297423)

Message Type: Status

This signal provides the status of Bezel Beeps settings (Enabled/ Disabled).

Logical Signal Name	Literals	Value	Description
Bezel_Beeps.St	Invalid	0x0	
	Enabled	0x1	
	Disabled	0x2	

3.6.1.3 MD-REQ-025386/B-Bezel_Beeps_Supported.St (TcSE ROIN-297429)

Message Type: Status

Signal from the Vehicle Settings Beep Server telling the Vehicle Settings Beep Client if Bezel Beeps are supported or not supported

Logical Signal Name	Literals	Value	Description
Bezel_Beeps_Supported.St	Invalid	0x0	
	Supported	0x1	
	Not Supported	0x2	

3.6.2 Use Cases

3.6.2.1 VS-UC-REQ-025234/A- Set Tone Panel Beep mode (TcSE ROIN-290777)

Actors	Vehicle Occupant
Pre-conditions	Infotainment System is On. Touch Panel Beeps is set to {mode X}.

Scenario Description	User selects <Mode Y> via the HMI.
Post-conditions	HMI is updated to {Mode Y}.
List of Exception Use Cases	NA
Interfaces	G-HMI CBI

3.6.3 Functional Requirements

3.6.3.1 VS-SR-REQ-025235/A-Touch panel beeps Supported / Not supported by Bezel interface module (TcSE ROIN-141577-2)

The vehicle settings beep server shall tell the vehicle settings client via the Bezel_Beeps_Supported.St signal whether touch panel beeps are supported or not supported. For example if they are not supported the display module HMI will not offer the option to enable / disable the beeps.

If the beep menu display (for enabling or disabling beeps) is End Of Line configurable then the Beep menu display module (Vehicle Settings Client) shall ignore the _Beeps_Supported display configuration signal(s) and use the EOL configuration for the beeps menu pick. See the Infotainment Diagnostic Spec for beep EOL configuration details.

Note: The vehicle settings beep server may not have a Bezel_Beeps_Supported.St CAN signal in the CAN dB if EOL configurable.

3.6.3.2 VS-REQ-025236/A-Enabling and Disabling Beeps (TcSE ROIN-273465)

The Vehicle Settings Beep Client can enable/disable beeps via the Bezel_Beeps.Rq signal.

The Vehicle Setting Beep Client shall remember the beeps setting between ignition cycles and power mode changes.

The Vehicle Setting Beep Server shall remember the beeps setting between ignition cycles and power mode changes.

3.6.3.3 VS-FUR-REQ-025237/A-EFP/ECP Beeps Default Parameters (TcSE ROIN-285003-1)

The EFP beep parameters shall be defaulted as shown below when:
- First shipped to the plant, or
- Upon loss of B+ power (if it causes a loss of Enable/Disable Beep parameters). The EFP shall be able to survive vehicle cranks and remember the Beep parameters.

If touch sense EFP :
Bezel_Beep_St = 0x1 Enabled
Bezel_Beeps_Supported = 0x1 Supported

If non Touch sense EFP:
Bezel_Beeps_Supported = 0x2 Not_Supported
Bezel_Beep_St = 0x0 (Invalid)

3.6.4 Sequence Diagrams

3.6.4.1 VS-SD-REQ-025238/A-Touch Panel Beeps (TcSE ROIN-118715-1)

Scenarios

Normal Usage

The user selects <turn Touch panel beeps on/off> via the HMI

Constraints

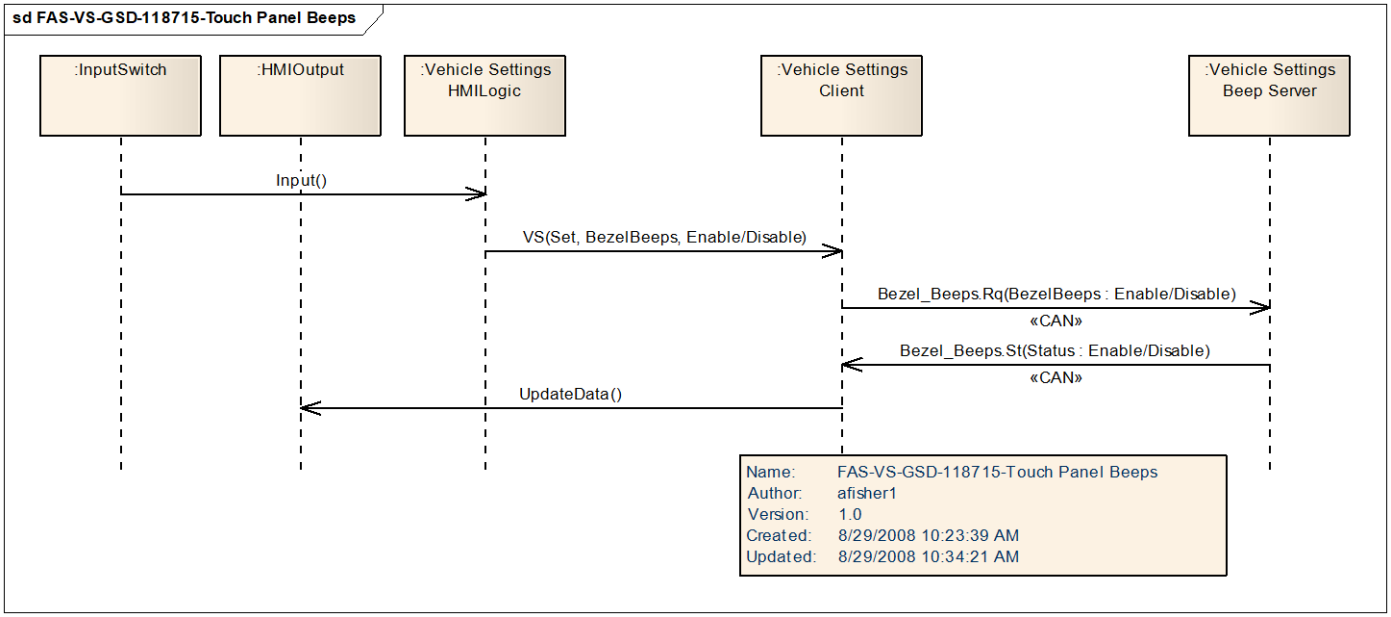
Pre-condition

Center Stack Display is On, Settings units menu is active.

Post-condition

The vehicle HMI indicates {Updated status of Touch Panel Beeps setting}

Sequence Diagram



3.7 VS-FUN-REQ-025239/C-Set 12/24 hour mode setting (TcSE ROIN-292339-1)

3.7.1 Interface Requirements - 12/24 hour mode

3.7.1.1 MD-REQ-025381/B-TimeAdjust.Rq (TcSE ROIN-297370)

Message Type: Request

This signal requests to change the setting for 12/24 hour mode.

Logical Signal Name	Literals	Value	Description
TimeAdjust.Rq	Inactive	0x0	
	12h_mode	0x1	
	24h_mode	0x2	

3.7.1.2 MD-REQ-025462/B-VehTimeFormat.St (TcSE ROIN-297375)

Message Type: Status

Signal by the Vehicle Settings Server to provide the status of the 12/24 hour time mode setting.

Logical Signal Name	Literals	Value	Description
VehTimeFormat.St	Invalid	0x0	
	12h_mode	0x1	
	24h_mode	0x2	

3.7.2 Functional Requirements

3.7.2.1 VS-SR-REQ-099559/A-12/24 Hour Status Storage

The Vehicle Settings Server shall retain the value for 12/24 hour mode for the VehTimeFormat signal across ignition cycles and sleep cycles. The Vehicle Settings Server shall only initialize VehTimeFormat apon battery connects.

3.7.2.2 VS-SR-REQ-099560/A-12/24 Hour Default Setting

The Vehicle Settings Server shall support a default configuration for 12 or 24 hour mode based on the vehicle market they are supporting. The VehicleTimeFormat signal shall be set on battery connect based on the configuration value used to determine 12 or 24 hour mode. If no configuration/value is available then the default shall be 12 hour mode.

3.7.2.3 VS-SR-REQ-099558/A-12/24 Hour Mode Error Handling

In the case that the Vehicle Settings Server is reporting an invalid value for 12/24 hour mode status the Vehicle Settings Client shall display the setting selected by the user. The setting displayed shall be retained through ignition/sleep cycles. If the Vehicle Settings Server starts to transmit a valid value in the 12/24 hour mode status then the Vehicle Settings Client shall update to the value received and refresh their stored value if necessary. The request from the Vehicle settings client does not require the vehicle settings server to reply with an updated status to update their HMI. (Example, Client sends request 24h to Server, Server ignores and continues to send invalid. Client updates HMI with 24h and stores internal the value)

If the TimeAdjust (SetTimeFormat) signal equals 0x0 Inactive or 0x3 Not Used the Vehicle Settings Server shall ignore these values and continue reporting the current value in VehicleTimeFormat.

3.7.3 Use Cases

3.7.3.1 VS-UC-REQ-025240/A- Set Time Format 12/24 hour mode (TcSE ROIN-290605)

Actors	Vehicle Occupant
Pre-conditions	Infotainment System is On. Clock time format is set to {mode X}.
Scenario Description	User selects <Mode Y> via the HMI.
Post-conditions	HMI is updated to {Mode Y}.
List of Exception Use Cases	NA
Interfaces	G-HMI CBI

3.7.4 Sequence Diagrams

3.7.4.1 VS-SD-REQ-025241/A-Set 12/24 hour mode (TcSE ROIN-174033-1)

Linked Elements
VS-UC-REQ-025395/A-Set Time Format 12/24 hour mode (TcSE ROIN-174042-1)

Scenarios

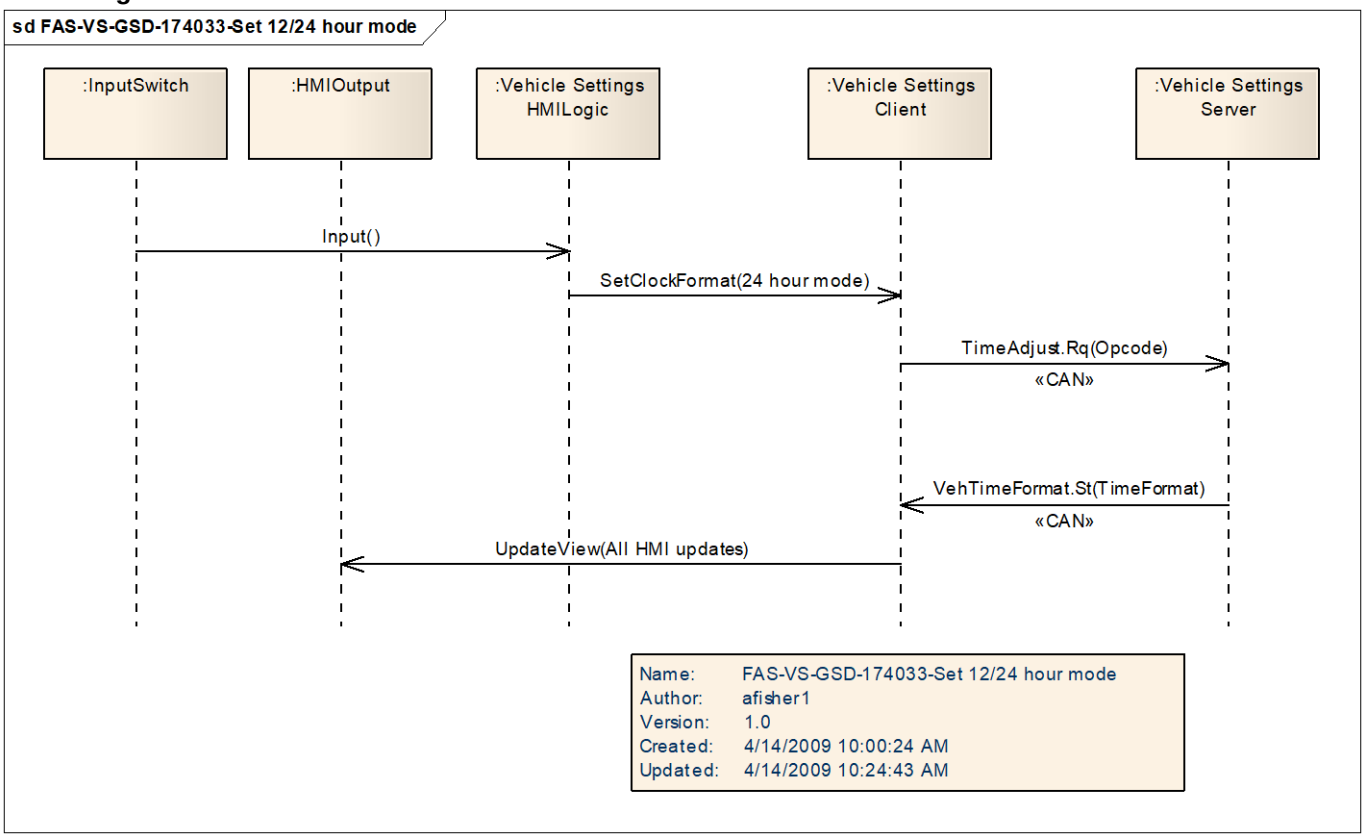
Normal Usage
The user selects <24 hour mode > via the HMI.

Constraints

Pre-condition
Center Stack Display is On, Settings units menu is active. Hour mode is currently set to 12 hours.

Post-condition
{Hour mode is updated to 24 hour mode on the HMI}

Sequence Diagram



3.8 VS-FUN-REQ-025246/E-Charge Port Light Ring (TcSE ROIN-292385-1)

3.8.1 Interface Requirements - Charge Port Light Ring

3.8.1.1 MD-REQ-025392/C-ChargePortLightRing_St (TcSE ROIN-270412)

If the CharePortLightRingClient supports both variants of the Charge Port Light Ring signals below then when selecting Charge Port Light Ring HMI the signal that will get updated will depend on what variant Charge Port Light Ring is configured for.

Variant 1 of ChargePortLightRing_St:
CAN Signal Name: CenterStackRing_D_Actl

Value	Equal
0x0	Null
0x1	Off
0x2	On
0x3	LimitedOn

Variant 2of ChargePortLightRing_St:
CAN Signal Name: ChrgStatDsply_D_Rq

Value	Equal
0x0	Off
0x1	On (default)
0x2	NotUsed_1
0x3	NotUsed_2

3.8.2 Use Cases

3.8.2.1 VS-UC-REQ-025247/A-Adjust Charge Port Light Ring (TcSE ROIN-290607)

Actors	Vehicle Occupant
Pre-conditions	Infotainment System is On
Scenario Description	The user selects a new charge port light ring setting
Post-conditions	The charge port light ring setting is updated and displayed to the user.
List of Exception Use Cases	NA
Interfaces	G-HMI

3.8.3 Requirements

3.8.3.1 VS-SR-REQ-238151/A-ChargePortLightRing_St signal

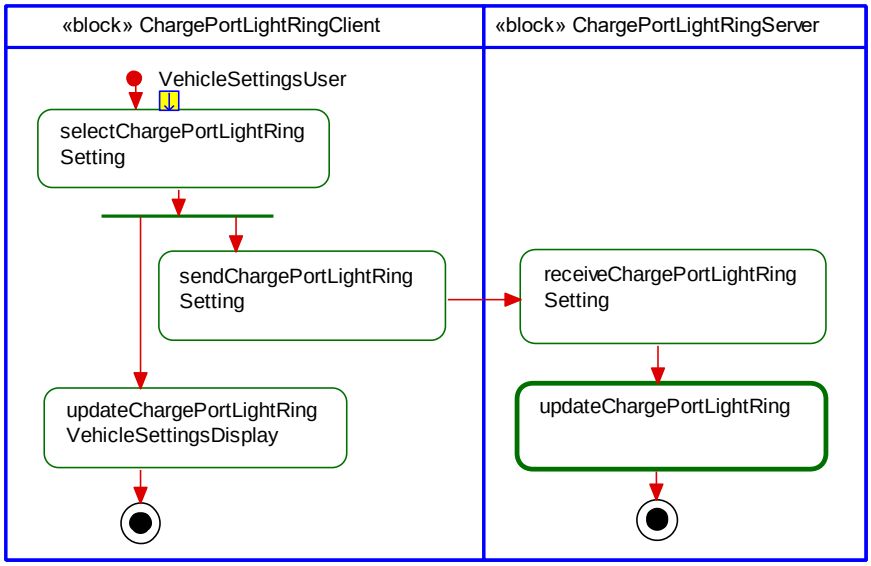
Once a selection is made for the Charge Port Light setting on the HMI the ChargePortLightRingClient shall keep this value set and save this setting between power modes (ie HMIAudioMode → ON → OFF → ON).

3.8.4 White Box View

3.8.4.1 VS-ACT-REQ-025152/A-Adjust Charge Port Light Ring (TcSE ROIN-270411)

Linked Elements
VS-SD-REQ-025248/A-Adjust Charge Port Light Ring (TcSE ROIN-270410)

Activity Diagram



3.8.4.2 VS-SD-REQ-025248/A-Adjust Charge Port Light Ring (TcSE ROIN-270410)

Scenarios

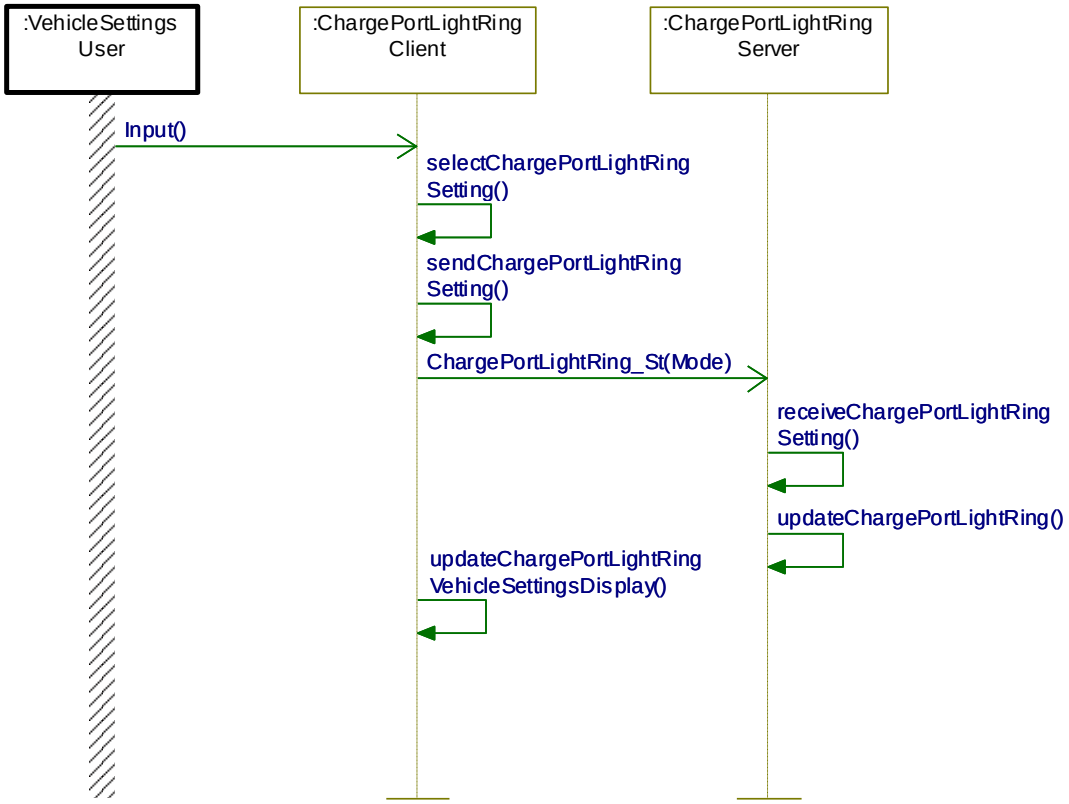
Normal Usage
The user selects a new charge port light ring setting using an input on the charge port light ring vehicle setting display.

Constraints

Pre-condition
The charge port light ring vehicle setting display is active.

Post-condition
The charge port light ring setting is updated and displayed to the user.

Sequence Diagram



3.9 VSv2-FUN-REQ-131582/B-Charge Cord Unlock

3.9.1 Interface Requirements - Charge Cord Unlock

3.9.1.1 MD-REQ-093985/B-ChargePortUnlock_Rq

Message Type: Request

This signal is requested by the Charge Port Unlock Client for the Charge Port Unlock Server to unlock the charge port connector.

Logical Signal Name	Literals	Value	Description
ChargePortUnlock_Rq	No_Request	0x0	
	Unlock Request	0x1	

3.9.1.2 MD-REQ-132658/B-ChrgCrdLck_D_Stat

Message Type: Response and Status

This signal reports the status of the Charge Port Unlock Server

Literals	Value	Description
Inactive / Retain	0x0	Retain treat same as Inactive
Unlocked	0x1	
Locked	0x2	
UnlockInProgress	0x3	
Unlocked / LockInProgress	0x4	This will say when the Lock is in Progress but to be treated as Unlocked by the Charge Port Unlock Client
Locked / Unlock_Fail	0x5	Unlock_Fail is treated the same as status set to Locked for the Charge Port Unlock Client
Unlocked / Lock_Fail	0x6	Lock_Fail is treated the same as status set to Unlocked for the Charge Port Unlock Client
Locked / Faulty	0x7	Faulty is treated the same as status set to Locked for the Charge Port Unlock Client

3.9.2 Use Cases

3.9.2.1 VS-UC-REQ-130593/B-Unlock Charge Cord from Centerstack

Actors	Vehicle Occupant
Pre-conditions	Infotainment System is On Charge cord is locked (ex charging in progress) HMI for charge cord locked is shown Ignition Status is Run
Scenario Description	The user selects unlock charge cord HMI from the infotainment Charge Cord Unlock Client
Post-conditions	The charger module (ie Charge Port Unlock Server) reports that the charge cord unlock is in progress. The HMI indicates the charge cord unlock is in progress. The charger module reports that the Charge Cord is unlocked. HMI shows Charge Cord Unlocked
Interfaces	G-HMI

3.9.2.2 VS-UC-REQ-130595/B-User tries to access Centerstack Charge Car Unlock HMI when Not in Run

Actors	Vehicle Occupant
Pre-conditions	Infotainment System is On Charge cord is locked Ignition Status is OFF / Acc
Scenario Description	The user selects settings menu from the Charge Cord Unlock Client
Post-conditions	HMI is not available to unlock the charge cord
Interfaces	G-HMI

3.9.2.3 VS-UC-REQ-130596/A-Charge Cord Centerstack HMI when Ignition changes out of Run to OFF or Accessory

Actors	Vehicle Occupant
Pre-conditions	Infotainment System is On Charge cord is locked Ignition Status is Run Settings Menu has Charge Cord Unlock HMI available for selection
Scenario Description	Ignition is changed to OFF / Accessory
Post-conditions	HMI is not available to unlock the charge cord
Interfaces	G-HMI

3.9.2.4 VS-UC-REQ-130598/A-User tries to Unlock from the Centerstack but Charge Cord is Not Unlocked

Actors	Vehicle Occupant
Pre-conditions	Infotainment System is On Charge Cord is connected and locked

	HMI for charge cord locked is shown Ignition Status is Run
Scenario Description	The user selects unlock charge cord but doesn't unlock
Post-conditions	HMI doesn't show Unlocked HMI
Interfaces	G-HMI

3.9.2.5 VS-UC-REQ-130653/B-Fast Charging Completes

Actors	Vehicle Occupant
Pre-conditions	Infotainment System is On Charge cord is connected and locked HMI for charge cord locked is shown Ignition Status is Run
Scenario Description	Charging completes
Post-conditions	Charge Cord is Unlocked. HMI shows as Unlocked HMI* *HMI shows whatever the status reported from the charging module
Interfaces	G-HMI

3.9.2.6 VS-UC-REQ-130654/A-Charge Cord is Not Connected

Actors	Vehicle Occupant
Pre-conditions	Infotainment System is On Charge cord is not connected Ignition Status is Run
Scenario Description	Go to the Vehicle Settings HMI screen for Charge Port Unlock
Post-conditions	HMI shows Unlocked* *HMI shows whatever the status reported from the charging module
Interfaces	G-HMI

3.9.2.7 VS-UC-REQ-130656/A-User selects Unlock from Hard Button

Actors	Vehicle Occupant
Pre-conditions	Infotainment System is On Charge cord is locked HMI for charge cord locked is shown Ignition Status is Run Settings Menu HMI is shown
Scenario Description	The user selects unlock charge cord via the hard button
Post-conditions	The charger module reports that the charge cord unlock is in progress.

	The HMI indicates the charge cord unlock is in progress. The charger module reports that the charge cord is unlocked. HMI shows charge cord unlocked HMI.
Interfaces	G-HMI

3.9.2.8 VS-UC-REQ-131663/A-User selects Unlock from the Hard Button with Infotainment System OFF

Actors	Vehicle Occupant
Pre-conditions	Infotainment System is OFF (ie Infotainment HMI is OFF) Charge cord is locked Ignition Status is Off
Scenario Description	The user selects unlock charge cord via the hard button
Post-conditions	No feedback on Infotainment HMI of in progress or lock status. • Note: Charge port light will be used for feedback
Interfaces	G-HMI

3.9.2.9 VS-UC-REQ-131664/B-User tries to Unlock via hard or soft button but the charger module reports Unlock Fail on the charger status signal

Actors	Vehicle Occupant
Pre-conditions	Infotainment System is On Charge Cord is connected and locked HMI for Charge Cord Locked is shown Ignition Status is Run
Scenario Description	The user selects unlock charge cord but charger responds with faulted status
Post-conditions	HMI displays Locked HMI for unlocked failed • Note: charge port light will be used for feedback
Interfaces	G-HMI

3.9.2.10 VS-UC-REQ-131665/B-The charger module reports lock fail on the charge status signal

Actors	Vehicle Occupant
Pre-conditions	Infotainment System is On Charge Cord is connected Ignition Status is Run
Scenario Description	The cord tries to lock, but fails
Post-conditions	HMI display Unlocked HMI for Lock Failed • charge port light will be used for feedback
Interfaces	G-HMI

3.9.2.11 VS-UC-REQ-131666/A-Charger module reports Inactive encoding on the charger status signal

Actors	Vehicle Occupant
Pre-conditions	Infotainment System is On Ignition Status is Run
Scenario Description	Charger module powers up and reports Inactive on the status signal
Post-conditions	HMI performs based on last state the charger status signal was received that was not Inactive. This applies only if received Inactive for less than 5 seconds in Run. If receive Inactive more than 5 seconds in Run then the signal is considered missing/unknown. When missing/unknown the HMI shall assume the cord is locked so that the unlock button is available.
Interfaces	G-HMI

3.9.2.12 VS-UC-REQ-131667/B-The Charger Module reports Faulty on the status signal

Actors	Vehicle Occupant
Pre-conditions	Infotainment System is On Charge Cord is connected Settings HMI is active Ignition Status is Run
Scenario Description	The charger reports faulty on the charge cord lock status
Post-conditions	HMI displays Locked HMI for faulty • charge port light will be used for feedback
Interfaces	G-HMI

3.9.2.13 VS-UC-REQ-131668/A-The charging module reports Locking In Progress on the charger status signal

Actors	Vehicle Occupant
Pre-conditions	Infotainment System is On Charge Cord is connected Ignition Status is Run
Scenario Description	The charger reports Locking In Progress on the charge cord lock status
Post-conditions	HMI shows Unlocked HMI for Locking In Progress • charge port light will be used for feedback
Interfaces	G-HMI

3.9.2.14 VS-UC-REQ-132657/A-User plugs in Charge Cord and Charge Cord is Automatically Locked

Actors	Vehicle Occupant
Pre-conditions	Infotainment System is On Charge Cord is not connected HMI for charge cord unlocked is shown Ignition Status is Run

	Vehicle settings screen is being viewed
Scenario Description	The user plugs in the vehicle
Post-conditions	The charger module reports that the charge cord lock is in progress. HMI shows Unlocked HMI* *HMI shows whatever the status reported from the charging module The charger module reports that the charge cord is locked. HMI shows Locked HMI* *HMI shows whatever the status reported from the charging module
Interfaces	G-HMI

3.9.3 Requirements

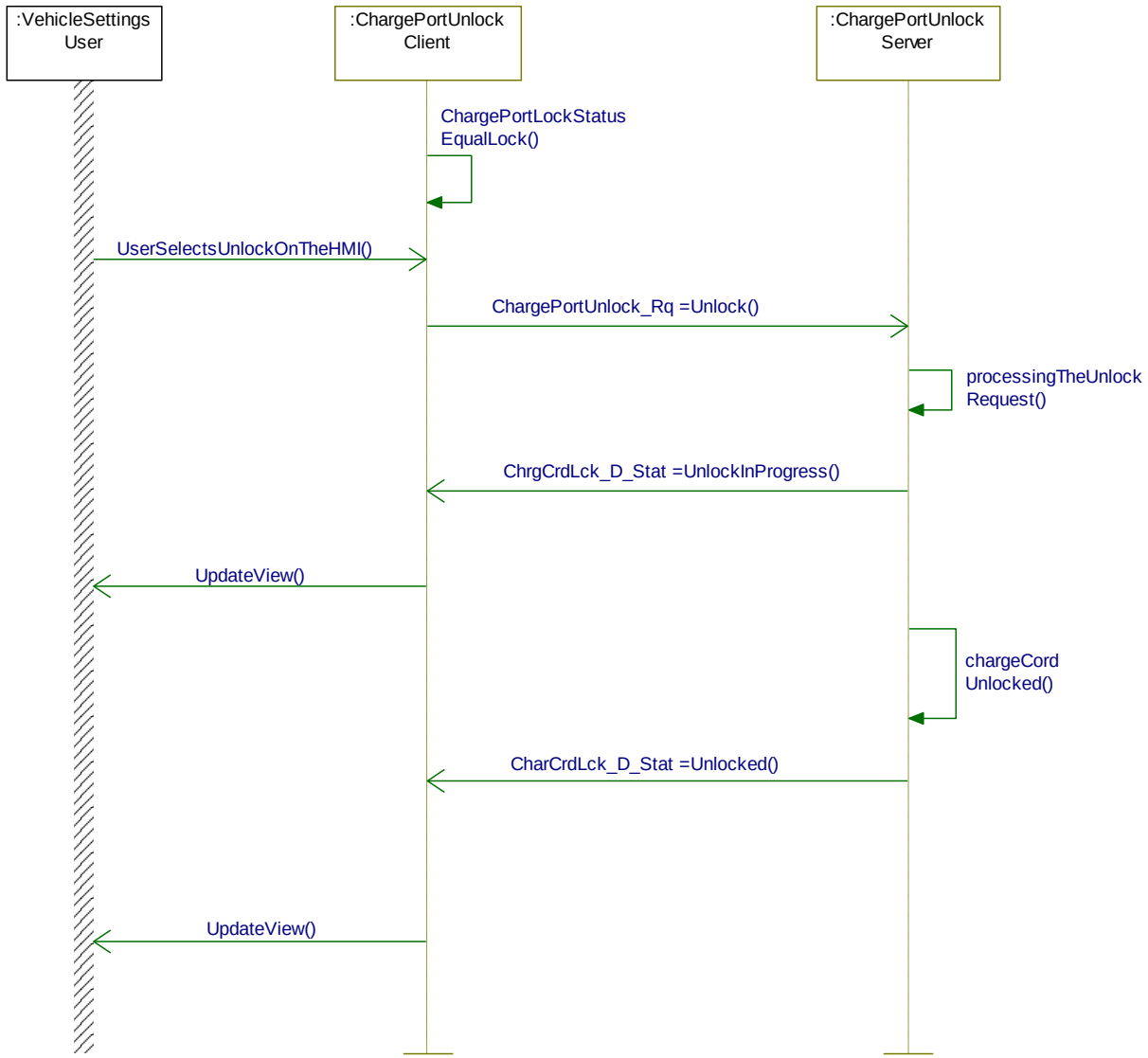
3.9.3.1 VS-HMI-REQ-132665/A-Charge Port HMI when Ignition is Run

The Charge Port Unlock Client shall only display Charge Port HMI when the Ignition Status is Run.

3.9.4 Sequence Diagrams

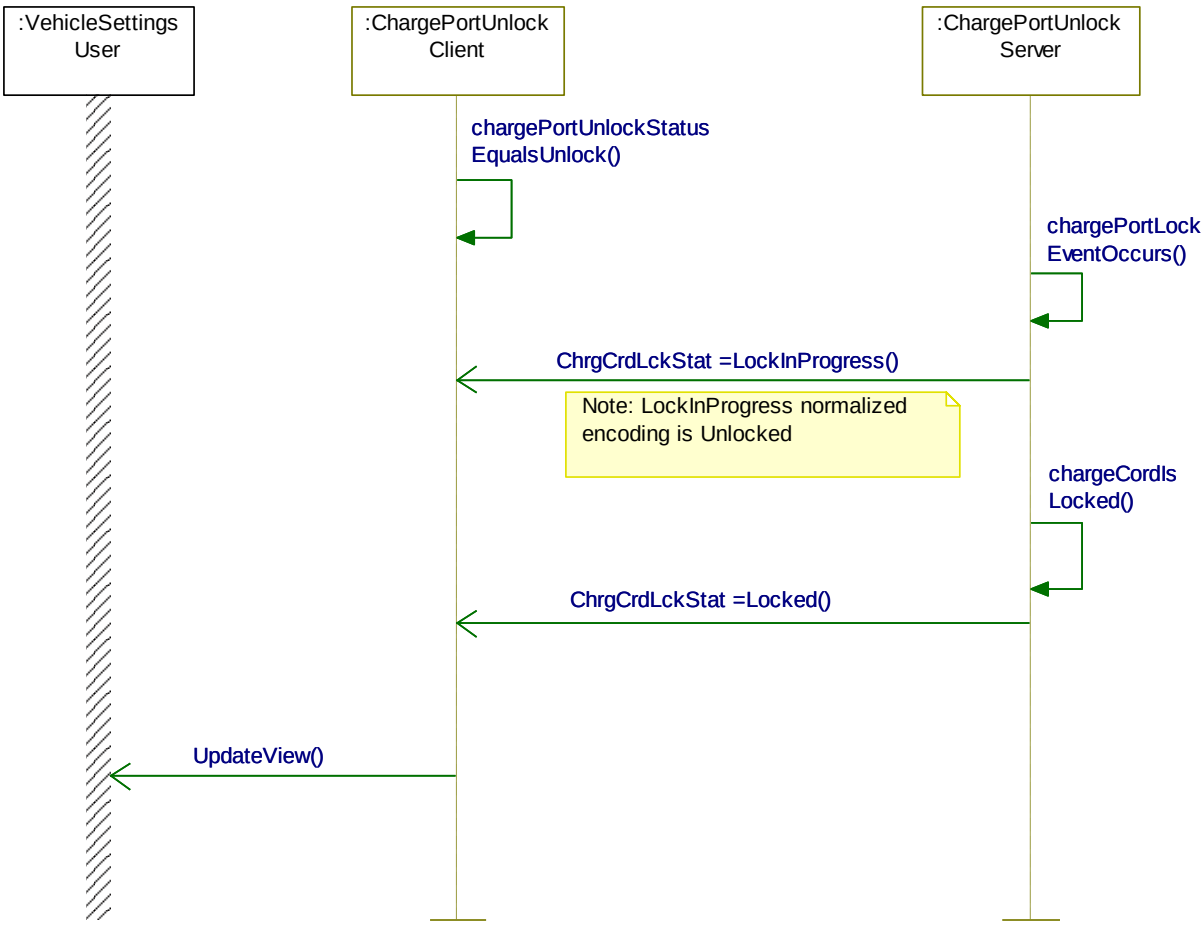
3.9.4.1 VS-SD-REQ-132666/B-Unlock Charge Port from Infotainment HMI

Pre-Condition:
Ignition = Run
Charge Cord is Locked and Status message is reporting Locked



3.9.4.2 VS-SD-REQ-132673/A-Lock Charge Cord

Pre-Condition:
Ignition = Run
Charge Cord is Unlocked and status message is reporting Unlocked



3.10 VS-FUN-REQ-023435/C-Edit Keypad Code (TcSE ROIN-284424-1)

3.10.1 Interface Requirements - Keypad

3.10.1.1 MD-REQ-023414/C-CntrStk_D_RqAssoc (TcSE ROIN-284870-1)

Message Type: Request

Note: Request signal from the Keypad Client / Personality Client to the Keypad Server with the keycode operation requested to be performed.

Logical Signal Name	Literals	Value	Description
CntrStk_D_RqAssoc	CHECK_KEYCODE	0x0	
	ERASE_KEYCODE	0x1	
	KEY	0x2	
	NULL	0x3	
	RKE	0x4	
	SET_KEYCODE	0x5	
	Cancel	0x6	
	Not Used	0x7	

3.10.1.2 MD-REQ-023415/B-CntrStkKeycodeActl (TcSE ROIN-284871-1)

Message Type: Request

Note: Keycode signal from the Keypad Client / Personality Client to the Keypad Server / PersonalizationFunction Server to be used for verifying factory keycode or for changing current keycode.

Logical Signal Name	Literals	Value	Description
CntrStkKeycodeActl	Keycode	0x0000 – 0xFFFF	See table below for decoding

CntrStkKeycodeActl Note: The Keycode entered from the center stack to the personalization. This is a bit encoded CAN signal. 001 = 1/2 button pressed 010 = 3/4 button pressed 011 = 5/6 button pressed 100 = 7/8 button pressed 101 = 9/0 button pressed 000, 110, 111 are Invalid entries.	CntrStkKeycodeActl Note: Bit 15 is ignored Bits 14 - 12 : First button pressed Bits 11 - 9 : Second button pressed Bits 8 - 6 : Third button pressed Bits 5 - 3 : Fourth button pressed Bits 2 - 0 : Fifth button pressed Where, bit 0 is the right most bit of this CAN signal. Example of decoding the Keycode from the CAN signal: CAN Signal Value: 0x58D1 Bit 15 Bit 14 Bit 13 Bit 12 Bit 11 Bit 10 Bit 9 Bit 8 0 1 0 1 1 0 0 0 Bit 7 Bit 6 Bit 5 Bit 4 Bit 3 Bit 2 Bit 1 Bit 0 1 1 0 1 0 0 0 1 Bit 15 is ignored. Bits 14 – 12: (9/0) First Button Pressed Bits 11 - 9 :(7/8) Second button pressed Bits 8 - 6 :(5/6) Third button pressed Bits 5 - 3 :(3/4) Fourth button pressed Bits 2 - 0 :(1/0) Fifth button pressed

3.10.1.3 MD-REQ-023425/B-AssocConfirm_D_Actl (TcSE ROIN-284863-1)

Message Type: Status

Note: Keypad Server / PersonalizationFunction Server communicates the state of the requested keycode association

Logical Signal Name	Literals	Value	Description
AssocConfirm_D_Actl	None	0x0	
	DISASSOCIATE	0x1	
	DUPLICATE	0x2	
	ERASE	0x3	
	IN_PROGRESS	0x4	
	KEYCODE_ACCEPTED	0x5	
	KEYCODE_REJECTED	0x6	
	ASSOCIATE	0x7	

3.10.2 Use Cases

3.10.2.1 VS-UC-REQ-023436/A-Set Keypad Code for Current User (TcSE ROIN-290608)

Actors	Vehicle Occupant
Pre-conditions	Infotainment System is On In key pad set mode
Scenario Description	The user enters <factory code, and then enters a valid new key code> via HMI. This is unique from all other entered key codes.
Post-conditions	New Keycode is stored {appropriate HMI is displayed}
List of Exception Use Cases	E1- VS-GUC-290609 -Invalid Keypad Code Entry E2- VS-GUC-290610 -Invalid Duplicate Keypad Code Entry E3- VS-GUC-290611 -Cancel Keypad Set Process
Interfaces	G-HMI Vehicle System Interface

3.10.2.2 VS-UC-REQ-023437/A-Erase Keypad Code from Current User (TcSE ROIN-290612)

Use Case Title	Erase Keypad Code from current user
Actors	Vehicle Occupant
Pre-conditions	Infotainment system is On In key pad set mode
Scenario Description	The user enters <factory code, and then selects erase key code> via HMI.
Post-conditions	The keycode is erased. {Appropriate HMI is displayed}
List of Exception Use Cases	E1-VS-GUC-290609 -Invalid Keycode Entry E2- VS-GUC-290611 -Cancel Keypad Set Process
Interfaces	G-HMI Vehicle System Interface

3.10.2.3 VS-UC-REQ-023438/A-Invalid Keypad Code Entry (TcSE ROIN-290609)

Linked Elements
VS-UC-REQ-023436/A-Set Keypad Code for Current User (TcSE ROIN-290608)
VS-UC-REQ-023437/A-Erase Keypad Code from Current User (TcSE ROIN-290612)

Use Case Title	Invalid keycode entry
Actors	Vehicle Occupant
Pre-conditions	Infotainment System is On In key pad set mode
Scenario Description	The user enters an invalid factory code.
Post-conditions	HMI indicates {invalid key code entered message}. Keycode is not Set or Erased
List of Exception Use Cases	NA
Interfaces	G-HMI Vehicle System Interface

3.10.2.4 VS-UC-REQ-023439/A-Invalid Duplicate Keypad Code Entry (TcSE ROIN-290610)

Linked Elements
VS-UC-REQ-023436/A-Set Keypad Code for Current User (TcSE ROIN-290608)

Actors	Vehicle Occupant
Pre-conditions	Infotainment System is On
Scenario Description	The user enters a duplicate key code
Post-conditions	HMI indicates {Duplicate key code entered message}. Keycode is not Set.
List of Exception Use Cases	NA
Interfaces	G-HMI Vehicle System Interface

3.10.2.5 VS-UC-REQ-023440/A-Cancel Keypad Set Process (TcSE ROIN-290611)

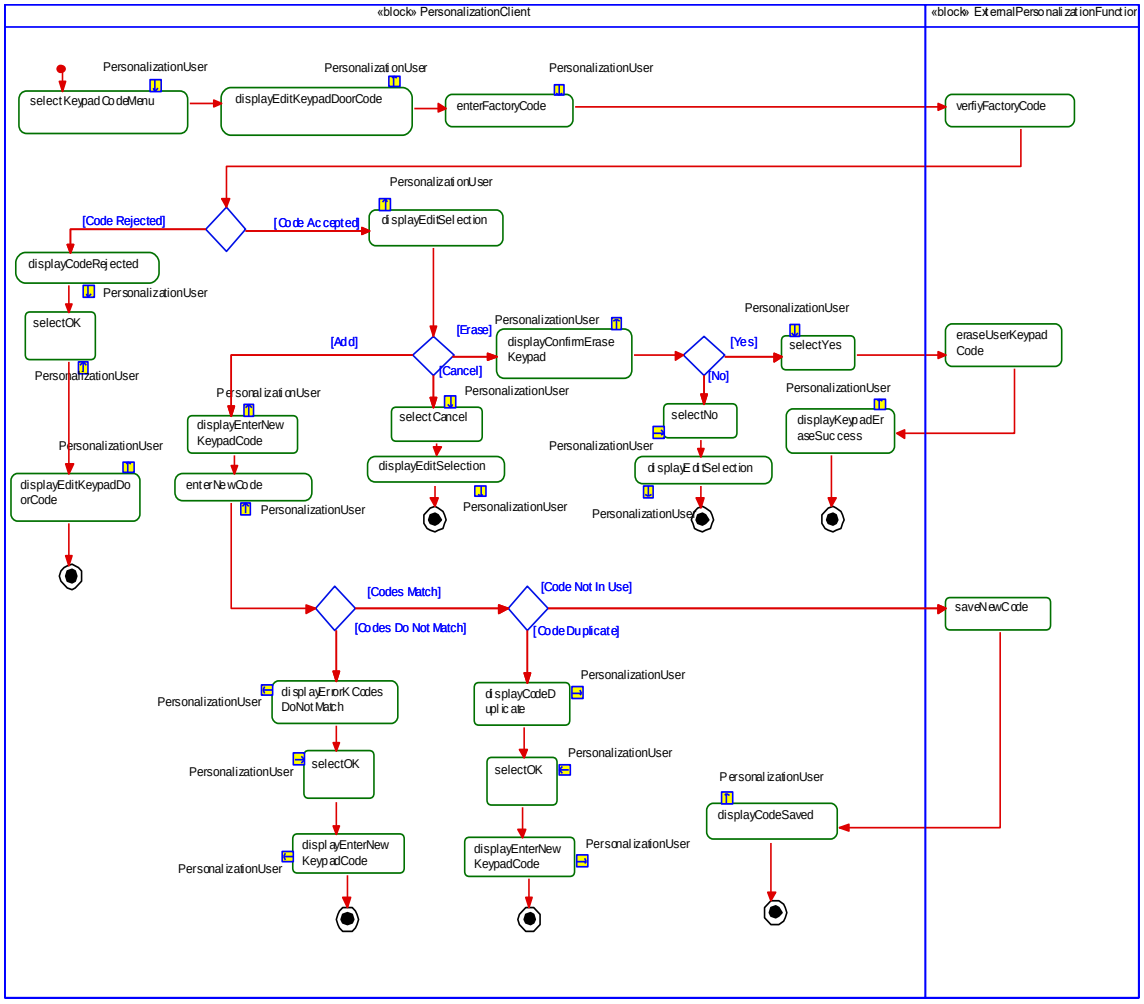
Linked Elements
VS-UC-REQ-023436/A-Set Keypad Code for Current User (TcSE ROIN-290608)
VS-UC-REQ-023437/A-Erase Keypad Code from Current User (TcSE ROIN-290612)

Actors	Vehicle Occupant
Pre-conditions	Infotainment System is On In key pad set mode
Scenario Description	Exit key pad set screen, while before setting keypad code.
Post-conditions	Operation is aborted.
List of Exception Use Cases	NA
Interfaces	G-HMI Vehicle System Interface

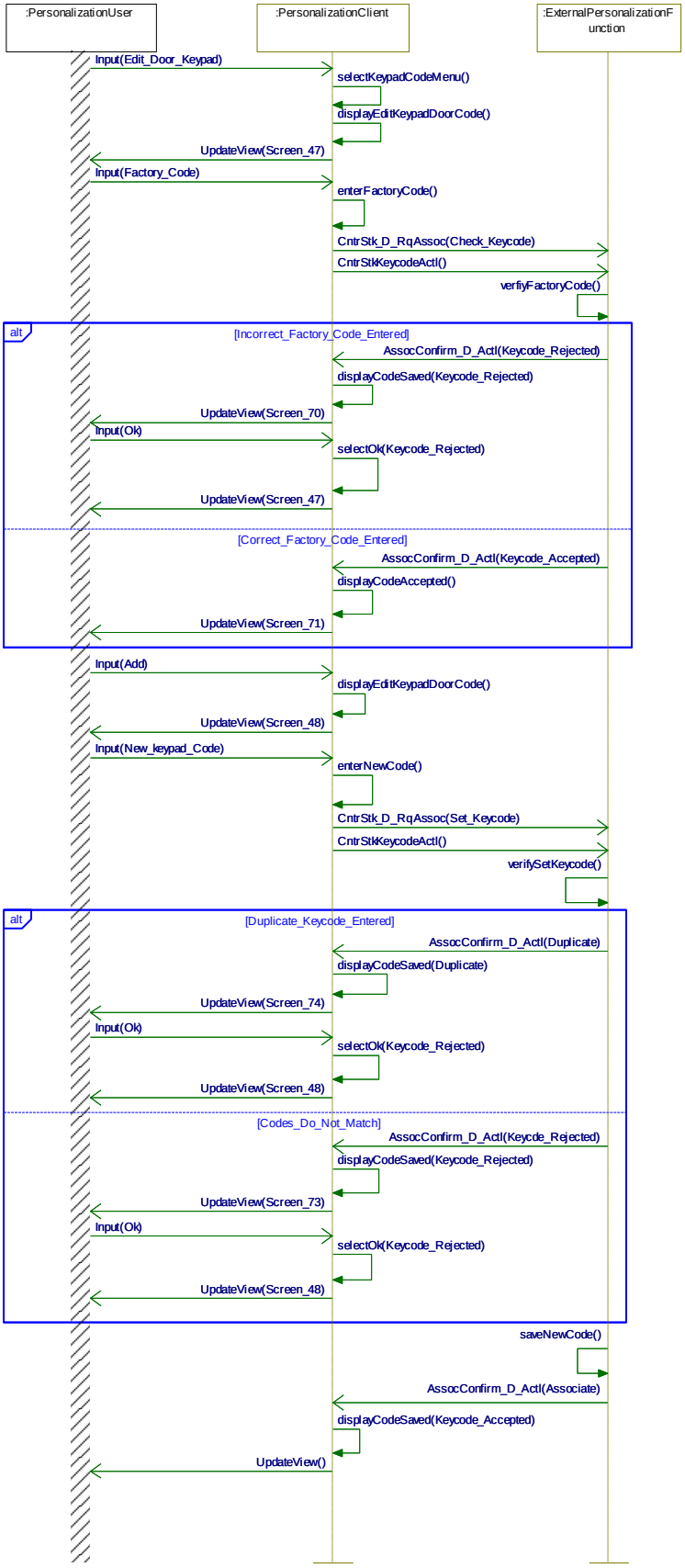
3.10.3 White Box Views

3.10.3.1 VS-ACT-REQ-023441/A-Edit Key Pad Code (TcSE ROIN-284422-1)

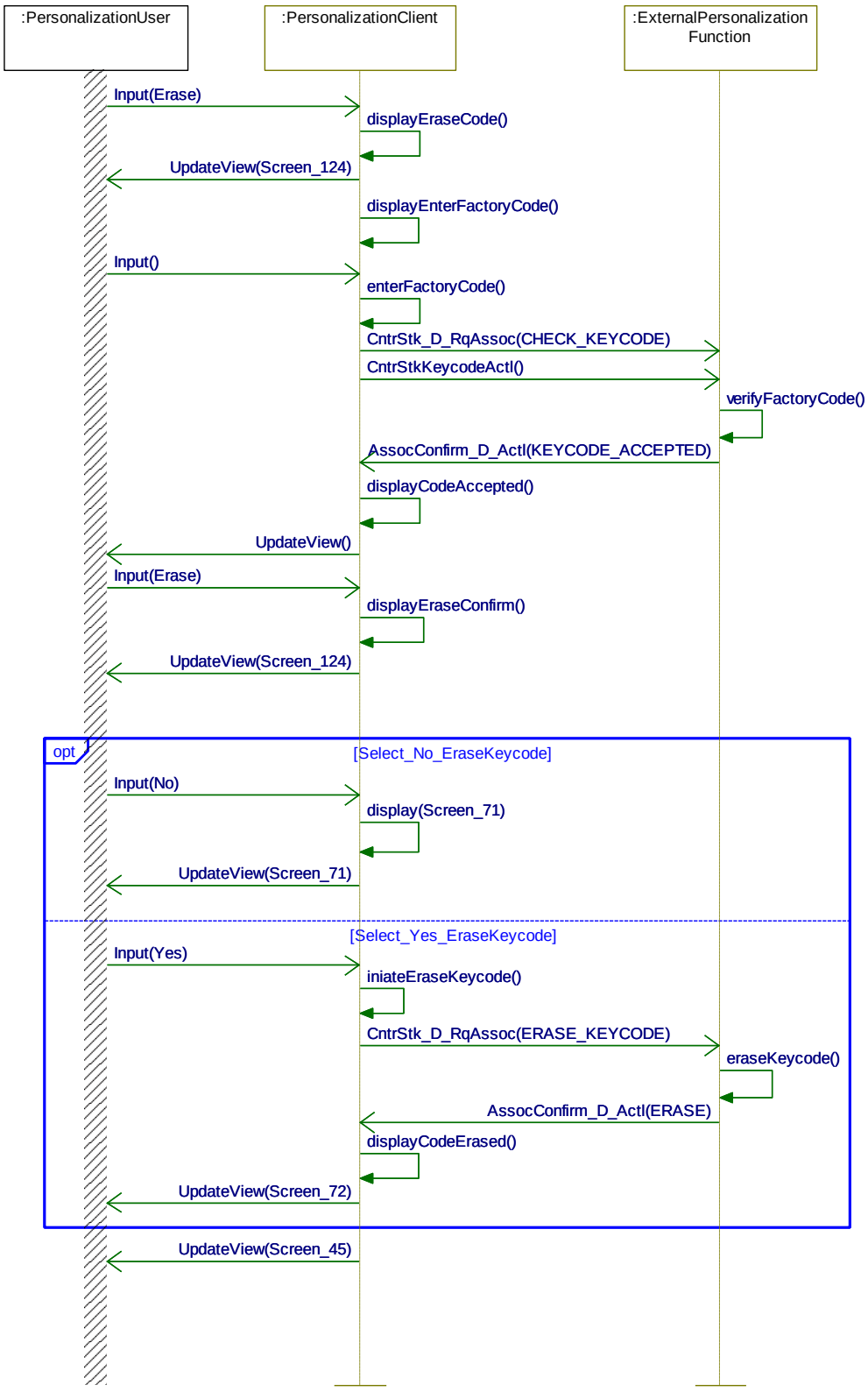
Activity Diagram



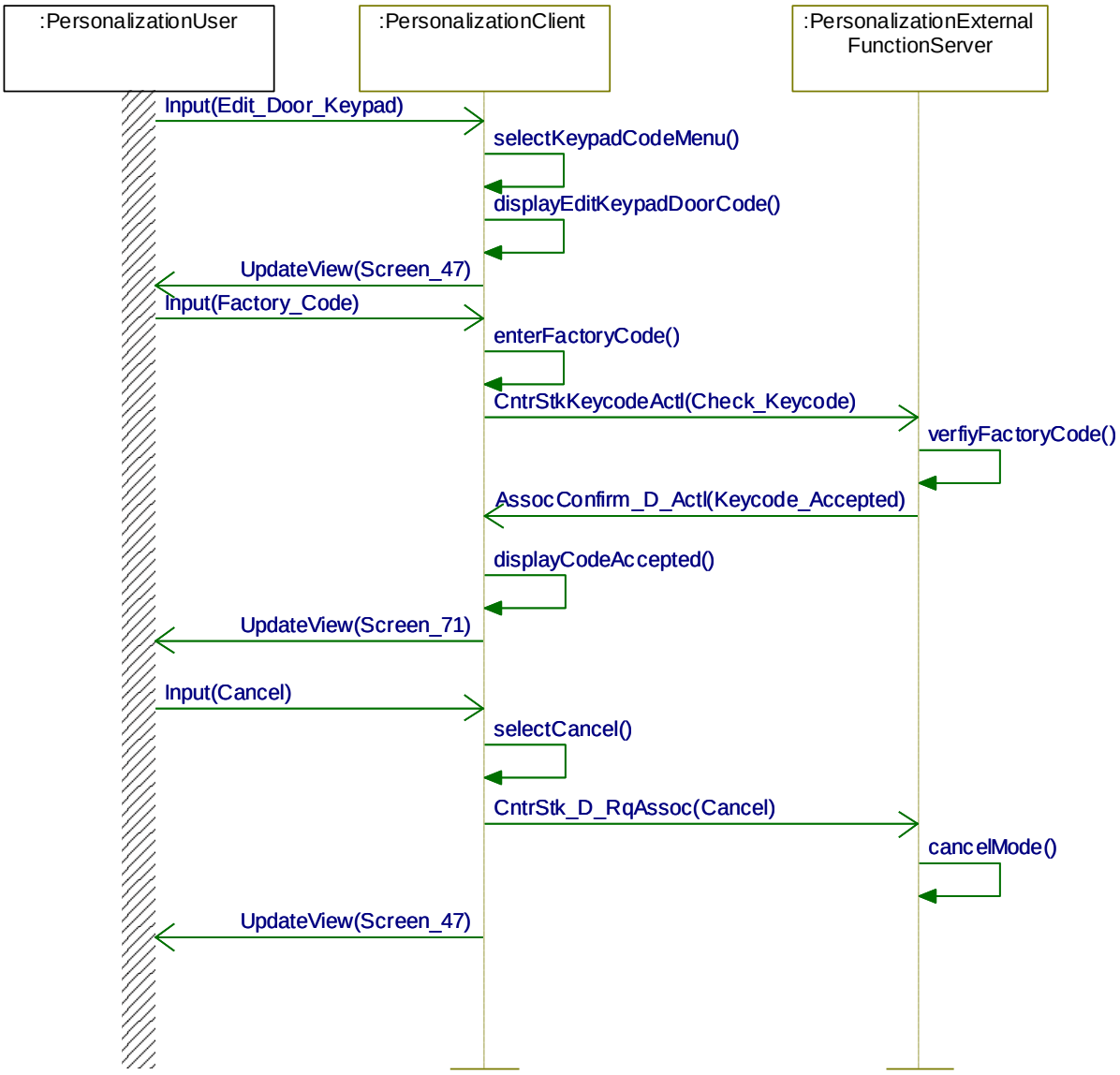
3.10.3.2 VS-SD-REQ-023442/B-Set Keypad Code for current user (TcSE ROIN-129661-2)



3.10.3.3 VS-SD-REQ-023443/B-Erase Keypad Code from current user (TcSE ROIN-129691-1)



3.10.3.4 VS-SD-REQ-086469/A-Cancel Keypad Code Edit



3.11 VSv2-FUN-REQ-331323/A-Edit Keypad Code - Variant 2

3.11.1 Interface Requirements - Keypad

3.11.1.1 MD-REQ-331324/A-CntrStk2_D_RqAssoc

Message Type: Request

Note: Request signal from the Keypad Client to the Keypad Server with the keycode operation requested to be performed.

Logical Signal Name	Literals	Value	Description
CntrStk2_D_RqAssoc	CHECK_KEYCODE	0x0	
	ERASE_KEYCODE	0x1	
	KEY	0x2	
	NULL	0x3	
	RKE	0x4	
	SET_KEYCODE	0x5	
	Cancel	0x6	
	Not Used	0x7	

Note: init value in the CAN dB for this signal should be 0x3 Null

3.11.1.2 MD-REQ-330676/A-KeyPadCodeDgtX_D_Stat

Message Type: Status

Keycode signal from the Keypad Client to the Keypad Server to be used for verifying factory keycode or for changing current keycode.

Note: the “X” in KeyPadCodeDgtX_D_Stat represents 1 – 7 for each of the 7 keypad signals

Logical Signal Name	Literals	Value	Description
KeyPadCodeDgtX_D_Stat	EndofString	0x0	
	Button1_2or1	0x1	Ex. HMI has button 1_2 option or HMI has an individual 1 digit
	Button2	0x2	Ex. HMI allows selection of individual 2 digit
	Button3_4or3	0x3	
	Button4	0x4	
	Button5_6or5	0x5	
	Button6	0x6	
	Button7_8or7	0x7	
	Button8	0x8	
	Button9_0or9	0x9	
	Button0	0xA	
	Button7_8and9_0	0xB	Not used, treat as a don’t care. Added for legacy reasons per the BCM team
	NotUsed1	0xC	
	NotUsed2	0xD	
	NotUsed3	0xE	
	NotUsed4	0xF	

Note: there would be 7 signals KeyPadCodeDgt1_D_Stat – KeyPadCodeDgt7_D_Stat where X represents the signal number

3.11.1.3 MD-REQ-023425/B-AssocConfirm_D_Actl (TcSE ROIN-284863-1)

Message Type: Status

Note: Keypad Server / PersonalizationFunction Server communicates the state of the requested keycode association

Logical Signal Name	Literals	Value	Description
AssocConfirm_D_Actl	None	0x0	
	DISASSOCIATE	0x1	
	DUPLICATE	0x2	
	ERASE	0x3	
	IN_PROGRESS	0x4	
	KEYCODE_ACCEPTED	0x5	
	KEYCODE_REJECTED	0x6	
	ASSOCIATE	0x7	

3.11.2 Use Cases

3.11.2.1 VS-UC-REQ-331327/A-Set Keypad Code for Current User

Actors	Vehicle Occupant
Pre-conditions	Infotainment System is On In keypad set mode
Scenario Description	The user enters <factory code, and then enters a valid new keycode> via HMI. This is unique from all other entered keycodes.
Post-conditions	New keycode is stored {appropriate HMI is displayed}
List of Exception Use Cases	E1- VS-GUC-290609 -Invalid Keypad Code Entry E2- VS-GUC-290610 -Invalid Duplicate Keypad Code Entry E3- VS-GUC-290611 -Cancel Keypad Set Process
Interfaces	G-HMI Vehicle System Interface
Notes	Unless the keypad signals are made wake-up signals then outside of Run the interface with the Keypad Server might not wake-up the bus the Keypad Server is on and the feature might not work outside of Run. HMI might want to limit entering the keycode to Run if that is the case.

3.11.2.2 VS-UC-REQ-331328/A-Erase Keypad Code from Current User

Actors	Vehicle Occupant
Pre-conditions	Infotainment system is On In keypad set mode
Scenario Description	The user enters <factory code, and then selects erase keycode> via HMI.
Post-conditions	The keycode is erased. {Appropriate HMI is displayed}
List of Exception Use Cases	E1-VS-GUC-290609 -Invalid Keycode Entry E2- VS-GUC-290611 -Cancel Keypad Set Process
Interfaces	G-HMI

	Vehicle System Interface
Notes	Unless the keypad signals are made wake-up signals then outside of Run the interface with the Keypad Server might not wake-up the bus the Keypad Server is on and the feature might not work outside of Run. HMI might want to limit entering the keycode to Run if that is the case.

3.11.2.3 VS-UC-REQ-331329/A-Invalid Keypad Code Entry

Linked Elements
VS-UC-REQ-331327/A-Set Keypad Code for Current User
VS-UC-REQ-331328/A-Erase Keypad Code from Current User

Actors	Vehicle Occupant
Pre-conditions	Infotainment System is On In keypad set mode
Scenario Description	The user enters an invalid factory code.
Post-conditions	HMI indicates {invalid key code entered message}. Keycode is not Set or Erased
List of Exception Use Cases	NA
Interfaces	G-HMI Vehicle System Interface
Notes	Unless the keypad signals are made wake-up signals then outside of Run the interface with the Keypad Server might not wake-up the bus the Keypad Server is on and the feature might not work outside of Run. HMI might want to limit entering the keycode to Run if that is the case.

3.11.2.4 VS-UC-REQ-331330/A-Invalid Duplicate Keypad Code Entry

Linked Elements
VS-UC-REQ-331327/A-Set Keypad Code for Current User

Actors	Vehicle Occupant
Pre-conditions	Infotainment System is On
Scenario Description	The user enters a duplicate keycode
Post-conditions	HMI indicates {Duplicate keycode entered message}. Keycode is not Set.
List of Exception Use Cases	NA
Interfaces	G-HMI Vehicle System Interface
Notes	Unless the keypad signals are made wake-up signals then outside of Run the interface with the Keypad Server might not wake-up the bus the Keypad Server is on and the feature might not work outside of Run. HMI might want to limit entering the keycode to Run if that is the case.

3.11.2.5 VS-UC-REQ-331331/A-Cancel Keypad Set Process

Linked Elements
VS-UC-REQ-331327/A-Set Keypad Code for Current User
VS-UC-REQ-331328/A-Erase Keypad Code from Current User

Actors	Vehicle Occupant
Pre-conditions	Infotainment System is On In keypad set mode

Scenario Description	Exit key pad set screen, while before setting keypad keycode.
Post-conditions	Operation is aborted.
List of Exception Use Cases	NA
Interfaces	G-HMI Vehicle System Interface
Notes	Unless the keypad signals are made wake-up signals then outside of Run the interface with the Keypad Server might not wake-up the bus the Keypad Server is on and the feature might not work outside of Run. HMI might want to limit entering the keycode to Run if that is the case.

3.11.3 Requirements

3.11.3.1 VS-SR-REQ-331337/A-Keypad Client supporting both Variant 1 and Variant 2 request signals at the same time

The Keypad Client shall send both the Variant 1 and Variant 2 keypad request signals at the same time when performing a keypad keycode function operation. To support this the Keypad Client shall:

- Send the variant 1 request signals CntrStk_D_RqAssoc and CntrStkKeycodeActl from the function "VS-FUN-REQ-023435-Edit Keypad Code", AND
- Send the variant 2 request signals Cntrstk2_D_RqAssoc and KeyPadCodeDgtX_D_Stat from this variant 2 function ("VSv2-FUN-REQ-331323-Edit Keypad Code – Variant 2).

The Keypad Client shall use the same response signal AssocConfirm_D_Actl from the Keypad Server (same signal in both variant 1 and variant 2 functions).

The Keypad Server shall determine if the variant 2 signals are to be used (Cntrstk2_D_RqAssoc, KeyPadCodeDgtX_D_Stat) or variant 1 signals are to be used (CntrStk_D_RqAssoc, CntrStkKeycodeActl). The Keypad Server shall only respond to one set of request and keycode signals from the Keypad Client.

- Disclaimer: the Keypad Server was using the strategy in the bullets below at the time of the spec release. If the strategy changes in the future (ex use configurations, only supports the new signals) that won't impact the strategy of the Keypad Client. The KeyPad Server shall only respond to either variant 1 or variant2 requests signals but not both regardless what strategy they use.
  - Keypad Server uses signals Cntrstk2_D_RqAssoc, KeyPadCodeDgtX_D_Stat:
    - If the new Keypad Client signals (Cntrstk2_D_RqAssoc, KeyPadCodeDgtX_D_Stat) are on the bus (would be in a new CAN message ID) then use these signal. If they are on the bus the Keypad Server shall support the new signals in this function.
  - Keypad Server uses signals CntrStk_D_RqAssoc, CntrStkKeycodeActl:
    - If the signals Cntrstk2_D_RqAssoc, KeyPadCodeDgtX_D_Stat are not received by the Keypad Server (Due to an older revision of the module) then the KeyPad Server shall support the signals CnterStk_D_RqAssoc, CntrsStkKeycodeActl in "VS-FUN-REQ-023435-Edit Keypad Code".

3.11.3.2 VS-SR-REQ-331338/A-Number of digits in Keycode

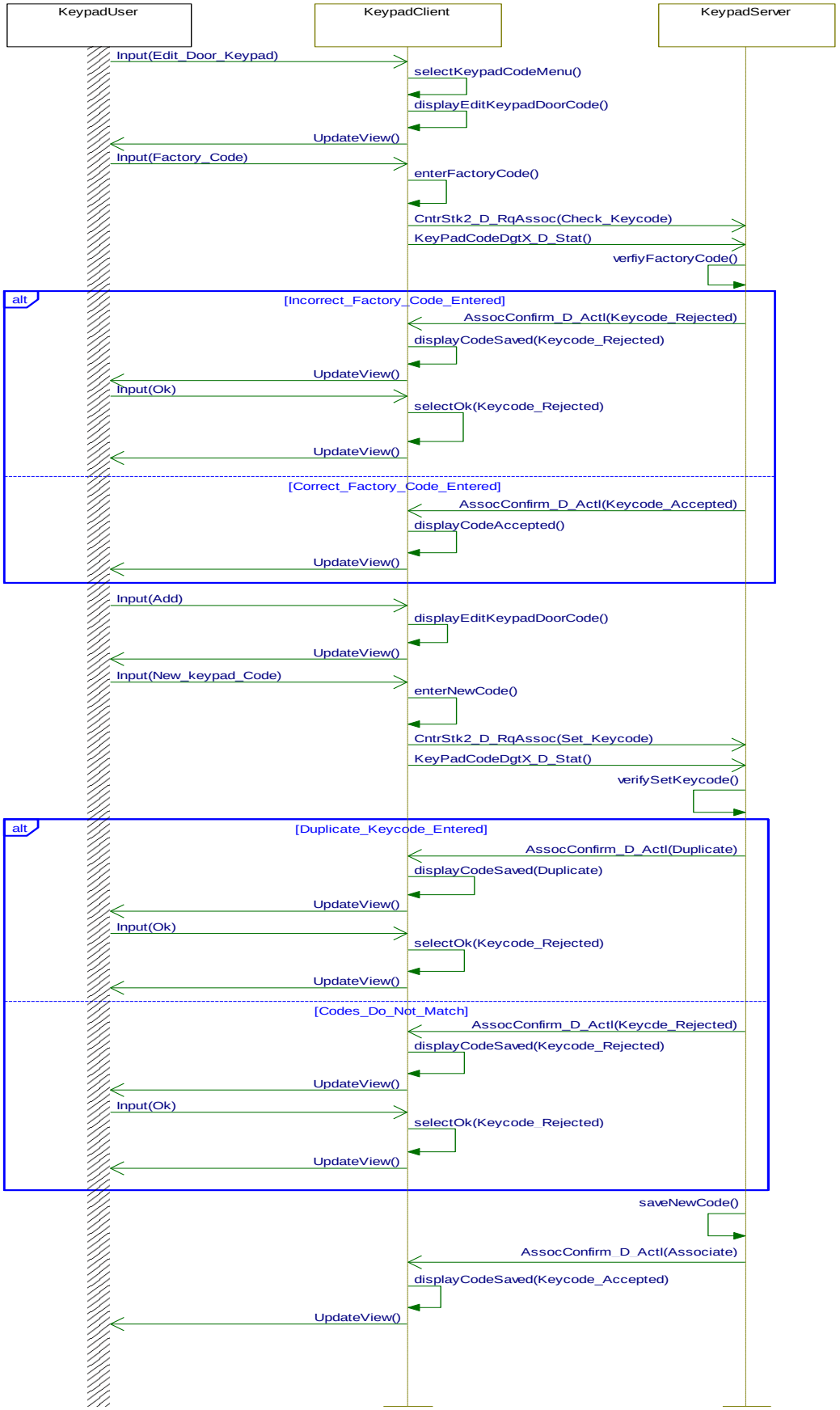
The EndOfString encoding in the KeyPadCodeDgtX_D_Stat signals is used to indicate how many button presses from the keypad keycode are being sent to the keypad server. The EndOfString shall be set in the KeyPadCodeDgtX_D_Stat signals not being used.

Example:

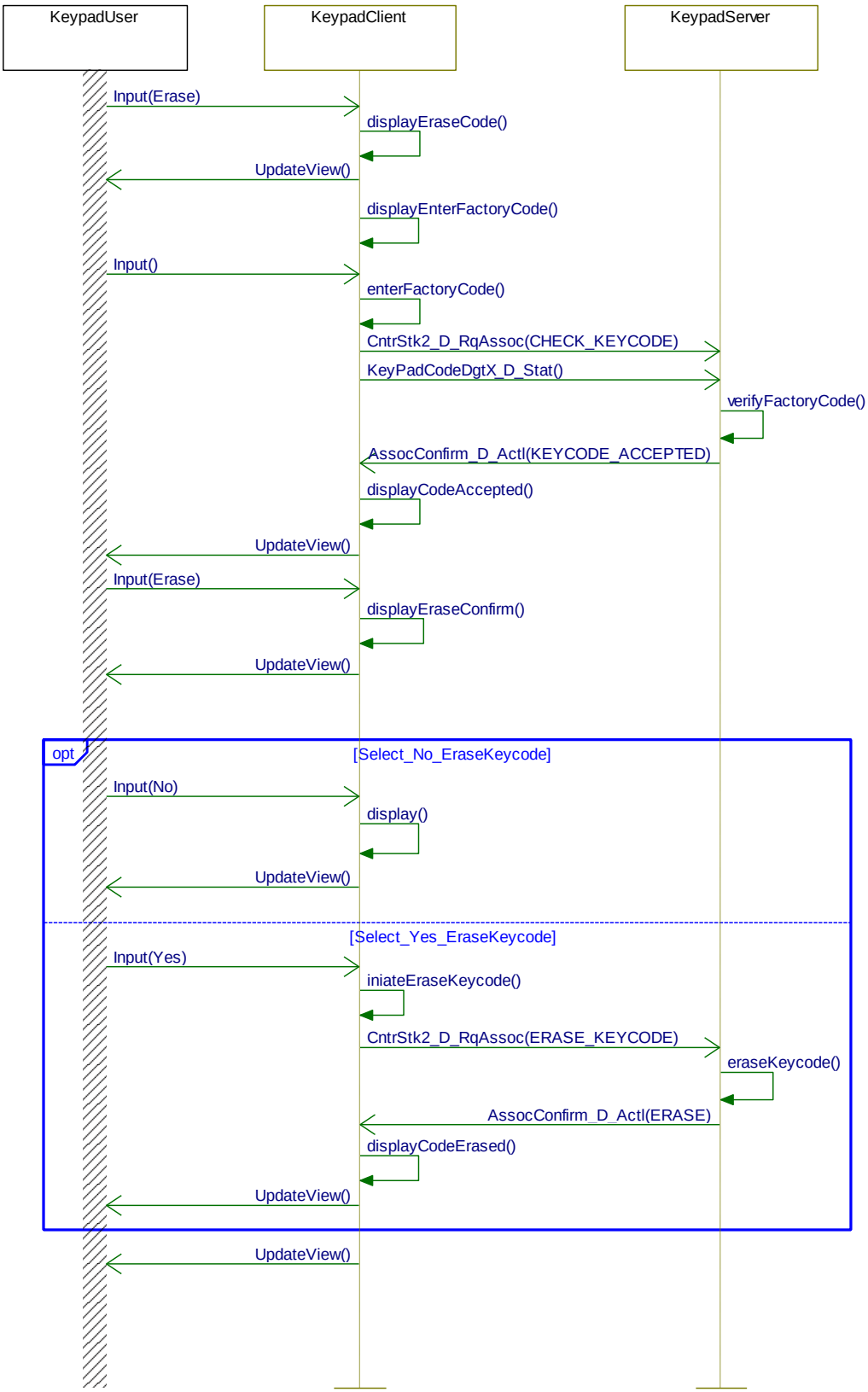
- For a 5 digit keycode with a keycode of 1_2, 3_4, 1_2, 9_0, 5_6 would be sent from the Keypad Client as follows:
  - KeypadCodeDgt1_D_Actl = 0x1 Button1_2or1
  - KeypadCodeDgt2_D_Actl = 0x3 Button3_4or3
  - KeypadCodeDgt3_D_Actl = 0x1 Button1_2or1
  - KeypadCodeDgt4_D_Actl = 0x9 Button9_0or9
  - KeypadCodeDgt5_D_Actl = 0x5 Button5_6or5
  - KeypadCodeDgt6_D_Actl = 0x0 EndOfString
  - KeypadCodeDgt7_D_Actl = 0x0 EndOfString

3.11.4 Sequence Diagrams

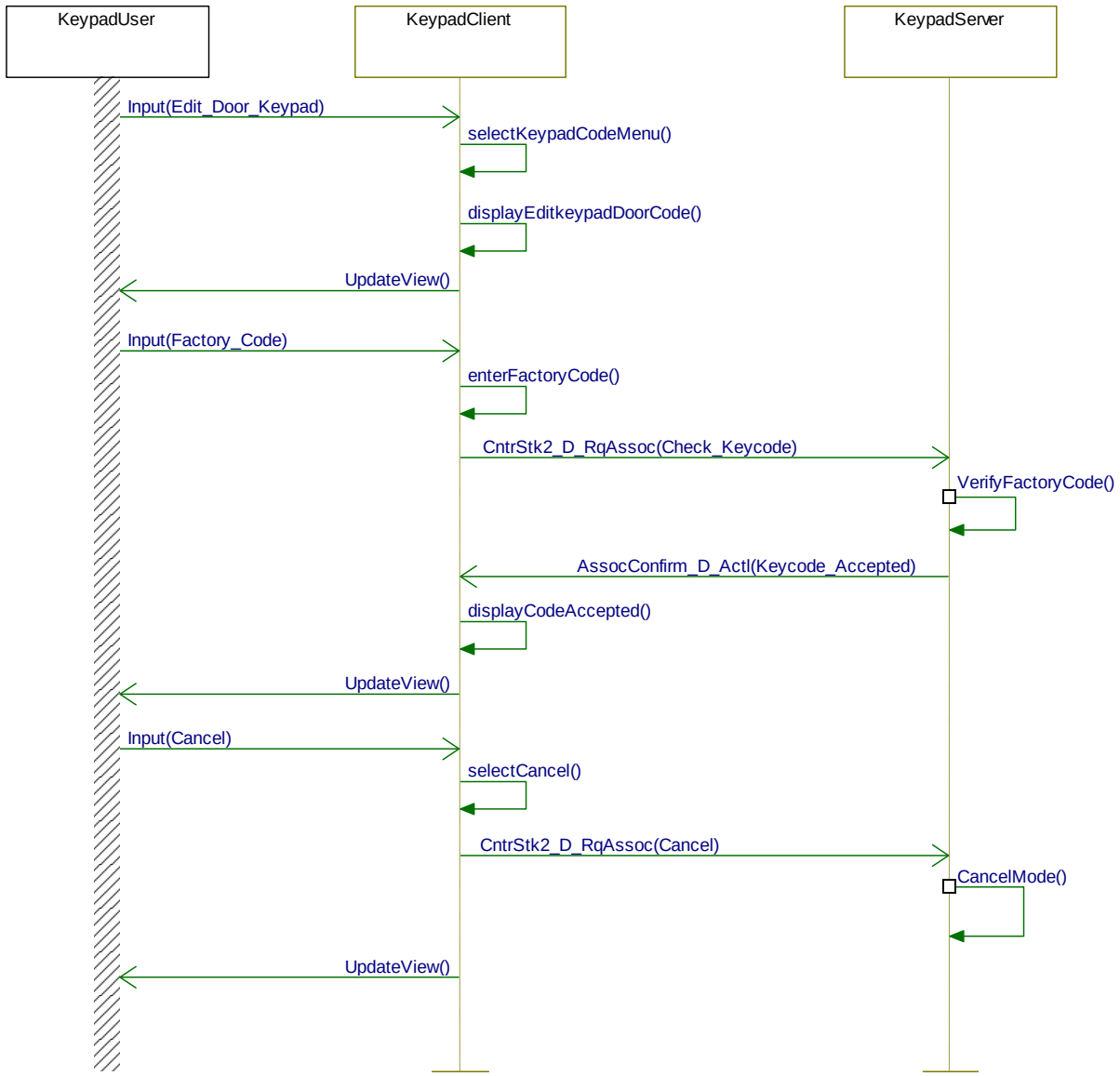
3.11.4.1 VS-SD-REQ-331333/A-Set Keypad Code for current user


KeypadUser
KeypadClient
KeypadServer
Input(Edit_Door_Keypad)
selectKeypadCodeMenu()
displayEditKeypadDoorCode()
UpdateView()
Input(Factory_Code)
enterFactoryCode()
CntrStk2_D_RqAssoc(Check_Keycode)
KeyPadCodeDgtX_D_Stat()
verfiyFactoryCode()
alt
[Incorrect_Factory_Code_Entered]
AssocConfirm_D_Actl(Keycode_Rejected)
displayCodeSaved(Keycode_Rejected)
UpdateView()
Input(Ok)
selectOk(Keycode_Rejected)
UpdateView()
[Correct_Factory_Code_Entered]
AssocConfirm_D_Actl(Keycode_Accepted)
displayCodeAccepted()
UpdateView()
Input(Add)
displayEditKeypadDoorCode()
UpdateView()
Input(New_keypad_Code)
enterNewCode()
CntrStk2_D_RqAssoc(Set_Keycode)
KeyPadCodeDgtX_D_Stat()
verifySetKeycode()
alt
[Duplicate_Keycode_Entered]
AssocConfirm_D_Actl(Duplicate)
displayCodeSaved(Duplicate)
UpdateView()
Input(Ok)
selectOk(Keycode_Rejected)
UpdateView()
[Codes_Do_Not_Match]
AssocConfirm_D_Actl(Keycde_Rejected)
displayCodeSaved(Keycode_Rejected)
UpdateView()
Input(Ok)
selectOk(Keycode_Rejected)
UpdateView()
saveNewCode()
AssocConfirm_D_Actl(Associate)
displayCodeSaved(Keycode_Accepted)
UpdateView()

3.11.4.2 VS-SD-REQ-331334/A-Erase Keypad Code from current user



3.11.4.3 VS-SD-REQ-331335/A-Cancel Keypad Code Edit



3.12 VS-FUN-REQ-025341/D-Master Reset to Factory Defaults - APIM (TcSE ROIN-296290-1)

3.12.1 Interface Requirements - Master Reset

3.12.1.1 MD-REQ-213361/C-FactoryReset_Rq

Message Type: Request

Signal sent by the Master Reset Client to initiate a Master Reset

Logical Signal Name	Literals	Value	Description
FactoryReset_Rq	Inactive	0x0	
	ResetFactoryDefaults	0x1	

3.12.1.2 MD-REQ-222036/B-FactoryReset.St

Message Type: Status

Signal sent by the Master Reset Server indicating that the master reset default settings were restored for a master reset event

Logical Signal Name	Literals	Value	Description
FactoryReset.St	Inactive	0x0	
	FactoryDefaultsRestored	0x1	
	Reserved	0x2	
	Reserved	0x3	

3.12.2 Use Cases

3.12.2.1 VS-UC-REQ-025342/A-User Decides to Restore Module back to its Original Factory State while Driving (Driver Restriction = ON) (TcSE ROIN-298054)

Actors	Vehicle Occupant
Pre-conditions	Infotainment system is available Driver Restriction = ON
Scenario Description	The user will like to perform a Master Reset while the vehicle is moving (Driver Restriction = ON)
Post-conditions	All Master Reset functionality should be a disabled
List of Exception Use Cases	E1 – Master reset started and user drivers off (Driver Restriction = ON)
Interfaces	G-HMI

3.12.2.2 VS-UC-REQ-025343/A-Master Reset Started and User Drivers Off (Driver Restriction = ON) (TcSE ROIN-298057)

Linked Elements

VS-UC-REQ-025342/A-User Decides to Restore Module back to its Original Factory State while Driving (Driver Restriction = ON) (TcSE ROIN-298054)

Actors	Vehicle Occupant
Pre-conditions	Same as normal use case
Scenario Description	User starts master reset and then drives off (turning ON driver restriction)
Post-conditions	Master reset and any reboots (if necessary) will continue as normal

List of Exception Use Cases	N/A
Interfaces	G-HMI

3.12.2.3 VS-UC-REQ-025344/A-User Decides to Restore Module Back to its Original Factory State (TcSE ROIN-298055)

Actors	Vehicle Occupant
Pre-conditions	Infotainment system is available Driver Restriction = OFF
Scenario Description	User select {Master Reset} option on the HMI The systems is locked out from usage until Master reset has completed successfully (if required, an immediate reboot shall occur right after master reset completion)
Post-conditions	All dynamic system & PII data is securely deleted and module is return back to its original factory state
List of Exception Use Cases	E1 – Loss of power while performing Master Reset E2 – Failure to remove/disconnect devices
Interfaces	G-HMI

3.12.2.4 VS-UC-REQ-025345/A-Loss of Power While Performing Master Reset (TcSE ROIN-298058)

Linked Elements
VS-UC-REQ-025344/A-User Decides to Restore Module Back to its Original Factory State (TcSE ROIN-298055)
VS-UC-REQ-213362/B-User Decides to Restore Module Back to its Original Factory State - Integrated AHU

Actors	Vehicle Occupant
Pre-conditions	Same as Normal Usage Use Case
Scenario Description	The user acknowledge the master reset action While Master reset functionality is active the module loses power After a few minutes the module acquires power
Post-conditions	Master reset actions shall not be preserved across power cycles. Only the master reset steps that took place while the module had power were the items deleted/restored.
List of Exception Use Cases	N/A
Interfaces	G-HMI

3.12.2.5 VS-UC-REQ-025346/A-Failure to Remove/Disconnect Devices (TcSE ROIN-298059)

Linked Elements
VS-UC-REQ-025344/A-User Decides to Restore Module Back to its Original Factory State (TcSE ROIN-298055)
VS-UC-REQ-213362/B-User Decides to Restore Module Back to its Original Factory State - Integrated AHU

Actors	Vehicle Occupant
Pre-conditions	Same as Normal Usage Use Case
Scenario Description	The user acknowledge the master reset action None of the index or connected devices are removed (i.e. iPod & BT Phone) Master reset functionality is active
Post-conditions	Same as Normal Usage Use Case. Master Reset should be able to ignore devices not removed.
List of Exception Use Cases	N/A
Interfaces	G-HMI

3.12.2.6 VS-UC-REQ-025347/A-User Decides to Reboot the Module (TcSE ROIN-298056)

Actors	Vehicle Occupant
Pre-conditions	Infotainment system is available
Scenario Description	User applies Center Stack Button combination for a set period of time User is presented with {reboot warning} HMI with a set period of time
Post-conditions	An immediate reboot shall occur
List of Exception Use Cases	E1 - User cancels via the {reboot warning} HMI
Interfaces	G-HMI CBI

3.12.2.7 VS-UC-REQ-025348/A-User Cancels via the {Reboot Warning} HMI (TcSE ROIN-298060)

Linked Elements
VS-UC-REQ-025347/A-User Decides to Reboot the Module (TcSE ROIN-298056)

Actors	Vehicle Occupant
Pre-conditions	Same as Normal Usage Use Case
Scenario Description	User cancels the manual reboot via the {reboot warning} HMI
Post-conditions	Reboot is cancelled
List of Exception Use Cases	N/A
Interfaces	G-HMI

3.12.2.8 VS-UC-REQ-025349/B-Master Reset (TcSE ROIN-296294)

Actors	Vehicle occupant
Pre-conditions	Center stack display is ON
Scenario Description	The user selects <Master Reset> via HMI.
Post-conditions	All settings are restored to the factory defaults. SDARS stations are reset to factory defaults. Audio Settings are set to the default settings
List of Exception Use Cases	N/A
Interfaces	G-HMI

3.12.3 Requirements

3.12.3.1 VS-SR-REQ-015044/E-Master Reset request to the infotainment components (TcSE ROIN-174375-1)

During a Master Reset, the Vehicle Settings Master Reset Client shall issue a FactoryReset.Rq = ResetFactoryDefaults to the ~~SDARS Server~~ infotainment components.

Note: when the infotainment components (ex AHU, Smart DSP AMP...) receive “FactoryReset_Rq = ResetFactoryDefaults” they will reset to their default settings things such as the Audio Settings (ex Bass, Treble, Volume…) and SDARS settings.

SPSS to CAN dB mapping: For this FactoryReset.Rq the Vehicle Setting Master Reset Client shall send “0x104 MFD_Request_Signals3 : SDARS_FactoryReset_Rq”.

3.12.3.2 VS-SR-REQ-213252/B-Master Reset request to the TCU (Telematic Control Unit)

During a Master Reset, the Vehicle Settings Master Reset Client shall issue a FactoryReset.Rq = ResetFactoryDefaults to the TCU.

SPSS to CAN dB mapping: For this FactoryReset.Rq the Vehicle Setting Master Reset Client shall send “0x105 APIM_Request_Signals : FactoryReset_Rq”.

3.12.3.3 VS-FUR-REQ-136296/B-Master Reset Language

The APIM / IAHU Master Reset shall not change the currently selected language the APIM / IAHU module is using. For example if Spanish is the language and the user then does a Master Reset then after the Master Reset Spanish shall still be the language.

The APIM / IAHU Master Reset shall have the APIM / IAHU send a language request so the Vehicle Settings Language Servers (ex. Cluster) to go to the currently selected Language by the APIM / IAHU. For example if the Cluster was at English and APIM / IAHU is at Spanish and the user then selects Master Reset the APIM / IAHU would request the Cluster to go to Spanish.

Note: IAHU is integrated AHU for those modules which send out the Master Reset (mutually exclusive to APIM)

3.12.3.4 VS-FUR-REQ-025350/B-Reboot module using Center Stack (TcSE ROIN-298037-1)

The user shall be able to perform an immediate reboot by holding a combination of center Stack buttons for 5 seconds. Combination = TBD.

See HMI specs for button combinations for Multimedia Reboot and see the HMI specs for button combinations.

3.12.3.5 VS-FUR-REQ-025351/A-Secure Deletion (TcSE ROIN-298038-1)

Secure deletion must overwrite/erase the memory in such a way that the data can't be observed in a subsequent bitwise copy of the entire flash area.

3.12.3.6 VS-FUR-REQ-025352/A-Secure Data Storage - Copies (TcSE ROIN-298039-1)

PII data must not be copied/cached elsewhere in the system unless those copies are securely deleted as well.

3.12.3.7 VS-FUR-REQ-025353/A-Remove all PII & Specific Applications Data (TcSE ROIN-298040-1)

A mechanism in the HMI shall provide the user with the ability to remove all PII and specific applications data.

3.12.3.8 VS-FUR-REQ-025354/A-Master Reset Completion Time Limit (TcSE ROIN-298041-1)

The removal of all PII and specific application data shall not take longer than 45 seconds.

3.12.3.9 VS-FUR-REQ-025355/A-Restore Factory Settings and Default Values (TcSE ROIN-298042-1)

The APIM Master Reset shall have an option to securely delete all content and restore all factory settings to its default values. See all items in *P01a_Master_Reset.xls* for expected behavior details.

3.12.3.10 VS-FUR-REQ-025356/A-Clean Cache (TcSE ROIN-298043-1)

After securely deleting and restoring all settings the system shall clear any remaining system/application cache.

3.12.3.11 VS-FUR-REQ-025357/A-Immediate Reboot after Completion (TcSE ROIN-298044-1)

After securely deleting and restoring all settings the system shall perform an immediate reboot.

3.12.3.12 VS-FUR-REQ-025358/B-Feature Unavailability during Master Reset (TcSE ROIN-298045-1)

For any immediate reboot the user confirmation message shall include a warning about the unavailability of rear view camera and other vehicle APIM / IAHU dependent features.

Note: IAHU is for Integrated AHU (mutually exclusive with APIM)

3.12.3.13 VS-FUR-REQ-025359/A-Confirmation Message & Device Disconnect Info (TcSE ROIN-298046-1)

A user confirmation message shall include a description of the function that will be performed and the appropriate devices that must be disconnected.

3.12.3.14 VS-FUR-REQ-025360/A-Dynamic/Manual Registration to Master Reset Service (TcSE ROIN-298047-1)

Third-party or external software applications/plug-ins shall be allow to register to a global master reset event.

3.12.3.15 VS-FUR-REQ-025361/A-System Blocked until Master Reset Completed (TcSE ROIN-298048-1)

After the master reset feature is activated the user shall not be able to perform any other functions in the systems after master reset completes and system reboot occurs.

3.12.3.16 VS-FUR-REQ-025362/A-Secure Delete APIs (TcSE ROIN-298049-1)

All data shall be securely deleted during Master Reset using the appropriate secure deletion APIs determined by Ford Motor Company.

3.12.3.17 VS-FUR-REQ-025363/A-Baseline OTA Data (TcSE ROIN-298050-1)

APIM's Baseline OTA data shall never be removed (e.i. STL, RDS-TMC).

3.12.3.18 VS-FUR-REQ-025364/A-System Upgrades and/or Languages Not Removable (TcSE ROIN-298051-1)

Installed language packs and System upgrades shall never be removed during Master Reset .

3.12.3.19 VS-FUR-REQ-025365/A-Driver Restriction 2 (TcSE ROIN-298053)

Driver restriction shall apply to master reset and its features. This options shall not be available while the vehicle is moving and driver restriction = ON

3.12.3.20 ENMEM-REQ-105569/E-Driver Profiles Deleted During Master Reset

The storage and maintenance of the Driver Profiles of Enhanced Memory shall comply with the design and requirements of Master Reset (refer to the latest version of VS-FUN-REQ-025341-Master Reset to Factory Defaults).

When a Master Reset operation is executed:

1. The EnhancedMemoryInterfaceClient shall delete all internal Driver Profile data (i.e. Profile Name, Button Association, Profile Number Association) for all Driver Profiles
2. If a keyfob is associated to a Driver Profile(s) the following actions shall be performed:
    - The EnhancedMemoryInterfaceClient shall request to disassociate the keyfob via EnMemProfilePairingRq(KeyPairing=DisassociateKey)
    - The EnhancedMemoryProfileServer shall respond with a successful keyfob disassociation via EnMemKeyPairing_St(KeyPairing=KeyDisassociated)

- The EnhancedMemoryProfileServer shall update the status of PersKeyPairing_St to KeyNotAssociated for the Driver Profile deleted
- If there are more than one profile with keys paired, the EnhancedMemoryInterfaceClient shall repeat steps 2 and 3 above until all the keyfobs are dissociated from all profiles

3. If a phone is associated to a Driver Profile(s) the following actions shall be performed:
    - The EnhancedMemoryInterfaceClient shall request to disassociate the phone via EnMemProfilePairingRq(KeyPairing=DisassociatePhone)
    - The EnhancedMemoryProfileServer shall respond with a successful phone disassociation via EnMemKeyPairing_St(KeyPairing=KeyDisassociated)
    - The EnhancedMemoryProfileServer shall update the status of PersPhonePairing_St to NoPhonesAssociated for the Driver Profile deleted
    - If there are more than one profile with phones paired, the EnhancedMemoryInterfaceClient shall repeat steps 2 and 3 above until all the phones are dissociated from all profiles
4. The EnhancedMemoryInterfaceClient shall send a recall request for Vehicle Profile via InfotainmentRecall_Rq(PersIndex = Vehicle)
5. The EnhancedMemoryInterfaceClient shall OptOut of all profiles and set all active personalities in PersonalityOptIn_St to NotOptedIn
6. The EnhancedMemoryInterfaceClient shall set the Enhanced Memory feature status to Off via EnhancedMemory_St(Status = ProfileOff)
7. The EnhancedMemoryProfileServer shall send a recall request for Vehicle to the EnhancedMemoryPositionClient via MemoryPosition_St. Note: this step does not apply to the EnhancedMemoryInterfaceClient and is don't care for the EnhancedMemoryInterfaceClient
8. The EnhancedMemoryInterfaceClient shall send a Factory Reset request to the EnhancedMemoryServers via FactoryReset_Rq(Type = Reset) to perform Master Reset on the EnhancedMemoryServers that support Master Reset (ex. AHU resets SDARS presets - see SDARS SPSS for details). If the EnhancedMemoryServer supports FactoryReset_Rq, all profiles shall reset (ex. SDARS presets reset for all profiles).
9. The EnhancedMemoryInterfaceClient performs a reboot for Master Reset following VS-FUN-REQ-025341-Master Reset to Factory Defaults).
    - Note: the EnhancedMemoryInterfaceClient/Infotainment System Master shall send the FactoryReset_Rq before shutting down the Infotainment System (i.e. sends FactoryReset_Rq(Type = Reset) while HMI_HMIMode_St = On).

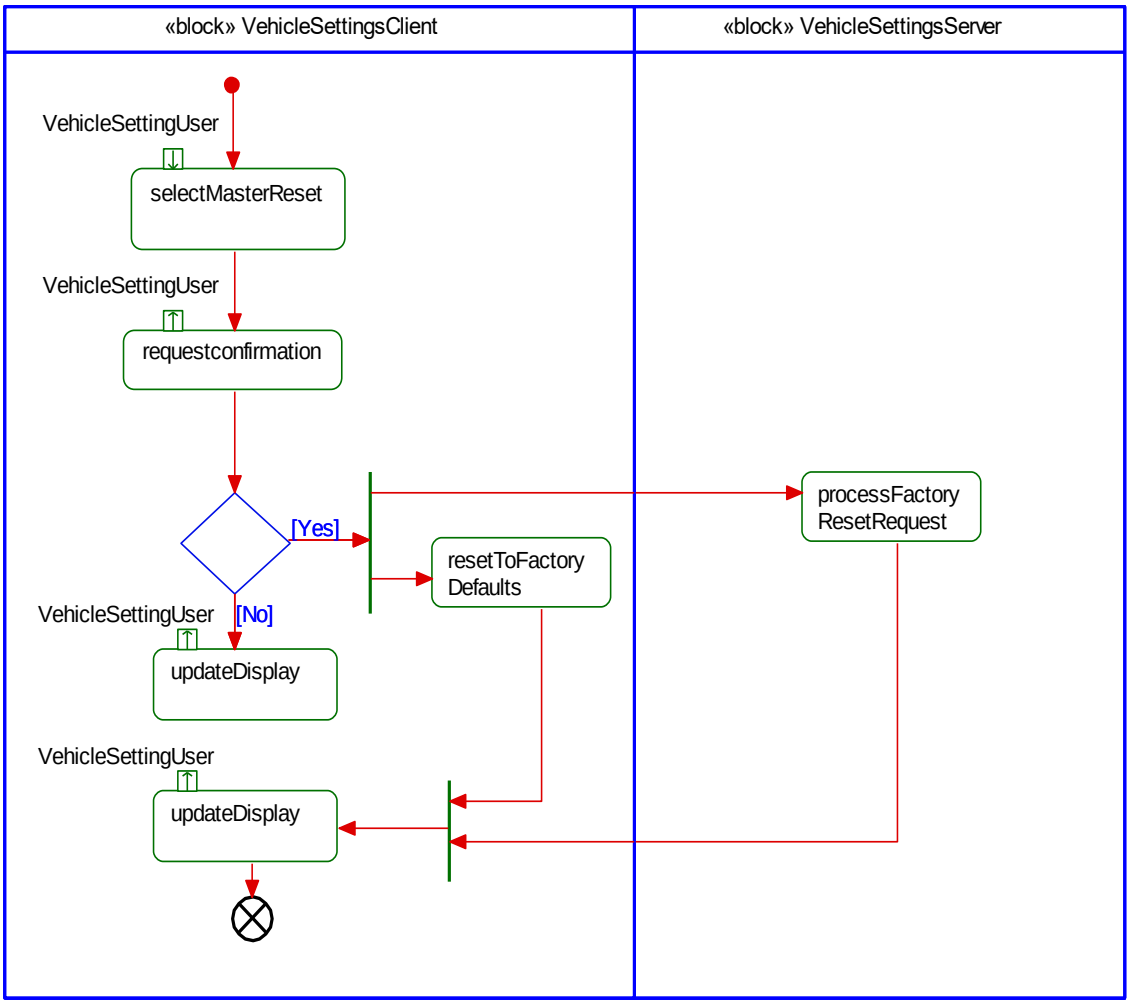
Reference sequence diagram ENMEM-SD-REQ-197509-Master Reset for details

3.12.4 White Box Views

3.12.4.1 VS-ACT-REQ-025151/A-Master Reset (TcSE ROIN-296296-1)

Linked Elements
VS-SD-REQ-025366/A-Master Reset (TcSE ROIN-296298)

Activity Diagram



3.12.4.2 VS-SD-REQ-025366/A-Master Reset (TcSE ROIN-296298)

Scenarios

Normal Usage

User requests {Master Reset} via the HMI.

Constraints

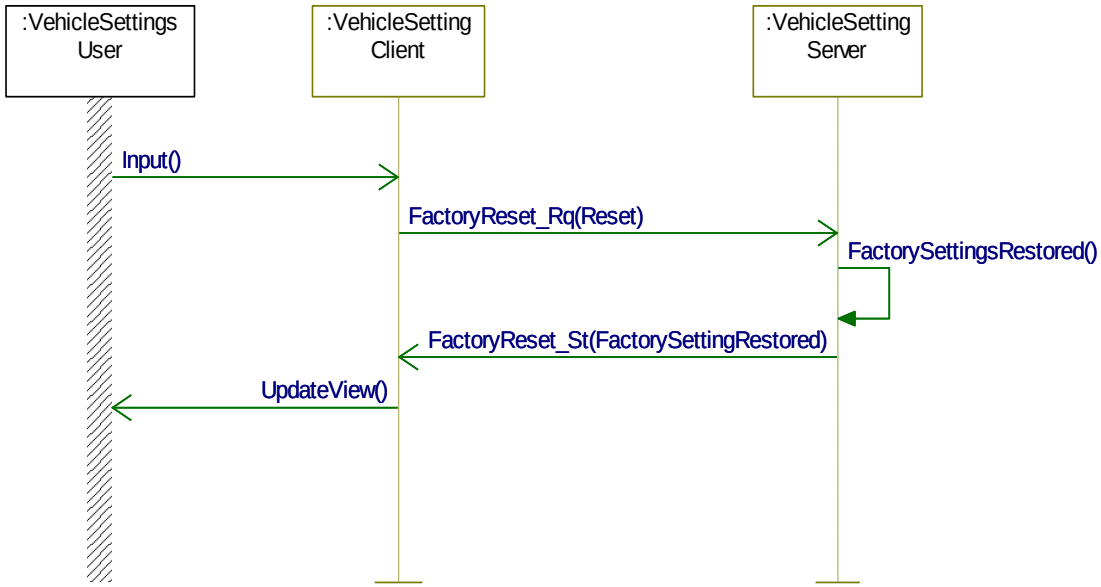
Pre-condition

CenterStack is On.

Post-condition

Requested Restore is completed.

Sequence Diagram



3.13 VS-FUN-REQ-096818/D-Set Valet Mode

3.13.1 Interface Requirement - Valet Mode

3.13.1.1 MD-REQ-097285/C-ValetMode_St

Message Type: Status

Signal used to indicate the Valet Mode Status.

Logical Signal Name	Literals	Value	Description
ValetMode_St	Invalid / Null	0x0	
	OFF	0x1	
	ON	0x2	
	Not Used	0x3	

3.13.2 Use Cases

3.13.2.1 VS-UC-REQ-096810/B-Enable/Disable Valet Mode

Actors	Vehicle Occupant
Pre-conditions	Infotainment System is powered ON (ie HMIAudioMode = ON). Valet Mode is available in the HMI.
Scenario Description	The user selects activate or deactivate Valet Mode from the HMI.
Post-conditions	Valet Mode is activated if user selects activate Valet Mode Features that are restricted by Valet Mode are now locked out Valet Mode is deactivated if user selects deactivate Valet Mode Features that were locked out by Valet Mode are no longer restricted
Notes	
Interfaces	G-HMI, Vehicle System Interface

3.13.3 Requirements

3.13.3.1 VS-FUR-REQ-104343/D-Valet Mode Infotainment Operation

The valet mode feature allows the touch screen (if touch screen on module) to be locked out using a 4 digit pin.

During activation, the touchscreen is locked out, and certain functionality is suspended/disabled as defined by HMI.

Valet mode is disabled using the same 4 digit pin that was used during activation.

There is a predetermined default pin that can be used to disable valet mode as defined by HMI.

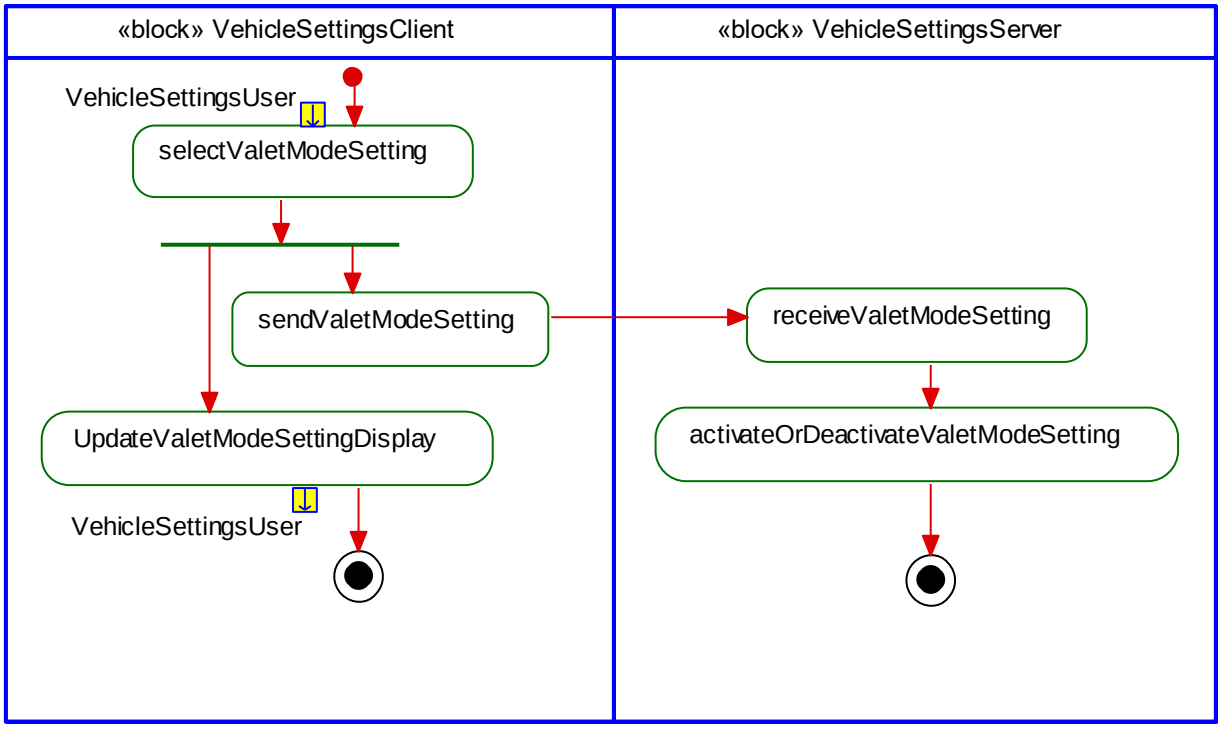
Valet mode shall only be disabled using a matching 4 digit pin to what was used to enable the feature or by the default pin.

While Valet mode is enabled it shall not be disabled over ignition cycles (ie HMIAudioMode turning OFF to ON to OFF..), during a battery reset (cold reboot) or after performing the user activated multimedia system reboot via the manual 2 button press procedure as called out by the HMI (ex. radio power + seek up).

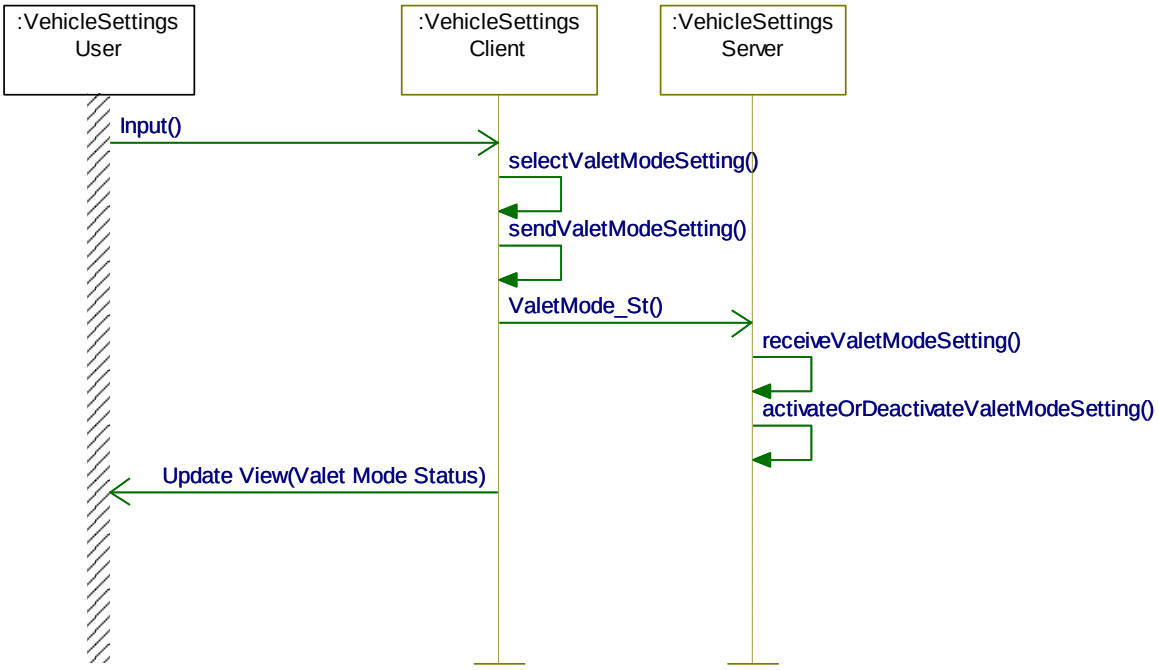
Upon activation/deactivation, the current valet mode state is communicated using the ValetMode_St signal. ValetMode_St = ON shall enable Valet Mode and ValetMode_St = OFF shall disable Valet Mode for modules receiving this signal. Modules receiving the ValetMode_St signal shall determine what features/functions to lock out while ValetMode is active.

3.13.4 White Box Views

3.13.4.1 VS-ACT-REQ-096820/A-Set Valet Mode



3.13.4.2 VS-SD-REQ-097279/B-Set Valet Mode



Note: Vehicle Setting Server can be the same module as the Vehicle Setting Client (ex locking screen which requires a PIN to unlock) or the Vehicle Settings Server could be a different module then the Vehicle Setting Client would require bus communication (ex. locking glove box if supported).

3.14 VS-FUN-REQ-334503/A-Drive History Reset

3.14.1 VS-CLD-REQ-339750/A-Drive History Client

The Drive History Client is responsible for requesting the Long Term Drive History Reset to the Drive History Server

3.14.2 VS-CLD-REQ-342947/A-Drive History Server

3.14.3 Interface Requirements

3.14.3.1 MD-REQ-338982/B-LongTermReset_B_RqMnu

Message Type: Request

Note: Request signal from the Drive History Client to the Drive History Server to reset the long term drive history information

Logical Signal Name	Literals	Value	Description
LongTermReset_B_RqMnu	OFF	0x0	
	ON	0x1	

Note: init value in the CAN dB for this signal should be 0x0 OFF

3.14.4 Requirements

3.14.4.1 VS-SR-REQ-334504/B-Drive History Reset

When the drive history setting is selected to reset the long term drive history the Drive History Client shall:

1. Set the signal LongTermReset_B_RqMnu to ON from OFF, AND
2. Hold the LongTermReset_B_RqMnu set to ON for 2 seconds +/- 10%, then
3. Set LongTermReset_B_RqMnu back to OFF

Note: There is no status signal back for the Drive History Client indicating if the reset was successful or not.

The Drive History Client is only allowed to display Drive History Long Term Reset Setting HMI when Ignition = Run or Accessory. See HMI specification for when this setting is actually shown (could be more limited) but this setting cannot be shown outside for Run/ACC

HMI Setting ID
1024

3.15 VS-FUN-REQ-333193/A-Low Battery Alert

3.15.1 VS-CLD-REQ-341184/A-Low Battery Alert Client

The Low Battery Alert Client interfaces with the user via HMI and is responsible for sending the Low Battery setting request to the Low Battery Server.

3.15.2 VS-CLD-REQ-341185/A-Low Battery Alert Server

The Low Battery Alert Server is responsible for control of the Low Battery Alert function and interfaces with the Low Battery Alert Server

3.15.3 Interface Requirements

3.15.3.1 MD-REQ-341180/B-BattTracLoThres_D_Stat

Message Type: Status

Note: Status signal from the Low Battery Alert Server with the status of the Low Battery Alert function

Logical Signal Name	Literals	Value	Description
BattTracLoThres_D_Stat	Null	0x0	
	20 mi / 32 km	0x1	Cluster speedometer major speed scale units MPH
	30 mi / 48 km	0x2	
	50 mi / 80 km	0x3	
	30 km / 18 mi	0x4	Cluster speedometer major speed scale units Km/h
	50 km / 31 mi	0x5	
	80 km / 50 mi	0x6	
	Not Used	0x7	

3.15.3.2 MD-REQ-341183/B-BattTracLoThres_D_Rq

Message Type: Request

Note: Request signal from the Low Battery Alert Client to the Low Battery Alert Server to set the feature

Logical Signal Name	Literals	Value	Description
BattTracLoThres_D_Rq	Null	0x0	
	20 mi / 32 km	0x1	Cluster speedometer major speed scale units MPH
	30 mi / 48 km	0x2	
	50 mi / 80 km	0x3	
	30 km / 18 mi	0x4	Cluster speedometer major speed scale units Km/h
	50 km / 31 mi	0x5	
	80 km / 50 mi	0x6	
	Not Used	0x7	

3.15.3.3 MD-REQ-341190/A-SpeedoMajorUnit_D_Confg

Message Type: Status

Note: Status signal from the Low Battery Alert Client with the status of the speedometer speed scale units

Logical Signal Name	Literals	Value	Description
SpeedoMajorUnit_D_Confg	Null	0x0	
	MPH	0x1	
	KPH	0x2	
	Not Used	0x3	

3.15.4 Requirements

3.15.4.1 VS-REQ-341338/A-Low Battery Alert Server functional requirement

The Low Battery Alert Server shall publish the status of what Low Battery Alert value is used to alert the driver via the BattTracLoThres_D_Stat signal.

The Low Battery Alert Server shall use the SpeedoMajorUnit_D_Confg signal to determine if the BattTracLoThres_D_Stat uses encodings Speedometer Major Units MPH or KPH values.

- If SpeedoMajorUnit_D_Confg = MPH then 0x1, 0x2 and 0x3 shall be used.
- If SpeedoMajorUnit_D_Confg = KPH then 0x4, 0x5 and 0x6 shall be used
- If SpeedoMajorUnit_D_Confg = Null then use the last MPH or KPH setting. The Low Battery Alert Server will have to remember this setting between ignition cycles.

Note: The Low Battery Alert Client which sends SpeedoMajorUnit_D_Confg may set the signal to Null when powering up when ignition goes from OFF to Run.

BattTracLoThres_D_Stat	SpeedoMajorUnit_D_Confg
0x0 Null	
0x1 20 mi / 32 km	MPH
0x2 30 mi / 48 km	
0x3 50 mi / 80 km	
0x4 30 km / 18 mi	KPH
0x5 50 km / 31 mi	
0x6 80 km / 50 mi	
0x7 Not Used	

3.15.4.2 VS-REQ-341290/A-Low Battery Alert Client functional requirement

The Low Battery Alert Client shall use the BattTracLoThres_D_Stat status signal to update the settings HMI to show what setting Low Battery Alert is set to.

The Low Battery Alert Client shall use the BattTracLoThres_D_Rq signal to request a Low Battery Alert setting selected by the user.

The Low Battery Alert Client shall broadcast the Speedometer Major Units that is used (MPH/KPH) in the SpeedoMajorUnit_D_Confg signal whenever the infotainment system is on (ie HMI_HMIMode_St = ON).

- The Low Battery Alert Client shall know the speedometer major units for a particular market based on:
  - the country code the Low Battery Alert Server is configured for, and
  - what Speedometer Major Unit is used for that country based on requirement "VS-REQ-341178-Mapping Table – Speedometer Major Units".

The Low Battery Alert Client shall use the Measure Units setting to determine if the Low Battery Alert setting is displayed in MPH or KPH on the HMI. See requirement VS-SR-REQ-234039-Measure Units in the Settings in the Centerstack SPSS for details.

- Ex. BattTracLoThresh_D_Stat is set to 0x1 20 mi / 32 km then,
  - If the measure units setting is set to miles, then 20 mi would be shown on the HMI
  - If the measure units setting is set to km, then 32 km would be shown on the HMI

The Low Battery Alert Client is only allowed to display the Low Battery Alert Setting HMI when Ignition_Status = Run or Accessory. See HMI specification for when this setting is actually shown (could be more limited) but this setting cannot be shown outside for Run/ACC.

- Note: if show this setting in accessory the measure units last state would need to remembered outside of Run so the Low Battery Alert Client know whether to show in MPH or KPH

HMI Setting ID
1023

3.15.4.3 VS-HMI-REQ-342159/A-HMI display options for Low Battery Alert - Low Battery Alert Client

Possible Low Battery Alert HMI settings that can be displayed:

1. Speedometer Major Units is MPH and Measure Units is set to miles:

20 miles
30 miles
50 miles

2. Speedometer Major Units is MPH and Measure Units is set to kilometers:

32 km
48 km
80 km

3. Speedometer Major Units is KPH and Measure Units is set to kilometers:

30 km
50 km
80 km

4. Speedometer Major Units is KPH and Measure Units is set to miles:

18 miles
31 miles
50 miles

3.15.4.4 VS-SR-REQ-341887/A-Selecting a Low Battery Alert Setting via the HMI

When a Low Battery Alert setting is selected via the HMI:

1. The Low Battery Alert Client shall set BattTracLoThres_D_Rq to the selected setting.
2. The Low Battery Alert Server shall respond within 100 msec to the BattTracLoThres_D_Rq signal setting request with the response via the BattTracLoThres_D_Stat signal and set the Low Battery Alert threshold to what was selected.

3. The Low Battery Alert Client shall update its HMI with the Low Battery Threshold value in the BattTracLoThres_D_Stat signal.

Note: See sequence diagram with example

3.15.4.5 VS-SR-REQ-341178/B-Mapping Table - Speedometer Major Units

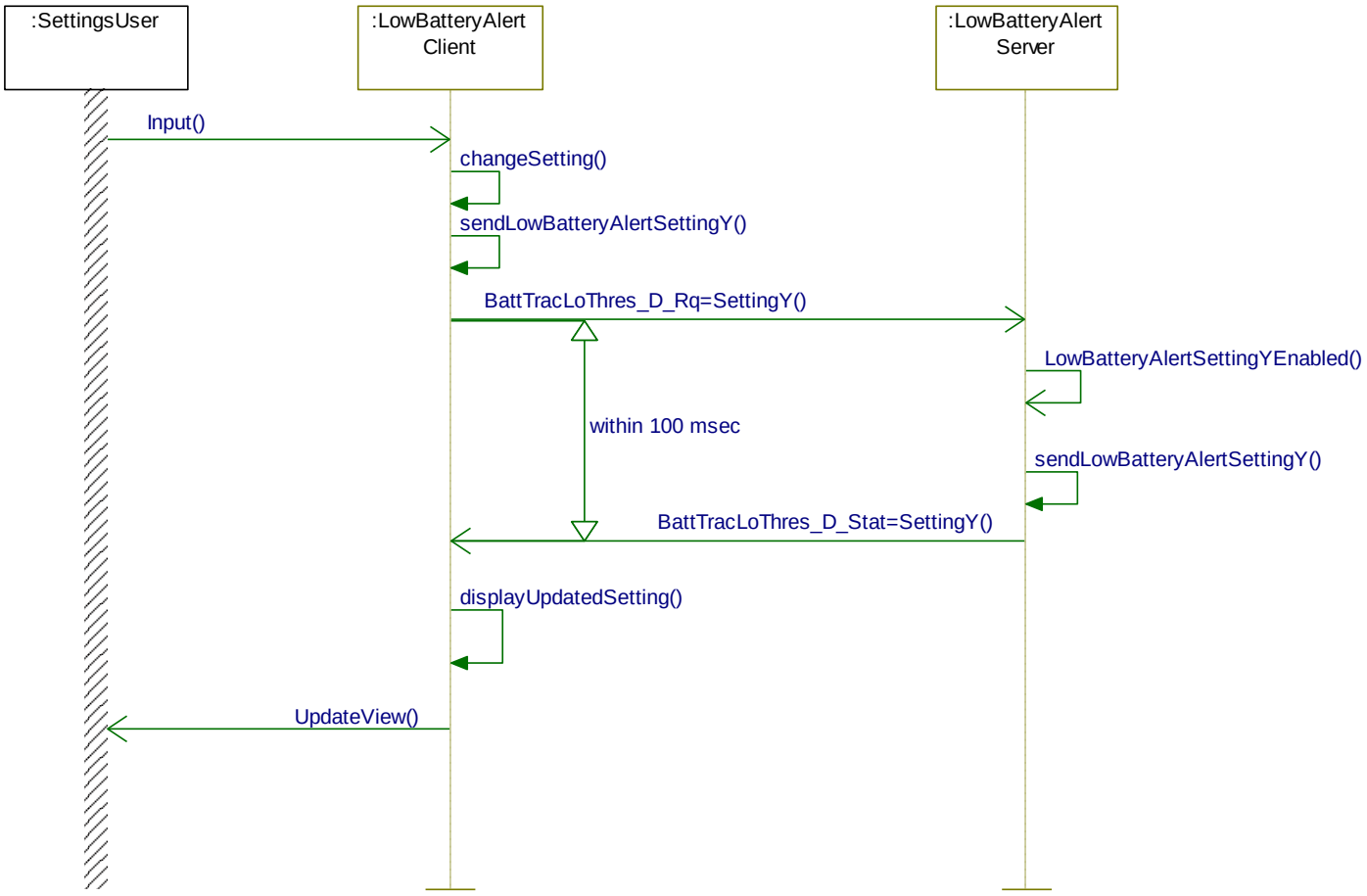
The table below maps the country to the Cluster major speedometer speed scale units (MPH or Km/h).

Market	Cluster Speedometer major speed scale units
US and US Territories	MPH
UK	MPH
All other markets	Km/h

3.15.5 Sequence Diagrams

3.15.5.1 VS-SD-REQ-341844/A-Low Battery Alert Setting Selection

Pre-condition:
Low Battery Alert has setting X active



3.16 VS-FUN-REQ-339665/A-Propulsion Sound

3.16.1 VS-CLD-REQ-339751/A-Propulsion Sound Client

The Propulsion Sound Client interfaces with the user via HMI and is responsible for sending the propulsion sound setting request to the propulsion sound server.

3.16.2 VS-CLD-REQ-339752/B-Propulsion Sound Server

The Propulsion Sound Server is responsible for control of the propulsion sound function and interfaces with the Propulsion Sound Client.

3.16.3 Use Case

3.16.3.1 VS-UC-REQ-340217/A-User Enables Propulsion Sound Setting

Actors	Vehicle front seat Occupant
Pre-conditions	Infotainment system is ON Propulsion Sound is Disabled
Scenario Description	User change propulsion sound setting to enabled
Post-conditions	Propulsion sound is enabled Propulsion sound HMI is shown set to enabled.
Notes	Propulsion sound is just referring to propulsion sound interior to vehicle

3.16.3.2 VS-UC-REQ-340218/A-User Disables Propulsion Sound Setting

Actors	Vehicle front seat occupant
Pre-conditions	Infotainment System is ON Propulsion Sound is Enabled
Scenario Description	User changes propulsion sound setting to disabled
Post-conditions	Propulsion sound is disabled Propulsion sound HMI is shown set to disabled
Notes	Propulsion sound is just referring to propulsion sound interior to vehicle

3.16.4 Interface Requirements

3.16.4.1 MD-REQ-339666/A-PrplSnd_D_Rq

Message Type: Request

Note: Request signal from the Propulsion Sound Client to the Propulsion Sound Server to enable or disable the feature

Logical Signal Name	Literals	Value	Description
PrplSnd_D_Rq	Null	0x0	
	Disabled	0x1	
	Enabled	0x2	

3.16.4.2 MD-REQ-339747/A-PrplSnd_D_Stat

Message Type: Status

Note: Status signal from the Propulsion Sound Server with the status of Propulsion Sound feature

Logical Signal Name	Literals	Value	Description
PrplSnd_D_Stat	Null	0x0	
	Disabled	0x1	
	Enabled	0x2	

3.16.5 Requirements

3.16.5.1 VS-SR-REQ-339667/A-Propulsion Sound Client requesting change to propulsion sound

The Propulsion Sound Client shall use the PrplSnd_D_Stat status signal to show the propulsion sound feature as Enabled or Disabled.

Ex. At infotainment feature start-up (ex ignition OFF to RUN) there is no setting selected by the customer but the HMI shows the status of the propulsion sound setting based on if PrplSnd_D_Stat is set to Enabled or Disabled.

The propulsion sound setting can be changed (if HMI support outside of Run) whenever HMI_HMIMode_St = ON (ie infotainment system is ON).

When the propulsion sound setting is selected via the HMI:

1. The Propulsion Sound Client shall set the PrplSnd_D_Rq to enabled or disabled based on what the user selected
2. The Propulsion Sound Server shall respond within T_PrplSnd_Rsp to the PrplSnd_D_Rq request with the response of the propulsion sound via the PrplSnd_D_Stat signal.
3. The Propulsion Sound Client shall update its HMI (if there is an update) with the Propulsion Sound Status after receiving the PrplSnd_D_Stat response to the request.

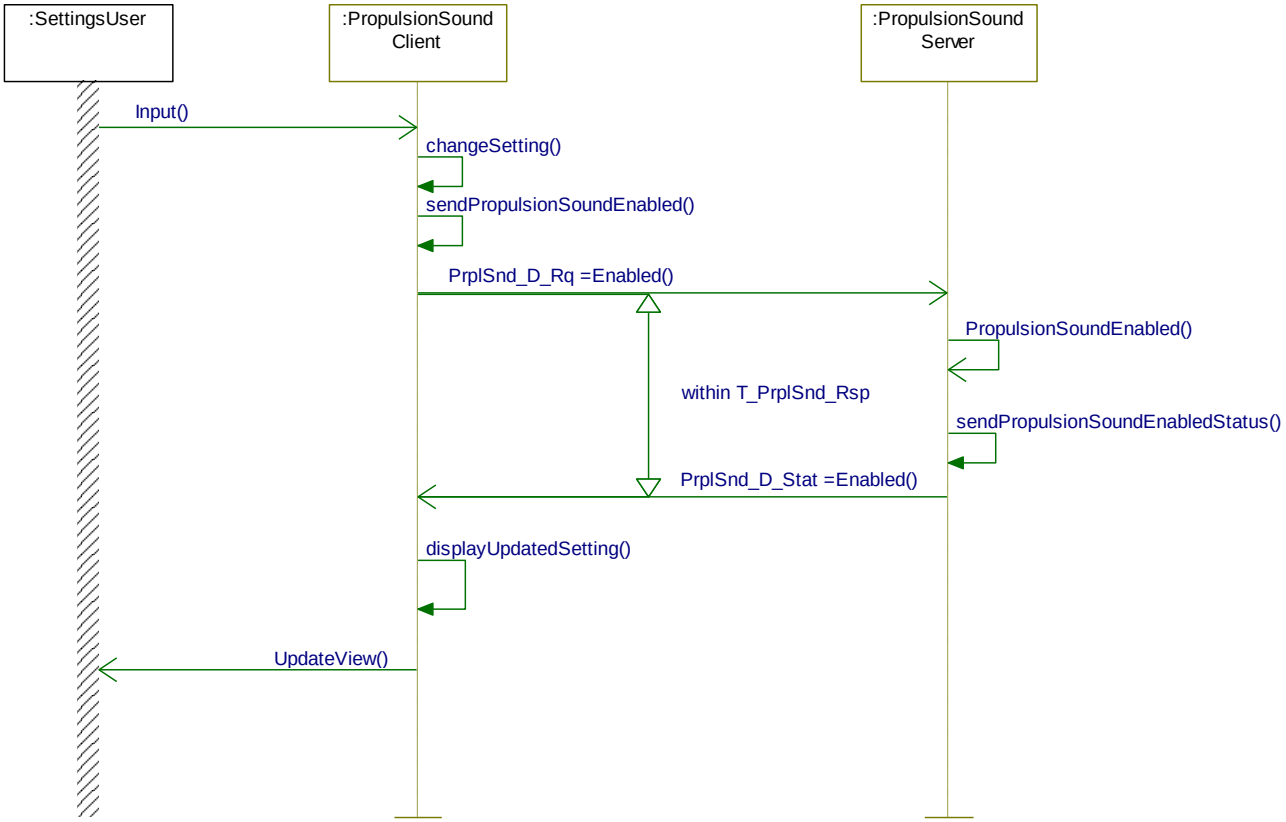
HMI Setting ID
1025

3.16.5.2 VS-TMR-REQ-339748/A-T_PrplSnd_Rsp

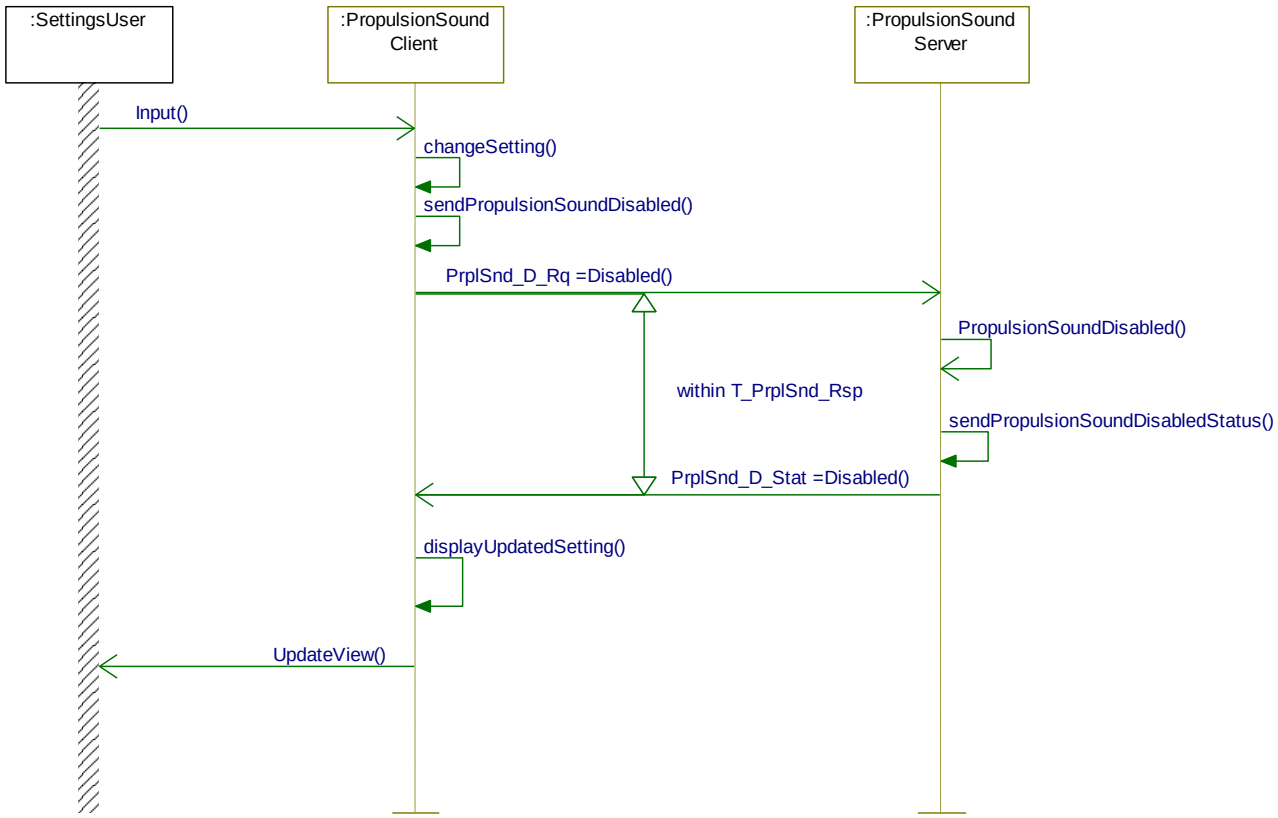
Name	Description	Units	Range	Resolution	Default
T_PrplSnd_Rsp	Maximum time the Propulsion Sound Server shall take to respond to the request in the PrplSnd_D_Rq signal. The response will be in the PrplSnd_D_Stat signal. Maximum time defined as the default value	msec	0-1000	5	100

3.16.6 Sequence Diagrams

3.16.6.1 VS-SD-REQ-340180/A-Propulsion Sound set to Enabled via the HMI



3.16.6.2 VS-SD-REQ-340184/A-Propulsion Sound set to Disabled via the HMI



3.17 VS-FUN-REQ-339729/A-Drive Mode Auto/Manual Ambient Lighting setting

3.17.1 VS-CLD-REQ-340540/A-Ambient Lighting Drive Mode Client

The Ambient Lighting Drive Mode Client interfaces with the user via HMI and is responsible for sending the Ambient Lighting Drive Mode setting request to the Ambient Lighting Drive Mode Server.

3.17.2 VS-CLD-REQ-340542/A-Ambient Lighting Drive Mode Server

The Ambient Lighting Drive Mode Server is responsible for the ambient lighting drive mode function and interfaces with the Ambient Lighting Drive Mode Client.

3.17.3 Use Cases

3.17.3.1 VS-UC-REQ-340546/A-User Enables Auto Ambient Lighting via HMI Setting

Actors	Vehicle front seat occupant(s)
Pre-conditions	Ambient Lighting is in manual mode Ambient Lighting auto/manual settings HMI shows manual as selected Ignition is in Run
Scenario Description	User selects the setting for auto mode via the HMI
Post-conditions	Ambient Lighting is in auto mode and the color is tied to drive mode Ambient Lighting auto/manual settings HMI shows auto mode selected
Notes	See Ambient Lighting Drive Mode Server specification for pre-conditions for activating ambient lighting in the vehicle. Ambient Lighting intensity is not affected by auto / manual mode and is not tied to drive mode when in auto mode

3.17.3.2 VS-UC-REQ-340547/A-User Disables Auto Ambient Lighting via HMI Setting

Actors	Vehicle front seat occupant(s)
Pre-conditions	Ambient Lighting is in auto mode Ambient Lighting auto/manual settings HMI shows auto as selected Ignition is in Run
Scenario Description	User selects the setting for manual mode via the HMI
Post-conditions	Ambient Lighting is in manual mode and the color is not tied to drive mode Last saved manual mode color becomes the ambient light color Ambient Lighting auto/manual settings HMI shows manual mode selected
Notes	See Ambient Lighting Drive Mode Server specification for pre-conditions for activating ambient lighting in the vehicle Ambient Lighting intensity is not affected by auto / manual mode and is not tied to drive mode when in auto mode

3.17.3.3 VS-UC-REQ-340548/A-User changes color while in Auto Ambient Lighting

Actors	Vehicle front seat occupant(s)
Pre-conditions	Ambient Lighting is in auto mode Ambient Lighting auto/manual settings HMI shows auto as selected Ignition is in Run
Scenario Description	User selects a color via the ambient lighting HMI
Post-conditions	The selected color is the new ambient lighting color and is the saved manual mode color Ambient Lighting is in manual mode and the color is not tied to drive mode Ambient Lighting auto/manual settings HMI shows manual mode selected
Notes	See Ambient Lighting Drive Mode Server specification for pre-conditions for activating ambient lighting in the vehicle Ambient Lighting intensity is not affected by auto / manual mode and is not tied to drive mode when in auto mode

3.17.3.4 VS-UC-REQ-340551/A-User changes color while in Manual Ambient Lighting

Actors	Vehicle front seat occupant(s)
Pre-conditions	Ambient Lighting is in manual mode Ambient Lighting auto/manual settings HMI shows manual as selected Ignition is in Run
Scenario Description	User selects a color via the ambient lighting HMI
Post-conditions	The selected color is the new ambient lighting color and is the saved manual mode color Ambient Lighting is in manual mode and the color is not tied to drive mode Ambient Lighting auto/manual settings HMI shows manual mode selected
Notes	See Ambient Lighting Drive Mode Server specification for pre-conditions for activating ambient lighting in the vehicle Ambient Lighting intensity is not affected by auto / manual mode and is not tied to drive mode when in auto mode

3.17.3.5 VS-UC-REQ-340569/A-Drive Mode change while in Auto Ambient Lighting mode

Actors	Vehicle front seat occupant(s)
Pre-conditions	Ambient Lighting is in auto mode The current drive mode ambient lighting color is active Ambient Lighting auto/manual settings HMI shows auto as selected Ignition is in Run

Scenario Description	The vehicle changes to new drive mode
Post-conditions	The ambient lighting color for the new drive mode is the new ambient lighting color (color could be the same or different from the previous color) Ambient Lighting auto/manual settings HMI shows auto mode selected
Notes	See Ambient Lighting Drive Mode Server specification for pre-conditions for activating ambient lighting in the vehicle Ambient Lighting intensity is not affected by auto / manual mode and is not tied to drive mode when in auto mode

3.17.4 Interface Requirements

3.17.4.1 MD-REQ-339730/A-LghtAmbDrvMde_D_Rq

Message Type: Request

Note: Request signal from the Ambient Lighting Drive Mode Client to the Ambient Lighting Drive Mode Server to select if Ambient Lighting is tied to Drive Mode or not.

Logical Signal Name	Literals	Value	Description
LghtAmbDrvMde_D_Rq	Null	0x0	
	Manual	0x1	
	Automatic	0x2	

3.17.4.2 MD-REQ-340538/A-LghtAmbDrvMde_B_Stat

Message Type: Status

Note: Status signal from the Ambient Lighting Drive Mode Server with the status of whether Ambient Lighting is tied to Drive Mode or not.

Logical Signal Name	Literals	Value	Description
LghtAmbDrvMde_B_Stat	Manual	0x0	
	Automatic	0x1	

3.17.4.3 MD-REQ-192193/C-LightAmbColor_No_Actl - Variant 2

Message Type: Status

This signal gives status of ambient lighting color (variant 2) status.

Logical Signal Name	Literals	Value	Description
LightAmbColor_No_Actl – Variant 2	Inactive	0x00	
	Color ID1	0x01	
	Color ID2	0x02	

	Color ID3	0x03	
	Cont.	0x04 – 0xFF	Reference separate document with the ambient light Colors and Color ID's used

3.17.4.4 MD-REQ-192189/B-LightAmbColor_No_Rq - Variant 2

Message Type: Request

The Ambient Lighting Client uses this signal to request the color selection for ambient lighting from the Ambient Lighting Server.

Logical Signal Name	Literals	Value	Description
LightAmbColor_No_Rq – Variant 2	Inactive	0x00	
	Color ID1	0x01	
	Color ID2	0x02	
	Color ID3	0x03	
	Color ID4	0x04	
	Color ID5	0x05	
	Color ID6	0x06	
	Color ID7	0x07	
	Color ID8	0x08	
	Color ID9	0x09	
	Color ID10	0x0A	
	Color ID11	0x0B	
	Color ID12	0x0C	
	Color ID13	0x0D	
	Color ID14	0x0E	
	Color ID15	0x0F	
	Color ID16	0x10	
	Reserved	0x11 to 0xFF	

3.17.5 Requirements

3.17.5.1 VS-SR-REQ-341024/A-Ambient Lighting Strategy required to be used when supporting Automatic/Manual Ambient Lighting Drive Mode

In order to support Manual and Auto Mode (color tied to drive mode in auto) both the Ambient Lighting Drive Mode Client and Server shall support "VSv2-FUN-192195-Ambient Lighting – Variant 2".

3.17.5.2 VS-REQ-341020/A-Ambient Lighting Drive Mode Server functional requirement

The Ambient Lighting Drive Mode Server shall publish the Auto/Manual mode status via the LghtAmbDrvMde_B_Stat signal

When in Auto mode, only the ambient lighting color is tied to Drive Mode. The Ambient Lighting Drive Mode Server shall update the ambient lighting color based on drive mode.

Ambient Lighting Intensity is not tied to auto mode (ie not tied to drive mode).

If enhanced memory is supported the Ambient Lighting Drive Mode Server shall update the LghtAmbDrvMde_B_Stat signal to reflect the Auto/Manual status for the new personality profile. See Ambient Lighting Drive Mode Server enhanced memory specification for details.

If the user selects a color during auto mode (ie receives LightAmbColor_No_Rq) then the Ambient Lighting Drive Mode Server shall change to manual mode and update LghtAmbDrvMde_B_Stat to manual mode to reflect the update.

See Ambient Lighting Drive Mode Server specification for additional details and requirements.

3.17.5.3 VS-REQ-341017/A-Ambient Lighting Drive Mode Client functional requirement

The Ambient Lighting Drive Mode Client shall use the LghtAmbDrvMde_B_Stat status signal to update the settings HMI to show whether the Ambient Lighting is in Auto or Manual mode.

The Ambient Lighting Drive Mode Client shall use the LghtAmbDrvMde_D_Rq signal to request Auto or Manual mode.

HMI Setting ID
1026

3.17.5.4 VS-SR-REQ-341018/A-Enabling/Disabling Ambient Lighting Auto/Manual setting via the HMI

When the Ambient Lighting Automatic / Manual Drive Mode setting is selected via the HMI:

1. The Ambient Lighting Drive Mode Client shall set LghtAmbDrvMde_D_Rq to select Automatic or Manual based on what the user selected.
2. The Ambient Lighting Drive Mode Server shall respond with T_LghtAmbDrvMde_Rsp to the LghtAmbDrvMde_D_Rq Manual or Automatic request with the response via the LghtAmbDrvMde_B_Stat signal.
3. The Ambient Lighting Drive Mode Client shall update its HMI (if there is an update) with the Ambient Lighting Auto/Manual mode status after receiving the LightAmbDrvMde_B_Stat response to the request

Note: See sequence diagrams with examples

The Auto/Manual setting on the HMI should only be available for selection when the ignition_status = Run.

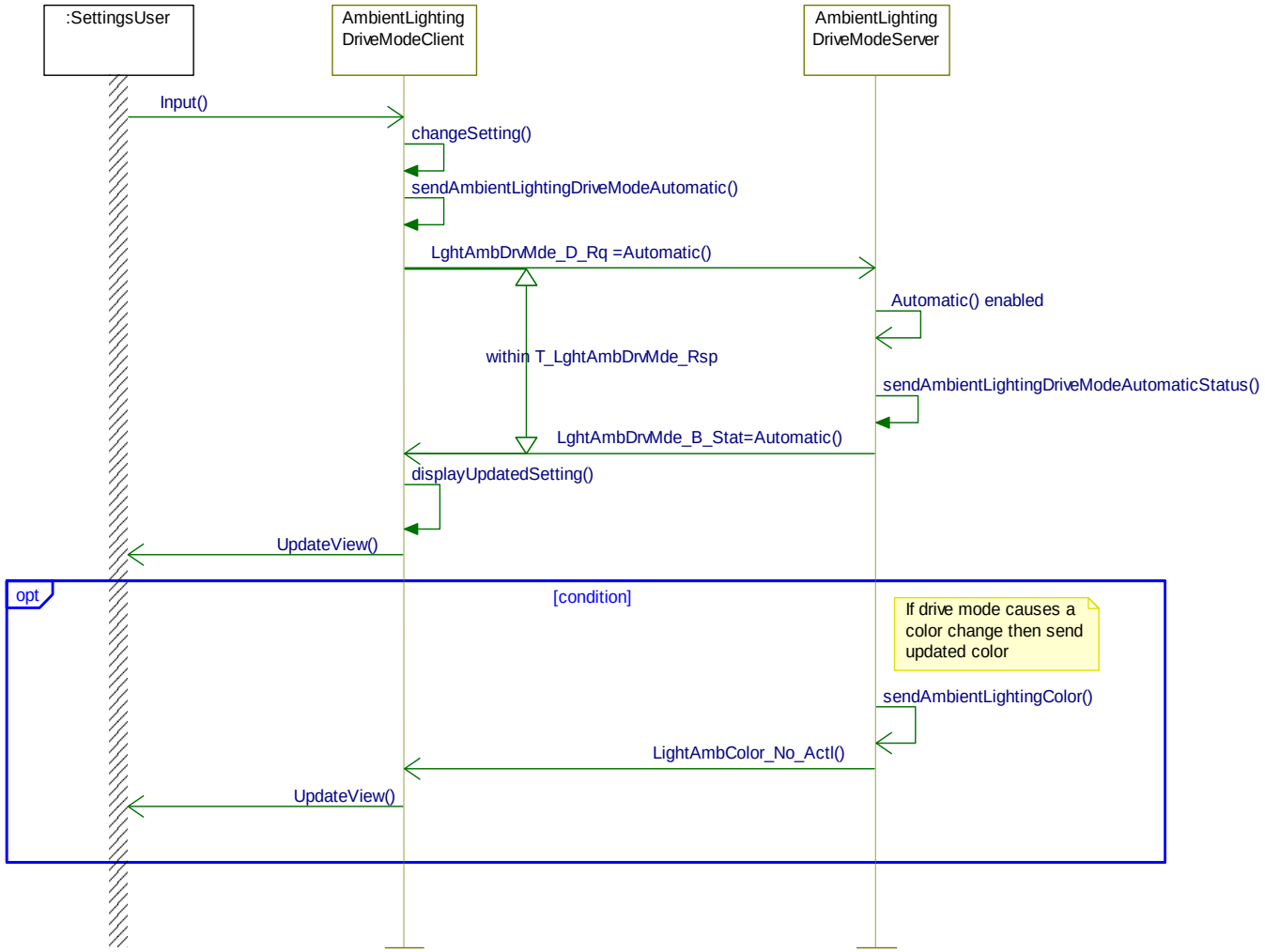
3.17.5.5 VS-TMR-REQ-340545/A-T_LghtAmbDrvMde_Rsp

Name	Description	Units	Range	Resolution	Default
T_LghtAmbDrvMde_Rsp	Maximum time the Ambient Lighting Drive Mode Server shall take to respond to the request in the LghtAmbDrvMde_D_Rq signal. The response will be in the LghtAmbDrvMde_B_Stat signal. Maximum time defined as the default value	msec	0-1000	5	100

3.17.6 Sequence Diagrams

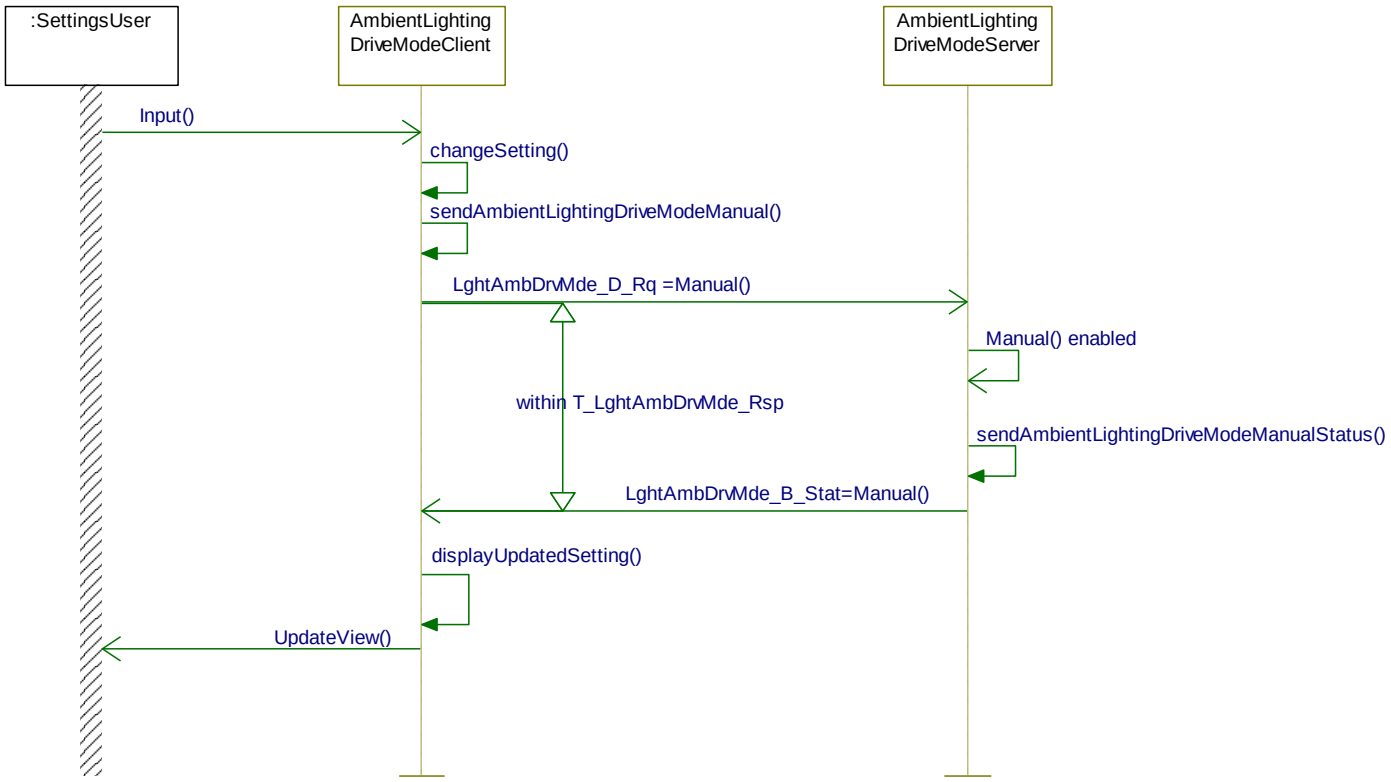
3.17.6.1 VS-SD-REQ-341028/A-Ambient Lighting Drive Mode set to Automatic via the HMI

Pre-Condition:
Ambient Lighting Drive Mode set to manual



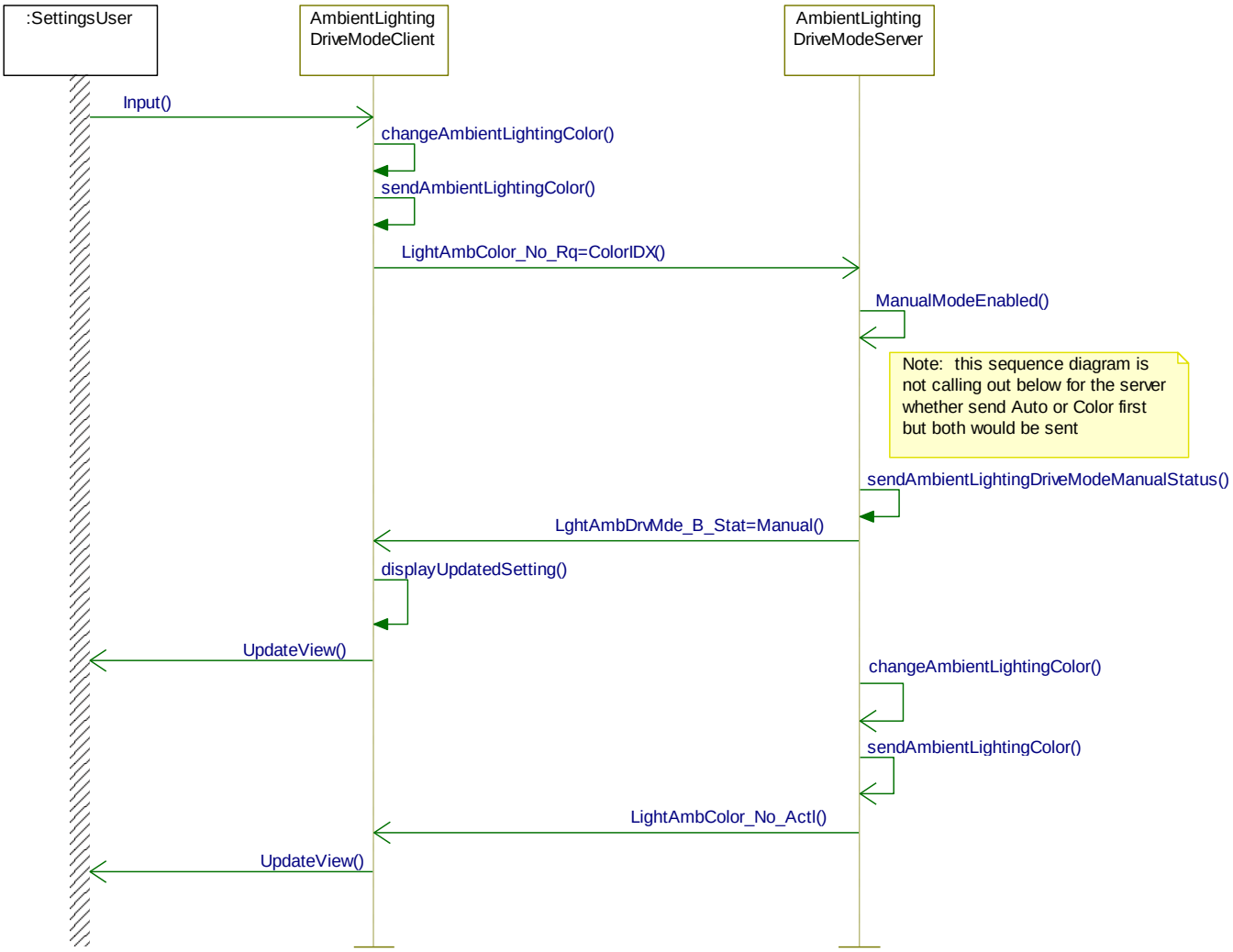
3.17.6.2 VS-SD-REQ-341027/A-Ambient Lighting Drive Mode set to Manual via the HMI

Pre-Condition:
Ambient Lighting Drive Mode in Auto Mode



3.17.6.3 VS-SD-REQ-341050/A-User changes ambient lighting color while in auto mode

Pre-Condition:
Ambient Lighting Drive Mode in Auto mode



3.18 VS-FUN-REQ-347046/A-Eco-Idle

3.18.1 VS-CLD-REQ-347054/A-Eco-Idle Client

The Eco-Idle Client interfaces with the user via the HMI and is responsible for sending the Eco-Idle Setting request to the Eco-Idle Server.

3.18.2 VS-CLD-REQ-347055/A-Eco-Idle Server

The Eco-Idle Server is responsible for the control of the Eco-Idle function and interfaces with the Eco-Idle Client.

3.18.3 Use Cases

3.18.3.1 VS-UC-REQ-347814/A-User Enables Eco-Idle Setting

Actors	Vehicle front seat Occupant
Pre-conditions	Ignition is in Run Eco-Idle is Disabled
Scenario Description	User changes Eco-Idle setting to enabled via the HMI
Post-conditions	Eco-Idle is enabled Eco-Idle HMI is shown set to enabled.
Notes	

3.18.3.2 VS-UC-REQ-347815/A-User Disables Eco-Idle Setting

Actors	Vehicle front seat occupant
Pre-conditions	Ignition is in Run Eco-Idle is enabled
Scenario Description	User changes Eco-Idle setting to disabled via the HMI
Post-conditions	Eco-Idle is disabled Eco-Idle HMI is shown set to disabled
Notes	

3.18.4 Interface Requirements

3.18.4.1 MD-REQ-347056/A-EcoIdl_D_Rq

Message Type: Request

Note: Request signal from the Eco-Idle Client to the Eco-Idle Server to enable or disable the feature

Logical Signal Name	Literals	Value	Description
EcoIdl_D_Rq	Null	0x0	
	Disabled	0x1	
	Enabled	0x2	

3.18.4.2 MD-REQ-347057/A-EcoIdl_D_Stat

Message Type: Status

Note: Status signal from the Eco-Idle Server with the status of Eco-Idle feature

Logical Signal Name	Literals	Value	Description
EcoIdl_D_Stat	Null	0x0	
	Disabled	0x1	
	Enabled	0x2	

3.18.5 Requirements

3.18.5.1 VS-SR-REQ-347812/A-Eco-Idle Setting change

The Eco-Idle Client shall use the EcoIdl_D_Stat status signal from the Eco-Idle Server to show the Eco-Idle setting as Enabled or Disabled.

The Eco-Idle setting shall be available on the HMI when ignition_status = Run.

When the Eco-Idle setting is selected via the HMI:

1. The Eco-Idle Client shall set the EcoIdl_D_Rq signal to enabled or disabled based on what the user selected
2. The Eco-Idle Server shall respond within T_EcoIdle_Rsp to the EcoIld_D_Rq request with the response of the Eco-Idle Server via the EcoIdle_D_Stat signal.
3. The Eco-Idle Client shall update the HMI (if there is an update) with the Eco-Idle status after receiving the EcoIdle_D_Stat response to the request.

HMI Setting ID
1037

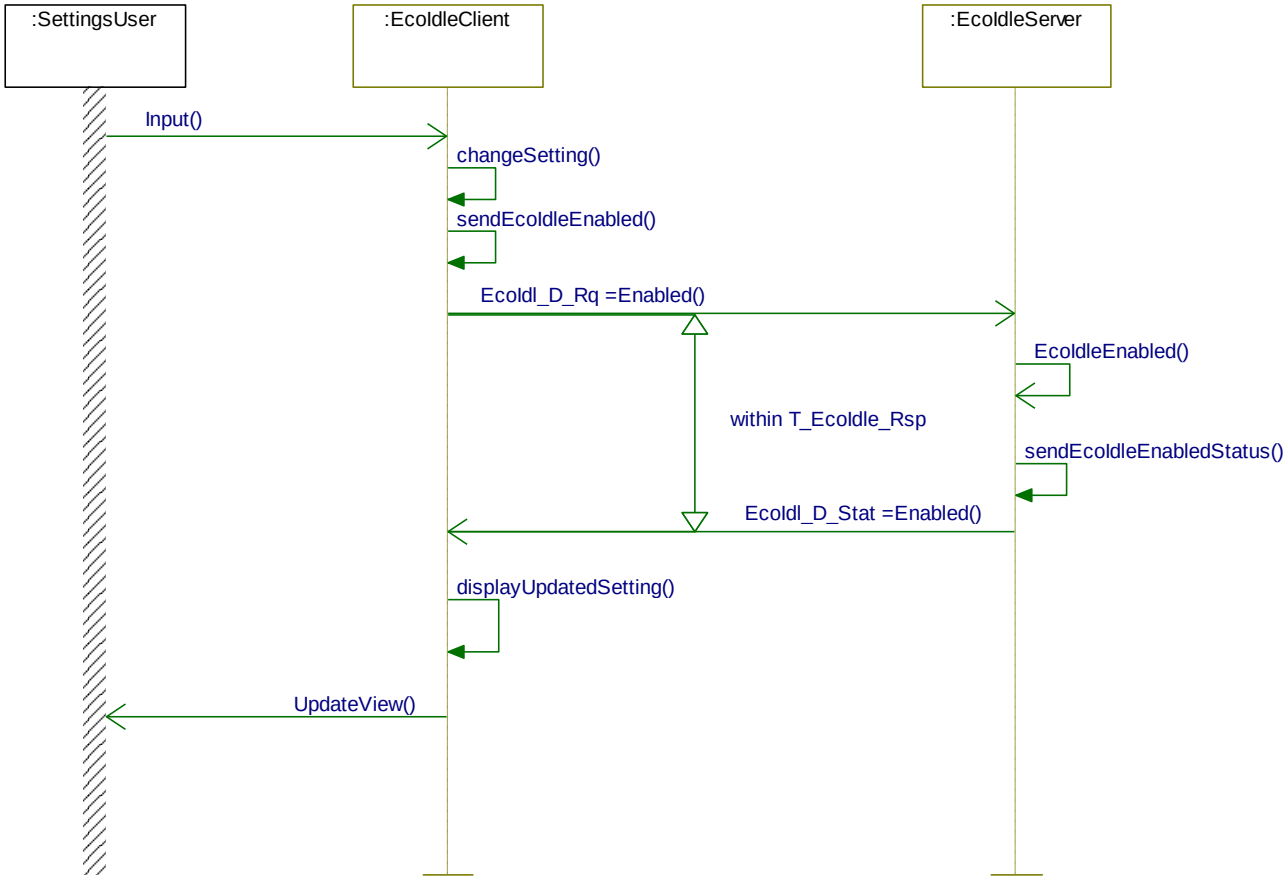
3.18.5.2 VS-TMR-REQ-347813/A-T_EcoIdle_Rsp

Name	Description	Units	Range	Resolution	Default
T_EcoIdle_Rsp	Maximum time the Eco-Idle Server shall take to respond to the EcoIdl_D_Rq signal. The response will be in the EcoIdl_D_Stat signal. Maximum time defined as the default value	msec			100

3.18.6 Sequence Diagrams

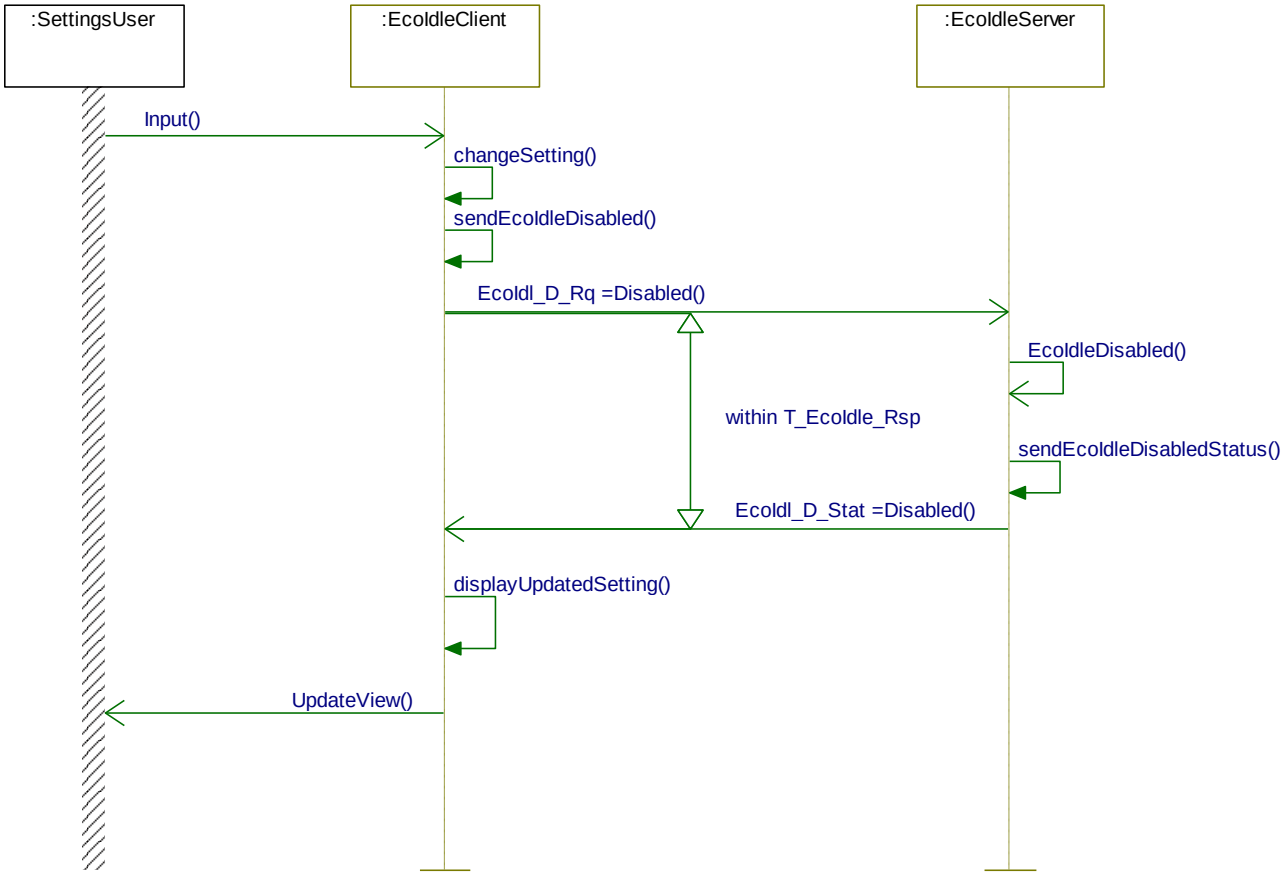
3.18.6.1 VS-SD-REQ-347816/A-Eco-Idle set to Enabled via the HMI

Pre-Condition: Eco-Idle is Disabled



3.18.6.2 VS-SD-REQ-347817/A-Eco-Idle set to Disabled via the HMI

Pre-condition: Eco-Idle is Enabled


:SettingsUser
:EcoIdleClient
:EcoIdleServer
Input()
changeSetting()
sendEcoIdleDisabled()
EcoIdl_D_Rq =Disabled()
EcoIdleDisabled()
within T_EcoIdle_Rsp
sendEcoIdleDisabledStatus()
EcoIdl_D_Stat =Disabled()
displayUpdatedSetting()
UpdateView()

3.19 VS-FUN-REQ-362897/A-Quiet Time for Exhaust Mode

3.19.1 Overview

The user will be able to enable “Quiet Mode” thru the setting menu. This is so that a loud exhaust mode does not cause any noise disturbance to anybody based on the time of day (ex early in the morning). Once enabled, the user can schedule a start and end time for the quiet mode. If the vehicle is started between the quiet modes start and end time then the vehicle’s exhaust will be in a quiet mode.

3.19.2 VS-CLD-REQ-362990/A-Quiet Time Client

The Quiet Time Client interfaces with the user via the HMI and is responsible for interfacing with the Quiet Time Server. This includes sending the quiet time requests and receiving the quiet time responses from the Quiet Time Server. See SPSS requirements for details

3.19.3 VS-CLD-REQ-362991/A-Quiet Time Server

The Quiet Time Server is responsible for the control of the Quiet Time function and interfaces with the Quiet Time Client.

3.19.4 Use Cases

3.19.4.1 VS-UC-REQ-365616/A-User Enabled Quiet Time Setting

Actors	Vehicle front seat Occupant
Pre-conditions	Ignition is in Run Quiet Time setting is disabled
Scenario Description	User changes Quiet Time setting to enabled via the HMI
Post-conditions	Quiet Time setting is enabled Quiet Time setting HMI is shown set to enabled. The user can change the Quiet Time start and end times
Notes	

3.19.4.2 VS-UC-REQ-365617/A-User Disabled Quiet Time Setting

Actors	Vehicle front seat Occupant
Pre-conditions	Ignition is in Run Quiet Time setting is enabled
Scenario Description	User changes Quiet Time setting to disabled via the HMI
Post-conditions	Quiet Time setting is disabled Quiet Time setting HMI is shown set to disabled. The user cannot change the Quiet Time start and end times
Notes	

3.19.4.3 VS-UC-REQ-365618/A-User changes Quiet Time start and end times

Actors	Vehicle front seat Occupant
Pre-conditions	Ignition is in Run Quiet Time setting is enabled

Scenario Description	User changes, via the HMI, the Quiet Time start and quiet time end times
Post-conditions	The Quiet Time start and Quiet Time end times are updated and the exhaust is in quiet mode between those times. Quiet Time HMI shows the updated start and end times.
Notes	

3.19.5 Interface Requirements

3.19.5.1 MD-REQ-365621/A-EngExhMdeHrEnbl_D_Rq

Message Type: Request

Request signal from Quiet Time Client to the Quite Time Server to enable or disable the feature

Logical Signal Name	Literals	Value	Description
EngExhMdeHrEnbl_D_Rq	Null	0x0	
	Disabled	0x1	
	Enabled	0x2	
	Menu Not Configured	0x3	

3.19.5.2 MD-REQ-365620/A-EngExhMdeHrEnbl_D_Stat

Message Type: Status

Status signal from the Quiet Time Server with the status of the Quiet Time setting

Logical Signal Name	Literals	Value	Description
EngExhMdeHrEnbl_D_Stat	Null	0x0	HMI setting treated as unknown (ex HMI greyed out, setting not shown as selected…)
	Disabled	0x1	
	Enabled	0x2	

3.19.5.3 MD-REQ-365623/A-EngExhMdeHrStrt_D_Rq

Message Type: Request

Request signal from Quiet Time Client to the Quite Time Server to request the Quiet Time start hour

Logical Signal Name	Literals	Value	Description
EngExhMdeHrStrt_D_Rq	Null	0x0	
	Hour 0 (12 am)	0x1	
	Hour 1 (1 am)	0x2	
	Hour 2 (2 am)	0x3	
	Hour 3 (3 am)	0x4	
	…	…	
	Hour 21 (9 pm)	0x16	

	Hour 22 (10 pm)	0x17	
	Hour 23 (11 pm)	0x18	

Note: Whether time is displayed in 12 or 24 mode depends what HMI setting is set for 12/24 hour mode.
Reference function "VS-FUN-REQ-025239-Set 12/24 hour mode setting" in the Vehicle Setting SPSS for details.

3.19.5.4 MD-REQ-365626/A-EngExhMdeHrStrt_D_Stat

Message Type: Status

Status signal from Quiet Time Server with the value the Quiet Time Start Hour is set to

Logical Signal Name	Literals	Value	Description
EngExhMdeHrStrt_D_Stat	Null	0x0	
	Hour 0 (12 am)	0x1	
	Hour 1 (1 am)	0x2	
	Hour 2 (2 am)	0x3	
	Hour 3 (3 am)	0x4	
	…	…	
	Hour 21 (9 pm)	0x16	
	Hour 22 (10 pm)	0x17	
	Hour 23 (11 pm)	0x18	

Note: Whether time is displayed in 12 or 24 mode depends what HMI setting is set for 12/24 hour mode.
Reference function "VS-FUN-REQ-025239-Set 12/24 hour mode setting" in the Vehicle Setting SPSS for details.

3.19.5.5 MD-REQ-365627/A-EngExhMdeHrEnd_D_Rq

Message Type: Request

Request signal from Quiet Time Client to the Quite Time Server to request the Quiet Time end hour

Logical Signal Name	Literals	Value	Description
EngExhMdeHrEnd_D_Rq	Null	0x0	
	Hour 0 (12 am)	0x1	
	Hour 1 (1 am)	0x2	
	Hour 2 (2 am)	0x3	
	Hour 3 (3 am)	0x4	
	…	…	
	Hour 21 (9 pm)	0x16	
	Hour 22 (10 pm)	0x17	
	Hour 23 (11 pm)	0x18	

Note: Whether time is displayed in 12 or 24 mode depends what HMI setting is set for 12/24 hour mode.
Reference function "VS-FUN-REQ-025239-Set 12/24 hour mode setting" in the Vehicle Setting SPSS for details.

3.19.5.6 MD-REQ-365628/A-EngExhMdeHrEnd_D_Stat

Message Type: Status

Status signal from Quiet Time Server with the value the Quiet Time End Hour is set to

Logical Signal Name	Literals	Value	Description
EngExhMdeHrEnd_D_Stat	Null	0x0	
	Hour 0 (12 am)	0x1	
	Hour 1 (1 am)	0x2	
	Hour 2 (2 am)	0x3	
	Hour 3 (3 am)	0x4	
	…	…	
	Hour 21 (9 pm)	0x16	
	Hour 22 (10 pm)	0x17	
	Hour 23 (11 pm)	0x18	

Note: Whether time is displayed in 12 or 24 mode depends what HMI setting is set for 12/24 hour mode.
Reference function "VS-FUN-REQ-025239-Set 12/24 hour mode setting" in the Vehicle Setting SPSS for details.

3.19.6 Requirements

3.19.6.1 VS-SR-REQ-365809/A-Quiet Time Enable/Disable Setting change

The Quiet Time Client shall use the EngExhMdeHrEnbl_D_Stat status signal from the Quiet Time Server to show the Quiet Time setting as Enabled or Disabled.

The Quiet Time setting shall only be available on the HMI when the ignition_status = Run.

When the Quiet Time enable/disable setting is selected via the HMI:

1. The Quiet Time Client shall set the EngExhMdeHrEnbl_D_Rq signal to enabled or disabled based on what the user selected, and then 100 msec +/- 10% later set the signal back to Null.
2. The Quiet Time Server shall respond within T_QuietTime_Rsp to the EngExhMdeHrEnbl_D_Rq request with the response of the Quiet Time Server via the EngExhMdeHrEnbl_D_Stat signal. Note, the Quiet Time Server does not wait for EngExhMdeHrEnbl_D_Rq = Null before responding, it responds to the initial EngExhMdeHrEnbl_D_Rq = enable/disable request.
3. The Quiet Time Client shall update the HMI (if there is an update) with the Quiet Time status after receiving the EngExhMdeHrEnbl_D_Stat response to the request.

See sequence diagrams for examples

The Quiet Time Server shall broadcast the current enable/disable state in the EngExhMdeHrEnbl_D_Stat status signal as long as that is current state of the Quiet Time feature.

Ex. If the Quiet Time feature is enabled on the vehicle, then the Quiet Time Server would be broadcasting the signal EngExhMdeHrEnbl_D_Stat set as enabled in its periodic status signal. Note that Null encoding state is only for start-up if the Quiet Time Server has not yet powered up and doesn't know the status of the feature.

When the Quiet Time Client has the Quiet Time feature configured OFF so that no Quiet Time HMI is shown, the Quiet Time Client shall set EngExhMdeHrEnbl_D_Rq equal to "Menu Not Configured". The EngExhMdeHrEnbl_D_Rq signal shall not be set back to Null in this case and shall instead always hold the "Menu Not Configured" encoding state (ie send "Menu Not Configured" periodically on the network bus).

HMI Setting ID
251

3.19.6.2 VS-SR-REQ-365811/A-Quiet Time Start and End time Setting change

The Quiet Time Client shall use the EngExhMdeHrStrt_D_Stat (start time) and EngExhMdeHrEnd_D_Stat (end time) status signals from the Quiet Time Server to show the Quiet Time Start and End times on the HMI.

The Quiet Time start and end time settings shall only be available on the HMI when the ignition_status = Run.

When the Quiet Time Start time setting is selected via the HMI:

1. The Quiet Time Client shall set the EngExhMdeHrStrt_D_Rq signal to the start time (ex start hour 10 pm) based on what the user selected, and then 100 msec +/- 10% later set the signal back to Null.
2. The Quiet Time Server shall respond within T_QuietTime_Rsp to the EngExhMdeHrStrt_D_Rq request with the response of the Quiet Time Server via the EngExhMdeHrStrt_D_Stat signal. Note, the Quiet Time Server does not wait for EngExhMdeHrStrt_D_Rq = Null before responding, it responds to the EngExhMdeHrStrt_D_Rq = Hour_X request.
3. The Quiet Time Client shall update the HMI (if there is an update) with the Quiet Time start time after receiving the EngExhMdeHrStrt_D_Stat response to the request.

See sequence diagrams for examples

When the Quiet Time End time setting is selected via the HMI:

1. The Quiet Time Client shall set the EngExhMdeHrEnd_D_Rq signal to the end time (ex end hour 8 am) based on what the user selected, and then 100 msec +/- 10% later set the signal back to Null.
2. The Quiet Time Server shall respond within T_QuietTime_Rsp to the EngExhMdeHrEnd_D_Rq request with the response of the Quiet Time Server via the EngExhMdeHrEnd_D_Stat signal. Note, the Quiet Time Server does not wait for EngExhMdeHrEnd_D_Rq = Null before responding, it responds to the EngExhMdeHrEnd_D_Rq = Hour_X request.
3. The Quiet Time Client shall update the HMI (if there is an update) with the Quiet Time end time after receiving the EngExhMdeHrEnd_D_Stat response to the request.

See sequence diagrams for examples

The Quiet Time Server shall broadcast the current Quiet Time Start and End time in the EngExhMdeHrStrt_D_Stat and EngExhMdeHrEnd_D_Stat status signals as long as that is current state of the Quiet Time feature.

Ex. If the Quiet Time feature End time is set to 8 am on the vehicle, then the Quiet Time Server would be broadcasting the signal EngExhMdeHrEnd_D_Stat set as Hour 8 (8 am) in its periodic status signal. Note Null is only for start-up if the Quiet Time Server has not yet powered up and doesn't know the status of the feature.

HMI Setting ID
252

3.19.6.3 VS-TMR-REQ-365810/A-T_QuietTime_Rsp

Name	Description	Units	Range	Resolution	Default
T_QuietTime_Rsp	Maximum time the Quiet Time Server shall take to respond to the Quiet Time request signals. The response will be in the Quiet Time status signal. Maximum time defined as the default value	msec			200

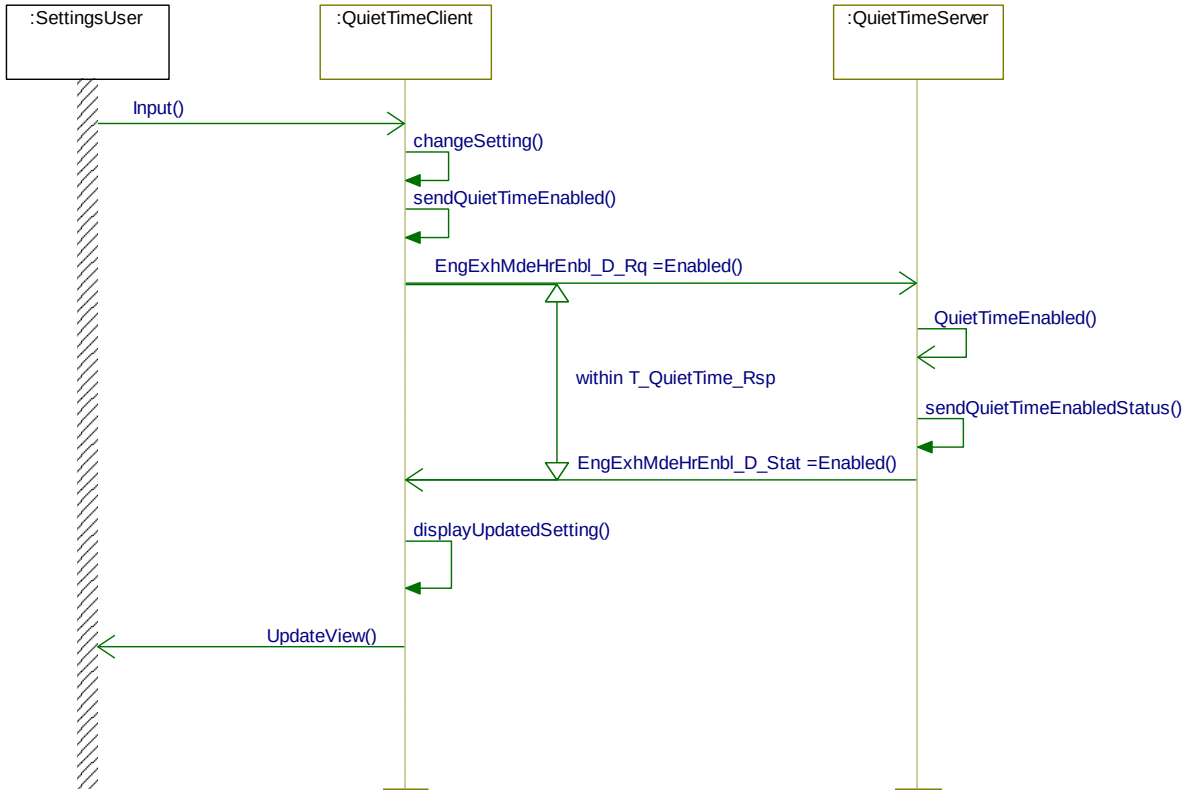
3.19.6.4 VS-SR-REQ-365642/A-HMI Speed Limited

The Quiet Time HMI is speed limited. Reference requirement "DRIVE-REQ-025157-HMI Driving Restrictions – General Applications" in the Driver Restrictions SPSS for details and signal interface.

3.19.7 Sequence Diagrams

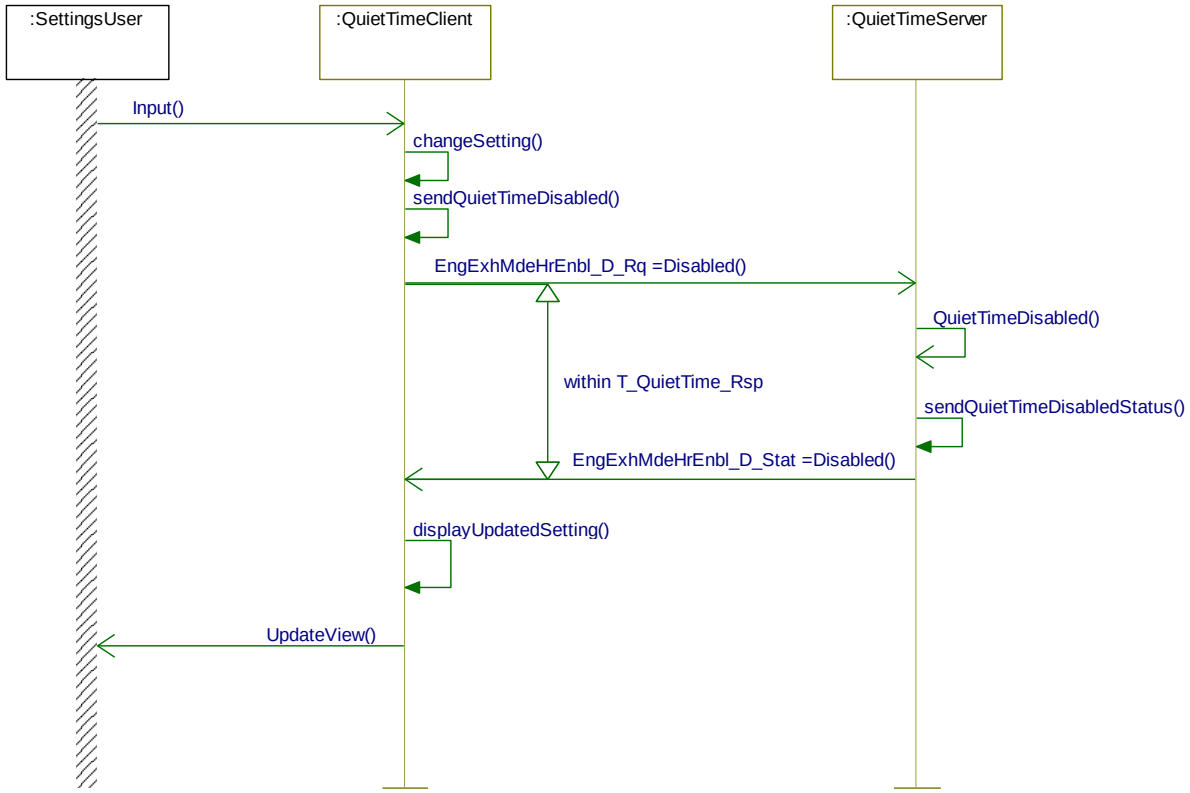
3.19.7.1 VS-SD-REQ-365814/A-Quiet Time set to Enabled via the HMI

Pre-Condition: Quiet Time is Disabled



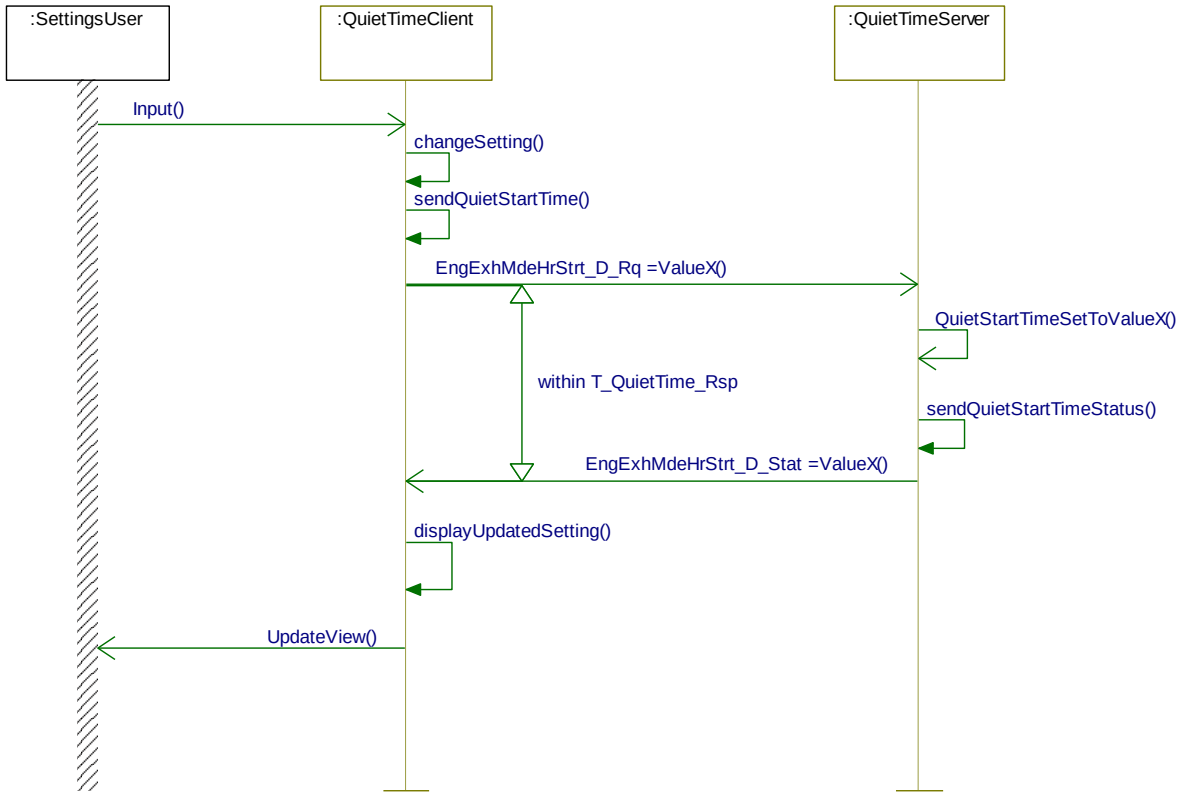
3.19.7.2 VS-SD-REQ-365815/A-Quiet Time set to Disabled via the HMI

Pre-condition: Quiet Time is Enabled



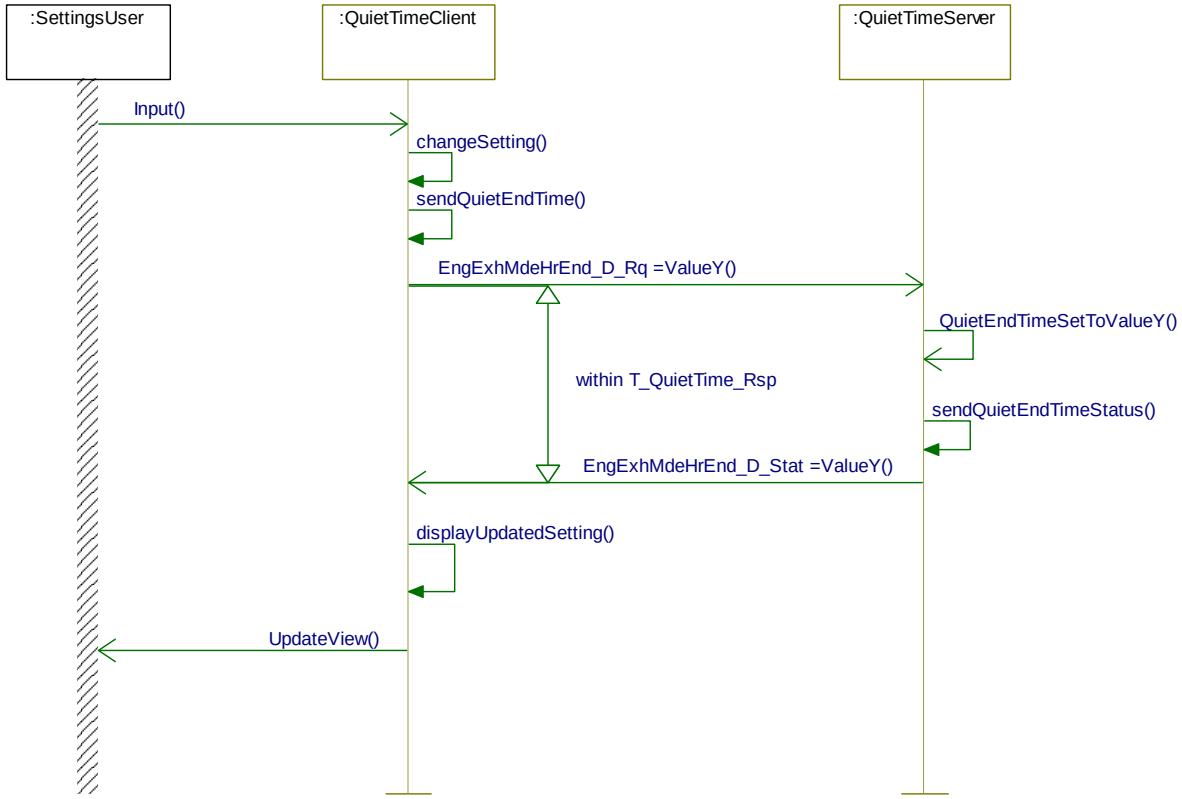
3.19.7.3 VS-SD-REQ-365816/A-Quiet Start Time set via the HMI

Pre-Condition: Quiet Time is enabled



3.19.7.4 VS-SD-REQ-365820/A-Quiet End Time set via the HMI

Pre-condition: Quiet Time is Enabled



4 Appendix: Reference Documents

Reference #	Document Title
1	Cluster STSS specs from Cluster group – for APIM 4.2 if Cluster is integrated.
2	Settings in the Centerstack SPSS – for settings that moved from the Cluster to Centerstack/APIM
3	APIM Clock Spec
4	A69 Language spec
5	HMI specifications
6	
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