

**Research & Vehicle Technology**

**“Infotainment Systems Product Development”**

**Feature – Vehicle Settings**

**APIM Infotainment Subsystem Part Specific Specification (SPSS)**

Version 1.19

**UNCONTROLLED COPY IF PRINTED**

**Version Date: October 30, 2019**

**FORD CONFIDENTIALF**

**Revision History**

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| **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). |
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| **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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# Architectural Design

## Interface Requirements

### 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 |  |

### 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 |  |

### 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 |  |

### 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 |

### 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 |  |

### 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 |  |

### 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.

### 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.

### 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 |  |

### 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 |  |

### 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 |  |

### 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 |  |

### 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 |  |

### 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 |  |

### 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 |  |

### 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 |  |

### 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 |  |

### 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 |  |

### 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 |  |

### 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 |

### 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 |  |

### 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 |

### 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 |  |

### 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 |  |

### 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 |  |

### 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 |

### 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 |  |

### 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 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 |

### 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 |  |

### 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 |  |

### 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 |

### 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

### 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 |  |

### 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 |  |

### 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 |  |

### 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 |  |

### 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 |  |

### 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 |  |

### 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 |  |

### 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 |  |

### 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 |  |

### 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 |  |

### 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 |  |

### 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.

### 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.

### 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.

### 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

## 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.

## 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.

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

## 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.

## 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.

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

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

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

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

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

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

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

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

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

## 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.

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

## 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.

## 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.

## 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.

## 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.

## 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.

## 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.

## 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.

## 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.

## 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.

## 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

## 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

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

## 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

## 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.

# General Requirements

## 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

## 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.

# Functional Definition

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

### Interface Requirement - Language

#### 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.

#### 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 |  |

#### 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.

### Use Cases

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

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | Infotainment System is On.  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 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** | 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 |

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

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | Infotainment System is On.  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** | 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** | 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 |

### Functional Requirements

#### 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** | **Vehicle Settings Language Server 1 LanguageUpdate.Rsp** | **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

#### 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.

#### 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 |

#### 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.

#### 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).

### Sequence Diagrams

#### 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.

### Interface Requirements - Distance

#### 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 |  |

#### 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 |  |

### Use Cases

#### 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 |

### Functional Requirements

#### 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.

#### 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.

#### 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 |

### Sequence Diagrams

#### 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)

### Interface Requirement - Temperature

#### 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 |  |

#### 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 |  |

### Use Cases

#### 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 |

### Functional Requirements

#### 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.

#### 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.

#### 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 |

### Sequence Diagrams

#### 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

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

#### Interface Requirements

##### 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 |  |

##### 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 |

#### Use Cases

##### 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 |

#### Requirements

##### 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).

##### 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 |

##### 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:
   1. 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.

#### Sequence Diagrams

##### 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)

#### Interface Requirements

##### 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 |  |

##### 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 |  |

#### Use Cases

##### 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 |

#### Requirements

##### 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).

##### 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 |

##### 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 |

#### Sequence Diagrams

##### 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

### 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

#### 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 |  |

#### 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

#### 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 |

#### 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

#### 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 |

#### 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 |

#### 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 |

#### 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 |

#### 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 |

#### 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 |

#### 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

#### 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.

#### 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.

#### 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.

#### 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.

#### 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

#### 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

#### 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



#### 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



#### 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.

#### 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



#### 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



#### 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



#### 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



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

### Interface Requirements - Beeps

#### 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 |  |

#### 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 |  |

#### 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 |  |

### Use Cases

#### 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 |

### Functional Requirements

#### 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 signalwhether 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.

#### 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.

#### 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)

### Sequence Diagrams

#### 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)

### Interface Requirements - 12/24 hour mode

#### 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 |  |

#### 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 |  |

### Functional Requirements

#### 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.

#### 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.

#### 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.

### Use Cases

#### 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 |

### Sequence Diagrams

#### 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)

### Interface Requirements - Charge Port Light Ring

#### 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 |

### Use Cases

#### 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 |

### Requirements

#### 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).

### White Box View

#### 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



#### 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

### Interface Requirements - Charge Cord Unlock

#### 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 |  |

#### 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

#### 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 |

#### 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 |

#### 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 |

#### 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 |

#### 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 |

#### 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 |

#### 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 |

#### 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 |

#### 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 |

#### 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 |

#### 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 |

#### 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 |

#### 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 |

#### 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

#### 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

#### 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



#### 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)

### Interface Requirements - Keypad

#### 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 |  |

#### 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 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 |

#### 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 |  |

### Use Cases

#### 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 |

#### 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 |

#### 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 |

#### 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 |

#### 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 |

### White Box Views

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

Activity Diagram



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



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



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



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

### Interface Requirements - Keypad

#### 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

#### 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

#### 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 |  |

### Use Cases

#### 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. |

#### 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. |

#### 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. |

#### 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. |

#### 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. |

### Requirements

#### 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”.

#### 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

### Sequence Diagrams

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



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



#### 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)

### Interface Requirements - Master Reset

#### 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 |  |

#### 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 |  |

### Use Cases

#### 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 |

#### 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 |

#### 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 |

#### 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 |

#### 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 |

#### 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 |

#### 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 |

#### 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 |

### Requirements

#### 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 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”.

#### 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”.

#### 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)

#### 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.

#### 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.

#### 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.

#### 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.

#### 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.

#### 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.

#### 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.

#### 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.

#### 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)

#### 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.

#### 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.

#### 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.

#### 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.

#### 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).

#### 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 .

#### 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

#### 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

### White Box Views

#### 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



#### 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

### Interface Requirement - Valet Mode

#### 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 |  |

### Use Cases

#### 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 |

### Requirements

#### 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.

### White Box Views

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



#### 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

### 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

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

### Interface Requirements

#### 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

### Requirements

#### 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

### 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.

### 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

### Interface Requirements

#### 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 |  |

#### 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 |  |

#### 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 |  |

### Requirements

#### 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 |  |

#### 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 |

#### 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 |

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

|  |
| --- |
| 32 km |
| 48 km |
| 80 km |

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

|  |
| --- |
| 30 km |
| 50 km |
| 80 km |

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

|  |
| --- |
| 18 miles |
| 31 miles |
| 50 miles |

#### 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

#### 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 |
|  |  |
|  |  |

### Sequence Diagrams

#### 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

### 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.

### 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.

### Use Case

#### 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 |

#### 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 |

### Interface Requirements

#### 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 |  |

#### 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 |  |

### Requirements

#### 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 |

#### 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 |

### Sequence Diagrams

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



#### 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

### 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.

### 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.

### Use Cases

#### 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 |

#### 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 |

#### 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 |

#### 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 |

#### 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 |

### Interface Requirements

#### 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 |  |

#### 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 |  |

#### 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 |

#### 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 |  |

### Requirements

#### 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”.

#### 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.

#### 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 |

#### 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.

#### 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 |

### Sequence Diagrams

#### VS-SD-REQ-341028/A-Ambient Lighting Drive Mode set to Automatic via the HMI

Pre-Condition:

Ambient Lighting Drive Mode set to manual



#### VS-SD-REQ-341027/A-Ambient Lighting Drive Mode set to Manual via the HMI

Pre-Condition:

Ambient Lighting Drive Mode in Auto Mode



#### 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

### 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.

### 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.

### Use Cases

#### 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** |  |

#### 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** |  |

### Interface Requirements

#### 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 |  |

#### 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 |  |

### Requirements

#### 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 |

#### 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 |

### Sequence Diagrams

#### VS-SD-REQ-347816/A-Eco-Idle set to Enabled via the HMI

Pre-Condition: Eco-Idle is Disabled



#### VS-SD-REQ-347817/A-Eco-Idle set to Disabled via the HMI

Pre-condition: Eco-Idle is Enabled



3.19 VS-FUN-REQ-362897/A-Quiet Time for Exhaust Mode

### 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.

### 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

### 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.

### Use Cases

#### 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** |  |

#### 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** |  |

#### 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** |  |

### Interface Requirements

#### 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 |  |

#### 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 |  |

#### 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.

#### 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.

#### 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.

#### 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.

### Requirements

#### 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 |

#### 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 |

#### 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 |

#### 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.

### Sequence Diagrams

#### VS-SD-REQ-365814/A-Quiet Time set to Enabled via the HMI

Pre-Condition: Quiet Time is Disabled



#### VS-SD-REQ-365815/A-Quiet Time set to Disabled via the HMI

Pre-condition: Quiet Time is Enabled



#### VS-SD-REQ-365816/A-Quiet Start Time set via the HMI

Pre-Condition: Quiet Time is enabled



#### VS-SD-REQ-365820/A-Quiet End Time set via the HMI

Pre-condition: Quiet Time is Enabled



# 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 |  |
| 7 |  |
| 8 |  |
| 9 |  |
| 10 |  |
| 11 |  |
| 12 |  |
| 13 |  |
| 14 |  |
| 15 |  |
| 16 |  |
| 17 |  |