

**Research & Vehicle Technology**

**“Product Development”**

**Enhanced Memory (F000172)**

**Feature Level Specification**

Version 4.2

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**Version Date: August 16, 2021**

**FORD CONFIDENTIALF**

**Revision History**

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| **Date** | **Version** | **Notes** | | |
| **July 13, 2015** | **1.0** | **Initial Release** |  | |
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| **February 2, 2016** | **2.0** | **Updated Release** |  | |
|  | ENMEM-FRD-REQ-204524/A-Enhanced Memory-Feature Level(Active Version) | | MBORREL4: Derived from REQ-165681 | |
|  | STR-310686/A-Purpose of Specification | | cwu3: Reformat, no content change | |
|  | STR-310689/A-Target Audience of Specification | | cwu3: added clarification why component suppliers are not the target audience of this specification | |
|  | STR-310690/A-Scope of Specification | | cwu3: Added more details | |
|  | STR-326830/A-Document Structure | | cwu3: New | |
|  | STR-312356/A-Terminology | | cwu3: Added Terminology | |
|  | STR-312357/A-Definitions | | MBORREL4: New | |
|  | STR-310691/A-Acronyms and Abbreviations | | MBORREL4: Updated table to include more abbreviations | |
|  | STR-312344/A-Assumptions & Dependencies | | cwu3: New | |
|  | STR-322086/A-Enhanced Memory Context Diagram | | cwu3:New | |
|  | ENMEM-PIC-310688/A-Enhanced Memory Context Diagram | | cwu3: New for context diagram | |
|  | STR-310692/A-Feature Requirements | | MBORREL4: Added req. 194098 & 194099 | |
|  | ENMEM-REQ-201660/A-Enhanced Memory Functions | | cwu3: New MBORREL4: Derived from REQ-166980 | |
|  | ENMEM-REQ-201674/A-Availability of Enhanced Memory Recall Functions | | cwu3: New | |
|  | ENMEM-REQ-199761/A-Methods to Recall a Driver Profile | | MBORREL4: Added "Remote Start" as a sign-in/recall method cwu3: (1)Added create profile as a recall method (2) Add phrase to clarify that seat button has to be previously associated to a Driver Profile MBORREL4: Derived from REQ-166094 | |
|  | ENMEM-REQ-199762/A-Operations Shall Not Recall a Driver Profile | | MBORREL4: Updated the third bullet point for clarification cwu3: Deleted “not including the Vehicle Profile" MBORREL4: Derived from REQ-166096 cwu3: Added Passenger Memory Seat button | |
|  | ENMEM-REQ-199763/A-Active Driver Profile in Different Recall Events | | MBORREL4: Updated the requirement regarding a non-associated Memory Seat Button. MBORREL4: Derived from REQ-179494 | |
|  | ENMEM-REQ-199764/A-Default Active Driver Profile | | MBORREL4: Derived from REQ-166993 | |
|  | ENMEM-REQ-199757/A-Recall Vehicle Profile | | MBORREL4: Derived from REQ-166113 | |
|  | ENMEM-REQ-199755/A-Numbers of Driver Profiles | | MBORREL4: Derived from REQ-166091 | |
|  | ENMEM-REQ-199756/A-N\_NumberOfProfiles | | MBORREL4: Derived from REQ-179347 | |
|  | ENMEM-REQ-199754/A-Opt-In Enhanced Memory Feature to Create Driver Profile | | MBORREL4: Derived from REQ-166086 | |
|  | ENMEM-REQ-199788/A-Opt-Out Enhanced Memory Feature | | cwu3: Fixed typo. Added Feature off. Added high level HMI requirement. MBORREL4: Derived from REQ-166086 & 166120 | |
|  | ENMEM-REQ-201676/A-Disable Enhanced Memory | | cwu3: New | |
|  | ENMEM-REQ-201675/A-Enable Enhanced Memory | | cwu3: New | |
|  | ENMEM-REQ-201961/A-Create Driver Profile | | cwu3: New | |
|  | ENMEM-REQ-199758/A-Associate Driver Profiles to Driver Memory Seat Buttons | | cwu3: Add Driver to Add “Driver” to emphasize that not a passenger Memory seat button MBORREL4: Derived from REQ-166092 | |
|  | ENMEM-REQ-199760/A-Optional Keyfob Association to a Driver Profile | | MBORREL4: Removed line regarding "multiple keyfobs per profile." Only one keyfob per profile is permitted. cwu3: Added "one Driver Profile can only be associated to one key/fob". cwu3: replaced four with available MBORREL4: Derived from REQ-166093 | |
|  | ENMEM-REQ-201962/A-Disassociate a Keyfob from a Driver Profile | | MBORREL4: Removed line regarding "multiple keyfobs per profile." Only one keyfob per profile is permitted. cwu3: Added "one Driver Profile can only be associated to one key/fob". cwu3: replaced four with available | |
|  | ENMEM-REQ-199787/A-Delete a Driver Profile | | MBORREL4: Derived from REQ-166119 | |
|  | ENMEM-REQ-199765/A-MyKey Takes Precedence Over Driver Profile Settings | | MBORREL4: Derived from REQ-134099 | |
|  | ENMEM-REQ-199767/A-Enhanced Memory Ignition Restriction | | cwu3: New to add ignition status restriction | |
|  | ENMEM-HMI-REQ-199778/A-Enhanced Memory User Interface | | cwu3: New for Enhanced Memory interface items MBORREL4: Derived from REQ-166980 | |
|  | ENMEM-HMI-REQ-202211/A-HMI for Personalized Feature Settings | | cwu3: New for personalized features setting interface | |
|  | ENMEM-HMI-REQ-199779/A-Indication of the Active Profile | | cwu3: Fixed typo and change requirement to be HMI-REQ MBORREL4: Derived from REQ-166115 | |
|  | ENMEM-HMI-REQ-201980/A-Indication of Existing Driver Profile Status | | cwu3: New | |
|  | ENMEM-HMI-REQ-199780/A-Indication of Operation Status | | cwu3: Changed requirement type to be HMI-REQ MBORREL4: Derived from REQ-166116 | |
|  | ENMEM-HMI-REQ-199781/A-Indication of Association Status | | cwu3: Changed requirement type to be HMI-REQ MBORREL4: Derived from REQ-166118 | |
|  | ENMEM-REQ-199875/A-No Overwrite for Driver Memory Seat Button Association | | cwu3: New to establish rule for no Memory Seat button association overwrite | |
|  | ENMEM-REQ-201981/A-Overwrite for Keyfob Association | | cwu3: New to establish rule for keyfob association Overwrite | |
|  | ENMEM-REQ-199786/A-Overwrite or Restart Keyfob Association | | MBORREL4: Derived from REQ-166979 | |
|  | ENMEM-HMI-REQ-199782/A-Multiple Opportunities for Association | | MBORREL4: Updated req to include T\_FobAssocOneTime, T\_FobAssocTotal, and removed detail regarding Memory Seat Button association. cwu3: Changed requirement type to be HMI-REQ MBORREL4: Derived from REQ-166117 | |
|  | ENMEM-REQ-199785/A-N\_NumberOfRetries | | MBORREL4: Derived from REQ-179346. Updated description to include Enter Memory Seat Button Association response failure. | |
|  | ENMEM-TMR-REQ-199783/A-T\_FobAssocOneTime | | MBORREL4: New Req | |
|  | ENMEM-TMR-REQ-199784/A-T\_FobAssocTotal | | cwu3: New | |
|  | ENMEM-TMR-REQ-199759/A-T\_SeatAssocOneTime | | MBORREL4: New APIM timer for seat button association between retries. | |
|  | ENMEM-TMR-REQ-199881/A-T\_SeatAssocOneTime2 | | MBORREL4: New DSM timer for seat button association between retries. | |
|  | ENMEM-HMI-REQ-199766/A-Enhanced Memory Specific Driving Restriction | | cwu3:Added "Recall positional settings that are tied with Classic Memory" and "vehicle speed is less than 5 KPH for a manual transmission" MBORREL4: Derived from REQ-166114 | |
|  | ENMEM-HMI-REQ-199772/A-Driver Distraction | | cwu3: Deleted confused and unnecessary sentences: "This includes changing a profile among or for any enhanced memory functions. For any conflicts bring to the attention to the Ford D&R." MBORREL4: Derived from REQ-136642 | |
|  | ENMEM-HMI-REQ-199768/A-Availability of Enhanced Memory Menu and Functions | | cwu3: (1)Change requirement type to be HMI-REQ (2) Added Driving Restriction (3) Added Driver Memory Seat button association mode as an exception for recall  MBORREL4: Derived from REQ-166981 | |
|  | ENMEM-HMI-REQ-199769/A-Enhanced Memory Driving Restriction Feedback | | cwu3: Changed requirement type to be HMI-REQ MBORREL4: Derived from REQ-179481 | |
|  | ENMEM-HMI-REQ-199771/A-Content of Enhanced Memory Driving Restriction Feedback | | cwu3: Changed requirement type to be HMI-REQ MBORREL4: Derived from REQ-179484 | |
|  | ENMEM-HMI-REQ-199777/A-Enhanced Memory HMI Driver Profile Identification | | cwu3: new for Enhanced Memory HMI Driver Profile Name | |
|  | ENMEM-HMI-REQ-199751/A-HMI Performance Requirement | | cwu3: Fixed typo: LOFIC--->LOGIC MBORREL4: Derived from REQ-179415 | |
|  | ENMEM-REQ-199750/A-Enhanced Memory Feature Classification | | cwu3: Clarified that Enhanced Memory is not a safety feature MBORREL4: Derived from REQ-136692 | |
|  | ENMEM-REQ-199752/A-Enhanced Memory Interaction via Feature Based Message Protocol | | cwu3: Removed "and". No real content change. MBORREL4: Derived from REQ-166080 | |
|  | ENMEM-SR-REQ-199753/A-Enhanced Memory Feature Inclusion Guidelines | | cwu3: (1)Rephrased for clarification (2) Added three example for clarification (3) Removed "This means when profile settings conflict with MyKey settings, MyKey settings shall override profile settings" MBORREL4: Derived from REQ-136937 | |
|  | ENMEM-REQ-199773/A-Retain Enhanced Memory Settings After Software Reflash | | cwu3: New to replace REQ-116801 | |
|  | ENMEM-SR-REQ-206880/A-Updates to Non-Volatile Memory | | MBORREL4: New Req. | |
|  | ENMEM-PIC-310694/A-Enhanced Memory Logic Block Diagram | | MBORREL4: Updated to include PersKeyPairing\_St & FactoryReset\_Rq | |
|  | ENMEM-CLD-REQ-199789/A-Enhanced Memory Interface Client | | MBORREL4: Derived from REQ-099554 | |
|  | ENMEM-CLD-REQ-199790/A-Enhanced Memory Position Client | | MBORREL4: Derived from REQ-099555 | |
|  | ENMEM-CLD-REQ-199791/A-Enhanced Memory Profile Server | | MBORREL4: Fixed Typo MBORREL4: Derived from REQ-099556 | |
|  | ENMEM-CLD-REQ-199792/A-Enhanced Memory Server | | MBORREL4: Derived from REQ-099557 | |
|  | ENMEM-DOC-310696/A-Physical Mapping of Classes | | cwu3: Deleted ABS, AHUD and VDM in EnhancedMemoryServers row | |
|  | ENMEM-REQ-203519/A-Enhanced Memory Feature Interface Requirement | | cwu3: New for Logic Interface. It summarizes and replaces  ENMEMv2-IIR-REQ-166636/A-EnhancedMemoryInterfaceClient\_Tx ENMEMv2-IIR-REQ-166637/A-EnhancedMemoryInterfaceClient\_Rx ENMEMv2-IIR-REQ-166623/A-EnhancedMemoryPositionClient\_Tx ENMEMv2-IIR-REQ-166624/A-EnhancedMemoryPositionClient\_Rx ENMEMv2-IIR-REQ-166625/A-EnhancedMemoryProfileServer\_Tx ENMEMv2-IIR-REQ-166626/A-EnhancedMemoryProfileServer\_Rx ENMEMv2-IIR-REQ-166631/A-EnhancedMemoryServer\_Rx | |
|  | ENMEM-DOC-310698/A-Logic Method to Physical Signal Translation Table | | cwu3: (1) Deleted DSM as Rx of EmPrflNo\_D\_Rq to match with GSDB (2) Deleted BCM as Rx of EmPrflButtnAssoc\_D\_Rq to match with GSDB (3)Deleted DSM as Rx of EmPrflKeyAssoc\_D\_Rq to match with GSDB (4) Changed mapping of PersonalityRecallCount\_St(CountValue) from CntrStk\_D\_RqRecall to RecallEvent\_No\_Cnt (5)Changed PersNo\_D\_Actl encoding value 0x05 from Not Used to NotDetermined (6) Changed \*ALL refers to Enhanced Memory Profile Server" to "\*ALL refers to Enhanced Memory Server " (7) Added PersKeyPairing\_St to the table (8) Added FactoryReset\_Rq to the table | |
|  | STR-322090/A-Enhanced Memory Logic Method Requirements | | cwu3: New for | |
|  | ENMEM-REQ-205033/A-Status Memory Storage Requirement for Profile Server | | cwu3: New to call out status memory storage requirement for Profile Server. Derived from and replaces ENMEM-SR-REQ-136591 | |
|  | ENMEM-REQ-206269/A-Status Memory Storage Requirement for Interface Client | | cwu3: New to call out status memory storage requirement for Interface Client. Derived from and replaces ENMEM-SR-REQ-136594 | |
|  | ENMEM-REQ-206271/A-Status Memory Storage Requirement for Enhanced Memory Servers | | cwu3: New to call out status memory storage requirement for Enhanced memory Servers. Derived from and replaces ENMEM-SR-REQ-136593 | |
|  | ENMEM-SR-REQ-199818/A-Request/Response return to Null state | | MBORREL4: Derived from REQ-136936 cwu3: Replace 1 second with timer T\_ReturnToNull | |
|  | ENMEM-TMR-REQ-199819/A-T\_ReturnToNull | | cwu3: New timer for return to Null state MBORREL4: Fixed table format | |
|  | ENMEM-SR-REQ-199820/A-Request/Response return to Idle state | | MBORREL4: Derived from REQ-180452 cwu3: Replaced 1 second with timer T-ReturnToIdle MBORREL4: Fixed Typo | |
|  | ENMEM-TMR-REQ-199821/A-T\_ReturnToIdle | | cwu3: New timer for return to Idle state MBORREL4: Fixed table format | |
|  | ENMEM-REQ-199774/A-Crank Event - Enhanced Memory | | MBORREL4: Derived from REQ-136644 | |
|  | MD-REQ-199794/A-EnMemProfilePairing\_Rq | | cwu3: added "Received by Enhanced Memory Profile Server only" to Description cell for EnMemProfilePairing\_Rq( PersIndex) MBORREL4: Derived from REQ-099304 | |
|  | MD-REQ-199796/A-InfotainmentPersStore\_Rq | | New Method Description MBORREL4: Derived from REQ-099305 | |
|  | MD-REQ-199797/A-InfotainmentRecall\_Rq | | New Method Description MBORREL4: Derived from REQ-099308 | |
|  | MD-REQ-199798/A-PersonalityOptIn\_St | | New Method Description MBORREL4: Derived from REQ-099309 | |
|  | MD-REQ-199795/A-EnhancedMemory\_St | | MBORREL4: Fixed Typo MBORREL4: Derived from REQ-099311 | |
|  | MD-REQ-199803/A-EnMemButtonPairing\_St | | New Method Description MBORREL4: Derived from REQ-099312 | |
|  | MD-REQ-199805/A-InfotainmentPersStore\_St | | New Method Description MBORREL4: Derived from REQ-099349 | |
|  | MD-REQ-199812/A-MemSwitchRecall\_Rq | | New Method Description MBORREL4: Derived from REQ-099350 | |
|  | MD-REQ-199804/A-EnMemKeyPairing\_St | | MBORREL4: Updated to include "NotUsed" values MBORREL4: Derived from REQ-099352 | |
|  | MD-REQ-199810/A-PersKeyPairing\_St | | MBORREL4: New Method Description | |
|  | MD-REQ-199802/A-ActivePersonality\_St | | cwu3: Changed encoding value 0x5 from NotUsed to NotDetermined MBORREL4: Derived from REQ-099354 | |
|  | MD-REQ-199806/A-PersonalityRecallCount\_St | | New Method Description MBORREL4: Derived from REQ-099356 | |
|  | MD-REQ-199814/A-MemoryPosition\_St | | MBORREL4: Derived from REQ-154253 | |
|  | MD-REQ-199799/A-Feature\_Rq | | sorris1: Updated the Personalization Index parameter encoding to match the CAN database. MBORREL4: Derived from REQ-014068 | |
|  | MD-REQ-199807/A-VehicleSpeed\_St | | MBORREL4: Derived from REQ-014025 | |
|  | MD-REQ-199808/A-GearLvrPos\_D\_Actl | | MBORREL4: Derived from REQ-014023 | |
|  | MD-REQ-199809/A-IgnitionStatus\_St | | MBORREL4: Derived from REQ-027149 | |
|  | MD-REQ-199800/A-FactoryReset\_Rq | | MBORREL4: Derived from REQ-015018 | |
|  | STR-322093/A-Enhanced Memory Functional Decomposition | | cwu3: New | |
|  | ENMEM-PIC-322145/A-Enhanced Memory Functional Decomposition Diagram | | cwu3: new to provide functional decomposition diagram | |
|  | ENMEM-FUN-REQ-199826/A-Enable/Disable Enhanced Memory | | New Function MBORREL4: Derived from REQ-095956 | |
|  | STR-318491/A-Enable and Disable Function Description | | cwu3:New | |
|  | ENMEM-PIC-322151/A-Enable-Disable Enhanced Memory Functional Decomposition Diagram | | cwu3: new for Enable-Disable Enhanced Memory Functional Decomposition Diagram | |
|  | ENMEM-UC-REQ-199827/A-Enable Enhanced Memory Feature | | cwu3:  (1)Deleted touchscreen to make requirement generic (2)Added "The active Driver Profile remains as Guest Profile until a recall is requested by the user" (3)Added "Previously created Driver Profiles are accessible again" MBORREL4: Derived from REQ-095714 | |
|  | ENMEM-UC-REQ-199828/A-Disable Enhanced Memory Feature | | cwu3:  (1)Deleted touchscreen to make requirement generic  (2) Added "Created Driver Profiles are not deleted and are temperately not accessible to the user" (3) Deleted with no HMI indication. Guest profile shall have HMI indication as other Driver Profiles MBORREL4: Derived from REQ-095715 | |
|  | STR-310707/A-Requirements | | cwu3: Revised to add new requirements | |
|  | ENMEM-HMI-REQ-199829/A-Configurable Parameter to Enable Driver Profiles HMI | | MBORREL4: Derived from REQ-140360 cwu3: Revised to change requirement type to HMI-REQ. No content is changed | |
|  | ENMEM-REQ-199830/A-Enhanced Memory Feature Activation Status | | cwu3:  (1) Replaced "create a new profile" with "opts in Enhanced memory to create the first Driver Profile" to correct design intent (2) Added one condition to turn feature on for the Use Case when on/off slider( switch) is changed from off to on. MBORREL4: Derived from REQ-099679 | |
|  | ENMEM-REQ-202359/A-Available Functions When Enhanced Memory Feature Is On | | cwu3: New to specify what functions are available when Enhanced memory feature is enabled | |
|  | ENMEM-REQ-202360/A-Available Functions When Enhanced Memory Feature Is Off | | cwu3: New to specify what functions are available when Enhanced memory feature is disabled | |
|  | ENMEM-REQ-199831/A-Recall Vehicle Profile When Enhanced Memory Feature Is Off | | MBORREL4: Derived from REQ-134104 cwu3: (1) Renamed the title to be self-explanatory  (2)Fixed error by replacing the EnhancedMemoryProfileServer with EnhancedMemoryInterfaceClient. | |
|  | ENMEM-REQ-199833/A-Driver Profiles Not Deleted When Enhanced Memory Feature OFF | | cwu3: New to clarify design intent | |
|  | ENMEM-HMI-REQ-199834/A-Enhanced Memory HMI Indications When Enhanced Memory Feature OFF | | cwu3: new to provide details on HMI indications when Enhanced Memory feature is off | |
|  | ENMEM-ACT-REQ-199835/A-Enable-Disable Enhanced Memory Feature | | New Activity Diagram MBORREL4: Derived from REQ-099381 | |
|  | ENMEM-SD-REQ-199836/A-Enable Enhanced Memory | | New Sequence Diagram MBORREL4: Derived from REQ-099429 | |
|  | ENMEM-SD-REQ-199837/A-Disable Enhanced Memory | | New Sequence Diagram MBORREL4: Derived from REQ-099428 | |
|  | ENMEM-FUN-REQ-204913/A-Opt-In | | cwu3; New for opt-in Function | |
|  | STR-321842/A-Opt-In Function Description | | cwu3: New for Opt\_in description | |
|  | ENMEM-PIC-322268/A-Opt-In Functional Decomposition Diagram | | cwu3: new for provide Opt In Functional Decomposition Diagram | |
|  | ENMEM-PIC-326715/A-Enhanced Memory Opt-In HMI Flow Chart | | cwu3: new for provide design aid for Opt In HMI flow chart. | |
|  | ENMEM-REQ-205009/A-Opt-In Condition | | cwu3: New to specify Opt-in condition | |
|  | ENMEM-HMI-REQ-205010/A-Opt-In HMI Display | | cwu3: New to specify Opt-in Display | |
|  | ENMEM-REQ-205011/A-Opt-In Transition State and Action | | cwu3: New to specify Opt-in transition | |
|  | ENMEM-FUN-REQ-199838/A-Create/Add Driver Profile | | New Function MBORREL4: Derived from REQ-095959 | |
|  | STR-321875/A-Create/Add Driver Profile Function Description | | cwu3: New for Create/Add Driver Profile Function Description | |
|  | ENMEM-PIC-322269/A-Create/Add Driver Profile Functional Decomposition Diagram | | cwu3: new for provide Create/Add Driver Profile Functional Decomposition Diagram | |
|  | ENMEM-PIC-326160/A-Enhanced Memory Create/Add Profile HMI Flow Chart | | cwu3: new for provide design aid for create/add Driver profile HMI flow chart. | |
|  | ENMEM-UC-REQ-199839/A-Create a Driver Profile | | MBORREL4: Derived from REQ-095721 cwu3: Deleted touchscreen to make requirement generic MBORREL4: Updated post-condition to clarify non-positional vs positional settings Cwu3: Added HMI requirement as the reference in note field | |
|  | ENMEM-UC-REQ-199850/A-User Aborts or System Cancel Event Occurs During Driver Profile Creation Process | | cwu3: added HMI Abort notification and restart instruction for profile creation MBORREL4: Derived from REQ-096801 | |
|  | STR-310725/A-Requirements | | MBORREL4: Added req. 194169, 194101, 197339, 197340 | |
|  | ENMEM-REQ-199852/A-Configurable Parameter for Personal Entry Code Association | | New Requirement MBORREL4: Derived from REQ-138622 | |
|  | ENMEM-REQ-199854/A-Driver Profile Opt-In Status | | cwu3: Removed opt-out status portion from this opt in requirement to opt out requirement MBORREL4: Derived from REQ-099681 | |
|  | ENMEM-HMI-REQ-199777/A-Enhanced Memory HMI Driver Profile Identification | | cwu3: new for Enhanced Memory HMI Driver Profile Name | |
|  | ENMEM-HMI-REQ-199856/A-Enhanced Memory HMI Indications for Driver Profile | | cwu3: new to provide details on HMI indications for Driver Profiles | |
|  | ENMEM-REQ-199857/A-Driver Profile to Personality Mapping | | New General Requirement MBORREL4: Derived from REQ-099684 | |
|  | ENMEM-REQ-199858/A-EnhancedMemoryInterfaceClient to Retain Settings After Software Reflash | | cwu3: Replaced "all" information with exact information. MBORREL4: Derived from REQ-116801 | |
|  | ENMEM-REQ-206864/A-EnhancedMemoryServers to Retain Settings After Software Reflash | | MBORREL4: New req | |
|  | ENMEM-HMI-REQ-199859/A-Maximum Number of Driver Profiles | | cwu3: change requirement to be HMI-REQ and add clarification for EOL menu configuration MBORREL4: Derived from REQ-095961 | |
|  | ENMEM-HMI-REQ-199860/A-Max Number of Profiles Reached | | cwu3: Derived from REQ-099701. Changed requirement to HMI-REQ | |
|  | ENMEM-REQ-199862/A-Alignment between Opt-In Driver Profile and Driver Memory Seat Button | | cwu3: New to specify that Personal Index at encoding value of Opt-in status shall align with number of Driver Memory Seat button the user pressed | |
|  | ENMEM-HMI-REQ-199863/A-Enhanced Memory HMI Display Order of Existing Driver Profiles | | cwu3: new to clarify display order of Driver Profiles shall be in ascending order for number of associated Driver Memory Seat button, not in the order of creating profile | |
|  | ENMEM-REQ-199864/A-Disable Driver Profile Creation and Editing when key is not in Run or Vehicle Speed is greater than Driver Restriction threshold | | MBORREL4: Derived from REQ-099699 | |
|  | ENMEM-REQ-199865/A-Profile Creation Interruption | | New Requirement MBORREL4: Derived from REQ-116802 | |
|  | ENMEM-HMI-REQ-199866/A-Enhanced Memory HMI Notification of Profile Creation Abort | | cwu3: new to add Enhanced Memory HMI Notification when profile creation is aborted | |
|  | ENMEM-HMI-REQ-199893/A-Edit Driver Profile | | cwu3: New for specify Edit Driver Profile | |
|  | ENMEM-REQ-199853/A-Missing DTC | | New Requirement MBORREL4: Derived from REQ-138631 | |
|  | STR-310734/A-Activity Diagrams | | MBORREL4: Added Master Reset Act. Diag. | |
|  | ENMEM-ACT-REQ-199915/A-Create Driver Profile | | MBORREL4: Updated diagram for clarity. MBORREL4: Derived from REQ-099377 | |
|  | STR-310739/A-Sequence Diagrams | | cwu3: Revised to add new sequence diagrams MBORREL4: Added Master Reset Act. Diag. | |
|  | ENMEM-SD-REQ-199919/A-Create Driver Profile (A Happy Path) | | MBORREL4: Updated Diagram to reflect happy path only. Updated to include <T\_ReturnToIdle> and <T\_ReturnToNull> timers. Changed Pers2 to Pers1 throughout and fixed PersIndex value when Feature\_Rq returns to Null. Rearranged messages so InfotainmentRecall\_Rq occurs after ExitButtonPairing. Updated Copy operation Feature\_Rq(Config=0xFFFF). Moved T\_RecallDelay and added T\_PersCopy. MBORREL4: Derived from REQ-099425 | |
|  | ENMEM-FUN-REQ-204951/A-Associate Keyfob | | cwu3: New for Associate Keyfob Function | |
|  | STR-310729/A-Associate Keyfob Function Description | | cwu3: New to contain introduction, diagram and requirements for Keyfob association | |
|  | ENMEM-PIC-326159/A-Enhanced Memory Associate Keyfob HMI Flow Chart | | cwu3: new for provide design aid for associate keyfob HMI flow chart. | |
|  | ENMEM-UC-REQ-199843/A-Associate Keyfob to a Driver Profile | | cwu3:  (1)Deleted touchscreen to make requirement generic (2)Deleted note to avoid confusion MBORREL4: Derived from REQ-095908 | |
|  | ENMEM-UC-REQ-199844/A-Attempt to Associate Already Associated Keyfob | | cwu3:(1)Renamed Title to shorten Title (2) Added over write option MBORREL4: Derived from REQ-095925 | |
|  | ENMEM-UC-REQ-199845/A-Associate a Keyfob with Incorrect Method | | cwu3: New use case for incorrect fob association method | |
|  | ENMEM-UC-REQ-199851/A-User Aborts or System Cancel Event Occurs During Keyfob Association Process | | MBORREL4: Added "Memory Button Recall Request" as a pairing process cancelling event cwu3: Added HMI Abort notification and restart instruction MBORREL4: Derived from REQ-096802 | |
|  | ENMEM-REQ-199894/A-Configurable Parameter for Keyfob Association | | MBORREL4: Derived from REQ-099672 | |
|  | ENMEM-REQ-199895/A-Configurable Parameter to Disable Classic Keyfob Association | | New General Requirement MBORREL4: Derived from REQ-099697 | |
|  | ENMEM-REQ-199906/A-Keyfob Association Error | | MBORREL4: Updated to include Ignition Status MBORREL4: Derived from REQ-116804 | |
|  | ENMEM-TMR-REQ-199905/A-T\_FobAssocTotal2 | | MBORREL4: New Req | |
|  | ENMEM-REQ-199904/A-Keyfob Association Timer Expired | | MBORREL4: New Req | |
|  | ENMEM-HMI-REQ-199903/A-Enhanced Memory HMI Notification of Keyfob Association Abort | | cwu3: new to add Enhanced Memory HMI Notification when keyfob association is aborted | |
|  | ENMEM-REQ-199902/A-Keyfob Association Failed | | New General Requirement MBORREL4: Derived from REQ-099690 | |
|  | ENMEM-HMI-REQ-199901/A-Enhanced Memory HMI Audible Notification of Successful Keyfob Association | | cwu3: new for Enhanced Memory HMI Audible Notification of Successful Keyfob Association | |
|  | ENMEM-REQ-199900/A-Successful Keyfob Association Status | | cwu3: New for Keyfob Association Status | |
|  | ENMEM-REQ-199899/A-Overwrite Associated Keyfob | | cwu3: New to specify EnhancedMemoryProfileServer to over write an already associated keyfob and to inform EnhancedMemoryInterfaceClient new keyfob association stats for two Driver Profiles | |
|  | ENMEM-HMI-REQ-199898/A-Enhanced Memory HMI Option for Associated Keyfob | | cwu3: New to specify the option for an associated keyfob | |
|  | ENMEM-REQ-199897/A-Detection of Associated Keyfob | | cwu3: New to specify EnhancedMemoryProfileServer to detect an already associated keyfob and to inform EnhancedMemoryInterfaceClient | |
|  | ENMEM-REQ-199896/A-Keyfob Association Mode | | MBORREL4: Updated req to include KeyAssociateSuccess as an exit condition. cwu3: Fix error by Changing EnMemProfilePairing\_St(KeyPairing = KeyAssociateSuccess) to EnMemKeyPairing\_St(KeyPairing = KeyAssociateSuccess) MBORREL4: Derived from REQ-099686 | |
|  | ENMEM-ACT-REQ-199916/A-Associate Keyfob To Driver Profile | | MBORREL4: Removed ControlFlow from endProfileCreation to exitKeyFobPairingMode. MBORREL4: Derived from REQ-099376 | |
|  | ENMEM-SD-REQ-199921/A-Associate Keyfob | | MBORREL4: Updated diagram to include new signal (PersKeyPairing\_St). Updated to include <T\_ReturnToNull> timer MBORREL4: Derived from REQ-099422 | |
|  | ENMEM-FUN-REQ-204969/A-Disassociate Keyfob | | cwu3: New for Disassociate Keyfob Function | |
|  | STR-322273/A-Disassociate Keyfob Description | | cwu3: New for Disassociate Keyfob description | |
|  | ENMEM-PIC-324190/A-Disassociate Keyfob Functional Decomposition Diagram | | MBORREL4: new to provide Disassociate Keyfob Functional Decomposition Diagram | |
|  | ENMEM-UC-REQ-199846/A-Disassociate Keyfob from a Driver Profile | | cwu3:Deleted touchscreen to make requirement generic MBORREL4: Derived from REQ-095927 | |
|  | ENMEM-UC-REQ-199844/A-Attempt to Associate Already Associated Keyfob | | cwu3:(1)Renamed Title to shorten Title (2) Added over write option MBORREL4: Derived from REQ-095925 | |
|  | ENMEM-UC-REQ-199847/A-Disassociate Keyfobs from Driver Profiles after Keyfobs Are Erased from a Vehicle | | cwu3: New use case for fob disassociation due to keyfobs erase process | |
|  | ENMEM-REQ-199913/A-Disassociate Keyfob when a Driver Profile is deleted | | cwu3: New to call out a fob disassociation request for Delete a Drive Profile operation | |
|  | ENMEM-REQ-199914/A-Keyfob Disassociation Status | | cwu3: New for Keyfob Disassociation Status | |
|  | ENMEM-REQ-199912/A-Disassociate the Keyfob per User Request | | cwu3: New to call out a fob disassociation request for the user's request | |
|  | ENMEM-SD-REQ-199922/A-Disassociate Keyfob | | MBORREL4: Updated diagram to include new signal (PersKeyPairing\_St). Updated to include <T\_ReturnToNull> timer MBORREL4: Derived from REQ-099423 | |
|  | ENMEM-FUN-REQ-204974/A-Delete Driver Profile | | cwu3: New for Delete Driver Profile Function | |
|  | STR-310731/A-Delete Driver Profile Function Description | | cwu3: New for Delete Driver Profiles | |
|  | ENMEM-PIC-324193/A-Delete Driver Profile Functional Decomposition Diagram | | MBORREL4: new to provide Delete Driver Profile Functional Decomposition Diagram | |
|  | ENMEM-UC-REQ-199848/A-Delete a Driver Profile | | cwu3: Added more details to clarify design intent MBORREL4: Derived from REQ-095929 | |
|  | ENMEM-REQ-199913/A-Disassociate Keyfob when a Driver Profile is deleted | | cwu3: New to call out a fob disassociation request for Delete a Drive Profile operation | |
|  | ENMEM-REQ-199909/A-Recall Vehicle Profile When Active or Last Driver Profile Is Deleted | | cwu3: Derived from ENMEM-REQ-134465 (1)Added last Profile in context (2) Renamed the requirement to be more descriptive (3)Deleted the requirement called out for EnhancedMemoryProfileServer as it is already covered by ENMEM-REQ-099682 to make this requirement unique and not to duplicate other requirement | |
|  | ENMEM-REQ-199908/A-Driver Profile Deleted Status | | cwu3: new and is derived from last sentence of REQ-099681 | |
|  | ENMEM-HMI-REQ-199910/A-Enhanced Memory HMI Indications for Delete a Driver Profile | | cwu3: new to provide details on HMI indications for deleting a Driver Profile | |
|  | ENMEM-ACT-REQ-199917/A-Delete Driver Profile | | MBORREL4: Updated to include "Active Profile Deleted" check and UpdateDisplay MBORREL4: Derived from REQ-099379 | |
|  | ENMEM-SD-REQ-199923/A-Delete Driver Profile | | MBORREL4: Updated diagram to include new signal (PersKeyPairing\_St) and UpdateView. Updated to include <T\_ReturnToIdle> timer MBORREL4: Derived from REQ-099427 | |
|  | ENMEM-FUN-REQ-204933/A-Create/Edit Name | | cwu3: New for Create/Edit Name Function | |
|  | STR-326138/A-Create/Edit Function Description | | cwu3: New | |
|  | ENMEM-PIC-326139/A-Create/Edit Name Functional Decomposition Diagram | | cwu3: new | |
|  | ENMEM-PIC-326156/A-Enhanced Memory Create/Edit Name HMI Flow Chart | | cwu3: new for provide design aid for Create/Edit Name HMI flow chart. | |
|  | ENMEM-UC-REQ-199840/A-Create or Edit Driver Profile Name | | cwu3: renamed title and added creating name use case to the original editing use case MBORREL4: Derived from REQ-134147 | |
|  | ENMEM-UC-REQ-199841/A-Attempt to Give a Driver Profile an Existing Name | | cwu3: New for not unique Driver Profile name | |
|  | ENMEM-REQ-199868/A-Do Not Enter Driver Memory Seat Button Association Mode When Editing Name | | cwu3: New to specify when in editing process EnhancedMemoryInterfaceClient shall not sent request to enter button association mode | |
|  | ENMEM-HMI-REQ-199861/A-Driver Profile Name Restrictions | | cwu3: New for Drive Profile name restrictions | |
|  | STR-310776/A-Recall Function Description and Interfaces | | cwu3: new to provide description and diagram | |
|  | ENMEM-PIC-324191/A-Recall Functional Decomposition Diagram | | MBORREL4: new to provide Recall Functional Decomposition Diagram | |
|  | ENMEM-UC-REQ-199926/A-Driver Memory Seat Button Press Recall with Enhanced Memory OFF | | cwu3: Derived from ENMEM-UC-REQ-095719. Deleted incomplete Class Memory examples to avoid confusion. | |
|  | ENMEM-UC-REQ-199927/A-Driver Memory Seat Button Press Recall | | cwu3: Derived from ENMEM-UC-REQ-095930 (1)Deleted incomplete information "seat/exterior mirrors/steering wheel" (2)Delete last sentence at note | |
|  | ENMEM-UC-REQ-199928/A-Driver Memory Seat Button Press Recall While Vehicle In Motion | | cwu3: Derived from ENMEM-UC-REQ-136944/A. Deleted incomplete information "seat/exterior mirrors/steering wheel" | |
|  | ENMEM-UC-REQ-199929/A-Driver Memory Seat Button Recall of the Active Driver Profile | | MBORREL4: Derived from REQ-095934 cwu3: deleted incomplete Classic Memory examples to avoid confusion | |
|  | ENMEM-UC-REQ-199958/A-Driver Memory Seat Button Store Recall with Enhanced Memory OFF | | cwu3: Derived from ENMEM-UC-REQ-095720. Deleted incomplete positional settings examples | |
|  | ENMEM-UC-REQ-199959/A-Driver Memory Seat Button Store Recall of an Alternate Associated Profile | | cwu3: Derived from ENMEN-REQ-095931. Deleted incomplete positional settings examples | |
|  | ENMEM-UC-REQ-199960/A-Driver Memory Seat Button Store Recall of the Active Driver Profile | | cwu3: Derived from ENMEM-REQ-095938. Deleted incomplete positional settings examples. | |
|  | ENMEM-UC-REQ-199961/A-Driver Memory Seat Button Store Recall of Unassociated Button | | cwu3: Derived from ENMEN-REQ-166195. | |
|  | ENMEM-UC-REQ-199930/A-HMI Menu Recall | | cwu3: Derived from ENMEM-UC-REQ-095939. Deleted touchscreen to make requirement generic | |
|  | ENMEM-UC-REQ-199931/A-Keyfob Detection Recall | | MBORREL4: Derived from ENMEM-UC-REQ-095940. Added "Remote Start" as a sign-in/recall method | |
|  | ENMEM-UC-REQ-199932/A-Keyfob Recall While Vehicle In Motion | | MBORREL4: Derived from ENMEM-UC-REQ-162635.  Changed 5kph to 8kph per kschmi77 | |
|  | ENMEM-UC-REQ-199933/A-Keyfob Recall with Enhanced Memory OFF | | MBORREL4: Derived from ENMEM-UC-REQ-161547. Changed 5 kph to 8 kph | |
|  | ENMEM-UC-REQ-199934/A-Recall Last Known Driver Profile With Keypad Code and no Keyfob | | cwu3: Derived from ENMEM-UC-REQ-137996 | |
|  | ENMEM-UC-REQ-199935/A-Recall Driver Profile With Keypad Code and IA Key | | MBORREL4: Derived from ENMEM-UC-REQ-162841 .Fixed typo. | |
|  | ENMEM-UC-REQ-199936/A-MyKey Overrides Driver Profile Setting | | MBORREL4: Derived from REQ-137858 | |
|  | ENMEM-UC-REQ-199937/A-Admin Key does not restrict Driver Profile Associated to MyKey | | MBORREL4: Updated use case title MBORREL4: Derived from REQ-137858 | |
|  | ENMEM-REQ-199944/A-Driver Profile Recall Event Counter | | MBORREL4: Derived from REQ-099694 cwu3:  (1) Added requirement for EnhancedMemoryServer (2) Changed error handling strategy from " then all EnhancedMemoryServers shall remain on the profile that was active prior to the ActivePersonality\_St change. " to " EnhancedMemoryServers shall still update the active Driver Profile per the change of ActivePersonality\_St." | |
|  | STR-310779/A-Keyfob Detection Recall | | cwu3: New to replace ENMEM-REQ-099671/-Keyfob Detection for Driver Profile Sign-In | |
|  | STR-310780/A-Driver Memory Seat Button Press Recall | | cwu3: New for Memory Seat Button Recall and to replace ENMEM-REQ-099682/-Determination of Profile After Recall | |
|  | ENMEM-REQ-199962/A-Driver Memory Seat Button Store Recall | | cwu3: Derived from ENMEM-REQ-099687 to   Clarify the requirement only applies to memory seat button press and hold store event. It is not applies to Infotainment Store event. | |
|  | ENMEM-TMR-REQ-199963/A-T\_PersStore | | New Timing Requirement MBORREL4: Derived from REQ-099764 | |
|  | ENMEM-REQ-199945/A-Menu Recall | | cwu3: New for Menu(infotainment) recall. It is derived from REQ-099682 1st bullet point and the first sentence of REQ-154252 | |
|  | ENMEM-REQ-202233/A-Recall Performance Requirement | | cwu3: New for specify recall timing requirement | |
|  | ENMEM-TMR-REQ-199943/A-T\_PersUpdate | | New Requirement MBORREL4: Derived from REQ-134102 | |
|  | ENMEM-REQ-199946/A-Recall Priority | | cwu3: New for specify recall priority | |
|  | STR-319049/A-StartUp Recall Strategies | | cwu3: New for startUp Recall strategies | |
|  | ENMEM-REQ-199938/A-Last Known Driver Profile Applied at Startup with No Recall | | New requirement MBORREL4: Derived from REQ-129547 | |
|  | ENMEM-REQ-202304/A-Startup Recall Timing Performance Requirement | | cwu3: New for specify start up recall timing requirement. Derived from ENMEM-SR-REQ-136592/J-Network Bus Start-up / Shut-down (EnhancedMemoryProfileServer) | |
|  | ENMEM-TMR-REQ-203821/A-T\_PrflSrvrUpdateStartUp | | MBORREL4: New timer for startup | |
|  | ENMEM-SR-REQ-199823/A-Startup Recall Assumptions when Status Unknown | | cwu3: New to specify startup Recall assumptions. Derived from ENMEM-SR-REQ-136592/J-Network Bus Start-up / Shut-down (EnhancedMemoryProfileServer) | |
|  | ENMEM-SR-REQ-206293/A-Startup Recall Assumptions when Status NotDetermined | | cwu3: New to specify What to do for NotDetermined case | |
|  | ENMEM-SR-REQ-199824/A-Startup Status Transmitting Requirement | | cwu3: New to specify status transmitting requirement. Derived from ENMEM-SR-REQ-136594/G-Network Bus Start-up / Shut-down (EnhancedMemoryInterfaceClient) | |
|  | ENMEM-REQ-203736/A-Resend Data at Startup | | cwu3: New for specify resend data requirement. Derived from ENMEM-SR-REQ-136594/G-Network Bus Start-up / Shut-down (EnhancedMemoryInterfaceClient) | |
|  | ENMEM-TMR-REQ-206538/A-T\_StartupResendData | | MBORREL4: New timer | |
|  | ENMEM-REQ-203735/A-Startup Transmitting Timing Performance Requirement | | cwu3: New for specify start up transmitting timing requirement. Derived from ENMEM-SR-REQ-136594/G-Network Bus Start-up / Shut-down (EnhancedMemoryInterfaceClient) | |
|  | ENMEM-REQ-202305/A-Startup Receiving Timing Performance Requirement | | cwu3: New for specify start up receiving timing requirement. Derived from ENMEM-SR-REQ-136592/J-Network Bus Start-up / Shut-down (EnhancedMemoryProfileServer) | |
|  | ENMEM-TMR-REQ-203854/A-T\_PrflSrvrRqStartUp | | MBORREL4: New timer for startup | |
|  | ENMEM-REQ-199939/A-Recall Settings for Active Driver Profile | | cwu3: new. Derived from REQ-099673 (1)Deleted HMI notification portion and moved it to REQ-199639 (2) Deleted timer requirement | |
|  | ENMEM-TMR-REQ-199940/A-T\_PersRecall | | New Timing Requirement MBORREL4: Derived from REQ-099762 | |
|  | ENMEM-REQ-202225/A-Error Handling Strategy for Recall Driver Profile | | cwu3: New for error handling of recalling Driver Profile | |
|  | ENMEM-REQ-202227/A-Provide Active Settings for Display after Recall | | cwu3: Derived from second bullet point of REQ-099673 | |
|  | ENMEM-TMR-REQ-199941/A-T\_PersRecallStatusUpdate | | New Requirement MBORREL4: Derived from REQ-134105 | |
|  | ENMEM-REQ-199947/A-Display Active Profile Settings after Recall | | cwu3: New. replaced ENMEM-REQ-099693/B-Display Data Refresh After Driver Profile Change MBORREL4: Derived from REQ-099673 | |
|  | ENMEM-REQ-199948/A-Positional Settings Recall | | cwu3: Added new specification for use case when an unassociated button is pressed MBORREL4: Derived from REQ-099700 | |
|  | ENMEM-REQ-199873/A-No Recall in Driver Memory Seat Button Association Mode | | cwu3: New to specify that no recall for when in button association motion. | |
|  | ENMEM-REQ-199949/A-No Recall for Positional Settings When Vehicle in Motion | | cwu3: New to specify that no recall for positional settings when vehicle in motion | |
|  | ENMEM-HMI-REQ-199950/A-Enhanced Memory HMI Notification for Updating Active Driver Profile | | cwu3: new to add Enhanced Memory HMI Notification when active Profile is updated via recall event. Tis is to replace 1st bullet point of REQ-099673 | |
|  | ENMEM-HMI-REQ-199942/A-Driver Profile Recall Notification Queue | | cwu3: new Requirement # with no content changed. Derived from ENMEM-REQ-099692/A-Driver Profile Sign-In Notification Queue | |
|  | ENMEM-ACT-REQ-199953/A-Recall Driver Profile Via Keyfob | | MBORREL4: Moved "UpdateMemoryPositionStatus" action after the Active Key Associated decision MBORREL4: Derived from REQ-099384 | |
|  | ENMEM-ACT-REQ-199951/A-Recall Driver Profile Via Driver Memory Seat Button | | MBORREL4: Removed the "checkIfButtonIsAssociatedToActievProfile" activity and adjoining decision block. Added fork node to make "updateMemoryPositionStatus" run parallel to the rest of the profile sign in process MBORREL4: Derived from REQ-099387 | |
|  | ENMEM-ACT-REQ-199952/A-Recall Driver Profile Via HMI Menu | | cwu3: changed title from "Touch Screen" to "HMI Menu" to make requirement generic MBORREL4: Derived from REQ-099388 | |
|  | ENMEM-ACT-REQ-199964/A-Driver Memory Seat Button Store Recall | | MBORREL4: Updated Diagram to include UpdateMemPos and removed Button Assoc. Check | |
|  | ENMEM-SD-REQ-199954/A-Recall Driver Profile Via Driver Memory Seat Button | | MBORREL4: Updated to include <T\_ReturnToIdle> timer MBORREL4: Derived from REQ-099433 | |
|  | ENMEM-SD-REQ-199955/A-Recall Driver Profile Via HMI Menu | | cwu3: Changed title from “Touch Screen" to "HMI Screen" to make requirement generic MBORREL4: Updated to include <T\_ReturnToIdle> timer MBORREL4: Derived from REQ-099434 | |
|  | ENMEM-SD-REQ-199956/A-Recall Driver Profile Via Keyfob | | MBORREL4: Moved [Immediately Update Memory Position Status] box under [Detected key is associated to a Profile] MBORREL4: Derived from REQ-099432 | |
|  | ENMEM-SD-REQ-199965/A-Driver Memory Seat Button Store Recall | | MBORREL4: Updated to include <T\_ReturnToIdle> timer | |
|  | ENMEM-FUN-REQ-204918/A-Opt-Out | | cwu3; New for opt-out Function | |
|  | STR-321867/A-Opt-Out Function Description | | cwu3: New for Opt out via Master Reset | |
|  | ENMEM-PIC-324192/A-Opt-Out Functional Decomposition Diagram | | MBORREL4: new to provide Opt Out Functional Decomposition Diagram | |
|  | ENMEM-UC-REQ-199849/A-Opt-Out Enhanced Memory via Master Reset | | cwu3: New use case for Pot-out via Master Reset | |
|  | ENMEM-REQ-199911/A-Driver Profiles Deleted During Master Reset | | cwu3: Derived from REQ-105569. Rephrased to clarify confusion. Deleted repeated statements of other requirement to make this requirement unique. | |
|  | ENMEM-ACT-REQ-199918/A-Opt-Out via Master Reset | | MBORREL4: New Activity Diagram | |
|  | ENMEM-SD-REQ-199924/A-Opt-Out via Master Reset | | MBORREL4: New Sequence Diagram. Updated to include <T\_ReturnToNull> timer | |
|  | ENMEM-FUN-REQ-204960/A-Copy | | cwu3: New for Copy Settings Function | |
|  | STR-310727/A-Driver Profile Creation via Copy Operation | | cwu3: New to contain introduction, diagram and requirements for Copy operation | |
|  | ENMEM-REQ-199882/A-Copy Request | | cwu3: New to specify when and how to set Copy command | |
|  | ENMEM-REQ-199883/A-Driver Profile Index for Copy Command | | cwu3: New to specify how to determine Driver Profile Index for Copy command | |
|  | ENMEM-REQ-199884/A-Execute Copy Operation | | cwu3: New to specify what features to be copied | |
|  | ENMEM-REQ-199885/A-Performance Requirement for Copy Operation | | cwu3: New for timing performance requirement ((derived from ENMEM-REQ-099695/A). | |
|  | ENMEM-TMR-REQ-199886/A-T\_PersCopy | | cwu3: Changed should to shall MBORREL4: Derived from REQ-105579 | |
|  | ENMEM-REQ-199890/A-Time Separation between Update Opt-In Status and Recall | | cwu3: New to specify when to update Opt-in status after Copy command | |
|  | ENMEM-TMR-REQ-199891/A-T\_OptInRecallSeparation | | cwu3: Changed should to shall MBORREL4: Derived from REQ-134146 | |
|  | ENMEM-REQ-199887/A-Request Exit Driver Memory Seat Button Association Mode After Copy | | cwu3: New to define when to request exit Button association mode after Copy | |
|  | ENMEM-REQ-199888/A-Recall New Driver Profile After Copy | | cwu3: New for recall after Copy (derived from ENMEM-REQ-099695/A) | |
|  | ENMEM-TMR-REQ-199889/A-T\_RecallDelay | | cwu3: Changed should to shall MBORREL4: Derived from REQ-099765 | |
|  | ENMEM-REQ-199892/A-Storing Positional Settings after Copy | | MBORREL4: Derived from REQ-099683 cwu3: (1)Added details on transmitter requirement for infotainment store request (2) Rename title | |
|  | ENMEM-FUN-REQ-204942/A-Associate Driver Memory Seat Button | | cwu3: New for Associate Memory Seat Button Function | |
|  | STR-325938/A-Associate Driver Memory Seat Button Function Description | | cwu3: New | |
|  | ENMEM-PIC-325939/A-Associate Driver Memory Seat Button Functional Decomposition Diagram | | MBORREL4: new to provide Opt Out Functional Decomposition Diagram | |
|  | ENMEM-PIC-326164/A-Enhanced Memory Associate Driver Seat Button HMI Flow Chart | | cwu3: new for provide design aid for associate Memory Seat button HMI flow chart. | |
|  | ENMEM-UC-REQ-199842/A-Attempt to Associate Already Associated Driver Memory Seat Button | | MBORREL4: Added UseCase for unhappy path (seat button already in use) cwu3: renamed Title to shorten it | |
|  | ENMEM-REQ-199867/A-Request Enter Driver Memory Seat Button Association Mode | | cwu3: (1) Derived from REQ-099685. Per atomic rule, divided this requirement in to several requirements (199867, 199879 and 199871) (2)Renamed Title to be specific and aligned to new content | |
|  | ENMEM-REQ-199868/A-Do Not Enter Driver Memory Seat Button Association Mode When Editing Name | | cwu3: New to specify when in editing process EnhancedMemoryInterfaceClient shall not sent request to enter button association mode | |
|  | ENMEM-REQ-199869/A-Entering Driver Memory Seat Button Association Mode | | cwu3: New to specify what EnhancedMemoryPositionClient shall do when receiving request to enter button association mode | |
|  | ENMEM-REQ-199870/A-Retry and Error Handling Strategies for Driver Memory Seat Button Association Mode | | cwu3: New to specify retry and error handling strategies for seat button association mode | |
|  | ENMEM-TMR-REQ-206535/A-T\_SeatBtnAsscRetry | | MBORREL4: New timer | |
|  | ENMEM-REQ-199871/A-Button Press in Driver Memory Seat Button Association Mode | | cwu3: Derived from REQ-099685 of No recall portion. New to specify what EnhancedMemoryPositionClient shall do when receiving button press in button association mode | |
|  | ENMEM-REQ-199872/A-Driver Memory Seat Button Press Error Strategy | | cwu3: New for button press error handling | |
|  | ENMEM-REQ-199873/A-No Recall in Driver Memory Seat Button Association Mode | | cwu3: New to specify that no recall for when in button association motion. | |
|  | ENMEM-REQ-199874/A-Successful Driver Memory Seat Button Association | | cwu3: New to specify when a button is successfully associated to a profile | |
|  | ENMEM-REQ-199875/A-No Overwrite for Driver Memory Seat Button Association | | cwu3: New to establish rule for no Memory Seat button association overwrite | |
|  | ENMEM-HMI-REQ-199876/A-HMI Prompt for Driver Memory Seat Button Press and Associated Driver Memory Seat Button Status | | cwu3: New for HMI button press prompt and associated buttons status indication | |
|  | ENMEM-HMI-REQ-199877/A-Enhanced Memory HMI for Associated Driver Memory Seat Button | | cwu3: new to provide HMI details for the use case when a memory seat button is already associated | |
|  | ENMEM-REQ-199878/A-Request Exit Driver Memory Seat Button Association Mode | | cwu3: Renamed Title and added more error conditions to complete exit conditions MBORREL4: Derived from REQ-116803 | |
|  | ENMEM-REQ-199879/A-Exit Driver Memory Seat Button Association Mode | | cwu3: Derived from REQ-09958 Exit portion with more details | |
|  | ENMEM-REQ-199880/A-Driver Memory Seat Button Pairing Timer Expired | | MBORREL4: New requirement. Replaced "1 second" with <T\_ReturnToNull> | |
|  | ENMEM-TMR-REQ-199881/A-T\_SeatAssocOneTime2 | | MBORREL4: New DSM timer for seat button association between retries. | |
|  | ENMEM-SD-REQ-199920/A-User Chooses a Driver Memory Seat Button That is Already Associated to Another Driver Profile | | MBORREL4: New Diagram to reflect unhappy path (seat button already in use). Updated to include <T\_ReturnToIdle> and <T\_ReturnToNull> timers | |
|  | STR-310817/A-Appendix: Reference Documents | | cwu3: added more reference documents | |
|  |  |  |  | |
| **April 6, 2016** | **2.1** | **Updated Release** |  | |
|  | ENMEM-FRD-REQ-204524/B-Enhanced Memory-Feature Level(Active Version) | | cwu3: revised for Ver 2.1 | |
|  | STR-312344/B-Assumptions & Dependencies | | cwu3: Replaced DNR ( a typo of D&R) with Feature Owner | |
|  | ENMEM-REQ-201961/B-Create Driver Profile | | cwu3: Replaced Drover with Driver to fix typo at 2nd bullet point | |
|  | ENMEM-DOC-310698/B-Logic Method to Physical Signal Translation Table | | MBORREL4: Changed FactoryReset\_Rq Tx from BCM to APIM and updated its CAN message to "SDARS\_FactoryReset\_Rq" | |
|  | STR-322090/B-Enhanced Memory Logic Method Requirements | | cwu3: Deleted (1)ENMEM-SR-REQ-199820/A-Request/Response return to Idle state (2)ENMEM-TMR-REQ-199821/A-T\_ReturnToIdle | |
|  | ENMEM-SR-REQ-199818/B-Request/Response return to Null state | | cwu3: Replaced "there" with "their" to fix typo | |
|  | ENMEM-SD-REQ-199919/B-Create Driver Profile (A Happy Path) | | MBORREL4: Updated Feature\_Rq Copy operation for Pers to stay in last known. Removed all instances of T\_ReturnToIdle as it is no longer needed. | |
|  | ENMEM-UC-REQ-199843/B-Associate Keyfob to a Driver Profile | | cwu3: Update heading format to correct section # error. No change in content | |
|  | STR-321536/B-Requirements | | cwu3: Added new REQ-212766 | |
|  | ENMEM-SR-REQ-212766/A-PersIndex used for Keyfob Association | | cwu3:New Requirement to clarify mapping between keyfob and Driver Profile index | |
|  | STR-321559/B-Use Cases | | cwu3: Deleted ENMEM-UC-REQ-199844/A-Attempt to Associate Already Associated Keyfob. REQ-199844 is listed in other section and should not be duplicated in this section. | |
|  | ENMEM-UC-REQ-199846/B-Disassociate Keyfob from a Driver Profile | | cwu3: Revised in order to delete REQ-199844. No change in content | |
|  | STR-319049/B-Network StartUp Recall Strategies | | cwu3: Added "Network" to section tile for clarification | |
|  | ENMEM-REQ-199938/B-Last Known Driver Profile Applied at Network Startup with No Recall | | cwu3: Added Network to title for clarification. No content change. | |
|  | ENMEM-REQ-202304/B-Network Startup Recall Timing Performance Requirement | | cwu3: Added Network to title for clarification. No content change. | |
|  | ENMEM-SR-REQ-199823/B-Network Startup Recall Assumptions when Status Unknown | | cwu3: Added Network to title for clarification. No content change. | |
|  | ENMEM-SR-REQ-206293/B-Network Startup Recall Assumptions when Status NotDetermined | | cwu3: Added Network to title for clarification. No content change. | |
|  | ENMEM-SR-REQ-199824/B-Network Startup Status Transmitting Requirement | | cwu3: Added Network to title for clarification. No content change. | |
|  | ENMEM-REQ-203736/B-Resend Data at Network Startup | | cwu3: Added Network to title for clarification. No content change. | |
|  | ENMEM-REQ-203735/B-Network Startup Transmitting Timing Performance Requirement | | cwu3: Added Network to title for clarification. No content change. | |
|  | ENMEM-REQ-202305/B-Network Startup Receiving Timing Performance Requirement | | cwu3: Added Network to title for clarification. No content change. | |
|  | ENMEM-HMI-REQ-199950/B-Enhanced Memory HMI Notification for Updating Active Driver Profile | | cwu3: Added Feature On/Off detailed information to clarify confusion | |
|  | STR-321524/B-Requirements | | cwu3: Deleted ENMEM-REQ-199875/A-No Overwrite for Driver Memory Seat Button Association. This requirement is already in Ch 3 | |
|  | ENMEM-REQ-199867/B-Request Enter Driver Memory Seat Button Association Mode | | cwu3: Added re-entering requirement | |
|  | ENMEM-REQ-199878/B-Request Exit Driver Memory Seat Button Association Mode | | cwu3: (1) Updated second bullet point from "The user is in action" to "The user is inactive"" (2) Added 4th bullet point "The user presses an already associated Driver Memory Seat button " | |
|  | ENMEM-REQ-199879/B-Exit Driver Memory Seat Button Association Mode | | cwu3: Replaced "EnhancedMemoryPositionClient" with "EnhancedMemoryInterfaceClient" to fix typo | |
|  | ENMEM-SD-REQ-199920/B-User Chooses a Driver Memory Seat Button That is Already Associated to Another Driver Profile | | MBORREL4: Removed all instances of T\_ReturnToIdle as it is no longer needed. | |
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| **July 18, 2016** | **2.2** | **Updated Release** |  | |
|  | ENMEM-FRD-REQ-204524/C-Enhanced Memory-Feature Level(Active Version) | | cwu3: revised for Ver 2.2 Release | |
|  | STR-312428/B-Functional Requirements | | cwu3: Revised to add new requirement (1)ENMEM-SR-REQ-220733/A-Recall Strategy when Valet Mode is from on to off (2)ENMEM-REQ-220734/A-Valet Mode Disables Enhanced Memory Feature | |
|  | ENMEM-SR-REQ-220733/A-Recall Strategy when Valet Mode is from on to off | | cwu3: New requirement added for Valet Mode recall strategy | |
|  | ENMEM-REQ-220734/A-Valet Mode Disables Enhanced Memory Feature | | cwu3: New for Valet Mode interaction with Enhanced Memory | |
|  | STR-322090/C-Enhanced Memory Logic Method Requirements | | cwu3: Revised to add new requirement ENMEM-REQ-226669/A-Enhanced Memory Network WakeUp Signal Designation | |
|  | ENMEM-REQ-226669/A-Enhanced Memory Network WakeUp Signal Designation | | cwu3: New for WakeUp Signal Designation | |
|  | ENMEM-SR-REQ-199818/C-Request/Response Return to Null State | | cwu3: Fixed Title format error. No new content. | |
|  | STR-310706/B-Use Cases | | cwu3: Revised to add three Use Cases for Valet Mode | |
|  | ENMEM-UC-REQ-214814/A-Disable Enhanced Memory When Valet Mode On | | cwu3: New Use Case for Valet Mode disabling Enhanced Memory | |
|  | ENMEM-UC-REQ-214816/A-Enable Enhanced Memory When Valet Mode From On To Off | | cwu3:New Use Case describing Enabling Enhanced Memory with Valet Mode from On To Off | |
|  | ENMEM-UC-REQ-214813/A-Valet Mode Disabled with Enhanced Memory Off | | New Use Case describing Valet Mode functionality | |
|  | STR-310707/B-Requirements | | cwu3: Revised to add new requirement ENMEM-SR-REQ-214810/A-Enable/Disable Enhanced Memory in Valet Mode | |
|  | ENMEM-SR-REQ-214810/A-Enable/Disable Enhanced Memory in Valet Mode | | MBORREL4: New req. added to cover Valet Mode functionality. | |
|  | ENMEM-FUN-REQ-204913/B-Opt-In | | cwu3: Revised in order to add new Use Case | |
|  | ENMEM-UC-REQ-201605/A-Opt in Enhanced Memory Feature | | cwu3: New for Opt in process | |
|  | STR-310777/B-Use Cases | | cwu3: Revised to add new Use Case ENMEM-UC-REQ-226667/A-No Recalls during a Crash Event | |
|  | ENMEM-UC-REQ-226667/A-No Recalls during a Crash Event | | cwu3: New Use Case for recall in crash event | |
|  | STR-310778/C-Requirements | | cwu3: Revised to add new requirements (1) ENMEM-SR-REQ-214302/A-No Recalls during an Emergency Assist Event | |
|  | STR-310779/B-Keyfob Detection Recall | | cwu3: (1) Added new requirement: ENMEM-REQ-227351/A to cover crash event (2) Revised requirements to include crash event as one of input: ENMEM-REQ-199583/B ENMEM-REQ-199584/B ENMEM-REQ-199585/B ENMEM-REQ-199586/B | |
|  | STR-310780/B-Driver Memory Seat Button Press Recall | | cwu3: (1) added new requirement ENMEM-REQ-227352/A to cover crash event recall strategy (2) revised requirements to include crash event as one of the recall input: ENMEM-REQ-199591/B ENMEM-REQ-199592/B ENMEM-REQ-199593/B ENMEM-REQ-199594/B ENMEM-REQ-199595/B | |
|  | ENMEM-REQ-199945/B-Menu Recall | | cwu3: Revised to include crash event as one of recall input | |
|  | ENMEM-SR-REQ-214302/A-No Recalls during a Crash Event | | cwu3: New to specify no recall during an Emergency Assist Event | |
|  | ENMEM-HMI-REQ-199950/C-Enhanced Memory HMI Notification for Updating Active Driver Profile | | cwu3: Add one scenario (Start Screen) to display Active Profile HMI notification. | |
|  | STR-321524/C-Requirements | | cwu3: Revised to update (1) ENMEM-REQ-199871/B-Button Press in Driver Memory Seat Button Association Mode (2) ENMEM-REQ-199878/C-Request Exit Driver Memory Seat Button Association Mode | |
|  | ENMEM-REQ-199871/B-Button Press in Driver Memory Seat Button Association Mode | | MBORREL4: Removed Memory\_Cmd from req and changed "should" to "shall" in 1st paragraph. | |
|  | ENMEM-REQ-199878/C-Request Exit Driver Memory Seat Button Association Mode | | cwu3: Replaced ENMEM-REQ-099699 by ENMEM-REQ-199864 | |
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| **September 29, 2016** | **3.0** | **Updated Release** |  | |
|  | ENMEM-FRD-REQ-204524/D-Enhanced Memory-Feature Level(Active Version) | | cwu3: Revised for Ver 3.0 to add phone as one of recall methods | |
|  | STR-312357/B-Definitions | | cwu3: Added Phone as a Key | |
|  | STR-310691/B-Acronyms and Abbreviations | | cwu3: Added PaaK | |
|  | STR-310687/B-Feature Overview | | cwu3: Added Phone as one of recall Methods | |
|  | STR-312428/C-Functional Requirements | | MBORREL4: Added REQ-232557 | |
|  | ENMEM-REQ-201660/B-Enhanced Memory Functions | | cwu3: added Phone association and disassociation | |
|  | ENMEM-REQ-199761/B-Methods to Recall a Driver Profile | | cwu3:Added phone as one of recall methods | |
|  | ENMEM-REQ-199762/B-Operations Shall Not Recall a Driver Profile | | cwu3: Added phone | |
|  | ENMEM-REQ-199763/B-Active Driver Profile in Different Recall Events | | cwu3: Added phone as one of recall methods | |
|  | ENMEM-REQ-199764/B-Default Active Driver Profile | | cwu3: Added phone as one of recall methods | |
|  | ENMEM-REQ-199788/B-Opt-Out Enhanced Memory Feature | | cwu3: Added phone | |
|  | ENMEM-REQ-199760/B-Optional Keyfob and Phone Association to a Driver Profile | | cwu3 : Added phone as one of recall methods and defined number of phone can be associated to a Driver Profile | |
|  | ENMEM-REQ-201962/B-Disassociate a Keyfob or a Phone from a Driver Profile | | cwu3: Added phone to the disassociation requirement | |
|  | ENMEM-REQ-199787/B-Delete a Driver Profile | | cwu3: Added phone requirement | |
|  | ENMEM-REQ-199765/B-MyKey Takes Precedence Over Driver Profile Settings | | cwu3:Added phone to requirement | |
|  | ENMEM-REQ-232557/A-Phone & Phone-As-A-Key | | MBORREL4: New Req. for PaaK | |
|  | STR-312430/B-HMI Requirements | | MBORREL4: Added REQ-233264 | |
|  | ENMEM-HMI-REQ-201980/B-Indication of Existing Driver Profile Status | | cwu3:Added phone to requirement | |
|  | ENMEM-HMI-REQ-199780/B-Indication of Operation Status | | cwu3: added phone association | |
|  | ENMEM-HMI-REQ-199781/B-Indication of Association Status | | cwu3: Added phone to requirement | |
|  | ENMEM-REQ-201981/B-Overwrite for Keyfob and phone Association | | cwu3: Added phone to requirement | |
|  | ENMEM-REQ-199786/B-Overwrite or Restart Keyfob and phone Association | | cwu3:Added phone to requirement | |
|  | ENMEM-HMI-REQ-199782/B-Multiple Opportunities for Association | | cwu3:Added phone to requirement | |
|  | ENMEM-REQ-199785/B-N\_NumberOfRetries | | cwu3: Added phone association | |
|  | ENMEM-TMR-REQ-199783/B-T\_FobAssocOneTime | | cwu3: Added phone so this timer can be used for both fob and phone association | |
|  | ENMEM-TMR-REQ-199784/B-T\_FobAssocTotal | | cwu3: Added phone so this timer can be used for both fob and phone association | |
|  | ENMEM-HMI-REQ-233264/A-Phone Association HMI Option | | MBORREL4: New Req. for PaaK | |
|  | ENMEM-SR-REQ-199753/B-Enhanced Memory Feature Inclusion Guidelines | | cwu3: added phone | |
|  | ENMEM-REQ-199773/B-Retain Enhanced Memory Settings After Software Reflash | | cwu3: Added phone | |
|  | ENMEM-PIC-310694/B-Enhanced Memory Logic Block Diagram | | MBORREL4: Updated for phone and PersPhonePairing\_St | |
|  | ENMEM-CLD-REQ-199791/B-Enhanced Memory Profile Server | | cwu3: Added phone association and phone disassociation | |
|  | ENMEM-REQ-203519/B-Enhanced Memory Feature Interface Requirement | | MBORREL4: Updated for phone to include PersPhonePairing\_St and changes to EnMemProfilePairing\_Rq and EnMemKeyPairing\_St | |
|  | ENMEM-DOC-310698/C-Logic Method to Physical Signal Translation Table | | MBORREL4: Updated for phone to include PersPhonePairing\_St and changes to EnMemProfilePairing\_Rq and EnMemKeyPairing\_St | |
|  | ENMEM-REQ-205033/B-Status Memory Storage Requirement for Profile Server | | cwu3: Added PersKeyPairing\_St | |
|  | STR-314205/B-Enhanced Memory Method Descriptions | | MBORREL4: Added REQ-233879 | |
|  | MD-REQ-199794/B-EnMemProfilePairing\_Rq | | MBORREL4: Updated for PaaK. Added EnterPhoneAssoc and DisassociatePhone encodings | |
|  | MD-REQ-199804/B-EnMemKeyPairing\_St | | MBORREL4: Updated for PaaK. Added WrongDeviceSelected encoding | |
|  | MD-REQ-233879/A-PersPhonePairing\_St | | MBORREL4: New Method Description | |
|  | STR-310703/C-Functional Definition | | cwu3: Added Associate/Disassociate Phone Functional Req's | |
|  | ENMEM-PIC-322145/B-Enhanced Memory Functional Decomposition Diagram | | cwu3: Added Phone Association Function and Phone Disassociation Function | |
|  | STR-310706/C-Use Cases | | cwu3: Added ENMEM-UC-REQ-232983 | |
|  | ENMEM-UC-REQ-232983/A-Valet Mode Enabled with Enhanced Memory Off | | cwu3: New Use Case describing Valet Mode functionality | |
|  | ENMEM-REQ-202359/B-Available Functions When Enhanced Memory Feature Is On | | cwu3: Added phone to requirement | |
|  | ENMEM-FUN-REQ-199838/B-Create/Add Driver Profile | | cwu3: Added phone association to create process | |
|  | STR-321875/B-Create/Add Driver Profile Function Description | | cwu3: Added phone association | |
|  | ENMEM-PIC-326160/B-Enhanced Memory Create/Add Profile HMI Flow Chart | | cwu3: Added phone association to create process | |
|  | ENMEM-HMI-REQ-199856/B-Enhanced Memory HMI Indications for Driver Profile | | cwu3: Added associated phone icon | |
|  | ENMEM-HMI-REQ-199893/B-Edit Driver Profile | | cwu3: Added phone association and phone disassociation | |
|  | ENMEM-PIC-326159/B-Enhanced Memory Associate Keyfob HMI Flow Chart | | MBORREL4: Updated to include WrongDeviceSelected option | |
|  | ENMEM-UC-REQ-199843/C-Associate Keyfob to a Driver Profile | | cwu3: Replaced active profile with chosen profile in post-condition | |
|  | STR-321536/C-Requirements | | cwu3: Added REQ-234053 & REQ-234054 | |
|  | ENMEM-REQ-199906/B-Keyfob Association Error | | cwu3: Added phone association | |
|  | ENMEM-TMR-REQ-199905/B-T\_FobAssocTotal2 | | cwu3: Added phone so this timer can be used for both fob and phone association | |
|  | ENMEM-REQ-234053/A-Detection of Wrong Device in Keyfob Association Mode | | cwu3: New for after adding phone association to Enhanced Memory | |
|  | ENMEM-HMI-REQ-234054/A-Enhanced Memory HMI Notification and Option for Wrong Device | | cwu3: New to specify HMI actions when wrong device is selected in association process | |
|  | ENMEM-REQ-199913/B-Disassociate Keyfob and Phone when a Driver Profile is deleted | | cwu3: Added phone to requirement and title | |
|  | ENMEM-FUN-REQ-232251/A-Associate Phone | | cwu3: New for associate phone function | |
|  | ENMEM-PIC-392072/A-Enhanced Memory Associate Phone HMI Flow Chart | | cwu3: New to provide design aid for associate phone HMI flow chart. | |
|  | ENMEM-UC-REQ-232252/A-Associate Phone to a Driver Profile | | cwu3: New for phone association | |
|  | ENMEM-UC-REQ-232253/A-Attempt to Associate Already Associated Phone | | cwu3:New for phone association | |
|  | ENMEM-UC-REQ-232254/A-Attempt to Associate a Non-Registered Phone | | cwu3: New for phone association | |
|  | ENMEM-UC-REQ-232255/A-User Aborts or System Cancel Event Occurs During Phone Association Process | | cwu3: New for phone association | |
|  | ENMEM-REQ-232258/A-Phone Association Error | | cwu3: New for phone association | |
|  | ENMEM-REQ-232260/A-Phone Association Timer Expired | | cwu3:: New for phone association | |
|  | ENMEM-HMI-REQ-232261/A-Enhanced Memory HMI Notification of Phone Association Abort | | cwu3: New to add Enhanced Memory HMI Notification when phone association is aborted | |
|  | ENMEM-REQ-232262/A-Phone Association Failed | | cwu3: New for phone association | |
|  | ENMEM-HMI-REQ-232263/A-Enhanced Memory HMI Audible Notification of Successful Phone Association | | cwu3: new for Enhanced Memory HMI Audible Notification of Successful Phone Association | |
|  | ENMEM-REQ-232264/A-Successful Phone Association Status | | cwu3: New Phone Association Status | |
|  | ENMEM-REQ-232267/A-Detection of Associated Phone | | cwu3: New to specify EnhancedMemoryProfleServer to detect an already associated keyfob and to inform EnhancedMemoryInterfaceClent | |
|  | ENMEM-HMI-REQ-232266/A-Enhanced Memory HMI Option for Associated Phone | | cwu3: New to specify the option for an associated keyfob | |
|  | ENMEM-REQ-232265/A-Overwrite Associated Phone | | cwu3: New for Phone Overwrite in phone association process | |
|  | ENMEM-REQ-232268/A-Phone Association Mode | | cwu3:New for phone association | |
|  | ENMEM-SR-REQ-232269/A-PersIndex Used for Phone Association | | cwu3:New Requirement to clarify mapping between keyfob and Driver Profile index | |
|  | ENMEM-REQ-234052/A-Detection of Wrong Device in Phone Association Mode | | cwu3: New for phone association | |
|  | ENMEM-HMI-REQ-234054/A-Enhanced Memory HMI Notification and Option for Wrong Device | | cwu3: New to specify HMI actions when wrong device is selected in association process | |
|  | ENMEM-SD-REQ-232271/A-Associate Phone | | cwu3: New for phone association | |
|  | ENMEM-UC-REQ-232274/A-Disassociate Phone from Driver Profiles after Phone Is Erased or Revoked from a Vehicle | | cwu3: New use case for fob disassociation due to phone erase process | |
|  | ENMEM-REQ-232275/A-Disassociate Keyfob and Phone when a Driver Profile is deleted | | cwu3: Added phone to requirement and title | |
|  | ENMEM-REQ-232276/A-Phone Disassociation Status | | cwu3: New for Phone Disassociation Status | |
|  | ENMEM-REQ-232277/A-Disassociate the Phone per User Request | | cwu3: New to call out a phone disassociation request for the user's request | |
|  | STR-392140/A-Activity Diagrams | | cwu3: New for phone disassociation | |
|  | ENMEM-SD-REQ-232278/A-Disassociate Phone | | cwu3: New for phone disassociation | |
|  | STR-310731/B-Delete Driver Profile Function Description | | cwu3:Added automatic phone disassociation when a Profile is delegated | |
|  | ENMEM-PIC-324193/B-Delete Driver Profile Functional Decomposition Diagram | | cwu3: Added automatic phone disassociation when a Profile is delegated | |
|  | ENMEM-UC-REQ-199848/B-Delete a Driver Profile | | cwu3: Added automatic phone disassociation when a Profile is deleted | |
|  | ENMEM-REQ-199913/B-Disassociate Keyfob and Phone when a Driver Profile is deleted | | cwu3: Added phone to requirement and title | |
|  | ENMEM-ACT-REQ-199917/B-Delete Driver Profile | | cwu3: Added automatic phone disassociation when a Profile is deleted | |
|  | ENMEM-SD-REQ-199923/B-Delete Driver Profile | | cwu3:Added automatic phone disassociation when a Profile is deleted | |
|  | STR-310776/B-Recall Function Description and Interfaces | | cwu3: Add phone detection as one of recall methods | |
|  | ENMEM-PIC-324191/B-Recall Functional Decomposition Diagram | | cwu3: Add phone as one of recall methods | |
|  | STR-310777/C-Use Cases | | cwu3: Added REQ-232343 to REQ-232347 | |
|  | ENMEM-UC-REQ-232343/A-Phone Detection Recall | | cwu3: New for phone recall | |
|  | ENMEM-UC-REQ-232344/A-Phone Recall While Vehicle In Motion | | cwu3: New for phone recall | |
|  | ENMEM-UC-REQ-232345/A-Phone Recall with Enhanced Memory OFF | | cwu3: New for phone recall | |
|  | ENMEM-UC-REQ-226667/B-No Recalls during a Crash Event | | cwu3: Added phone as one of recall methods | |
|  | ENMEM-UC-REQ-199934/B-Recall Last Known Driver Profile With Keypad Code and no Keyfob nor Phone | | cwu3: Added phone as one of recall methods | |
|  | ENMEM-UC-REQ-199935/B-Recall Driver Profile With Keypad Code and IA Key or Phone | | cwu3: Added phone as one of recall methods | |
|  | ENMEM-UC-REQ-199936/B-MyKey Keyfob Overrides Driver Profile Setting | | cwu3: Add Keyfob to title. No content change. | |
|  | ENMEM-UC-REQ-232346/A-MyKey Phone Overrides Driver Profile Setting | | cwu3: New for Mykey phone. | |
|  | ENMEM-UC-REQ-199937/B-Admin Keyfob Does Not Restrict Driver Profile Associated to MyKey | | cwu3: Add Phone | |
|  | ENMEM-UC-REQ-232347/A-Admin Phone Does Not Restrict Driver Profile Associated to MyKey | | cwu3: New for Phone interfaced with MyKey | |
|  | STR-310778/D-Requirements | | cwu3: Added Phone Detection Recall section with ENMEM-REQ-232352/A ENMEM-REQ-232354/A ENMEM-REQ-232355/A ENMEM-REQ-232356/A ENMEM-REQ-232357/A | |
|  | STR-392889/A-Phone Detection Recall | | cwu3: New for phone recall requirements: ENMEM-REQ-232352/A ENMEM-REQ-232354/A ENMEM-REQ-232355/A ENMEM-REQ-232356/A ENMEM-REQ-232357/A | |
|  | ENMEM-REQ-199946/B-Recall Priority | | cwu3: Added phone recall | |
|  | ENMEM-REQ-199948/B-Positional Settings Recall | | cwu3: added more information to clarify what "unassociated Memory Seat button" means | |
|  | ENMEM-ACT-REQ-199953/B-Recall Driver Profile Via Keyfob/Phone | | MBORREL4: Updated for Phone Recall | |
|  | ENMEM-SD-REQ-199956/B-Recall Driver Profile Via Keyfob/Phone | | MBORREL4: Updated for phone recall | |
|  | STR-321867/B-Opt-Out Function Description | | cwu3: Revised to add phone | |
|  | ENMEM-PIC-324192/B-Opt-Out Functional Decomposition Diagram | | cwu3: Added Disassociation Phone Function | |
|  | ENMEM-UC-REQ-199849/B-Opt-Out Enhanced Memory via Master Reset | | cwu3: Added phone | |
|  | ENMEM-ACT-REQ-199918/B-Opt-Out via Master Reset | | cwu3: Added phone disassociation | |
|  | ENMEM-SD-REQ-199924/B-Opt-Out via Master Reset | | cwu3: Added phone disassociation | |
|  | ENMEM-REQ-199871/B-Button Press in Driver Memory Seat Button Association Mode | | MBORREL4: Removed Memory\_Cmd from req and changed "should" to "shall" in 1st paragraph. | |
|  | STR-310817/B-Appendix: Reference Documents | | cwu3: Added Paak spec | |
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| **January 24, 2017** | **3.1** | **Updated Release** |  | |
|  | STR-310686/B-Purpose of Specification | | wstephe1: Updated to reflect Enhance Memory feature ownership change | |
|  | ENMEM-HMI-REQ-233264/B-Phone Association HMI Option | | MBORREL4: Updated to include new signal name | |
|  | ENMEM-REQ-203519/C-Enhanced Memory Feature Interface Requirement | | wstephe1: Updated to add method PaaKConnection\_St | |
|  | STR-314205/C-Enhanced Memory Method Descriptions | | wstephe1: Added signal MD-REQ-238321-PaakConnection\_St | |
|  | MD-REQ-238321/A-PaakConnection\_St | | wstephe1: Added method description to indicate whether a PaaK device (phone) is connected | |
|  | ENMEM-REQ-199902/B-Keyfob Association Failed | | MBORREL4: Removed recalls from memory seat button during keyfob association. That is no longer allowed | |
|  | ENMEM-REQ-232262/B-Phone Association Failed | | MBORREL4: Removed recalls from memory seat button during phone association. That is no longer allowed | |
|  | ENMEM-REQ-239418/A-Phone Revoked Status | | cwu3: New for Phone Revoked Status | |
|  | ENMEM-UC-REQ-199848/C-Delete a Driver Profile | | MBORREL4: Corrected keyfob/phone disassociation post conditions | |
|  |  |  |  | |
| **November 30, 2020** | **3.2** | **Updated Release** | **Changes to decouple from dependency of profile creation on DSM and memory seat buttons** | |
|  | STR-310690/B-Scope of Specification | | wstephe1: Updated to fix typos (Chat to Chart). | |
|  | STR-326830/B-Document Structure | | wstephe1: Updated to fix typos (Chat to Chart). | |
|  | STR-310687/C-Feature Overview | | wstephe1: Updated overview to allow to conditionally require button association only "when equipped" Updated optional associations verbiage to include "or phones" | |
|  | STR-312428/D-Functional Requirements | | wstephe1: Adding requirement (ENMEM-REQ-404205) for a unique configuration of the EM Interface Client for the presence of positional memory (i.e. "Classic" memory) | |
|  | ENMEM-REQ-201961/C-Create Driver Profile | | wstephe1: Update requirement to allow for profile creation when driver memory seat buttons are not present. | |
|  | ENMEM-REQ-199758/B-Associate Driver Profiles to Driver Memory Seat Buttons | | wstephe1: Update requirement to allow for profile creation when driver memory seat buttons are not present. | |
|  | ENMEM-REQ-404205/A-Determining Positional Memory Presence | | wstephe1: Adding requirement for a unique configuration of the EM Interface Client for the presence of positional memory (i.e. "Classic" memory) | |
|  | STR-312430/C-HMI Requirements | | wstephe1: Added REQ-233260 for keyfob and phone association specifically during profile creation. | |
|  | ENMEM-HMI-REQ-199777/B-Enhanced Memory HMI Driver Profile Identification | | wstephe1: Updated to accommodate profiles with no positional memory (i.e. Classic memory present). | |
|  | ENMEM-SR-REQ-199753/C-Enhanced Memory Feature Inclusion Guidelines | | wstephe1: Bullet point about remotely activating a setting prior to reliable driver ID removed per K. Schmidt as no longer applicable. | |
|  | ENMEM-REQ-199773/C-Retain Enhanced Memory Settings After Software Reflash | | wstephe1: Updated to add reference to OTA software updates | |
|  | MD-REQ-238321/B-PaaKConnection\_St | | cwu3: change Logic name typo (Paak) to PaaK. No content changes. | |
|  | MD-REQ-199807/B-VehicleSpeed\_St | | asimukhi: revised to update the Logical-Physical Mapping Attachement I | |
|  | STR-318491/B-Enable and Disable Function Description | | wstephe1: Updated to allow for presence of Enhanced Memory without classic memory | |
|  | ENMEM-FUN-REQ-199838/C-Create/Add Driver Profile | | wstephe1: Updated to reflect allowing profile creation without memory seat buttons if not present and without classic memory | |
|  | STR-321875/C-Create/Add Driver Profile Function Description | | wstephe1: Updated to allow profile creation without memory seat buttons when they are not present | |
|  | ENMEM-UC-REQ-199839/B-Create a Driver Profile (with EnhancedMemoryPositionClient) | | wstephe1 Revised to become use case with DSM (positional memory vs. added use case to capture without DSM. | |
|  | ENMEM-UC-REQ-404224/A-Create a Driver Profile (without EnhancedMemoryPositionClient) | | wstephe1 Added use case for profile creation without DSM (positional memory) | |
|  | ENMEM-HMI-REQ-199777/B-Enhanced Memory HMI Driver Profile Identification | | wstephe1: Updated to accommodate profiles with no positional memory (i.e. Classic memory present). | |
|  | ENMEM-HMI-REQ-199856/C-Enhanced Memory HMI Indications for Driver Profile | | wstephe1: updated to account for optional presences of memory seat buttons | |
|  | ENMEM-REQ-199858/B-EnhancedMemoryInterfaceClient to Retain Settings After Software Reflash | | wstephe1: Revised to account for OTA updates | |
|  | ENMEM-REQ-206864/B-EnhancedMemoryServers to Retain Settings After Software Reflash | | wstephe1: Revised to account for OTA updates | |
|  | ENMEM-HMI-REQ-199859/B-Maximum Number of Driver Profiles | | wstephe1: Updated for the absence of classic memory or memory seat buttons | |
|  | ENMEM-REQ-199862/B-Alignment between Opt-In Driver Profile and Driver Memory Seat Button | | wstephe1: Updated requirement for profile opt-in's with and without positional memory or memory seat buttons | |
|  | ENMEM-REQ-404230/A-Alignment between Opt-in Driver Profile and Profile Number | | wstephe1: New requirement for profile opt-in's without positional memory or memory seat buttons | |
|  | ENMEM-ACT-REQ-199915/B-Create Driver Profile | | wstephe1: Updated diagram to accommodate profile creation without positional memory or memory seat buttons | |
|  | ENMEM-SD-REQ-199919/C-Create Driver Profile (A Happy Path) | | wstephe1: Updated diagram to accommodate profile creation without positional memory or memory seat buttons | |
|  | ENMEM-FUN-REQ-204974/B-Delete Driver Profile | | wstephe1: Updated function description. Updated delete use case to delete w/ EM Position client. Added use case for delete w/o EM Position client | |
|  | ENMEM-UC-REQ-199848/D-Delete a Driver Profile (with EnhancedMemoryPositionClient) | | wstephe1: Updated delete use case to delete w/ EM Position client. | |
|  | ENMEM-UC-REQ-404253/A-Delete a Driver Profile (without EnhancedMemoryPositionClient) | | wstephe1: Added use case for delete w/o EM Position client | |
|  | ENMEM-REQ-199868/B-Do Not Enter Driver Memory Seat Button Association Mode When Editing Name | | wstephe1: update to account for no DSM present | |
|  | ENMEM-UC-REQ-199926/B-Driver Memory Seat Button Press Recall with Enhanced Memory OFF | | wstephe1: Revised precondition to call out presences of EM Position Client (DSM) | |
|  | ENMEM-UC-REQ-199927/B-Driver Memory Seat Button Press Recall | | wstephe1: Revised precondition to call out presences of EM Position Client (DSM) | |
|  | ENMEM-UC-REQ-199928/B-Driver Memory Seat Button Press Recall While Vehicle In Motion | | wstephe1: Revised precondition to call out presences of EM Position Client (DSM) | |
|  | ENMEM-UC-REQ-199929/B-Driver Memory Seat Button Recall of the Active Driver Profile | | wstephe1: Revised precondition to call out presences of EM Position Client (DSM) | |
|  | ENMEM-UC-REQ-199958/B-Driver Memory Seat Button Store Recall with Enhanced Memory OFF | | wstephe1: Revised precondition to call out presences of EM Position Client (DSM) | |
|  | ENMEM-UC-REQ-199959/B-Driver Memory Seat Button Store Recall of an Alternate Associated Profile | | wstephe1: Revised precondition to call out presences of EM Position Client (DSM) | |
|  | ENMEM-UC-REQ-199960/B-Driver Memory Seat Button Store Recall of the Active Driver Profile | | wstephe1: Revised precondition to call out presences of EM Position Client (DSM) | |
|  | ENMEM-UC-REQ-199961/B-Driver Memory Seat Button Store Recall of Unassociated Button | | wstephe1: Revised precondition to call out presences of EM Position Client (DSM) | |
|  | ENMEM-UC-REQ-199930/B-HMI Menu Recall | | wstephe1: Revised note to call out presences of EM Position Client (DSM) | |
|  | ENMEM-UC-REQ-199933/B-Keyfob Recall with Enhanced Memory OFF | | wstephe1: Revised precondition to call out presences of EM Position Client (DSM) | |
|  | ENMEM-SD-REQ-199954/B-Recall Driver Profile Via Driver Memory Seat Button | | wstephe1: Update preconditions to call out presence of DSM | |
|  | ENMEM-SD-REQ-199965/B-Driver Memory Seat Button Store Recall | | wstephe1: Update preconditions to call out presence of DSM | |
|  | ENMEM-UC-REQ-199849/C-Opt-Out Enhanced Memory via Master Reset (with EnhancedMemoryPositionClient) | | wstephe1: Updated title and precondition to distinguish as Opt-Out UC with DSM present | |
|  | ENMEM-UC-REQ-404264/A-Opt-Out Enhanced Memory via Master Reset (without EnhancedMemoryPositionClient) | | wstephe1: Added use case to denote as Opt-Out UC without DSM present | |
|  | ENMEM-REQ-199882/B-Copy Request | | wstephe1: Updated to allow for profile number with no MSB present | |
|  | ENMEM-REQ-199883/B-Driver Profile Index for Copy Command | | wstephe1: Updated to allow for profile with or without positional memory and MSB and describes distinction in COPY command as such | |
|  | ENMEM-REQ-199887/B-Request Exit Driver Memory Seat Button Association Mode After Copy | | wstephe1: Updated to allow for conditional Tx of exit button association. | |
|  | ENMEM-REQ-199888/B-Recall New Driver Profile After Copy | | wstephe1: Update to allow for recalls that do not included exiting button pairing due to lack of DSM and MSB. | |
|  | ENMEM-REQ-199892/B-Storing Positional Settings after Copy | | wstephe1: Updated to make Infotainment store conditional on presence of positional memory. | |
|  | ENMEM-FUN-REQ-204942/B-Associate Driver Memory Seat Button | | wstephe1: Update of function description to make function required only when DSM and Memory Seat Buttons are present | |
|  | ENMEM-UC-REQ-199842/B-Attempt to Associate Already Associated Driver Memory Seat Button | | wstephe1: Updated precondition for presence of DSM | |
|  | ENMEM-UC-REQ-404265/A-Associate Driver Memory Seat Button via Memory Seat Button | | wstephe1: New use case to reflect profile association to memory seat button via actual button press | |
|  | ENMEM-UC-REQ-404266/A-Associate Driver Memory Seat Button via HMI selection | | wstephe1: New use case to reflect profile association to memory seat button via HMI Screen button press | |
|  | ENMEM-REQ-199868/B-Do Not Enter Driver Memory Seat Button Association Mode When Editing Name | | wstephe1: update to account for no DSM present | |
|  | ENMEM-REQ-404267/A-Button Press via HMI in Driver Memory Seat Button Association Mode | | wstephe1: Add requirement for button press on HMI for profile association selection | |
|  | ENMEM-REQ-404268/A-Driver Memory Seat Button Press Handling | | wstephe1: Add requirement for button press priority between HMI and physical button | |
|  | ENMEM-REQ-199874/B-Successful Driver Memory Seat Button Association | | wstephe1: Revised to add allow for button press status from seat buttons on door or in HMI screen. | |
|  | ENMEM-SD-REQ-199920/C-User Chooses a Driver Memory Seat Button That is Already Associated to Another Driver Profile | | wstephe1: Updated precondition for DSM presence. Update SD to reflect HMI screen association of memory seat buttons. | |
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| **May 3, 2021** | **4.0** | **Updated Release** | **Major update to add Functions to support association of NFC Key for recall. Adding Connected data analytics and Functional Safety status** | |
|  | STR-312357/C-Definitions | | wstephe1: Added definitions for NFC Key | |
|  | STR-310691/C-Acronyms and Abbreviations | | wstephe1: Updates to acronyms and terms for NFC updates | |
|  | STR-310687/D-Feature Overview | | wstephe1: Updated to add references to NFC Key as required | |
|  | STR-310692/B-Feature Requirements | | wstephe1: Adding section for Functional Safety; Adding section for data analytics | |
|  | ENMEM-REQ-201660/C-Enhanced Memory Functions | | wstephe1: Updated to add references to NFC Key as required | |
|  | ENMEM-REQ-199761/C-Methods to Recall a Driver Profile | | wstephe1: Updated to add references to NFC Key as required | |
|  | ENMEM-REQ-199763/C-Active Driver Profile in Different Recall Events | | wstephe1: Updated to add references to NFC Key as required | |
|  | ENMEM-REQ-199764/C-Default Active Driver Profile | | wstephe1: Updated to add references to NFC Key as required | |
|  | ENMEM-REQ-199788/C-Opt-Out Enhanced Memory Feature | | wstephe1: Updated to add references to NFC Key as required | |
|  | ENMEM-REQ-199760/C-Optional Keyfob Association to a Driver Profile | | wstephe1: Splitting requirement into 3 req'ts to address keyfob (here), phone (REQ-404655) and digital key-NFC (REQ-404656) separately. | |
|  | ENMEM-REQ-404655/A-Optional Phone Association to a Driver Profile | | wstephe1: Adding req't, split from ENMEM-REQ-199760, to capture optional phone association. NO change in req't just capturing keyfob and phone in separate requirements | |
|  | ENMEM-REQ-404656/A-Optional NFC Key Association to a Driver Profile | | wstephe1: Adding req't, to capture optional digital key (NFC) association to driver profile | |
|  | ENMEM-REQ-409953/A-N\_NumberOfKeys | | wstephe1: Added requirement for max number of NFC Keys variable definition | |
|  | ENMEM-REQ-201962/C-Disassociate a Keyfob, Phone or NFC Key from a Driver Profile | | wstephe1: Updated to add NFC Key reference to function call and disassociation | |
|  | ENMEM-REQ-199787/C-Delete a Driver Profile | | wstephe1: Updated to add references to NFC Key as required | |
|  | ENMEM-REQ-404657/A-NFC Key Driver Profile Association Support | | wstephe1: Added enhance memory feature requirement defining NFC requirement to support profile association | |
|  | ENMEM-HMI-REQ-201980/C-Indication of Existing Driver Profile Status | | wstephe1: Updated to add references to NFC Key as required | |
|  | ENMEM-HMI-REQ-199780/C-Indication of Operation Status | | wstephe1: Updated to add references to NFC Key as required | |
|  | ENMEM-HMI-REQ-199781/C-Indication of Association Status | | wstephe1: Updated to add references to NFC Key as required | |
|  | ENMEM-REQ-201981/C-Overwrite for Keyfob, Phone, and NFC Key Association | | wstephe1: Updated to add references to NFC Key as required | |
|  | ENMEM-REQ-199786/C-Overwrite or Restart Keyfob, Phone, and NFC Key Association | | wstephe1: Updated to add references to NFC Key as required | |
|  | ENMEM-HMI-REQ-199782/C-Multiple Opportunities for Association | | wstephe1: Updated to add NFC Key reference | |
|  | ENMEM-REQ-199785/C-N\_NumberOfRetries | | wstephe1: Updated to add NFC Key reference | |
|  | ENMEM-TMR-REQ-199783/C-T\_FobAssocOneTime | | wstephe1: Updated timer description to include NFC Key | |
|  | ENMEM-TMR-REQ-199784/C-T\_FobAssocTotal | | wstephe1: Updated timer description to include NFC Key | |
|  | ENMEM-HMI-REQ-233260/B-Keyfob, Phone, & NFC Key Association During Profile Creation | | wstephe1: Updated to include NFC Key association | |
|  | ENMEM-REQ-416380/A-Selection of Functions for HARA | | wstephe1: Addition of functional safety requirement to document 1.) Enhanced Memory as NOT an item and 2.) Captue items that use EM and whether there are FSR or TSR cascades. | |
|  | ENMEM-REQ-416381/A-Cloud Connectivity Data Analytics | | wstephe1: Adding data analytics collection to EM feature spec to define what the enhanced memory feature should capture | |
|  | ENMEM-FUR-REQ-416429/A-Cloud Connectivity Data Elements | | wstephe1: Adding data analytics collection to EM feature spec to define the data elements to be collected where feasible | |
|  | ENMEM-CLD-REQ-199791/C-Enhanced Memory Profile Server | | wstephe1: Updated to add NFC Key changes | |
|  | ENMEM-REQ-203519/D-Enhanced Memory Feature Interface Requirement | | wstephe1: Updated to add interface for new NFC key to support new associate and disassociate functions | |
|  | ENMEM-DOC-310698/D-Logic Method to Physical Signal Translation Table | | wstephe1: Updated to add interface for new NFC key to support new associate and disassociate functions | |
|  | ENMEM-REQ-205033/C-Status Memory Storage Requirement for Profile Server | | wstephe1: Adding PersPhonePairing\_St for PaaK to NVM req't. (previously left off) wstephe1: Adding PersNFCKeyPairing\_St for NFC to NVM req't | |
|  | MD-REQ-199794/C-EnMemProfilePairing\_Rq | | wstephe1: Update method to add logical parameter (signal) for NFC Key pairing | |
|  | MD-REQ-199804/C-EnMemKeyPairing\_St | | wstephe1: Updated to add NFC Key reference to KeyPairing logical parameter | |
|  | MD-REQ-404690/A-PersNFCKeyPairing\_St | | wstephe1: Add method description for communicating NFC key status per profile | |
|  | ENMEM-PIC-322145/C-Enhanced Memory Functional Decomposition Diagram | | wstephe1: Adding decompositions for NFC Key | |
|  | ENMEM-REQ-202359/C-Available Functions When Enhanced Memory Feature Is On | | wstephe1: Updated to add NFC Key reference | |
|  | ENMEM-TMR-REQ-199905/C-T\_FobAssocTotal2 | | wstephe1: Updated to add NFC Key reference | |
|  | ENMEM-REQ-234053/B-Detection of Wrong Device in Keyfob Association Mode | | wstephe1: Updated to include NFC Key | |
|  | ENMEM-HMI-REQ-234054/B-Enhanced Memory HMI Notification and Option for Wrong Device | | wstephe1: Updated req't to add NFC association to wrong device notificatoin | |
|  | ENMEM-REQ-199913/C-Disassociate Keyfob when a Driver Profile is deleted | | wstephe1: Updated keyfob disassociation with profile delete to apply to keyfob only | |
|  | ENMEM-SR-REQ-232269/B-PersIndex Used for Phone Association | | wstephe1: Updated to include auto profile number when no MSB present | |
|  | ENMEM-REQ-234052/B-Detection of Wrong Device in Phone Association Mode | | wstephe1: Updated requirement to add NFC Key | |
|  | ENMEM-HMI-REQ-234054/B-Enhanced Memory HMI Notification and Option for Wrong Device | | wstephe1: Updated req't to add NFC association to wrong device notificatoin | |
|  | ENMEM-REQ-232275/B-Disassociate Phone when a Driver Profile is deleted | | wstephe1: Updated phone disassociation with profile delete to apply to phone only | |
|  | ENMEM-FUN-REQ-404698/A-Associate NFC Key | | wstephe1: New function to add NFC key association to a driver profile | |
|  | STR-835521/A-Associate NFC Key Function Description | | wstephe1: New Function description for NFC Key association | |
|  | ENMEM-PIC-835522/A-Enhanced Memory Associate NFC Key HMI Flow Chart | | wstephe1: New to provide design aid for associate NFC Key HMI flow chart. | |
|  | ENMEM-UC-REQ-404699/A-Associate NFC Key to a Driver Profile | | wstephe1: New use case for NFC Key association | |
|  | ENMEM-UC-REQ-404700/A-Attempt to Associate Already Associated NFC Key | | wstephe1: New use case for NFC Key association | |
|  | ENMEM-UC-REQ-404701/A-Attempt to Associate a Non-Registered NFC Key | | wstephe1: New use case for NFC Key association | |
|  | ENMEM-UC-REQ-404702/A-User Aborts or System Cancel Event Occurs During NFC Key Association Process | | wstephe1: New use case for NFC Key association | |
|  | STR-835524/A-Requirements | | cwu3: Added new REQ-212766 | |
|  | ENMEM-REQ-404703/A-NFC Association Error | | wstephe1: New for NFC Key association | |
|  | ENMEM-REQ-404704/A-NFC Association Timer Expired | | wstephe1: New for NFC Key association | |
|  | ENMEM-HMI-REQ-404705/A-Enhanced Memory HMI Notification of NFC Key Association Abort | | wstephe1: New to add Enhanced Memory HMI Notification when NFC Key association is aborted | |
|  | ENMEM-REQ-404706/A-NFC Association Failed | | wstephe1: adding requirements based on NFC | |
|  | ENMEM-HMI-REQ-404707/A-Enhanced Memory HMI Audible Notification of Successful NFC Key Association | | wstephe1: New req't for Enhanced Memory HMI Audible Notification of Successful NFC Association similar to phone | |
|  | ENMEM-REQ-404708/A-Successful NFC Key Association Status | | wstephe1: New NFC successful association status definition | |
|  | ENMEM-TBL-880588/A-Mapping of Logical Parameter to Profile and Key Number | | wstephe1: New requirement table define the mapping of Index/status signals to proflie and key number | |
|  | ENMEM-IR-REQ-415898/A-NFC Key Association Status Periodicity | | wstephe1: New requirement for how quickly to rotate through NFC associations for each profile | |
|  | ENMEM-TMR-REQ-415899/A-T\_NFCAssocStatTime | | wstephe1: New timing req't for sending NFC Assoctioan status | |
|  | ENMEM-REQ-404709/A-Detection of Associated NFC Key | | wstephe1: New to requirement for detecting already associate NFC Key | |
|  | ENMEM-HMI-REQ-404710/A-Enhanced Memory HMI Option for Associated NFC Key | | wstephe1: New req't to specify the option for an associated NFC Key | |
|  | ENMEM-REQ-404711/A-Overwrite Associated NFC Key | | wstephe1: New requirement updated for NFC Overwrite | |
|  | ENMEM-REQ-404712/A-NFC Key Association Mode | | wstephe1: New for defining NFC Key association | |
|  | ENMEM-SR-REQ-404713/A-PersIndex Used for NFC Key Association | | wstephe1: New Requirement to clarify mapping between NFC Key and Driver Profile index | |
|  | ENMEM-REQ-404714/A-Detection of Wrong Device in NFC Key Association Mode | | wstephe1: New requirement for wrong device while in NFC association | |
|  | ENMEM-HMI-REQ-234054/B-Enhanced Memory HMI Notification and Option for Wrong Device | | wstephe1: Updated req't to add NFC association to wrong device notificatoin | |
|  | ENMEM-ACT-REQ-404716/A-Associate NFC Key To Driver Profile | | wstephe1: New activity diagram for NFC Key association | |
|  | ENMEM-SD-REQ-404717/A-Associate NFC Key | | wstephe1: New sequence diagram for NFC Key association | |
|  | ENMEM-FUN-REQ-404718/A-Disassociate NFC Key | | wstephe1: New function to add disassociate from NFC key function | |
|  | STR-835541/A-Disassociate NFC Key Description | | wstephe1: New for disassociate NFC Key description narrative | |
|  | ENMEM-PIC-835542/A-Disassociate NFC Key Functional Decomposition Diagram | | wstephe1: New to provide Disassociate NFC Key Functional Decomposition Diagram | |
|  | STR-835543/A-Use Cases | | cwu3: Deleted ENMEM-UC-REQ-199844/A-Attempt to Associate Already Associated Keyfob. REQ-199844 is listed in other section and should not be duplicated in this section. | |
|  | ENMEM-UC-REQ-404719/A-Disassociate NFC Key from a Driver Profile | | wstephe1: New use case for Disassociate NFC Key Function | |
|  | ENMEM-UC-REQ-404720/A-Disassociate NFC Key from Driver Profiles after NFC Key Is Erased or Revoked from a Vehicle | | wstephe1: New use case for NFC disassociation due to NFC erase from vehicle | |
|  | ENMEM-REQ-404721/A-Disassociate NFC Key when a Driver Profile is deleted | | wstephe1: Added req't for disassociation upon profile deletion | |
|  | ENMEM-REQ-404722/A-NFC Key Disassociation Status | | wstephe1: New for NFC Key Disassociation Status | |
|  | ENMEM-REQ-404723/A-Disassociate NFC Key per User Request | | wstephe1: New to call out a NFC Key disassociation request for the user's request | |
|  | ENMEM-REQ-404724/A-NFC Key Revoked Status | | wstephe1: New for NFC Key Revoked Status | |
|  | STR-835547/A-Activity Diagrams | | cwu3: New for phone disassociation | |
|  | ENMEM-SD-REQ-404725/A-Disassociate NFC Key | | wstephe1: New sequence diagram for NFC Key disassociation | |
|  | ENMEM-FUN-REQ-204974/C-Delete Driver Profile | | wstephe1: Update function description to include NFC; Updated decomposition table to add disassociate NFC key; Update use cases to add NFC Update Req'ts to split disassociate on delete into 3 separate for keyfob, phone, and NFC | |
|  | ENMEM-UC-REQ-199848/E-Delete a Driver Profile (with EnhancedMemoryPositionClient) | | wstephe1: Update use case to include NFC | |
|  | ENMEM-UC-REQ-404253/B-Delete a Driver Profile (without EnhancedMemoryPositionClient) | | wstephe1: Update use case to include NFC | |
|  | ENMEM-REQ-199913/C-Disassociate Keyfob when a Driver Profile is deleted | | wstephe1: Updated keyfob disassociation with profile delete to apply to keyfob only | |
|  | ENMEM-REQ-232275/B-Disassociate Phone when a Driver Profile is deleted | | wstephe1: Updated phone disassociation with profile delete to apply to phone only | |
|  | ENMEM-REQ-404721/A-Disassociate NFC Key when a Driver Profile is deleted | | wstephe1: Added req't for disassociation upon profile deletion | |
|  | STR-310776/C-Recall Function Description and Interfaces | | wstephe1: Update function description paragraph to add NFC as described key device recall method. Also updated functional decomposition diagram/table | |
|  | ENMEM-FUN-REQ-204918/B-Opt-Out | | wstephe1: Update function description and decomposition diagram to include NFC. Update use cases to include NFC | |
|  | ENMEM-UC-REQ-199849/D-Opt-Out Enhanced Memory via Master Reset (with EnhancedMemoryPositionClient) | | wstephe1: Updated use case to add NFC references | |
|  | ENMEM-UC-REQ-404264/B-Opt-Out Enhanced Memory via Master Reset (without EnhancedMemoryPositionClient) | | wstephe1: Updated use case to add NFC references | |
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| **July 29, 2021** | **4.1** | **Updated Release** | **Updated/Finalized requirements for NFC association to profile including recall, delete, and master reset diagrams. Added EM NFC Server Class description** | |
|  | ENMEM-REQ-199761/D-Methods to Recall a Driver Profile | | wstephe1: Update req't to add NFC interior tap and generalize HMI recall | |
|  | ENMEM-REQ-199762/C-Operations Shall Not Recall a Driver Profile | | wstephe1: Update req't to add NFC Key references | |
|  | ENMEM-REQ-404657/B-NFC Key Driver Profile Association Support | | wstephe1: Updated wording of NFC Key authorization and adding interior tap reference | |
|  | ENMEM-HMI-REQ-233264/C-Phone Association HMI Option | | wstephe1: Wording change from "both" to all for popup selection | |
|  | ENMEM-HMI-REQ-233260/C-Keyfob, Phone, & NFC Key Association During Profile Creation | | MBORREL4: Updated to include NFC in the bulleted items | |
|  | ENMEM-HMI-REQ-427495/A-Association During Profile Creation - Checkbox Method | | MBORREL4: New req. for NFC | |
|  | ENMEM-CLD-REQ-434188/A-Enhanced Memory NFC Server | | wstephe1: New Class Description for the NFAM module to send all NFC Keys to APIM for unlinking from EM profile and showing which and how many NFC keys are linked to a profile. | |
|  | ENMEM-DOC-310696/B-Physical Mapping of Classes | | wstephe1: Update class description mapping to add NFAM and update list of EM Servers | |
|  | ENMEM-REQ-203519/E-Enhanced Memory Feature Interface Requirement | | wstephe1: Added Method Description Interface to retrieve NFC Key List: MD-REQ-404938, MD-REQ-404939, MD-REQ-426998, MD-REQ-426999 | |
|  | ENMEM-DOC-310698/E-Logic Method to Physical Signal Translation Table | | wstephe1: Updated to add MD's (404938, 404939, 426998, 426999) | |
|  | STR-314205/E-Enhanced Memory Method Descriptions | | wstephe1: Added signals for NFC interface based on NFC feature: MD-REQ-404938-DigitalKeyList\_Rq MD-REQ-404939-DigitalKeyList\_Rsp MD-REQ-426998-NFCDeviceTapPaired\_St MD-REQ-426999-NFCDeviceTap\_Rq | |
|  | MD-REQ-404938/B-DigitalKeyList\_Rq | | MBORREL4: Changed signal name | |
|  | MD-REQ-404939/B-DigitalKeyList\_Rsp | | MBORREL4: Added CAK to DeviceType, PairingID to Vector. Changed signal name | |
|  | MD-REQ-426998/A-NFCDeviceTapPaired\_St | | MBORREL4: New req. | |
|  | MD-REQ-426999/A-NFCDeviceTap\_Rq | | MBORREL4: New req. | |
|  | ENMEM-UC-REQ-404699/B-Associate NFC Key to a Driver Profile | | wstephe1: Updated UC reference of exception use case calling it unauthorized ilo Non-registered | |
|  | ENMEM-UC-REQ-404701/B-Attempt to Associate an Unauthorized NFC Key | | wstephe1: Updated UC title to. unauthorized ilo Non-registered | |
|  | ENMEM-REQ-427326/A-NFC Key Association - Unauthorized Device Tapped | | MBORREL4: New req. for NFC | |
|  | ENMEM-REQ-404712/B-NFC Key Association Mode | | wstephe1: Updated to limit NFC Key association to an interior tap only | |
|  | ENMEM-ACT-REQ-404716/B-Associate NFC Key To Driver Profile | | wstephe1: Update activity diagram to include EM NFC Server to include NFC validity | |
|  | ENMEM-SD-REQ-404717/B-Associate NFC Key | | wstephe1: Update sequence diagram to include EM NFC Server to include NFC validity | |
|  | ENMEM-REQ-427474/A-Requesting the NFC Key List | | MBORREL4: New req. for NFC | |
|  | ENMEM-REQ-427475/A-Display Associated NFC Key Names | | MBORREL4: New req. for NFC | |
|  | ENMEM-REQ-427477/A-Display Associated NFC Key Names - Index Mismatch | | MBORREL4: New req. for NFC | |
|  | ENMEM-ACT-REQ-434380/A-Display NFC Key Associations | | wstephe1: New req. for NFC. Diagram derived from EM Interface Client SPSS (APIM) created by mborrel4 due to need to display list of associated NFC's to user | |
|  | ENMEM-SD-REQ-404725/B-Disassociate NFC Key | | wstephe1: Updated Seq Diag to now contain additional not clarifying that carryover EnMemKeyPairing\_St from BCM is used for response to associate/disassociate just like keyfob and PaaK. | |
|  | ENMEM-SD-REQ-434386/A-Display NFC Key Associations | | wstephe1: New req. for NFC. Diagram derived from EM Interface Client SPSS (APIM) created by mborrel4 due to need to display list of associated NFC's to user | |
|  | ENMEM-ACT-REQ-199917/C-Delete Driver Profile | | wstephe1: Updated diagram to account for NFC disassociation upon profile deletion | |
|  | ENMEM-SD-REQ-199923/C-Delete Driver Profile | | wstephe1: Updated diagram to account for NFC disassociation upon profile deletion | |
|  | STR-310776/D-Recall Function Description and Interfaces | | wstephe1: Updated function description for clarity of distinction of 3 user methods (MSB, Ignition key device, HMI menu) | |
|  | ENMEM-UC-REQ-232345/B-Phone Recall with Enhanced Memory OFF | | wstephe1: Update to include precondition of DSM present (EM Position Client) | |
|  | ENMEM-UC-REQ-434195/A-NFC Key Recall via Exterior Reader with No Passive Key Present | | wstephe1: New use case to support NFC Key recall behavior | |
|  | ENMEM-UC-REQ-434419/A-NFC Key Recall via Exterior Reader - No PK with Enhanced Memory Off | | wstephe1: New use case to support NFC Key recall behavior | |
|  | ENMEM-UC-REQ-434216/A-NFC Key Recall via Exterior Reader with Passive Key Present | | wstephe1: New use case to support NFC Key recall behavior | |
|  | ENMEM-UC-REQ-434424/A-NFC Key Recall via Exterior Reader - PK with Enhanced Memory Off | | wstephe1: New use case to support NFC Key recall behavior | |
|  | ENMEM-UC-REQ-434218/A-NFC Key Recall via Interior Reader | | wstephe1: New use case to support NFC Key recall behavior | |
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|  | ENMEM-UC-REQ-226667/C-No Recalls during a Crash Event | | wstephe1: Update scenario to assume user attempt by any recall method | |
|  | STR-310779/C-Keyfob Detection Recall | | wstephe1: Updating structure to show requirements as tables in spec to support tables and figures numbering and captioning. NO requirement changes | |
|  | STR-392889/B-Phone Detection Recall | | wstephe1: Updating structure to show requirements as tables in spec to support tables and figures numbering and captioning. NO requirement changes | |
|  | STR-938570/A-NFC Key Detection Recall | | wstephe1: New table for NFC Key recall requirements: ENMEM-REQ-434473; ENMEM-REQ-434474; ENMEM-REQ-434475; ENMEM-REQ-434476; ENMEM-REQ-434477; ENMEM-REQ-434477 | |
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|  | ENMEM-REQ-199946/C-Recall Priority | | wstephe1: Updated to include NFC Tap priority | |
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|  | ENMEM-HMI-REQ-199950/D-Enhanced Memory HMI Notification for Updating Active Driver Profile | | wstephe1: Small spelling correction "ProfilesOff" instead of "ProfilesOf" | |
|  | ENMEM-ACT-REQ-199953/C-Recall Driver Profile Via Keyfob/Phone/NFC Key | | wstephe1: Update diagram and title to include NFC Key | |
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|  | ENMEM-ACT-REQ-199918/C-Opt-Out via Master Reset | | wstephe1: Update master reset diags to include NFC Key | |
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| **August 16, 2021** | **4.2** | **Updated Release** | **Updates to include “Soft” buttons for Save and Reload/Restore Positionals** | |
|  | ENMEM-REQ-404205/B-Determining Positional Memory Presence | | wstephe1: Updated to add detail for implications of each config as well as provide default configuration. |
|  | ENMEM-REQ-436437/A-Determining Driver Memory Seat Button Presence | | wstephe1: New requirement for adding APIM configuration for the presence or not of memory seat buttons (Driver) |
|  | ENMEM-REQ-436438/A- Memory Seat Button Configuration Dependency | | wstephe1: New requirement to require configuration for no MSB when no DSM is present |
|  | ENMEM-HMI-REQ-434227/A-Recall Driver Profile via HMI Menu | | nrahman9: new requirements for UX soft button changes. |
|  | ENMEM-HMI-REQ-434236/A-Recall Button Availability | | nrahman9: new requirements for UX soft button changes. |
|  | ENMEM-HMI-REQ-434228/A-Store Driver Profile Positional Settings via HMI Menu | | nrahman9: new requirements for UX soft button changes. |
|  | ENMEM-HMI-REQ-434237/A-Positional Store Button Availability | | nrahman9: new requirements for UX soft button changes. | |
|  | ENMEM-REQ-203519/F-Enhanced Memory Feature Interface Requirement | | wstephe1: Updated to add DriverPositionalChange\_St and parameters for UX Buttons and update PaakConnection\_St to change encoding from NoneConnected to NotConnected |
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|  | ENMEM-FUN-REQ-435131/A-Store Positional Settings | | wstephe1: New function to accommodate manual storage of positional settings via HMI |
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# Introduction

## Purpose of Specification

The following feature from the [Global Feature & Function List](https://www.vsemweb.ford.com/tc/launchapp?-attach=true&-s=226TCSession&-o=ZmZNi0JHx3NrTDAAAAAAAAAAAAA) is described in this specification.

| **Feature ID** | **Feature Name** | **Owner** | **Reference** |
| --- | --- | --- | --- |
| F000172 | Enhanced Memory | Walter Stephens (wstephe1@ford.com) | [VDOC041625-Enhanced Memory Feature Specification](https://www.vsemweb.ford.com/tc/launchapp?-attach=true&-s=226TCSession&-o=boRV6owSx3NrTDAAAAAAAAAAAAA) |

This document specifies

* Functionalities of the Enhanced Memory feature from the customer perspective
* Generic electrical/electronic system functional and architectural requirements

This feature specification can be used to define subsystems and component design as well as Netcom signals for each program and for different architectures. This specification alone shall not directly pass to suppliers without additional specifications and other documents.

## Target Audience of Specification

The target audience of this document includes:

* Core Engineers responsible for writing the specifications of Enhanced Memory sub-systems and related components
* Electrical Systems Engineers, System Integration Test Engineers and D&R Engineers conducting breadboard, system and vehicle integration testing and sign off

Component Suppliers are not the target audiences of this document due to the fact this document contains little or no details on physical and program specific information.

## Scope of Specification

The scope of this document is:

* General Feature Requirements
* Logic Architecture Design
* Functional Requirements including Functional Decomposition Diagram, HMI Flow Chart, Use Cases, Activity Diagrams and Sequence Diagrams
* High level HMI Requirements
* Physical mapping of Classes
* Logic Methods to Physical (CAN) signals translation table

Note: No physical level or program specific requirements will be included in this document. Important physical level and program specific specifications and information can be found in the Reference section.

## Document Structure

The structure of this document is explained below:

Change log

Table of Content

**Section 1** – Introduction: Giving an explanation how to use this document including responsibilities and the scope of the document. It explains the terminology and clarifies the definitions, concepts, and abbreviations used in the document

**Section 2** – Feature Description: Stating briefly the background and the purpose of the feature with use of a Feature Context Diagram

**Section 3** – Feature Requirements: Listing high level Feature functional, HMI and non-functional requirements with no implementation or physical layer information

**Section 4** – Feature Architecture:

* Defining architecture via Classes and Logic Methods
* Listing functionalities of each Class
* Defining interfaces among 4 Classes via Logic Methods
* Listing description of Logic Methods
* Providing physical mapping of Class and Logic Methods to Physical (CAN) signals translation table

**Section 5** – Functional Definition:

* Function Decomposition**:** Giving an overview of which functions are necessary to implement this feature, relation between User functions and Logic Functions, relation among Logic Functions, and Functional Decomposition Diagram
* Function Definitions: Giving functional description, Functional Decomposition Diagram, HMI Flow Chart, Use Cases, Requirements, Activity Diagram and Sequence Diagram

**Section 6** – Appendix: Presenting additional data mainly in a tabular form, e.g., a data dictionary, an automatically generated list of requirements or a traceability matrix

Note: No physical level or program specific requirements will be included in this document. Documents of important physical level and program specific specifications and information can be found in the Reference section.

## Terminology

### Definitions

|  |  |
| --- | --- |
| Enhanced Memory | The personalization feature defined in this SPSS which allows a user to create, manage, and recall up to 4 Driver Profiles all containing different positional and non-positional settings configurations. |
| Classic Memory | The original personalization feature which allows a user to store and recall positional settings for 3 drivers. |
| MyKey | Feature allowing a user to restrict a set of vehicle settings for specific vehicle keys |
| Keyfob | A vehicle key with lock, unlock, and alarm functionalities |
| Door Unlock Event | Event from Keyfob/phone Unlock button that triggers a recall request |
| Remote Start Event | Event from Keyfob/phone Remote Start button that triggers a recall request |
| Driving Restriction | HMI restrictions imposed to reduce the distraction risk connected to electronic devices built into a vehicle |
| Driver Profile | A collection of personalized vehicle settings that can be recalled by a user in an Enhanced Memory vehicle |
| Keyfob Association | The process by which a Keyfob is linked to a Driver Profile |
| Keyfob Disassociation | The process by which a Keyfob is unlinked from a Driver Profile |
| Driver Memory Seat Button Association | The process by which a Driver Memory Seat Button is linked to a Driver Profile |
| Positional Settings | Settings personalized by Classic Memory such as driver seat, exterior mirrors, adjustable pedals, the tilt/telescope steering column and Heads-up Display features. The complete list is vehicle dependent. |
| Non-Positional Settings | Settings personalized by Enhanced Memory such as radio presets, language, time, distance units, temperature, navigation, etc. |
| Phone as a Key | Feature that makes phone as a key to remote start vehicle, lock, unlock doors, start Engine, recall Enhanced Memory Driver Profiles and many other keyfob functions |
| Phone Association | The process by which a Phone is linked to a Driver Profile |
| Phone Disassociation | The process by which a Phone is unlinked from a Driver Profile |
| NFC Entry and Starting | A feature that enables a customer to unlock and start their vehicle using an NFC-enabled device (e.g. key card or smartphone) as a vehicle key. |
| NFC Key Association | The process by which an NFC Key is linked to a Driver Profile |
| NFC Key Disassociation | The process by which an NFC Key is unlinked from a Driver Profile |

### Acronyms and Abbreviations

|  |  |
| --- | --- |
| ABS | Automatic Braking System |
| ACC | Accessory |
| Admin Key | Administrator’s Key |
| AHU | Audio Head Unit |
| AHUD | Advanced Heads Up Display |
| APIM | Auxiliary Protocol Interface Module (SYNC Module) |
| BCM | Body Control Module |
| BTMBF | Bass-Treble-Middle-Balance-Fade (Audio Adjustment Settings) |
| CAN | Controller Area Network |
| CAN dB init | Controller Area Network Database Initial Value |
| CES | Command Execution Status |
| CGEA 1.3 | Common Global Electrical Architecture 1.3 |
| D&R | Design and Release Engineer |
| DDM | Driver Door Module |
| DSM | Door Seat Module |
| DSP AMP | Digital Signal Processing Amplifier |
| DTC | Diagnostic Trouble Code |
| ECU | Electronic Control Unit |
| EM | Enhanced Memory |
| FCIM | Front Control Interface Module |
| FS | Feature Specification Document |
| GSDB | Global Signal Database |
| HCM | Headlamp Control Module |
| HMI | Human Machine Interface |
| IA | Intelligent Access Key |
| IKT | Integrated Key Transmitter |
| IPC | Instrument Panel Cluster |
| IPMA | Image Processing Module A |
| MY18 | Model Year 2018 |
| OCC Mode | Occupancy Mode |
| PEPS | Passive Entry Passive Start |
| RKE | Remote Keyless Entry |
| SCV | Speed Compensated Volume |
| VDM | Vehicle Dynamic Module |
| PaaK | Phone as a Key Feature |
| NFC | Near Field Communication |

# Feature Description

## Feature Overview

The Enhanced Memory feature introduces the Driver Profiles concept which extends memory capability of the vehicle from Classic Memory, mainly positional settings, to include many other settings such as radio presets, navigation preferences, and climate control settings.

Enhanced Memory can be summarized as:

* Driver recognition system in which different drivers can have his/her own personalized settings in a vehicle
* Users must “opt-in” to create Driver Profiles. Without opt-in, vehicle will operate as it does normally with no separate Driver Profiles for different drivers
* A Driver Profile must be associated to one of the “Classic Memory” driver seat buttons, when equipped, and can be optionally associated to one or more key fobs or phones
* Upon entry into a vehicle, through Smart Handle or NFC Key or unlock button pressing from a Keyfob or a phone, a driver will be identified, and his/her Driver Profile will be recalled
* Once in a vehicle, the active Driver Profile can be changed by going through Center Stack screen menus, momentarily pressing the Driver Memory Seat button, or pressing a keyfob or a phone unlock button
* If a feature configuration is changed, it will automatically be saved to the active Driver Profile with the exception of Classic Memory positional settings that require the user to press and hold a Driver Memory Seat button (or use a SET button) to save the changed positional settings

## Assumptions & Dependencies

Enhanced Memory is assumed to enhance and extend the Classic Memory feature, which is limited to strictly positional settings, to include and personalize non-positional settings. Technically speaking, vehicles without Classic Memory feature can still personalize non-positional settings with Enhanced Memory feature. In that case, the recall interface will not include the Driver Memory Seat button. However, Marketing and Brand strategy may not favor offering Enhanced Memory to vehicles without Classic Memory.

This specification, chapters 4 & 5 in particular, assumes a distributed system. Modules included in this system (Enhanced Memory) are responsible for auto-saving, recalling, maintaining, and storing the non-positional settings their Feature Owner have agreed to personalize, as defined in the Enhanced Memory Feature List (see references). A central module/interface will not be provided to manage/view all personalized settings.

## Enhanced Memory Context Diagram

The Context Diagram below shows the systems and entities that interact with the Enhanced Memory feature (for example Classic Memory and MyKey).



Figure 1 – Enhanced Memory Context Diagram

# Feature Requirements

## Functional Requirements

### ENMEM-REQ-201660/C-Enhanced Memory Functions

In order to allow the user to recall his or her personal settings, the Enhanced Memory feature shall contain the following functions:

* Opt-In and Opt-Out Enhanced Memory feature
* Enable and Disable Enhanced Memory feature
* Create/add Driver Profiles:
  + Obtain Driver Profile name
  + Associate a Driver Memory Seat button
  + Copy current settings
* Recall Driver Profiles
* Edit Driver Profiles:
  + Change Driver Profile Name
  + Associate keyfob
  + Disassociate keyfob
  + Associate phone if the vehicle is equipped with PaaK Feature
  + Disassociate phone if the vehicle is equipped with PaaK Feature
  + Associate NFC Key
  + Disassociate NFC Key
  + Delete Driver Profiles

### ENMEM-REQ-201674/A-Availability of Enhanced Memory Recall Functions

Enhanced Memory shall allow the user to recall a Driver Profile without the restrictions of vehicle ignition status, transmission status, and driving restriction.

### ENMEM-REQ-199761/D-Methods to Recall a Driver Profile

Enhanced Memory shall provide the following methods to the user for recalling a Driver Profile:

* Pressing the unlock or remote start button on an RKE transmitter (for both IKT and IA Key)
* Opening driver door with Smart Door Handle without pressing unlock button on an IA Key (Push to start engine type of keyfob)
* Opening the driver door via NFC Key
* NFC Key Interior reader detection
* Momentarily pressing a Driver Memory Seat button
* Storing Classic Memory positional settings to a Driver Memory Seat button that had been associated to a Driver Profile
* Selecting to recall a Driver Profile through the Menu Display device
* Creating a Driver Profile
* Pressing the unlock or remote start button on a phone

### ENMEM-REQ-199762/C-Operations Shall Not Recall a Driver Profile

Enhanced Memory shall not allow the following operations to recall a Driver Profile, when Enhanced Memory is enabled:

* Entering a keypad code
* Starting engine with an associated or unassociated keyfob, phone or NFC Key
* Storing positional settings via the Classic Memory Method to a button that has not been associated to a Driver Profile. In this case, the saved Classic Memory positional settings shall be recalled and the Vehicle Profile shall be recalled for applicable soft settings.
* Associating a keyfob, phone or NFC Key to a Driver Profile
* Pressing a Passenger Memory Seat Button

### ENMEM-REQ-199763/C-Active Driver Profile in Different Recall Events

When the Enhanced Memory feature is turned on and the vehicle is not in Driver Memory Seat button association mode, if the user recalls a Driver Profile through a keyfob, a phone, an NFC Key or Driver Memory Seat button that is already associated to a Driver Profile, that particular Driver Profile shall be recalled as the active Driver Profile.

In the event where a device has not been associated to any Driver Profile, the last known Driver Profile shall be recalled as the active Driver Profile.

In the event where a Driver Memory Seat button has not been associated to any Driver Profile, the Vehicle (Guest) profile shall be recalled as the active Driver Profile.

### ENMEM-REQ-199764/C-Default Active Driver Profile

When the Enhanced Memory feature is turned On, Enhanced Memory shall recall the last known Driver Profile as the active Drive Profile in the following use cases:

* There is no profile recall event occurring
* In the event where a profile recall event occurs but the recalled Drive Profile cannot be determined
* In the event where an unassociated keyfob, phone, or NFC Key is used to trigger the unlock door event

When the last known Driver Profile cannot be determined in all of the above scenarios, Enhanced Memory shall recall the Vehicle level Profile (Guest Profile) as the active Driver Profile.

### ENMEM-REQ-199757/A-Recall Vehicle Profile

Enhanced Memory shall recall the Vehicle Profile (Guest Profile) for the following use cases:

* When Enhanced Memory is not enabled because the user does not Opt-In to Enhanced Memory or the user turns Off Enhanced Memory
* The user recalls Guest Profile via the HMI menu while Enhanced Memory is enabled
* The active Profile is deleted while Enhanced Memory is enabled
* An unassociated Driver Memory Seat button is pressed while Enhanced Memory is enabled

### ENMEM-SR-REQ-220733/A-Recall Strategy when Valet Mode is from on to off

When Valet Mode is turned off from on, Enhanced Memory shall recall the active Driver Profile prior to Valet Mode being turned on.

Examples:

If the active Drive Profile was Driver Profile 2 while the Valet Mode was turned on, then Enhanced Memory shall recall Driver Profile 2 once the Valet mode is turned off from on.

If the active Drive Profile was Guest Profile while the Valet Mode was turned on, then Enhanced Memory shall recall Guest Profile once the Valet mode is turned off from on. This example could happen for Enhanced Memory featured was on or off when Valet mode is turned off.

### ENMEM-REQ-199755/A-Numbers of Driver Profiles

Enhanced Memory shall provide the user a defined number, N\_NumberOfProfiles, of Driver Profiles, plus a Guest Profile. The defined number of Driver Profiles for any program/carline shall be the same as the number of that program’s Driver Memory Seat buttons.

### ENMEM-REQ-199756/A-N\_NumberOfProfiles

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | **Description** | **Units** | **Range** | **Resolution** | **Default** |
| N\_NumberOfProfiles | N\_NumberOfProfiles is the number of Driver Profiles available from Enhanced Memory. The Number is program dependent and shall be the same as the number of that program’s Driver Memory Seat buttons |  | 2-5 | 1 | Program dependent |

### ENMEM-REQ-199754/A-Opt-In Enhanced Memory Feature to Create Driver Profile

Opt-in shall be required from the user to enable Enhanced Memory and create the first Driver Profile. Without the opt-in step the user cannot create any Driver Profiles and the vehicle will operate as it does normally without separate Driver Profiles for different drivers.

### ENMEM-REQ-199788/C-Opt-Out Enhanced Memory Feature

Enhanced Memory shall allow the user to opt-out of the Enhanced Memory feature and remove the capability of separate Driver Profiles for different drivers. All existing Driver Profiles, along with the association to keyfobs, phones, and NFC keys, shall be permanently deleted.

### ENMEM-REQ-201676/A-Disable Enhanced Memory

Enhanced Memory shall provide a means to allow the user to switch between Enhanced Memory mode and Classic Memory mode after the user has opted in to Enhanced Memory. A Disable Enhanced Memory function can allow the user to temporarily switch from Enhanced Memory mode to Classic Memory mode in which non-positional settings are not personalized for different users. Unlike opting out of Enhanced Memory, which permanently deletes all Driver Profiles, disabling Enhanced Memory only temporarily removes access to the Enhanced Memory Driver Profiles and all Enhanced Memory functions, allowing the vehicle to revert back to Classic Memory mode.

The Disable Enhanced Memory function shall temporarily remove access to the Enhanced Memory feature until it is enabled once again. All existing Driver Profiles (prior to disabling) shall be restored to the user when Enhanced Memory is enabled.

### ENMEM-REQ-201675/A-Enable Enhanced Memory

Enhanced Memory shall provide a means to allow the user to switch between Enhanced Memory mode and Classic Memory mode after the user has opted in to Enhanced Memory.

Enable Enhanced Memory function shall allow the user to access all existing Driver Profiles and all functions provide by Enhanced Memory feature.

### ENMEM-REQ-201961/C-Create Driver Profile

An Enhanced Memory Driver Profile is a collection of personalized vehicle settings that can be recalled by a user. The process of creating a Driver Profile allows the driver to create a Driver Profile Name and associate the Driver Profile to a Driver Memory Seat button or profile number. The creation process also allows the user to copy the current vehicle settings to the Driver Profile.

* Create/Add Driver Profile function shall solicit a unique Driver Profile name from the user
* Create/Add Driver Profile function shall request the user to associate the Driver profile to a Driver Memory Seat button that has not been associated to any Driver Profile (when Driver Memory Seat buttons are present)
* Create/Add Driver Profile function shall associate the profile to a profile number that has not been associated to any Driver Profile (when no Driver Memory Seat buttons are present).
* Create/Add Driver Profile function shall copy current applicable settings to the Driver Profile
* Create/Add Driver Profile function shall automatically recall the newly created Driver Profile as the active Driver Profile upon completion

### ENMEM-REQ-199758/B-Associate Driver Profiles to Driver Memory Seat Buttons

If vehicle is so equipped, associating a Driver Memory Seat button to a Driver Profile is required in order to create a Driver Profile that includes both positional and non-positional settings. Therefore, if equipped, each Enhanced Memory Driver Profile is requested to be associated to a Driver Memory Seat button.

If vehicle is so equipped, each Driver Profile shall be required to associate to one and only one Driver Memory Seat button. Without associating to a Driver Memory Seat button, a Driver Profile shall not be created.

### ENMEM-REQ-199760/C-Optional Keyfob Association to a Driver Profile

Enhanced Memory shall allow a keyfob to be associated to an available Driver Profile. Each keyfob shall only be associated to one Driver Profile and one Driver Profile shall only be associated to one keyfob.

### ENMEM-REQ-404655/A-Optional Phone Association to a Driver Profile

Enhanced Memory shall allow a phone to be associated to an available Driver Profile. Each phone shall only be associated to one Driver Profile and one Driver Profile shall only be associated to one phone.

### ENMEM-REQ-404656/A-Optional NFC Key Association to a Driver Profile

Enhanced Memory shall allow an NFC Key to be associated to an available Driver Profile. Each NFC key shall only be associated to one Driver Profile.

Enhanced Memory shall allow each Driver Profile to be associated to a maximum of N\_NumberOfKeys NFC Keys

### ENMEM-REQ-409953/A-N\_NumberOfKeys

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | **Description** | **Units** | **Range** | **Resolution** | **Default** |
| N\_NumberOfKeys | N\_NumberOfKeys is the maximum number of NFC Keys that can be associated to a single driver profile |  | 2-8 | 1 | 4 |

### ENMEM-REQ-201962/C-Disassociate a Keyfob, Phone or NFC Key from a Driver Profile

Disassociate Keyfob function shall allow the associated keyfob to be disassociated from a Driver Profile.

Disassociate phone function shall allow the associated phone to be disassociated from a Driver Profile.

Disassociate NFC Key function shall allow an associated NFC key to be disassociated from a Driver Profile.

Once the associated keyfob, phone, or NFC key is disassociated, the keyfob, phone, or NFC key shall not be able to recall any Driver Profile including both positional and non-positional settings. This means a disassociated keyfob, phone, or NFC key cannot to be used to recall Classic Memory settings.

### ENMEM-REQ-199787/C-Delete a Driver Profile

Delete Driver Profile function shall allow the user to delete a Driver Profile one at a time. Once a Driver Profile is deleted, the settings for all personalized features, the association to the Driver Memory Seat button, and the association to the associated Keyfob, the associated phone and associated NFC key(s) shall be permanently erased.

Consequently, deleting a Driver Profile will automatically disassociate that Driver Profile from the associated keyfob, the associated phone and associated NFC key(s). Once a Driver Profile is deleted, pressing that unassociated keyfob, phone or NFC key shall not recall any personalized settings (positional and non-position).

Since there is no “un-save” function for positional settings under Classic Memory, the association of a Driver Memory Seat button to positional settings will remain unchanged once a Driver Profile is deleted. Therefore, pressing a Driver Memory Seat button that used to be associated to a deleted Driver Profile will still recall a set of personalized positional settings.

### ENMEM-REQ-199765/B-MyKey Takes Precedence Over Driver Profile Settings

If a MyKey is the active key or phone in the vehicle, all MyKey restrictions shall remain active regardless of which Driver Profile is active. In the event of any conflict between a MyKey restriction and an Enhanced Memory personalized setting, the MyKey restriction shall over write the personalized setting.

Speed Compensated Radio Volume, Land Departure Warning and Forward Collision Warning are examples of features that are restricted by MyKey. Driver Profile settings of those MyKey restricted features will be overwritten by MyKey restrictions if a MyKey Keyfob or phone is used to start vehicle engine.

### ENMEM-REQ-220734/A-Valet Mode Disables Enhanced Memory Feature

When Valet Mode is turned on, Enhanced Memory shall be disabled in order to prevent Driver Profiles from being changed.

### ENMEM-REQ-199767/A-Enhanced Memory Ignition Restriction

Enhanced Memory shall impose ignition restrictions to the following specific Enhanced Memory operations:

* Create/add Driver Profiles
* Edit Driver Profiles

These operations shall be allowed only when ignition is in Run.

### ENMEM-REQ-232557/A-Phone & Phone-As-A-Key

The association of a phone to a Driver Profile shall be supported by use of the Phone-As-A-Key (PaaK) feature. The phone must be setup, authorized, and connected as a PaaK before it can be associated to a Driver Profile.

Refer to the PaaK feature specification for detailed information.

### ENMEM-REQ-404657/B-NFC Key Driver Profile Association Support

The association of an NFC enabled device (or NFC Card) to a Driver Profile shall be supported by use of the NFC Entry & Starting feature (NFCES) via interior NFC reader. The NFC Key must be setup and authorized before it can be associated to a Driver Profile.

Refer to the NFC Entry & Starting feature specification for detailed information.

### ENMEM-REQ-404205/B-Determining Positional Memory Presence

The EnhancedMemoryInterfaceClient shall have a configurable parameter/DID to indicate whether the EnhancedMemoryPositionClient is present or not.

* When the parameter indicates that EnhancedMemoryPositionClient is “Present”, all functionality and signals defined in this specification shall be supported assuming EnhancedMemoryPositionClient to be present
* When the parameter indicates that EnhancedMemoryPositionClient is “Not Present”, all functionality defined in this specification including applicable signals, and requirements that assume the EnhancedMemoryPositionClient is present shall not apply. HMI shall be implemented assuming EnhancedMemoryPositionClient is not present
  + The default value for this parameter shall be “Not Present”.

### ENMEM-REQ-436437/A-Determining Driver Memory Seat Button Presence

The EnhancedMemoryInterfaceClient shall have a configurable parameter/DID to indicate whether the Driver Memory Seat Buttons are present or not.

* When the parameter indicates that Driver Memory Seat Buttons are “Present”, all functionality and signals defined in this specification shall be supported assuming that Driver Memory Seat Buttons are present.
  + The default value for this parameter shall be “Present”.
* When the parameter indicates that Driver Memory Seat Buttons are “Not Present”, all functionality and signals defined in this specification shall be supported assuming that Driver Memory Seat Buttons are not present.

### ENMEM-REQ-436438/A-Memory Seat Button Configuration Dependency

When the Enhanced Memory Position Client is not present (per ENMEM-REQ-404205) then the EnhancedMemoryInterfaceClient shall also be configured with Driver Memory Seat Buttons not present (per ENMEM-REQ-436437)

## HMI Requirements

### ENMEM-HMI-REQ-199778/A-Enhanced Memory User Interface

Enhanced Memory shall provide a user interface to support Enhanced Memory functions defined by ENMEM-REQ-201660/-Enhanced Memory Functions.

The user interface could be done via a menu in vehicle, smart phone, voice command, switch/button in vehicle, other devices not in vehicle, or any other remote methods.

### ENMEM-HMI-REQ-202211/A-HMI for Personalized Feature Settings

Enhanced Memory shall not alter how personalized features settings are set and saved. With and without Enhanced Memory, all personalized features settings shall have the same existing interface for feature settings and display:

* Enhanced Memory shall not provide unique Enhanced Memory interfaces for the user to setup and save features personalized by Enhanced Memory.
* Enhanced Memory shall not provide any HMI indication/feedback for saved settings.

Example: After a user has Opt’d In to Enhanced Memory and created a Driver Profile via the Enhanced Memory HMI, the user operates the FM Radio to set and save their favorite radio stations as radio presets. These presets are saved using the same “Press & Hold” method that existed prior to Enhanced Memory with the same feedback to the user. No new HMI notifications are provided to the user to confirm the save operation by Enhanced Memory.

### ENMEM-HMI-REQ-199779/A-Indication of the Active Profile

Enhanced Memory shall provide the user an indication of the active Driver Profile, the Driver Profile that is currently recalled with its personalized settings executed. The indication of the active Driver Profile shall be displayed, but not limited to, the following circumstances:

* In a Welcome Message when vehicle is first started
* In a Driver Profile Menu when Enhanced Memory is turned on
* Whenever a Driver Profile change occurs

### ENMEM-HMI-REQ-201980/C-Indication of Existing Driver Profile Status

Enhanced Memory shall provide the user the statuses of all existing Driver Profiles. Within each existing Driver Profile, the following items shall be displayed:

* Driver Profile Name
* Driver Memory Seat button number that is associated to the Driver Profile
* A keyfob icon if a keyfob is associated to a Driver Profile
* A phone icon if a phone is associated to a Driver Profile
* An NFC Key icon if at least one NFC Key is associated to a Driver Profile
* Active Profile indication if the Driver Profile is the Active profile

### ENMEM-HMI-REQ-199780/C-Indication of Operation Status

Enhanced Memory shall provide the user the status, including success, failure, and time-out, of the following operations:

* Keyfob, Phone, and NFC Key Association
* Driver Profile Creation
  + Driver Memory Seat Button Association
  + Copy Operation

### ENMEM-HMI-REQ-199781/C-Indication of Association Status

In the Enhanced Memory Association process, Enhanced Memory shall provide the user the status of an already associated Driver Memory Seat button, phone, keyfob, and NFC key if that particular button, phone, keyfob, or NFC key is selected by the user to be associated to a newly created Driver Profile.

### ENMEM-REQ-199875/A-No Overwrite for Driver Memory Seat Button Association

Enhanced Memory shall not allow the user to associate an already associated Driver Memory Seat button to a different Driver Profile

### ENMEM-REQ-201981/C-Overwrite for Keyfob, Phone, and NFC Key Association

Enhanced Memory shall permit the user to associate an already associated keyfob, phone, or NFC key to a different Driver Profile.

### ENMEM-REQ-199786/C-Overwrite or Restart Keyfob, Phone, and NFC Key Association

In the Keyfob, phone, or NFC key Association process, if the user selects a keyfob, phone or NFC key that is already associated to another Driver Profile, the Enhanced Memory HMI shall provide the user a chance to overwrite the existing association or restart the Association process to select a different keyfob, phone, or NFC key.

### ENMEM-HMI-REQ-199782/C-Multiple Opportunities for Association

Enhanced Memory shall allow the user a defined number of retries, N\_NumberOfRetries, each with a defined length of time, T\_FobAssocOneTime, to associate a keyfob, phone, or NFC Key to a Driver Profile. The total Keyfob, phone, or NFC Key Association process shall be limited to a defined amount of time, T\_FobAssocTotal, to prevent system lock-up.

Enhanced Memory shall allow the user a defined number of retries, N\_NumberOfRetries, each with a defined length of time, T\_SeatAssocOneTime, to associate a Driver Memory Seat button to a Driver Profile.

The total Driver Memory Seat Button Association process shall be limited to a defined amount of time, T\_SeatAssocOneTime2, to prevent system lock-up.

### ENMEM-REQ-199785/C-N\_NumberOfRetries

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | **Description** | **Units** | **Range** | **Resolution** | **Default** |
| N\_NumberOfRetries | N\_NumberOfRetries is the number of retries:   * offered to the user to associate a Driver Memory Seat button * offered to the user to associate a fob to a Driver Profile * offered to the user to associate a phone to a Driver Profile * offered to the user to associate an NFC Key to a Driver Profile * Performed by the EnhancedMemoryInterfaceClient when no response is detected from the Enter Driver Memory Seat Button Association request. |  | 2-5 | 1 | 3 |

### ENMEM-TMR-REQ-199783/C-T\_FobAssocOneTime

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | **Description** | **Units** | **Range** | **Resolution** | **Default** |
| T\_FobAssocOneTime | Maximum time the EnhancedMemoryInterfaceClient shall allow user to assign a keyfob, phone, or NFC Key to a Driver Profile within one attempt. | sec | 10-60 | 5 | 15 |

### ENMEM-TMR-REQ-199784/C-T\_FobAssocTotal

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | **Description** | **Units** | **Range** | **Resolution** | **Default** |
| T\_FobAssocTotal | Maximum time the EnhancedMemoryInterfaceClient shall allow user to assign a keyfob, phone, or NFC Key to a Driver Profile for all attempts. | sec | 180-600 | 60 | 300 |

### ENMEM-TMR-REQ-199759/A-T\_SeatAssocOneTime

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | **Description** | **Units** | **Range** | **Resolution** | **Default** |
| T\_SeatAssocOneTime | Maximum time the EnhancedMemoryInterfaceClient shall allow for the button pairing process. | sec | 30-120 | 5 | 60 |

### ENMEM-TMR-REQ-199881/A-T\_SeatAssocOneTime2

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | **Description** | **Units** | **Range** | **Resolution** | **Default** |
| T\_SeatAssocOneTime2 | Maximum time the EnhancedMemoryPositionClient shall wait before exiting Driver Memory Seat Button Association Mode. | sec | 40-130 | 5 | 70 |

### ENMEM-HMI-REQ-199766/A-Enhanced Memory Specific Driving Restriction

Enhanced Memory shall impose driving restriction, defined by DRIVE-RESv2-FUR-REQ-025157-HMI Driving Restriction – General Applications, to the following specific Enhanced Memory operations:

* Create/add Driver Profiles
* Edit Driver Profiles

### ENMEM-HMI-REQ-199772/A-Driver Distraction

Any existing driver distraction requirements and/or guidelines shall apply for settings personalized under Enhanced Memory and shall supersede any Enhanced Memory requirements. For example, positional settings shall follow Classic Memory requirements to restrict recalls while a vehicle is in motion (among other conditions).

### ENMEM-HMI-REQ-199768/A-Availability of Enhanced Memory Menu and Functions

The Enhanced Memory recall user interface shall be available to the user without the restrictions of vehicle ignition status, transmission status, and driving restriction:

* Opt-Out Enhanced Memory feature
* Enable Enhanced Memory feature
* Disable Enhanced Memory feature
* Recall a Driver Profile (except in Driver Seat Button Association Mode)

All Enhanced Memory interfaces shall comply with requirements of driver restriction and ignition restriction, ENMEM-REQ-199766 -Enhanced Memory Specific Driving Restriction and ENMEM-REQ-199767 -Enhanced Memory Ignition Restriction.

### ENMEM-HMI-REQ-199769/A-Enhanced Memory Driving Restriction Feedback

Enhanced Memory shall provide the user feedback in the event where the user attempts to use Enhanced Memory menus and functionalities that are disabled due to a driving restriction.

### ENMEM-HMI-REQ-199771/A-Content of Enhanced Memory Driving Restriction Feedback

Enhanced Memory driving restriction feedback shall provide the information listed below:

* The reason why the menu and functionalities are disabled
* The instruction to enable the menus and functionalities

### ENMEM-HMI-REQ-199777/B-Enhanced Memory HMI Driver Profile Identification

The Enhanced Memory HMI shall identify a Driver Profile by a unique Driver Profile Name and a Driver Memory Seat button. Driver Profiles shall not be created without both a unique Driver Profile Name and the association to a Driver Memory Seat button. When the EnhancedMemoryPositionClient is not present or vehicle is not equipped with memory seat buttons, the memory seat button is not required to identify a profile

The need of the association between a Driver Profile and a Driver Memory Seat button is to include positional settings in the Enhanced Memory Driver Profile and also to allow the user to use the Driver Memory Seat button as a recall interface to recall Enhanced Memory Driver Profiles.

### ENMEM-HMI-REQ-199751/A-HMI Performance Requirement

Enhanced Memory shall comply with Ford Trustmark RQT-001301-003538-12 LOGIC OF OPERATION: FEEDBACK.

### ENMEM-HMI-REQ-233264/C-Phone Association HMI Option

The EnhancedMemoryInterfaceClient shall monitor PaakConnection\_St and make active/inactive the offered “phone” and “all” pairing selections (see REQ-233260) and the ability to pair a phone via an edit menu as such:

* When PaakConnection\_St = Connected, the above shall be made active
* When PaakConnection\_St = NoneConnected, the above shall be made inactive (greyed-out, hidden, etc.)

### ENMEM-HMI-REQ-233260/C-Keyfob, Phone, & NFC Key Association During Profile Creation

During Profile Creation, the EnhancedMemoryInterfaceClient shall offer the user the ability to pair a keyfob, a phone, NFC Key, or all of the above.

* A selection of “keyfob” shall begin the Keyfob Association Process
* A selection of “phone” shall begin the Phone Association Process
* A selection of “NFC Key” shall begin the NFC Key Association Process
* A selection of “All” shall begin the Keyfob Association Process, followed by the Phone Association Process, followed by the NFC Key Association Process
* The EnhancedMemoryInterfaceClient shall remember a user selection of “All” in order to support the below functionality:
  + If the Keyfob Association Process successfully completes or is cancelled by the user, the Phone Association Process shall follow
  + If the Keyfob Association Process times-out (and after all retry attempts), the Phone Association Process shall follow
  + If the Keyfob Association Process is aborted by the system (see REQ-099690), the Phone Association Process and the NFC Key Association Process shall not follow
  + If the Phone Association Process successfully completes or is cancelled by the user, the NFC Key Association Process shall follow
  + If the Phone Association Process times-out (and after all retry attempts), the NFC Key Association Process shall follow
  + If the Phone Association Process is aborted by the system (see REQ-099690), the NFC Key Association Process shall not follow

### ENMEM-HMI-REQ-427495/A-Association During Profile Creation - Checkbox Method

During Profile Creation, the EnhancedMemoryInterfaceClient shall offer the user the ability to pair a keyfob, a phone and/or an NFC key:

* The EnhancedMemoryInterfaceClient shall allow the user to select which device pairings they would like to attempt during profile creation via a checkbox
* The checkbox shall allow for none, one or many device pairing selections
* The checkbox device pairing options are to be made available per the configurations defined for PaaK and NFC (see REQ-232984, REQ-427169)
* If “Skip” is selected, no pairing methods shall be attempted
* If the “Key Fob” box was checked when “Continue” was selected, the Keyfob Association Process shall be started
* If the “Phone As A Key” box was checked when “Continue” was selected, the Phone Association Process shall be started
* If the “NFC” box was checked when “Continue” was selected, the NFC Association Process shall be started
  + The “Continue” button shall not be selectable until at least one checkbox is selected/checked.
* If multiple boxes are checked, or all boxes are checked, the EnhancedMemoryInterfaceClient shall follow the order of Keyfob Association Process, Phone Association Process, NFC Key Association Process.
  + If any of the preceding processes are successfully completed, cancelled by the user, or time-out (after all retry attempts), the subsequent process shall follow
  + If any of the preceding processes are aborted by the system (see REQ-099690), the subsequent process shall not follow

**Note**: This variant shall be used (instead of REQ-233260) for all QNX versions starting with P708 onward.

### ENMEM-HMI-REQ-434227/A-Recall Driver Profile via HMI Menu

When Memory Seat Buttons are not present on the vehicle and Auto Save is configured on, Enhanced Memory shall provide a dedicated button in the HMI that executes a recall.

When driver profile is active and the user changes a positional setting, Enhanced Memory shall allow the user to recall saved positional settings from the active profile.

### ENMEM-HMI-REQ-434236/A-Recall Button Availability

The EnhancedMemoryInterfaceClient shall make the Recall Soft Button active based on the criteria below:

* Enhanced Memory Feature (EnhancedMemory\_St) = On
* Driver Profile Created (Opted-in) Status = Opted-in
* Active Profile is not the Guest Profile
* VehicleSpeed\_St = Less than the Driving Restriction threshold
* If any of the following parameters of DriverPositionalChange\_St do not equal None:
* DriverMirrorAdjustStat
* PassengerMirrorAdjustStat
* PedalAdjustStat
* SteeringWheelAdjustStat
* DriverSeatAdjustStat
* DriverMCSAdjustStat

### ENMEM-HMI-REQ-434228/A-Store Driver Profile Positional Settings via HMI Menu

When Memory Seat Buttons are not present on the vehicle and Auto Save is configured on, Enhanced Memory shall provide a dedicated button in the HMI that executes a store operation.  
  
When a driver profile is active and the user changes a positional setting, Enhanced Memory shall allow the user to store the current positional settings to the active profile.

### ENMEM-HMI-REQ-434237/A-Positional Store Button Availability

The EnhancedMemoryInterfaceClient shall make the Save Soft Button active based on the criteria below:

* Enhanced Memory Feature (EnhancedMemory\_St) = On
* Driver Profile Created (Opted-in) Status = Opted-in
* Active Profile is not the Guest Profile
* If any of the following parameters of DriverPositionalChange\_St do not equal None:
  + DriverMirrorAdjustStat
  + PassengerMirrorAdjustStat
  + PedalAdjustStat
  + SteeringWheelAdjustStat
  + DriverSeatAdjustStat
  + DriverMCSAdjustStat

## Non-Functional Requirements

### ENMEM-REQ-199750/A-Enhanced Memory Feature Classification

The feature classification of Enhanced Memory is B per ES1W7T-F407K00-AA. This means that Enhanced Memory is not a safety feature.

### ENMEM-REQ-199752/A-Enhanced Memory Interaction via Feature Based Message Protocol

Feature Based Message Protocol shall be used to implement Enhanced Memory personalized features whenever CAN signal structure permits. Please see reference for Feature Based Message Protocol specifications for different menu displays devices.

### ENMEM-SR-REQ-199753/C-Enhanced Memory Feature Inclusion Guidelines

As a general guideline, the following conditions were considered to determine if a feature shall be included as part of Enhanced Memory:

* If a setting is reset to a default value at every key cycle, then that setting is not included. One example of this type features is Traction Control setting
* MyKey is not included. All MyKey settings remain the same for different MyKey keyfobs, MyKey Phones and different Driver Profiles within a vehicle. For example, the MyKey Max Speed setting for MyKey keyfob1, MyKey keyfob2 MyKey phone1 must be the same value and cannot be personalized for different drivers within a vehicle.

Exact features included in Enhanced Memory could vary among different programs and different vehicle packages. Information about program specific Enhanced Memory Feature List can be found in the Reference section.

### ENMEM-REQ-199773/C-Retain Enhanced Memory Settings After Software Reflash

Enhanced Memory shall retain Driver Profile information and personalizable settings after software reflash occurs. This is to prevent the customer from having to recreate and reprogram their Driver Profiles, keyfobs, phones and feature settings after a software reflash service is performed at a dealership, or via WiFi or Over The Air (OTA) Automatic Software Update.

### ENMEM-SR-REQ-206880/A-Updates to Non-Volatile Memory

Personalized settings supported by Enhanced Memory shall be stored in NVM (Non-Volatile Memory) in order to survive power loss. These settings shall be saved and updated immediately in the NVM as user changes occur. NVM changes shall not be accumulated for later writing.

## Functional Safety

### ENMEM-REQ-416380/A-Selection of Functions for HARA

For the purposes of Functional Safety, the feature as described in this document does not constitute an Item per ISO 26262, but rather a service or function used by other Items in the vehicle.  As such, Functional Safety for this feature shall not include a unique HARA, but will instead rely on the Functional Safety Analysis of the Items that make use of this feature.  Towards that ends, any ASIL rated Item that makes use of this feature to realize its behaviors shall cascade any and all relevant FSR/TSRs required to be fulfilled by this feature.  These requirements shall then be further developed in the appropriate Functional Safety work product by the team responsible for this feature.  At the time of this authoring the list of Items making use of this feature is as follows:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Item/Feature Name | Documentation Reference (e.g. VSEM ID) | Contact Information (e.g. Feature Owner name) | # FSRs Cascaded | # TSR Cascaded | Highest Rating Cascaded (e.g. QM, A, etc.) |
| Classic Memory | F000717 |  | 0 | 0 | N/A |
| Remote Vehicle Setup |  |  | 0 | 0 | N/A |
| Auto Save |  |  | 0 | 0 | N/A |

## Data Analytics

### ENMEM-REQ-416381/A-Cloud Connectivity Data Analytics

The Enhanced Memory feature shall capture the following outputs:

|  |  |  |
| --- | --- | --- |
| **Data Element (Variable)** | **Data Element Description** | **Purpose** |
| **Data Elements for Customer Outputs** | | |
| Enhanced Memory Disabled | Event counter when feature is disabled | - Determine if feature is disabled after a disable request  Determine which of the following events triggered the feature to be disabled: - User selects to disable feature via HMI screen - The last driver profile is deleted resulting in the feature to be disabled |
| Enhanced Memory Enabled (Opt-In) | Event counter when feature is enabled | - Determine if feature is enabled after an enable request |
| Driver Profile Created | Event counter when new Driver Profile is created and associated with selected memory button | - Determine if new driver profile is created - Determine if the chosen driver memory button is associated to the new driver profile |
| Driver Profile Not Created | Event counter when the profile creation process has been aborted and a Driver Profile was not successfully created | - Determine if HMI provides abort notification and instruction to restart the driver profile creation process |
| Max Number of Profiles Reached | Event counter when the maximum number of Driver Profiles has been reached | - Determine when a vehicle has reached the maximum number of profiles - Determine if function for creating a new driver profile is disabled |
| KeyFob Associated | Event counter for when a KeyFob is successfully associated to a Driver Profile | - Determine if the chosen keyfob is now associated to the chosen driver profile - Determine how many profiles in a vehicle has a keyfob associated |
| KeyFob Not Associated | Event counter for when the Keyfob Association process has been aborted and a KeyFob was not successfully paired to the desired Driver Profile | - Determine if HMI provides abort notification and instruction to restart the keyfob association process |
| Disassociate KeyFob | Event counter when a previously associated KeyFob is disassociated | - Determine if the previously associated keyfob is now removed from the chosen driver profile |
| Phone Associated | Event counter for when a Phone is successfully associated to a Driver Profile | - Determine if the chosen phone is now associated to the chosen driver profile - Determine how many profiles in a vehicle has a phone associated |
| Phone Not Associated | Event counter for when the Phone Association process has been aborted and a Phone was not successfully paired to the desired Driver Profile | - Determine if HMI provides abort notification and instruction to restart the phone association process |
| Disassociate Phone | Event counter when a previously associated Phone is disassociated | - Determine if the previously associated phone is now removed from the chosen driver profile |
| NFC Key Associated | Event counter for when an NFC Key is successfully associated to a Driver Profile | - Determine if the chosen NFC key is now associated to the chosen driver profile - Determine how many profiles in a vehicle has an NFC key associated |
| NFC Key Not Associated | Event counter for when the NFC Key Association process has been aborted and an NFC Key was not successfully paired to the desired Driver Profile | - Determine if HMI provides abort notification and instruction to restart the NFC key association process |
| Disassociate NFC Key | Event counter when a previously associated NFC Key is disassociated | - Determine if the previously associated NFC key is now removed from the chosen driver profile |
| Driver Profile Deleted | Event counter when a Driver Profile is deleted | - Determine if the Driver Profile selected by the user is now deleted - If the active Driver Profile or the last existing Driver Profile is deleted, determine if Guest Profile is recalled automatically |
| Driver Profile Recall | Event counter when Enhanced Memory Servers update the Active Driver Profile with the recalled Driver Profile | - Determine if the requested driver profile is now loaded as the active driver profile - Recall execution time |
| Active Driver Profile Settings Recalled and Displayed | Event counter when the Active Driver Profile settings are displayed | - Determine if active driver profile settings are recalled - Determine if active driver profile settings are displayed - Recall execution time - Display execution time |
| Active Driver Profile Positional Settings Recalled and Applied | Event counter when the Enhanced Memory Position Client recalls positional settings | - Determine if active driver profile positional settings are recalled - Determine if active driver profile positional settings are applied - Recall execution time - Application execution time |
| Store Positional Settings | Event counter when current positional settings are stored to selected Driver Profile | - Determine if the current positional settings are stored to the selected Driver Profile - If the memory seat button that is pressed by the user is not associated to a Driver Profile, determine if the current positional settings are stored to the Guest Profile |
| Save Changes to Non-Positional Settings | Event counter when changes to non-positional settings are stored to Driver Profile | - Determine if the changes made by the user to the non-positional settings are stored to the Driver Profile |
| System current conditions | Periodic synchronization of current Enhanced Memory settings | - The vehicle must periodically read all of the current settings associated to enhanced memory |

Table 2 – Cloud Connectivity Data Analytics

### ENMEM-FUR-REQ-416429/A-Cloud Connectivity Data Elements

The EnhancedMemoryInterfaceClient, or equivalent logical block or Logical Functional Class, shall collect analytics data as specified, but not limited to the data as denoted below and as agreed upon in support of any corporate connected data analytics strategy.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Data Element Details** | | | **Data** | | | | |
| **Prioritized Data Elements** | **Use-Case Description** | **Function Definition** | **Allocated Source ECU** | **Signal Name** | **Identified DIDs** | **Identified DTCs** | **Identified Other Data Types** |
| Enhanced Memory Enable / Disable | Does the customer disable the feature and under what conditions? | Event counter when user selects to Disable the feature | APIM | Em\_D\_Stat | N/A | N/A | GSDB Encoding: ProfilesOn |
| Does the customer enable the feature and under what conditions? | Event counter when user selects to Enable the feature | APIM | Em\_D\_Stat | N/A | N/A | GSDB Encoding: ProfilesOff |
| Does the feature get disabled due to the last driver profile being deleted? | When the last driver profile is deleted, determine if the feature is automatically disabled | TBD | N/A | New DID to be added | New DTC to be added | N/A |
| Failure mode: feature enabled / disabled under incorrect conditions | Run-time diagnostic | TBD | N/A | New DID to be added | New DTC to be added | N/A |
| Failure mode: feature not enabled / disabled after request | Run-time diagnostic | TBD | N/A | New DID to be added | New DTC to be added | N/A |
| Create Driver Profile | Does the user initialize the driver profile creation process? | Event counters when the user chooses to create a new Driver Profile | APIM | Pers1OptIn\_B\_Stats, Pers2OptIn\_B\_Stats, Pers3OptIn\_B\_Stats, Pers4OptIn\_B\_Stats | New DID to be added | New DTC to be added | GSDB Encoding: OptedIn |
| Track user flow through profile set up process | Track user decisions page by page during profile set up process via HMI screen interactions and button presses | APIM | N/A | New DID to be added | New DTC to be added | N/A |
| Duration of time spent in the profile creation process | Run time comparison of internal clock or global time between start of profile creation process to end of profile creation process | TBD | N/A | New DID to be added | New DTC to be added | N/A |
| If user aborts profile creation process, determine at what point in the profile creation process the user aborts | On abort trigger, record snapshot of system information including current HMI screen | APIM | N/A | New DID to be added | New DTC to be added | N/A |
| Determine when profile creation process is successfully completed | Event counter when new Driver Profile is created and associated with selected Memory button | APIM | CtrStkDsplyOp\_D\_Rq, PersStore\_D\_Rq | N/A | N/A | GSDB Encoding: Pers1, Pers2, Pers3, Pers4 |
| Maximum number of driver profiles reached | Event counter when the last remaining Driver Profile memory slot is occupied | APIM | CtrStkDsplyOp\_D\_Rq, PersStore\_D\_Rq | N/A | N/A | GSDB Encoding: Pers1, Pers2, Pers3, Pers5 |
| Failure mode: Driver Profile not successfully associated with memory button | Run-time diagnostic | APIM | N/A | If (Enhanced Memory (DID DE00 Byte-9, Bit-1) = "Enabled" (1)) AND (DSM (DID DE00,byte-19, Bit-5)= "Present" (1)) set when message 0x3E1 is missing for five seconds. | DTC 0xC20800 - Lost Communication With "Seat Control Module A" No Sub Type Information | N/A |
| Failure mode: Driver Profile creation process aborts due to system failure | Run-time diagnostic | APIM | N/A | New DID to be added | New DTC to be added | N/A |
| KeyFob Association | Does the user select to initiate the KeyFob association process? | Event counter when the user selects to associate a keyfob to a driver profile | APIM | EmPrflKeyAssoc\_D\_Rq  EmPrflKeyAssoc\_D\_Stat | New DID to be added | New DTC to be added | GSDB Encoding: EnterKeyAssociation  KeyAssociationEntered |
| Does the user select to abort the KeyFob association process? | On abort trigger, record snapshot of system information including current HMI screen | APIM | EmPrflKeyAssoc\_D\_Rq  EmPrflKeyAssoc\_D\_Stat | New DID to be added | New DTC to be added | GSDB Encoding: ExitKeyAssociation, KeyAssociationExited |
| How many and which profiles in a vehicle has a KeyFob associated? | Sample of signals to determine which profiles have a keyfob associated | BCM | EmPrflKeyAssoc\_D\_Stat, Pers1Key\_D\_Stat, Pers2Key\_D\_Stat, Pers3Key\_D\_Stat, Pers4Key\_D\_Stat | N/A | N/A | GSDB Encoding: KeyAssociated, KeyUnAssociated |
| Does the user manually select to disassociate the selected KeyFob? | Event counter on disassociation event trigger (via HMI) | APIM, BCM | Pers1Key\_D\_Stat, Pers2Key\_D\_Stat, Pers3Key\_D\_Stat, Pers4Key\_D\_Stat | New DID to be added | New DTC to be added | GSDB Encoding: KeyUnAssociated |
| Does the user select to overwrite a KeyFob during The KeyFob Association process? | Event counter on overwrite event trigger (via HMI) | APIM | EmPrflKeyAssoc\_D\_Rq  EmPrflKeyAssoc\_D\_Stat | New DID to be added | New DTC to be added | GSDB Encoding: OverwriteKey  KeyAssociateSuccess |
| Failure mode: KeyFob disassociated due to system failure | Run-time diagnostic | APIM | N/A | New DID to be added | New DTC to be added | N/A |
| Failure mode: KeyFob not associated due to system failure | Run-time diagnostic | APIM | N/A | New DID to be added | New DTC to be added | N/A |
| Phone Association | Does the user select to initiate the Phone association process? | Event counter when the user selects to associate a phone to a driver profile | APIM | N/A | New DID to be added | New DTC to be added | N/A |
| Does the user select to abort the Phone association process? | On abort trigger, record snapshot of system information including current HMI screen | APIM | N/A | New DID to be added | New DTC to be added | N/A |
| How many and which profiles in a vehicle has a Phone associated? | Sample of signals to determine which profiles have a phone associated | BCM | Pers1Phone\_D\_Stat, Pers2Phone\_D\_Stat, Pers3Phone\_D\_Stat, Pers4Phone\_D\_Stat | N/A | N/A | GSDB Encoding: NoPhoneAssociated, OnePhoneAssociated, TwoPhoneAssociated, ThreePhoneAssociated, FourPhoneAssociated, FivePhoneAssociated, SixPhoneAssociated, SevenPhoneAssociated |
| Does the user manually select to disassociate the selected Phone? | Event counter on disassociation event trigger (via HMI) | BCM | Pers1Phone\_D\_Stat, Pers2Phone\_D\_Stat, Pers3Phone\_D\_Stat, Pers4Phone\_D\_Stat | New DID to be added | New DTC to be added | GSDB Encoding: NoPhoneAssociated |
| Does the user select to overwrite a Phone during The Phone Association process? | Event counter on overwrite event trigger (via HMI) | APIM | N/A | New DID to be added | New DTC to be added | N/A |
| Failure mode: Phone disassociated due to system failure | Run-time diagnostic | APIM | N/A | New DID to be added | New DTC to be added | N/A |
| Failure mode: Phone not associated due to system failure | Run-time diagnostic | APIM | N/A | New DID to be added | New DTC to be added | N/A |
| NFC Key Association | Does the user select to initiate the NFC Key association process? | Event counter when the user selects to associate a NFC Key to a driver profile | APIM | DgtlKeyPrflAssoc\_D\_Rq  EmPrflKeyAssoc\_D\_Stat | New DID to be added | New DTC to be added | GSDB Encoding: EnterKeyAssociation  KeyAssociationEntered |
| Does the user select to abort the NFC Key association process? | On abort trigger, record snapshot of system information including current HMI screen | APIM | DgtlKeyPrflAssoc\_D\_Rq  EmPrflKeyAssoc\_D\_Stat | New DID to be added | New DTC to be added | GSDB Encoding: ExitKeyAssociation, KeyAssociationExited |
| How many and which profiles in a vehicle has a NFC Key associated? | Sample of signals to determine which profiles have a NFC Key associated | BCM | PersPrfl\_D\_Stat PersDgtlKey1\_D\_Stat PersDgtlKey2\_D\_Stat PersDgtlKey3\_D\_Stat PersDgtlKey4\_D\_Stat | N/A | N/A | N/A |
| Does the user manually select to disassociate the selected NFC Key? | Event counter on disassociation event trigger (via HMI) | APIM, BCM | DgtlKeyPrflAssoc\_D\_Rq  PersPrfl\_D\_Stat PersDgtlKey1\_D\_Stat PersDgtlKey2\_D\_Stat PersDgtlKey3\_D\_Stat PersDgtlKey4\_D\_Stat | N/A | N/A | GSDB Encoding: DisassociateKey1, DisassociateKey2, DisassociateKey3 DisassociateKey4 |
| Does the user select to overwrite a NFC Key during The NFC Key Association process? | Event counter on overwrite event trigger (via HMI) | APIM | DgtlKeyPrflAssoc\_D\_Rq  EmPrflKeyAssoc\_D\_Stat | New DID to be added | New DTC to be added | GSDB Encoding: OverwriteKey  KeyAssociateSuccess |
| Failure mode: NFC Key disassociated due to system failure | Run-time diagnostic | APIM | N/A | New DID to be added | New DTC to be added | N/A |
| Failure mode: NFC Key not associated due to system failure | Run-time diagnostic | APIM | N/A | New DID to be added | New DTC to be added | N/A |
| Driver Profile Recall | Determine when driver profile recall request event counter increments | Event counter when there is a driver profile recall request | BCM | RecallEvent\_No\_Cnt, PersNo\_D\_Actl | N/A | N/A | N/A |
| Recall execution time | Run time comparison of internal clock or global time between recall request event and active personality profile update | BCM | N/A | New DID to be added | New DTC to be added | N/A |
| Failure Mode: Driver profile not recalled | Run-time diagnostic | BCM | N/A | If (Enhanced Memory (DID DE00 Byte-9, Bit-1) = "Enabled" (1)) AND (DSM (DID DE00,byte-19, Bit-5)= "Present" (1)) set when message 0x3E1 is missing for five seconds. | DTC 0xC20800 - Lost Communication With "Seat Control Module A" No Sub Type Information | N/A |
| Active Driver Profile Settings Recalled and Displayed | Determine if active driver profile settings are recalled | Determine if upon receiving Recall Event Counter and Driver Profile Index, do all EnhancedMemoryServers update the Active Driver Profile with the recalled Driver Profile settings? | BCM | PersNo\_D\_Actl | New DID to be added | New DTC to be added | GSDB Encoding: Pers1, Pers2, Pers3, Pers4 |
| Determine if active driver profile settings are displayed | Determine if feature display device displays personalized feature settings for the current active driver profile | APIM | N/A | New DID to be added | New DTC to be added | N/A |
| Display execution time | Run time comparison of internal clock or global time between update of active driver profile and feature display device update | BCM, APIM | N/A | New DID to be added | New DTC to be added | N/A |
| Failure Mode: Driver profile settings not recalled | Run-time diagnostic | BCM, APIM | N/A | If (Enhanced Memory (DID DE00 Byte-9, Bit-1) = "Enabled" (1)) AND (DSM (DID DE00,byte-19, Bit-5)= "Present" (1)) set when message 0x3E1 is missing for five seconds. | New DTC to be added | N/A |
| Active Driver Profile Positional Settings Recalled and Applied | Determine if active driver profile positional settings are recalled | Determine if upon receiving Recall Event Counter and Driver Profile Index, EnhancedMemoryPositionClient updates the Active Driver Profile with the recalled positional settings | BCM | PersNoPos\_D\_Actl | New DID to be added | New DTC to be added | GSDB Encoding: Pers1, Pers2, Pers3, Pers4 |
| Determine if active driver profile positional settings are applied | Determine if positional modules apply personalized position settings | BCM, Various | N/A | New DID to be added | New DTC to be added | N/A |
| Application execution time | Run time comparison of internal clock or global time between update of active driver profile and positional settings being applied | BCM, Various | N/A | New DID to be added | New DTC to be added | N/A |
| Failure Mode: Driver profile positional settings not recalled | Run-time diagnostic | BCM, Various | N/A | If (Enhanced Memory (DID DE00 Byte-9, Bit-1) = "Enabled" (1)) AND (DSM (DID DE00,byte-19, Bit-5)= "Present" (1)) set when message 0x3E1 is missing for five seconds. | DTC 0xC20800 - Lost Communication With "Seat Control Module A" No Sub Type Information | N/A |
| Driver Profile Recall Source | Determine if recall triggered by Memory Seat Button | Determine recall trigger source is Memory Seat Button by signal sample | DSM | MemSwtch\_D\_RqRecall | N/A | N/A | GSDB Encoding: Pers1, Pers2, Pers3, Pers4 |
| Determine if recall triggered by HMI Menu | Determine recall trigger source is HMI Menu by signal sample | APIM | CntrStk\_D\_RqRecall | N/A | N/A | GSDB Encoding: Pers1, Pers2, Pers3, Pers4 |
| Determine if recall triggered by KeyFob | Determine recall trigger source is KeyFob by signal sample | TBD | Personalization\_Lock\_Requestor, Personalization\_Lock\_Event | New DID to be added | New DTC to be added | N/A |
| Determine if recall triggered by Phone | Determine recall trigger source is Phone by signal sample | TBD | Personalization\_Lock\_Requestor, Personalization\_Lock\_Event | New DID to be added | New DTC to be added | N/A |
| Determine if recall triggered by NFC Key | Determine recall trigger source is NFC Key by signal sample | TBD | TBD | New DID to be added | New DTC to be added | N/A |
| Determine if recall triggered by System request | Determine recall trigger source is Memory Seat Button by signal sample | TBD | TBD | New DID to be added | New DTC to be added | N/A |
| Store Positional Settings | Determine when store operation is triggered by memory seat button press and hold | Determine when store operation is triggered and what the system conditions are at that moment | DSM, APIM | PersStore\_D\_Actl, MemSwtch\_D\_RqRecall | N/A | N/A | GSDB Encoding: Pers1, Pers2, Pers3, Pers4  Complete, InProgress |
| Failure Mode: Positional settings not stored to selected driver profile | Run-time diagnostic | DSM, APIM | N/A | New DID to be added | New DTC to be added | N/A |
| Edit Non-Positional Settings | Determine when the user selects to change a personalizable setting associated to Enhanced Memory via the HMI screen | Track user interaction with HMI screen to determine which settings are changed and what they are changed to | APIM | N/A | New DID to be added | New DTC to be added | N/A |
| Failure Mode: Settings not stored to selected driver profile | Run-time diagnostic | APIM, BCM, Various | N/A | New DID to be added | Update DTC E10100 Pass/Fail Criteria to add DSM to Enhanced Memory and Number of Personalizations condition | N/A |
| System current conditions | Periodic synchronization of current Enhanced Memory settings | The vehicle must periodically read all of the current settings associated to enhanced memory | APIM, BCM, Various | N/A | New DID to be added | New DTC to be added | N/A |

Table 3 – Cloud Connectivity Data Elements

# Feature Architecture Design

At the logical level, the Enhanced Memory feature is distributed across four different classes, two servers, and two clients. These classes are:

* Enhanced Memory Interface Client
* Enhanced Memory Position Client
* Enhanced Memory Profile Server
* Enhanced Memory Server

The logic block diagram below summarizes the interface among the four classes. After the block diagram, functions of each class and their detailed class interface descriptions are given. The logic to physical signal translation table is listed for reference.



Figure 4 – Enhanced Memory Logic Block Diagram

## Enhanced Memory Class Functional Description

### ENMEM-CLD-REQ-199789/A-Enhanced Memory Interface Client

The EnhancedMemoryInterfaceClient is responsible for the tasks listed below.

* Offering the user an interface to turn on and off the Enhanced Memory feature
* Offering the user an interface to create, edit, delete and change Driver Profiles
* Displaying information related to the active Driver Profile
* Providing indications of changes to the active Driver Profile
* Indicating which Driver Profiles have been created (pers1-4 possible) to the vehicle system interface
* Maintaining the mapping of the created Driver Profile names to the network personality index

Please review the implementation guide/block diagram to locate the EnhancedMemoryInterfaceClient class

### ENMEM-CLD-REQ-199790/A-Enhanced Memory Position Client

The EnhancedMemoryPositionClient is responsible for the tasks listed below.

* Maintaining the settings related to driver position and its relation to the active personality profile
* Selecting the proper driver position (seat position, exterior mirror position, steering column position) as determined by the active personality profile signal on the vehicle network interface
* Requesting changes the active personality profile when it detects a Driver Memory Seat button is pressed
* Making changes to the position settings when a setting store operation is detected via a Driver Memory Seat button

Please review the implementation guide/block diagram to locate the EnhancedMemoryPositionClient object.

### ENMEM-CLD-REQ-199791/C-Enhanced Memory Profile Server

The EnhancedMemoryProfileServer is responsible for the tasks listed below.

* Determining the active Driver Profile
* Broadcasting the active Driver Profile to vehicle network interface
* Associating or Disassociating a selected keyfob, a phone, and NFC keys to/from a selected Driver Profile

Review the implementation guide/block diagram to locate the EnhancedMemoryProfileServer class.

### ENMEM-CLD-REQ-199792/A-Enhanced Memory Server

The EnhancedMemoryServer is responsible for the tasks listed below.

* Executing settings for the active Driver Profile as requested by the vehicle system interface
* Maintaining settings for four separate Driver Profiles and one Vehicle Profile

Please review the implementation guide/ block diagram to locate the EnhancedMemoryServer class

### ENMEM-CLD-REQ-434188/A-Enhanced Memory NFC Server

The EnhancedMemoryNFCServer is responsible for the tasks listed below.

* Broadcasting the NFC key information to vehicle network interface

Review the implementation guide/block diagram to locate the EnhancedMemoryNFCServer class.

## Physical Mapping of Classes

The table below shows an example of how the four logical classes that make up the Enhanced Memory feature can be mapped into physical modules. This mapping example is generic to CGEA1.3 and FNV2 architectures and does not necessarily represent all other vehicle architectures. Refer to the program specific network topology or Feature Boundary diagram for details

Please note that one physical module can belong to more than one class.

|  |  |
| --- | --- |
| Logical Class | Physical Module (ECU) |
| Enhanced Memory Interface Client | APIM |
| Enhanced Memory Position Client | DSM |
| Enhanced Memory Profile Server | BCM |
| Enhanced Memory NFC Server | NFAM |
| Enhanced Memory Server | AHU, APIM, BCM, DSP, HVAC\_RCCM, IPC, IPMA, DDM |

## Enhanced Memory Class Interface Description

The table below summarizes the interface among the four classes. Transmitting methods and receiving methods of each class are given after the table.

### ENMEM-REQ-203519/F-Enhanced Memory Feature Interface Requirement

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Logic Method Name | Logic Parameter Name | Literals | Value | Tx | Rx |
| EnMemProfilePairing\_Rq | PersIndex | Null | 0x0 | EnhancedMemory InterfaceClient | EnhancedMemory ProfileServer |
| Pers1 | 0x1 |
| Pers2 | 0x2 |
| Pers3 | 0x3 |
| Pers4 | 0x4 |
| NotUsed | 0x5 |
| NotUsed | 0x6 |
| NotUsed | 0x7 |
| ButtonPairing | Null | 0x0 | EnhancedMemory InterfaceClient | EnhancedMemory PositionClient |
| EnterButtonPairing | 0x1 |
| ExitButtonPairing | 0x2 |
| NotUsed | 0x3 |
| KeyPairing | Null | 0x0 | EnhancedMemory InterfaceClient | EnhancedMemory ProfileServer |
| EnterKeyPairing | 0x1 |
| ExitKeyPairing | 0x2 |
| DisassociateKey | 0x3 |
| OverwriteKey | 0x4 |
| EnterPhonePairing | 0x5 |
| DisassociatePhone | 0x6 |
| NFCKeyPairing | Null | 0x0 | EnhancedMemory InterfaceClient | EnhancedMemory ProfileServer |
| EnterKeyAssociation | 0x1 |
| ExitKeyAssociation | 0x2 |
| DisassociateKey1 | 0x3 |
| DisassociateKey2 | 0x4 |
| DisassociateKey3 | 0x5 |
| DisassociateKey4 | 0x6 |
| OverwriteKey | 0x7 |
|  |  |  |  |  |  |
| InfotainmentPersStore\_Rq | PersIndex | Null | 0x0 | EnhancedMemory InterfaceClient | EnhancedMemory PositionClient |
| Pers1 | 0x1 |
| Pers2 | 0x2 |
| Pers3 | 0x3 |
| Pers4 | 0x4 |
| Vehicle | 0x5 |
| InfotainmentRecall\_Rq | PersIndex | Null | 0x0 | EnhancedMemory InterfaceClient | EnhancedMemory ProfileServer |
| Pers1 | 0x1 |
| Pers2 | 0x2 |
| Pers3 | 0x3 |
| Pers4 | 0x4 |
| Vehicle | 0x5 |
| PersonalityOptIn\_St | Pers1Status | NotOptedIn | 0x0 | EnhancedMemory InterfaceClient | EnhancedMemory ProfileServer |
| OptedIn | 0x1 |
| Pers2Status | NotOptedIn | 0x0 | EnhancedMemory InterfaceClient | EnhancedMemory ProfileServer |
| OptedIn | 0x1 |
| Pers3Status | NotOptedIn | 0x0 | EnhancedMemory InterfaceClient | EnhancedMemory ProfileServer |
| OptedIn | 0x1 |
| Pers4Status | NotOptedIn | 0x0 | EnhancedMemory InterfaceClient | EnhancedMemory ProfileServer |
| OptedIn | 0x1 |
|  |  |  |  |  |  |
| EnhancedMemory\_St | Status | Null | 0x0 | EnhancedMemory InterfaceClient | EnhancedMemory ProfileServer |
| ProfilesOn | 0x1 |
| ProfilesOff | 0x2 |
| NotSupported | 0x3 |
|  |  |  |  |  |  |
| EnMemButtonPairing\_St | ButtonPairing | Null | 0x0 | EnhancedMemory PositionClient, | EnhancedMemory InterfaceClient EnhancedMemory  ProfileServer |
| Button1Pressed | 0x1 |
| Button2Pressed | 0x2 |
| Button3Pressed | 0x3 |
| Button4Pressed | 0x4 |
| ButtonPairingEntered | 0x5 |
| ButtonPairingExited | 0x6 |
| ButtonPairingFailed | 0x7 |
|  |  |  |  |  |  |
| InfotainmentPersStore\_St | Status | Complete | 0x0 | EnhancedMemory PositionClient | EnhancedMemory InterfaceClient |
| InProgress | 0x1 |
| Null | 0x2 |
| MemSwitchRecall\_Rq | PersIndex | Null | 0x0 | EnhancedMemory PositionClient | EnhancedMemory ProfileServer |
| Pers1 | 0x1 |
| Pers2 | 0x2 |
| Pers3 | 0x3 |
| Pers4 | 0x4 |
|  |  |  |  |  |  |
| EnMemKeyPairing\_St | PersIndex | Null | 0x0 | EnhancedMemory ProfileServer | EnhancedMemory InterfaceClient |
| Pers1 | 0x1 |
| Pers2 | 0x2 |
| Pers3 | 0x3 |
| Pers4 | 0x4 |
| NotUsed | 0x5 |
| NotUsed | 0x6 |
| NotUsed | 0x7 |
| KeyPairing | Null | 0x0 | EnhancedMemory ProfileServer | EnhancedMemory InterfaceClient |
| KeyPairingEntered | 0x1 |
| KeyPairingExited | 0x2 |
| KeyDisassociated | 0x3 |
| KeyAlreadyInUse | 0x4 |
| KeyAssociateSuccess | 0x5 |
| KeyAssociateFailed | 0x6 |
| WrongDeviceSelected | 0x7 |
| PersKeyPairing\_St | Pers1KeyStatus | Null | 0x0 | EnhancedMemory ProfileServer | EnhancedMemory InterfaceClient |
| Key Associated | 0x1 |
| Key Not Associated | 0x2 |
| Reserved | 0x3 |
| Pers2KeyStatus | Null | 0x0 | EnhancedMemory ProfileServer | EnhancedMemory InterfaceClient |
| Key Associated | 0x1 |
| Key Not Associated | 0x2 |
| Reserved | 0x3 |
| Pers3KeyStatus | Null | 0x0 | EnhancedMemory ProfileServer | EnhancedMemory InterfaceClient |
| Key Associated | 0x1 |
| Key Not Associated | 0x2 |
| Reserved | 0x3 |
| Pers4KeyStatus | Null | 0x0 | EnhancedMemory ProfileServer | EnhancedMemory InterfaceClient |
| Key Associated | 0x1 |
| Key Not Associated | 0x2 |
| Reserved | 0x3 |
| PersPhonePairing\_St | Pers1PhoneStatus | No Phones Associated | 0x0 | EnhancedMemory ProfileServer | EnhancedMemory InterfaceClient |
| One Phone Associated | 0x1 |
| Two Phones Associated | 0x2 |
| Three Phones Associated | 0x3 |
| Four Phones Associated | 0x4 |
| Five Phones Associated | 0x5 |
| Six Phones Associated | 0x6 |
| Seven Phones Associated | 0x7 |
| Pers2PhoneStatus | No Phones Associated | 0x0 | EnhancedMemory ProfileServer | EnhancedMemory InterfaceClient |
| One Phone Associated | 0x1 |
| Two Phones Associated | 0x2 |
| Three Phones Associated | 0x3 |
| Four Phones Associated | 0x4 |
| Five Phones Associated | 0x5 |
| Six Phones Associated | 0x6 |
| Seven Phones Associated | 0x7 |
| Pers3PhoneStatus | No Phones Associated | 0x0 | EnhancedMemory ProfileServer | EnhancedMemory InterfaceClient |
| One Phone Associated | 0x1 |
| Two Phones Associated | 0x2 |
| Three Phones Associated | 0x3 |
| Four Phones Associated | 0x4 |
| Five Phones Associated | 0x5 |
| Six Phones Associated | 0x6 |
| Seven Phones Associated | 0x7 |
| Pers4PhoneStatus | No Phones Associated | 0x0 | EnhancedMemory ProfileServer | EnhancedMemory InterfaceClient |
| One Phone Associated | 0x1 |
| Two Phones Associated | 0x2 |
| Three Phones Associated | 0x3 |
| Four Phones Associated | 0x4 |
| Five Phones Associated | 0x5 |
| Six Phones Associated | 0x6 |
| Seven Phones Associated | 0x7 |
| PaakConnection\_St | Status | Null | 0x0 | PaaKServer | EnhancedMemory InterfaceClient |
| NoneConnected | 0x1 |
| Connected | 0x2 |
|  | PersIndex | Null | 0x0 | EnhancedMemory ProfileServer | EnhancedMemory InterfaceClient |
|  | Pers1 | 0x1 |
|  | Pers2 | 0x2 |
|  | Pers3 | 0x3 |
|  | Pers4 | 0x4 |
|  | NotUsed | 0x5 |
|  | NotUsed | 0x6 |
|  | NotUsed | 0x7 |
| PersNFCKeyPairing\_St | PersNFCKey1Index | Inactive | 0x0 | EnhancedMemory ProfileServer | EnhancedMemory InterfaceClient |
| Index 1 | 0x1 |
| Index 2 | 0x2 |
| Index 3 | 0x3 |
| … | … |
| Index 255 | 0xFF |
| PersNFCKey2Index | Inactive | 0x0 | EnhancedMemory ProfileServer | EnhancedMemory InterfaceClient |
| Index 1 | 0x1 |
| Index 2 | 0x2 |
| Index 3 | 0x3 |
| … | … |
| Index 255 | 0xFF |
| PersNFCKey3Index | Inactive | 0x0 | EnhancedMemory ProfileServer | EnhancedMemory InterfaceClient |
| Index 1 | 0x1 |
| Index 2 | 0x2 |
| Index 3 | 0x3 |
| … | … |
| Index 255 | 0xFF |
| PersNFCKey4Index | Inactive | 0x0 | EnhancedMemory ProfileServer | EnhancedMemory InterfaceClient |
| Index 1 | 0x1 |
| Index 2 | 0x2 |
| Index 3 | 0x3 |
| … | … |
| Index 255 | 0xFF |
|  |  |  |  |  |  |
| ActivePersonality\_St | PersIndex | Pers1 | 0x0 | EnhancedMemory ProfileServer | ALL\* |
| Pers2 | 0x1 |
| Pers3 | 0x2 |
| Pers4 | 0x3 |
| Vehicle | 0x4 |
| NotDetermined | 0x5 |
| NotUsed | 0x6 |
| NotUsed | 0x7 |
| PersonalityRecallCount\_St | CountValue | 0 | 0x00 | EnhancedMemory ProfileServer | ALL\* |
| 1 | 0x01 |
| … |  |
| 255 | 0xFF |
| MemoryPosition\_St | PersIndex | Pers1 | 0x0 | EnhancedMemory ProfileServer | EnhancedMemory PositionClient |
| Pers2 | 0x1 |
| Pers3 | 0x2 |
| Pers4 | 0x3 |
| Vehicle | 0x4 |
| Not Used | 0x5 |
| Not Used | 0x6 |
| Not Used | 0x7 |
|  |  |  |  |  |  |
| Feature\_Rq | Operation | Null | 0x0 | EnhancedMemory InterfaceClient | ALL\* |
| Query | 0x1 |
| Set | 0x2 |
| Upload | 0x3 |
| Restore | 0x4 |
| Copy | 0x5 |
| NotUsed | 0x6 |
| NotUsed | 0x7 |
| FeatureID | - | 0x0000 – 0xFFFF | EnhancedMemory InterfaceClient | ALL\* |
|  |
|  |
| Configuration | - | 0x0000 – 0xFFFF | EnhancedMemory InterfaceClient | ALL\* |  |
|  |
|  |
| PersIndex | PERS\_1 | 0x0 | EnhancedMemory InterfaceClient | ALL\* |  |
| PERS\_2 | 0x1 |  |
| PERS\_3 | 0x2 |  |
| PERS\_4 | 0X3 |  |
| VEHICLE | 0X4 |  |
| Not Used | 0x5 |  |
| Not Used | 0x6 |  |
| Not Used | 0x7 |  |
|  |  |  |  |  |  |  |
| VehicleSpeed\_St | Type | kph | 0x0000 - 0xFFFF | PCM | EnhancedMemory InterfaceClient |  |
| GearLvrPos\_D\_Actl | Type | Park | 0x0 | TCM | EnhancedMemory InterfaceClient |  |
| Reverse | 0x1 |  |
| Neutral | 0x2 |  |
| Drive | 0x3 |  |
| Sport\_DriveSport | 0x4 |  |
| Low | 0x5 |  |
| First | 0x6 |  |
| Second | 0x7 |  |
| Third | 0x8 |  |
| Fourth | 0x9 |  |
| Fifth | 0xA |  |
| Sixth | 0xB |  |
| Undefined\_Treat\_as\_Fault | 0xC |  |
| Undefined\_Treat\_as\_Fault1 | 0xD |  |
| Unknown\_Position | 0xE |  |
| Fault | 0xF |  |
| IgnitionStatus\_St | Type | Unknown | 0x0 | EnhancedMemory ProfileServer | EnhancedMemory InterfaceClient |  |
| Off | 0x1 |  |
| Accessory | 0x2 |  |
| Run | 0x4 |  |
| Start | 0x8 |  |
| Invalid | 0xF |  |
| FactoryReset\_Rq | Type | Invalid | 0x0 | EnhancedMemory InterfaceClient | INFO\*\* |  |
| Reset | 0x1 |  |
|  |  |  |  |  |  |  |
| DigitalKeyList\_Rq | OpCode | Reserved | 0x00 | EnhancedMemory InterfaceClient | EnhancedMemory NFCServer |  |
| Read | 0x01 |  |
| Reserved | 0x02 - 0xFF |  |
| NumberOfItems | Invalid | 0x00 | EnhancedMemory InterfaceClient | EnhancedMemory NFCServer |  |
| 1 | 0x01 |  |
| 2 | 0x02 |  |
| … |  |  |
| 254 | 0xFE |  |
| No Entry | 0xFF |  |
| StartIndex | Invalid | 0x00 | EnhancedMemory InterfaceClient | EnhancedMemory NFCServer |  |
| 1 | 0x01 |  |
| 2 | 0x02 |  |
| … |  |  |
| 254 | 0xFE |  |
| No Entry | 0xFF |  |
| DigitalKeyList\_Rsp | List Size | Inactive | 0x00 | EnhancedMemory NFCServer | EnhancedMemory InterfaceClient |  |
| List Size 1 | 0x01 |  |
| List Size 2 | 0x02 |  |
| … |  |  |
| List Size 254 | 0xFE |  |
| No Entry | 0xFF |  |
| Total Number Of Keys Available | Invalid | 0x00 | EnhancedMemory NFCServer | EnhancedMemory InterfaceClient |  |
| 1 Key Available | 0x01 |  |
| 2 Keys Available | 0x02 |  |
| … |  |  |
| 254 Keys Available | 0xFE |  |
| No Entry | 0xFF |  |
| Additional Key Storage Available | No | 0x00 | EnhancedMemory NFCServer | EnhancedMemory InterfaceClient |  |
| Yes | 0x01 |  |
| Reserved | 0x02-0xFF |  |
| Vector |  |  |  |
| IndexNumber | Inactive | 0x00 | EnhancedMemory NFCServer | EnhancedMemory InterfaceClient |  |
| Index 1 | 0x01 |  |
| Index 2 | 0x02 |  |
| … | … |  |
| Index 255 | 0xFF |  |
| DeviceType | NFC Card | 0x00 | EnhancedMemory NFCServer | EnhancedMemory InterfaceClient |  |
| Digital Key | 0x01 |  |
| CAK | 0x02 |  |
| Reserved | 0x03 - 0xFF |  |
| KeyType | Factory | 0x00 |  |
| Retail User | 0x01 |  |
| Fleet User | 0x02 |  |
| Reserved | 0x03 – 0xFF |  |
| KeyStatus | Pending Add | 0x00 |  |
| Pending Delete | 0x01 |  |
| Added/Confirmed | 0x02 |  |
| Reserved | 0x03 – 0xFF |  |
| FESN | - | - | EnhancedMemory NFCServer | EnhancedMemory InterfaceClient |  |
| FriendlyName | - | - |  |
| PairingID | - | - |  |
| NFCDeviceTapPaired\_St | Status | No | 0x0 | EnhancedMemory NFCServer | EnhancedMemory InterfaceClient |  |
| Yes | 0x1 |  |
| NFCDeviceTap\_Rq | Type | Initial Value | 0x0 |  |
| Code Value | 0x1 To 0x6 |  |
| Not Used | 0x7 |  |
| DriverPositionalChange\_St | DriverMirrorAdjustStat | None | 0x0 | EnhancedMemoryServer | EnhancedMemory InterfaceClient |  |
| In Progress | 0x1 |  |
| Major | 0x2 |  |
| Minor | 0x3 |  |
| PassengerMirrorAdjustStat | None | 0x0 | EnhancedMemoryServer | EnhancedMemory InterfaceClient |  |
| In Progress | 0x1 |  |
| Major | 0x2 |  |
| Minor | 0x3 |  |
| PedalAdjustStat | None | 0x0 | EnhancedMemoryServer | EnhancedMemory InterfaceClient |  |
| In Progress | 0x1 |  |
| Major | 0x2 |  |
| Minor | 0x3 |  |
| SteeringWheelAdjustStat | None | 0x0 | EnhancedMemoryServer | EnhancedMemory InterfaceClient |  |
| In Progress | 0x1 |  |
| Major | 0x2 |  |
| Minor | 0x3 |  |
| DriverSeatAdjustStat | None | 0x0 | EnhancedMemoryServer | EnhancedMemory InterfaceClient |  |
| In Progress | 0x1 |  |
| Major | 0x2 |  |
| Minor | 0x3 |  |
| DriverMCSAdjustStat | None | 0x0 | EnhancedMemoryServer | EnhancedMemory InterfaceClient |  |
| In Progress | 0x1 |  |
| Major | 0x2 |  |
| Minor | 0x3 |  |

\* ALL refers to EnhancedMemoryServer

\*\* INFO refers to Infotainment Enhanced Memory Servers that support Master Reset

### Logic Method to Physical Signal Translation Table

Logic parameter names are translated into GSDB signal names in this table. The Global Signal Database (GSDB) is the master for all signals. GSDB signal names listed here are reference only.  Readers are advised to refer Global Signal Database for up to date information. Tx and Rx in this table reflect the generally assumed ECU implementation as a reference only. For the latest ECU implementation, please reference the Enhanced Memory Feature boundary diagram.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Logic Method Name | Logic Parameter Name |  | GSDB Signal Name | GSDB Encoding Name | Value | Tx | Rx |
| EnMemProfilePairing\_Rq | PersIndex | EmPrflNo\_D\_Rq | Null | 0x0 | APIM | BCM |
| Pers1 | 0x1 |
| Pers2 | 0x2 |
| Pers3 | 0x3 |
| Pers4 | 0x4 |
| NotUsed | 0x5 |
| NotUsed | 0x6 |
| NotUsed | 0x7 |
| ButtonPairing | EmPrflButtnAssoc\_D\_Rq | Null | 0x0 | APIM | DSM |
| EnterButtonAssociation | 0x1 |
| ExitButtonAssociation | 0x2 |
| NotUsed | 0x3 |
| KeyPairing | EmPrflKeyAssoc\_D\_Rq | Null | 0x0 | APIM | BCM |
| EnterKeyAssociation | 0x1 |
| ExitKeyAssociation | 0x2 |
| DisassociateKey | 0x3 |
| OverwriteKey | 0x4 |
| EnterPhoneAssociation | 0x5 |
| DisassociatePhone | 0x6 |
| NFCKeyPairing | DgtlKeyPrflAssoc\_D\_Rq | Null | 0x0 | APIM | BCM |
| EnterKeyAssociation | 0x1 |
| ExitKeyAssociation | 0x2 |
| DisassociateKey1 | 0x3 |
| DisassociateKey2 | 0x4 |
| DisassociateKey3 | 0x5 |
| DisassociateKey4 | 0x6 |
| OverwriteKey | 0x7 |
|  |  |  |  |  |  |  |
| InfotainmentPersStore\_Rq | PersIndex | PersStore\_D\_Rq | Null | 0x0 | APIM | DSM |
| Pers1 | 0x1 |
| Pers2 | 0x2 |
| Pers3 | 0x3 |
| Pers4 | 0x4 |
| Vehicle | 0x5 |
| InfotainmentRecall\_Rq | PersIndex | CntrStk\_D\_RqRecall | Null | 0x0 | APIM | BCM |
| Pers1 | 0x1 |
| Pers2 | 0x2 |
| Pers3 | 0x3 |
| Pers4 | 0x4 |
| Vehicle | 0x5 |
| PersonalityOptIn\_St | Pers1Status | Pers1OptIn\_B\_Stats | NotOptedIn | 0x0 | APIM | BCM |
| OptedIn | 0x1 |
| Pers2Status | Pers2OptIn\_B\_Stats | NotOptedIn | 0x0 | APIM | BCM |
| OptedIn | 0x1 |
| Pers3Status | Pers3OptIn\_B\_Stats | NotOptedIn | 0x0 | APIM | BCM |
| OptedIn | 0x1 |
| Pers4Status | Pers4OptIn\_B\_Stats | NotOptedIn | 0x0 | APIM | BCM |
| OptedIn | 0x1 |
|  |  |  |  |  |  |  |
| EnhancedMemory\_St | Status | Em\_D\_Stat | Null | 0x0 | APIM | BCM |
| ProfilesOn | 0x1 |
| ProfilesOff | 0x2 |
| NotSupported | 0x3 |
|  |  |  |  |  |  |  |
| EnMemButtonPairing\_St | ButtonPairing | EmButtn\_D\_Stat | Null | 0x0 | DSM | BCM APIM |
| Button1Pressed | 0x1 |
| Button2Pressed | 0x2 |
| Button3Pressed | 0x3 |
| Button4Pressed | 0x4 |
| ButtonAssociationEntered | 0x5 |
| ButtonAssociationExited | 0x6 |
| ButtonAssociationFailed | 0x7 |
|  |  |  |  |  |  |  |
| InfotainmentPersStore\_St | Status | PersStore\_D\_Actl | Complete | 0x0 | DSM | APIM |
| InProgress | 0x1 |
| Null | 0x2 |
| MemSwitchRecall\_Rq | PersIndex | MemSwtch\_D\_RqRecall | Null | 0x0 | DSM | BCM |
| Pers1 | 0x1 |
| Pers2 | 0x2 |
| Pers3 | 0x3 |
| Pers4 | 0x4 |
|  |  |  |  |  |  |  |
| EnMemKeyPairing\_St | PersIndex | EmPrflNo\_D\_Stat | Null | 0x0 | BCM | APIM |
| Pers1 | 0x1 |
| Pers2 | 0x2 |
| Pers3 | 0x3 |
| Pers4 | 0x4 |
| NotUsed | 0x5 |
| NotUsed | 0x6 |
| NotUsed | 0x7 |
| KeyPairing | EmPrflKeyAssoc\_D\_Stat | Null | 0x0 | BCM | APIM |
| KeyAssociationEntered | 0x1 |
| KeyAssociationExited | 0x2 |
| KeyDisassociated | 0x3 |
| KeyAlreadyInUse | 0x4 |
| KeyAssociateSuccess | 0x5 |
| KeyAssociateFailed | 0x6 |
| WrongDevice | 0x7 |
| PersKeyPairing\_St | Pers1KeyStatus | Pers1Key\_D\_Stat | Null | 0x0 | BCM | APIM |
| KeyAssociated | 0x1 |
| KeyUnAssociated | 0x2 |
| NotUsed\_1 | 0x3 |
| Pers2KeyStatus | Pers2Key\_D\_Stat | Null | 0x0 | BCM | APIM |
| KeyAssociated | 0x1 |
| KeyUnAssociated | 0x2 |
| NotUsed\_1 | 0x3 |
| Pers3KeyStatus | Pers3Key\_D\_Stat | Null | 0x0 | BCM | APIM |
| KeyAssociated | 0x1 |
| KeyUnAssociated | 0x2 |
| NotUsed\_1 | 0x3 |
| Pers4KeyStatus | Pers4Key\_D\_Stat | Null | 0x0 | BCM | APIM |
| KeyAssociated | 0x1 |
| KeyUnAssociated | 0x2 |
| NotUsed\_1 | 0x3 |
| PersPhonePairing\_St | Pers1PhoneStatus | Pers1Phone\_D\_Stat | NoPhoneAssociated | 0x0 | BCM | APIM |
| OnePhoneAssociated | 0x1 |
| TwoPhoneAssociated | 0x2 |
| ThreePhoneAssociated | 0x3 |
| FourPhoneAssociated | 0x4 |
| FivePhoneAssociated | 0x5 |
| SixPhoneAssociated | 0x6 |
| SevenPhoneAssociated | 0x7 |
| Pers2PhoneStatus | Pers2Phone\_D\_Stat | NoPhoneAssociated | 0x0 | BCM | APIM |
| OnePhoneAssociated | 0x1 |
| TwoPhoneAssociated | 0x2 |
| ThreePhoneAssociated | 0x3 |
| FourPhoneAssociated | 0x4 |
| FivePhoneAssociated | 0x5 |
| SixPhoneAssociated | 0x6 |
| SevenPhoneAssociated | 0x7 |
| Pers3PhoneStatus | Pers3Phone\_D\_Stat | NoPhoneAssociated | 0x0 | BCM | APIM |
| OnePhoneAssociated | 0x1 |
| TwoPhoneAssociated | 0x2 |
| ThreePhoneAssociated | 0x3 |
| FourPhoneAssociated | 0x4 |
| FivePhoneAssociated | 0x5 |
| SixPhoneAssociated | 0x6 |
| SevenPhoneAssociated | 0x7 |
| Pers4PhoneStatus | Pers4Phone\_D\_Stat | NoPhoneAssociated | 0x0 | BCM | APIM |
| OnePhoneAssociated | 0x1 |
| TwoPhoneAssociated | 0x2 |
| ThreePhoneAssociated | 0x3 |
| FourPhoneAssociated | 0x4 |
| FivePhoneAssociated | 0x5 |
| SixPhoneAssociated | 0x6 |
| SevenPhoneAssociated | 0x7 |
| PaakConnection\_St | Status |  | PaakCnnct\_D\_Stat | Null | 0x0 | RFA | APIM |
|  | NoneConnected | 0x1 |
|  | Connected | 0x2 |
| PersNFCKeyPairing\_St | PersIndex |  | PersPrfl\_D\_Stat | Null | 0x0 | BCM | APIM |
|  | Pers1 | 0x1 |
|  | Pers2 | 0x2 |
|  | Pers3 | 0x3 |
|  | Pers4 | 0x4 |
|  | NotUsed | 0x5 |
|  | NotUsed | 0x6 |
|  | NotUsed | 0x7 |
| PersNFCKey1Index |  | PersDgtlKey1\_D\_Stat | Inactive | 0x0 | BCM | APIM |
|  | Index 1 | 0x1 |
|  | Index 2 | 0x2 |
|  | Index 3 | 0x3 |
|  | … | … |
|  | Index 255 | 0xFF |
| PersNFCKey2Index |  | PersDgtlKey2\_D\_Stat | Inactive | 0x0 | BCM | APIM |
|  | Index 1 | 0x1 |
|  | Index 2 | 0x2 |
|  | Index 3 | 0x3 |
|  | … | … |
|  | Index 255 | 0xFF |
| PersNFCKey3Index |  | PersDgtlKey3\_D\_Stat | Inactive | 0x0 | BCM | APIM |
|  | Index 1 | 0x1 |
|  | Index 2 | 0x2 |
|  | Index 3 | 0x3 |
|  | … | … |
|  | Index 255 | 0xFF |
| PersNFCKey4Index |  | PersDgtlKey4\_D\_Stat | Inactive | 0x0 | BCM | APIM |
|  | Index 1 | 0x1 |
|  | Index 2 | 0x2 |
|  | Index 3 | 0x3 |
|  | … | … |
|  | Index 255 | 0xFF |
|  |  |  |  |  |  |  |  |
| ActivePersonality\_St | PersIndex | PersNo\_D\_Actl | Pers1 | 0x0 | BCM | ALL\* |
| Pers2 | 0x1 |
| Pers3 | 0x2 |
| Pers4 | 0x3 |
| Vehicle | 0x4 |
| NotDetermined | 0x5 |
| Unused\_2 | 0x6 |
| Unused\_3 | 0x7 |
| PersonalityRecallCount\_St | CountValue | RecallEvent\_No\_Cnt | 0 | 0x00 | BCM | ALL\* |
| 1 | 0x01 |
| … |  |
| 255 | 0xFF |
| MemoryPosition\_St | PersIndex | PersNoPos\_D\_Actl | Pers1 | 0x0 | BCM | DSM |
| Pers2 | 0x1 |
| Pers3 | 0x2 |
| Pers4 | 0x3 |
| Vehicle | 0x4 |
| Not Used | 0x5 |
| Not Used | 0x6 |
| Not Used | 0x7 |
|  |  |  |  |  |  |  |
| Feature\_Rq | Operation | CtrStkDsplyOp\_D\_Rq | Null | 0x0 | APIM | ALL\* |
| Query | 0x1 |
| Set | 0x2 |
| Upload | 0x3 |
| Restore | 0x4 |
| Copy | 0x5 |
| NotUsed | 0x6 |
| NotUsed | 0x7 |
| FeatureID | CtrStkFeatNoActl | - | 0x0000 – 0xFFFF | APIM | ALL\* |
|  |
|  |
| Configuration | CtrStkFeatConfigActl | - | 0x0000 – 0xFFFF | APIM | ALL\* |  |
|  |
|  |
| PersIndex | CtrStkPersIndex\_D\_Actl | PERS\_1 | 0x0 | APIM | ALL\* |  |
| PERS\_2 | 0x1 |  |
| PERS\_3 | 0x2 |  |
| PERS\_4 | 0X3 |  |
| VEHICLE | 0X4 |  |
| Not Used | 0x5 |  |
| Not Used | 0x6 |  |
| Not Used | 0x7 |  |
|  |  |  |  |  |  |  |  |
| VehicleSpeed\_St | Type | Veh\_V\_ActlEng | kph | 0x0000 - 0xFFFF | PCM | APIM |  |
| GearLvrPos\_D\_Actl | Type | GearLvrPos\_D\_Actl | Park | 0x0 | TCM | APIM |  |
| Reverse | 0x1 |  |
| Neutral | 0x2 |  |
| Drive | 0x3 |  |
| Sport\_DriveSport | 0x4 |  |
| Low | 0x5 |  |
| First | 0x6 |  |
| Second | 0x7 |  |
| Third | 0x8 |  |
| Fourth | 0x9 |  |
| Fifth | 0xA |  |
| Sixth | 0xB |  |
| Undefined\_Treat\_as\_Fault | 0xC |  |
| Undefined\_Treat\_as\_Fault1 | 0xD |  |
| Unknown\_Position | 0xE |  |
| Fault | 0xF |  |
| IgnitionStatus\_St | Type | IgnitionStatus | Unknown | 0x0 | BCM | APIM |  |
| Off | 0x1 |  |
| Accessory | 0x2 |  |
| Run | 0x4 |  |
| Start | 0x8 |  |
| Invalid | 0xF |  |
| FactoryReset\_Rq | Type | SDARS\_FactoryReset\_Rq | Invalid | 0x0 | APIM | INFO\*\* |  |
| Reset | 0x1 |  |
| DigitalKeyList\_Rq | OpCode |  | See TP SPSS | Reserved | 0x00 | APIM | NFAM |  |
|  |  | Read | 0x01 |  |
|  |  | Reserved | 0x02 - 0xFF |  |
| NumberOfItems |  | See TP SPSS | Invalid | 0x00 | APIM | NFAM |  |
|  |  | 1 | 0x01 |  |
|  |  | 2 | 0x02 |  |
|  |  | … |  |  |
|  |  | 254 | 0xFE |  |
|  |  | No Entry | 0xFF |  |
| StartIndex |  | See TP SPSS | Invalid | 0x00 | APIM | NFAM |  |
|  |  | 1 | 0x01 |  |
|  |  | 2 | 0x02 |  |
|  |  | … |  |  |
|  |  | 254 | 0xFE |  |
|  |  | No Entry | 0xFF |  |
| DigitalKeyList\_Rsp | List Size |  | See TP SPSS | Inactive | 0x00 | NFAM | APIM |  |
|  |  | List Size 1 | 0x01 |  |
|  |  | List Size 2 | 0x02 |  |
|  |  | … |  |  |
|  |  | List Size 254 | 0xFE |  |
|  |  | No Entry | 0xFF |  |
| Total Number Of Keys Available |  | See TP SPSS | Invalid | 0x00 | NFAM | APIM |  |
|  |  | 1 Key Available | 0x01 |  |
|  |  | 2 Keys Available | 0x02 |  |
|  |  | … |  |  |
|  |  | 254 Keys Available | 0xFE |  |
|  |  | No Entry | 0xFF |  |
| Additional Key Storage Available |  | See TP SPSS | No | 0x00 | NFAM | APIM |  |
|  |  | Yes | 0x01 |  |
|  |  | Reserved | 0x02-0xFF |  |
| Vector |  | See TP SPSS |  |  | NFAM | APIM |  |
| IndexNumber |  | See TP SPSS | Inactive | 0x00 | NFAM | APIM |  |
|  |  | Index 1 | 0x01 |  |
|  |  | Index 2 | 0x02 |  |
|  |  | … | … |  |
|  |  | Index 255 | 0xFF |  |
| DeviceType |  | See TP SPSS | NFC Card | 0x00 | NFAM | APIM |  |
|  |  | Digital Key | 0x01 |  |
|  |  | CAK | 0x02 |  |
|  |  | Reserved | 0x03 - 0xFF |  |
| KeyType |  | See TP SPSS | Factory | 0x00 | NFAM | APIM |  |
|  |  | Retail User | 0x01 |  |
|  |  | Fleet User | 0x02 |  |
|  |  | Reserved | 0x03 – 0xFF |  |
| KeyStatus |  | See TP SPSS | Pending Add | 0x00 | NFAM | APIM |  |
|  |  | Pending Delete | 0x01 |  |
|  |  | Added/Confirmed | 0x02 |  |
|  |  | Reserved | 0x03 – 0xFF |  |
| FESN |  | See TP SPSS | - | - | NFAM | APIM |  |
| FriendlyName |  | See TP SPSS | - | - | NFAM | APIM |  |
| PairingID |  | See TP SPSS | - | - | NFAM | APIM |  |
| NFCDeviceTapPaired\_St | Status |  | NfcDevcTapPrd\_B\_Stat | No | 0x0 | NFAM | APIM |  |
|  | Yes | 0x1 |  |
| NFCDeviceTap\_Rq | Type |  | NfcDevcTap2\_No\_Rq | Initial Value | 0x0 | NFAM | APIM |  |
|  | Code Value | 0x1 To 0x6 |  |
|  | Not Used | 0x7 |  |
| DriverPositionalChange\_St | DriverMirrorAdjustStat |  | MrorAutoSavDrv\_D\_Stat | None | 0x0 | DDM | APIM |  |
| In Progress | 0x1 |  |
| Major | 0x2 |  |
| Minor | 0x3 |  |
| PassengerMirrorAdjustStat | MrorAutoSavPsngr\_D\_Stat | None | 0x0 | PDM | APIM |  |
| In Progress | 0x1 |  |
| Major | 0x2 |  |
| Minor | 0x3 |  |
| PedalAdjustStat | PdlAutoSav\_D\_Stat | None | 0x0 | DSM | APIM |  |
| In Progress | 0x1 |  |
| Major | 0x2 |  |
| Minor | 0x3 |  |
| SteeringWheelAdjustStat | SteAutoSav\_D\_Stat | None | 0x0 | DSM | APIM |  |
| In Progress | 0x1 |  |
| Major | 0x2 |  |
| Minor | 0x3 |  |
| DriverSeatAdjustStat | SeatAutoSavDrv\_D\_Stat | None | 0x0 | DSM | APIM |  |
| In Progress | 0x1 |  |
| Major | 0x2 |  |
| Minor | 0x3 |  |
| DriverMCSAdjustStat | StmsAutoSavDrv\_D\_Stat | None | 0x0 | SCMG | APIM |  |
| In Progress | 0x1 |  |
| Major | 0x2 |  |
| Minor | 0x3 |  |

\* ALL refers to Enhanced Memory Server

\*\* INFO refers to Infotainment Enhanced Memory Servers that support Master Reset

## Enhanced Memory Logic Method Requirements

### ENMEM-REQ-205033/C-Status Memory Storage Requirement for Profile Server

The EnhancedMemoryProfileServer shall maintain the following signals in non-volatile memory:

* Enhanced Memory Profile Status (PersonalityOptIn\_St)
* Enhanced Memory Feature status (EnhancedMemory\_St)
* Enhanced Memory Active Profile status (ActivePersonality\_St)
* Enhanced Memory Keyfob Association/Disassociation status (PersKeyPairing\_St)
* Enhanced Memory Phone Association/Disassociation status (PersPhonePairing\_St)
* Enhanced Memory NFC Key Association/Disassociation status (PersNFCKeyPairing\_St)

If the above requirement cannot be met, the EnhancedMemoryProfileServer shall use other mechanism or design to ensure that the values of above signals can be recalled after the following events:

* After a B+ reset (Exception: ActivePersonality\_St shall be set to Vehicle after a B+ reset)
* After a module reset
* Between ignition cycles
* Between network bus sleep and wake-up events

### ENMEM-REQ-206269/A-Status Memory Storage Requirement for Interface Client

The EnhancedMemoryInterfaceClient shall maintain the following signals in non-volatile memory:

1. Enhanced Memory Profile Status (PersonalityOptIn\_St)
2. Enhanced Memory Feature status (EnhancedMemory\_St)

The EnhancedMemoryInterfaceClient shall ensure that the values required to be stored in non-volatile memory can be recalled after the following events:

* After a B+ reset
* After a module reset
* Between ignition cycles
* Between network bus sleep and wake-up events

### ENMEM-REQ-206271/A-Status Memory Storage Requirement for Enhanced Memory Servers

The EnhancedMemoryServers shall maintain the following signals in non-volatile memory:

* Enhanced Memory Active Profile status (ActivePersonality\_St)
* Enhanced Memory Driver Profile Recall Counter (PersonalityRecallCounter\_St)

The EnhancedMemoryServers shall ensure that the values required to be stored in non-volatile memory can be recalled for the following (but not limited to) events:

* Between network bus sleep and wake-up events
* Between ignition cycles
* When any network communication failure prevents these signals from being transmitted by the EnhancedMemoryProfileServer

### ENMEM-REQ-226669/A-Enhanced Memory Network WakeUp Signal Designation

The following signals shall be designated as Network WakeUp Signals as defined in the requirement of EY-0088(HIGH SPEED & MEDIUM SPEED CONTROLLER AREA NETWORK PROTOCOLS), when transmitter and receiver of the signal are not in the same Network:

* Enhanced Memory Profile Status (PersonalityOptIn\_St)
* Enhanced Memory Feature status (EnhancedMemory\_St)
* Enhanced Memory Menu Recall Request (InfotainmentRecall\_Rq)

This requirement is needed to ensure that Driver Profile can be recalled in the case when ignition is not in Run in which not all modules are awake at the same time.

### ENMEM-SR-REQ-199818/C-Request/Response Return to Null State

When updating on event, the following event-periodic signals listed below shall hold their signal encoding values for a period of time defined by T\_ReturnToNull and then shall transit back to Null as shown in the sequence diagrams:

* InfotainmentRecall\_Rq
* InfotainmentPersStore\_Rq
* EnMemProfilePairing\_Rq
* EnMemKeyPairing\_St
* MemSwitchRecall\_Rq
* InfotainmentPersStore\_St
* Feature\_Rq

The receiving modules of these signals shall act upon the event signal and shall not wait for the “Null” to act upon the signal request.

### ENMEM-TMR-REQ-199819/A-T\_ReturnToNull

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | **Description** | **Units** | **Range** | **Resolution** | **Default** |
| T\_ReturnToNull | Minimum time to hold on an event state before return to Null state | sec | 0.5-2 | 0.5 | 1 |

### ENMEM-REQ-199774/A-Crank Event - Enhanced Memory

In the context of Enhanced Memory, when a Crank event occurs (ex Ignition\_Status = Crank) it is to be considered a don’t care and assume the last state unless noted otherwise.

* For example, if Ignition\_Status = Run and a Crank event happens with Ignition\_Status = Crank and then Ignition\_Status goes back to Run, unless noted otherwise it shall be assumed that in the use cases and functional requirements that Ignition remained in Run.

## Enhanced Memory Method Descriptions

### MD-REQ-199794/C-EnMemProfilePairing\_Rq

Message Type: Request

The signal is used to request that the Enhanced Memory Position Client or Enhanced Memory Profile Server make a change to the state of driver memory seat button pairing mode, keyfob pairing mode, and phone pairing mode, and NFC key pairing mode.

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Literals** | **Value** | **Description** |
| PersIndex | - | - | Indicates which Personality Profile the "Pairing" request is referring to.  Received by Enhanced Memory Profile Server only |
|  | Null | 0x0 |  |
|  | Pers1 | 0x1 |  |
|  | Pers2 | 0x2 |  |
|  | Pers3 | 0x3 |  |
|  | Pers4 | 0x4 |  |
|  | NotUsed | 0x5 |  |
|  | NotUsed | 0x6 |  |
|  | NotUsed | 0x7 |  |
| ButtonPairing | - | - | Indicates the Personality Profile button pairing mode request value. Received by Enhanced Memory Position Client only |
|  | Null | 0x0 |  |
|  | EnterButtonPairing | 0x1 |  |
|  | ExitButtonPairing | 0x2 |  |
|  | NotUsed | 0x3 |  |
| KeyPairing | - | - | Indicates the Personality Profile keyfob and phone pairing modes request value. Received by Enhanced Memory Profile Server only |
|  | Null | 0x0 |  |
|  | EnterKeyPairing | 0x1 |  |
|  | ExitKeyPairing | 0x2 |  |
|  | DisassociateKey | 0x3 |  |
|  | OverwriteKey | 0x4 |  |
|  | EnterPhonePairing | 0x5 |  |
|  | DisassociatePhone | 0x6 |  |
|  |  |  |  |
| NFCKeyPairing | - | - | Indicates the Personality Profile NFC Key association mode request value. Received by Enhanced Memory Profile Server only |
|  | Null | 0x0 |  |
|  | EnterKeyAssociation | 0x1 |  |
|  | ExitKeyAssociation | 0x2 |  |
|  | DisassociateKey1 | 0x3 |  |
|  | DisassociateKey2 | 0x4 |  |
|  | DisassociateKey3 | 0x5 |  |
|  | DisassociateKey4 | 0x6 |  |
|  | OverwriteKey | 0x7 |  |

### MD-REQ-199796/A-InfotainmentPersStore\_Rq

Message Type: Request

The signal is used by the EnhancedMemoryInterfaceClient to request current Classic Memory settings be stored to the indicated personality profile by the EnhancedMemorySystem parts.

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Literals** | **Value** | **Description** |
| PersIndex | - | - | Indicates the Personality Profile the requested store operation is referring to. |
|  | Null | 0x0 |  |
|  | Pers1 | 0x1 |  |
|  | Pers2 | 0x2 |  |
|  | Pers3 | 0x3 |  |
|  | Pers4 | 0x4 |  |
|  | Vehicle | 0x5 |  |

### MD-REQ-199797/A-InfotainmentRecall\_Rq

Message Type: Request

The signal is used by the Enhanced Memory Interface Client to change the active personality profile to the personality profile indicated in the request.

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Literals** | **Value** | **Description** |
| PersIndex | - | - | Indicates the Personality Profile being requested. |
|  | Null | 0x0 |  |
|  | Pers1 | 0x1 |  |
|  | Pers2 | 0x2 |  |
|  | Pers3 | 0x3 |  |
|  | Pers4 | 0x4 |  |
|  | Vehicle | 0x5 |  |

### MD-REQ-199798/A-PersonalityOptIn\_St

Message Type: Status

The signal is used to inform the Enhanced Memory Profile Server which personality profiles have been created (Opted-In).

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Literals** | **Value** | **Description** |
| Pers1Status | - | - | Indicates Personality Profile 1 Opt-In Status. |
|  | NotOptedIn | 0x0 |  |
|  | OptedIn | 0x1 |  |
| Pers2Status | - | - | Indicates Personality Profile 2 Opt-In Status. |
|  | NotOptedIn | 0x0 |  |
|  | OptedIn | 0x1 |  |
| Pers3Status | - | - | Indicates Personality Profile 3 Opt-In Status. |
|  | NotOptedIn | 0x0 |  |
|  | OptedIn | 0x1 |  |
| Pers4Status | - | - | Indicates Personality Profile 4 Opt-In Status. |
|  | NotOptedIn | 0x0 |  |
|  | OptedIn | 0x1 |  |

### MD-REQ-199795/A-EnhancedMemory\_St

Message Type: Status

The signal is used to inform the Enhanced Memory System whether the personality profiles feature is currently active or not.

Notes:

Enhanced Memory Active (enabled) means, Pers1/2/3/4 may be the active personality profile.

Enhanced Memory Not Active (disabled) means, only Guest can be the active personality profile.

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Literals** | **Value** | **Description** |
| Status | - | - | Indicates the status of the Enhanced Memory feature as selected by the driver. |
|  | Null | 0x0 |  |
|  | ProfilesOn | 0x1 |  |
|  | ProfilesOff | 0x2 |  |
|  | NotSupported | 0x3 |  |

### MD-REQ-199803/A-EnMemButtonPairing\_St

Message Type: Status

The signal is used to inform the Enhanced Memory Interface Client the status of driver memory seat button pairing mode.

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Literals** | **Value** | **Description** |
| ButtonPairing | - | - | Indicates the Personality Profile driver memory seat button pairing mode status value. |
|  | Null | 0x0 |  |
|  | Button1Pressed | 0x1 |  |
|  | Button2Pressed | 0x2 |  |
|  | Button3Pressed | 0x3 |  |
|  | Button4Pressed | 0x4 |  |
|  | ButtonPairingEntered | 0x5 |  |
|  | ButtonPairingExited | 0x6 |  |
|  | ButtonPairingFailed | 0x7 |  |

### MD-REQ-199805/A-InfotainmentPersStore\_St

Message Type: Status

The signal is used to inform the Enhanced Memory Interface Client the status of a requested store event.

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Literals** | **Value** | **Description** |
| Status | - | - | Indicates the Personality Profile the store operation completed for. |
|  | Complete | 0x0 |  |
|  | InProgress | 0x1 |  |
|  | Null | 0x2 |  |

### MD-REQ-199812/A-MemSwitchRecall\_Rq

Message Type: Request

The signal is used by the Enhanced Memory Position Client to change the active personality profile to the personality profile indicated in the request.

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Literals** | **Value** | **Description** |
| PersIndex | - | - | Indicates the Personality Profile being requested. |
|  | Null | 0x0 |  |
|  | Pers1 | 0x1 |  |
|  | Pers2 | 0x2 |  |
|  | Pers3 | 0x3 |  |
|  | Pers4 | 0x4 |  |

### MD-REQ-199804/C-EnMemKeyPairing\_St

Method Type: Status

The signal is used to inform the Enhanced Memory Interface Client the status of keyfob, phone, and NFC Key pairing modes.

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Literals** | **Value** | **Description** |
| PersIndex | - | - | Indicates which Personality Profile the "Pairing" status is referring to. |
|  | Null | 0x0 |  |
|  | Pers1 | 0x1 |  |
|  | Pers2 | 0x2 |  |
|  | Pers3 | 0x3 |  |
|  | Pers4 | 0x4 |  |
|  | NotUsed | 0x5 |  |
|  | NotUsed | 0x6 |  |
|  | NotUsed | 0x7 |  |
| KeyPairing | - | - | Indicates the Personality Profile keyfob, phone, and NFC key pairing modes status value. |
|  | Null | 0x0 |  |
|  | KeyPairingEntered | 0x1 |  |
|  | KeyPairingExited | 0x2 |  |
|  | KeyDisassociated | 0x3 |  |
|  | KeyAlreadyInUse | 0x4 |  |
|  | KeyAssociateSuccess | 0x5 |  |
|  | KeyAssociateFailed | 0x6 |  |
|  | WrongDeviceSelected | 0x7 |  |

### MD-REQ-199810/A-PersKeyPairing\_St

Message Type: Status

The signal is used to inform the EnhancedMemoryInterfaceClient if a personality profile has a keyfob associated to it or not.

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Literals** | **Value** | **Description** |
| Pers1KeyStatus | - | - | Indicates Personality Profile 1 Keyfob Association Status. |
|  | Null | 0x0 |  |
|  | Key Associated | 0x1 |  |
|  | Key Not Associated | 0x2 |  |
|  | Reserved | 0x3 |  |
| Pers2KeyStatus | - | - | Indicates Personality Profile 2 Keyfob Association Status. |
|  | Null | 0x0 |  |
|  | Key Associated | 0x1 |  |
|  | Key Not Associated | 0x2 |  |
|  | Reserved | 0x3 |  |
| Pers3KeyStatus | - | - | Indicates Personality Profile 3 Keyfob Association Status. |
|  | Null | 0x0 |  |
|  | Key Associated | 0x1 |  |
|  | Key Not Associated | 0x2 |  |
|  | Reserved | 0x3 |  |
| Pers4KeyStatus | - | - | Indicates Personality Profile 4 Keyfob Association Status. |
|  | Null | 0x0 |  |
|  | Key Associated | 0x1 |  |
|  | Key Not Associated | 0x2 |  |
|  | Reserved | 0x3 |  |

### MD-REQ-233879/A-PersPhonePairing\_St

Message Type: Status

The signal is used to inform the EnhancedMemoryInterfaceClient if a personality profile has a phone (or phones) associated to it or not.

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Literals** | **Value** | **Description** |
| Pers1PhoneStatus | - | - | Indicates Personality Profile 1 Phone Association Status. |
|  | No Phones Associated | 0x0 |  |
|  | One Phone Associated | 0x1 |  |
|  | Two Phones Associated | 0x2 |  |
|  | Three Phones Associated | 0x3 |  |
|  | Four Phones Associated | 0x4 |  |
|  | Five Phones Associated | 0x5 |  |
|  | Six Phones Associated | 0x6 |  |
|  | Seven Phones Associated | 0x7 |  |
| Pers2PhoneStatus | - | - | Indicates Personality Profile 2 Phone Association Status. |
|  | No Phones Associated | 0x0 |  |
|  | One Phone Associated | 0x1 |  |
|  | Two Phones Associated | 0x2 |  |
|  | Three Phones Associated | 0x3 |  |
|  | Four Phones Associated | 0x4 |  |
|  | Five Phones Associated | 0x5 |  |
|  | Six Phones Associated | 0x6 |  |
|  | Seven Phones Associated | 0x7 |  |
| Pers3PhoneStatus | - | - | Indicates Personality Profile 3 Phone Association Status. |
|  | No Phones Associated | 0x0 |  |
|  | One Phone Associated | 0x1 |  |
|  | Two Phones Associated | 0x2 |  |
|  | Three Phones Associated | 0x3 |  |
|  | Four Phones Associated | 0x4 |  |
|  | Five Phones Associated | 0x5 |  |
|  | Six Phones Associated | 0x6 |  |
|  | Seven Phones Associated | 0x7 |  |
| Pers4PhoneStatus | - | - | Indicates Personality Profile 4 Phone Association Status. |
|  | No Phones Associated | 0x0 |  |
|  | One Phone Associated | 0x1 |  |
|  | Two Phones Associated | 0x2 |  |
|  | Three Phones Associated | 0x3 |  |
|  | Four Phones Associated | 0x4 |  |
|  | Five Phones Associated | 0x5 |  |
|  | Six Phones Associated | 0x6 |  |
|  | Seven Phones Associated | 0x7 |  |

### MD-REQ-404690/A-PersNFCKeyPairing\_St

Message Type: Status

The signal is used to inform the EnhancedMemoryInterfaceClient if a personality profile has NFC key(s) associated to it as well as their specific key index. Specific profile association status is determined by Key Index and PersIndex

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Literals** | **Value** | **Description** |
| PersIndex | - | - | Indicates which Personality Profile the "Pairing" (Key Index) is referring to. |
|  | Null | 0x0 |  |
|  | Pers1 | 0x1 |  |
|  | Pers2 | 0x2 |  |
|  | Pers3 | 0x3 |  |
|  | Pers4 | 0x4 |  |
|  | NotUsed | 0x5 |  |
| PersNFCKey1Index | - | - | Key 1 Index and Status for profile identified by PersIndex of PersNFCKeyPairing\_St |
|  | Inactive | 0x00 |  |
|  | Index 1 | 0x01 |  |
|  | Index 2 | 0x02 |  |
|  | … | … |  |
|  | Index 255 | 0xFF |  |
| PersNFCKey2Index | - | - | Key 2 Index and Status for profile identified by PersIndex of PersNFCKeyPairing\_St |
|  | Inactive | 0x00 |  |
|  | Index 1 | 0x01 |  |
|  | Index 2 | 0x02 |  |
|  | … | … |  |
|  | Index 255 | 0xFF |  |
| PersNFCKey3Index | - | - | Key 3 Index and Status for profile identified by PersIndex of PersNFCKeyPairing\_St |
|  | Inactive | 0x00 |  |
|  | Index 1 | 0x01 |  |
|  | Index 2 | 0x02 |  |
|  | … | … |  |
|  | Index 255 | 0xFF |  |
| PersNFCKey4Index | - | - | Key 4 Index and Status for profile identified by PersIndex of PersNFCKeyPairing\_St |
|  | Inactive | 0x00 |  |
|  | Index 1 | 0x01 |  |
|  | Index 2 | 0x02 |  |
|  | … | … |  |
|  | Index 255 | 0xFF |  |

### MD-REQ-238321/B-PaaKConnection\_St

Message Type: Status

This signal is used to inform whether a Phone-As-A-Key is currently connected to the vehicle.

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Literals** | **Value** | **Description** |
| Status | - | - | Indicates the connection status of a PaaK. |
|  | Null | 0x0 |  |
|  | NotConnected | 0x1 |  |
|  | Connected | 0x2 |  |

### MD-REQ-199802/A-ActivePersonality\_St

Message Type: Status

The signal is used to inform the Enhanced Memory System which personality profile is currently active.

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Literals** | **Value** | **Description** |
| PersIndex | - | - | Indicates which Personality Profile is currently active. |
|  | Pers1 | 0x0 |  |
|  | Pers2 | 0x1 |  |
|  | Pers3 | 0x2 |  |
|  | Pers4 | 0x3 |  |
|  | Vehicle | 0x4 |  |
|  | NotDetermined | 0x5 |  |
|  | NotUsed | 0x6 |  |
|  | Inactive/Null | 0x7 |  |

### MD-REQ-199806/A-PersonalityRecallCount\_St

Message Type: Status

The signal is used to inform the Enhanced Memory System a change in personality profile has occurred (counter is incremented each time a profile change occurs).

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Literals** | **Value** | **Description** |
| CountValue | - | - | Increment indicates a change to active personality profile. |
|  | 0 | 0x0 |  |
|  | 1 | 0x1 |  |
|  | … |  |  |
|  | 255 | 0xFF |  |

### MD-REQ-199814/A-MemoryPosition\_St

Message Type: Status

The signal is used to inform the Classic Memory Sub-system which memory position is currently active.

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Literals** | **Value** | **Description** |
| PersIndex | - | - | Indicates which memory position is currently active. |
|  | Pers1 | 0x0 |  |
|  | Pers2 | 0x1 |  |
|  | Pers3 | 0x2 |  |
|  | Pers4 | 0x3 |  |
|  | Vehicle | 0x4 |  |
|  | NotUsed | 0x5 |  |
|  | NotUsed | 0x6 |  |
|  | NotUsed | 0x7 |  |

### MD-REQ-199799/A-Feature\_Rq

Message Type: Request

Represents the request to command a feature change (select new feature, change feature setting, query features, etc.).

Included Parameters:

Operation

FeatureID

Configuration

PersIndex

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Literals** | **Value** | **Description** |
| Operation | **-** | **-** | Type of operation being requested |
|  | Null | 0x0 |  |
|  | Query | 0x1 |  |
|  | Set | 0x2 |  |
|  | Upload | 0x3 |  |
|  | Restore | 0x4 |  |
|  | Copy | 0x5 |  |
|  | NotUsed | 0x6 – 0x7 |  |
| FeatureID | **-** | **-** | Feature number being requested |
|  |  | 0x0000 – 0xFFFF |  |
| Configuration | **-** | **-** | Configuration value being requested |
|  |  | 0x0000 – 0xFFFF |  |
| PersIndex | **-** | **-** | Indicates which personality profile is being accessed |
|  | PERS\_1 | 0x0 |  |
|  | PERS\_2 | 0x1 |  |
|  | PERS\_3 | 0x2 |  |
|  | PERS\_4 | 0X3 |  |
|  | VEHICLE | 0X4 |  |
|  | Not Used | 0x5 |  |
|  | Not Used | 0x6 |  |
|  | Not Used | 0x7 |  |

### MD-REQ-199807/B-VehicleSpeed\_St

Message Type: Status

Status used to indicate vehicle speed.

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Literals** | **Value** | **Description** |
| Type | - | - | Indicates vehicle speed.  Unit: kph  Resolution:0.01  Offset:0 |
|  | kph | 0x0 to 0xFFFF |  |

### MD-REQ-199808/A-GearLvrPos\_D\_Actl

Message Type: Status

Vehicle status signal for the Gear Lever Position on an automatic transmission vehicle.

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Literals** | **Value** | **Description** |
| Type | - | - | - |
|  | Park | 0x0 |  |
|  | Reverse | 0x1 |  |
|  | Neutral | 0x2 |  |
|  | Drive | 0x3 |  |
|  | Sport\_DriveSport | 0x4 |  |
|  | Low | 0x5 |  |
|  | First | 0x6 |  |
|  | Second | 0x7 |  |
|  | Third | 0x8 |  |
|  | Fourth | 0x9 |  |
|  | Fifth | 0xA |  |
|  | Sixth | 0xB |  |
|  | Undefined\_Treat\_as\_Fault | 0xC |  |
|  | Undefined\_Treat\_as\_Fault1 | 0xD |  |
|  | Unknown\_Position | 0xE |  |
|  | Fault | 0xF |  |

### MD-REQ-199809/A-IgnitionStatus\_St

Message Type: Status

Signal used to indicate ignition state.

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Literals** | **Value** | **Description** |
| Type | - | - | Indicates ignition state |
|  | Unknown | 0x0 |  |
|  | Off | 0x1 |  |
|  | Accessory | 0x2 |  |
|  | Run | 0x4 |  |
|  | Start | 0x8 |  |
|  | Invalid | 0xF |  |

### MD-REQ-199800/A-FactoryReset\_Rq

Message Type: Request

Note: Reset all user adjustable parameters to the factory default setting.

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Literals** | **Value** | **Description** |
| Type | - | - | Reset all user adjustable parameters to the factory default setting. |
|  | Int Reset |  |  |
|  | Invalid | 0x0 |  |
|  | Reset | 0x1 |  |
|  |  |  |  |

### MD-REQ-404938/B-DigitalKeyList\_Rq

Message Type: Request

This signal is used to request the Digital Key List from the NFCESServer.

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Literals** | **Value** | **Description** |
| OpCode | - | - | Describes which opcode is being requested |
|  | Reserved | 0x00 |  |
|  | Read | 0x01 |  |
|  | Reserved | 0x02 - 0xFF |  |
|  |  |  |  |
| NumberOfItems | - | - | The number of items being requested |
|  | Invalid | 0x00 |  |
|  | 1 | 0x01 |  |
|  | 2 | 0x02 |  |
|  | … |  |  |
|  | 254 | 0xFE |  |
|  | No Entry | 0xFF |  |
|  |  |  |  |
| StartIndex | - | - | The position in the list from which the request shall start |
|  | Invalid | 0x00 |  |
|  | 1 | 0x01 |  |
|  | 2 | 0x02 |  |
|  | … |  |  |
|  | 254 | 0xFE |  |
|  | No Entry | 0xFF |  |

### MD-REQ-404939/B-DigitalKeyList\_Rsp

Message Type: Response

This signal is used to provide the Digital Key List to the requestor.

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Literals** | **Value** | **Description** |
| List Size | - | - | The provided list size |
|  | Inactive | 0x00 |  |
|  | List Size 1 | 0x01 |  |
|  | List Size 2 | 0x02 |  |
|  | … |  |  |
|  | List Size 254 | 0xFE |  |
|  | No Entry | 0xFF |  |
|  |  |  |  |
| Total Number Of Keys Available | - | - | The total number of keys available in the list (paired keys) |
|  | Invalid | 0x00 |  |
|  | 1 Key Available | 0x01 |  |
|  | 2 Keys Available | 0x02 |  |
|  | … |  |  |
|  | 254 Keys Available | 0xFE |  |
|  | No Entry | 0xFF |  |
|  |  |  |  |
| Additional Key Storage Available | - | - | Indicator for whether there is additional storage available for new keys |
|  | No | 0x00 |  |
|  | Yes | 0x01 |  |
|  | Reserved | 0x02-0xFF |  |
|  |  |  |  |
| Vector |  |  | Array (1…N) of record (IndexNumber, DeviceType, KeyType, KeyStatus, FriendlyName, FESN, PairingID) with TotalNumberOfKeysAvailable defined in ListSize |
| IndexNumber | - | - |  |
|  | Inactive | 0x00 |  |
|  | Index 1 | 0x01 |  |
|  | Index 2 | 0x02 |  |
|  | … | … |  |
|  | Index 255 | 0xFF |  |
|  |  |  |  |
| DeviceType | - | - | Describes Device type |
|  | NFC Card | 0x00 |  |
|  | Digital Key | 0x01 |  |
|  | CAK | 0x02 |  |
|  | Reserved | 0x03 - 0xFF |  |
|  |  |  |  |
| KeyType | - | - | Describes Key type |
|  | Factory | 0x00 |  |
|  | Retail User | 0x01 |  |
|  | Fleet User | 0x02 |  |
|  | Reserved | 0x03 – 0xFF |  |
|  |  |  |  |
| KeyStatus | - | - | Describes Key status |
|  | Pending Add | 0x00 |  |
|  | Pending Delete | 0x01 |  |
|  | Added/Confirmed | 0x02 |  |
|  | Reserved | 0x03 – 0xFF |  |
|  |  |  |  |
| FESN | - | - | Data array that consists of textual information up to 8 characters in length, plus end of string |
| FriendlyName | - | - | Data array that consists of textual information up to 64 characters in length, plus end of string |
| PairingID | - | - | Data array that consists of textual information up to 8 characters in length, plus end of string |

### MD-REQ-426998/A-NFCDeviceTapPaired\_St

Message Type: Status

This signal is used indicate when an NFC Tap Event is authorized or not authorized.

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Literals** | **Value** | **Description** |
| Status | - | - | Indicates whether tapped device is authorized |
|  | No | 0x0 |  |
|  | Yes | 0x1 |  |

### MD-REQ-426999/A-NFCDeviceTap\_Rq

Message Type: Request

This signal is a counter used to indicate an NFC Tap Event.

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Literals** | **Value** | **Description** |
| Type | - | - | Unit: SED  Resolution: 1  Offset: 0 |
|  | Initial Value | 0x0 | Reserved for transmitter reset |
|  | Code Value | 0x1 To 0x6 |  |
|  | Not Used | 0x7 |  |

|  |
| --- |
| **Acceptance Criteria** |
|  |

### MD-REQ-434540/A-DriverPositionalChange\_St

Message Type: Status

This method is used to provide the Enhanced Memory Interface Client with a status of whether positional settings have changed to support availability of HMI Save and Recall functionality.

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Literals** | **Value** | **Description** |
| DriverMirrorAdjustStat | - | - | Indicate that changes have occurred on the driver mirror.  Received by Enhanced Memory Interface Client. |
|  | None | 0x0 |  |
|  | In Progress | 0x1 |  |
|  | Major | 0x2 |  |
|  | Minor | 0x3 |  |
| PassengerMirrorAdjustStat | - | - | Indicate that changes have occurred on the passenger mirror.  Received by Enhanced Memory Interface Client. |
|  | None | 0x0 |  |
|  | In Progress | 0x1 |  |
|  | Major | 0x2 |  |
|  | Minor | 0x3 |  |
| PedalAdjustStat | - | - | Indicate that changes have occurred on the pedals.  Received by Enhanced Memory Interface Client. |
|  | None | 0x0 |  |
|  | In Progress | 0x1 |  |
|  | Major | 0x2 |  |
|  | Minor | 0x3 |  |
| SteeringWheelAdjustStat | - | - | Indicate that changes have occurred on the steering column.  Received by Enhanced Memory Interface Client. |
|  | None | 0x0 |  |
|  | In Progress | 0x1 |  |
|  | Major | 0x2 |  |
|  | Minor | 0x3 |  |
| DriverSeatAdjustStat | - | - | Indicate that changes have occurred on the driver's seat.  Received by Enhanced Memory Interface Client. |
|  | None | 0x0 |  |
|  | In Progress | 0x1 |  |
|  | Major | 0x2 |  |
|  | Minor | 0x3 |  |
| DriverMCSAdjustStat | - | - | Indicate that changes have occurred on the driver's MultiContoured seat.  Received by Enhanced Memory Interface Client. |
|  | None | 0x0 |  |
|  | In Progress | 0x1 |  |
|  | Major | 0x2 |  |
|  | Minor | 0x3 |  |

# Functional Definition

## Enhanced Memory Functional Decomposition

At the functional level, Enhanced Memory can be decomposed into Logic Functions to support customer functions. Some Logic Functions call other Logic Functions as shown in the diagram below:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Enhanced Memory Functional Decomposition Diagram | | | | |
| HMI Menu Customer Function | Logic Function | | | |
| Level1 | | Level2 | Level3 |
| Enable Enhanced Memory | Enable-Disable Enhanced Memory | Enable Enhanced Memory |  | |
| Disable Enhanced Memory | Disable Enhanced Memory | Recall Driver Profile |  |
| Opt-In | Opt In | | Enable Enhanced Memory |  |
| Create/Add Driver Profile | Create/Edit Name |
| Associate Memory Seat Button |
| Copy |
| Recall Driver Profile |
| Add Driver Profile | Create/Add Driver Profile | | Create/Edit Name |  |
| Associate Memory Seat Button |
| Copy |
| Recall Driver Profile |
| Recall Driver Profile | Recall Driver Profile | |  | |
| Delete Driver Profile | Delete Driver Profile | | Disassociate Keyfob |  |
| Disassociate Phone |
| Disassociate NFC Key |
| Recall Driver Profile |
| Disable Enhanced Memory |
| Associate Keyfob | Associate Keyfob | |  |  |
| Disassociate Keyfob | Disassociate Keyfob | |  |  |
| Associate Phone | Associate Phone | |  |  |
| Disassociate Phone | Disassociate Phone | |  |  |
| Associate NFC Key | Associate NFC Key | |  |  |
| Disassociate NFC Key | Disassociate NFC Key | |  |  |
| Edit Name | Create/Edit Name | |  |  |
| Master Reset | Opt Out | | Delete Driver Profile | Disassociate Keyfob |
| Disassociate Phone |
| Disassociate NFC Key |
| Recall Driver Profile |
| Disable Enhanced Memory |

To distinguish between a Customer Function and Logic Function, the Customer Functions will be named as “function” and Logic Functions will be named as “Function”. For example, Delete Driver Profile Function is a Logic Function that supports the customer Delete Driver Profile function.

Figure 5 – Enhanced Memory Functional Decomposition Diagram

## ENMEM-FUN-REQ-199826/A-Enable/Disable Enhanced Memory

### Enable and Disable Function Description

Enable-Disable Enhanced Memory is a function that allows a user to switch between Enhanced Memory Mode and Classic Memory Mode after at least one Driver Profile is created. When no classic memory is present the function allows user to only turn off Enhanced Memory

The Enable Enhanced Memory function allows a user to access all existing Driver Profiles and functions provided by the Enhanced Memory feature.

Once the first Driver Profile is created, the Enhanced Memory feature is turned On. A user then has the option to temporarily disable Enhanced Memory and bring the vehicle back to Classic Memory mode (if equipped) in which non-positional settings are not personalized for different users. Access to the Enhanced Memory feature is removed until Enhanced Memory is once again enabled. When Enhanced Memory is disabled, all existing Driver Profiles are not deleted and are made available to the user when the feature is re-enabled.

Other than the request from the user, the system will also enable and disable Enhanced Memory automatically in the following use cases:

1. System will disable Enhanced Memory:

* When the last Driver Profile is deleted
* When Master Reset is executed
* When the first Driver Profile is not successfully created

1. System will enable Enhanced Memory:

* When the user opts into Enhanced Memory and successfully creates their first Driver Profile

1. System will recall Vehicle Profile:

* When Enhanced Memory is turned off automatically
* When the active Driver Profile is deleted

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Enable-Disable Enhanced Memory Functional Decomposition Diagram | | | | |
| HMI Menu Customer Function | Logic Function | | | |
| Level1 | | Level2 | Level3 |
| Enable Enhanced Memory | Enable-Disable Enhanced Memory | Enable Enhanced Memory |  | |
| Disable Enhanced Memory | Disable Enhanced Memory |  | |
| Opt-In | Opt-In | | Enable Enhanced Memory |  |
| Delete Driver Profile | Delete Driver Profile | | Disable Enhanced Memory |  |
| Master Reset | Opt-Out | | Delete Driver Profile | Disable Enhanced Memory |

Figure 6 – Enable-Disable Enhanced Memory Functional Decomposition Diagram

### Use Cases

#### ENMEM-UC-REQ-199827/A-Enable Enhanced Memory Feature

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | The Enhanced Memory feature is disabled (set to Off). |
| **Scenario Description** | The User accesses the Enhanced Memory HMI menu and chooses to enable the Enhanced Memory feature |
| **Post-conditions** | * The Enhanced Memory feature is now enabled (set to On) * New Driver Profiles can be added * Existing Driver Profiles now can be recalled and edited |
| **List of Exception Use Cases** |  |
| **Interfaces** | Personalization Interface |
| **Notes** |  |

#### ENMEM-UC-REQ-199828/A-Disable Enhanced Memory Feature

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | The Enhanced Memory feature is enabled (set to On).  At least one Driver Profile has been created. |
| **Scenario Description** | The User accesses the Enhanced Memory HMI and chooses to disable the Enhanced Memory feature. |
| **Post-conditions** | * The Enhanced Memory feature is now disabled (set to Off) * The active Driver Profile is set to *Vehicle (i.e. Guest)* with no HMI Guest Profile notification   + All applicable non-positional settings will be recalled for the Guest profile   + Positional settings remains unchanged * New profiles can no longer be added * Created Driver Profiles are not deleted but made temporarily inaccessible to the user * HMI menu will not display any Enhanced Memory attributes but feature On/Off switch is available |
| **List of Exception Use Cases** |  |
| **Interfaces** | Personalization Interface |
| **Notes** | When the feature is turned on again, all created Driver Profiles will become accessible |

#### ENMEM-UC-REQ-214814/A-Disable Enhanced Memory When Valet Mode On

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | The ignition status is in Run.  The vehicle speed is less than the Driving Restriction threshold\*  Enhanced Memory is set to On  Valet Mode is Off |
| **Scenario Description** | The user enables Valet Mode from the HMI |
| **Post-conditions** | Active Personality Profile is remembered  Enhanced Memory is set to Off   * By default, the Guest Profile is recalled   Valet Mode is enabled |
| **Interfaces** | Personalization Interface |
| **Notes** | \*Driving Restriction threshold is defined in DRIVE-RESv2-FUR-REQ-025157-HMI Driving Restriction. |

#### ENMEM-UC-REQ-214816/A-Enable Enhanced Memory When Valet Mode From On To Off

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | The ignition status is in Run.  The vehicle speed is less than the Driving Restriction threshold\*  Valet Mode is ON  Enhanced Memory is set to Off (was On prior to enabling Valet Mode) |
| **Scenario Description** | The user disables Valet Mode from the HMI |
| **Post-conditions** | Valet Mode is disabled  Enhanced Memory is set to On  The remembered Active Personality Profile is recalled |
| **List of Exception Use Cases** | ENMEM-UC-REQ-214813-Valet Mode disabled with Enhanced Memory Off |
| **Interfaces** | Personalization Interface |
| Note | \*Driving Restriction threshold is defined in DRIVE-RESv2-FUR-REQ-025157-HMI Driving Restriction. |

#### ENMEM-UC-REQ-214813/A-Valet Mode Disabled with Enhanced Memory Off

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | The ignition status is in Run.  The vehicle speed is less than the Driving Restriction threshold\*  Enhanced Memory is set to Off (prior to enabling Valet Mode)  Valet Mode is On |
| **Scenario Description** | The user disables Valet Mode from the HMI |
| **Post-conditions** | Valet Mode is disabled  Enhanced Memory remains Off  No recall is performed |
| **Interfaces** | Personalization Interface |
| **Notes** | \*Driving Restriction threshold is defined in DRIVE-RESv2-FUR-REQ-025157-HMI Driving Restriction. |

#### ENMEM-UC-REQ-232983/A-Valet Mode Enabled with Enhanced Memory Off

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | The ignition status is in Run.  The vehicle speed is less than the Driving Restriction threshold\*  Enhanced Memory is set to Off (prior to enabling Valet Mode)  Valet Mode is Off |
| **Scenario Description** | The user enables Valet Mode from the HMI |
| **Post-conditions** | Valet Mode is enabled  Enhanced Memory remains Off  No recall is performed |
| **Interfaces** | Personalization Interface |
| **Notes** | \*Driving Restriction threshold is defined in DRIVE-RESv2-FUR-REQ-025157-HMI Driving Restriction. |

### Requirements

#### ENMEM-HMI-REQ-199829/A-Configurable Parameter to Enable Driver Profiles HMI

The EnhancedMemoryInterfaceClient shall have a configurable parameter to determine whether the vehicle supports the Enhanced Memory feature. If the parameter indicates that the vehicle is to support “Enhanced Memory”, then the Driver Profiles HMI shall be enabled and accessible within the existing HMI menu hierarchy.

#### ENMEM-REQ-199830/A-Enhanced Memory Feature Activation Status

The EnhancedMemoryInterfaceClient shall report the activation status of the Driver Profile feature via the EnhancedMemory\_St method:

* If a user opts in to Enhanced Memory to create the first Driver Profile, the EnhancedMemoryInterfaceClient shall then update the status of the EnhancedMemory\_St method to indicate that the Driver Profiles feature is currently ON
* If a user selects to turn the Enhanced Memory feature on via the HMI interface, the EnhancedMemoryInterfaceClient shall report the status of the EnhancedMemory\_St method as ON to indicate that the Driver Profiles feature is currently ON.
* If a user selects to turn the Enhanced Memory feature off via the HMI interface, the EnhancedMemoryInterfaceClient shall report the status of the EnhancedMemory\_St method as OFF to indicate that the Driver Profiles feature is currently OFF.
* If no profiles exist (either because none have yet to be created or because all have been deleted by the user one by one or via Master Reset), the EnhancedMemoryInterfaceClient shall report the status of the EnhancedMemory\_St method as OFF to indicate that the Driver Profiles feature is currently OFF.

#### ENMEM-REQ-202359/C-Available Functions When Enhanced Memory Feature Is On

When Enhanced Memory feature is enabled, the follow functions shall be available to the user:

* Create/Add Driver Profiles:
  + Obtain Driver Profile Name
  + Associate a Driver Memory Seat button
  + Copy current settings
* Recall Driver Profiles
* Edit Driver Profiles:
  + Change Driver Profile Name
  + Associate keyfob
  + Disassociate keyfob
  + Associate phone
  + Disassociate phone
  + Associate NFC Key
  + Disassociate NFC Key
  + Delete Driver Profiles

#### ENMEM-REQ-202360/A-Available Functions When Enhanced Memory Feature Is Off

When Enhanced Memory feature is disabled, the user can only turn the Enhanced Memory feature on. All other Enhanced Memory functions shall not be available.

The Classic Memory feature shall be available when Enhanced Memory feature is disabled. The association between a set of positional settings and a Driver Memory Seat button shall not be affected by Enhanced Memory being disabled. Pressing a Driver Memory Seat button that is associated to a Driver Profile shall recall the corresponding positional settings the same as if Enhanced Memory was enabled.

#### ENMEM-REQ-199831/A-Recall Vehicle Profile When Enhanced Memory Feature Is Off

When the Enhanced Memory feature is Off, indicated via EnhancedMemory\_St(ProfilesOff), the EnhancedMemoryInterfaceClient shall recall the Vehicle Profile via InfotainmentRecall\_Rq.

#### ENMEM-REQ-199833/A-Driver Profiles Not Deleted When Enhanced Memory Feature OFF

When the Enhanced Memory feature is turned off by the user, the EnhancedMemoryInterfaceClient shall NOT delete the existing Driver Profiles so that those Driver Profiles can be accessible to the user when Enhanced Memory is set back to on.

#### ENMEM-SR-REQ-214810/A-Enable/Disable Enhanced Memory in Valet Mode

If EnhancedMemory\_St = ProfilesOn when Valet Mode is enabled, the EnhancedMemoryInterfaceClient shall disable the Enhanced Memory feature by setting EnhancedMemory\_St = ProfilesOff.

When Valet Mode is then disabled, the EnhancedMemoryInterfaceClient shall re-enable the Enhanced Memory feature by setting EnhancedMemory\_St = ProfilesOn.

If EnhancedMemory\_St = ProfilesOff when Valet Mode is enabled, the feature status shall remain set as EnhancedMemory\_St = ProfilesOff when Valet Mode is disabled.

All existing Valet Mode requirements/restrictions shall also apply for Enhanced Memory and supersede any Enhanced Memory requirements.

#### ENMEM-HMI-REQ-199834/A-Enhanced Memory HMI Indications When Enhanced Memory Feature OFF

After Enhanced Memory is set to Off:

* The EnhancedMemoryInterfaceClient shall provide HMI indication that the Enhanced Memory feature is OFF.
* The EnhancedMemoryInterfaceClient shall not display any Driver Profile information
* The EnhancedMemoryInterfaceClient shall disable all Driver Profile menus, except the Enhanced Memory feature ON/OFF selector

### White Box View

#### Activity Diagrams

##### ENMEM-ACT-REQ-199835/A-Enable-Disable Enhanced Memory Feature

Activity Diagram



#### Sequence Diagrams

##### ENMEM-SD-REQ-199836/A-Enable Enhanced Memory

Constraints

Pre-Condition

Driver profiles feature is disabled (set to Off)

Scenarios

Normal Usage

The driver chooses to enable the Enhanced Memory feature (set to On).

Post-Condition

The Enhanced Memory feature is enabled (set to On).

Sequence Diagram



##### ENMEM-SD-REQ-199837/A-Disable Enhanced Memory

Constraints

Pre-Condition

Enhanced Memory feature is enabled (set to On)

Scenarios

Normal Usage

The driver chooses to disable the Enhanced Memory feature (set to Off).

Post-Condition

The Enhanced Memory feature is disabled (set to off).

The active Driver Profile is set to “Guest”.

Positional settings are unaffected

Sequence Diagram



## ENMEM-FUN-REQ-204913/B-Opt-In

### Opt-In Function Description

The Opt-In function is a customer function that explains to a user the capabilities of Driver Profiles and the steps needed to create a Driver Profile before soliciting the user’s decision to create their first Driver Profile.

If the user chooses to proceed with the Opt-In process, the system will enable Enhanced Memory and direct the user through the Driver Profile creation process. If the user chooses to cancel the Opt-In process, the system will direct the user back to the previous menu.

The Opt-In Function is an Enhanced Memory Logic Function that supports all the functionalities mentioned above. Upon receiving the user request to proceed with the Opt-In process, the Opt-In Function calls the Enable-Disable Enhanced Memory Function and Create/Add Driver Profile Function in order to create a Driver Profile. This is illustrated in the diagram below:

|  |  |  |  |
| --- | --- | --- | --- |
| Opt-In Functional Decomposition Diagram | | | |
| HMI Menu Customer Function | Logic Function | | |
| Level1 | Level2 | Level3 |
| Opt-In | Opt-In | Enable Enhanced Memory |  |
| Create/Add Driver Profile | Create/Edit Name |
| Associate Driver Memory Seat Button |
| Copy |
| Recall Driver Profile |

Figure 7 – Opt-In Functional Decomposition Diagram

The HMI flow chart below illustrates the HMI process of Opt-In Enhanced Memory. The process explains the capabilities of Driver Profiles and the steps needed to create a Driver Profile before soliciting the user’s decision to create their first Driver Profile.

Please note that this flow chart only serves as a design aid and does not necessarily represent the final implementation.



Figure 8 – Enhanced Memory Opt-In HMI Flow Chart

### Use Cases

#### ENMEM-UC-REQ-201605/A-Opt in Enhanced Memory Feature

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | The Enhanced Memory feature is disabled (set to Off)  No Existing Driver Profiles |
| **Scenario Description** | The user accesses the Enhanced Memory HMI menu and chooses to Opt-In to Enhanced Memory in order to create a Driver Profile |
| **Post-conditions** | * The Enhanced Memory feature is enabled (set to On) * New Driver Profiles can be created |
| **List of Exception Use Cases** |  |
| **Interfaces** | Personalization Interface |
| **Notes** |  |

### Requirements

#### ENMEM-REQ-205009/A-Opt-In Condition

The Opt-In Function shall be called when the following conditions are all met:

* The user presses "Driver Profiles" on the HMI Settings Menu
* EnhancedMemory\_St = ProfilesOff
* No Driver Profile is created as indicated by PersonalityOptIn\_St

#### ENMEM-HMI-REQ-205010/A-Opt-In HMI Display

The Opt-In HMI display shall provide the user information on what features a Driver Profile can provide to the user and what steps are required to create a Driver Profile. The Opt-In HMI display shall also provide the user with a method to proceed in creating their first Driver Profile or to cancel the Opt-In process altogether.

Below is an example of what the Opt-In HMI display could look like. Please not this should only be treated as an example aid and not the actual final implementation



#### ENMEM-REQ-205011/A-Opt-In Transition State and Action

* Upon receiving a user’s “Opt-In” selection, the EnhancedMemoryInterfaceClient shall call Enable-Disable Enhanced Memory Function to set EnhancedMemory\_St = ProfilesOn, then call the Create/Add Function
* Upon receiving a user’s “Not Opt In” selection, the EnhancedMemoryInterfaceClient shall return to the previous HMI Menu without altering EnhancedMemory\_St status.

## ENMEM-FUN-REQ-199838/C-Create/Add Driver Profile

### Create/Add Driver Profile Function Description

An Enhanced Memory Driver Profile is a collection of personalized vehicle settings that can be recalled by a user. The Driver Profile creation process allows a user to name the Driver Profile and to associate the Driver Profile to a Driver Memory Seat button. The creation process also copies the current active vehicle settings to the created Driver Profile.

To create the first Driver Profile, the user is required to first opt-in to the Enhanced Memory feature. Once a Driver Profile is created, the user may add more Driver Profiles without having to opt-in again. During the creation process, the user also has an option to associate a keyfob and/or a phone to the newly created Driver Profile.

The Create/Add Driver Profile Function is an Enhanced Memory Logic Function that will support all the functionalities mentioned above.

The Create/Add Driver Profile Function can be triggered by the user or called by the Opt-In Function. This Function first will call the Create/Edit Name Function to obtain a unique Driver Profile Name from the user, then, if equipped with Driver Memory Seat buttons, call the Associate Driver Memory Seat button Function to associate the new Driver Profile to an un-associated Driver Memory Seat button. The Create/Add Driver Profile Function calls the Copy Function to copy all current active settings to the new Driver Profile. The Create/Add Driver Function HMI will also solicit the user option for associating a keyfob and a phone and call the Associate Keyfob Function and/or Associate Phone Function when the user successfully chooses to associate a keyfob and/or a phone. The Create/Add Driver Profile Function then calls the Recall Driver Profile Function to recall the newly created Driver Profile for the user automatically.

|  |  |  |  |
| --- | --- | --- | --- |
| Create/Add Driver Profile Functional Decomposition Diagram | | | |
| HMI Menu Customer Function | Logic Function | | |
| Level1 | Level2 | Level3 |
| Opt-In | Opt-In | Create/Add Driver Profile | Create/Edit Name |
| Associate Driver Memory Seat Button |
| Copy |
| Recall Driver Profile |
| Add Driver Profile | Create/Add Driver Profile | Create/Edit Name |  |
|  | Associate Driver Memory Seat Button |
|  | Copy |
|  | Recall Driver Profile |

Figure 9 – Create/Add Driver Profile Functional Decomposition Diagram

The HMI flow chart below illustrates the HMI process of Create/Add Driver Profile that includes obtaining Driver Profile Name, Associating Driver Memory Seat button, waiting for Copy and the optional Keyfob Association and Phone Association steps.

Please note that this flow chart only serves as a design aid and does not necessarily represent the final implementation.



Figure 10 – Enhanced Memory Create/Add Profile HMI Flow Chart

### Use Cases

#### ENMEM-UC-REQ-199839/B-Create a Driver Profile (with EnhancedMemoryPositionClient)

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | The Ignition Status is in Run.  The vehicle transmission is in Park OR vehicle speed is less than the Driving Restriction threshold\* for a manual transmission  EnhancedMemoryPositionClient present  The Enhanced Memory feature is enabled (set to On)  The maximum number of Driver Profiles has not yet been reached |
| **Scenario Description** | The User accesses the Enhanced Memory menu, chooses to create a new Driver Profile, and then chooses to associate a Driver Memory Seat button to that profile |
| **Post-conditions** | A new profile is created with:   * all applicable non-positional settings copied from the previous Driver Profile to the new Driver Profile * all applicable positional settings copied from the currently active settings (from previous Driver Profile, or from recently changed but not saved settings) to the new Driver Profile   The chosen Driver Memory Seat button is associated to the new Driver Profile |
| **List of Exception Use Cases** |  |
| **Interfaces** | Personalization Interface |
| **Notes** | Available Driver Memory Seat buttons for association are defined in ENMEM-HMI-REQ-198876  \*Driving Restriction threshold is defined in DRIVE-RESv2-FUR-REQ-025157-HMI Driving Restriction. |

#### ENMEM-UC-REQ-404224/A-Create a Driver Profile (without EnhancedMemoryPositionClient)

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | The Ignition Status is in Run.  The vehicle transmission is in Park OR vehicle speed is less than the Driving Restriction threshold\* for a manual transmission  EnhancedMemoryPositionClient not present  The Enhanced Memory feature is enabled (set to On)  The maximum number of Driver Profiles has not yet been reached |
| **Scenario Description** | The User accesses the Enhanced Memory menu, chooses to create a new Driver Profile |
| **Post-conditions** | A new profile is created with all applicable non-positional settings copied from the previous profile to the new profile  The automatically selected PersIndex by the EnhancedMemoryInterfaceClient is associated to the new profile |
| **List of Exception Use Cases** |  |
| **Interfaces** | Personalization Interface |
| **Notes** | \*Driving Restriction threshold is defined in DRIVE-RESv2-FUR-REQ-025157-HMI Driving Restriction. |

#### ENMEM-UC-REQ-199850/A-User Aborts or System Cancel Event Occurs During Driver Profile Creation Process

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | The Ignition Status is in Run  The vehicle transmission is in Park OR vehicle speed is less than the Driving Restriction threshold\* for a manual transmission  The user is in the process of creating a Driver Profile |
| **Scenario Description** | * The user cancels out of the creation process   or   * A system event occurs that terminates the pairing process   + Vehicle gear shifts out of Park   + Vehicle in motion   + System Timeout   + Ignition no longer in Run   + System shutdown |
| **Post-conditions** | * The profile creation process has been aborted and a Driver Profile was not successfully created * HMI provides abort notification and instruction to restart the Driver Profile creation process |
| **List of Exception Use Cases** |  |
| **Interfaces** | Personalization Interface |
| **Notes** | \*Driving Restriction threshold is defined in DRIVE-RESv2-FUR-REQ-025157-HMI Driving Restriction |

### Requirements

#### ENMEM-REQ-199852/A-Configurable Parameter for Personal Entry Code Association

The EnhancedMemoryProfileServer shall have a configurable parameter to determine whether the vehicle supports the Enhanced Memory feature:

* If the parameter indicates that the vehicle is to support “Enhanced Memory”, then a user-created personal entry code shall not be associated to auser created profile or Driver Memory Seat location
* If the parameter indicates that the vehicle is to support “Classic Memory”, then association of user-created personal entry codes shall be handled as defined by the Classic Memory systemstrategy.

#### ENMEM-REQ-199854/A-Driver Profile Opt-In Status

The EnhancedMemoryInterfaceClient shall notify the EnhancedMemoryProfileServer of all Driver Profiles that have been created via the PersonalityOptIn\_St method.

#### ENMEM-HMI-REQ-199777/B-Enhanced Memory HMI Driver Profile Identification

The Enhanced Memory HMI shall identify a Driver Profile by a unique Driver Profile Name and a Driver Memory Seat button. Driver Profiles shall not be created without both a unique Driver Profile Name and the association to a Driver Memory Seat button. When the EnhancedMemoryPositionClient is not present or vehicle is not equipped with memory seat buttons, the memory seat button is not required to identify a profile

The need of the association between a Driver Profile and a Driver Memory Seat button is to include positional settings in the Enhanced Memory Driver Profile and also to allow the user to use the Driver Memory Seat button as a recall interface to recall Enhanced Memory Driver Profiles.

#### ENMEM-HMI-REQ-199856/C-Enhanced Memory HMI Indications for Driver Profile

The Enhanced Memory HMI indication of an existing Driver Profile shall include:

* the number of the associated Driver Memory Seat button (when present)
* the User’s keyed in Profile Name
* icon for an associated keyfob if one has been associated
* icon for an associated phone if one has been associated

#### ENMEM-REQ-199857/A-Driver Profile to Personality Mapping

The EnhancedMemoryInterfaceClient shall determine which Driver Profile value reported in the ActivePersonality\_St method is mapped to each Driver Profile Name. This mapping is done during Profile Creation and shall be stored and maintained by the EnhancedMemoryInterfaceClient until that Driver Profile is deleted.

See sequence diagram “ENMEM-SD-REQ-199919/-Create Driver Profile” for a detailed example.

#### ENMEM-REQ-199858/B-EnhancedMemoryInterfaceClient to Retain Settings After Software Reflash

The EnhancedMemoryInterfaceClient shall retain Driver Profile information and internally managed settings values after a software reflash occurs. This is to prevent the customer from recreating Driver Profiles and associating keyfobs after a software reflash service is done at a dealership or via WiFi or Over The Air (OTA) Automatic Software Update.

The information that shall be retained included Opt-In and Opt-Out (created and deleted) status of all Driver Profiles, Driver Profile’s keyed-in name and the association of a Driver profile name to a Driver Memory Seat button number.

#### ENMEM-REQ-206864/B-EnhancedMemoryServers to Retain Settings After Software Reflash

The EnhancedMemoryServers shall retain all personalizable settings for each Driver Profile after a software reflash occurs.

This is to prevent the customer from having to reprogram their settings after a software reflash service performed at a dealership or via WiFi or Over The Air (OTA) Automatic Software Update. For example, the information to be retained may include Language Settings, Climate Control Settings, Navigation Preferences, etc.

#### ENMEM-HMI-REQ-199859/B-Maximum Number of Driver Profiles

The EnhancedMemoryInterfaceClient shall have a configurable parameter to indicate the max number of possible Driver Profiles that the vehicle can support. This parameter shall be set equal to the number of Driver Memory Seat buttons, excluding the SET button, on the driver door panel.

When configured for “EnhancedMemoryPositionClient = NotPresent”, or vehicle is not equipped with Memory Seat buttons this parameter shall be set equal to 3.

#### ENMEM-HMI-REQ-199860/A-Max Number of Profiles Reached

When the maximum number of created Driver Profiles has been reached, the EnhancedMemoryInterfaceClient shall disable the functional of creating a new Driver Profile.

#### ENMEM-REQ-199862/B-Alignment between Opt-In Driver Profile and Driver Memory Seat Button

When equipped with memory seat buttons, the value of Personal Index in PersonalityOptIn\_St shall align with the number of the pressed Driver Memory Seat button, not the order of Driver Profile creation. In other words, the number of Personal Index in PersonalityOptIn\_St shall not be aligned with the order of Driver Profile creation.

Example: the first created Driver Profile is associated to Driver Memory Seat button #2

Precondition: Before any Driver Profile is created, the status of PersonalityOptIn\_St is

|  |  |  |  |
| --- | --- | --- | --- |
| Logic Method Name | Logic Parameter Name | GSDB Encoding Name | GSDB Encoding Value |
| PersonalityOptIn\_St | Pers1Status | NotOptedIn | 0x0 |
| Pers2Status | NotOptedIn | 0x0 |
| Pers3Status | NotOptedIn | 0x0 |
| Pers4Status | NotOptedIn | 0x0 |

Scenario: The user creates the first Driver Profile and presses Driver Memory Seat button #2 during the profile creation process

Post Condition: After the first Driver Profile is created, the status of PersonalityOptIn\_St shall be

|  |  |  |  |
| --- | --- | --- | --- |
| Logic Method Name | Logic Parameter Name | GSDB Encoding Name and Value | GSDB Signal Value |
| PersonalityOptIn\_St | Pers1Status | NotOptedIn | 0x0 |
| **Pers2Status** | **OptedIn** | **0x1** |
| Pers3Status | NotOptedIn | 0x0 |
| Pers4Status | NotOptedIn | 0x0 |

#### ENMEM-REQ-404230/A-Alignment between Opt-in Driver Profile and Profile Number

When not equipped with memory seat buttons, the value of Personal Index in PersonalityOptIn\_St shall align with the order of Driver Profile creation.

**Example**: the first created Driver Profile is created

Precondition: Before any Driver Profile is created, the status of PersonalityOptIn\_St is

|  |  |  |  |
| --- | --- | --- | --- |
| Logic Method Name | Logic Parameter Name | GSDB Encoding Name | GSDB Encoding Value |
| PersonalityOptIn\_St | Pers1Status | NotOptedIn | 0x0 |
| Pers2Status | NotOptedIn | 0x0 |
| Pers3Status | NotOptedIn | 0x0 |
| Pers4Status | NotOptedIn | 0x0 |

Scenario: The user creates the first Driver Profile

Post Condition: After the first Driver Profile is created, the status of PersonalityOptIn\_St shall be

|  |  |  |  |
| --- | --- | --- | --- |
| Logic Method Name | Logic Parameter Name | GSDB Encoding Name and Value | GSDB Signal Name |
| PersonalityOptIn\_St | **Pers1Status** | **OptedIn** | **0x1** |
| Pers2Status | NotOptedIn | 0x0 |
| Pers3Status | NotOptedIn | 0x0 |
| Pers4Status | NotOptedIn | 0x0 |

#### ENMEM-HMI-REQ-199863/A-Enhanced Memory HMI Display Order of Existing Driver Profiles

The Enhanced Memory HMI display shall organize the Driver Profiles by their associated Driver Memory Seat Button number in ascending order, not in the order of profile creation. The number in the Driver Profile display shall be denoted by the associated Driver Memory Seat button number, not the order of creation.

Examples:

The first created Driver Profile is associated to Driver Memory Seat button #2. The number 2 indicates that this profile is associated to Driver Memory Seat button # 2.



The second created Driver Profile is associated to Driver Memory Seat button #1. The list is arranged by Driver Memory Seat number and thus the new Driver Profile moved to the top.



The third created Driver Profile is associated to Driver Memory Seat button #3, and placed at bottom.



#### ENMEM-REQ-199864/A-Disable Driver Profile Creation and Editing when key is not in Run or Vehicle Speed is greater than Driver Restriction threshold

The EnhancedMemoryInterfaceClient shall disable Driver Profile creation and editing if the Ignition Status is any value other than Run or if the Vehicle Speed is greater than the Driving Restriction threshold, as defined in DRIVE-RESv2-FUR-REQ-025157/A-HMI Driving Restriction.

#### ENMEM-REQ-199865/A-Profile Creation Interruption

If the profile creation process is interrupted (ex. Ignition cycle, vehicle shifted out of park or vehicle speed becomes greater than the Driving Restriction threshold as defined in DRIVE-RESv2-FUR-REQ-025157-HMI Driving Restriction, Infotainment system reset, etc.) prior to completion, then the process shall be aborted. The EnhancedMemoryInterfaceClient shall set the EnMemProfilePairing\_Rq method to “ExitButtonPairing” and any profile information that was entered for the attempted profile creation shall be discarded.

#### ENMEM-HMI-REQ-199866/A-Enhanced Memory HMI Notification of Profile Creation Abort

When Driver Profile creation is aborted, per ENMEM-REQ-199878, the Enhanced Memory HMI shall notify the user that the process is aborted and shall provide the user the option to retry or cancel

#### ENMEM-HMI-REQ-199893/B-Edit Driver Profile

The Enhanced Memory Edit HMI menu shall contain Edit Name, Keyfob Association, Keyfob Disassociation, Phone Association, Phone Disassociation and Delete Drive Profile Menus.

Upon receiving the user input, Edit Driver Profile Function shall call Create/Edit Name Function, Delete Driver Profile Function, Associate Keyfob Function, Disassociate Keyfob Function, Associate Phone Function and Disassociate Phone Function accordingly.

#### ENMEM-REQ-199853/A-Missing DTC

* The EnhancedMemoryInterfaceClient shall set a “lost communication” DTC for any expected Enhanced Memory periodic messages that are not received for more than 5 seconds.
* The EnhancedMemoryPositionClient shall set a “lost communication” DTC for any expected Enhanced Memory periodic messages that are not received for more than 5 seconds.
* The EnhancedMemoryProfileServer shall set a “lost communication” DTC for any expected Enhanced Memory periodic messages that are not received for more than 5 seconds.

### White Box View

#### Activity Diagrams

##### ENMEM-ACT-REQ-199915/B-Create Driver Profile

Activity Diagram



#### Sequence Diagrams

##### ENMEM-SD-REQ-199919/C-Create Driver Profile (A Happy Path)

Constraints

Pre-Condition

Ignition\_Status = Run

Vehicle transmission is in Park OR vehicle speed is less than the Driving Restriction threshold\*

Maximum number of Driver Profiles has not yet been reached

\*Driving Restriction threshold is defined in DRIVE-RESv2-FUR-REQ-025157-HMI Driving Restriction

Scenarios

Normal Usage

The driver chooses to create a new Driver Profile and Driver Memory Seat button to associate to that Driver Profile.

Post-Condition

Enhanced Memory feature is enabled

A new Driver Profile is created

The chosen Driver Memory Seat button is associated to the new Driver Profile

Sequence Diagram(我们的EM Position Client一直是存在的，只是button selected on EM interface Client 不要看错哦)



## ENMEM-FUN-REQ-204951/A-Associate Keyfob

### Associate Keyfob Function Description

The Associate KeyFob function allows the user to associate a keyfob to a Driver Profile in order to recall the associated Driver Profile when unlocking the vehicle from the associated keyfob.

Unlike Driver Memory Seat button association, keyfob association is not required to create a Driver Profile. Any keyfob that is shared among multiple users is not recommended to be associated to a Driver Profile. The user has the option to associate a keyfob during the Driver Profile creation process or after the Driver Profile has been created.

The Associate KeyFob Function is an Enhanced Memory Logic Function that will support all the functionalities mentioned above.

The HMI flow chart below illustrates the HMI process of Associate Keyfob where the user is provided multiple opportunities to select a keyfob along with an option to overwrite a keyfob or select a different keyfob if an already associated keyfob is selected.

Please note that this flow chart only serves as a design aid and does not necessarily represent the final implementation.



Figure 11 – Enhanced Memory Associate Keyfob HMI Flow Chart

### Use Cases

#### ENMEM-UC-REQ-199843/C-Associate Keyfob to a Driver Profile

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | The ignition status is in Run.  The vehicle transmission is in Park OR vehicle speed is less than the Driving Restriction threshold\* for a manual transmission  The user is in the process of creating or editing a Driver Profile |
| **Scenario Description** | The user accesses the Enhanced Memory HMI, chooses to create or edit a new Driver Profile, and has chosen to associate a keyfob to that profile. |
| **Post-conditions** | The chosen keyfob is now associated to the chosen Driver Profile. |
| **List of Exception Use Cases** | ENMEM-UC-REQ-095925/B-Attempt to Associate Already Associated Keyfob |
| **Interfaces** | Personalization Interface |
| **Notes** | \*Driving Restriction threshold is defined in DRIVE-RESv2-FUR-REQ-025157-HMI Driving Restriction |

#### ENMEM-UC-REQ-199844/A-Attempt to Associate Already Associated Keyfob

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | The Ignition Status is in Run  The vehicle transmission is in Park OR vehicle speed is less than the Driving Restriction threshold\* for a manual transmission  The user is in the process of associating a keyfob to a Driver Profile |
| **Scenario Description** | The user attempts to associate a keyfob that is already associated to another Driver Profile. |
| **Post-conditions** | * The user is informed by HMI indication that the chosen keyfob is already associated to another Driver Profile * The user is given the option to overwrite the chosen keyfob |
| **List of Exception Use Cases** |  |
| **Interfaces** | Personalization Interface |
| **Notes** | \*Driving Restriction threshold is defined in DRIVE-RESv2-FUR-REQ-025157-HMI Driving Restriction |

#### ENMEM-UC-REQ-199845/A-Associate a Keyfob with Incorrect Method

|  |  |
| --- | --- |
| **Actor** | Vehicle Occupant |
| **Pre-conditions** | The Ignition Status is in Run  Vehicle is in Park or Neutral or Vehicle Speed is less than the Driving Restriction threshold\* for manual transmission  At least one set of positional settings is set (one Driver Memory Seat button is defined) |
| **Scenario Description** | The User tries to associate a keyfob to a preset positional setting (a Driver Memory Seat button) without using the Driver Profiles menu |
| **Post-conditions** | No chime is given (the indication of successful fob association).  The keyfob is not associated to any preset positional settings  The keyfob is not associated to any existing Driver Profile |
| **List of Exception Use Cases** |  |
| **Interfaces** | Personalization Interface |
| **Notes** | For vehicles with Enhanced Memory, keyfob association can only be done through Enhanced Memory Keyfob Association menu. If the user does not create a Driver Profile, the user cannot associate the keyfob to any Driver Memory Seat buttons. When Driver Profiles are created, the user can only then associate a keyfob via the HMI menu.  \*Driving Restriction threshold is defined in DRIVE-RESv2-FUR-REQ-025157-HMI Driving Restriction |

#### ENMEM-UC-REQ-199851/A-User Aborts or System Cancel Event Occurs During Keyfob Association Process

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | The Ignition Status is in Run  The vehicle transmission is in Park OR vehicle speed is less than the Driving Restriction threshold\* for a manual transmission  The user is in the process of associating a keyfob to a Driver Profile |
| **Scenario Description** | * The user cancels out of the pairing process   or   * A system event occurs that terminates the pairing process   + Vehicle gear shifts out of Park   + Vehicle in motion   + Recall Event occurs   + System Timeout   + Ignition no longer in Run   + System shutdown |
| **Post-conditions** | * The Keyfob Association process has been aborted and a keyfob was not successfully paired to the desired Driver Profile * HMI provides abort notification and instruction to restart the Keyfob Association process |
| **List of Exception Use Cases** |  |
| **Interfaces** | Personalization Interface |
| **Notes** | \*Driving Restriction threshold is defined in DRIVE-RESv2-FUR-REQ-025157-HMI Driving Restriction |

### Requirements

#### ENMEM-REQ-199894/A-Configurable Parameter for Keyfob Association

The EnhancedMemoryProfileServer shall have a configurable parameter to determine whether the vehicle supports the Enhanced Memory feature:

* If the parameter indicates that the vehicle is to support “Classic Memory”, then the EnMemProfilePairing\_Rq(KeyPairing) method shall be ignored since keyfob association will instead be coordinated via the legacy MemSwtch\_D\_RqAssoc method, which is defined in the existing Classic Memory subsystem specifications.
* If the parameter indicates that the vehicle is to support “Enhanced Memory”, then the legacy MemSwtch\_D\_RqAssoc method shall be ignored since keyfob association will instead be coordinated via the EnMemProfilePairing\_Rq(KeyPairing) method.

#### ENMEM-REQ-199895/A-Configurable Parameter to Disable Classic Keyfob Association

The EnhancedMemoryPositionClient shall have a configurable parameter to determine whether the vehicle supports the Enhanced Memory feature. If the parameter indicates that the vehicle is to support “Enhanced Memory”, then the legacy MemSwtch\_D\_RqAssoc method shall be sent with null values to the EnhancedMemoryProfileServer and any associated chimes/tones for keyfob association shall be suppressed.

#### ENMEM-REQ-199906/B-Keyfob Association Error

If neither Keyfob Association nor Phone Association process is active (not in process of associating a keyfob or a phone to a Driver Profile) and the EnhancedMemoryInterfaceClient receives EnMemKeyPairing\_St(KeyPairing != Null), then the EnhancedMemoryInterfaceClient shall send EnMemProfilePairing\_Rq(KeyPairing = ExitKeyPairing).

In the event that the EnhancedMemoryInterfaceClient detects the vehicle is in motion, transitions out of Run, or shifts into Reverse in the middle of the Keyfob Association process, it shall abort the process by sending EnMemProfilePairing\_Rq(KeyPairing = ExitKeyPairing) to the EnhancedMemoryProfileServer.

#### ENMEM-TMR-REQ-199905/C-T\_FobAssocTotal2

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | **Description** | **Units** | **Range** | **Resolution** | **Default** |
| T\_FobAssocTotal2 | Maximum time the EnhancedMemoryProfileServer shall wait before exiting Key/phone/NFC Association Mode. | msec | 300000-420000 | 60000 | 360000 |

#### ENMEM-REQ-199904/A-Keyfob Association Timer Expired

When T\_FobAssocTotal2 expires, the EnhancedMemoryProfileServer shall exit Keyfob Association Mode and update the status of EnMemKeyPairing\_St(KeyPairing) to KeyAssociateFailed for 1 second, followed by Null.

#### ENMEM-HMI-REQ-199903/A-Enhanced Memory HMI Notification of Keyfob Association Abort

When the Keyfob Association process is aborted, per ENMEM-REQ-199906-Keyfob Association Error, the Enhanced Memory HMI shall notify the user that the process has aborted and shall provide the user the option to retry or cancel

#### ENMEM-REQ-199902/B-Keyfob Association Failed

Any fault of the EnhancedMemoryProfileServer that prevents keyfob association shall result in the EnhancedMemoryProfileServer communicating to the EnhancedMemoryInterfaceClient that the keyfob wasn’t able to be associated by updating the status of EnMemKeyPairing\_St(KeyPairing) to KeyAssociateFailed.

#### ENMEM-HMI-REQ-199901/A-Enhanced Memory HMI Audible Notification of Successful Keyfob Association

When a keyfob is successfully associated to a Driver Profile, the EnhancedMemoryProfileServer shall submit a Chime request for keyfob association successful audible notification.

#### ENMEM-REQ-199900/A-Successful Keyfob Association Status

The EnhancedMemoryProfileServer shall set PersKeyPairing\_St for the applicable personality to KeyAssociated when a keyfob is successfully associated to a Driver Profile.

#### ENMEM-REQ-199897/A-Detection of Associated Keyfob

In the Keyfob Association Process, EnhancedMemoryProfileServer shall check if the requested keyfob is already associated to an existing Driver Profile.

In the case when the keyfob is already associated to an existing Driver Profile, EnhancedMemoryProfileServer shall update the status of EnMemKeyPairing\_St(KeyPairing) to KeyAlreadyInUse

#### ENMEM-HMI-REQ-199898/A-Enhanced Memory HMI Option for Associated Keyfob

In the Keyfob Association Process:

* EnhancedMemoryInterfaceClient shall monitor EnMemKeyPairing\_St to determine when a user attempts to associate an already associated keyfob to a new Driver Profile.
* When receiving KeyAlreadyInUse via EnMemKeyPairing\_St(KeyPairing):
* EnhancedMemoryInterfaceClient shall provide notification to the user that the keyfob was already associated to an existing Driver Profile
* EnhancedMemoryInterfaceClient shall provide the user an option to overwrite that associated keyfob or restart to associate a different keyfob
* When the user opts to overwrite the associated keyfob, EnhancedMemoryInterfaceClient shall set EnMemKeyPairing\_S\_Rq(KeyPairing) to OverwriteKey

#### ENMEM-REQ-199899/A-Overwrite Associated Keyfob

When receiving OverwriteKey via EnMemKeyPairing\_S\_Rq(KeyPairing),

* EnhancedMemoryProfileServer shall erase the existing keyfob association then associate the keyfob to a different Driver Profile denoted by EnMemKeyPairing\_S\_Rq(PersIndex)
* EnhancedMemoryProfileServer shall update PersKeyPairing\_St accordingly
* The Driver Profile with keyfob association erased shall be updated from KeyAssociated to KeyUnAssociated
* The Driver Profile with newly associated keyfob shall be updated from KeyUnAssociated to KeyAssociated

#### ENMEM-REQ-199896/A-Keyfob Association Mode

To associate a Driver Profile to a keyfob, the EnhancedMemoryInterfaceClient will communicate to the EnhancedMemoryProfileServer that a special Keyfob Association Mode has been entered via the EnMemProfilePairing\_Rq (KeyPairing) method.

* Once the request is sent with the value EnterKeyPairing, the EnhancedMemoryProfileServer shall begin looking for a “Lock” button press from a keyfob to determine which keyfob to associate the requested Driver Profile to, and then transmit EnMemKeyPairing\_St(KeyPairing = KeyAssociateSuccess) after associating the detected fob to the requested Driver Profile.
* The EnhancedMemoryProfileServer shall associate the detected keyfob to the requested Driver Profile, defined in EnMemProfilePairing\_Rq(PersIndex) and shall not associate to the active profile.
* The EnhancedMemoryProfileServer shall exit Keyfob Association Mode when indicated by EnMemProfilePairing\_Rq(KeyPairing = ExitKeyPairing), EnMemKeyPairing\_St(KeyPairing = KeyAssociateSuccess), or when Ignition\_Status\_St transitions out of *Run*, whichever comes first.

#### ENMEM-SR-REQ-212766/A-PersIndex used for Keyfob Association

When requesting to enter Keyfob Association Mode, the EnhancedMemoryInterfaceClient shall set the PersIndex of the EnMemProfilePairing\_Rq to the value of:

* The Driver Memory Seat Button selected during the Create Driver Profile process, which is indicated by EnMemButtonPairing\_St(ButtonPairing), OR
* The PersIndex of the selected Driver Profile Edit button when attempting associate a keyfob

If a recall should occur any time after the Driver Memory Seat Button Association and the start of the Keyfob Association process, the recalled PersIndex shall not be used for the Keyfob Association.

#### ENMEM-REQ-234053/B-Detection of Wrong Device in Keyfob Association Mode

When a phone or NFC Key is selected by the user in Keyfob Association process, EnhancedMemoryProfileServer shall update the status of EnMemKeyPairing\_St(KeyPairing) to WrongDeviceSelected for 1 second, and then return to KeyPairingEntered to resume normal Keyfob Association mode operation.

#### ENMEM-HMI-REQ-234054/B-Enhanced Memory HMI Notification and Option for Wrong Device

In the Keyfob or Phone or NFC Key Association Process, the EnhancedMemoryInterfaceClient shall monitor EnMemKeyPairing\_St to provide the wrong device HMI notification to the user.

When a value of WrongDeviceSelected is detected via EnMemKeyPairing\_St(KeyPairing):

* The EnhancedMemoryInterfaceClient shall provide a notification to the user that a wrong type of device is selected
* This notification shall be triggered, not sustained, by the above signal value (See H31a\_SYNC3\_EMDriverProfile for notification duration).

### White Box View

#### Activity Diagrams

##### ENMEM-ACT-REQ-199916/A-Associate Keyfob To Driver Profile

Activity Diagram



#### Sequence Diagrams

##### ENMEM-SD-REQ-199921/A-Associate Keyfob

Constraints

Pre-Condition

IgnitionStatus\_St = Run

Vehicle transmission is in Park OR vehicle speed is less than the Driving Restriction threshold\*

\*Driving Restriction threshold is defined in DRIVE-RESv2-FUR-REQ-025157-HMI Driving Restriction

Scenarios

Normal Usage

The driver chooses to associate a keyfob to a selected Diver Profile.

Post-Condition

The selected keyfob is associated to the selected Driver Profile.

Sequence Diagram



## ENMEM-FUN-REQ-204969/A-Disassociate Keyfob

### Disassociate Keyfob Description

The Disassociate Keyfob function allows the user to disassociate a keyfob from a Driver Profile in order to remove the recall functionality that is provided with the associated keyfob.

The user has the option to disassociate a keyfob only after a Driver Profile has been created. If a user chooses to overwrite a keyfob during the Keyfob Association Process, the associated keyfob will be automatically disassociated at that time. An automatic disassociation will also occur for any associated keyfob when a Driver Profile is deleted either manually or from a Master Reset.

The Disassociate Keyfob Function is an Enhanced Memory Logic Function that will support all the functionalities mentioned above.

|  |  |  |  |
| --- | --- | --- | --- |
| Disassociate Keyfob Functional Decomposition Diagram | | | |
| HMI Menu Customer Function | Logic Function | | |
| Level1 | Level2 | Level3 |
| Delete Driver Profile | Delete Driver Profile | Disassociate Keyfob |  |
| Recall Driver Profile |
| Disable Enhanced Memory |
| Disassociate Keyfob | Disassociate Keyfob |  | |
| Master Reset | Opt-Out | Delete Driver Profile | Disassociate Keyfob |
| Recall Driver Profile |
| Disable Enhanced Memory |

Figure 12 – Disassociate Keyfob Functional Decomposition Diagram

### Use Cases

#### ENMEM-UC-REQ-199846/B-Disassociate Keyfob from a Driver Profile

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | The Ignition Status is in Run  The vehicle transmission is in Park OR Vehicle Speed is less than the Driving Restriction threshold\*  User is in the process of editing a Driver Profile |
| **Scenario Description** | The User accesses the Enhanced Memory HMI, chooses to edit a new Driver Profile, and has chosen to remove the keyfob association from that profile. |
| **Post-conditions** | The previous keyfob association is now removed from the chosen Driver Profile. |
| **List of Exception Use Cases** |  |
| **Interfaces** | Personalization Interface |
| **Notes** | Disassociating a keyfob does not delete the profile, it only removes the link between the selected profile and the keyfob.  \*Driving Restriction threshold is defined in DRIVE-RESv2-FUR-REQ-025157-HMI Driving Restriction |

#### ENMEM-UC-REQ-199847/A-Disassociate Keyfobs from Driver Profiles after Keyfobs Are Erased from a Vehicle

|  |  |
| --- | --- |
| **Actors** | Ford Dealership Technician and Vehicle Occupant |
| **Pre-conditions** | At least one keyfob is associated to a Driver Profile |
| **Scenario Description** | Keyfobs are erased by diagnostic tool and then keyfobs (new or original ones) are reprogrammed to the vehicle  The user starts up the vehicle and selects Enhanced Memory menu |
| **Post-conditions** | All Driver Profiles remain unchanged  All reprogrammed keyfobs are not associated to any Driver Profile.  HMI does not display keyfob association indicator for any Driver Profile |
| **List of Exception Use Cases** |  |
| **Interfaces** | Personalization Interface |
| **Notes** | Keyfob association will be erased when the keyfobs are erased by the diagnostic tool |

### Requirements

#### ENMEM-REQ-199913/C-Disassociate Keyfob when a Driver Profile is deleted

When a user requests to delete a Driver Profile which has a keyfob associated to it, the EnhancedMemoryInterfaceClient shall automatically send a keyfob disassociation request, via EnMemProfilePairing\_Rq(KeyPairing=DisassociateKey) without requiring separate disassociation requests from the user.

#### ENMEM-REQ-199914/A-Keyfob Disassociation Status

The EnhancedMemoryProfileServer shall set PersKeyPairing\_St for the applicable personality to KeyNotAssociated:

* When a keyfob is successfully disassociated for a Driver profile
* When all keyfobs are erased from a vehicle by a Diagnostic tool

#### ENMEM-REQ-199912/A-Disassociate the Keyfob per User Request

When a user requests to disassociate a keyfob from a Driver Profile, the EnhancedMemoryInterfaceClient shall set EnMemProfilePairing\_Rq(KeyPairing) to DisassociateKey for the requested Driver Profile

### White Box View

#### Activity Diagrams

### Please refer to ENMEM-ACT-REQ-199916-Associate Keyfob To Driver Profile

#### Sequence Diagrams

##### ENMEM-SD-REQ-199922/A-Disassociate Keyfob

Constraints

Pre-Condition

IgnitionStatus\_St = Run

Vehicle transmission is in Park OR vehicle speed is less than the Driving Restriction threshold\*

\*Driving Restriction threshold is defined in DRIVE-RESv2-FUR-REQ-025157-HMI Driving Restriction

Scenarios

Normal Usage

The driver chooses to disassociate a keyfob from a selected Driver Profile.

Post-Condition

The selected keyfob is disassociated from the selected Driver Profile.

Sequence Diagram



## ENMEM-FUN-REQ-232251/A-Associate Phone

### Associate Phone Function Description

The Associate Phone function allows the user to associate a phone to a Driver Profile in order to recall the associated Driver Profile when remote start or unlocking the vehicle with the associated phone.

Unlike Driver Memory Seat button association, phone association is not required to create a Driver Profile. The user has the option to associate a phone during the Driver Profile creation process or after the Driver Profile has been created.

The Associate Phone Function is an Enhanced Memory Logic Function that will support all the functionalities mentioned above.

The HMI flow chart below illustrates the HMI process of Associate Phone where the user is provided multiple opportunities to select a phone along with an option to overwrite a phone or select a different phone if an already associated phone is selected.

Please note that this flow chart only serves as a design aid and does not necessarily represent the final implementation.



Figure 13 – Enhanced Memory Associate Phone HMI Flow Chart

### Use Cases

#### ENMEM-UC-REQ-232252/A-Associate Phone to a Driver Profile

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | The ignition status is in Run.  The vehicle transmission is in Park OR vehicle speed is less than the Driving Restriction threshold\* for a manual transmission  The user is in the process of creating or editing a Driver Profile |
| **Scenario Description** | The user accesses the Enhanced Memory HMI, chooses to create or edit a Driver Profile, and has chosen to associate a phone to that profile. |
| **Post-conditions** | The chosen phone is now associated to the chosen Driver Profile |
| **List of Exception Use Cases** | ENMEM-UC-REQ-232254-- Associate a Non-Registered Phone |
| **Interfaces** | Personalization Interface |
| **Notes** | \*Driving Restriction threshold is defined in DRIVE-RESv2-FUR-REQ-025157-HMI Driving Restriction |

#### ENMEM-UC-REQ-232253/A-Attempt to Associate Already Associated Phone

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | The Ignition Status is in Run  The vehicle transmission is in Park OR vehicle speed is less than the Driving Restriction threshold\* for a manual transmission  The user is in the process of associating a phone to a Driver Profile |
| **Scenario Description** | The user attempts to associate a phone that is already associated to another Driver Profile. |
| **Post-conditions** | * The user is informed by HMI indication that the chosen phone is already associated to another Driver Profile * The user is given the option to overwrite the chosen phone |
| **List of Exception Use Cases** |  |
| **Interfaces** | Personalization Interface |
| **Notes** | \*Driving Restriction threshold is defined in DRIVE-RESv2-FUR-REQ-025157-HMI Driving Restriction |

#### ENMEM-UC-REQ-232254/A-Attempt to Associate a Non-Registered Phone

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | The ignition status is in Run.  The vehicle transmission is in Park OR vehicle speed is less than the Driving Restriction threshold\* for a manual transmission  Phone is not registered, authorized, paired or connected as a PaaK  The user is in the process of creating or editing a Driver Profile |
| **Scenario Description** | The user accesses the Enhanced Memory HMI, chooses to create or edit a Driver Profile, and has chosen to associate a phone |
| **Post-conditions** | The non-registered phone cannot be detected by the vehicle, thus it cannot be associated to any Driver Profile in that vehicle.    HMI will time out |
| **List of Exception Use Cases** |  |
| **Interfaces** | Personalization Interface |
| **Notes** | \*Driving Restriction threshold is defined in DRIVE-RESv2-FUR-REQ-025157-HMI Driving Restriction |

#### ENMEM-UC-REQ-232255/A-User Aborts or System Cancel Event Occurs During Phone Association Process

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | The Ignition Status is in Run  The vehicle transmission is in Park OR vehicle speed is less than the Driving Restriction threshold\* for a manual transmission  The user is in the process of associating a phone to a Driver Profile |
| **Scenario Description** | * The user cancels out of the pairing process   or   * A system event occurs that terminates the pairing process * Vehicle gear shifts out of Park * Vehicle in motion * Recall Event occurs * System Timeout * Ignition no longer in Run * System shutdown |
| **Post-conditions** | * The Phone Association process has been aborted and a phone was not successfully paired to the desired Driver Profile * HMI provides abort notification and instruction to restart the Phone Association process |
| **List of Exception Use Cases** |  |
| **Interfaces** | Personalization Interface |
| **Notes** | \*Driving Restriction threshold is defined in DRIVE-RESv2-FUR-REQ-025157-HMI Driving Restriction |

### Requirements

#### ENMEM-REQ-232258/A-Phone Association Error

If neither Keyfob Association nor Phone Association process is active (not in process of associating a keyfob or a phone to a Driver Profile) and the EnhancedMemoryInterfaceClient receives EnMemKeyPairing\_St(KeyPairing != Null), then the EnhancedMemoryInterfaceClient shall send EnMemProfilePairing\_Rq(KeyPairing = ExitKeyPairing).

In the event that the EnhancedMemoryInterfaceClient detects the vehicle is in motion, transitions out of Run, or shifts into Reverse in the middle of the Phone Association process, it shall abort the process by sending EnMemProfilePairing\_Rq(KeyPairing = ExitKeyPairing) to the EnhancedMemoryProfileServer.

#### ENMEM-REQ-232260/A-Phone Association Timer Expired

When T\_FobAssocTotal2 expires, the EnhancedMemoryProfileServer shall exit Phone Association Mode and update the status of EnMemKeyPairing\_St(KeyPairing) to KeyAssociateFailed for 1 second, followed by Null.

#### ENMEM-HMI-REQ-232261/A-Enhanced Memory HMI Notification of Phone Association Abort

When the Phone Association process is aborted, per ENMEM-REQ-232258-Phone Association Error, the Enhanced Memory HMI shall notify the user that the process has aborted and shall provide the user the option to retry or cancel

#### ENMEM-REQ-232262/B-Phone Association Failed

Any fault of the EnhancedMemoryProfileServer that prevents phone association shall result in the EnhancedMemoryProfileServer communicating to the EnhancedMemoryInterfaceClient that the phone wasn’t able to be associated by updating the status of EnMemKeyPairing\_St(KeyPairing) to KeyAssociateFailed.

#### ENMEM-HMI-REQ-232263/A-Enhanced Memory HMI Audible Notification of Successful Phone Association

When a phone is successfully associated to a Driver Profile, the EnhancedMemoryProfileServer shall submit a Chime request for phone association successful audible notification.

#### ENMEM-REQ-232264/A-Successful Phone Association Status

The EnhancedMemoryProfileServer shall update PersPhonePairing\_St to OnePhoneAssociated for the applicable personality to reflect the phone association status after a phone is successfully associated to a Driver Profile.

#### ENMEM-REQ-232267/A-Detection of Associated Phone

In the Phone Association Process, EnhancedMemoryProfileServer shall check if the requested phone is already associated to an existing Driver Profile.

In the case when the phone is already associated to an existing Driver Profile, EnhancedMemoryProfileServer shall update the status of EnMemKeyPairing\_St(KeyPairing) to KeyAlreadyInUse

#### ENMEM-HMI-REQ-232266/A-Enhanced Memory HMI Option for Associated Phone

In the Phone Association Process:

* EnhancedMemoryInterfaceClient shall monitor EnMemKeyPairing\_St to determine when a user attempts to associate an already associated Phone to a new Driver Profile.
* When receiving KeyAlreadyInUse via EnMemKeyPairing\_St(KeyPairing):
* EnhancedMemoryInterfaceClient shall provide notification to the user that the phone was already associated to an existing Driver Profile
* EnhancedMemoryInterfaceClient shall provide the user an option to overwrite that associated phone or restart to associate a different phone
* When the user opts to overwrite the associated phone, EnhancedMemoryInterfaceClient shall set EnMemProfilePairing\_Rq (KeyPairing) to OverwriteKey

#### ENMEM-REQ-232265/A-Overwrite Associated Phone

When receiving OverwriteKey via EnMemProfilePairing\_Rq (KeyPairing) during phone association process,

* EnhancedMemoryProfileServer shall erase the existing phone association then associate the phone to a different Driver Profile denoted by EnMemProfilePairing\_Rq (PersIndex)
* EnhancedMemoryProfileServer shall update PersPhonePairing\_St accordingly
* The Driver Profile with phone association erased shall be updated to NoPhoneAssociated or X-1PhoneAssociated where X is the original number of associated phones before overwriting
* The Driver Profile with newly associated Phone shall be updated to Y+1PhoneAssociated where Y is the original number of associated phones before overwriting

#### ENMEM-REQ-232268/A-Phone Association Mode

To associate a Driver Profile to a phone, the EnhancedMemoryInterfaceClient will communicate to the EnhancedMemoryProfileServer that a Phone Association Mode has been entered via the EnMemProfilePairing\_Rq (KeyPairing) method.

* Once the request is sent via the EnMemProfilePairing\_Rq (KeyPairing) with the value EnterPhonePairing, the EnhancedMemoryProfileServer shall begin looking for a “Lock” button press from a phone to determine which phone to associate the requested Driver Profile to, and then transmit EnMemKeyPairing\_St(KeyPairing = KeyAssociateSuccess) after associating the detected phone to the requested Driver Profile
* The EnhancedMemoryProfileServer shall associate the detected phone to the requested Driver Profile, defined in EnMemProfilePairing\_Rq(PersIndex) and shall not associate to the active profile
* The EnhancedMemoryProfileServer shall exit Phone Association Mode when indicated by EnMemProfilePairing\_Rq(KeyPairing = ExitKeyPairing), EnMemKeyPairing\_St(KeyPairing = KeyAssociateSuccess), or when Ignition\_Status\_St transitions out of *Run*, whichever comes first.

#### ENMEM-SR-REQ-232269/B-PersIndex Used for Phone Association

When requesting to enter Phone Association Mode, the EnhancedMemoryInterfaceClient shall set the PersIndex of the EnMemProfilePairing\_Rq to the value of:

* The Driver Memory Seat Button selected during the Create Driver Profile process, which is indicated by EnMemButtonPairing\_St(ButtonPairing), OR
* The automatically selected Profile number association by the EnhancedMemoryInterfaceClient, OR
* The PersIndex of the selected Driver Profile Edit button when attempting associate a phone

If a memory seat button recall should occur any time after the Driver Memory Seat Button Association and the start of the phone Association process, the recalled PersIndex shall not be used for the Phone Association.

#### ENMEM-REQ-234052/B-Detection of Wrong Device in Phone Association Mode

When a keyfob or NFC Key is selected by the user in Phone Association process, EnhancedMemoryProfileServer shall update the status of EnMemKeyPairing\_St(KeyPairing) to WrongDeviceSelected, for 1 second, and then return to KeyPairingEntered to resume normal Phone Association mode operation.

#### ENMEM-HMI-REQ-234054/B-Enhanced Memory HMI Notification and Option for Wrong Device

In the Keyfob or Phone or NFC Key Association Process, the EnhancedMemoryInterfaceClient shall monitor EnMemKeyPairing\_St to provide the wrong device HMI notification to the user.

When a value of WrongDeviceSelected is detected via EnMemKeyPairing\_St(KeyPairing):

* The EnhancedMemoryInterfaceClient shall provide a notification to the user that a wrong type of device is selected
* This notification shall be triggered, not sustained, by the above signal value (See H31a\_SYNC3\_EMDriverProfile for notification duration).

### White Box View

#### Activity Diagrams

##### ENMEM-ACT-REQ-232270/A-Associate Phone To Driver Profile

Activity Diagram



#### Sequence Diagrams

##### ENMEM-SD-REQ-232271/A-Associate Phone

Constraints

Pre-Condition

IgnitionStatus\_St = Run

Vehicle transmission is in Park OR vehicle speed is less than the Driving Restriction threshold\*

\*Driving Restriction threshold is defined in DRIVE-RESv2-FUR-REQ-025157-HMI Driving Restriction

Scenarios

Normal Usage

The driver chooses to associate a phone to a selected Diver Profile.

Post-Condition

The selected phone is associated to the selected Driver Profile.

Sequence Diagram



## ENMEM-FUN-REQ-232272/A-Disassociate Phone

### Disassociate Phone Description

The Disassociate Phone function allows the user to disassociate a phone from a Driver Profile in order to remove the recall functionality that is provided with the associated phone.

The user has the option to disassociate a phone only after a Driver Profile has been created. If a user chooses to overwrite a phone during the Phone Association Process, the associated phone will be automatically disassociated at that time. An automatic disassociation will also occur for any associated phone if the phone is erased or revoked from the vehicle or when a Driver Profile is deleted either manually or from a Master Reset.

The Disassociate Phone Function is an Enhanced Memory Logic Function that will support all the functionalities mentioned above.

|  |  |  |  |
| --- | --- | --- | --- |
| Disassociate Phone Functional Decomposition Diagram | | | |
| HMI Menu Customer Function | Logic Function | | |
| Level1 | Level2 | Level3 |
| Delete Driver Profile | Delete Driver Profile | Disassociate Phone |  |
| Disassociate Keyfob |
| Recall Driver Profile |
| Disable Enhanced Memory |
| Disassociate Phone | Disassociate Phone |  | |
| Master Reset | Opt-Out | Delete Driver Profile | Disassociate Phone |
| Disassociate Keyfob |
| Recall Driver Profile |
| Disable Enhanced Memory |

Figure 14 – Disassociate Phone Functional Decomposition Diagram

### Use Cases

#### ENMEM-UC-REQ-232273/A-Disassociate Phone from a Driver Profile

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | The Ignition Status is in Run  The vehicle transmission is in Park OR Vehicle Speed is less than the Driving Restriction threshold\*  User is in the process of editing a Driver Profile |
| **Scenario Description** | The User accesses the Enhanced Memory HMI, chooses to edit a Driver Profile, and has chosen to remove the phone association from that profile. |
| **Post-conditions** | The previous phone association is now removed from the chosen Driver Profile.  HMI does not display phone indicator for the chosen Driver Profile |
| **List of Exception Use Cases** |  |
| **Interfaces** | Personalization Interface |
| **Notes** | Disassociating a phone does not delete the profile nor erase the registration of the phone from the vehicle. It only removes the link between the selected profile and the phone.  \*Driving Restriction threshold is defined in DRIVE-RESv2-FUR-REQ-025157-HMI Driving Restriction |

#### ENMEM-UC-REQ-232274/A-Disassociate Phone from Driver Profiles after Phone Is Erased or Revoked from a Vehicle

|  |  |
| --- | --- |
| **Actors** | Ford Dealership Technician and Vehicle Occupant |
| **Pre-conditions** | A phone is associated to Driver Profile X |
| **Scenario Description** | The associated phone is erased or revoked from the vehicle  The user starts up the vehicle and selects Enhanced Memory menu |
| **Post-conditions** | Driver Profile X remain unchanged but no longer has a phone associated to it  HMI does not display phone association indicator for any Driver Profile |
| **List of Exception Use Cases** |  |
| **Interfaces** | Personalization Interface |
| **Notes** | Phone association to a Driver Profile will be automatically ( without the user disassociating it) erased when the registration of that phone to the vehicle is erased or revoked |

### Requirements

#### ENMEM-REQ-232275/B-Disassociate Phone when a Driver Profile is deleted

When a user requests to delete a Driver Profile which has a phone associated to it, the EnhancedMemoryInterfaceClient shall automatically send a phone disassociation request, via EnMemProfilePairing\_Rq(KeyPairing=DisassociatePhone), without requiring separate disassociation requests from the user.

#### ENMEM-REQ-232276/A-Phone Disassociation Status

The EnhancedMemoryProfileServer shall update PersPhonePairing\_St for the applicable personality to reflect phone disassociated status after any of the following actions:

* When a phone is successfully disassociated from a Driver profile
* When a phone is revoked from a vehicle
* When all phones are erased from a vehicle

#### ENMEM-REQ-232277/A-Disassociate the Phone per User Request

When a user requests to disassociate a phone from a Driver Profile, the EnhancedMemoryInterfaceClient shall set EnMemProfilePairing\_Rq(KeyPairing) to DisassociatePhone for the requested Driver Profile

#### ENMEM-REQ-239418/A-Phone Revoked Status

When a PaaK is erased or revoked from the vehicle, the PaaKServer shall send signal XXXX (TBD) to the EnhancedMemoryProfileServer stating revoked/erased operation occurred at a particular phone via Phone Index or Phone ID.

This status notification from PaaKServer to EnhancedMemoryProfileServer is needed so that EnhancedMemoryProfileServer can update Driver Profile Phone Disassociation status accordingly and provide the updated dissociation status to EnhancedMemoryInterfaceClient for vehicle menu display.

### White Box View

#### Activity Diagrams

### Please refer to ENMEM-ACT-REQ-232270-Associate Phone to Driver Profile

#### Sequence Diagrams

##### ENMEM-SD-REQ-232278/A-Disassociate Phone

Constraints

Pre-Condition

IgnitionStatus\_St = Run

Vehicle transmission is in Park OR vehicle speed is less than the Driving Restriction threshold\*

\*Driving Restriction threshold is defined in DRIVE-RESv2-FUR-REQ-025157-HMI Driving Restriction

Scenarios

Normal Usage

The driver chooses to disassociate a phone from a selected Driver Profile.

Post-Condition

The selected phone is disassociated from the selected Driver Profile.

Sequence Diagram



## ENMEM-FUN-REQ-404698/A-Associate NFC Key

### Associate NFC Key Function Description

The Associate NFC Key function allows the user to associate an NFC Key to a Driver Profile in order to recall the associated Driver Profile when unlocking the vehicle with the associated NFC Key.

Unlike Driver Memory Seat button association (when present), NFC Key association is not required to create a Driver Profile. The user has the option to associate a NFC Key during the Driver Profile creation process or after the Driver Profile has been created.

The Associate NFC Key Function is an Enhanced Memory Logic Function that will support all the functionalities mentioned above.

The HMI flow chart below illustrates the HMI process of Associate NFC Key where the user is provided multiple opportunities to select aN NFC key along with an option to overwrite an NFC Key or select a different NFC key if an already associated NFC Key is selected.

Please note that this flow chart only serves as a design aid and does not necessarily represent the final implementation.



Figure 15 – Enhanced Memory Associate NFC Key HMI Flow Chart

### Use Cases

#### ENMEM-UC-REQ-404699/B-Associate NFC Key to a Driver Profile

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | The ignition status is in Run.  The vehicle transmission is in Park OR vehicle speed is less than the Driving Restriction threshold\* for a manual transmission  The user is in the process of creating or editing a Driver Profile |
| **Scenario Description** | The user accesses the Enhanced Memory HMI, chooses to create or edit a Driver Profile, and has chosen to associate an NFC Key to that profile. |
| **Post-conditions** | The chosen NFC Key is now associated to the chosen Driver Profile |
| **List of Exception Use Cases** | ENMEM-UC-REQ-404701--Attempt to Associate an Unauthorized NFC Key |
| **Interfaces** | Personalization Interface |
| **Notes** | \*Driving Restriction threshold is defined in DRIVE-RESv2-FUR-REQ-025157-HMI Driving Restriction |

#### ENMEM-UC-REQ-404700/A-Attempt to Associate Already Associated NFC Key

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | The Ignition Status is in Run  The vehicle transmission is in Park OR vehicle speed is less than the Driving Restriction threshold\* for a manual transmission  The user is in the process of associating an NFC Key to a Driver Profile |
| **Scenario Description** | The user attempts to associate an NFC Key that is already associated to another Driver Profile. |
| **Post-conditions** | * The user is informed by HMI indication that the chosen NFC Key is already associated to another Driver Profile * The user is given the option to overwrite the chosen NFC Key |
| **List of Exception Use Cases** |  |
| **Interfaces** | Personalization Interface |
| **Notes** | \*Driving Restriction threshold is defined in DRIVE-RESv2-FUR-REQ-025157-HMI Driving Restriction |

#### ENMEM-UC-REQ-404701/B-Attempt to Associate an Unauthorized NFC Key

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | The ignition status is in Run.  The vehicle transmission is in Park OR vehicle speed is less than the Driving Restriction threshold\* for a manual transmission  NFC Key is not registered, authorized, paired to the vehicle  The user is in the process of creating or editing a Driver Profile |
| **Scenario Description** | The user accesses the Enhanced Memory HMI, chooses to create or edit a Driver Profile, and has chosen to associate an NFC Key |
| **Post-conditions** | The NFC Key is not authorized to the vehicle, thus it cannot be associated to any Driver Profile in that vehicle.    HMI will time out |
| **List of Exception Use Cases** |  |
| **Interfaces** | Personalization Interface |
| **Notes** | \*Driving Restriction threshold is defined in DRIVE-RESv2-FUR-REQ-025157-HMI Driving Restriction |

#### ENMEM-UC-REQ-404702/A-User Aborts or System Cancel Event Occurs During NFC Key Association Process

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | The Ignition Status is in Run  The vehicle transmission is in Park OR vehicle speed is less than the Driving Restriction threshold\* for a manual transmission  The user is in the process of associating an NFC Key to a Driver Profile |
| **Scenario Description** | * The user cancels out of the pairing process   or   * A system event occurs that terminates the pairing process   + Vehicle gear shifts out of Park   + Vehicle in motion   + Recall Event occurs   + System Timeout   + Ignition no longer in Run   + System shutdown |
| **Post-conditions** | * The NFC Key Association process has been aborted and an NFC Key was not successfully paired to the desired Driver Profile * HMI provides abort notification and instruction to restart the NFC Key Association process |
| **List of Exception Use Cases** |  |
| **Interfaces** | Personalization Interface |
| **Notes** | \*Driving Restriction threshold is defined in DRIVE-RESv2-FUR-REQ-025157-HMI Driving Restriction |

### Requirements

#### ENMEM-REQ-404703/A-NFC Association Error

If neither Keyfob Association, Phone Association or NFC Key association process is active (not in process of associating a keyfob or a phone to a Driver Profile) and the EnhancedMemoryInterfaceClient receives EnMemKeyPairing\_St(KeyPairing != Null), then the EnhancedMemoryInterfaceClient shall send EnMemProfilePairing\_Rq(NFCKeyPairing = ExitKeyAssociation).

In the event that the EnhancedMemoryInterfaceClient detects the vehicle is in motion, transitions out of Run, or shifts into Reverse in the middle of the NFC Key Association process, it shall abort the process by sending EnMemProfilePairing\_Rq(NFCKeyPairing = ExitKeyAssociation) to the EnhancedMemoryProfileServer.

#### ENMEM-REQ-404704/A-NFC Association Timer Expired

When T\_FobAssocTotal2 expires, the EnhancedMemoryProfileServer shall exit NFC Key Association Mode and update the status of EnMemKeyPairing\_St(KeyPairing) to KeyAssociateFailed for 1 second, followed by Null.

#### ENMEM-HMI-REQ-404705/A-Enhanced Memory HMI Notification of NFC Key Association Abort

When the NFC Key Association process is aborted, per ENMEM-REQ-404703-NFC Association Error, the Enhanced Memory HMI shall notify the user that the process has aborted and shall provide the user the option to retry or cancel

|  |
| --- |
| **Acceptance Criteria** |
|  |

#### ENMEM-REQ-404706/A-NFC Association Failed

Any fault of the EnhancedMemoryProfileServer that prevents NFC Key association shall result in the EnhancedMemoryProfileServer communicating to the EnhancedMemoryInterfaceClient that the NFC Key wasn’t able to be associated by updating the status of EnMemKeyPairing\_St(KeyPairing) to KeyAssociateFailed.

#### ENMEM-REQ-427326/A-NFC Key Association - Unauthorized Device Tapped

After requesting to enter NFC Key Association, the EnhancedMemoryInterfaceClient shall monitor NFCDeviceTapPaired\_St and NFCDeviceTap\_Rq to determine whether an unauthorized/unpaired NFC Key was tapped.

If during the “tap an NFC Key” screen, the below conditions are both true, the EnhancedMemoryInterfaceClient shall request to exit NFC Key Association via EnMemProfilePairing\_Rq(NFCKeyPairing = ExitKeyPairing) and display a notification to the user stating that the tapped key is not authorized/paired to the vehicle:

* NFCDeviceTap\_Rq indicates that a tap event has occurred
  + A tap event is determined by NFCDeviceTap\_Rq changing from any value to any non-zero value
* NFCDeviceTapPaired\_St = No

Upon the user closing this notification, the user shall be returned to the “tap an NFC Key” screen and the EnhancedMemoryInterfaceClient shall send EnMemProfilePairing\_Rq(NFCKeyPairing = EnterKeyPairing) to re-enter NFC Key Association.

#### ENMEM-HMI-REQ-404707/A-Enhanced Memory HMI Audible Notification of Successful NFC Key Association

When an NFC Key is successfully associated to a Driver Profile, the EnhancedMemoryProfileServer shall submit a Chime request for NFC Key association successful audible notification.

#### ENMEM-REQ-404708/A-Successful NFC Key Association Status

The EnhancedMemoryProfileServer shall update PersNFCKeyPairing\_St with the key index of the associated NFC Key, using the appropriate corresponding parameter, for the applicable personality, as defined by PersNFCKeyPairing\_St (PersIndex) and NFC Key number based on the table below to reflect the NFC Key association status after an NFC Key is successfully associated to a Driver Profile:

|  |  |  |
| --- | --- | --- |
| Logical Parameter Mapping to Profile and Key Number | | |
| **Personality Index** | **NFC Key #** | **Parameter** |
| PersIndex =PERS1 | 1 | PersNFCKey1Status |
| 2 | PersNFCKey2Status |
| 3 | PersNFCKey3Status |
| 4 | PersNFCKey4Status |
| PersIndex =PERS2 | 1 | PersNFCKey1Status |
| 2 | PersNFCKey2Status |
| 3 | PersNFCKey3Status |
| 4 | PersNFCKey4Status |
| PersIndex =PERS3 | 1 | PersNFCKey1Status |
| 2 | PersNFCKey2Status |
| 3 | PersNFCKey3Status |
| 4 | PersNFCKey4Status |
| PersIndex =PERS4 | 1 | PersNFCKey1Status |
| 2 | PersNFCKey2Status |
| 3 | PersNFCKey3Status |
| 4 | PersNFCKey4Status |

Table 16 – Mapping of Logical Parameter to Profile and Key Number

#### ENMEM-IR-REQ-415898/A-NFC Key Association Status Periodicity

The EnhancedMemoryProfileServer shall provide ongoing update of the key index of all NFC Keys for each personality, published on a rotational basis, for each value of PersNFCKeyPairing\_St(PersIndex).

EnhancedMemoryProfileServer shall continually rotate through each value of PersNFCKeyPairing\_St(PersIndex), sending all NFC Keys each time as mapped per ENMEM-REQ-404708. The interval between sending PersNFCKeyPairing\_St shall be a defined length of time, T\_NFCAssocStatTime.

#### ENMEM-TMR-REQ-415899/A-T\_NFCAssocStatTime

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | **Description** | **Units** | **Range** | **Resolution** | **Default** |
| T\_NFCAssocStatTime | Update interval for the EnhancedMemoryProfileServer to send PersNFCKeyPairing\_St for successive values of PersIndex. | msec | 200-300 | 50 | 250 |

#### ENMEM-REQ-404709/A-Detection of Associated NFC Key

In the NFC Key Association Process, EnhancedMemoryProfileServer shall check if the requested NFC Key is already associated to an existing Driver Profile.

In the case when the NFC Key is already associated to an existing Driver Profile, EnhancedMemoryProfileServer shall update the status of EnMemKeyPairing\_St(KeyPairing) to KeyAlreadyInUse

#### ENMEM-HMI-REQ-404710/A-Enhanced Memory HMI Option for Associated NFC Key

In the NFC Key Association Process:

* EnhancedMemoryInterfaceClient shall monitor EnMemKeyPairing\_St to determine when a user attempts to associate an already associated NFC Key to a new Driver Profile.
* When receiving KeyAlreadyInUse via EnMemKeyPairing\_St(KeyPairing):
* EnhancedMemoryInterfaceClient shall provide notification to the user that the NFC Key was already associated to an existing Driver Profile
* EnhancedMemoryInterfaceClient shall provide the user an option to overwrite that associated NFC Key or restart to associate a different NFC Key
* When the user opts to overwrite the associated NFC Key, EnhancedMemoryInterfaceClient shall set EnMemProfilePairing\_Rq (NFCKeyPairing) to OverwriteKey

#### ENMEM-REQ-404711/A-Overwrite Associated NFC Key

When receiving OverwriteKey via EnMemProfilePairing\_Rq (NFCKeyPairing) during NFC Key association process,

* EnhancedMemoryProfileServer shall erase the existing NFC Key association then associate the NFC Key to a different Driver Profile denoted by EnMemProfilePairing\_Rq (PersIndex)
* EnhancedMemoryProfileServer shall update the new parameter of PersNFCKeyPairing\_St based on ENMEM-REQ-404708 with the key index of the existing NFC Key.

#### ENMEM-REQ-404712/B-NFC Key Association Mode

To associate a Driver Profile to an NFC Key, the EnhancedMemoryInterfaceClient will communicate to the EnhancedMemoryProfileServer that a NFC Key Association Mode has been entered via the EnMemProfilePairing\_Rq (NFCKeyPairing) method.

* Once the request is sent via the EnMemProfilePairing\_Rq (NFCKeyPairing) with the value EnterKeyAssociation, the EnhancedMemoryProfileServer shall begin looking for an NFC tap event to determine which NFC Key to associate the requested Driver Profile to, and then transmit EnMemKeyPairing\_St(KeyPairing = KeyAssociateSuccess) after associating the detected NFC Key to the requested Driver Profile
* The EnhancedMemoryProfileServer shall only respond to an interior tap to make an association to a driver profile.
* The EnhancedMemoryProfileServer shall associate the detected NFC Key to the requested Driver Profile, defined in EnMemProfilePairing\_Rq(PersIndex) and shall not associate to the active profile
* The EnhancedMemoryProfileServer shall exit NFC Key Association Mode when indicated by EnMemProfilePairing\_Rq(NFCKeyPairing = ExitKeyAssociation), EnMemKeyPairing\_St(KeyPairing = KeyAssociateSuccess), or when Ignition\_Status\_St transitions out of *Run*, whichever comes first.

#### ENMEM-SR-REQ-404713/A-PersIndex Used for NFC Key Association

When requesting to enter NFC Key Association Mode, the EnhancedMemoryInterfaceClient shall set the PersIndex of the EnMemProfilePairing\_Rq to the value of:

* The Driver Memory Seat Button selected during the Create Driver Profile process, which is indicated by EnMemButtonPairing\_St(ButtonPairing), OR
* The automatically selected Profile number association by the EnhancedMemoryInterfaceClient, OR
* The PersIndex of the selected Driver Profile Edit button when attempting associate a NFC Key

If a memory seat button recall should occur any time after the Driver Memory Seat Button Association and the start of the NFC Key Association process, the recalled PersIndex shall not be used for the NFC Key Association.

#### ENMEM-REQ-404714/A-Detection of Wrong Device in NFC Key Association Mode

When a keyfob or phone is selected by the user in NFC Key Association process, EnhancedMemoryProfileServer shall update the status of EnMemKeyPairing\_St(KeyPairing) to WrongDeviceSelected, for 1 second, and then return to KeyPairingEntered to resume normal NFC Key Association mode operation.

#### ENMEM-HMI-REQ-234054/B-Enhanced Memory HMI Notification and Option for Wrong Device

In the Keyfob or Phone or NFC Key Association Process, the EnhancedMemoryInterfaceClient shall monitor EnMemKeyPairing\_St to provide the wrong device HMI notification to the user.

When a value of WrongDeviceSelected is detected via EnMemKeyPairing\_St(KeyPairing):

* The EnhancedMemoryInterfaceClient shall provide a notification to the user that a wrong type of device is selected
* This notification shall be triggered, not sustained, by the above signal value (See H31a\_SYNC3\_EMDriverProfile for notification duration).

### White Box View

#### Activity Diagrams

##### ENMEM-ACT-REQ-404716/B-Associate NFC Key To Driver Profile

Activity Diagram



#### Sequence Diagrams

##### ENMEM-SD-REQ-404717/B-Associate NFC Key

Constraints

Pre-Condition

IgnitionStatus\_St = Run

Vehicle transmission is in Park OR vehicle speed is less than the Driving Restriction threshold\*

\*Driving Restriction threshold is defined in DRIVE-RESv2-FUR-REQ-025157-HMI Driving Restriction

Scenarios

Normal Usage

The driver chooses to associate an NFC Key to a selected Diver Profile.

Post-Condition

The selected NFC Key is associated to the selected Driver Profile.

Sequence Diagram



## ENMEM-FUN-REQ-404718/A-Disassociate NFC Key

### Disassociate NFC Key Description

The Disassociate NFC Key function allows the user to disassociate an NFC Key from a Driver Profile in order to remove the recall functionality that is provided with the associated NFC Key.

The user has the option to disassociate an NFC Key only after a Driver Profile has been created. If a user chooses to overwrite a given NFC Key during the NFC Key Association Process, when all NFC Key slots are full, the particular associated NFC Key will be automatically disassociated at that time. An automatic disassociation will also occur for any associated NFC Key if the NFC Key is erased or revoked from the vehicle or when a Driver Profile is deleted either manually or from a Master Reset.

The Disassociate NFC Key Function is an Enhanced Memory Logic Function that will support all the functionalities mentioned above.

|  |  |  |  |
| --- | --- | --- | --- |
| Disassociate NFC Key Functional Decomposition Diagram | | | |
| HMI Menu Customer Function | Logic Function | | |
| Level1 | Level2 | Level3 |
| Delete Driver Profile | Delete Driver Profile | Disassociate NFC Key |  |
| Disassociate Phone |
| Disassociate Keyfob |
| Recall Driver Profile |
| Disable Enhanced Memory |
| Disassociate NFC Key | Disassociate NFC Key |  | |
| Master Reset | Opt-Out | Delete Driver Profile | Disassociate NFC Key |
| Disassociate Phone |
| Disassociate Keyfob |
| Recall Driver Profile |
| Disable Enhanced Memory |

Figure 17 – Disassociate NFC Key Functional Decomposition Diagram

### Use Cases

#### ENMEM-UC-REQ-404719/A-Disassociate NFC Key from a Driver Profile

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | The Ignition Status is in Run  The vehicle transmission is in Park OR Vehicle Speed is less than the Driving Restriction threshold\*  User is in the process of editing a Driver Profile |
| **Scenario Description** | The User accesses the Enhanced Memory HMI, chooses to edit a Driver Profile, and has chosen to remove an NFC Key association from that profile. |
| **Post-conditions** | The previous NFC Key association is now removed from the chosen Driver Profile.  HMI display is updated to indicate NFC Key association removal for the chosen Driver Profile |
| **List of Exception Use Cases** |  |
| **Interfaces** | Personalization Interface |
| **Notes** | Disassociating an NFC Key does not delete the profile nor erase the registration of the NFC Key from the vehicle. It only removes the link between the selected profile and the NFC Key.  \*Driving Restriction threshold is defined in DRIVE-RESv2-FUR-REQ-025157-HMI Driving Restriction |

#### ENMEM-UC-REQ-404720/A-Disassociate NFC Key from Driver Profiles after NFC Key Is Erased or Revoked from a Vehicle

|  |  |
| --- | --- |
| **Actors** | Ford Dealership Technician and Vehicle Occupant |
| **Pre-conditions** | An NFC Key is associated to Driver Profile X |
| **Scenario Description** | The associated NFC Key is erased or revoked from the vehicle  The user starts up the vehicle and selects Enhanced Memory menu |
| **Post-conditions** | Driver Profile X remain unchanged but no longer has the revoked NFC Key associated to it  HMI does not display the previous NFC Key association to any Driver Profile |
| **List of Exception Use Cases** |  |
| **Interfaces** | Personalization Interface |
| **Notes** | NFC Key association to a Driver Profile will be automatically ( without the user disassociating it) erased when the registration of that NFC Key to the vehicle is erased or revoked |

### Requirements

#### ENMEM-REQ-427474/A-Requesting the NFC Key List

Upon entering the Enhanced Memory/Personalization Edit Menu, the EnhancedMemoryInterfaceClient shall request the NFC Key List from the EnhancedMemoryNFCServer using DigitalKeyList\_Rq. The EnhancedMemoryInterfaceClient shall request the entire list by specifying NumberOfItems = 254, and StartIndex = 1.

#### ENMEM-REQ-427475/A-Display Associated NFC Key Names

The EnhancedMemoryInterfaceClient shall correlate the IndexNumber of each NFC Key received by DigitalKeyList\_Rsp to that of the received PersNFCKeyPairing\_St(PersNFCKeyXStatus), and display the FriendlyName to the user accordingly. If for some reason the FriendlyName was not populated in the response, the FESN shall be used in its place. The KeyIndex shall never be displayed to the customer.

Example:

* The EnhancedMemoryProfileServer is publishing PersNFCKeyPairing\_St(PersIndex = Pers1, PersNFCKey1Status = Index24, PersNFCKey2Status = Inactive, PersNFCKey3Status = Inactive, PersNFCKey4Status = Inactive)
* The user enters the Enhanced Memory/Personalization Edit Menu for Pers1
* The EnhancedMemoryInterfaceClient sends DigitalKeyList\_Rq(NumberOfItems = 254, StartIndex = 1) and receives DigitalKeyList\_Rsp
* The DigitalKeyList\_Rsp provides a list of NFC Keys, of which Index24 has a FriendlyName of “John’s NFC Card”
* The user enters the ‘NFC Devices’ screen under the Edit Menu and displays one associated NFC Key with the name “John’s NFC Card”

#### ENMEM-REQ-427477/A-Display Associated NFC Key Names - Index Mismatch

If the EnhancedMemoryInterfaceClient cannot correlate the IndexNumber as per REQ-427475, the EnhancedMemoryInterfaceClient shall display “NFC Device X”, where X shall equate to the Key# of ‘PersNFCKey#Status’ that is unable to be correlated.

#### ENMEM-REQ-404721/A-Disassociate NFC Key when a Driver Profile is deleted

When a user requests to delete a Driver Profile which has any NFC Keys associated to it, the EnhancedMemoryInterfaceClient shall automatically send an NFC Key disassociation request, via EnMemProfilePairing\_Rq(NFCKeyPairing) for each associated NFC Key successively, without requiring separate disassociation requests from the user.

#### ENMEM-REQ-404722/A-NFC Key Disassociation Status

The EnhancedMemoryProfileServer shall update PersNFCKeyPairing\_St for the applicable personality and key # to reflect NFC Key disassociated status after any of the following actions:

* When an NFC Key is successfully disassociated from a Driver profile
* When an NFC Key is revoked from a vehicle
* When all NFC Keys are erased from a vehicle

#### ENMEM-REQ-404723/A-Disassociate NFC Key per User Request

When a user requests to disassociate an NFC Key from a Driver Profile, the EnhancedMemoryInterfaceClient shall set EnMemProfilePairing\_Rq(NFCKeyPairing) to Disassociate Key base on the key# for the requested key for the Driver Profile per EnMemProfilePairing\_Rq(PersIndex)

#### ENMEM-REQ-404724/A-NFC Key Revoked Status

When an NFC Key is erased or revoked from the vehicle and the EnhancedMemoryProfileServer is notified, the EnhancedMemoryProfileServer shall update Driver Profile NFC Key association status to the EnhancedMemoryInterfaceClient for vehicle menu display.

### White Box View

#### Activity Diagrams

##### Disassociate NFC Key - Please refer to ENMEM-ACT-REQ-404716-Associate NFC Key to Driver Profile

##### ENMEM-ACT-REQ-434380/A-Display NFC Key Associations

Activity Diagram



#### Sequence Diagrams

##### ENMEM-SD-REQ-404725/B-Disassociate NFC Key

Constraints

Pre-Condition

IgnitionStatus\_St = Run

Vehicle transmission is in Park OR vehicle speed is less than the Driving Restriction threshold\*

\*Driving Restriction threshold is defined in DRIVE-RESv2-FUR-REQ-025157-HMI Driving Restriction

Scenarios

Normal Usage

The driver chooses to disassociate an NFC Key from a selected Driver Profile.

Post-Condition

The selected NFC Key is disassociated from the selected Driver Profile.

Sequence Diagram



##### ENMEM-SD-REQ-434386/A-Display NFC Key Associations

Constraints

Pre-Condition

IgnitionStatus\_St = Run

Vehicle transmission is in Park OR vehicle speed is less than the Driving Restriction threshold\*

\*Driving Restriction threshold is defined in DRIVE-RESv2-FUR-REQ-025157-HMI Driving Restriction

Scenarios

Normal Usage

The driver enters the NFC Key Association screen for a selected personality profile.

Post-Condition

The associated NFC keys are displayed.

Sequence Diagram



## ENMEM-FUN-REQ-204974/C-Delete Driver Profile

### Delete Driver Profile Function Description

The Delete Driver Profile function allows the user to delete a Driver Profile, one at a time. Once a Driver Profile is deleted the settings for all personalized features, the association to the Driver Memory Seat button (when equipped), and the association to the keyfob, the phone, and any NFC Keys are all permanently erased. When the active Driver Profile or Last Driver Profile is deleted, the system will automatically recall the Vehicle Profile. Master Reset also triggers the Delete Driver Profile function to delete all Driver Profiles sequentially (simultaneously to the user).

Upon receiving the user request to delete a Driver Profile or perform a Master Reset, the Delete Driver Profile Function is triggered which calls the Disassociate Keyfob Function, the Disassociate Phone Function, the Disassociate NFC Key Function, the Recall User Profile Function and the Disable Enhanced Memory Function if necessary.

|  |  |  |  |
| --- | --- | --- | --- |
| Delete Driver Profile Functional Decomposition Diagram | | | |
| HMI Menu Customer Function | Logic Function | | |
| Level1 | Level2 | Level3 |
| Delete Driver Profile | Delete Driver Profile | Disassociate Keyfob |  |
|  | Disassociate Phone |  |
|  | Disassociate NFC Key |  |
|  | Recall Driver Profile |  |
|  | Disable Enhanced Memory |  |
| Master Reset | Opt Out | Delete Driver Profile | Disassociate Keyfob |
|  | Disassociate Phone |
|  | Disassociate NFC Key |
|  | Recall Driver Profile |
|  | Disable Enhanced Memory |

Figure 18 – Delete Driver Profile Functional Decomposition Diagram

### Use Cases

#### ENMEM-UC-REQ-199848/E-Delete a Driver Profile (with EnhancedMemoryPositionClient)

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | The Ignition Status is in Run  EnhancedMemoryPositionClient is present  The vehicle transmission is in Park OR vehicle speed is less than the Driving Restriction threshold\* for manual transmission vehicles  At least one Driver Profile has been created |
| **Scenario Description** | The user accesses the Enhanced Memory HMI and chooses to delete a Driver Profile (need not to be the active Driver Profile) |
| **Post-conditions** | * The Driver Profile selected by the user now is deleted * If the active Driver Profile is deleted, Guest Profile is recalled automatically.   + Positional settings remain unchanged * If the last existing Driver Profile is deleted, Guest Profile is recalled automatically and Enhanced Memory is set to Off.   + Positional settings remain unchanged * Positional settings that were associated to the deleted Driver Profile remain associated to the Driver Memory Seat button. Pressing the disassociated Driver Memory Seat button will recall the stored positional settings * A keyfob, phone, or NFC Keys previously associated to the deleted Driver Profile are automatically disassociated   + Using the disassociated keyfob, phone, or NFC Keys will no longer trigger a recall.   + Positional settings will also not respond to keyfob or phone pressing * HMI disables Edit menu and deletes the Driver Profile Name along with keyfob, phone, and NFC Key association status for the deleted Driver Profile |
| **List of Exception Use Cases** |  |
| **Interfaces** | Personalization Interface |
| **Note** | \*Driving Restriction threshold is defined in DRIVE-RESv2-FUR-REQ-025157-HMI Driving Restriction |

#### ENMEM-UC-REQ-404253/B-Delete a Driver Profile (without EnhancedMemoryPositionClient)

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | The Ignition Status is in Run  EnhancedMemoryPositionClient is not present  The vehicle transmission is in Park OR vehicle speed is less than the Driving Restriction threshold\* for manual transmission vehicles  At least one Driver Profile has been created |
| **Scenario Description** | The user accesses the Enhanced Memory HMI and chooses to delete a Driver Profile (need not to be the active Driver Profile) |
| **Post-conditions** | * The Driver Profile selected by the user now is deleted * If the active Driver Profile is deleted, Guest Profile is recalled automatically. * If the last existing Driver Profile is deleted, Guest Profile is recalled automatically, and Enhanced Memory is set to Off. * Any keyfob, phone or NFC Keys previously associated to the deleted Driver Profile are automatically disassociated   + - Using the disassociated keyfob, phone, or NFC Keys will no longer trigger a recall. * HMI disables Edit menu and deletes the Driver Profile Name along with any keyfob, phone, and NFC Key association status for the deleted Driver Profile |
| **List of Exception Use Cases** |  |
| **Interfaces** | Personalization Interface |
| **Note** | \*Driving Restriction threshold is defined in DRIVE-RESv2-FUR-REQ-025157-HMI Driving Restriction |

### Requirements

#### ENMEM-REQ-199913/C-Disassociate Keyfob when a Driver Profile is deleted

When a user requests to delete a Driver Profile which has a keyfob associated to it, the EnhancedMemoryInterfaceClient shall automatically send a keyfob disassociation request, via EnMemProfilePairing\_Rq(KeyPairing=DisassociateKey) without requiring separate disassociation requests from the user.

#### ENMEM-REQ-232275/B-Disassociate Phone when a Driver Profile is deleted

When a user requests to delete a Driver Profile which has a phone associated to it, the EnhancedMemoryInterfaceClient shall automatically send a phone disassociation request, via EnMemProfilePairing\_Rq(KeyPairing=DisassociatePhone), without requiring separate disassociation requests from the user.

#### ENMEM-REQ-404721/A-Disassociate NFC Key when a Driver Profile is deleted

When a user requests to delete a Driver Profile which has any NFC Keys associated to it, the EnhancedMemoryInterfaceClient shall automatically send an NFC Key disassociation request, via EnMemProfilePairing\_Rq(NFCKeyPairing) for each associated NFC Key successively, without requiring separate disassociation requests from the user.

#### ENMEM-REQ-199909/A-Recall Vehicle Profile When Active or Last Driver Profile Is Deleted

The EnhancedMemoryInterfaceClient shall send an infotainment recall to recall Vehicle Profile via InfotainmentRecall\_Rq for the following cases

* + - When PersonalityOptIn\_St is updated to indicate that the currently active Driver Profile is deleted
    - When PersonalityOptIn\_St is updated to indicate that the last Driver Profile is deleted

#### ENMEM-REQ-199908/A-Driver Profile Deleted Status

When a Driver Profile is deleted, the EnhancedMemoryInterfaceClient shall update the requested Driver Profile status to NotOptedIn via PersonalityOptIn\_St

#### ENMEM-HMI-REQ-199910/A-Enhanced Memory HMI Indications for Delete a Driver Profile

When a Driver Profile is deleted, The EnhancedMemoryInterfaceClient shall remove the deleted Driver Profile indication and Edit menu entirely.

Example of before Driver Profile #1 is deleted



Example of after Driver Profile #1 is deleted:



### White Box View

#### Activity Diagrams

##### ENMEM-ACT-REQ-199917/C-Delete Driver Profile

Activity Diagram



#### Sequence Diagrams

##### ENMEM-SD-REQ-199923/C-Delete Driver Profile

Constraints

Pre-Condition

Ignition Status = Run

Infotainment System is active

Vehicle transmission is in Park OR Vehicle Speed is less than the Driving Restriction threshold\*

\*Driving Restriction threshold is defined in DRIVE-RESv2-FUR-REQ-025157-HMI Driving Restriction

Scenarios

Normal Usage

The driver chooses to delete a Driver Profile.

Post-Condition

The selected Driver Profile is deleted.

Any keyfob associated to the deleted Driver Profile are disassociated.

Any phones associated to the deleted Driver Profile are disassociated.

Any NFC Keys associated to the deleted Driver Profile are disassociated.

Sequence Diagram



## ENMEM-FUN-REQ-204933/A-Create/Edit Name

### Create/Edit Function Description

Create/Edit Name is an Enhanced Memory user function that allows the user to name a Driver Profile during the Driver Profile creation process or edit existing Driver Profiles Names.

Each Driver Profile Name has to be at least 4-chacacters long and has to be unique. The Enhanced Memory feature will check the uniqueness of the name for the user, inform the user of any duplicates, should one be entered, and allow the user to enter a different name.

The Create/Edit Name Function is an Enhanced Memory Logic Function that will support all the functionalities mentioned above. This Function can be called out when the user selects to Edit Drive Profile Name or by the Create/Add Driver Profile Function as shown in the Functional Decomposition diagram below.

|  |  |  |  |
| --- | --- | --- | --- |
| Create/Edit Name Functional Decomposition Diagram | | | |
| HMI Menu Customer Function | Logic Function | | |
| Level1 | Level2 | Level3 |
| Opt-In | Opt-In | Enable Enhanced Memory |  |
| Create/Add Driver Profile | Create/Edit Name |
| Associate Driver Memory Seat Button |
| Copy |
| Recall Driver Profile |
| Add Driver Profile | Create/Add Driver Profile | Create/Edit Name |  |
| Associate Driver Memory Seat Button |
| Copy |
| Recall Driver Profile |
| Edit Name | Create/Edit Name |  | |

Figure 19 – Create/Edit Name Functional Decomposition Diagram

The HMI flow chart below illustrates the Create/Edit Name functionalities that Enhanced Memory will perform, such as checking the uniqueness of the Driver Profile Name, informing the user of any duplicates, should one be entered, and allowing the user to enter a different name.

Please note that this flow chart only serves as a design aid and does not necessarily represent the final implementation.



Figure 20 – Enhanced Memory Create/Edit Name HMI Flow Chart

### Use Cases

#### ENMEM-UC-REQ-199840/A-Create or Edit Driver Profile Name

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | The Ignition Status is in Run  The vehicle transmission is in Park OR vehicle speed is less than the Driving Restriction threshold\* for a manual transmission  The user is in the process of creating or editing a Driver Profile |
| **Scenario Description** | The user chooses to create or edit a new Driver Profile Name, and has entered the new name for that Driver Profile |
| **Post-conditions** | The entered name has now been assigned to the new Driver Profile  or  The Driver Profile name has now been updated to the new name |
| **List of Exception Use Cases** | NMEM-UC-REQ-198925/A-Attempt to give a Driver Profile an Existing Name |
| **Interfaces** | Personalization Interface |
| **Notes** | The user must choose a name that is not identical to an existing Driver Profile name.  \*Driving Restriction threshold is defined in DRIVE-RESv2-FUR-REQ-025157-HMI Driving Restriction |

#### ENMEM-UC-REQ-199841/A-Attempt to Give a Driver Profile an Existing Name

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | The ignition status is in Run.  The vehicle transmission is in Park OR vehicle speed is less than the Driving Restriction threshold\* for a manual transmission  The user is in the process of creating or editing a Driver Profile |
| **Scenario Description** | The user enters an existing Driver Profile name |
| **Post-conditions** | * The user is informed by HMI indication that the Driver Profile entered name already exists * The user is given opportunity to retry |
| **List of Exception Use Cases** |  |
| **Interfaces** | Personalization Interface |
| **Notes** | \*Driving Restriction threshold is defined in DRIVE-RESv2-FUR-REQ-025157-HMI Driving Restriction |

### Requirements

#### ENMEM-REQ-199868/B-Do Not Enter Driver Memory Seat Button Association Mode When Editing Name

While editing a Drive Profile Name, even if a unique Driver Profile name is successfully entered, the EnhancedMemoryInterfaceClient shall not command the EnhancedMemoryPositionClient to enter Driver Memory Seat Button Association Mode.

The requirement is needed to prevent the system from entering Driver Memory Seat Button Association Mode once a Driver Profile name is successful edited. Contrary to this case, when creating a Driver Profile, once a Profile name is successful entered, the system shall enter Driver Memory Seat Button Association Mode (when EnhancedMemoryPositionClient is present). Please refer to ENMEM-REQ-199867/-Request Enter Driver Memory Seat Button Association Mode.

#### ENMEM-HMI-REQ-199861/A-Driver Profile Name Restrictions

* Enhanced Memory Driver Profile Names shall be unique.
* In the event when an existing name is entered by the user:
  + The Enhanced Memory HMI shall provide notification to the user that the name already exists
  + The Enhanced Memory HMI shall not allow the existing name be overwritten
  + The Enhanced Memory HMI shall provide the user retry opportunity until an unique name is entered before proceeding to next step
* The length of each Driver Profile name shall be at least 1 character in length, but no more than 32 characters.
* The Driver Profile Name must begin with an alphabetic character.
* The button used to enter the Driver Profile Name and continue to the next screen shall be made inactive (inoperable) until the Driver Profile Name meets the above conditions.
* The keyboard used to enter the Driver Profile Name shall stop accepting character input when the maximum character limit has been reached.

## ENMEM-FUN-REQ-199925/A-Recall Driver Profile

### Recall Function Description and Interfaces

Recall is a function that loads a requested Driver Profile as the Active Driver Profile. This provides a user with his/her own personal settings to use and edit while in the vehicle.

The Recall Function can be initiated by three different user requests and by one Enhanced Memory system request. A user recall request is sent by a Driver Memory Seat Button press, by keyfob detection (via unlock/remote start event), phone detection (via unlock/remote start event), or NFC Key detection (via NFC exterior/interior tap), and by manual HMI selection. The Enhanced Memory system request occurs when the Active or Last Driver Profile is deleted, when a Driver Profile is first created, and when the Enhanced Memory feature is turned from On to Off.

In addition to the user request, the Recall Function requires various other vehicle operation statuses in order to determine which Driver Profile to set as the Active Driver Profile. Those statuses include the Enhanced Memory feature On/Off status, the Driver Profile existing status and the Driver Memory Seat Button Association Mode status.

The Recall Function provides the Recall Event Counter and Driver Profile Index to all EnhancedMemoryServers so that each server knows which Driver Profile to recall and when.



Recall Function Data Flow Diagram

Upon receiving Recall Event Counter and Driver Profile Index, all EnhancedMemoryServers update the Active Driver Profile with the recalled Driver Profile and provide the Active Driver Profile settings for display, whereas the EnhancedMemoryPositionClient recalls positional settings.

The interfaces for all functions that support the Recall operation and the deployment mapping from functions to Classes can be summarized as below:



Recall Function Interfaces and Deployment Diagram

The Recall Function can be triggered by the user request and other Logic Functions as shown in the Diagram below

|  |  |  |  |
| --- | --- | --- | --- |
| Recall Functional Decomposition Diagram | | | |
| HMI Menu Customer Function | Logic Function | | |
| Level1 | Level2 | Level3 |
| Disable Enhanced Memory | Disable Enhanced Memory | Recall Driver Profile |  |
| Opt-In | Opt-In | Enable Enhanced Memory |  |
| Create/Add Driver Profile | Create/Edit Name |
| Associate Memory Seat Button |
| Copy |
| Recall Driver Profile |
| Add Driver Profile | Create/Add Driver Profile | Create/Edit Name |  |
| Associate Memory Seat Button |
| Copy |
| Recall Driver Profile |
| Recall Driver Profile | Recall Driver Profile |  | |
| Delete Driver Profile | Delete Driver Profile | Disassociate Keyfob |  |
| Disassociate Phone |
| Disassociate NFC Key |
| Recall Driver Profile |
| Disable Enhanced Memory |
| Master Reset | Opt-Out | Delete Driver Profile | Disassociate Keyfob |
| Disassociate Phone |
| Disassociate NFC Key |
| Recall Driver Profile |
| Disable Enhanced Memory |

Figure 21 – Recall Functional Decomposition Diagram

### Use Cases

#### ENMEM-UC-REQ-199926/B-Driver Memory Seat Button Press Recall with Enhanced Memory OFF

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | The Enhanced Memory feature is disabled (set to Off)  EnhancedMemoryPositionClient present |
| **Scenario Description** | The user presses any Driver Memory Seat button on the driver door panel |
| **Post-conditions** | The positional settings are recalled for that particular button and the user stays signed into the Guest Profile, though no Enhanced Memory user profile HMI indication is given while the Enhanced Memory feature is OFF |
| **List of Exception Use Cases** |  |
| **Interfaces** | Personalization Interface |

#### ENMEM-UC-REQ-199927/B-Driver Memory Seat Button Press Recall

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | The Enhanced Memory feature is enabled (set to ON)  EnhancedMemoryPositionClient present |
| **Scenario Description** | The User presses a Driver Memory Seat button that is associated to an alternate Driver Profile (other than the active profile.) |
| **Post-conditions** | All applicable user settings including positional settings that tied with Classic Memory are recalled for that particular button and an HMI indication is given that the user has now signed into the associated Driver Profile for that button. |
| **List of Exception Use Cases** | E1 – ENMEM-UC-REQ-199928/ - Driver Memory Seat Button Press Recall While Vehicle In Motion |
| **Interfaces** | Personalization Interface |
| **Note:** | The Guest profile would be considered an “alternate Driver Profile” for any buttons that aren’t associated to a created Driver Profile. |

#### ENMEM-UC-REQ-199928/B-Driver Memory Seat Button Press Recall While Vehicle In Motion

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | The Enhanced Memory feature is enabled (set to On)  EnhancedMemoryPositionClient present |
| **Scenario Description** | The User presses a Driver Memory Seat button on the driver door panel that is associated to an alternate Driver Profile (other than the active profile) while the vehicle is in motion (not in Park or vehicle speed is greater than the Driving Restriction threshold\* for a manual transmission) |
| **Post-conditions** | All applicable user settings, excluding positional settings that are tied to Classic Memory, are recalled for that particular button and an HMI indication is given that the user has now signed into the associated Driver Profile for that button |
| **List of Exception Use Cases** |  |
| **Interfaces** | Personalization Interface |
| **Notes** | \*Driving Restriction threshold is defined in DRIVE-RESv2-FUR-REQ-025157-HMI Driving Restriction |

#### ENMEM-UC-REQ-199929/B-Driver Memory Seat Button Recall of the Active Driver Profile

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | The vehicle transmission is in Park OR vehicle speed is less than the Driving Restriction threshold\* for a manual transmission  The Enhanced Memory feature is enabled (set to On)  EnhancedMemoryPositionClient present |
| **Scenario Description** | The User presses a Driver Memory Seat button on the driver door panel that is associated to the active Driver Profile. |
| **Post-conditions** | The last saved positional settings are recalled for the active Driver Profile. |
| **List of Exception Use Cases** |  |
| **Interfaces** | Personalization Interface |
| **Notes** | If the current positional settings are the same as the last saved positional settings, then no position change will occur.  \*Driving Restriction threshold is defined in DRIVE-RESv2-FUR-REQ-025157-HMI Driving Restriction |

#### ENMEM-UC-REQ-199958/B-Driver Memory Seat Button Store Recall with Enhanced Memory OFF

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | The Enhanced Memory feature is disabled (set to Off)  EnhancedMemoryPositionClient present |
| **Scenario Description** | The user initiates a “store position” operation via any Driver Memory Seat button press and hold |
| **Post-conditions** | The current positional settings are stored for that particular pressed Driver Memory Seat button and the user stays signed into the Guest Profile, though no HMI indication is given while the Enhanced Memory feature is OFF |
| **List of Exception Use Cases** |  |
| **Interfaces** | Personalization Interface |

#### ENMEM-UC-REQ-199959/B-Driver Memory Seat Button Store Recall of an Alternate Associated Profile

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | The Enhanced Memory feature is enabled (set to On)  EnhancedMemoryPositionClient present |
| **Scenario Description** | The User initiates a “store position” operation via a Driver Memory Seat button that is associated to an alternate Driver Profile (other than the active Driver Profile.) |
| **Post-conditions** | The current positional settings are stored to the alternate Driver Profile, an HMI indication is given that the user has now signed into the alternate Driver Profile, and all applicable user settings are recalled for that new Driver Profile. |
| **List of Exception Use Cases** |  |
| **Interfaces** | Personalization Interface |
| **Note:** | The Guest profile would be considered an “alternate Driver Profile” for any Driver Memory Seat buttons that aren’t associated to a created Driver Profile.(ENMEM-UC-REQ-199961-Driver Memory Seat Button Store Recall of Unassociated Button) |

#### ENMEM-UC-REQ-199960/B-Driver Memory Seat Button Store Recall of the Active Driver Profile

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | The Enhanced Memory feature is enabled (set to On)  EnhancedMemoryPositionClient present |
| **Scenario Description** | The user initiates a “store position” operation via a Driver Memory Seat button  that is associated to the active Driver Profile. |
| **Post-conditions** | The current positional settings are stored to the active Driver Profile. |
| **List of Exception Use Cases** |  |
| **Interfaces** | Personalization Interface |

#### ENMEM-UC-REQ-199961/B-Driver Memory Seat Button Store Recall of Unassociated Button

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | The Enhanced Memory feature is enabled (set to On)  EnhancedMemoryPositionClient present |
| **Scenario Description** | The user initiates a “store position” operation via a Driver Memory Seat button that has not been associated to any Driver Profile |
| **Post-conditions** | The current positional settings are stored to the unassociated Driver Memory Seat button.  The Guest Profile will be recalled |
| **List of Exception Use Cases** |  |
| **Interfaces** | Personalization Interface |
| **Note:** | The Guest profile would be considered an “alternate Driver Profile” for any Driver Memory Seat buttons that aren’t associated to a created Driver Profile. |

#### ENMEM-UC-REQ-199930/B-HMI Menu Recall

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | The Enhanced Memory feature is enabled (set to On) |
| **Scenario Description** | The User accesses the Enhanced Memory HMI menu and chooses to recall  (sign in to) a Driver Profile. |
| **Post-conditions** | All applicable user settings are recalled for the chosen Driver Profile and an  HMI indication is given that the user has now signed into that Driver Profile. |
| **List of Exception Use Cases** |  |
| **Interfaces** | Personalization Interface |
| **Note** | Positional settings will only be recalled if vehicle is in “Park” OR vehicle  speed is less than the Driving Restriction threshold as defined by DRIVE-  RESv2-FUR-REQ-025157-HMI Driving Restriction and when EnhancedMemoryPositionClient is present |

#### ENMEM-UC-REQ-199931/A-Keyfob Detection Recall

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | The Enhanced Memory feature is enabled (set to On)  The User has chosen to associate their keyfob to their Driver Profile. |
| **Scenario Description** | The User’s keyfob is detected and the associated Driver Profile is signed in automatically. |
| **Post-conditions** | All applicable user settings are recalled for the chosen Driver Profile and an HMI indication is given that the user has now signed into that Driver Profile. |
| **List of Exception Use Cases** |  |
| **Interfaces** | Personalization Interface |
| **Notes** | - Keyfob detection may be the result of an unlock or remote start button press from an associated keyfob (IKT or IA Key) or the result of a PEPS unlock event from an associated passive key. (i.e. Driver door handle unlock with a passive IA key present.) |

#### ENMEM-UC-REQ-199932/A-Keyfob Recall While Vehicle In Motion

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | The Enhanced Memory feature is enabled (set to On) |
| **Scenario Description** | The User presses a keyfob unlock button that is associated to an alternate Driver Profile (other than the active profile) while the vehicle is in motion (not in Park or vehicle speed is greater than 8 KPH). |
| **Post-conditions** | No new Drive Profile is recalled |
| **List of Exception Use Cases** |  |
| **Interfaces** | Personalization Interface |

#### ENMEM-UC-REQ-199933/B-Keyfob Recall with Enhanced Memory OFF

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | The User’s keyfob is associated to a Driver Profile  The Enhanced Memory feature is disabled (set to Off).  Vehicle is in PARK or less than 8 kph  EnhancedMemoryPositionClient present |
| **Scenario Description** | The User’s keyfob is detected. |
| **Post-conditions** | All Classic Memory positional settings are recalled for the associated memory position number and no Driver Profile recall occurs (i.e. Guest profile remains active.) |
| **List of Exception Use Cases** |  |
| **Interfaces** | Personalization Interface |
| **Notes** | - Keyfob detection may be the result of a unlock button press from an associated keyfob (IKT or IA Key) or the result of a PEPS unlock event from an associated passive key. (i.e. Driver door handle unlock with a passive IA key present.)  - No HMI indication is given that the user has signed into the Guest Profile while the Driver Profiles feature is set to OFF. |

#### ENMEM-UC-REQ-232343/A-Phone Detection Recall

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | The Enhanced Memory feature is enabled (set to On)  The User has already associated their phone to a Driver Profile. |
| **Scenario Description** | The User’s phone is detected in a remote start event or in an unlock even. |
| **Post-conditions** | * The associated Driver Profile is recalled in automatically. * All applicable user settings are recalled for the chosen Driver Profile and an HMI indication is given that the user has now recalled that Driver Profile. |
| **List of Exception Use Cases** |  |
| **Interfaces** | Personalization Interface |
| **Notes** |  |

#### ENMEM-UC-REQ-232344/A-Phone Recall While Vehicle In Motion

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | The Enhanced Memory feature is enabled (set to On) |
| **Scenario Description** | The User presses a phone unlock button that is associated to an alternate Driver Profile (other than the active profile) while the vehicle is in motion (not in Park or vehicle speed is greater than 8 KPH). |
| **Post-conditions** | No new Drive Profile is recalled |
| **List of Exception Use Cases** |  |
| **Interfaces** | Personalization Interface |

#### ENMEM-UC-REQ-232345/B-Phone Recall with Enhanced Memory OFF

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | The User’s phone is associated to a Driver Profile  The Enhanced Memory feature is disabled (set to Off).  Vehicle is in PARK or less than 8 kph  EnhancedMemoryPositionClient present |
| **Scenario Description** | The User’s phone is detected in a remote start event or an unlock event. |
| **Post-conditions** | All Classic Memory positional settings are recalled for the associated memory position number and no Driver Profile recall occurs (i.e. Guest profile remains active.) |
| **List of Exception Use Cases** |  |
| **Interfaces** | Personalization Interface |
| **Notes** | No HMI indication is given that the user has signed into the Guest Profile while the Driver Profiles feature is set to OFF. |

#### ENMEM-UC-REQ-434195/A-NFC Key Recall via Exterior Reader with No Passive Key Present

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | The Enhanced Memory feature is enabled (set to On)  The User has already associated their NFC Key to a Driver Profile.  No Passive Key is present |
| **Scenario Description** | The User’s NFC Key is detected by the vehicle exterior NFC reader. |
| **Post-conditions** | * The associated Driver Profile is recalled automatically. * All applicable user settings are recalled for the chosen Driver Profile and an HMI indication is given that the user has now recalled that Driver Profile. |
| **List of Exception Use Cases** |  |
| **Interfaces** | Personalization Interface |

#### ENMEM-UC-REQ-434419/A-NFC Key Recall via Exterior Reader - No PK with Enhanced Memory Off

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | The Enhanced Memory feature is disabled (set to Off)  The User has already associated their NFC Key to a Driver Profile.  No Passive Key is present  Vehicle is in PARK or less than 8 kph  EnhancedMemoryPositionClient present |
| **Scenario Description** | The User’s NFC Key is detected by the vehicle exterior NFC reader. |
| **Post-conditions** | All Classic Memory positional settings are recalled for the associated memory position number and no Driver Profile recall occurs (i.e. Guest profile remains active.) |
| **List of Exception Use Cases** |  |
| **Interfaces** | Personalization Interface |

#### ENMEM-UC-REQ-434216/A-NFC Key Recall via Exterior Reader with Passive Key Present

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | The Enhanced Memory feature is enabled (set to On)  The User has already associated their NFC Key to a Driver Profile.  A Passive Key is present |
| **Scenario Description** | The User’s NFC Key is detected by the vehicle exterior NFC reader. |
| **Post-conditions** | * The associated Driver Profile is recalled automatically. * Passive key is ignored and does not trigger recall * All applicable user settings are recalled for the chosen Driver Profile and an HMI indication is given that the user has now recalled that Driver Profile. |
| **List of Exception Use Cases** |  |
| **Interfaces** | Personalization Interface |

#### ENMEM-UC-REQ-434424/A-NFC Key Recall via Exterior Reader - PK with Enhanced Memory Off

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | The Enhanced Memory feature is disabled (set to Off)  The User has already associated their NFC Key to a Driver Profile.  A Passive Key is present  Vehicle is in PARK or less than 8 kph  EnhancedMemoryPositionClient present |
| **Scenario Description** | The User’s NFC Key is detected by the vehicle exterior NFC reader. |
| **Post-conditions** | All Classic Memory positional settings are recalled for the associated memory position number and no Driver Profile recall occurs (i.e. Guest profile remains active.) |
| **List of Exception Use Cases** |  |
| **Interfaces** | Personalization Interface |

#### ENMEM-UC-REQ-434218/A-NFC Key Recall via Interior Reader

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | The Enhanced Memory feature is enabled (set to On)  The User has already associated their NFC Key to a Driver Profile. |
| **Scenario Description** | The User’s NFC Key is detected by any vehicle interior NFC reader |
| **Post-conditions** | * The associated Driver Profile is recalled automatically. * All applicable user settings are recalled for the chosen Driver Profile and an HMI indication is given that the user has now recalled that Driver Profile. |
| **List of Exception Use Cases** |  |
| **Interfaces** | Personalization Interface |

#### ENMEM-UC-REQ-434425/A-NFC Key Recall via Interior Reader - Enhanced Memory Off

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | The Enhanced Memory feature is disabled (set to Off)  The User has already associated their NFC Key to a Driver Profile.  Vehicle is in PARK or less than 8 kph  EnhancedMemoryPositionClient present |
| **Scenario Description** | The User’s NFC Key is detected by any vehicle interior NFC reader |
| **Post-conditions** | All Classic Memory positional settings are recalled for the associated memory position number and no Driver Profile recall occurs (i.e. Guest profile remains active.) |
| **List of Exception Use Cases** |  |
| **Interfaces** | Personalization Interface |

#### ENMEM-UC-REQ-434220/A-NFC Key Recall While Vehicle In Motion

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | The Enhanced Memory feature is enabled (set to On) |
| **Scenario Description** | The User’s NFC Key is detected by any vehicle NFC reader that is associated to an alternate Driver Profile (other than the active profile) while the vehicle is in motion (not in Park or vehicle speed is greater than 8 KPH). |
| **Post-conditions** | No new Drive Profile is recalled |
| **List of Exception Use Cases** |  |
| **Interfaces** | Personalization Interface |

#### ENMEM-UC-REQ-226667/C-No Recalls during a Crash Event

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | * The Enhanced Memory feature is enabled (set to On) * Emergency Assistance feature is activated by a crash event * Emergency Assistance feature is trying to make an Emergency Assistance call using connected phone device or connected CarPlay device |
| **Scenario Description** | The user attempts to recall a Driver Profile by any method |
| **Post-conditions** | The vehicle will continue executing Emergency Assistance feature and ignore the Driver Profile recall request |
| **List of Exception Use Cases** |  |
| **Interfaces** | Personalization Interface |
| **Notes** |  |

#### ENMEM-UC-REQ-199934/B-Recall Last Known Driver Profile With Keypad Code and no Keyfob nor Phone

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | * The Enhanced Memory feature is enabled (set to On) * The Vehicle ignition is OFF * The user approaches the vehicle with NO keyfob nor phone |
| **Scenario Description** | The User uses the Vehicle Keypad to unlock the door then opens the door and finally starts the engine |
| **Post-conditions** | The last known Driver Profile is recalled |
| **Interfaces** | Personalization Interface |
| **Note** | * Because there is no keyfob and no Phone with the user, opening the door by via door handle will not change profiles for vehicles with or without Smart Door Handle * Starting the engine is not a method of recall profile * Keypad code entry not a method of recall profile |

#### ENMEM-UC-REQ-199935/B-Recall Driver Profile With Keypad Code and IA Key or Phone

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | * The Enhanced Memory feature is enabled (set to On) * The Vehicle ignition is OFF * The Vehicle is equipped with Smart Door Handle * The user approaches the vehicle with an IA Key or phone |
| **Scenario Description** | The user uses the Vehicle Keypad to unlock the door then opens the door and finally starts the engine |
| **Post-conditions** | * The last known Driver Profile is recalled if the IA Key or phone is not associated to any Driver Profile * The Driver Profile associated to the IA Key or phone with the user will be recalled, if the IA Key or phone is associated to a Driver Profile (it could be the last know Driver Profile or any other Driver Profile). |
| **Interfaces** | Personalization Interface |
| **Note** | Because the vehicle is equipped with Smart Door Handle and the IA Key or phone is with the user, opening the door via door handle will trigger passive unlock search. Depending on the keyfob or phone association status, passive unlock search may or may not recall a Driver Profile different than the last known Driver Profile. |

#### ENMEM-UC-REQ-199936/B-MyKey Keyfob Overrides Driver Profile Setting

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | * The Enhanced Memory feature is enabled (set to On) * Driver Profile X has speed compensated volume set to HIGH * Driver Profile Y has speed compensated volume set to Low * Keyfob A is associated with Driver Profile X and is programmed as a MyKey * Volume Limiter is set to ON for MyKey |
| **Scenario Description** | Vehicle is started up with Keyfob A |
| **Post-conditions** | * Speed Compensated Volume is overridden from HIGH to disabled due to MyKey restriction if the active Driver Profile is X * Speed Compensated Volume is overridden from LOW to disabled due to MyKey restriction if the active Driver Profile is Y |
| **List of Exception Use Cases** |  |
| **Interfaces** | G-HMI  Vehicle System Interface |
| **Note** | No matter which profile is recalled to be the active Driver Profile, as long as a MyKey is in the ignition (recognized by vehicle to start engine), MyKey restrictions shall apply |

#### ENMEM-UC-REQ-232346/A-MyKey Phone Overrides Driver Profile Setting

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | * The Enhanced Memory feature is enabled (set to On) * Driver Profile X has speed compensated volume set to HIGH * Driver Profile Y has speed compensated volume set to Low * Phone A is associated with Driver Profile X and is programmed as a MyKey * Volume Limiter is set to ON for MyKey |
| **Scenario Description** | Vehicle is started up with Phone A |
| **Post-conditions** | * Speed Compensated Volume is overridden from HIGH to disabled due to MyKey restriction if the active Driver Profile is X * Speed Compensated Volume is overridden from LOW to disabled due to MyKey restriction if the active Driver Profile is Y |
| **List of Exception Use Cases** |  |
| **Interfaces** | G-HMI  Vehicle System Interface |
| **Note** | No matter which profile is recalled to be the active Driver Profile, as long as a MyKey phone is recognized by vehicle to start engine, MyKey restrictions shall apply |

#### ENMEM-UC-REQ-199937/B-Admin Keyfob Does Not Restrict Driver Profile Associated to MyKey

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | * The Enhanced Memory feature is enabled (set to On) * Driver Profile X has speed compensated volume set to HIGH * Keyfob A is associated with Driver Profile X and is programmed as a MyKey * Volume Limiter is set to ON for MyKey |
| **Scenario Description** | * Vehicle is started up with Keyfob B, an Admin Key (a non-MyKey Keyfob) * The driver recalls Driver Profile X after engine started |
| **Post-conditions** | Speed Compensated Volume from Driver Profile X is not overridden and remains HIGH |
| **List of Exception Use Cases** |  |
| **Interfaces** | G-HMI  Vehicle System Interface |
| **Note** | No matter which profile is recalled to be the active Driver Profile (even if associated to a MyKey Keyfob or a MyKey Phone), as long as an Admin Key (non-MyKey keyfob) is in the ignition (recognized by vehicle to start engine), MyKey restrictions shall NOT apply |

#### ENMEM-UC-REQ-232347/A-Admin Phone Does Not Restrict Driver Profile Associated to MyKey

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | * The Enhanced Memory feature is enabled (set to On) * Driver Profile X has speed compensated volume set to HIGH * Phone A is associated with Driver Profile X and is programmed as a MyKey phone * Volume Limiter is set to ON for MyKey |
| **Scenario Description** | * Vehicle is started up with Phone B, an Admin Phone (a non-MyKey Phone) * The driver recalls Driver Profile X after engine started |
| **Post-conditions** | Speed Compensated Volume from Driver Profile X is not overridden and remains HIGH |
| **List of Exception Use Cases** |  |
| **Interfaces** | G-HMI  Vehicle System Interface |
| **Note** | No matter which profile is recalled to be the active Driver Profile (even if associated to a MyKey keyfob or MyKey Phone), as long as an Admin Phone (non-MyKey Phone) is recognized by vehicle to start engine, MyKey restrictions shall NOTapply |

### Requirements

#### ENMEM-REQ-199944/A-Driver Profile Recall Event Counter

A Driver Profile recall event is denoted by the increment of PersonalityRecallCount\_St. The purpose of the counter is to indicate when a recall event has occurred and the active Driver Profile needs to be updated. The newly recalled Driver Profile may or may not be different than the previous active Driver Profile in terms of name of the Driver Profile and actual settings of Driver Profile. The recall event includes momentary pressing of a Driver Memory Seat button, door unlock events, remote start event, user menu request and Enhanced Memory system recall. Definitions and requirements for Driver Memory Seat button press recall, door unlock recall and Remote start shall follow the design and requirements of Classic Memory.

* The EnhancedMemoryProfileServer shall increment the recall counter PersonalityRecallCount\_St each time a recall event occurs. Definitions and requirements for Driver Memory Seat button press recall and door unlock recall shall follow the design and requirements of Classic Memory.
* In the error case where the ActivePersonality\_St method changes values without a corresponding increment to the PersonalityRecallCount\_St method, EnhancedMemoryServers shall still update the active Driver Profile based on the change of ActivePersonality\_St.

#### Keyfob Detection Recall

To recall a Driver Profile triggered by unlock or remote start event, the EnhancedMemoryProfileServer shall recall a Driver Profile based on the Enhanced Memory feature On/Off status, vehicle crash event status, the Keyfob Association status and Driver Memory Seat button Association status as defined in the table below:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Fob Recall REQ | Input | | | | | Output | | |
| Trigger Action | Seat Button Association Mode (EnMemButtonPairing\_St) | Vehicle in Crashed Mode | Enhanced Memory  Feature (EnhancedMemory\_St) | Keyfob X Association Status (PersKeyPairing\_St) | Recalled Profile | | Driver Profile Recall Event Counter Increment (PersonalityRecallCount\_St) |
| Positional Settings (MemoryPosition\_St) | Non-positional Settings (ActivePersonality\_St) |
| ENMEM-REQ-199583/B | Unlock/Remote Start Event via Keyfob X | Not in Association Mode | No | On | Associated to X | Driver Profile X | Driver Profile X | Yes |
| ENMEM-REQ-199584/B | Not in Association Mode | No | Off | Associated to X | Driver Profile X | Vehicle Profile | Yes |
| ENMEM-REQ-199585/B | Don't Care | No | Don't Care | Not Associated to X | No changed (Last known Profile) | No changed (Last known Profile) | No |
| ENMEM-REQ-199586/B | In Association Mode | Don't Care | Don't Care | Don't Care | No changed (Last known Profile) | No changed (Last known Profile) | No |
| ENMEM-REQ-227351/A | Don't Care | Yes | Don't Care | Don't Care | No changed (Last known Profile) | No changed (Last known Profile) | No |

Table 22 – Keyfob Detection Recall Requirements

#### Phone Detection Recall

To recall a Driver Profile triggered by unlock or remote start event via a phone, the EnhancedMemoryProfileServer shall recall a Driver Profile based on the Enhanced Memory feature On/Off status, vehicle crash event status, the phone Association status and Driver Memory Seat button Association status as defined in the table below:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Phone Recall REQ | Input | | | | | Output | | |
| Trigger Action | Seat Button Association Mode (EnMemButtonPairing\_St) | Vehicle in Crashed Mode | Enhanced Memory  Feature (EnhancedMemory\_St) | Phone X Association Status (PersPhonePairing\_St) | Recalled Profile | | Driver Profile Recall Event Counter Increment (PersonalityRecallCount\_St) |
| Positional Settings (MemoryPosition\_St) | Non-positional Settings (ActivePersonality\_St) |
| ENMEM-REQ-232352/A | Unlock/Remote Start Event via Phone X | Not in Association Mode | No | On | Associated to X | Driver Profile X | Driver Profile X | Yes |
| ENMEM-REQ-232354/A | Not in Association Mode | No | Off | Associated to X | Driver Profile X | Vehicle Profile | Yes |
| ENMEM-REQ-232355/A | Don't Care | No | Don't Care | Not Associated to X | No changed (Last known Profile) | No changed (Last known Profile) | No |
| ENMEM-REQ-232356/A | In Association Mode | Don't Care | Don't Care | Don't Care | No changed (Last known Profile) | No changed (Last known Profile) | No |
| ENMEM-REQ-232357/A | Don't Care | Yes | Don't Care | Don't Care | No changed (Last known Profile) | No changed (Last known Profile) | No |

Table 23 – Phone Detection Recall Requirements

#### NFC Key Detection Recall

To recall a Driver Profile triggered by interior or exterior reader tap event via NFC Key, the EnhancedMemoryProfileServer shall recall a Driver Profile based on the Enhanced Memory feature On/Off status, vehicle crash event status, the NFC Key Association status, NFC MyKey creation status and Driver Memory Seat button Association status as defined in the table below:

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| NFC Key Recall REQ |  | | Input | | | | | Output | | |
| Trigger Action | NFC MyKey Creation | | Seat Button Association Mode (EnMemButtonPairing\_St) | Vehicle in Crashed Mode | Enhanced Memory  Feature (EnhancedMemory\_St) | NFC Key X Association Status (PersNFCKeyPairing\_St) | Recalled Profile | | Driver Profile Recall Event Counter Increment (PersonalityRecallCount\_St) |
| Positional Settings (MemoryPosition\_St) | Non-positional Settings (ActivePersonality\_St) |
| ENMEM-REQ-434473/A | NFC Reader Tap Event via NFC Key X | Not in MyKey Creation | | Not in Association Mode | No | On | Associated to X | Driver Profile X | Driver Profile X | Yes |
| ENMEM-REQ-434474/A | Not in MyKey Creation | | Not in Association Mode | No | Off | Associated to X | Driver Profile X | Vehicle Profile | Yes |
| ENMEM-REQ-434475/A | Don't Care | | Don't Care | Don't Care | Don't Care | Not Associated to X | No change (Last known Profile) | No change (Last known Profile) | No |
| ENMEM-REQ-434476/A | Don't Care | | In Association Mode | Don't Care | Don't Care | Don't Care | No change (Last known Profile) | No change (Last known Profile) | No |
| ENMEM-REQ-434477/A | In MyKey Creation | | Don't Care | Don't Care | Don't Care | Don't Care | No change (Last known Profile) | No change (Last known Profile) | No |
| ENMEM-REQ-434478/A | Don't Care | | Don't Care | Yes | Don't Care | Don't Care | No change (Last known Profile) | No change (Last known Profile) | No |

Table 24 – NFC Key Detection Recall Requirements

#### Driver Memory Seat Button Press Recall

To recall a Driver Profile triggered by Driver Memory Seat button press, the EnhancedMemoryProfileServer shall recall a Driver Profile based on the Enhanced Memory feature On/Off status, the Driver Memory Seat button Association status, vehicle crash event status and the Driver Profile existing status as defined in the table below. Please note that when a Driver Memory Seat button is never associated to positional settings, pressing that button will not recall any personalized settings. In the case of Driver Profile X\*, a Driver Profile with personalized settings will be recalled whereas in the case of Driver Profile X\*\*, the user will not see any positional settings change after recall as that Driver Memory Seat button is not associated to any positional settings.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Seat Button Recall REQ | Input | | | | | Output | | | Note | |
| Trigger Action | Seat Button Association Mode (EnMemButtonPairing\_St) | Vehicle in Crashed Mode | Enhanced Memory  Feature (EnhancedMemory\_St) | Driver Profile Created (Opted-in) Status | Recalled Profile | | Driver Profile Recall Event Counter Increment (PersonalityRecallCount\_St) | Seat Button X Associated to Poistional Settings | Use Case |
| Positional Settings (MemoryPosition\_St) | Non-positional Settings (ActivePersonality\_St) |
| ENMEM-REQ-199591/B | Memory Seat Button X is Pressed | Not in Association Mode | No | On | Opted-in | Driver Profile X | Driver Profile X | Yes | Yes | A happy path case |
| ENMEM-REQ-199592/B | Not in Association Mode | No | On | Opted-out | Driver Profile X\* | Vehicle Profile | Yes | Yes | Profile X was created then deleted. Classic Memory still woks |
| Driver Profile X\*\* | No | Seat button X is never associated to any positional settings nor any Driver Profile |
| ENMEM-REQ-199593/B | Not in Association Mode | No | Off | Opted-in | Driver Profile X | Vehicle Profile | Yes | Yes |  |
| ENMEM-REQ-199594/B | Not in Association Mode | No | Off | Opted-out | Driver Profile X\* | Vehicle Profile | Yes | Yes | Profile X was created then deleted |
| Driver Profile X\*\* | No | Seat button X is never associated to any positional settings nor any Driver Profile |
| ENMEM-REQ-199595/B | In Association Mode | Don't Care | Don't Care | Don't Care | No changed (Last known Profile) | No changed (Last known Profile) | No | Don't Care |  |
| ENMEM-REQ-227352/A | Don't Care | Yes | Don't Care | Don't Care | No changed (Last known Profile) | No changed (Last known Profile) | No | Don't Care |  |

Table 25 – Driver Memory Seat Button Press Recall Requirements

#### ENMEM-REQ-199962/A-Driver Memory Seat Button Store Recall

After detecting a Driver Memory Seat button press and hold store event,

EnhancedMemoryPositionClient shall wait T\_PersStore before sending the recall request via MemSwitchRecall\_Rq to the EnhancedMemoryProfileServer

#### ENMEM-TMR-REQ-199963/A-T\_PersStore

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | **Description** | **Units** | **Range** | **Resolution** | **Default** |
| T\_PersStore | Minimum time the EnhancedMemoryPositionClient should wait before sending a recall request to the EnhancedMemoryProfileServer. | msec | 150-350 | 5 | 250 |

#### ENMEM-REQ-199945/B-Menu Recall

When receiving a Driver Profile recall request via the InfotainmentRecall\_Rq method, the EnhancedMemoryProfileServer shall recall a Driver Profile based on the Enhanced Memory feature On/Off status, the Driver Memory Seat button Association status, vehicle crash event status and Driver Profile existing status as defined in the table below.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Input | | | | | Output | | |
| Trigger Action | Seat Button Association Mode (EnMemButtonPairing\_St) | Enhanced Memory  Feature (EnhancedMemory\_St) | Vehicle in Crashed Mode | Driver Profile Created (Opted-in) Status | Recalled Profile | | Driver Profile Recall Event Counter Increment (PersonalityRecallCount\_St) |
| Positional Settings (MemoryPosition\_St) | Non-positional Settings (ActivePersonality\_St) |
| InfotainmentRecall\_Rq=X | Not in Association Mode | On | No | Opted-in | Driver Profile X | Driver Profile X | Yes |
| Don't Care | On | Yes | Opted-in | No changed (Last known Profile) | No changed (Last known Profile) | No |

With the Enhanced Memory menu restriction, Menu Recall can only be accessed to existing Driver Profiles when the Enhanced Memory feature is On and not in Driver Memory Seat Button Association Mode. In the error cases where any one of three restrictions is violated, the EnhancedMemoryProfileServer shall responds to the error cases by complying with ENMEM-REQ-199593, ENMEM-REQ-199594, or ENMEM-REQ-199595.

#### ENMEM-REQ-202233/A-Recall Performance Requirement

After receiving a recall request, EnhancedMemoryProfileServer shall update the PersonalityRecallCounter\_St and ActivePersonality\_St within a defined period of time, T\_PersUpdate.

#### ENMEM-TMR-REQ-199943/A-T\_PersUpdate

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | **Description** | **Units** | **Range** | **Resolution** | **Default** |
| T\_PersUpdate | Maximum time the EnhancedMemoryProfileServer shall take to update the PersonalityRecallCounter\_St and ActivePersonality\_St on the vehicle system interface, after receiving a recall request. | msec | 50-150 | 5 | 100 |

#### ENMEM-REQ-199946/C-Recall Priority

The EnhancedMemoryProfileServer shall prioritize the recall requests in the following descending order:

* Menu Recall
* NFC Key Interior Tap
* NFC Key Exterior Tap
* Unlock Event by phone and keyfob
* Remote Start Event by phone and keyfob
* Driver Memory Seat button Press

#### Network StartUp Recall Strategies

##### ENMEM-REQ-199938/B-Last Known Driver Profile Applied at Network Startup with No Recall

Upon network wakeup, if no recall event is detected, the last known Driver Profile shall be set as the active Drive Profile via ActivePersonality\_St and the PersonalityRecallCount\_St shall NOT be incremented.

##### ENMEM-REQ-202304/B-Network Startup Recall Timing Performance Requirement

The EnhancedMemoryProfileServer shall update the ActivePersonality\_St within a defined time, T\_PrflSrvrUpdateStartUp, of network bus wake-up.

##### ENMEM-TMR-REQ-203821/A-T\_PrflSrvrUpdateStartUp

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | **Description** | **Units** | **Range** | **Resolution** | **Default** |
| T\_PrflSrvrUpdateStartUp | Maximum time from network bus wake-up that the EnhancedMemoryProfileServer shall take to update ActivePersonality\_St, and the EnhancedMemoryInterfaceClient shall take to update EnhancedMemory\_St and PersonalityOptIn\_St.  Note: Use the default value | msec | 400-600 | 50 | 500 |

##### ENMEM-SR-REQ-199823/B-Network Startup Recall Assumptions when Status Unknown

If the ActivePersonality\_St signal is published on the network bus before the value of the signal is known then the ActivePersonality\_St signal shall be set to NotDetermined by the EnhancedMemoryProfileServer at network bus start-up.

In addition, to determine which Driver Profile to be recalled, the status of EnhancedMemory\_St and PersonalityOptIn\_St are needed. The following assumptions shall apply to startup period for Driver Profile Recall:

Within the first defined period, T\_PrflSrvrUpdateStartUp, of network bus wakeup,

* If the EnhancedMemoryProfileServer receives EnhancedMemory\_St =Null then the EnhancedMemoryProfileServer shall assume the last known state. For example, if Enhanced Memory was last ON before network shutdown then assume EnhancedMemory\_St is still ON
* If the EnhancedMemoryProfileServer has not received PersonalityOptIn\_St, then the EnhancedMemoryProfileServer shall assume the last known state. For example, if all Driver Profiles were opted-in before network shutdown then assume they are still opted-in
* If the value of ActivePersonality\_St is not known because of an NVM type error (i.e. application powered up and still doesn’t know), then the EnhancedMemoryProfileServer shall update the ActivePersonality\_St signal with the default value of Vehicle. This could possibly occur for example if the EEPROM was corrupted

##### ENMEM-SR-REQ-206293/B-Network Startup Recall Assumptions when Status NotDetermined

The EnhancedMemoryServers shall treat ActivePersonality\_St = NotDetermined as a “don’t care” and shall recall the last known Driver Profile.

##### ENMEM-SR-REQ-199824/B-Network Startup Status Transmitting Requirement

* If the EnhancedMemory\_St signal is published on the network bus before the last known state can be published then the EnhancedMemory\_St signal shall be set to Null at network bus start-up
* The PersonalityOptIn\_St signals shall not be published on the bus until the last known state is published and shall not publish its CAN initial value at CAN bus startup.

Note: This requirement is to prevent the Driver Profile from flicking. PersonalityOptIn\_St has no “Null” value to be published, therefore the publishing has to be held up until last know status is available.

##### ENMEM-REQ-203736/B-Resend Data at Network Startup

The EnhancedMemoryProfileServer and EnhancedMemoryInterfaceClient can be on different network buses such that one bus is asleep while the other is awake (ex. Infotainment System ON while Ignition\_Status = OFF). In order for request signals / updated status signals not to be missed (first change in the signal encoding value wakes up the other bus) the following shall be supported:

* When using the request signal “InfotainmentRecall\_Rq = a new Personality” the EnhancedMemoryInterfaceClient shall send the request and re-send the same request after a defined period of time, T\_StartupResendData, without setting to Null between those two requests (the EnhancedMemoryProfileServer will act on the second request if its bus was asleep when the first request was sent).
* When the status signal EnhancedMemory\_St has an encoding value change (ex. ProfilesOn changes to ProfilesOff) the EnhancedMemoryInterfaceClient shall send the updated signal and re-send the same signal a defined period, T\_PrflSrvrUpdateStartUp, later (the EnhancedMemoryProfileServer will act on the second signal if its bus was asleep when the first updated signal was sent).

Note: PersonalityOptIn\_St can only be changed when Ignition Status = Run. In Run all the network buses are awake and therefore do not need to re-send the signal.

##### ENMEM-TMR-REQ-206538/A-T\_StartupResendData

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | **Description** | **Units** | **Range** | **Resolution** | **Default** |
| T\_StartupResendData | Nominal time the EnhancedMemoryInterfaceClient shall wait before resending InfotainmentRecall\_Rq or EnhancedMemory\_St.  Note: Use the default value | msec | 400-600 | 50 | 500 |

##### ENMEM-REQ-203735/B-Network Startup Transmitting Timing Performance Requirement

The EnhancedMemoryInterfaceClient shall update the EnhancedMemory\_St and PersonalityOptIn\_St signals with the last known state within the first defined period, T\_PrflSrvrUpdateStartUp of network bus wake-up.

##### ENMEM-REQ-202305/B-Network Startup Receiving Timing Performance Requirement

The EnhancedMemoryProfileServer shall be able to receive Enhanced Memory request signals such as InfotainmentRecall\_Rq or EnhancedMemory\_St within a defined period, T\_PrflSrvrRqStartUp, of network bus wake-up. If the application software is not completely powered up after a defined period of time, T\_PrflSrvrRqStartUp, those signals shall be stored and processed later by the EnhancedMemoryProfileServer.

This requirement is need in order to support ENMEM-REQ-202304/- Startup Recall Timing Performance Requirement. In addition, this requirement is also needed to prevent request signals from being lost when EnhancedMemoryInterfaceClient is awake whereas the EnhancedMemoryProfileServer is not awake. The use case for this scenario could be when EnhancedMemoryInterfaceClient is awake in delayed accessory mode or power extended mode (ignition is off) but EnhancedMemoryProfileServer is not awake.

##### ENMEM-TMR-REQ-203854/A-T\_PrflSrvrRqStartUp

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | **Description** | **Units** | **Range** | **Resolution** | **Default** |
| T\_PrflSrvrRqStartUp | Nominal time from network bus wake-up that the EnhancedMemoryProfileServer shall be able to receive Enhanced Memory request signals (i.e. InfotainmentRecall\_Rq, InfotainmentPersStore\_Rq).  Note: Use the default value | msec | 100-300 | 50 | 200 |

#### ENMEM-REQ-199939/A-Recall Settings for Active Driver Profile

A Driver Profile recall event is signaled when the PersonalityRecallCount\_St method is incremented.

When detecting an increment of PersonalityRecallCount\_St, EnhancedMemoryServers shall recall all settings for the active Driver Profile bases on ActivePersonality\_St within T\_PersRecall.

#### ENMEM-TMR-REQ-199940/A-T\_PersRecall

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | **Description** | **Units** | **Range** | **Resolution** | **Default** |
| T\_PersRecall | Maximum time the EnhancedMemoryServer shall take to recall all settings for a Driver Profile once the ActivePersonality\_St signal update is received to change a profile. | msec | 50-150 | 5 | 75 |

#### ENMEM-REQ-202225/A-Error Handling Strategy for Recall Driver Profile

* When recall settings for Active Profile, EnhancedMemoryServers shall treat any reserved or non-valid value of *ActivePersonality\_St* as Vehicle
* In the error case where the ActivePersonality\_St method changes values without a corresponding increment to the PersonalityRecallCount\_St method, EnhancedMemoryServers shall still update the active Driver Profile based on the change of ActivePersonality\_St

#### ENMEM-REQ-202227/A-Provide Active Settings for Display after Recall

The EnhancedMemoryServers shall wait for T\_PersRecallStatusUpdate, but no longer than 500 msec, before sending any status signals affected/updated sending any status signals affected/updated as a result Recall event

#### ENMEM-TMR-REQ-199941/A-T\_PersRecallStatusUpdate

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | **Description** | **Units** | **Range** | **Resolution** | **Default** |
| T\_PersRecallStatusUpdate | Minimum time the EnhancedMemoryServer shall wait after receiving the ActivePersonality\_St signal update before sending any status messages affected by the change in Driver Profile. | msec | 100-200 | 5 | 150 |

#### ENMEM-REQ-199947/A-Display Active Profile Settings after Recall

After each Driver Profile is recalled, the setting Display Devices shall update their display of Active Profile settings. This can be initiated by display device through Feature Based Message Protocol Query operation or be initiated by EnhancedMemoryServers that provide Active Driver Profile settings to the Display Devices. Existing HMI standards and requirements agreed by the EnhancedMemoryServer and its setting Display Devices shall be followed.

#### ENMEM-REQ-199948/B-Positional Settings Recall

The EnhancedMemoryPositionClient shall recall any positional settings when receiving an update of the MemoryPosition\_St method.

* An update of the MemoryPosition\_St to the value of Vehicle shall not trigger the recall of any positional settings
* A recall, triggered by pressing of an unassociated Driver Memory Seat button, shall not trigger the recall of any positional settings. An unassociated Seat button in this requirement is defined as a driver Memory Seat button is never associated to any positional settings via Press and Hold operation nor any Enhanced Memory Driver Profile.

#### ENMEM-REQ-199873/A-No Recall in Driver Memory Seat Button Association Mode

During Driver Memory Seat Button Association Mode, all profile recall requests from the user (regardless of recall method) shall be ignored by the EnhancedMemoryProfileServer. This is to prevent any confusion regarding what settings will be copied to a Driver Profile during Profile Creation.

#### ENMEM-REQ-199949/A-No Recall for Positional Settings When Vehicle in Motion

EnhancedMemoryServers shall not recall settings that are tied with Classic Memory when the vehicle is in motion per the requirements mandated by Classic Memory.

#### ENMEM-REQ-434467/A-No Recall during NFC MyKey Creation

The EnhancedMemoryProfileServer shall neither update ActivePersonality\_St nor PersonalityRecallCounter\_St during NFC MyKey creation. There shall be no recall event.

#### ENMEM-SR-REQ-214302/A-No Recalls during a Crash Event

The EnhancedMemoryProfileServer shall neither update ActivePersonality\_St nor PersonalityRecallCounter\_St when a Crash Event is in progress.

#### ENMEM-HMI-REQ-199950/D-Enhanced Memory HMI Notification for Updating Active Driver Profile

When Enhanced Memory feature is on, indicated by EnhancedMemory\_St = ProfilesOn, the EnhancedMemoryInterfaceClient shall provide its HMI active Driver Profile notification

* Each time the “Start Screen” is shown as defined by H22g\_SYNC3\_Welcome\_Power\_Modes
* Within T\_PersRecall when a changed/new value of ActivePersonality\_St is detected

The HMI active Driver Profile notification shall not be shown when EnhancedMemory\_St changes from ProfilesOn to ProfilesOff

#### ENMEM-HMI-REQ-199942/A-Driver Profile Recall Notification Queue

When a Driver Profile change occurs at a time when the EnhancedMemoryInterfaceClient cannot display a notification to the User, it shall queue up this display update until a time when a notification can then be displayed. This shall only apply for the last recall request.

#### ENMEM-REQ-434229/A-HMI Recall of the Active Profile

After detecting a Recall Soft Button press event, the EnhancedMemoryInterfaceClient shall request a recall of the active Driver Profile via the InfotainmentRecall\_Rq method.

#### ENMEM-HMI-REQ-434236/A-Recall Button Availability

The EnhancedMemoryInterfaceClient shall make the Recall Soft Button active based on the criteria below:

* Enhanced Memory Feature (EnhancedMemory\_St) = On
* Driver Profile Created (Opted-in) Status = Opted-in
* Active Profile is not the Guest Profile
* VehicleSpeed\_St = Less than the Driving Restriction threshold
* If any of the following parameters of DriverPositionalChange\_St do not equal None:
* DriverMirrorAdjustStat
* PassengerMirrorAdjustStat
* PedalAdjustStat
* SteeringWheelAdjustStat
* DriverSeatAdjustStat
* DriverMCSAdjustStat

### White Box View

#### Activity Diagrams

##### ENMEM-ACT-REQ-199953/C-Recall Driver Profile Via Keyfob/Phone/NFC Key

Activity Diagram



##### ENMEM-ACT-REQ-199951/A-Recall Driver Profile Via Driver Memory Seat Button

Activity Diagram



##### ENMEM-ACT-REQ-199964/A-Driver Memory Seat Button Store Recall

Activity Diagram



##### ENMEM-ACT-REQ-199952/A-Recall Driver Profile Via HMI Menu

Activity Diagram



#### Sequence Diagrams

##### ENMEM-SD-REQ-199956/C-Recall Driver Profile Via Keyfob/Phone/NFC Key

Constraints

Pre-Condition

A keyfob, phone, or NFC Key is associated to a Driver Profile

The Enhanced Memory feature is enabled (set to On)

Scenarios

Normal Usage

The associated keyfob, phone, or NFC Key is detected by the EnhancedMemoryProfileServer and the active Driver Profile is set to the Driver Profile associated to the keyfob, phone, or NFC Key.

Post-Condition

All applicable user settings are recalled for the associated Driver Profile.

The associated Driver Profile is active.

Sequence Diagram



##### ENMEM-SD-REQ-199954/B-Recall Driver Profile Via Driver Memory Seat Button

Constraints

Pre-Condition

The Enhanced Memory feature is enabled (set to On)

EnhancedMemoryPositionClient is present

Scenarios

Normal Usage

A Driver Memory Seat button press is detected by the EnhancedMemoryPositionClient. A request is sent on the vehicle system interface to change the active Driver Profile to the Driver Profile associated to the pressed Driver Memory Seat button. The active Driver Profile is set to the associated Driver Profile.

Post-Condition

All applicable user settings are recalled for the associated Driver Profile.

The associated Driver Profile is active.

Sequence Diagram



##### ENMEM-SD-REQ-199965/B-Driver Memory Seat Button Store Recall

Constraints

Pre-Condition

The Enhanced Memory feature is enabled (set to On)

EnhancedMemoryPositionClient is present

Scenarios

Normal Usage

A Driver Memory Seat button store operation is detected by the EnhancedMemoryPositionClient. All applicable current settings are stored to the driver Profile associated to the pressed Driver Memory Seat button. The driver Profile associated to the pressed Driver Memory Seat button becomes active if not currently active.

Post-Condition

All applicable user settings are stored to the associated Driver Profile.

The associated Driver Profile is active.

Sequence Diagram



##### ENMEM-SD-REQ-199955/A-Recall Driver Profile Via HMI Menu

Constraints

Pre-Condition

The infotainment system is active

The Enhanced Memory feature is enabled (set to On)

Scenarios

Normal Usage

An HMI selection for signing into a Driver Profile is detected by the EnhanceMemoryInterfaceClient. A request is sent on the vehicle system interface to change the active Driver Profile to the driver Profile associated to the HMI selection. The active Driver Profile is set to the associated Driver Profile.

Post-Condition

All applicable user settings are recalled for the associated Driver Profile. The associated Driver Profile is active.

Sequence Diagram



## ENMEM-FUN-REQ-204918/B-Opt-Out

### Opt-Out Function Description

Opt-Out is an Enhanced Memory function that allows a user to opt-out of the Enhanced Memory feature, removing separate Driver Profiles for different drivers in the vehicle. All existing Driver Profiles along with associated keyfobs, phones, and NFC Keys are permanently deleted. The difference between the Opt-Out function and the Disable function is that Opt-Out permanently disables Enhanced Memory whereas the Disable function only temporarily removes access to Enhanced Memory. Opt-Out will also erase all Driver settings from the vehicle’s NVM, this cannot be done when using the Delete Drive Profile function to delete all Driver Profiles.

Vehicles with the Master Reset Function may utilize the Master Reset feature (ex. reuse the same HMI menu) and add Enhanced Memory Opt-Out requirements to the existing Master Reset feature.

The Opt-Out Function is triggered by a user request and will call the Delete Driver Profile Function to delete all existing Driver Profiles. In addition, the Opt-Out Function also erases Driver Profile information from NVM that is not required to be executed by Delete Driver Profile Function. This is to align with Master Reset feature to erase applicable personal information from NVM.

|  |  |  |  |
| --- | --- | --- | --- |
| Opt Out Functional Decomposition Diagram | | | |
| HMI Menu Customer Function | Logic Function | | |
| Level1 | Level2 | Level3 |
| Master Reset | Opt Out | Delete Driver Profile | Disassociate Keyfob |
| Disassociate Phone |
| Disassociate NFC Key |
| Recall Driver Profile |
| Disable Enhanced Memory |

Figure 26 – Opt-Out Functional Decomposition Diagram

### Use Cases

#### ENMEM-UC-REQ-199849/D-Opt-Out Enhanced Memory via Master Reset (with EnhancedMemoryPositionClient)

|  |  |
| --- | --- |
| **Actor** | Vehicle Occupant |
| **Pre-conditions** | Infotainment system is on  Enhanced Memory feature is enabled (set to On)  EnhancedMemoryPositionClient is present  Vehicle speed is less than the Driving Restriction threshold\*  At least one Driver Profile is created |
| **Scenario Description** | The user initiates Master Reset |
| **Post-conditions** | * All Driver Profiles are deleted and Enhanced Memory feature is disabled (set to Off) * HMI provides indication of Enhanced Memory feature is OFF. * All keyfobs, phones, and NFC Keys are disassociated from Driver Profiles and Driver Memory Seat buttons * Positional settings remain associated to the Driver Memory Seat buttons |
| **List of Exception Use Cases** |  |
| **Interfaces** | Personalization Interface |
| **Notes** | Requirements of deleting a Driver Profile apply here as all Driver Profiles are deleted  \*Driving Restriction threshold is defined in DRIVE-RESv2-FUR-REQ-025157-HMI Driving Restriction |

#### ENMEM-UC-REQ-404264/B-Opt-Out Enhanced Memory via Master Reset (without EnhancedMemoryPositionClient)

|  |  |
| --- | --- |
| **Actor** | Vehicle Occupant |
| **Pre-conditions** | Infotainment system is on  Enhanced Memory feature is enabled (set to On)  EnhancedMemoryPositionClient is not present  Vehicle speed is less than the Driving Restriction threshold\*  At least one Driver Profile is created |
| **Scenario Description** | The user initiates Master Reset |
| **Post-conditions** | * All Driver Profiles are deleted and Enhanced Memory feature is disabled (set to Off) * HMI provides indication of Enhanced Memory feature is OFF. * All keyfobs, phones, and NFC Keys are disassociated from Driver Profiles |
| **List of Exception Use Cases** |  |
| **Interfaces** | Personalization Interface |
| **Notes** | Requirements of deleting a Driver Profile apply here as all Driver Profiles are deleted  \*Driving Restriction threshold is defined in DRIVE-RESv2-FUR-REQ-025157-HMI Driving Restriction |

### Requirements

#### ENMEM-REQ-199911/A-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:

* The EnhancedMemoryInterfaceClient shall execute a Delete Driver Profile operation for all exiting Driver Profiles sequentially. Consequently, all requirements of Delete a Driver Profile shall apply to Master Reset.
* The EnhancedMemoryInterfaceClient shall set EnhancedMemory\_St to ProfilesOff per ENMEM-REQ-199830-Enhanced Memory Feature Activation Status
* Only after the Vehicle Profile is recalled, per ENMEM-REQ-199909-Recall Vehicle Profile When Active or Last Driver Profile Is Deleted, the EnhancedMemoryInterfaceClient and EnhancedMemoryServers (for infotainment modules that support Master Reset) shall reset applicable features in all Driver Profiles back to factory default settings per VS-FUN-REQ-025341-Master Reset to Factory Defaults

### White Box View

#### Activity Diagrams

##### ENMEM-ACT-REQ-199918/C-Opt-Out via Master Reset

Activity Diagram



#### Sequence Diagrams

##### ENMEM-SD-REQ-199924/C-Opt-Out via Master Reset

Constraints

Pre-Condition

Infotainment system is On

Vehicle speed is less than the Driving Restriction threshold\*

The Enhanced Memory feature is enabled (set to On)

\*Driving Restriction threshold is defined in DRIVE-RESv2-FUR-REQ-025157-HMI Driving Restriction

Scenarios

Normal Usage

The driver performs a Master Reset

Post-Condition

The Enhanced Memory feature is disabled (set to off).

All Driver Profiles are deleted.

All associated keyfobs, phones and NFC Keys are disassociated.

The active Driver Profile is set to “Guest”.

Positional settings remain unchanged

Applicable personalized infotainment settings are reset to factory default values for all Driver Profiles.

Sequence Diagram



## ENMEM-FUN-REQ-204960/A-Copy

### Driver Profile Creation via Copy Operation

A new Driver Profile is created by copying the current active settings to the target Driver Profile that’s being created.

This Driver Profile creation task is accomplished through a Copy operation that is designed to allow multiple features to be saved to a different profile at once with one signal command. Unlike other Feature Based Message Protocol operations such as Query and Set, the Copy command is not designed to be issued one at a time for a feature and thus does not provide the setting configuration for any feature. Each EnhancedMemoryServer needs to know all of its personalized features and retain its current active settings, which may or may not be the same as the settings stored in the Active Driver Profile at any given time. This discrepancy could occur before changes of current active settings are stored to Active Profile and could also occur if the user changes positional settings without storing the changes through Driver Memory Seat button press and hold action.

### Requirements

#### ENMEM-REQ-199882/B-Copy Request

After a Driver Memory Seat button or Profile Number is successfully associated to a Driver Profile, EnhancedMemoryInterfaceClient shall send the Copy operation request via Feature\_Rq(Operation=copy, FeatureID=0,Configuration=0xFFFF, PersIndex)to all EnhancedMemoryServers.

To prevent FeatureID and Configuration from being used in Copy command, FeatureID shall be set to zero to indicate an invalid feature ID whereas Configuration shall be set to 0xFFFF to indicate a non-existing setting.

#### ENMEM-REQ-199883/B-Driver Profile Index for Copy Command

In Copy request, the Drive Profile index, Feature\_Rq(PersIndex), shall be defined by an unassociated Driver Memory Seat button pressed by the user (when “EnhancedMemoryPositionClient = Present”), or the Profile Number associated by the EnhancedMemoryInterfaceClient (when “EnhancedMemoryPositionClient = NotPresent”).

Example 1 (when “EnhancedMemoryPositionClient = Present”):

If Driver Memory Seat button X is pressed, indicated by EnMemButtonPairing\_St(ButtonPairing=ButtonXPressed), the EnhancedMemoryInterfaceClient will then determine the Driver Memory Seat button’s association status internally. If the status is not associated, the EnhancedMemoryInterfaceClient will then set Feature\_Rq(PersIndex) to PERS\_X.

Example 2 (when “EnhancedMemoryPositionClient = NotPresent”):

The EnhancedMemoryInterfaceClient uses the next available Profile Number upon creation and sets Feature\_Rq(PersIndex) to the corresponding Profile Number. The Profile Number is managed internally and cannot already be associated to another Driver Profile.

#### ENMEM-REQ-199884/A-Execute Copy Operation

When receiving a Copy command via Feature\_Rq(Operation = Copy), the EnhancedMemoryServer shall copy all applicable personalized features’ current active settings (not the active Driver Profile settings as that could be different than current active settings) to the new Driver Profile indicated by Feature\_Rq(PersIndex = PERS\_X).

Personalized features that are to be copied to the new Driver Profile shall be internally managed by the EnhancedMemoryServer itself and shall be determined by a separate program-specific document for each EnhancedMemoryServer.

The Copy command shall only be used as an indicator for the EnhancedMemoryServer to perform an internal copy of all applicable personalized features. It shall not be used as a series of Copy commands for each individual FeatureID and Configuration supported by an EnhancedMemoryServer. For this reason, the Feature\_Rq(FeatureID) and Feature\_Rq(Configuration) values shall be ignored by the EnhancedMemoryServer for all Copy commands sent by the EnhancedMemoryInterfaceClient.

#### ENMEM-REQ-199885/A-Performance Requirement for Copy Operation

All EnhancedMemoryServers shall perform the Copy operation within T\_PersCopy.

#### ENMEM-TMR-REQ-199886/A-T\_PersCopy

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | **Description** | **Units** | **Range** | **Resolution** | **Default** |
| T\_PersCopy | Maximum time the EnhancedMemoryServer shall take to complete all Enhanced Memory related Copy operations for a given Driver Profile upon request. | msec | 1500-4500 | 500 | 3000 |

#### ENMEM-REQ-199890/A-Time Separation between Update Opt-In Status and Recall

After updating the newly created Driver Profile Opt-In status, the EnhancedMemoryInterfaceClient shall wait a minimum of T\_OptInRecallSeparation then issue a recall request to make the newly created Driver Profile as the Active Profile.

#### ENMEM-TMR-REQ-199891/A-T\_OptInRecallSeparation

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | **Description** | **Units** | **Range** | **Resolution** | **Default** |
| T\_OptInRecallSeparation | Minimum separation time the EnhancedMemoryInterfaceClient shall have between sending the PersonalityOptIn\_St and sending the InfotainmentRecall\_Rq. | msec |  | 5 | 100 |

#### ENMEM-REQ-199887/B-Request Exit Driver Memory Seat Button Association Mode After Copy

When configured with “EnhancedMemoryPositionClient = Present” and after sending Copy request, EnhancedMemoryInterfaceClient shall wait a minimum of T\_PersCopy before sending a request to exit Driver Memory Seat Button Association Mode.

#### ENMEM-REQ-199888/B-Recall New Driver Profile After Copy

* After sending the Copy request and then sending an exit Driver Memory Seat Button Association request, the EnhancedMemoryInterfaceClient shall ensure EnMemButtonPairing\_St(ButtonPairing= ButtonPairingExited) is received and shall wait a minimum of T\_RecallDelay from the time the Copy request was first sent, before sending a request to update to the new Driver Profile via the InfotainmentRecall\_Rq method
* When “EnhancedMemoryPositionClient = NotPresent”, after sending the Copy request, the EnhancedMemoryInterfaceClient shall wait a minimum of T\_RecallDelay from the time the Copy request was first sent, before sending a request to update to the new Driver Profile via the InfotainmentRecall\_Rq method
* The value of T\_RecallDelay shall be a configurable value

#### ENMEM-TMR-REQ-199889/A-T\_RecallDelay

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | **Description** | **Units** | **Range** | **Resolution** | **Default** |
| T\_RecallDelay | Minimum time the EnhancedMemoryInterfaceClient shall wait after sending a copy operation, before sending a recall request to the vehicle system interface.  Example:  The EnhancedMemoryInterfaceClient sends a copy operation at time-stamp 10:00:00.  The EnhancedMemoryInterfaceClient must wait until 10:00:05 before sending a recall request to update the active driver profile. | msec | 3000-7000 | 500 | 5000 |

#### ENMEM-REQ-199892/B-Storing Positional Settings after Copy

When creating a Driver Profile, the current positional settings shall be copied to the new Driver Profile that’s being created. In order to guarantee this task is accomplished, an infotainment store operation is also issued after Copy operation but before recall request. This shall only be performed when configured for “EnhancedMemoryPositionClient = Present.”

* When sending a recall request for the new Driver Profile after Copy operation, the EnhancedMemoryInterfaceClient shall also send a store positional settings request via InfotainmentPersStore\_Rq to EnhancedMemoryPositionClient after Copy operation but before recall request
* The EnhancedMemoryPositionClient shall store all current Classic Memory settings to the indicated Driver Memory Seat button (which may include performing a Classic Memory subsystem store operation) upon reception of the InfotainmentPersStore\_Rq method and respond with InfotainmentPersStore\_St(Status = Complete) when complete.
  + While the store operation is being performed, the EnhancedMemoryPositionClient shall respond with InfotainmentPersStore\_St(Status = InProgress).

## ENMEM-FUN-REQ-204942/B-Associate Driver Memory Seat Button

### Associate Driver Memory Seat Button Function Description

If equipped with Driver Memory Seat buttons, associating a Driver Profile to a Driver Memory Seat button is a required step in creating an Enhanced Memory Driver Profile. This step allows a user to extend personalized features from positional features to include non-positional features and in turn allows the Driver Memory Seat button to be used as an interface to recall a Driver Profile.

To prevent any existing Driver Profiles from being unintentionally overwritten, Enhanced Memory will not allow the user to associate a new Driver Profile to a Driver Memory Seat button that has already been associated to an existing Driver Profile. The system will inform the user of any pre-associated Driver Memory Seat buttons, should one be pressed, and allow the user multiple opportunities to select a different Driver Memory Seat button.

The Associate Driver Memory Seat button Function is an Enhanced Memory Logic Function that will support all the functionalities mentioned above. This Function can only be called out by Create Driver Function

**Note:** This association only applies to the Driver’s Memory Seat buttons. The Passenger Memory Seat buttons are not tied to any Driver Profile and thus cannot be used to recall an Enhanced Memory Driver Profile.

|  |  |  |  |
| --- | --- | --- | --- |
| Associate Driver Memory Seat Button  Functional Decomposition Diagram | | | |
| HMI Menu Customer Function | Logic Function | | |
| Level1 | Level2 | Level3 |
| Opt-In | Opt-In | Enable Enhanced Memory |  |
| Create/Add Driver Profile | Create/Edit Name |
| Associate Driver Memory Seat Button |
| Copy |
| Recall Driver Profile |
| Add Driver Profile | Create/Add Driver Profile | Create/Edit Name |  |
| Associate Driver Memory Seat Button |
| Copy |
| Recall Driver Profile |

Figure 27 – Associate Driver Memory Seat Button Functional Decomposition Diagram

The HMI flow chart below illustrates the HMI process of Associating a Driver Profile to a Driver Memory Seat button where the user is provided multiple opportunities to select a Driver Memory Seat button and will be informed to select a different Driver Memory Seat button if an already associated button is selected.

Please note that this flow chart only serves as a design aid and does not necessarily represent the final implementation.



Figure 28 – Enhanced Memory Associate Driver Seat Button HMI Flow Chart

### Use Cases

#### ENMEM-UC-REQ-199842/B-Attempt to Associate Already Associated Driver Memory Seat Button

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | The Ignition Status is in Run  The vehicle transmission is in Park OR vehicle speed is less than the Driving Restriction threshold\* for a manual transmission  EnhancedMemoryPositionClient present  Enhanced Memory HMI prompts the user to press a Driver Memory Seat button during Driver Profile creation process |
| **Scenario Description** | The user presses a Driver Memory Seat button that has already been associated to another Driver Profile |
| **Post-conditions** | * The user is informed by HMI indication that the chosen Driver Memory Seat button is already associated to another Driver Profile * The user is given multiple opportunities to retry |
| **List of Exception Use Cases** |  |
| **Interfaces** | Personalization Interface |
| **Notes** | ENMEM-REQ-199875-No Overwrite for Driver Memory Seat Button Association  \*Driving Restriction threshold is defined in DRIVE-RESv2-FUR-REQ-025157-HMI Driving Restriction |

#### ENMEM-UC-REQ-404265/A-Associate Driver Memory Seat Button via Memory Seat Button

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | The Ignition Status is in Run  The vehicle transmission is in Park OR vehicle speed is less than the Driving Restriction threshold\* for a manual transmission  EnhancedMemoryPositionClient present  Enhanced Memory HMI prompts the user to press a Driver Memory Seat button during Driver Profile creation process |
| **Scenario Description** | The user presses a Driver Memory Seat button through the EnhancedMemoryPositionClient |
| **Post-conditions** | The button pressed is detected by the EnhancedMemoryInterfaceClient and used to associate the driver memory seat button to the profile |
| **List of Exception Use Cases** |  |
| **Interfaces** | Personalization Interface |
| **Notes** | \*Driving Restriction threshold is defined in DRIVE-RESv2-FUR-REQ-025157-HMI Driving Restriction |

#### ENMEM-UC-REQ-404266/A-Associate Driver Memory Seat Button via HMI selection

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | The Ignition Status is in Run  The vehicle transmission is in Park OR vehicle speed is less than the Driving Restriction threshold\* for a manual transmission  EnhancedMemoryPositionClient present  Enhanced Memory HMI prompts the user to press a Driver Memory Seat button during Driver Profile creation process |
| **Scenario Description** | The user selects a Driver Memory Seat button on the EnhancedMemoryInterfaceClient |
| **Post-conditions** | The button pressed is detected by the EnhancedMemoryInterfaceClient and used to associate the driver memory seat button to the profile |
| **List of Exception Use Cases** |  |
| **Interfaces** | Personalization Interface |
| **Notes** | \*Driving Restriction threshold is defined in DRIVE-RESv2-FUR-REQ-025157-HMI Driving Restriction |

### Requirements

#### ENMEM-REQ-199867/B-Request Enter Driver Memory Seat Button Association Mode

After a unique Driver Profile Name is successfully entered in Driver Profile creating process (not in editing mode), the EnhancedMemoryInterfaceClient shall command the EnhancedMemoryPositionClient to enter a Driver Memory Seat Button Association Mode via EnMemProfilePairing\_Rq(ButtonPairing) method.

This button pairing state shall also be re-entered between Driver Memory Seat Button Association attempts (limited to ENMEM-REQ-199785-N\_NumberOfRetries) if an unsuccessful attempt should occur (i.e. timer expires or an already associated Driver Memory Seat button is pressed, as detailed in ENMEM-REQ- 199878-Request Exit Memory Seat Button Association Mode).

#### ENMEM-REQ-199868/B-Do Not Enter Driver Memory Seat Button Association Mode When Editing Name

While editing a Drive Profile Name, even if a unique Driver Profile name is successfully entered, the EnhancedMemoryInterfaceClient shall not command the EnhancedMemoryPositionClient to enter Driver Memory Seat Button Association Mode.

The requirement is needed to prevent the system from entering Driver Memory Seat Button Association Mode once a Driver Profile name is successful edited. Contrary to this case, when creating a Driver Profile, once a Profile name is successful entered, the system shall enter Driver Memory Seat Button Association Mode (when EnhancedMemoryPositionClient is present). Please refer to ENMEM-REQ-199867/-Request Enter Driver Memory Seat Button Association Mode.

#### ENMEM-REQ-199869/A-Entering Driver Memory Seat Button Association Mode

When receiving the enter Driver Memory Seat Button Association Mode request via (EnMemProfilePairing\_Rq(ButtonPairing = EnterButtonPairing)), the EnhancedMemoryPositionClient shall enter Driver Memory Seat Button Association Mode and shall acknowledge its current state by set EnMemButtonPairing\_St(ButtonPairing) to ButtonPairingEntered.

#### ENMEM-REQ-199870/A-Retry and Error Handling Strategies for Driver Memory Seat Button Association Mode

* After sending the request of entering Driver Memory Seat Button Association Mode, if there is no response within a defined period, T\_SeatBtnAsscRetry, or communication data is invalid or corrupted, the EnhancedMemoryInterfaceClient shall re-send the request up to N\_NumberOfRetries times before quitting.
* When multiple requests do not yield the correct response, the EnhancedMemoryInterfaceClient shall abort the Driver Profile creation process entirely by doing the following actions:
  + Set EnMemProfilePairing\_Rq(ButtonPairing) to ExitButtonPairing
  + Erase the Driver Profile Name from internal memory
  + Turn the Enhanced Memory feature Off if the there is no other existing Driver Profiles
  + Set loss commination DTC if no communication can be established
* The EnhancedMemoryInterfaceClient shall provide the user HMI notification about the abort process status and shall instruct the user to recycle ignition before retry

#### ENMEM-TMR-REQ-206535/A-T\_SeatBtnAsscRetry

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | **Description** | **Units** | **Range** | **Resolution** | **Default** |
| T\_SeatBtnAsscRetry | Nominal time the EnhancedMemoryInterfaceClient shall wait before resending the request to enter Driver Memory Seat Button Association Mode.  Note: Use the default value | msec | 400-600 | 50 | 500 |

#### ENMEM-REQ-199871/B-Button Press in Driver Memory Seat Button Association Mode

In Driver Memory Seat Button Association Mode, the button press as well as press and hold actions are not meant to recall Driver Profile or save positional settings. Instead, button press actions shall only serve as the indicator of a Driver Memory Seat button being associated to a new Driver Profile.

* In Driver Memory Seat Button Association Mode, EnhancedMemoryPositionClient shall suppress the transmission of MemSwitchRecall\_Rq when a Driver Memory Seat button is pressed during this mode.
* When detecting a Driver Memory Seat button press in Driver Memory Seat Button Association Mode, EnhancedMemoryPositionClient shall inform EnhancedMemoryInterfaceClient which Driver Memory Seat button is pressed via EnMemButtonPairing\_St (ButtonPairing).

#### ENMEM-REQ-404267/A-Button Press via HMI in Driver Memory Seat Button Association Mode

The EnhancedMemoryInterfaceClient shall allow the user to select a Memory Seat button via its HMI while in Driver Memory Seat button association mode. A button press via HMI in this mode is not meant to recall Driver Profiles or save positional settings (press & hold not supported via the HMI). Instead, button press actions shall only serve as the indicator of a button being associated to a new Driver Profile.

#### ENMEM-REQ-404268/A-Driver Memory Seat Button Press Handling

In Driver Memory Seat button association mode, a button press made on the EnhancedMemoryPositionClient or the EnhancedMemoryInterfaceClient shall be handled on a first come, first serve basis by the EnhancedMemoryInterfaceClient. The button press the EnhancedMemoryInterfaceClient detects first shall be acted on, any subsequent presses shall be ignored (for a given pairing attempt).

#### ENMEM-REQ-199872/A-Driver Memory Seat Button Press Error Strategy

EnhancedMemoryPositionClient shall report ButtonAssociationFailed via EnMemButtonPairing\_St(ButtonPairing) whenever the user presses a SET Driver Memory Seat button during Driver Memory Seat Button Association process.

Other customer Driver Memory Seat button press errors, defined by Classic Memory feature specification, shall also trigger EnhancedMemoryPositionClient to report ButtonAssociationFailed during Driver Memory Seat button association process.

#### ENMEM-REQ-199873/A-No Recall in Driver Memory Seat Button Association Mode

During Driver Memory Seat Button Association Mode, all profile recall requests from the user (regardless of recall method) shall be ignored by the EnhancedMemoryProfileServer. This is to prevent any confusion regarding what settings will be copied to a Driver Profile during Profile Creation.

#### ENMEM-REQ-199874/B-Successful Driver Memory Seat Button Association

A successful Driver Memory Seat button association event shall be defined as when in Driver Memory Seat Button Association Mode the EnhancedMemoryInterfaceClient receives a valid Driver Memory Seat button press status (from either the EnhancedMemoryPositionClient or the EnhancedMemoryInterfaceClient) and internally determines that the pressed button is not associated to any existing Driver Profile.

A valid Driver Memory Seat button press shall be defined as EnMemButtonPairing\_St(ButtonPairing) with encoding value in the range from 1 to 4.

The Enhanced Memory HMI shall prompt the user retry popup, up to the N\_NumberOfRetries, when:

* EnMemButtonPairing\_St(ButtonPairing) is not in valid range
* EnMemButtonPairing\_St(ButtonPairing) is in failure state
* The pressed Driver Memory Seat button is associated to other existing Driver Profile

#### ENMEM-HMI-REQ-199876/A-HMI Prompt for Driver Memory Seat Button Press and Associated Driver Memory Seat Button Status

During Driver Profile creation process, EnhancedMemoryInterfaceClient shall prompt the user to press a Driver Memory Seat button, and the prompt shall contain the already associated Driver Memory Seat buttons status.

This is to prevent the user from pressing already associated Driver Memory Seat button to overwrite an existing Driver Profile.

#### ENMEM-HMI-REQ-199877/A-Enhanced Memory HMI for Associated Driver Memory Seat Button

When a user attempts to associate an already associated Driver Memory Seat button to a new Driver Profile,

* The Enhanced Memory HMI shall provide notification to the user that the Driver Memory Seat button was already associated to an existing Driver Profile
* The Enhanced Memory HMI shall not allow that associated Driver Memory Seat button be overwritten in order to be associated to a new Driver profile
* The Enhanced Memory HMI shall provide the user multiple opportunities, per N\_NumberOfRetries, to select another unassociated Driver Memory Seat button.

#### ENMEM-REQ-199878/C-Request Exit Driver Memory Seat Button Association Mode

EnhancedMemoryInterfaceClient shall command the EnhancedMemoryPositionClient to exit Button Association Mode via EnMemProfilePairing\_Rq(ButtonPairing = ButtonPairingExited) for the following cases:

* The user cancels out of the association process (ex. presses touch screen exit/back button)
* The user is inactive after T\_SeatAssocOneTime expires. This is indicated through no change state of EnMemButtonPairing\_St(ButtonPairing = ButtonPairingEntered)
* The user presses the Driver Memory Seat’s SET button. This is indicated via EnMemButtonPairing\_St(ButtonPairing= ButtonPairingFailed)
* The user presses an already associated Driver Memory Seat button
* The Association Retry Counter, N\_NumberOfRetries, as defined in ENMEM-REQ-179346, is exceeded
* If the profile creation process is not active (not in process of creating a new profile) and the EnhancedMemoryInterfaceClient receives EnMemButtonPairing\_St(ButtonPairing != Null)
* A system event occurs that terminates the association process
  + Vehicle speed is greater than 8kph (see ENMEM-REQ-199864)
  + Vehicle ignition is no longer in Run
  + Infotainment System is powered down (ex. Load Shed event)
  + Communication data is invalid, corrupted or Communication with EnhancedMemoryPositionClient is lost

#### ENMEM-REQ-199879/B-Exit Driver Memory Seat Button Association Mode

The EnhancedMemoryPositionClient shall exit Driver Memory Seat Button Association Mode and set EnMemButtonPairing\_St(ButtonPairing = ButtonPairingExited) for the following cases:

* When receiving EnMemProfilePairing\_Rq(ButtonPairing = ExitButtonPairing)
* When the association timer T\_SeatAssocOneTime2 expires as defined in ENMEM-TMR-REQ-199881-T\_SeatAssocOneTime2
* Communication with the EnhancedMemoryInterfaceClient is lost

#### ENMEM-REQ-199880/A-Driver Memory Seat Button Pairing Timer Expired

When T\_SeatAssocOneTime2 expires, the EnhancedMemoryPositionClient shall exit Driver Memory Seat Button Association Mode and update the status of EnMemButtonPairing\_St(ButtonPairing) to ButtonPairingExited for a time of <T\_ReturnToNull>, followed by Null.

#### ENMEM-TMR-REQ-199881/A-T\_SeatAssocOneTime2

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | **Description** | **Units** | **Range** | **Resolution** | **Default** |
| T\_SeatAssocOneTime2 | Maximum time the EnhancedMemoryPositionClient shall wait before exiting Driver Memory Seat Button Association Mode. | sec | 40-130 | 5 | 70 |

### White Box View

#### Activity Diagrams

#### Please refer to ENMEM-ACT-REQ-199915/-Create Driver Profile

#### Sequence Diagrams

##### ENMEM-SD-REQ-199920/C-User Chooses a Driver Memory Seat Button That is Already Associated to Another Driver Profile

Constraints

Pre-Condition

EnhancedMemoryPositionClient is present

Vehicle HMI prompts the user to press a Driver Memory Seat button on the door panel during the Driver Profile creation process

Scenarios

Normal Usage

The user presses a Driver Memory Seat button that had been associated to another Driver Profile

Post-Condition

Vehicle HMI provides notification that the Driver Memory Seat button is already associated and provides the user multiple opportunities to retry

Sequence Diagram



## FUN-REQ-435131/A-Positional Store

### Positional Store Operation

Save is a function that requests a positional store operation to a specific Driver Profile. This allows the user to save their current positional settings to a Driver Profile.

The Save Function can be initiated by a user request. A user request is sent by a manual HMI selection.

In addition to the user request, the Save Function requires various other vehicle operation statuses in order to determine which Driver Profile to use for the save operation. Those statuses include the Enhanced Memory feature On/Off status and the Driver Profile existing status.

The Save Function provides the Driver Profile Index to the EnhancedMemoryPositionClient so that the server knows for which Driver Profile to store the current positional settings.

### Use Cases

#### ENMEM-UC-REQ-435697/A-HMI Soft Button Store to the Active Driver Profile

|  |  |
| --- | --- |
| **Actors** | Vehicle Occupant |
| **Pre-conditions** | The Enhanced Memory feature is enabled (set to On)  EnhancedMemoryPositionClient present  The Active Profile is not the Guest Profile |
| **Scenario Description** | The user initiates a “store position” operation via soft button on HMI with a Driver Profile active |
| **Post-conditions** | The current positional settings are stored to the active Driver Profile. |
| **List of Exception Use Cases** |  |
| **Interfaces** | Personalization Interface |

### Requirements

#### ENMEM-REQ-434230/A-Positional Store Operation

After detecting a Save Soft Button press event, the EnhancedMemoryInterfaceClient shall send a store positional settings request via InfotainmentPersStore\_Rq to EnhancedMemoryPositionClient for the active personality.

#### ENMEM-HMI-REQ-434237/A-Positional Store Button Availability

The EnhancedMemoryInterfaceClient shall make the Save Soft Button active based on the criteria below:

* Enhanced Memory Feature (EnhancedMemory\_St) = On
* Driver Profile Created (Opted-in) Status = Opted-in
* Active Profile is not the Guest Profile
* If any of the following parameters of DriverPositionalChange\_St do not equal None:
  + DriverMirrorAdjustStat
  + PassengerMirrorAdjustStat
  + PedalAdjustStat
  + SteeringWheelAdjustStat
  + DriverSeatAdjustStat
  + DriverMCSAdjustStat

# Appendix: Reference Documents

|  |  |
| --- | --- |
| Reference # | Document Title |
| 1 | Enhanced Memory Module Implementation Guide |
| 2 | H84a\_SYNC3\_EMDriverProfile HMI specification |
| 3 | FBMP SPSS (Feature Based Message Protocol SPSS spec). This Sync (APIM) specification. Modules with menus at Sync should refer to this document |
| 4 | Personalization (Enhanced Memory) Display Setup Overview – CGEA1.X. This is Cluster(IPC) specification Modules with menus at Cluster should refer to this document |
| 5 | RQT-001301-003538 LOGIC OF OPERATION:  FEEDBACK |
| 6 | Official Enhanced Memory Feature Number List  <https://www.vsemweb.ford.com:443/tc/launchapp?-attach=true&-s=226TCSession&-o=yBVV1Efix3NrTDAAAAAAAAAAAAA> |
| 7 | U544 Enhanced Memory Feature List |
| 8 | ES1W7T-F407K00-AA |
| 9 | VS-FUN-REQ-025341-Master Reset to Factory Defaults. This requirement contains Master Reset existing requirements |
| 10 | Place holder for PaaK Feature spec |
| 11 | Place holder for BCM PaaK spec |