



Research & Vehicle Technology
“Product Development”

**Feature – Enhanced Memory
InterfaceClient**

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

Version 1.14

UNCONTROLLED COPY IF PRINTED

Version Date: April 8, 2022

FORD CONFIDENTIAL



Revision History

Date	Version	Notes	
September 17, 2015	0.01	Draft Release	Draft release. Not to have software coded to. That will be when have the official 1.0 release
December 14, 2015	1.0	Initial Release	
February 9, 2016	1.1		
		STR-196365/D-General Requirements	MBORREL4: Added New Req 206864 & 207325
		ENMEM-REQ-206864/A-EnhancedMemoryServers to Retain Settings After Software Reflash	MBORREL4: New req
		ENMEM-SR-REQ-207325/A-Updates to Non-Volatile Memory	MBORREL4: New Req.
		ENMEM-SR-REQ-136593/K-Network Bus Start-up / Shut-down (EnhancedMemoryServer)	MBORREL4: Updated to clarify software reflash functionality.
		ENMEM-FUN-REQ-195573/B-EnhancedMemoryInterfaceClient HMI Requirements - APIM	MBORREL4: Added New Req 207327
		ENMEM-HMI-REQ-207327/A-Driver Profile Name Restrictions	cwu3: New for Drive Profile name restrictions
February 12, 2016	1.2		
		STR-176691/C-Requirements	MBORREL4: Added req 099763, 099674, 136618
		ENMEM-SR-REQ-136618/D-Recall Event - Infotainment Audio	MBORREL4: New Req.
		ENMEM-REQ-099674/B-Requesting Audio Preset Info After Profile Change	MBORREL4: New Req.
		ENMEM-TMR-REQ-099763/B-T_PersPresetWait	MBORREL4: New Req.
		STR-176718/C-Requirements	MBORREL4: Added Req-099698
		STR-307926/C-Driver Profile Creation via Copy Operation	MBORREL4: Added Req-099698
		ENMEM-REQ-099698/B-Wait Response From AudioServer While Copy Operation is Still in Progress	MBORREL4: New Req.
March 18, 2016	1.3		
		ENMEM-IIR-REQ-099360/G-EnhancedMemoryInterfaceClient_Tx	MBORREL4: Updated Logical to GSDB Signal Name table to include FactoryReset_Rq
		ENMEM-IIR-REQ-099371/B-EnhancedMemoryServer_Rx	MBORREL4: Added REQ-015018-FactoryReset_Rq and updated Logical to GSDB Signal Name table to include FactoryReset_Rq
		ENMEM-UC-REQ-195889/B-Associate a Keyfob with Incorrect Method	MBORREL4: Fixed spelling error in Notes
		ENMEM-REQ-099685/D-Request Enter Memory Seat Button Association Mode	MBORREL4: Updated to include re-entry conditions upon unsuccessful pairing attempts.
		ENMEM-REQ-116803/C-Request Exit Memory Seat Button Association Mode	MBORREL4: Updated the "SET button" condition and added condition for "already associated Driver Memory Seat button press"
		STR-307927/B-Keyfob Association	MBORREL4: Added ENMEM-FUN-REQ-212303
		ENMEM-SR-REQ-212303/A-PersIndex used for Keyfob Association	MBORREL4: New Req.
		ENMEM-SD-REQ-099425/D-Create Driver Profile	MBORREL4: Updated Feature_Rq Copy operation for Pers to stay in last known.
		STR-297590/D-Requirements	MBORREL4: Added REQ-212764
		ENMEM-HMI-REQ-212764/A-Enhanced Memory HMI Notification of Profile Creation Abort	MBORREL4: New Req.
April 11, 2016	1.4		
		ENMEM-FUR-REQ-134134/K-Enhanced Memory Features Supported - APIM	MBORREL4: Removed 11 features from NAV section per vpatel18 (no longer supported)



ENMEM-IIR-REQ-099371/B-EnhancedMemoryServer_Rx	MBORREL4: Added REQ-015018-FactoryReset_Rq and updated Logical to GSDB Signal Name table to include FactoryReset_Rq
STR-196365/E-General Requirements	MBORREL4: Removed REQ-198778-T_ReturnToldle and REQ-180452-Request/Response return to Idle state, as they are no longer needed/used.
ENMEM-REQ-099685/E-Request Enter Memory Seat Button Association Mode	MBORREL4: Updated first paragraph to clarify when button pairing is entered
ENMEM-SD-REQ-099425/E-Create Driver Profile	MBORREL4: Removed all instances of T_ReturnToldle as it is no longer needed
ENMEM-SD-REQ-197169/B-User Chooses a Seat Button That is Already Associated to Another Driver Profile	MBORREL4: Removed all instances of T_ReturnToldle as it is no longer needed
ENMEM-HMI-REQ-207327/B-Driver Profile Name Restrictions	MBORREL4: Removed Profile Name character limits and details that were moved to the H84a Enhanced Memory HMI Spec in [H84a.R043.xx]

May 11, 2016

1.5

STR-176673/B-Use Cases	Added REQ-214249, REQ-214250, and REQ-214246
ENMEM-UC-REQ-214249/A-Valet Mode enabled with Enhanced Memory On	New Use Case describing Valet Mode functionality
ENMEM-UC-REQ-214250/A-Valet Mode disabled with Enhanced Memory On	New Use Case describing Valet Mode functionality
ENMEM-UC-REQ-214246/A-Valet Mode disabled with Enhanced Memory Off	New Use Case describing Valet Mode functionality
STR-176669/C-Requirements	MBORREL4: Added REQ-214801
ENMEM-SR-REQ-214801/A-Enable/Disable Enhanced Memory in Valet Mode	MBORREL4: New req. added to cover Valet Mode functionality.
STR-176692/C-Use Cases	Added REQ-214249, REQ-214250
ENMEM-UC-REQ-214249/A-Valet Mode enabled with Enhanced Memory On	New Use Case describing Valet Mode functionality
ENMEM-UC-REQ-214250/A-Valet Mode disabled with Enhanced Memory On	New Use Case describing Valet Mode functionality
STR-176691/D-Requirements	MBORREL4: Added REQ-214221
ENMEM-REQ-099673/C-Driver Profile Settings Recall	MBORREL4: Updated to have HMI sign-in notification shown each time the "Start Screen" is shown as defined by H22g_SYNC3_Welcome_Power_Modes, as well as during a profile recall.
ENMEM-SR-REQ-136618/E-Recall Event - Infotainment Audio	MBORREL4: Updated to describe muting when in a phone call/VR session.
ENMEM-SR-REQ-214221/A-Recall behavior when Valet Mode Enabled/Disabled	MBORREL4: New req. added for Valet Mode recall functionality
ENMEM-REQ-099699/C-Disable Driver Profile Creation and Editing When Key is Not in Run or Vehicle Speed is greater than 5KPH	MBORREL4: Updated to include condition of Gear Position = Park
ENMEM-REQ-116802/C-Profile Creation Interruption	MBORREL4: Updated to include all actions required to be taken when aborted (spec clarification). Added Park condition to the interrupt example
ENMEM-SR-REQ-198055/B-Enhanced Memory HMI Option for Associated Keyfob	MBORREL4: Updated signal in last bullet from EnMemKeyPairing_S_Rq to EnMemProfilePairing_Rq (spec correction)
ENMEM-REQ-198100/B-Overwrite Associated Keyfob	MBORREL4: Updated signals to EnMemProfilePairing_Rq (spec correction)
ENMEM-REQ-116804/D-Keyfob Pairing Error	MBORREL4: Added Park condition as an interrupt method
ENMEM-SR-REQ-198055/B-Enhanced Memory HMI Option for Associated Keyfob	MBORREL4: Updated signal in last bullet from EnMemKeyPairing_S_Rq to EnMemProfilePairing_Rq (spec correction)

July 18, 2016

1.6

ENMEM-SR-REQ-136593/L-Network Bus Start-up / Shut-down (EnhancedMemoryServer)	MBORREL4: Added clarification for when the last active personality cannot be determined.
ENMEM-REQ-129547/C-Last Known Driver Profile Applied	MBORREL4: Added clarification for when the Last Known Driver Profile cannot be determined.
ENMEM-REQ-198928/B-Button Press in Button Association Mode	MBORREL4: Removed Memory_Cmd from req and changed "should" to "shall" in 1st paragraph.

September 26, 2016

1.7

STR-184156/C-Overview	MBORREL4: Updated to include PaaK
ENMEM-CLD-REQ-099556/E-Enhanced Memory Profile Server - BCM	MBORREL4: Updated to include PaaK
MD-REQ-099304/D-EnMemProfilePairing_Rq	MBORREL4: Updated for PaaK. Added EnterPhoneAssoc and DisassociatePhone encodings



ENMEM-IIR-REQ-099363/F-EnhancedMemoryInterfaceClient_Rx	MBORREL4: Updated for PaaK. Added new signal PersPhonePairing_St
MD-REQ-099352/C-EnMemKeyPairing_St	MBORREL4: Updated for PaaK. Added WrongDeviceSelected encoding
MD-REQ-233493/A-PersPhonePairing_St	MBORREL4: New Method Description
STR-196365/F-General Requirements	MBORREL4: Added new REQ-232557
ENMEM-REQ-116801/D-Retain Enhanced Memory Settings After Software Reflash	MBORREL4: Updated to include PaaK
ENMEM-SR-REQ-136937/E-Enhanced Memory Feature Inclusion Guidelines	MBORREL4: Updated to include PaaK
ENMEM-REQ-137867/B-Keyfob/Phone Association Term Consolidation	MBORREL4: Updated to include PaaK
ENMEM-REQ-166096/E-Operations Shall Not Recall a Driver Profile	MBORREL4: Updated to include PaaK
ENMEM-REQ-232557/A-Phone & Phone-As-A-Key	MBORREL4: New Req. for PaaK
STR-310182/B-Recall Function Description	MBORREL4: Updated to include PaaK
ENMEM-UC-REQ-095940/D-Sign Into a Driver Profile via Keyfob/Phone	MBORREL4: Updated to include PaaK
ENMEM-UC-REQ-162635/C-Sign Into a Driver Profile via Keyfob/Phone Button Press While Vehicle In Motion	MBORREL4: Updated to include PaaK
ENMEM-UC-REQ-161547/D-Classic Memory Only Recall via Previously Associated Keyfob/Phone	MBORREL4: Updated to include PaaK
ENMEM-UC-REQ-137996/D-Recall Last Known Driver Profile With Keypad Code When A Keyfob/Phone Is Not With The User	MBORREL4: Updated to include PaaK
ENMEM-UC-REQ-137858/D-MyKey Overrides Driver Profile Setting	MBORREL4: Updated to include PaaK
ENMEM-UC-REQ-162575/C-Admin Key does not restrict Driver Profile associated to MyKey	MBORREL4: Updated to include PaaK
ENMEM-REQ-099671/E-Keyfob/Phone Detection for Driver Profile Sign-In	MBORREL4: Updated to include PaaK
ENMEM-ACT-REQ-099384/D-Sign Into Driver Profile Via Keyfob/Phone	MBORREL4: Updated to include PaaK
ENMEM-SD-REQ-099432/D-Sign Into Driver Profile Via Keyfob/Phone	MBORREL4: Updated to include PaaK
STR-176719/C-Use Cases	MBORREL4: Added REQ-232959
ENMEM-UC-REQ-095908/D-Associate Keyfob/Phone to a Driver Profile	MBORREL4: Updated to include PaaK
ENMEM-UC-REQ-095925/C-Attempt to Associate Already Associated Keyfob/Phone	MBORREL4: Updated to include PaaK
ENMEM-UC-REQ-195889/C-Associate a Keyfob with Incorrect Method	MBORREL4: Updated to include PaaK
ENMEM-UC-REQ-095927/C-Disassociate Keyfob/Phone from a Driver Profile	MBORREL4: Updated to include PaaK
ENMEM-UC-REQ-232959/A-Disassociate Phone from Driver Profiles after Phone is Erased/Revoked	MBORREL4: New req. for PaaK
ENMEM-UC-REQ-095929/C-Delete a Driver Profile	MBORREL4: Updated to include PaaK
ENMEM-UC-REQ-195890/B-Delete All Driver Profiles via Master Reset	MBORREL4: Updated to include PaaK
ENMEM-UC-REQ-096802/D-User Aborts or System Cancel Event Occurs During Keyfob/Phone Association Process	MBORREL4: Updated to include PaaK
STR-176718/D-Requirements	MBORREL4: Added REQ-232984 & REQ-233009
ENMEM-SR-REQ-232984/A-Configurable Parameter to Enable PaaK HMI	MBORREL4: New req. and config bit for InterfaceClient to support PaaK
ENMEM-REQ-116801/D-Retain Enhanced Memory Settings After Software Reflash	MBORREL4: Updated to include PaaK
ENMEM-REQ-116802/D-Profile Creation Interruption	MBORREL4: Updated to include PaaK
ENMEM-HMI-REQ-233009/A-Phone HMI Indication	MBORREL4: New req. for PaaK
ENMEM-REQ-198928/B-Button Press in Button Association Mode	MBORREL4: Removed Memory_Cmd from req and changed "should" to "shall" in 1st paragraph.
STR-307927/C-Keyfob/Phone Association	MBORREL4: Updated to include PaaK, added REQ-233118, REQ-233161, REQ-234278, REQ-234279



ENMEM-REQ-099672/C-Configurable Parameter for Key/Phone Pairing	MBORREL4: Updated to include PaaK
ENMEM-REQ-233118/A-Phone Pairing Mode	MBORREL4: New req. for PaaK
ENMEM-REQ-234278/A-Detection of a Keyfob/Phone in Opposite Pairing Mode	MBORREL4: New req. for PaaK
ENMEM-HMI-REQ-234279/A-Wrong Device Detected HMI	MBORREL4: New req. for PaaK
ENMEM-REQ-198044/B-Detection of Associated Keyfob/Phone	MBORREL4: Updated to include PaaK
ENMEM-SR-REQ-198055/C-Enhanced Memory HMI Option for Associated Keyfob/Phone	MBORREL4: Updated to include PaaK
ENMEM-REQ-233161/A-Overwrite Associated Phone	MBORREL4: New req. for PaaK
ENMEM-REQ-099690/C-Keyfob/Phone Pairing Failed	MBORREL4: Updated to include PaaK
ENMEM-REQ-194169/B-Keyfob/Phone Pairing Timer Expired	MBORREL4: Updated to include PaaK
ENMEM-TMR-REQ-194101/C-T_FobAssocTotal2	MBORREL4: Updated to include PaaK
ENMEM-REQ-116804/E-Keyfob/Phone Pairing Error	MBORREL4: Updated to include PaaK
ENMEM-SR-REQ-212303/B-PersIndex used for Keyfob/Phone Association	MBORREL4: Updated to include PaaK
STR-307929/B-Delete Driver Profiles	MBORREL4: Updated to include PaaK
ENMEM-REQ-134465/D-Delete Driver Profile	MBORREL4: Updated to include PaaK
ENMEM-HMI-REQ-197502/B-Enhanced Memory HMI Indications for Delete a Driver Profile	MBORREL4: Updated to include PaaK
ENMEM-REQ-105569/D-Driver Profiles Deleted During Master Reset	MBORREL4: Updated to include PaaK
STR-307928/C-Keyfob/Phone Disassociation	MBORREL4: Updated to include PaaK, added RED-233009
ENMEM-REQ-233209/A-Disassociate the Phone per User Request	MBORREL4: New req. for PaaK
ENMEM-REQ-233210/A-Phone Disassociation Status	MBORREL4: New req. for PaaK
ENMEM-HMI-REQ-233009/A-Phone HMI Indication	MBORREL4: New req. for PaaK
STR-176721/C-Activity Diagrams	MBORREL4: Added REQ-233257
ENMEM-ACT-REQ-233257/A-Associate Phone To Driver Profile	MBORREL4: New req. for PaaK
ENMEM-ACT-REQ-099379/D-Delete Driver Profile	MBORREL4: Updated to include PaaK
ENMEM-ACT-REQ-197508/B-Master Reset	MBORREL4: Updated to include PaaK
STR-176722/C-Sequence Diagrams	MBORREL4: Added REQ-233258 & REQ-233259
ENMEM-SD-REQ-233258/A-Associate Phone	MBORREL4: New req. for PaaK
ENMEM-SD-REQ-233259/A-Disassociate Phone	MBORREL4: New req. for PaaK
ENMEM-SD-REQ-099427/D-Delete Driver Profile	MBORREL4: Updated to include PaaK
ENMEM-SD-REQ-197509/B-Master Reset	MBORREL4: Updated to include PaaK
ENMEM-FUN-REQ-195573/C-EnhancedMemoryInterfaceClient HMI Requirements - APIM	MBORREL4: Added REQ-233009, REQ-233260, REQ-234279, REQ-233264
STR-297590/E-Requirements	MBORREL4: Added REQ-233009, REQ-233260, REQ-234279, REQ-233264
ENMEM-HMI-REQ-195574/B-HMI Timeout for Overall Keyfob/Phone Pairing Process	MBORREL4: Updated to include PaaK
ENMEM-TMR-REQ-194098/C-T_FobAssocTotal	MBORREL4: Updated to include PaaK
ENMEM-HMI-REQ-195576/B-HMI Timeout for One Keyfob/Phone Pairing Attempt	MBORREL4: Updated to include PaaK
ENMEM-TMR-REQ-194099/C-T_FobAssocOneTime	MBORREL4: Updated to include PaaK
ENMEM-HMI-REQ-195575/B-Number of Retries on HMI for Keyfob/Phone Pairing	MBORREL4: Updated to include PaaK
ENMEM-REQ-179346/B-N_NumberOfRetries	MBORREL4: Updated to include PaaK



ENMEM-HMI-REQ-233009/A-Phone HMI Indication	MBORREL4: New req. for PaaK
ENMEM-HMI-REQ-197850/B-Enhanced Memory HMI Indications for Driver Profile	MBORREL4: Updated to include PaaK
ENMEM-SR-REQ-198055/C-Enhanced Memory HMI Option for Associated Keyfob/Phone	MBORREL4: Updated to include PaaK
ENMEM-HMI-REQ-197502/B-Enhanced Memory HMI Indications for Delete a Driver Profile	MBORREL4: Updated to include PaaK
ENMEM-HMI-REQ-233260/A-Keyfob & Phone Association During Profile Creation	MBORREL4: New Req. for PaaK
ENMEM-HMI-REQ-234279/A-Wrong Device Detected HMI	MBORREL4: New req. for PaaK
ENMEM-HMI-REQ-233264/A-Phone Association HMI Option	MBORREL4: New Req. for PaaK

February 1, 2017

1.8

ENMEM-IIR-REQ-099363/G-EnhancedMemoryInterfaceClient_Rx	MBORREL4: Added REQ-238321 and updated table to include PaaKConnection_St
MD-REQ-238321/A-PaaKConnection_St	wstephe1: Added method description to indicate whether a PaaK device (phone) is connected
ENMEM-UC-REQ-095721/C-Create a Driver Profile	MBORREL4: Updated to include Park as a pre-condition (clarification, no new content)
ENMEM-UC-REQ-134147/C-Create or Edit Driver Profile Name	MBORREL4: Updated to include Park as a pre-condition (clarification, no new content)
ENMEM-UC-REQ-095929/D-Delete a Driver Profile	MBORREL4: Corrected keyfob/phone disassociation post conditions
ENMEM-REQ-099686/C-Keyfob Pairing Mode	MBORREL4: Updated to include Park for exit condition (clarification, no new content)
ENMEM-REQ-233118/B-Phone Pairing Mode	MBORREL4: Updated to include Park for exit condition (clarification, no new content)
ENMEM-REQ-099690/D-Keyfob/Phone Pairing Failed	MBORREL4: Removed recalls from memory seat button during keyfob or phone association. That is no longer allowed
ENMEM-SD-REQ-099425/F-Create Driver Profile	MBORREL4: Updated Precondition to include Park (correction, no new content)
ENMEM-SD-REQ-099422/D-Associate Key Fob	MBORREL4: Updated Precondition to include Park (correction, no new content)
ENMEM-SD-REQ-233258/B-Associate Phone	MBORREL4: Updated Precondition to include Park (correction, no new content)
ENMEM-HMI-REQ-233264/B-Phone Association HMI Option	MBORREL4: Updated to include new signal name

June 6, 2018

1.9

MD-REQ-238321/B-PaaKConnection_St	cwu3: change Logic name typo (Paak) to PaaK. No content changes.
ENMEM-SR-REQ-136593/M-Network Bus Start-up / Shut-down (EnhancedMemoryServer)	MBORREL4: Removed line regarding B+ Reset, contradicts REQ-207325
ENMEM-UC-REQ-136944/C-Sign Into a Driver Profile via Memory Seat Button While Vehicle In Motion	MBORREL4: Clarification (8 KPH, not 5 KPH)
ENMEM-UC-REQ-095934/C-Memory Seat Button Recall of the Active Driver Profile	MBORREL4: Clarification (8 KPH, not 5 KPH)
ENMEM-UC-REQ-095939/C-Sign Into a Driver Profile via HMI Menu	MBORREL4: Clarification (8 KPH, not 5 KPH)
ENMEM-REQ-099693/E-Display Data Refresh After Driver Profile Change	MBORREL4: Updated to clarify that all Clients that display any EnMem settings shall perform refresh.
ENMEM-SR-REQ-136618/F-Recall Event - Infotainment Audio	MBORREL4: Updated to include TA. Added detail regarding Feature Volume session behavior
ENMEM-REQ-099674/C-Requesting Audio Preset Info After Profile Change	MBORREL4: Updated to include to all Clients that display audio presets
ENMEM-TMR-REQ-099763/C-T_PersPresetWait	MBORREL4: Updated to include to all Clients that display audio presets
ENMEM-REQ-099699/D-Disable Driver Profile Creation and Editing When Key is Not in Run or Vehicle Speed is greater than 8KPH+	MBORREL4: Updated title for clarification (8 KPH, not 5 KPH)
ENMEM-REQ-099699/E-Disable Driver Profile Creation and Editing When Key is Not	MBORREL4: Updated to specify that Gear=Park is for Auto Trans vehicles only.

in Run or Vehicle Speed is greater than
8KPHENMEM-REQ-116802/E-Profile Creation
Interruption+

MBORREL4: Clarification (8 KPH, not 5 KPH)

ENMEM-REQ-116802/F-Profile Creation
Interruption

MBORREL4: Updated to include domain changes

ENMEM-REQ-116804/F-Keyfob/Phone
Pairing Error

MBORREL4: Updated to include domain changes

May 8, 2019

1.10

STR-184156/D-Overview

MBORREL4: Updated for DSM Decouple

STR-196365/G-General Requirements

MBORREL4: Added REQ-347371 for DSM Decouple

ENMEM-REQ-116801/E-Retain Enhanced
Memory Settings After Software Reflash

MBORREL4: Updated for DSM Decouple

ENMEM-REQ-347371/A-Determining
EnhancedMemoryPositionClient Presence

MBORREL4: New req for DSM Decouple

STR-310182/C-Recall Function Description

MBORREL4: Updated for DSM Decouple

ENMEM-UC-REQ-095719/D-Memory Seat
Button Recall with Driver Profiles OFF

MBORREL4: Updated for DSM Decouple

ENMEM-UC-REQ-095930/D-Sign Into a
Driver Profile via Memory Seat Button

MBORREL4: Updated for DSM Decouple

ENMEM-UC-REQ-136944/D-Sign Into a
Driver Profile via Memory Seat Button While
Vehicle In Motion

MBORREL4: Updated for DSM Decouple

ENMEM-UC-REQ-095934/D-Memory Seat
Button Recall of the Active Driver Profile

MBORREL4: Updated for DSM Decouple

ENMEM-UC-REQ-095939/D-Sign Into a
Driver Profile via HMI Menu

MBORREL4: Updated for DSM Decouple

ENMEM-UC-REQ-161547/E-Classic Memory
Only Recall via Previously Associated
Keyfob/Phone

MBORREL4: Updated for DSM Decouple

ENMEM-SD-REQ-099433/D-Sign Into Driver
Profile Via Memory Seat Button

MBORREL4: Updated preconditions to clarify DSM presence

ENMEM-UC-REQ-095720/C-Memory Seat
Button Storing with Driver Profiles OFF

MBORREL4: Updated to convey DSM presence

ENMEM-UC-REQ-095931/C-Memory Seat
Button Storing of an Alternate Associated
Profile

MBORREL4: Updated to convey DSM presence

ENMEM-UC-REQ-095938/C-Memory Seat
Button Storing of the Active Driver Profile

MBORREL4: Updated to convey DSM presence

ENMEM-UC-REQ-166195/C-Memory Seat
Button Storing of an Unassociated Button

MBORREL4: Updated to convey DSM presence

ENMEM-SD-REQ-099435/D-Store Position
Settings To Driver Profile

MBORREL4: Updated preconditions to clarify DSM presence

STR-176719/D-Use Cases

MBORREL4: Added REQ-352157, REQ-352158, REQ-352159

ENMEM-UC-REQ-095721/D-Create a Driver
Profile (with
EnhancedMemoryPositionClient)

MBORREL4: Updated title, updated UC to convey DSM presence

ENMEM-UC-REQ-352157/A-Create a Driver
Profile (without
EnhancedMemoryPositionClient)

MBORREL4: New req. for DSM Decouple

ENMEM-UC-REQ-197170/B-Attempt to
Associate Already Associated Memory Seat
Button

MBORREL4: Updated preconditions to clarify DSM presence

ENMEM-UC-REQ-195889/D-Associate a
Keyfob with Incorrect Method

MBORREL4: Updated preconditions to clarify DSM presence

ENMEM-UC-REQ-095929/E-Delete a Driver
Profile (with EnhancedMemoryPositionClient)

MBORREL4: Updated title, updated UC to convey DSM presence

ENMEM-UC-REQ-352158/A-Delete a Driver
Profile (without
EnhancedMemoryPositionClient)

MBORREL4: New req. for DSM decouple

ENMEM-UC-REQ-195890/C-Delete All
Driver Profiles via Master Reset (with
EnhancedMemoryPositionClient)

MBORREL4: Updated title, updated UC to convey DSM presence

ENMEM-UC-REQ-352159/A-Delete All Driver
Profiles via Master Reset (without
EnhancedMemoryPositionClient)

MBORREL4: New req. for DSM decouple

ENMEM-UC-REQ-096801/C-User Aborts or
System Cancel Event Occurs During Driver
Profile Creation Process

MBORREL4: Updated preconditions to clarify DSM presence



STR-176718/E-Requirements	MBORREL4: Added REQ-352354 for DSM Decouple
ENMEM-REQ-138631/C-Missing Message DTC	MBORREL4: Updated for DSM Decouple
ENMEM-REQ-116801/E-Retain Enhanced Memory Settings After Software Reflash	MBORREL4: Updated for DSM Decouple
ENMEM-SR-REQ-095961/C-Maximum Number of Driver Profiles	MBORREL4: Updated for DSM Decouple
ENMEM-REQ-198384/B-Alignment between Opt-in Driver Profile and Memory Seat Button	MBORREL4: Updated to convey DSM presence
ENMEM-REQ-352354/A-Alignment between Opt-in Driver Profile and Profile Number	MBORREL4: New req. for DSM Decouple
ENMEM-REQ-116802/G-Profile Creation Interruption	MBORREL4: Updated for DSM Decouple
STR-307925/B-Memory Seat Button & Profile Number Association	MBORREL4: Updated name and content for DSM Decouple
ENMEM-REQ-352357/A-Memory Seat Button vs Profile Number Association	MBORREL4: New req. for DSM Decouple
ENMEM-REQ-198923/B-Copy Request	MBORREL4: Updated for DSM Decouple
ENMEM-REQ-198922/B-Driver Profile Index for Copy Command	MBORREL4: Updated for DSM Decouple
ENMEM-REQ-199347/B-Request Exit Memory Button Association Mode After Copy	MBORREL4: Updated for DSM Decouple
ENMEM-REQ-198918/B-Recall New Driver Profile After Copy	MBORREL4: Updated for DSM Decouple
ENMEM-REQ-099683/E-Storing Positional Settings for the Copy Operation	MBORREL4: Updated for DSM Decouple
ENMEM-SR-REQ-212303/C-PersIndex used for Keyfob/Phone Association	MBORREL4: Updated for DSM Decouple
STR-307929/C-Delete Driver Profiles	MBORREL4: Updated for DSM Decouple
ENMEM-REQ-105569/E-Driver Profiles Deleted During Master Reset	MBORREL4: Updated for DSM Decouple
ENMEM-ACT-REQ-099377/D-Create Driver Profile	MBORREL4: Updated for DSM Decouple
ENMEM-SD-REQ-099425/G-Create Driver Profile	MBORREL4: Updated for DSM Decouple
ENMEM-SD-REQ-197169/C-User Chooses a Seat Button That is Already Associated to Another Driver Profile	MBORREL4: Updated to convey DSM presence
ENMEM-HMI-REQ-197344/B-HMI Timeout for One Button Pairing Attempt	MBORREL4: Updated for DSM Decouple
ENMEM-HMI-REQ-197850/C-Enhanced Memory HMI Indications for Driver Profile	MBORREL4: Updated for DSM Decouple

October 18, 2019

1.11

ENMEM-FUR-REQ-134134/L-Enhanced Memory Features Supported - APIM	MBORREL4: Added Sound Immersion, DSP Mode, Tone Touch as "System Interface"
STR-176719/E-Use Cases	MBORREL4: Added REQ-368046 for HMI Seat Assoc. update
ENMEM-UC-REQ-197170/C-Attempt to Associate Already Associated Memory Seat Button	MBORREL4: Updated for HMI Seat Assoc.
ENMEM-UC-REQ-368046/A-Attempt to Associate Memory Seat Button from EnhancedMemoryInterfaceClient & EnhancedMemoryPositionClient	MBORREL4: New req. for HMI Seat Assoc.
STR-307925/C-Memory Seat Button & Profile Number Association	MBORREL4: Updated for HMI Seat Assoc. Added REQ-368047-048
ENMEM-REQ-198928/C-EnhancedMemoryPositionClient Button Press in Button Association Mode	MBORREL4: Updated title and req for HMI Seat Assoc.
ENMEM-REQ-368047/A-EnhancedMemoryInterfaceClient Button Press in Button Association Mode	MBORREL4: New req. for HMI Seat Assoc.
ENMEM-REQ-368048/A-Memory Seat Button Press Handling	MBORREL4: New req. for HMI Seat Assoc.
ENMEM-REQ-199352/B-Successful Memory Button Association	MBORREL4: Updated for HMI Seat Assoc.
ENMEM-REQ-116803/D-Request Exit Memory Seat Button Association Mode	MBORREL4: Updated for HMI Seat Assoc.
ENMEM-ACT-REQ-099377/E-Create Driver Profile	MBORREL4: Updated diagram for HMI Seat Assoc.



ENMEM-SD-REQ-099425/H-Create Driver Profile
ENMEM-SD-REQ-197169/D-User Chooses a Seat Button That is Already Associated to Another Driver Profile
ENMEM-REQ-199352/B-Successful Memory Button Association

MBORREL4: Updated diagram for HMI Seat Assoc.
MBORREL4: Updated diagram for HMI Seat Assoc.
MBORREL4: Updated for HMI Seat Assoc.

June 25, 2021

1.12

ENMEM-FRD-REQ-139772/B-Enhanced Memory InterfaceClient SPSS
ENMEM-IIR-REQ-099360/H-EnhancedMemoryInterfaceClient_Tx
MD-REQ-425793/A-FeatureCopyProfile_Rq
ENMEM-REQ-206864/B-EnhancedMemoryServers to Retain Settings After Software Reflash
STR-307926/D-Driver Profile Creation via Copy Operation
ENMEM-REQ-425794/A-Copy Request - CCPU to VIP
ENMEM-REQ-425795/A-Copy Request - VIP to FBMP Translation
ENMEM-HMI-REQ-233260/B-Keyfob, Phone, & NFC Key Association During Profile Creation

MBORREL4: Updated name to InterfaceClient
MBORREL4: Added REQ-425793
MBORREL4: New req. for internal interface from CCPU to VIP
wstephe1: Revised to account for OTA updates
MBORREL4: Added REQ-425794, REQ-425795
MBORREL4: New req. for internal interface from CCPU to VIP
MBORREL4: New req. for translating CCPU to VIP interface to FBMP
wstephe1: Updated to include NFC Key association

July 30, 2021

1.13

STR-184156/E-Overview
STR-206802/B-Architectural Design
ENMEM-CLD-REQ-099556/F-Enhanced Memory Profile Server - BCM
ENMEM-CLD-REQ-426997/A-Enhanced Memory NFC Server - NFAM
ENMEM-FUR-REQ-134134/M-Enhanced Memory Features Supported - APIM
ENMEM-IIR-REQ-099360/I-EnhancedMemoryInterfaceClient_Tx
MD-REQ-099304/E-EnMemProfilePairing_Rq
MD-REQ-404938/B-DigitalKeyList_Rq
ENMEM-IIR-REQ-099363/H-EnhancedMemoryInterfaceClient_Rx
MD-REQ-099352/D-EnMemKeyPairing_St
MD-REQ-404939/B-DigitalKeyList_Rsp
MD-REQ-426998/A-NFCDeviceTapPaired_St
MD-REQ-426999/A-NFCDeviceTap_Rq
STR-196365/H-General Requirements
ENMEM-REQ-116801/F-Retain Enhanced Memory Settings After Software Reflash
ENMEM-REQ-137867/C-Keyfob/Phone/NFC Association Term Consolidation
ENMEM-REQ-166096/F-Operations Shall Not Recall a Driver Profile
ENMEM-REQ-427000/A-NFC Key & NFCES
STR-310182/D-Recall Function Description
ENMEM-UC-REQ-095940/E-Sign Into a Driver Profile via Keyfob/Phone/NFC Key
ENMEM-UC-REQ-162635/D-Sign Into a Driver Profile via Keyfob/Phone Button Press or NFC Key Tap While Vehicle In Motion
ENMEM-UC-REQ-161547/F-Classic Memory Only Recall via Previously Associated Keyfob/Phone/NFC Key
ENMEM-UC-REQ-137996/E-Recall Last Known Driver Profile With Keypad Code

MBORREL4: Updated for NFC
MBORREL4: Added REQ-426997
MBORREL4: Added NFC Association
MBORREL4: New req.
MBORREL4: Added note for Clock setting/ Added Sirius IP SID Mapping Table
MBORREL4: Updated table. Added REQ-404938
MBORREL4: Added NFC to MD
MBORREL4: Changed signal name
MBORREL4: Update table. Added REQ-404690, REQ-404939, REQ-426998, REQ-426999
MBORREL4: Added NFC to MD
MBORREL4: Added CAK to DeviceType, PairingID to Vector. Changed signal name
MBORREL4: New req.
MBORREL4: New req.
MBORREL4: Added REQ-427000
MBORREL4: Added NFC detail
MBORREL4: Updated name for NFC, added NFC detail
MBORREL4: Added NFC detail
MBORREL4: New req.
MBORREL4: Updated for NFC
MBORREL4: Updated req and title for NFC
MBORREL4: Updated req and title for NFC
MBORREL4: Updated req and title for NFC
MBORREL4: Updated req and title for NFC



When A Keyfob/Phone/NFC Key Is Not With The User	
ENMEM-UC-REQ-137858/E-MyKey Overrides Driver Profile Setting	MBORREL4: Updated for NFC
ENMEM-UC-REQ-162575/D-Admin Key does not restrict Driver Profile associated to MyKey	MBORREL4: Updated for NFC
ENMEM-REQ-099694/C-Driver Profile Recall Event	MBORREL4: Updated for NFC
ENMEM-REQ-099671/F-Keyfob/Phone/NFC Key Detection for Driver Profile Sign-In	MBORREL4: Updated req. and title for NFC
ENMEM-REQ-199604/B-Recall Priority	MBORREL4: Updated for NFC
ENMEM-ACT-REQ-099384/E-Sign Into Driver Profile Via Keyfob/Phone/NFC Key	MBORREL4: Updated name and diagram for NFC
ENMEM-SD-REQ-099432/E-Sign Into Driver Profile Via Keyfob/Phone/NFC Key	MBORREL4: Updated name and diagram for NFC
STR-176719/F-Use Cases	MBORREL4: Added REQ-427168
ENMEM-UC-REQ-095908/E-Associate Keyfob/Phone/NFC Key to a Driver Profile	MBORREL4: Updated req. and title for NFC
ENMEM-UC-REQ-095925/D-Attempt to Associate Already Associated Keyfob/Phone/NFC Key	MBORREL4: Updated req. and title for NFC
ENMEM-UC-REQ-195889/E-Associate a Keyfob with Incorrect Method	MBORREL4: Updated for NFC
ENMEM-UC-REQ-095927/D-Disassociate Keyfob/Phone/NFC Key from a Driver Profile	MBORREL4: Updated req. and title for NFC
ENMEM-UC-REQ-194188/B-Disassociate Keyfobs from Driver Profiles after Keyfobs Are Erased from a Vehicle	MBORREL4: Updated referenced req in note
ENMEM-UC-REQ-232959/B-Disassociate Phone from Driver Profiles after Phone is Erased/Revoked	MBORREL4: Updated referenced req in note
ENMEM-UC-REQ-427168/A-Disassociate NFC key from Driver Profiles after NFC key is remotely deleted	MBORREL4: New req.
ENMEM-UC-REQ-095929/F-Delete a Driver Profile (with EnhancedMemoryPositionClient)	MBORREL4: Updated for NFC
ENMEM-UC-REQ-352158/B-Delete a Driver Profile (without EnhancedMemoryPositionClient)	MBORREL4: Updated for NFC
ENMEM-UC-REQ-195890/D-Delete All Driver Profiles via Master Reset (with EnhancedMemoryPositionClient)	MBORREL4: Updated for NFC
ENMEM-UC-REQ-352159/B-Delete All Driver Profiles via Master Reset (without EnhancedMemoryPositionClient)	MBORREL4: Updated for NFC
ENMEM-UC-REQ-096802/E-User Aborts or System Cancel Event Occurs During Keyfob/Phone/NFC Key Association Process	MBORREL4: Updated req. and title for NFC
STR-176718/F-Requirements	MBORREL4: Added REQ-427169, REQ-427170. Added 'Displaying NFC Key Association/Name' section and nested reqs
ENMEM-REQ-427169/A-Configurable Parameter to Enable NFC HMI	MBORREL4: New req. for NFC
ENMEM-REQ-116801/F-Retain Enhanced Memory Settings After Software Reflash	MBORREL4: Added NFC detail
ENMEM-REQ-116802/H-Profile Creation Interruption	MBORREL4: Updated for NFC
ENMEM-HMI-REQ-427170/A-NFC Key HMI Indication	MBORREL4: New req. for NFC
STR-307927/D-Keyfob/Phone/NFC Key Association	MBORREL4: Updated title and description. Added REQ-427323-327
ENMEM-REQ-099672/D-Configurable Parameter for Key/Phone/NFC Key Pairing	MBORREL4: Updated req. and title for NFC
ENMEM-REQ-427323/A-Maximum Number of NFC Key Associations per Profile	MBORREL4: New req. for NFC
ENMEM-REQ-427324/A-NFC Key Pairing Mode	MBORREL4: New req. for NFC
ENMEM-REQ-427325/A-NFC Key Association Status	MBORREL4: New req. for NFC
ENMEM-REQ-427326/A-NFC Key Association - Unauthorized Device Tapped	MBORREL4: New req. for NFC



ENMEM-REQ-234278/B-Detection of a Keyfob/Phone/NFC Key in Opposite Pairing Mode	MBORREL4: Updated req. and title for NFC
ENMEM-HMI-REQ-234279/B-Wrong Device Detected HMI	MBORREL4: Updated for NFC
ENMEM-REQ-198044/C-Detection of Associated Keyfob/Phone/NFC Key	MBORREL4: Updated req. and title for NFC
ENMEM-SR-REQ-198055/D-Enhanced Memory HMI Option for Associated Keyfob/Phone/NFC Key	MBORREL4: Updated req. and title for NFC
ENMEM-REQ-427327/A-Overwrite NFC Key	MBORREL4: New req. for NFC
ENMEM-REQ-099690/E-Keyfob/Phone/NFC Key Pairing Failed	MBORREL4: Updated req. and title for NFC
ENMEM-REQ-194169/C-Keyfob/Phone/NFC Key Pairing Timer Expired	MBORREL4: Updated req. and title for NFC
ENMEM-TMR-REQ-194101/D-T_FobAssocTotal2	MBORREL4: Updated for NFC
ENMEM-REQ-116804/G-Keyfob/Phone/NFC Key Pairing Error	MBORREL4: Updated req. and title for NFC
ENMEM-SR-REQ-212303/D-PersIndex used for Keyfob/Phone/NFC Key Association	MBORREL4: Updated req. and title for NFC
STR-307929/D-Delete Driver Profiles	MBORREL4: Updated for NFC
ENMEM-REQ-134465/E-Delete Driver Profile	MBORREL4: Updated for NFC
ENMEM-HMI-REQ-197502/C-Enhanced Memory HMI Indications for Delete a Driver Profile	MBORREL4: Updated for NFC
ENMEM-REQ-105569/F-Driver Profiles Deleted During Master Reset	MBORREL4: Updated for NFC
STR-307928/D-Keyfob/Phone/NFC Key Disassociation	MBORREL4: Updated name and description. Added REQ-427170, REQ-427464, REQ-427465
ENMEM-REQ-427464/A-Disassociate the NFC Key per User Request	MBORREL4: New req. for NFC
ENMEM-REQ-427465/A-NFC Key Disassociation Status	MBORREL4: New req. for NFC
ENMEM-HMI-REQ-427170/A-NFC Key HMI Indication	MBORREL4: New req. for NFC
STR-928016/A-Displaying NFC Key Association/Name	MBORREL4: New section for NFC. Added REQ-427472-475, REQ-427477, REQ-427480
ENMEM-REQ-427472/A-Max NFC Key Associations Reached	MBORREL4: New req. for NFC
ENMEM-REQ-427473/A-Display NFC Key Association	MBORREL4: New req. for NFC
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-REQ-427480/A-Update Association when NFC Key is Deleted	MBORREL4: New req. for NFC
STR-176721/D-Activity Diagrams	MBORREL4: Added REQ-427617, REQ-427798
ENMEM-ACT-REQ-427617/A-Associate NFC Key To Driver Profile	MBORREL4: New req. for NFC
ENMEM-ACT-REQ-099379/E-Delete Driver Profile	MBORREL4: Updated for NFC
ENMEM-ACT-REQ-197508/C-Master Reset	MBORREL4: Updated for NFC
ENMEM-ACT-REQ-427798/A-Display NFC Key Associations	MBORREL4: New req. for NFC
STR-176722/D-Sequence Diagrams	MBORREL4: Added REQ-427618, REQ-427619, REQ-427797
ENMEM-SD-REQ-427618/A-Associate NFC Key	MBORREL4: New req. for NFC
ENMEM-SD-REQ-427619/A-Disassociate NFC Key	MBORREL4: New req. for NFC
ENMEM-SD-REQ-099427/E-Delete Driver Profile	MBORREL4: Updated for NFC
ENMEM-SD-REQ-197509/C-Master Reset	MBORREL4: Updated for NFC
ENMEM-SD-REQ-427797/A-Display NFC Key Associations	MBORREL4: New req. for NFC
STR-297590/F-Requirements	MBORREL4: Added REQ-427170, REQ-427495



ENMEM-HMI-REQ-195574/C-HMI Timeout for Overall Keyfob/Phone/NFC Key Pairing Process	MBORREL4: Updated req. and title for NFC
ENMEM-TMR-REQ-194098/D-T_FobAssocTotal	MBORREL4: Updated for NFC
ENMEM-HMI-REQ-195576/C-HMI Timeout for One Keyfob/Phone/NFC Key Pairing Attempt	MBORREL4: Updated req. and title for NFC
ENMEM-TMR-REQ-194099/D-T_FobAssocOneTime	MBORREL4: Updated for NFC
ENMEM-HMI-REQ-195575/C-Number of Retries on HMI for Keyfob/Phone/NFC Key Pairing	MBORREL4: Updated req. and title for NFC
ENMEM-REQ-179346/C-N_NumberOfRetries	MBORREL4: Updated for NFC
ENMEM-HMI-REQ-427170/A-NFC Key HMI Indication	MBORREL4: New req. for NFC
ENMEM-HMI-REQ-197850/D-Enhanced Memory HMI Indications for Driver Profile	MBORREL4: Updated for NFC
ENMEM-SR-REQ-198055/D-Enhanced Memory HMI Option for Associated Keyfob/Phone/NFC Key	MBORREL4: Updated req. and title for NFC
ENMEM-HMI-REQ-197502/C-Enhanced Memory HMI Indications for Delete a Driver Profile	MBORREL4: Updated for NFC
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-HMI-REQ-234279/B-Wrong Device Detected HMI	MBORREL4: Updated for NFC
ENMEM-HMI-REQ-233264/C-Phone Association HMI Option	wstephe1: Wording change from "both" to all for popup selection

April 8, 2022

1.14

STR-184156/F-Overview	MBORREL4: Updated for Positional Save/Recall
STR-206802/C-Architectural Design	MBORREL4: Added REQ-485447
ENMEM-CLD-REQ-099554/E-Enhanced Memory Interface Client - APIM/PDC+	MBORREL4: Updated name to include PDC
ENMEM-CLD-REQ-099554/F-Enhanced Memory Interface Client - APIM/PDC	MBORREL4: Updated req. for PDC and Positional Save/Recall
ENMEM-FUR-REQ-134134/N-Enhanced Memory Features Supported - APIM	MBORREL4: Added Preset Pages
ENMEM-CLD-REQ-485447/A-Enhanced Memory Server - PDC	MBORREL4: New for PDC
ENMEM-FUR-REQ-485448/A-Enhanced Memory Features Supported - PDC	MBORREL4: New for PDC
ENMEM-IIR-REQ-099363/I-EnhancedMemoryInterfaceClient_Rx	MBORREL4: Updated table. Added REQ-420472-477, REQ-420479, REQ-490717
MD-REQ-238321/C-PaakConnection_St	rpaquet2 - Change NoneConnected to NotConnected
MD-REQ-404939/C-DigitalKeyList_Rsp+	MBORREL4: Added LocalID
MD-REQ-404939/D-DigitalKeyList_Rsp	MBORREL4: Updated KeyType
MD-REQ-420472/B-MirrorAutoSaveDriver_St	MBORREL4: Changed 'left' to 'driver'
MD-REQ-420473/B-MirrorAutoSavePassenger_St	MBORREL4: Changed 'right' to 'passenger'
MD-REQ-420474/A-DriverSeatAutoSave_St	MBORREL4: New req.
MD-REQ-420475/A-DriverMcsAutoSaveDriver_St	MBORREL4: New req.
MD-REQ-420476/A-PedalAutoSave_St	MBORREL4: New req.
MD-REQ-420477/A-SteeringAutoSave_St	MBORREL4: New req.
MD-REQ-420479/B-ClassicMemory_Rq	MBORREL4: Clarified this is for Driver
MD-REQ-490717/A-MemoryFeedback_Rq	MBORREL4: New req.
STR-196365/I-General Requirements	MBORREL4: Added REQ-489997-998
ENMEM-REQ-489997/A-Determining Memory Seat Button Presence	MBORREL4: New req. for Positional Save/Recall
ENMEM-REQ-489998/A-Memory Seat Button Configuration Dependency	MBORREL4: New req. for Positional Save/Recall
STR-176669/D-Requirements	MBORREL4: Added REQ-485449



ENMEMv2-REQ-485449/A-Enhanced Memory Feature Activation Status v2	MBORREL4: New req. for PDC
STR-176692/D-Use Cases	MBORREL4: Added REQ-485450
ENMEM-UC-REQ-485450/A-Sign Into a Driver Profile when Profile Locked	MBORREL4: New req. for PDC
STR-176691/E-Requirements	MBORREL4: Added REQ-435084
ENMEMv2-SR-REQ-435084/A-Recall Event - Infotainment Audio v2	MBORREL4: New req. for PAC/DSP_Phoenix
ENMEM-FUN-REQ-095958/B-Store/Recall Occupant Position Settings	MBORREL4: Added 'Recall'
STR-176708/C-Use Cases	MBORREL4: Added REQ-490737, REQ-490738
ENMEM-UC-REQ-095720/D-Memory Seat Button Storing with Driver Profiles OFF	MBORREL4: Updated preconditions
ENMEM-UC-REQ-095931/D-Memory Seat Button Storing of an Alternate Associated Profile	MBORREL4: Updated preconditions
ENMEM-UC-REQ-095938/D-Memory Seat Button Storing of the Active Driver Profile	MBORREL4: Updated preconditions
ENMEM-UC-REQ-166195/D-Memory Seat Button Storing of an Unassociated Button	MBORREL4: Updated preconditions
ENMEM-UC-REQ-490737/A-Positional Storing via HMI of the Active Driver Profile	MBORREL4: New req.
ENMEM-UC-REQ-490738/A-Positional Recalling via HMI of the Active Driver Profile	MBORREL4: New req.
STR-176706/C-Requirements	MBORREL4: Added REQ-490739-748
ENMEM-HMI-REQ-490739/A-Recall Driver Profile Positional Settings via HMI Menu	MBORREL4: New req. for Positional Save/Recall
ENMEM-HMI-REQ-490740/A-Positional Recall Button Availability	MBORREL4: New req. for Positional Save/Recall
ENMEM-REQ-490741/A-Positional Recall Operation	MBORREL4: New req. for Positional Save/Recall
ENMEM-HMI-REQ-490742/A-Positional Recall Notification - Success	MBORREL4: New req. for Positional Save/Recall
ENMEM-HMI-REQ-490743/A-Positional Recall Notification - Fail	MBORREL4: New req. for Positional Save/Recall
ENMEM-HMI-REQ-490744/A-Store Driver Profile Positional Settings via HMI Menu	MBORREL4: New req. for Positional Save/Recall
ENMEM-HMI-REQ-490745/A-Positional Store Button Availability	MBORREL4: New req. for Positional Save/Recall
ENMEM-REQ-490746/A-Positional Store Operation	MBORREL4: New req. for Positional Save/Recall
ENMEM-HMI-REQ-490747/A-Positional Store Notification - Success	MBORREL4: New req. for Positional Save/Recall
ENMEM-HMI-REQ-490748/A-Positional Recall Notification - Fail	MBORREL4: New req. for Positional Save/Recall
STR-176719/G-Use Cases	MBORREL4: Added REQ-485455
ENMEM-UC-REQ-485455/A-Startup Profile Auto-Creation - User selects different Memory Seat Button than Pers1	MBORREL4: New req. for PDC
STR-176718/G-Requirements	MBORREL4: Added REQ-485456, REQ-485458, REQ-485459
ENMEMv2-REQ-485456/A-Profile Creation Interruption v2	MBORREL4: New req. for PDC
ENMEM-REQ-485458/A-Tracking the Profile Creation process	MBORREL4: New req. for PDC
ENMEM-REQ-485459/A-Resume Profile Creation after Interruption	MBORREL4: New req. for PDC
STR-307925/D-Memory Seat Button & Profile Number Association	MBORREL4: Added REQ-485464
ENMEM-REQ-099685/F-Request Enter Memory Seat Button Association Mode	MBORREL4: Updated logical signal name ClassicMemory_Rq
ENMEMv2-REQ-485464/A-Retry and Error Handling Strategies for Seat Button Association Mode v2	MBORREL4: New req. for PDC
STR-307926/E-Driver Profile Creation via Copy Operation+	MBORREL4: Added REQ-435085
ENMEM-STR-307926/F-Driver Profile Creation via Copy Operation	MBORREL4: Added REQ-485465, REQ-485466, REQ-485467
ENMEMv2-REQ-435085/A-Wait Response From AudioServer While Copy Operation is Still in Progress v2	MBORREL4: New Req. for PAC/PDC redesign of Radio Presets



ENMEM-REQ-485465/A-Startup Profile Auto-Creation	MBORREL4: New req. for PDC
ENMEM-REQ-485466/A-Startup Profile Auto-Creation - Recall New Driver Profile After Copy	MBORREL4: New req. for PDC
ENMEM-REQ-485467/A-Startup Profile Auto-Creation - Reassign PersIndex	MBORREL4: New req. for PDC
STR-307929/E-Delete Driver Profiles	MBORREL4: Added REQ-485470
ENMEMv2-REQ-485470/A-Delete Driver Profile v2	MBORREL4: New req. for PDC
STR-176721/E-Activity Diagrams	MBORREL4: Added REQ-485472
ENMEMv2-ACT-REQ-485472/A-Create Driver Profile v2	MBORREL4: New req. for PDC
STR-176722/E-Sequence Diagrams	MBORREL4: Added REQ-485473
ENMEMv2-SD-REQ-485473/A-Create Driver Profile v2	MBORREL4: New req. for PDC



Table of Contents

REVISION HISTORY.....	2
1 OVERVIEW.....	17
2 ARCHITECTURAL DESIGN	18
2.1 ENMEM-CLD-REQ-099554/F-Enhanced Memory Interface Client - APIM/PDC.....	18
2.2 ENMEM-CLD-REQ-099555/C-Enhanced Memory Position Client - DSM.....	18
2.3 ENMEM-CLD-REQ-099556/F-Enhanced Memory Profile Server - BCM	18
2.4 ENMEM-CLD-REQ-099557/D-Enhanced Memory Server	18
2.5 ENMEM-CLD-REQ-426997/A-Enhanced Memory NFC Server - NFAM.....	18
2.6 ENMEM-CLD-REQ-134131/B-Enhanced Memory Server - APIM.....	18
2.6.1 ENMEM-FUR-REQ-134134/N-Enhanced Memory Features Supported - APIM	19
2.7 ENMEM-CLD-REQ-485447/A-Enhanced Memory Server - PDC	21
2.7.1 ENMEM-FUR-REQ-485448/A-Enhanced Memory Features Supported - PDC.....	21
2.8 EnhancedMemoryInterfaceClient Interface - APIM	23
2.8.1 ENMEM-IIR-REQ-099360/I-EnhancedMemoryInterfaceClient_Tx.....	23
2.8.2 ENMEM-IIR-REQ-099363/I-EnhancedMemoryInterfaceClient_Rx	27
2.9 EnhancedMemoryServer Interface.....	38
2.9.1 ENMEM-IIR-REQ-099371/B-EnhancedMemoryServer_Rx.....	38
3 GENERAL REQUIREMENTS	40
3.1 ENMEM-REQ-116801/F-Retain Enhanced Memory Settings After Software Reflash.....	40
3.2 ENMEM-REQ-206864/B-EnhancedMemoryServers to Retain Settings After Software Reflash.....	40
3.3 ENMEM-SR-REQ-207325/A-Updates to Non-Volatile Memory.....	40
3.4 ENMEM-REQ-134099/B-MyKey Takes Precedence Over Driver Profile Settings.....	40
3.5 ENMEM-REQ-136642/B-Driver Distraction	40
3.6 ENMEM-REQ-198389/B-Enhanced Memory Ignition Restriction	40
3.7 ENMEM-REQ-136644/A-Crank Event - Enhanced Memory.....	40
3.8 ENMEM-REQ-136692/C-Enhanced Memory Feature Classification	41
3.9 ENMEM-SR-REQ-136936/C-Request/Response return to Null state	41
3.10 ENMEM-TMR-REQ-198777/A-T_ReturnToNull.....	41
3.11 ENMEM-SR-REQ-136937/E-Enhanced Memory Feature Inclusion Guidelines	41
3.12 ENMEM-REQ-137866/A-Recall and Sign-In term consolidation.....	41
3.13 ENMEM-REQ-137867/C-Keyfob/Phone/NFC Association Term Consolidation	41
3.14 ENMEM-REQ-166096/F-Operations Shall Not Recall a Driver Profile.....	41
3.15 ENMEM-REQ-232557/A-Phone & Phone-As-A-Key.....	42
3.16 ENMEM-REQ-347371/A-Determining EnhancedMemoryPositionClient Presence	42
3.17 ENMEM-REQ-427000/A-NFC Key & NFCES.....	42
3.18 ENMEM-REQ-489997/A-Determining Memory Seat Button Presence	42



3.19	ENMEM-REQ-489998/A-Memory Seat Button Configuration Dependency	42
4	FUNCTIONAL DEFINITION.....	43
4.1	ENMEM-FUN-REQ-136591/B-System Start-Up and Shut Down.....	43
4.1.1	Requirements	43
4.2	ENMEM-FUN-REQ-095956/A-Enable/Disable Driver Profiles.....	45
4.2.1	Use Cases	45
4.2.2	Requirements	46
4.2.3	White Box View.....	48
4.3	ENMEM-FUN-REQ-095957/B-Sign-In/Recall Settings.....	51
4.3.1	Recall Function Description.....	51
4.3.2	Use Cases	51
4.3.3	Requirements	56
4.3.4	White Box View.....	61
4.4	ENMEM-FUN-REQ-095958/B-Store/Recall Occupant Position Settings	68
4.4.1	Use Cases	68
4.4.2	Requirements	70
4.4.3	White Box View.....	72
4.5	ENMEM-FUN-REQ-095959/A-Create/Edit Driver Profile	74
4.5.1	Use Cases	74
4.5.2	Requirements	82
4.5.3	White Box View.....	103
4.6	ENMEM-FUN-REQ-195573/C-EnhancedMemoryInterfaceClient HMI Requirements - APIM.....	127
4.6.1	Requirements	127
5	APPENDIX: REFERENCE DOCUMENTS.....	132



1 Overview

The Enhanced Memory feature introduces the Driver Profiles concept which extends memory capability of the vehicle. The current memory capability, commonly referred to as "Classic Memory," only covers things related to driver position such as seat position, exterior mirror position and steering column position. With the addition of a driver profiles the memory capabilities are expanded to include many other settings that may include but are not limited to radio presets, navigation preferences, and drive assist settings.

Enhanced Memory allows a driver to create a unique profile that, when active, will automatically save included settings and keep those settings associated to this profile. When "Classic Memory" is available on the vehicle, the unique profile will be associated to one of the "Classic Memory" driver seat buttons and the driver can use this button to sign into his/her profile. The driver may also elect to associate a keyfob or phone or NFC Card/Digital Key to his/her profile such that when the unlock button of the chosen keyfob or phone is pressed, or an NFC tap is detected, the driver is automatically signed into his/her associated profile. Additionally, the driver has the option to sign-into his/her profile through the infotainment screen HMI.

In support of the Reductive Switch Design effort, when physical Memory Seat Buttons are not available, soft buttons on the HMI are offered that allow a user to manually Save and Recall their positional settings.



2 Architectural Design

2.1 ENMEM-CLD-REQ-099554/F-Enhanced Memory Interface Client - APIM/PDC

The EnhancedMemoryInterfaceClient is responsible for the tasks listed below.

- Offering the user an interface to turn on and off Enhanced Memory feature
- Offering the user an interface to create, edit, delete and change Driver Profiles
- Offering the user an interface to save and recall Positional Settings (when conditions met)
- 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
- Performing Startup Profile Auto-Creation when applicable

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

2.2 ENMEM-CLD-REQ-099555/C-Enhanced Memory Position Client - DSM

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 memory seat button is pressed
- Making changes to the position settings when a setting store operation is detected via a memory seat button

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

2.3 ENMEM-CLD-REQ-099556/F-Enhanced Memory Profile Server - BCM

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 or phone to/from a selected Driver Profile
- Associating or Disassociating a selected NFC key to/from a selected Driver Profile

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

2.4 ENMEM-CLD-REQ-099557/D-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

2.5 ENMEM-CLD-REQ-426997/A-Enhanced Memory NFC Server - NFAM

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.

2.6 ENMEM-CLD-REQ-134131/B-Enhanced Memory Server - APIM



2.6.1 ENMEM-FUR-REQ-134134/N-Enhanced Memory Features Supported - APIM

Remembered Feature	Remembered Settings	Affected Module	Feature Name
Screen Display Settings & Vehicle Settings	Center Stack Display: Auto Dim, Screen Mode, Brightness, etc Vehicle Setting		
	Clock Settings	APIM (Internal)	Time Zone
	Display Settings	APIM (Internal)	Screen mode (ie day/night mode)
	Display Settings	APIM (Internal)	Auto Dim
	Display Settings	APIM (Internal)	Screen Brightness
	Touchscreen Settings	APIM (Internal)	Sounds - Touchscreen button beep
	Touchscreen Settings	APIM (Internal)	Sounds - EFP Button Beep
	Language Settings	System interface / APIM (internal)	Language***
	Vehicle Settings	System interface	Distance Units
	Vehicle Settings	System interface	Clock (12/24 mode) Note: Starting with MY23 programs
	Vehicle Settings	System interface	Temperature Units
	Vehicle Settings	System interface / APIM (internal)	Ambient Lighting**
	Camera Setting	APIM (Internal)	Enhanced Park Aids
	Camera Setting	APIM (Internal)	Rear Camera Delay ON / OFF
Radio Settings - Station presets	Station Presets (SDARS, Preset Pages)		
	Radio Presets	APIM (Internal)	Sirius IP SID Mapping Table (to support/enable IP Channel Radio Preset personalization)
	Radio Presets	APIM (Internal)	Preset Pages
Audio / Volume Settings	Audio / Volume Settings		
	Volume Settings	System interface	Speed Compensated Volume
	Volume Settings	System interface	Phone Volume
	Volume Settings	System interface	Prompt Volume
	Volume Settings	System interface	Voice Recognition Volume
	Volume Settings	System interface	TA Volume
	Audio Settings	System interface	Equalizer Setting - Bass
	Audio Settings	System interface	Equalizer Setting - Treble



	Audio Settings	System interface	Equalizer Setting - Balance
	Audio Settings	System interface	Equalizer Setting - Fade
	Audio Settings	System interface	Equalizer Setting - Mid
	Audio Settings	System interface	Audio Occupancy Modes
	Audio Settings	System interface	DSP Mode (ex Surround, Stereo, OnStage, Audience ...)
	Audio Settings	System interface	Sound Immersion
	Audio Settings	System interface	Propulsion Sound
	Audio Settings	System interface	Tone Touch
Phone	Phone		
	Favorite Phone	APIM (internal)	Favorite Phone (includes phone settings: ring tone, Phonebook sorting...)
Voice Recognition Settings	Center Stack Display: Interaction Mode, Confirmation Prompts		
	Voice Recognition Settings	APIM (Internal)	Voice Recognition – Advance Mode
	Voice Recognition Settings	APIM (Internal)	Voice Recognition – Phone Confirmation
	Voice Recognition Settings	APIM (Internal)	Voice Recognition – Voice Command List
Navigation Preferences and Settings	Center Stack Display: Navigation: Map Preferences, Route Preferences, Navigation Preferences, Traffic Preferences, Avoid Areas.		
	Navigation Settings	APIM (Internal)	Nav Prefs - Guidance Prompts
	Navigation Settings	APIM (Internal)	Nav Prefs - Parking POI Notification
	Navigation Settings	APIM (Internal)	Route Prefs - Preferred Route
	Navigation Settings	APIM (Internal)	Route Prefs - Avoid Freeways
	Navigation Settings	APIM (Internal)	Route Prefs - Avoid Tollroads
	Navigation Settings	APIM (Internal)	Route Prefs - Avoid Ferries / Car trains
	Navigation Settings	APIM (Internal)	Route Preferences - Use HOV Lanes
	Navigation Settings	APIM (Internal)	Route Prefs - Avoid Tunnels
	Navigation Settings	APIM (Internal)	Map Prefs - Map Content - Breadcrumbs
	Navigation Settings	APIM (Internal)	Map Prefs - Map Content - Point of Interest (POI) Icons
	Navigation Settings	APIM (Internal)	POI map overlay



	Navigation Settings	APIM (Internal)	Previous destinations
	Navigation Settings	APIM (Internal)	Traffic Prefs - traffic (map)
	Navigation Settings	APIM (Internal)	Dynamic Route Guidance (On/Off)

- Note when says "System interface" it can be something as simple as monitoring the status signals which APIM module should be doing already (ex Audio Settings, Vehicle Settings, Volume periodic status messages). See enhanced memory SPSS functional requirements for how this is done
 - If don't have an * asterisk(s) next to a feature name marked as System Interface there should be no new requirements that need to be added to the SPSS features/functions.
- ** For Ambient Lighting to support enhanced memory see "Ambient Lighting – Variant 2"
- *** For Language see SPSS updates for Language and enhanced memory

2.7 ENMEM-CLD-REQ-485447/A-Enhanced Memory Server - PDC

2.7.1 ENMEM-FUR-REQ-485448/A-Enhanced Memory Features Supported - PDC

Remembered Feature	Remembered Settings	Affected Module	Feature Name
Screen Display Settings & Vehicle Settings	Center Stack Display: Auto Dim, Screen Mode, Brightness, etc Vehicle Setting		
	Clock Settings	PDC (Internal)	Time Zone
	Display Settings	PDC (Internal)	Screen mode (ie day/night mode)
	Display Settings	PDC (Internal)	Auto Dim
	Display Settings	PDC (Internal)	Screen Brightness
	Touchscreen Settings	PDC (Internal)	Sounds - Touchscreen button beep
	Touchscreen Settings	PDC (Internal)	Sounds - EFP Button Beep
	Language Settings	System interface / PDC (internal)	Language***
	Vehicle Settings	System interface	Distance Units
	Vehicle Settings	System interface	Clock (12/24 mode) Note: Starting with MY23 programs
	Vehicle Settings	System interface	Temperature Units
	Vehicle Settings	System interface / PDC (internal)	Ambient Lighting**
	Camera Setting	PDC (Internal)	Enhanced Park Aids
	Camera Setting	PDC (Internal)	Rear Camera Delay ON / OFF
Radio Settings - Station presets	Station Presets (SDARS, Preset Pages)		
	Radio Presets	PDC (Internal)	Sirius IP SID Mapping Table (to support/enable IP Channel Radio Preset personalization)
	Radio Presets	PDC (Internal)	Preset Pages



Audio / Volume Settings	Audio / Volume Settings		
	Volume Settings	System interface	Speed Compensated Volume
	Volume Settings	PDC (Internal)	Phone Volume
	Volume Settings	PDC (Internal)	Mixable Prompt Volume (ex SYNC Prompts) and VR Volume
	Volume Settings	PDC (Internal)	Radio Announcement Volume
	Volume Settings	PDC (Internal)	Call Ring Volume
	Audio Settings	System interface	Equalizer Setting - Bass
	Audio Settings	System interface	Equalizer Setting - Treble
	Audio Settings	System interface	Equalizer Setting - Balance
	Audio Settings	System interface	Equalizer Setting - Fade
	Audio Settings	System interface	Equalizer Setting - Mid
	Audio Settings	System interface	Audio Occupancy Modes
	Audio Settings	System interface	DSP Mode (ex Surround, Stereo, OnStage, Audience ...)
	Audio Settings	System interface	Sound Immersion
	Audio Settings	PDC (Internal)	Propulsion Sound
	Audio Settings	System interface	Tone Touch
Phone	Phone		
	Favorite Phone	PDC (internal)	Favorite Phone (includes phone settings: ring tone, Phonebook sorting...)
Voice Recognition Settings	Center Stack Display: Interaction Mode, Confirmation Prompts		
	Voice Recognition Settings	PDC (Internal)	Voice Recognition – Advance Mode
	Voice Recognition Settings	PDC (Internal)	Voice Recognition – Phone Confirmation
	Voice Recognition Settings	PDC (Internal)	Voice Recognition – Voice Command List

- Note when says "System interface" it can be something as simple as monitoring the status signals which PDC module should be doing already (ex Audio Settings, Vehicle Settings, Volume periodic status messages). See enhanced memory SPSS functional requirements for how this is done
 - If don't have an * asterisk(s) next to a feature name marked as System Interface there should be no new requirements that need to be added to the SPSS features/functions.
- ** For Ambient Lighting to support enhanced memory see "Ambient Lighting – Variant 2"
- *** For Language see SPSS updates for Language and enhanced memory



2.8 EnhancedMemoryInterfaceClient Interface - APIM

2.8.1 ENMEM-IIR-REQ-099360/I-EnhancedMemoryInterfaceClient_Tx

The EnhancedMemoryInterfaceClient_Tx represents all the Enhanced Memory feature related signals transmitted by the EnhancedMemoryInterfaceClient object. The below table represents the mapping of the logical signal names (as described in this specification) to the global GSDB signal names.

Logical Signal Name	Parameter Name	GSDB Signal Name
EnMemProfilePairing_Rq	PersIndex	EmPrfINo_D_Rq
	ButtonPairing	EmPrfIButtnAssoc_D_Rq
	KeyPairing	EmPrfIKeyAssoc_D_Rq
	NFCKeyPairing	DgtlKeyPrfIAssoc_D_Rq
EnhancedMemory_St	Status	Em_D_Stat
InfotainmentPersStore_Rq	PersIndex	PersStore_D_Rq
InfotainmentRecall_Rq	PersIndex	CntrStk_D_RqRecall
PersonalityOptIn_St	Pers1Status	Pers1OptIn_B_Stats
	Pers2Status	Pers2OptIn_B_Stats
	Pers3Status	Pers3OptIn_B_Stats
	Pers4Status	Pers4OptIn_B_Stats
Feature_Rq	Operation	CtrStkDsplyOp_D_Rq
	FeatureID	CtrStkFeatNoActl
	Configuration	CtrStkFeatConfigActl
	PersIndex	CtrStkPersIndex_D_Actl
FactoryReset_Rq	Type	SDARS_FactoryReset_Rq
DigitalKeyList_Rq	See TP SPSS	See TP SPSS

Note: GSDB signal names are reference only. The Global Signal Database (GSDB) is the master for all signals. If there is a conflict bring to the module D&R's attention.

2.8.1.1 MD-REQ-099304/E-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 memory seat button pairing mode, keyfob pairing mode, phone pairing mode, or 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 key fob and phone pairing mode 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 pairing mode request value. Received by Enhanced Memory Profile Server only
	Null	0x0	
	EnterKeyPairing	0x1	
	ExitKeyPairing	0x2	
	DisassociateKey1	0x3	
	DisassociateKey2	0x4	
	DisassociateKey3	0x5	
	DisassociateKey4	0x6	
	OverwriteKey	0x7	

2.8.1.2 MD-REQ-099311/B-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	

2.8.1.3 MD-REQ-099305/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	

2.8.1.4 MD-REQ-099308/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	

2.8.1.5 MD-REQ-099309/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	

2.8.1.6 MD-REQ-014068/A-Feature_Rq (TcSE ROIN-282333-2)

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	

2.8.1.7 MD-REQ-015018/A-FactoryReset_Rq (TcSE ROIN-284876-1)

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	

2.8.1.8 MD-REQ-425793/A-FeatureCopyProfile_Rq

Message Type: VIP Internal Request

This request is sent internally to VIP from CCPU to perform a copy of a given Personality Index.

Signal Name	Size (bits)	Detail	Units	Res.	Offset	State Encoded	Min	Max
FeatureCopyProfile_Rq	3		SED	1	0		0 (0x0)	1 (0x7)
		PERS_1				0 (0x0)		
		PERS_2				1 (0x1)		
		PERS_3				2 (0x2)		
		PERS_4				3 (0x3)		
		Vehicle				4 (0x4)		
		Unused				5 (0x5)		
		Unused				6 (0x6)		
		Unused				7 (0x7)		

**2.8.1.9 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	

2.8.2 ENMEM-IIR-REQ-099363/I-EnhancedMemoryInterfaceClient_Rx

The EnhancedMemoryInterfaceClient_Rx represents all the Enhanced Memory feature related signals received by the EnhancedMemoryInterfaceClient object. The below table represents the mapping of the logical signal names (as described in this specification) to the global GSDB signal names.

Logical Signal Name	Parameter Name	GSDB Signal Name
ActivePersonality_St	PersIndex	PersNo_D_Actl
EnMemButtonPairing_St	ButtonPairing	EmButtn_D_Stat
EnMemKeyPairing_St	PersIndex	EmPrflNo_D_Stat
	KeyPairing	EmPrflKeyAssoc_D_Stat
InfotainmentPersStore_St	Status	PersStore_D_Actl
PersonalityRecallCount_St	CountValue	RecallEvent_No_Cnt
PersKeyPairing_St	Pers1KeyStatus	Pers1Key_D_Stat
	Pers2KeyStatus	Pers2Key_D_Stat
	Pers3KeyStatus	Pers3Key_D_Stat
	Pers4KeyStatus	Pers4Key_D_Stat
PersPhonePairing_St	Pers1PhoneStatus	Pers1Phone_D_Stat
	Pers2PhoneStatus	Pers2Phone_D_Stat
	Pers3PhoneStatus	Pers3Phone_D_Stat
	Pers4PhoneStatus	Pers4Phone_D_Stat
PersNFCKeyPairing_St	PersIndex	PersPrfl_D_Stat



	PersNFCKey1Index	PersDgtlKey1_D_Stat
	PersNFCKey2Index	PersDgtlKey2_D_Stat
	PersNFCKey3Index	PersDgtlKey3_D_Stat
	PersNFCKey4Index	PersDgtlKey4_D_Stat
PaakConnection_St	Status	PaakCnnct_D_Stat
DigitalKeyList_Rsp	See TP SPSS	See TP SPSS
NFCDeviceTapPaired_St	Type	NfcDevcTapPrd_B_Stat
NFCDeviceTap_Rq	Type	NfcDevcTap2_No_Rq
MirrorAutoSaveDriver_St	Type	MrorAutoSavDrv_D_Stat
MirrorAutoSavePassenger_St	Type	MrorAutoSavPsngr_D_Stat
DriverSeatAutoSave_St	Type	SeatAutoSavDrv_D_Stat
DriverMcsAutoSaveDriver_St	Type	StmsAutoSavDrv_D_Stat
PedalAutoSave_St	Type	PdlAutoSav_D_Stat
SteeringAutoSave_St	Type	SteAutoSav_D_Stat
ClassicMemory_Rq	Type	Memory_Cmd
MemoryFeedback_Rq	Type	Memory_Feedback_Rqst

Note: GSDB signal names are reference only. The Global Signal Database (GSDB) is the master for all signals. If there is a conflict bring to the module D&R's attention.

2.8.2.1 MD-REQ-099354/E-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	
	NotUsed	0x7	

2.8.2.2 MD-REQ-099312/A-EnMemButtonPairing_St

Message Type: Status

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

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

**2.8.2.3 MD-REQ-099352/D-EnMemKeyPairing_St**

Method Type: Status

The signal is used to inform the Enhanced Memory Interface Client the status of key fob, phone, and NFC 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 key fob, phone, and NFC Key pairing mode status value.
	Null	0x0	
	KeyPairingEntered	0x1	
	KeyPairingExited	0x2	
	KeyDisassociated	0x3	
	KeyAlreadyInUse	0x4	
	KeyAssociateSuccess	0x5	
	KeyAssociateFailed	0x6	
	WrongDeviceSelected	0x7	

2.8.2.4 MD-REQ-099349/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	

2.8.2.5 MD-REQ-099356/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	

**2.8.2.6 MD-REQ-197231/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	

2.8.2.7 MD-REQ-233493/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	

2.8.2.8 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	

2.8.2.9 MD-REQ-238321/C-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	

**2.8.2.10 MD-REQ-404939/D-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, LocalID, 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	
	Owner Device	0x03	
	Shared Device	0x04	
	Reserved	0x05 – 0xFF	
KeyStatus	-	-	Describes Key status
	Pending Add	0x00	
	Pending Delete	0x01	
	Added/Confirmed	0x02	
	Reserved	0x03 – 0xFF	
LocalID	-	-	Describes the Local ID
	Inactive	0x00	
	ID 1	0x01	
	ID 2	0x02	
	
	ID 255	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

2.8.2.11 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	

2.8.2.12 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	

2.8.2.13 MD-REQ-420472/B-MirrorAutoSaveDriver_St

Message Type: Status

The signal is used to indicate that changes have occurred on the Driver mirror.

Name	Literals	Value	Description
Type	-	-	Indicates that changes have occurred on the Driver mirror
	None	0x0	
	InProgress	0x1	
	Major	0x2	
	Minor	0x3	

2.8.2.14 MD-REQ-420473/B-MirrorAutoSavePassenger_St

Message Type: Status

The signal is used to indicate that changes have occurred on the Passenger mirror.

Name	Literals	Value	Description
Type	-	-	Indicates that changes have occurred on the Passenger mirror
	None	0x0	
	InProgress	0x1	
	Major	0x2	
	Minor	0x3	

2.8.2.15 MD-REQ-420474/A-DriverSeatAutoSave_St

Message Type: Status

The signal is used to indicate that changes have occurred on the driver seat.

Name	Literals	Value	Description
Type	-	-	Indicates that changes have occurred on the driver seat
	None	0x0	
	InProgress	0x1	
	Major	0x2	
	Minor	0x3	

2.8.2.16 MD-REQ-420475/A-DriverMcsAutoSaveDriver_St

Message Type: Status

The signal is used to indicate that changes have occurred on the drivers multi contour seat.

Name	Literals	Value	Description
Type	-	-	Indicates that changes have occurred on the drivers multi contour seat
	None	0x0	
	InProgress	0x1	



	Major	0x2	
	Minor	0x3	

2.8.2.17 MD-REQ-420476/A-PedalAutoSave_St

Message Type: Status

The signal is used to indicate that changes have occurred on the pedals.

Name	Literals	Value	Description
Type	-	-	Indicates that changes have occurred on the pedals
	None	0x0	
	InProgress	0x1	
	Major	0x2	
	Minor	0x3	

2.8.2.18 MD-REQ-420477/A-SteeringAutoSave_St

Message Type: Status

The signal is used to indicate that changes have occurred on the steering column.

Name	Literals	Value	Description
Type	-	-	Indicates that changes have occurred on the steering column
	None	0x0	
	InProgress	0x1	
	Major	0x2	
	Minor	0x3	

2.8.2.19 MD-REQ-420479/B-ClassicMemory_Rq

Message Type: Request

The signal is used to request a store or recall of the driver classic memory/positional modules.

Name	Literals	Value	Description
Type	-	-	Indicates store or recall of driver classic memory
	Null	0x0	
	Store_1	0x1	
	Store_2	0x2	
	Store_3	0x3	
	Store_4	0x4	
	Recall_1	0x5	
	Recall_2	0x6	
	Recall_3	0x7	
	Recall_4	0x8	
	NotUsed	0x9 -0xF	

2.8.2.20 MD-REQ-490717/A-MemoryFeedback_Rq

Message Type: Request

The signal is used to request feedback when a memory store or remote transmitter association to memory has taken place.

Name	Literals	Value	Description
Type	-	-	Indicates request for feedback
	No	0x0	
	Yes	0x1	



Ford Motor Company

Subsystem Part Specific Specification
Engineering Specification



2.9 EnhancedMemoryServer Interface

2.9.1 ENMEM-IIR-REQ-099371/B-EnhancedMemoryServer_Rx

The EnhancedMemoryServer_Rx represents all the Enhanced Memory feature related signals received by the EnhancedMemoryServer object. The below table represents the mapping of the logical signal names (as described in this specification) to the global GSDB signal names.

Logical Signal Name	Parameter Name	GSDB Signal Name
ActivePersonality_St	PersIndex	PersNo_D_Actl
PersonalityRecallCount_St	CountValue	RecallEvent_No_Cnt
Feature_Rq	Operation	CtrStkDsplyOp_D_Rq
	FeatureID	CtrStkFeatNoActl
	Configuration	CtrStkFeatConfigActl
	PersIndex	CtrStkPersIndex_D_Actl
FactoryReset_Rq	Type	SDARS_FactoryReset_Rq

Note: GSDB signal names are reference only. The Global Signal Database (GSDB) is the master for all signals. If there is a conflict bring to the module D&R's attention.

2.9.1.1 MD-REQ-099354/E-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	
	NotUsed	0x7	

2.9.1.2 MD-REQ-099356/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	

**2.9.1.3 MD-REQ-014068/A-Feature_Rq (TcSE ROIN-282333-2)**

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	

2.9.1.4 MD-REQ-015018/A-FactoryReset_Rq (TcSE ROIN-284876-1)

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	



3 General Requirements

3.1 ENMEM-REQ-116801/F-Retain Enhanced Memory 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, phones and/or NFC keys after a software reflash service is done at dealership.

The information to be retained shall include:

- Opted in and opted out (created and deleted) status of all Driver Profiles
- Driver Profile's keyed-in name
- The association of Driver Profile name to Memory Seat button number (when "EnhancedMemoryPositionClient = Present"), OR
- The association of Driver Profile name to Profile Number (when "EnhancedMemoryPositionClient = NotPresent")

3.2 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.

3.3 ENMEM-SR-REQ-207325/A-Updates to Non-Volatile Memory

Personalized settings supported by EnhancedMemoryServers shall be stored in those modules' 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.

3.4 ENMEM-REQ-134099/B-MyKey Takes Precedence Over Driver Profile Settings

If a MyKey is the active key 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 override the personalized setting.

3.5 ENMEM-REQ-136642/B-Driver Distraction

For the purpose of this document if there are any existing driver distraction requirements and / or guidelines those requirements do apply for enhanced memory and supersede any requirements in this specification.

For any conflicts bring to the attention to the Ford D&R.

3.6 ENMEM-REQ-198389/B-Enhanced Memory Ignition Restriction

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

- Create/add Driver Profiles
- Edit Driver Profiles

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

3.7 ENMEM-REQ-136644/A-Crank Event - Enhanced Memory

For the purposes of this document 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 then unless noted otherwise it shall be assumed that in the use cases and functional requirements that Ignition remained in Run.



3.8 ENMEM-REQ-136692/C-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.

3.9 ENMEM-SR-REQ-136936/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.

3.10 ENMEM-TMR-REQ-198777/A-T_ReturnToNull

Name	Description	Units	Range	Resolution	Default
T_ReturnToNull	The nominal hold time before returning to a Null state. Use the default value +/- 10%.	sec	0.5-2	0.5	1

3.11 ENMEM-SR-REQ-136937/E-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 keyfobs, phones, and Driver Profiles within a vehicle. For example, the MyKey Max Speed setting for MyKey keyfob1 and MyKey keyfob2 can only be the same.

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 Reference section.

3.12 ENMEM-REQ-137866/A-Recall and Sign-In term consolidation

For purposes of this specification the terms "Recall" and "Sign-In" are used interchangeably and have the same meaning.

3.13 ENMEM-REQ-137867/C-Keyfob/Phone/NFC Association Term Consolidation

For purposes of this specification the terms "Link," "Pair," and "Associate" are used interchangeably with respect to describing a keyfob's, phone's, or NFC key's connection to the Enhanced Memory feature, and thus have the same meaning.

3.14 ENMEM-REQ-166096/F-Operations Shall Not Recall a Driver Profile

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

- Entering a keypad code
- Starting engine with an associated or an 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

3.15 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.

3.16 ENMEM-REQ-347371/A-Determining EnhancedMemoryPositionClient Presence

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

3.17 ENMEM-REQ-427000/A-NFC Key & NFCES

The association of an NFC Key/Digital Key to a Driver Profile shall be supported by use of the NFC Entry and Starting (NFCES) feature. The NFC key must be setup/paired/authorized before it can be associated to a Driver Profile.

Refer to the NFCES feature specification for detailed information.

3.18 ENMEM-REQ-489997/A-Determining Memory Seat Button Presence

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

- When the parameter indicates that Memory Seat Buttons are “Present”, all functionality and signals defined in this specification (see FUN-REQ-095958) shall be supported assuming that Memory Seat Buttons are present.
 - The default value for this parameter shall be “Present”.
- When the parameter indicates that Memory Seat Buttons are “Not Present”, all functionality and signals defined in this specification (see FUN-REQ-095958) shall be supported assuming that Memory Seat Buttons are not present.

3.19 ENMEM-REQ-489998/A-Memory Seat Button Configuration Dependency

When the Enhanced Memory Position Client is not present (per REQ-347371) then the EnhancedMemoryInterfaceClient shall also be configured with Memory Seat Buttons not present (per REQ-489997).

In the event that the Memory Seat Buttons are configured as present when the Enhanced Memory Position Client is configured as not present, the EnhancedMemoryInterfaceClient shall consider/ behave as though Memory Seat Buttons are not present.



4 Functional Definition

4.1 ENMEM-FUN-REQ-136591/B-System Start-Up and Shut Down

4.1.1 Requirements

4.1.1.1 ENMEM-SR-REQ-136592/M-Network Bus Start-up / Shut-down (EnhancedMemoryProfileServer)

The EnhancedMemoryProfileServer shall update the ActivePersonality_St signal with the active personality (Vehicle, Pers1 – Pers4) used within 500 msec of network bus wake-up.

- 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 at network bus start-up.
- Exception: If within the first 500 msec of bus wake-up if the value of ActivePersonality_St is not known because of an error (ie application powered up and still doesn't know), then the Enhanced Memory Profile Server shall update the ActivePersonality_St signal with the default value of Vehicle. This could possibly occur for example if the EEPROM was corrupted.

At network bus wake-up/start-up if the EnhancedMemoryProfileServer receives EnhancedMemory_St =Null then the EnhancedMemoryProfileServer shall assume the last known state (ex if Enhanced Memory was last ON before network shutdown then assume still ON).

At network bus wake-up/start-up if the EnhancedMemoryProfileServer has not received PersonalityOptIn_St within 500 msec of network bus wake-up then the EnhancedMemoryProfileServer shall assume the last known state (ex if all profiles were opted-in before network shutdown than assume they are still opted-in).

The EnhancedMemoryProfileServer shall remember the last active personality profile between different power mode cycles such as remembering (but not limited to):

- between network bus sleep and wake-up events, and
- between ignition cycles

Responding to request signals at network bus start-up:

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 when Ignition_Status = OFF). In order for request signals not to be lost (first change in the request signal encoding value wakes up the other bus) the following shall be supported:

- The EnhancedMemoryProfileServer shall be able to receive enhanced memory request signals such as "InfotainmentRecall = New PersonX" or "EnhancedMemory = ON/OFF" within 200 msec of network bus wake-up. If the application software is not completely powered up after 200 msec those signals shall be stored and processed later by the EnhancedMemoryProfileServer.

4.1.1.2 ENMEM-SR-REQ-136594/I-Network Bus Start-up / Shut-down (EnhancedMemoryInterfaceClient)

The EnhancedMemoryInterfaceClient shall update the "EnhancedMemory_St" and "PersonalityOptIn_St : Pers1/2/3/4Status" signals with the last known state within 500 msec of network bus wake-up.

- 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 : Pers1/2/3/4Status" signals shall not be published on the bus until the last known state is published and shall not publish its CAN init value at CAN bus start-up.
 - Note: The "PersonalityOptIn_St : Pers1/2/3/4Status" signals shall not be set to the CAN dB Init value at CAN bus start-up since there is no "Null" value and only put on the bus the last value of the OptIn is published (has to be done within 500 msec of network bus wake-up)



The EnhancedMemoryInterfaceClient shall remember the “EnhancedMemory_St” and “PersonalityOptIn_St : Pers1/2/3/4Status” signal settings between different power mode cycles such as remembering:

- between network bus sleep and wake-up events, and
- between ignition cycles, and
- after a B+ reset

Note: ActivePersonality_St = NotDetermined is treated as a don't care and shall assume the last known state.

Request signals / Status signal update:

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 500 msec later 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 500 msec 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.

4.1.1.3 ENMEM-SR-REQ-136593/M-Network Bus Start-up / Shut-down (EnhancedMemoryServer)

At network bus wake-up/start-up the EnhancedMemoryServer shall act on the ActivePersonality_St and PersonalityRecallCounter_St signals.

- The EnhancedMemoryServer shall remember the last active personality and PersonalityRecallCounter_St for the following (but not limited to):
 - between network bus sleep and wake-up events, and
 - between ignition cycles
 - when any network communication failure prevents these signals from being transmitted by the EnhancedMemoryProfileServer

Note: If the last active personality cannot be determined, the EnhancedMemoryServer shall default to the Vehicle level Profile (Guest Profile).

Note: ActivePersonality_St = NotDetermined is treated as a don't care and shall assume the last known state.

Infotainment Only:

At infotainment system start-up the Infotainment System Master (ex SYNC) shall recall the last savable active audio source prior to the last shutdown. The active audio source is not personalizable for different personality profiles.

- For example if Profile 3 was last active at shutdown with CD as the last active source and if personality Profile 1 (last source SDARS) is active at start-up then the System Master shall still activate CD for personality Profile 1.

If a tuner source was the last savable source at shutdown then at system start-up the last known tuner frequency and band shall be activated regardless of personality Profile used at start-up.



4.2 ENMEM-FUN-REQ-095956/A-Enable/Disable Driver Profiles

4.2.1 Use Cases

4.2.1.1 ENMEM-UC-REQ-095714/B-Enable Driver Profiles Feature

Actors	Vehicle Occupant
Pre-conditions	The Driver Profiles feature is set to Off (i.e. enhanced memory feature is turned Off).
Scenario Description	The User accesses the Driver Profiles HMI menu and chooses to enable the Driver Profiles feature (set to On)
Post-conditions	<ul style="list-style-type: none">The Driver Profiles feature is set to <i>ON</i>New Driver Profiles can be addedExisting Driver Profiles now can be recalled and edited
List of Exception Use Cases	
Interfaces	Personalization Interface
Notes	

4.2.1.2 ENMEM-UC-REQ-095715/C-Disable Driver Profiles Feature

Actors	Vehicle Occupant
Pre-conditions	The Driver Profiles feature is set to On. At least one Driver Profile has been created.
Scenario Description	The User accesses the Driver Profiles HMI and chooses to disable the Driver Profiles feature (set to Off).
Post-conditions	<ul style="list-style-type: none">The Driver Profiles feature is now set to <i>OFF</i>The active Driver Profile is set to <i>Vehicle (i.e. Guest)</i><ul style="list-style-type: none">All applicable non-positional settings will be recalled for the Guest profilePositional settings remains unchangedNew profiles can no longer be addedCreated Driver Profiles are not deleted and are temperately not accessible to the user
List of Exception Use Cases	
Interfaces	Personalization Interface
Notes	When the feature is turned on again, all created profile will be accessible again

4.2.1.3 ENMEM-UC-REQ-214249/A-Valet Mode enabled with Enhanced Memory On

Actors	Vehicle Occupant
Pre-conditions	The ignition status is in Run. The vehicle speed is less than 8 KPH 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 <ul style="list-style-type: none">By default, the Guest Profile is recalled Valet Mode is enabled
Interfaces	Personalization Interface

4.2.1.4 ENMEM-UC-REQ-214250/A-Valet Mode disabled with Enhanced Memory On

Actors	Vehicle Occupant
Pre-conditions	The ignition status is in Run. The vehicle speed is less than 8 KPH 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	<u>ENMEM-UC-REQ-214246-Valet Mode disabled with Enhanced Memory Off</u>
Interfaces	Personalization Interface

4.2.1.5 ENMEM-UC-REQ-214246/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 8 KPH 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

4.2.2 Requirements

4.2.2.1 ENMEM-SR-REQ-140360/B-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.



4.2.2.2 ENMEM-REQ-099679/B-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 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 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 the Enhanced Memory Feature is OFF or a user selects to turn the Enhanced Memory feature OFF via 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 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.

4.2.2.3 ENMEMv2-REQ-485449/A-Enhanced Memory Feature Activation Status v2

The EnhancedMemoryInterfaceClient shall report the activation status of the Driver Profile feature via the EnhancedMemory_St method:

- The EnhancedMemoryInterfaceClient shall set the status of the EnhancedMemory_St method to indicate that the Driver Profiles feature is currently ON by default, upon automatic creation of the first driver profile
- The user shall not be given a means to manually enable or disable the Driver Profiles feature

4.2.2.4 ENMEM-REQ-134104/B-Recall Vehicle Profile When Enhanced Memory Feature Is Turned Off

When Enhanced Memory feature is turned Off, as indicated via EnhancedMemory_St(ProfilesOff), the EnhancedMemoryInterfaceClient shall recall Vehicle Profile via InfotainmentRecall_Rq

4.2.2.5 ENMEM-REQ-197515/A-Driver Profiles Not Deleted When Enhanced Memory Feature OFF

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

4.2.2.6 ENMEM-SR-REQ-214801/A-Enable/Disable Enhanced Memory in Valet Mode

If EnhancedMemory_St = ProfilesOn when Valet Mode is enabled, the EnhancedMemoryInterfaceClient shall temporarily 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 apply for Enhanced Memory and supersede any requirements in this specification.

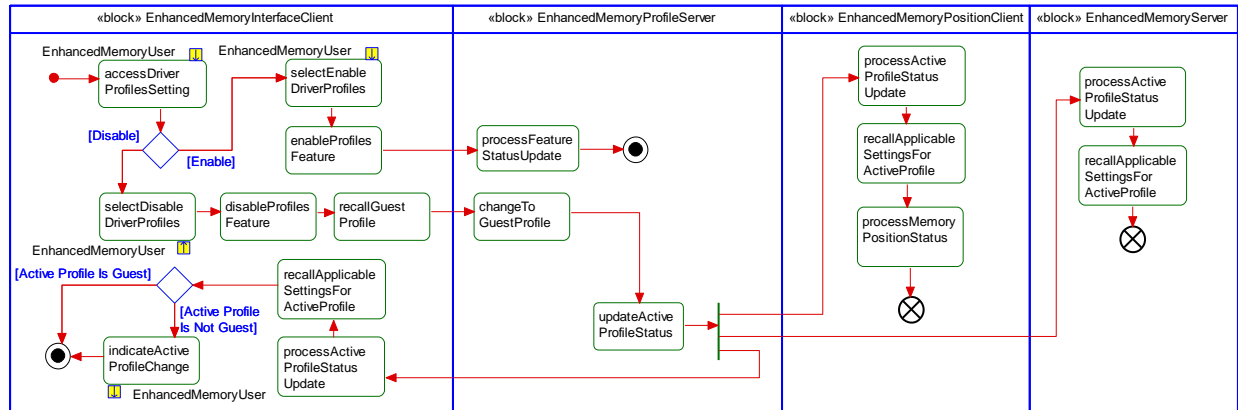
For any conflicts bring to the attention of the Ford D&R.

4.2.3 White Box View

4.2.3.1 Activity Diagrams

4.2.3.1.1 ENMEM-ACT-REQ-099381/B-Enable/Disable Driver Profiles Feature

Activity Diagram



4.2.3.2 Sequence Diagrams

4.2.3.2.1 ENMEM-SD-REQ-099429/A-Enable Driver Profiles

Constraints

Pre-Condition

Driver profiles feature is disabled

Scenarios

Normal Usage

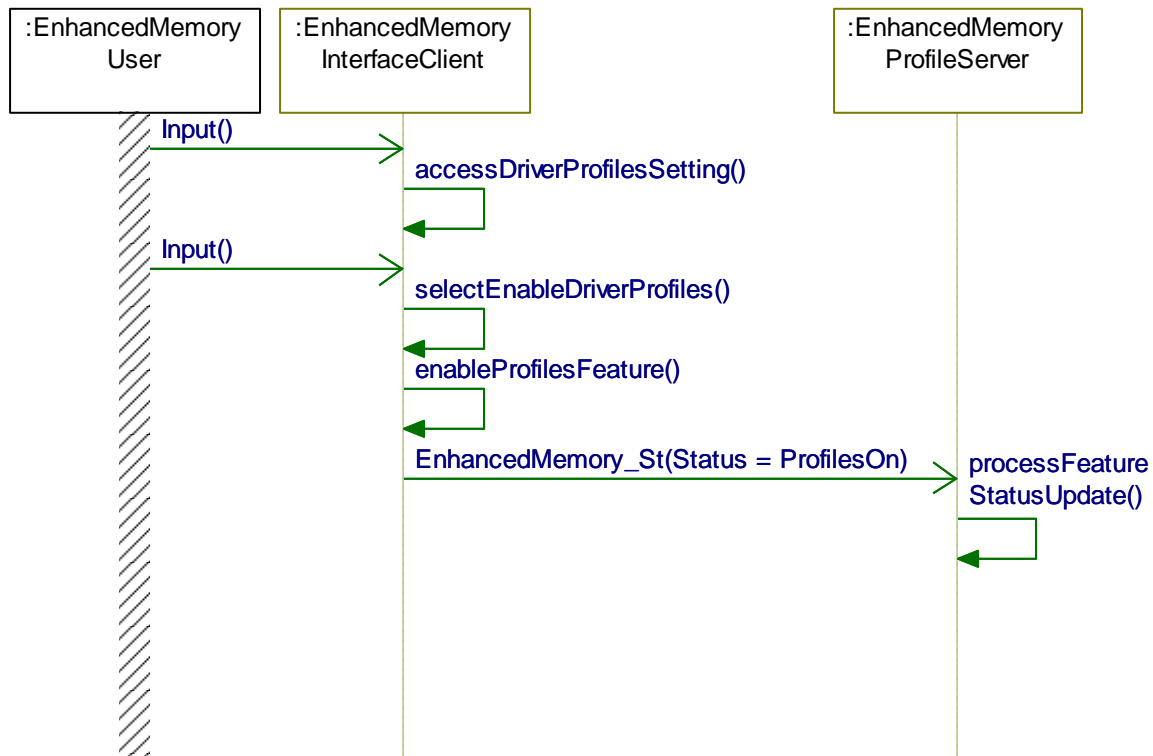
The driver chooses to enable the driver profiles feature (set to on).

Post-Condition

The driver profiles feature is enabled (set to on).



Sequence Diagram



4.2.3.2.2 ENMEM-SD-REQ-099428/B-Disable Driver Profiles

Constraints

Pre-Condition

Driver profiles feature is enabled

Scenarios

Normal Usage

The driver chooses to disable the driver profiles feature (set to off).

Post-Condition

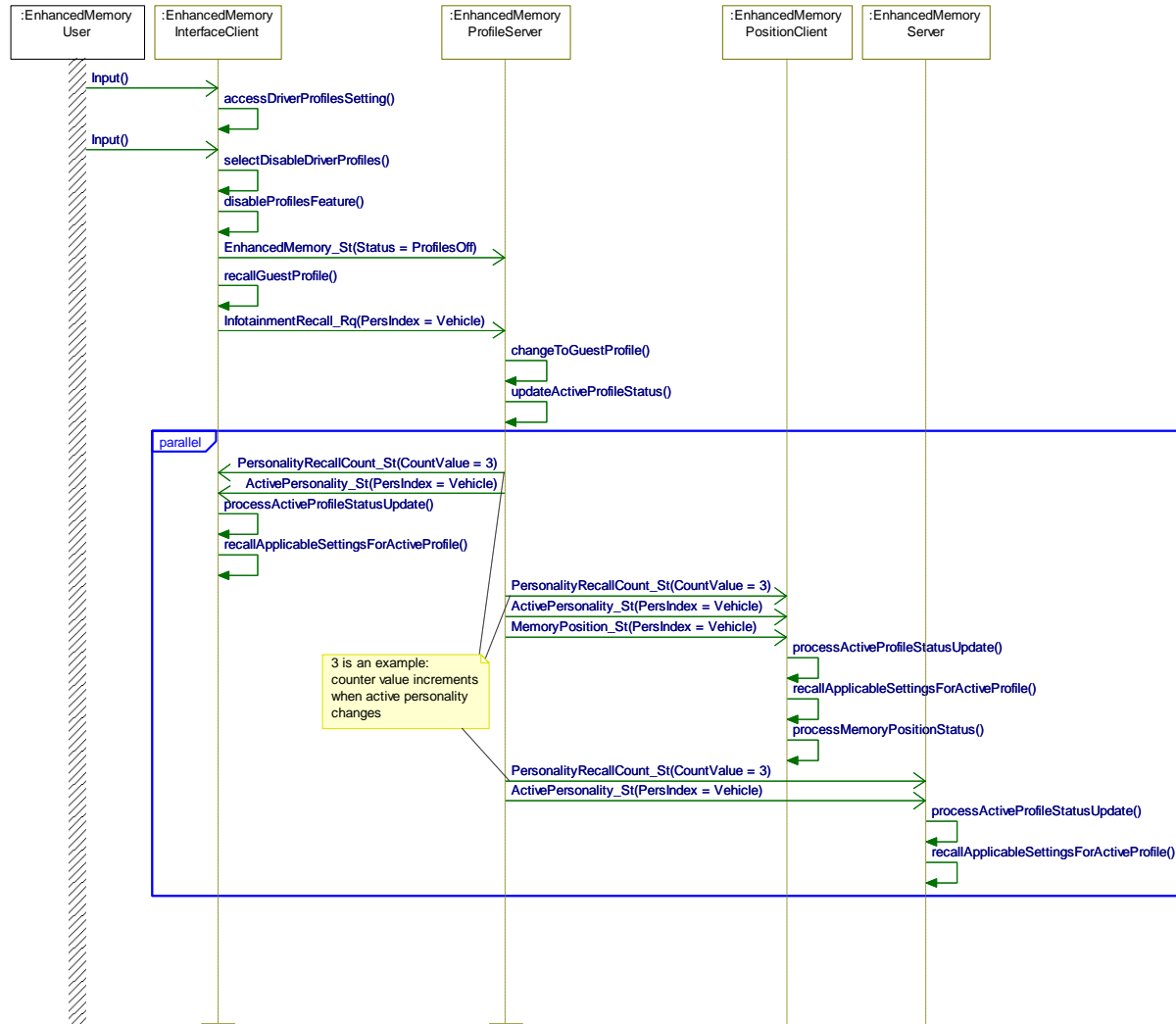
The driver profiles feature is disabled (set to off).

The active personality profile is set to "Guest".

Positional settings are unaffected



Sequence Diagram





4.3 ENMEM-FUN-REQ-095957/B-Sign-In/Recall Settings

4.3.1 Recall Function Description

Recall is a function that loads a requested Driver Profile, via a recall request, 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 various user requests and by an Enhanced Memory system request. A user recall request may be sent by a Memory Seat Button press (when present), by Keyfob, Phone, or NFC key detection (via unlock event, remote start event, or tap event), and by touch screen manual selection. The Enhanced Memory System recall request may occur 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.

4.3.2 Use Cases

4.3.2.1 ENMEM-UC-REQ-095719/D-Memory Seat Button Recall with Driver Profiles OFF

Actors	Vehicle Occupant
Pre-conditions	The Driver Profiles feature is set to OFF EnhancedMemoryPositionClient present
Scenario Description	The User presses any 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
List of Exception Use Cases	
Interfaces	Personalization Interface

4.3.2.2 ENMEM-UC-REQ-095930/D-Sign Into a Driver Profile via Memory Seat Button

Actors	Vehicle Occupant
Pre-conditions	The Driver Profiles feature is set to ON EnhancedMemoryPositionClient present
Scenario Description	The User presses a memory seat button on the driver door panel 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-136944/A-Sign Into a Driver Profile via Memory Seat Button 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.

4.3.2.3 ENMEM-UC-REQ-136944/D-Sign Into a Driver Profile via Memory Seat Button While Vehicle In Motion

Actors	Vehicle Occupant
Pre-conditions	The Driver Profiles feature is set to ON EnhancedMemoryPositionClient present



Scenario Description	The User presses a 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 8 KPH for a manual transmission)
Post-conditions	All applicable user settings, excluding positional settings that are 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	
Interfaces	Personalization Interface

4.3.2.4 ENMEM-UC-REQ-095934/D-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 8 KPH for a manual transmission The Driver Profiles feature is set to ON EnhancedMemoryPositionClient present
Scenario Description	The User presses a 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.

4.3.2.5 ENMEM-UC-REQ-095939/D-Sign Into a Driver Profile via HMI Menu

Actors	Vehicle Occupant
Pre-conditions	The Driver Profiles feature is set to ON
Scenario Description	The User accesses the Driver Profiles HMI menu and chooses to 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 the vehicle speed is less than 4 KPH (when EnhancedMemoryPositionClient is present).

4.3.2.6 ENMEM-UC-REQ-095940/E-Sign Into a Driver Profile via Keyfob/Phone/NFC Key

Actors	Vehicle Occupant
Pre-conditions	The Driver Profiles feature is set to ON. The User has chosen to associate their keyfob, phone, or NFC key to their Driver Profile. Phone is registered, authenticated, and connected as a PaaK (refer to the Phone-As-A-Key SPSS) NFC key is created and authorized (refer to NFCES SPSS)
Scenario Description	The User's keyfob, phone or NFC key 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, phone, or NFC key detection may be the result of an unlock or remote start button press or tap event from an associated phone, keyfob (IKT or IA Key), or NFC key, or from the result of a PEPS unlock event from an associated passive key. (i.e. Driver door handle unlock with a passive IA key present.)

4.3.2.7 ENMEM-UC-REQ-162635/D-Sign Into a Driver Profile via Keyfob/Phone Button Press or NFC Key Tap While Vehicle In Motion

Actors	Vehicle Occupant
Pre-conditions	The Driver Profiles feature is set to ON The User's keyfob, phone or NFC key is associated to a Driver Profile Phone is registered, authenticated, and connected as a PaaK (refer to the Phone-As-A-Key SPSS) NFC key is created and authorized (refer to NFCES SPSS)
Scenario Description	The User presses a keyfob or phone unlock button, or taps an NFC key 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 Driver Profile is recalled
List of Exception Use Cases	
Interfaces	Personalization Interface

4.3.2.8 ENMEM-UC-REQ-485450/A-Sign Into a Driver Profile when Profile Locked

Actors	Vehicle Occupant
Pre-conditions	The Driver Profiles feature is set to ON Driver Profile was previously Locked
Scenario Description	The User accesses the Driver Profiles HMI menu and chooses to sign in to a Driver Profile.
Post-conditions	All applicable user settings are recalled for the chosen Driver Profile and an HMI displays a Lock Screen to user.
List of Exception Use Cases	
Interfaces	Personalization Interface

4.3.2.9 ENMEM-UC-REQ-161547/F-Classic Memory Only Recall via Previously Associated Keyfob/Phone/NFC Key

Actors	Vehicle Occupant
Pre-conditions	The User's keyfob, phone or NFC key is associated to a Driver Profile Phone is registered, authenticated, and connected as a PaaK (refer to the Phone-As-A-Key SPSS)



	NFC key is created and authorized (refer to NFCES SPSS) The Driver Profiles feature is set to OFF. Vehicle is in PARK or less than 8 kph EnhancedMemoryPositionClient present
Scenario Description	The User's keyfob, phone or NFC key is detected, and the associated Classic Memory Position is recalled.
Post-conditions	All Classic Memory position 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	<ul style="list-style-type: none">- Keyfob, phone, or NFC key detection may be the result of an unlock or remote start button press or tap event from an associated phone, keyfob (IKT or IA Key), or NFC key, or from 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.

4.3.2.10 ENMEM-UC-REQ-137996/E-Recall Last Known Driver Profile With Keypad Code When A Keyfob/Phone/NFC Key Is Not With The User

Actors	Vehicle Occupant
Pre-conditions	<ul style="list-style-type: none">• The Driver Profile feature is set to ON• The Vehicle ignition is OFF• The user approaches the vehicle with NO associated keyfob, phone or NFC key
Scenario Description	The User unlocks the door via the Vehicle Keypad then opens the door and starts the engine
Post-conditions	The last known Driver Profile is recalled
Interfaces	Personalization Interface
Note	<ul style="list-style-type: none">• Because there is no keyfob, phone or NFC key with the user, opening the door via door handle will not change profile for vehicle with or without Smart Door Handle• Starting the engine is not a method of recall profile

4.3.2.11 ENMEM-UC-REQ-162841/C-Recall Driver Profile When An IA Key Is With The User

Actors	Vehicle Occupant
Pre-conditions	<ul style="list-style-type: none">• The Driver Profile feature is 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



Scenario Description	The User opens the door
Post-conditions	<p>The last known Driver Profile is recalled if the IA Key is not associated to any Driver Profile.</p> <p>The Driver Profile associated to the user's IA Key will be recalled. It could be the last known Driver Profile or any other Driver Profiles.</p>
Interfaces	Personalization Interface
Note	Because the vehicle is equipped with Smart Door Handle and the IA Key is with the user, opening the door via door handle will trigger passive key unlock search. Depending on the fob association status, passive key unlock search may or may not recall a Driver Profile different than the last known Driver Profile.

4.3.2.12 ENMEM-UC-REQ-137858/E-MyKey Overrides Driver Profile Setting

Actors	Vehicle Occupant
Pre-conditions	<ul style="list-style-type: none">• The Driver Profiles feature is set to ON• Personality profile X has speed compensated volume set to HIGH• Personality profile Y has speed compensated volume set to Low• Fob A is associated with profile X and is programmed as a MyKey• Volume Limiter is set to ON for MyKey
Scenario Description	<ol style="list-style-type: none">1. Vehicle is started up with MyKey Fob A and activates Profile X2. User manually changes to Profile Y via the HMI
Post-conditions	Speed Compensated Volume is overridden and disabled due to the MyKey restriction on both Profile X and Profile Y
List of Exception Use Cases	
Interfaces	G-HMI Vehicle System Interface
Note	<ul style="list-style-type: none">- No matter which profile is recalled to be the active profile as long as a MyKey is in the ignition (recognized by vehicle to start engine), MyKey restrictions shall apply.- Phones associated via PaaK may also be made a MyKey. The same functionality shall apply.- NFC keys associated via NFCES may also be made a MyKey. The same functionality shall apply.

4.3.2.13 ENMEM-UC-REQ-162575/D-Admin Key does not restrict Driver Profile associated to MyKey

Actors	Vehicle Occupant
Pre-conditions	<ul style="list-style-type: none">• The Driver Profiles feature is set to ON• Personality profile X has speed compensated volume set to HIGH• Fob A is associated with profile X and is programmed as a MyKey• Volume Limiter is set to ON for MyKey
Scenario Description	<ul style="list-style-type: none">• Vehicle is started up with Fob B, an Admin Key (a non-MyKey Fob)• The driver recalls 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	<ul style="list-style-type: none">- No matter which profile is recalled to be the active profile (even if associated to a MyKey Keyfob) as long as an Admin Key (non-MyKey Fob) is in ignition (recognized by vehicle to start engine), MyKey restrictions shall not apply- Phones associated via PaaK may also be made a MyKey. The same functionality shall apply.



- NFC keys associated via NFCES may also be made a MyKey. The same functionality shall apply.

4.3.2.14 ENMEM-UC-REQ-214249/A-Valet Mode enabled with Enhanced Memory On

Actors	Vehicle Occupant
Pre-conditions	The ignition status is in Run. The vehicle speed is less than 8 KPH 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 <ul style="list-style-type: none">By default, the Guest Profile is recalled Valet Mode is enabled
Interfaces	Personalization Interface

4.3.2.15 ENMEM-UC-REQ-214250/A-Valet Mode disabled with Enhanced Memory On

Actors	Vehicle Occupant
Pre-conditions	The ignition status is in Run. The vehicle speed is less than 8 KPH 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	<u>ENMEM-UC-REQ-214246-Valet Mode disabled with Enhanced Memory Off</u>
Interfaces	Personalization Interface

4.3.3 Requirements

4.3.3.1 ENMEM-REQ-129547/C-Last Known Driver Profile Applied

If upon network wakeup, no sign-in method is detected, the EnhancedMemoryProfileServer shall recall the last known Driver Profile by updating the ActivePersonality_St method to the last known value. The PersonalityRecallCount_St shall NOT be incremented.

If the last known Driver Profile cannot be determined, the EnhancedMemoryProfileServer shall recall the Vehicle level Profile (Guest Profile) as the active Driver Profile.

4.3.3.2 ENMEM-REQ-099694/C-Driver Profile Recall Event

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 and may not be different than the previous active Driver Profile in terms of name of the Driver Profile and actual settings of Driver Profile.

- EnhancedMemoryProfileServer shall increment the recall counter PersonalityRecallCount_St each time a recall event occurs. The recall event includes memory seat button momentarily pressing, door unlock events, NFC tap events and infotainment recall via InfotainmentRecall_Rq. Definitions and requirements for seat button press recall and door unlock recall shall follow the design and requirements of Classic memory.
- When detecting an increment of PersonalityRecallCount_St, EnhancedMemoryServers shall update the active Driver Profile according to ActivePersonality_St which may and may not be changed.
- In error case when 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.

4.3.3.3 ENMEM-REQ-099673/C-Driver Profile Settings Recall

When an EnhancedMemoryServer receives a Driver Profile recall event, it shall recall all settings for the Driver Profile indicated in the ActivePersonality_St method within T_PersRecall. Any reserved or non-valid value of ActivePersonality_St shall be treated as Vehicle.

- The EnhancedMemoryInterfaceClient shall update its driver profile sign-in notification HMI:
 - each time the "Start Screen" is shown as defined by H22g_SYNC3_Welcome_Power_Modes.
 - within T_PersRecall of receiving the ActivePersonality_St update
 - Note: No driver profile sign-in notification will be given when the Driver Profiles feature is disabled
- Any status signals that are updated as a result of the driver profile change shall not be sent until T_PersRecallStatusUpdate has elapsed since the EnhancedMemoryServer received the ActivePersonality_St but shall not take more than 500 msec from receiving the updated ActivePersonality_St signal to send all its status signals with the updated values.

4.3.3.4 ENMEM-TMR-REQ-099762/B-T_PersRecall

Name	Description	Units	Range	Resolution	Default
T_PersRecall	Maximum time the EnhancedMemoryServer should take to recall all settings for a Driver Profile once the ActivePersonality_St signal update is received to change a profile. Note: Use the default value	msec	50-150	5	75

4.3.3.5 ENMEM-TMR-REQ-134105/B-T_PersRecallStatusUpdate

Name	Description	Units	Range	Resolution	Default
T_PersRecallStatusUpdate	Minimum time the EnhancedMemoryServer should wait after receiving the ActivePersonality_St signal update before sending any status messages affected by the change in driver profile. Note: Use the default value	msec	100-200	5	150

4.3.3.6 ENMEM-HMI-REQ-099692/B-Driver Profile Sign-In 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.

4.3.3.7 ENMEM-TMR-REQ-134102/B-T_PersUpdate

Name	Description	Units	Range	Resolution	Default
------	-------------	-------	-------	------------	---------



T_PersUpdate	Maximum time the EnhancedMemoryProfileServer should take to update the PersonalityRecallCounter_St and ActivePersonality_St on the vehicle system interface, after receiving a recall request. Note: Use the default value	msec	50-150	5	100
--------------	---	------	--------	---	-----

4.3.3.8 ENMEM-REQ-099671/F-Keyfob/Phone/NFC Key Detection for Driver Profile Sign-In

The EnhancedMemoryProfileServer shall determine when an unlock event has originated from a keyfob (per the existing Classic Memory Keyfob detection strategy) or phone (per PaaK) or if an NFC tap event has occurred, and check if the EnhancedMemory_St method is reporting that the Driver Profiles feature is ON or OFF

- If the feature is ON and if the originating keyfob, phone or NFC key is associated to a Driver Profile, then the EnhancedMemoryProfileServer shall update the ActivePersonality_St and MemoryPosition_St methods with the corresponding Driver Profile number associated to that keyfob, phone or NFC key.
- If the feature is OFF and if the originating keyfob, phone or NFC key has been associated to a Driver Profile prior to the feature being set to OFF, then the EnhancedMemoryProfileServer shall update the ActivePersonality_St method to "Vehicle" and MemoryPosition_St method to the corresponding Driver Profile number associated to the keyfob, phone or NFC key.
- Regardless if the feature is ON or OFF, if the originating keyfob, phone or NFC key is not associated to a Driver Profile, then the EnhancedMemoryProfileServer shall maintain the last known ActivePersonality_St and MemoryPosition_St methods. The PersonalityRecallCount_St shall not increment.

For the latest EnhancedMemoryProfileServer requirements see the latest Enhanced Memory Feature Spec. This requirement may be outdated.

4.3.3.9 ENMEM-REQ-099682/C-Determination of Profile After Recall

When the EnhancedMemoryProfileServer receives a Driver Profile recall request via the MemSwitchRecall_Rq or InfotainmentRecall_Rq method, it shall check both the EnhancedMemory_St to determine if the feature is on or off, and PersonalityOptIn_St method to determine if that particular Driver Profile exists:

- If the EnhancedMemory_St method indicates that the feature is on and the PersonalityOptIn_St method reports that the requested Driver Profile is "Opted-In," then the EnhancedMemoryProfileServer shall report a Driver Profile recall event by incrementing the PersonalityRecallCount_St method and updating the ActivePersonality_St and MemoryPosition_St methods to the requested Driver Profile.
- If the EnhancedMemory_St method indicates that the feature is on and the PersonalityOptIn_St method reports that the requested Driver Profile is "Not Opted-In" then the EnhancedMemoryProfileServer shall report a Driver Profile recall event by incrementing the PersonalityRecallCount_St method and updating the ActivePersonality_St method to the Guest profile (ActivePersonality_St = Vehicle) and MemoryPosition_St to the requested Driver Profile.
- If the EnhancedMemory_St method indicates that the feature is off, then the EnhancedMemoryProfileServer shall report a Driver Profile recall event by incrementing the PersonalityRecallCount_St method and updating the ActivePersonality_St method to the Guest profile (ActivePersonality_St = Vehicle) regardless of the PersonalityOptIn_St method value. The MemoryPosition_St shall update to the requested Driver Profile

For the latest EnhancedMemoryProfileServer requirements see the latest Enhanced Memory Feature Spec. This requirement may be outdated.

4.3.3.10 ENMEM-REQ-154252/A-Positional Settings Status Update

When receiving the InfotainmentRecall_Rq, the EnhancedMemoryProfileServer shall update the value of MemoryPosition_St to the PersIndex value indicated by the recall request. This means that if the InfotainmentRecall_Rq is received with a PersIndex set to the value of Vehicle, then the MemoryPosition_St shall be updated to Vehicle as well.

4.3.3.11 ENMEM-REQ-199604/B-Recall Priority

The EnhancedMemoryProfileServer shall prioritize the recall requests in the following descending order:

- Menu/Infotainment 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

For the latest EnhancedMemoryProfileServer requirements see the latest Enhanced Memory Feature Spec. This requirement may be outdated.

4.3.3.12 ENMEM-REQ-099693/E-Display Data Refresh After Driver Profile Change

After a driver profile change has occurred, the EnhancedMemoryInterfaceClient, and any Client displaying settings status (ex. Cluster, RACM, etc.), shall always refresh all applicable settings data (including the active screen) according to existing module setting HMI standards and requirements. This is to reflect the most recent settings values once a Driver Profile has been recalled.

Ex. The Cluster active screen has information displayed that was originally requested with feature based message protocol. While on the screen the ActivePersonality_St signal changes from Pers1 to Pers3. When changing to Pers3, the Cluster shall re-request the active screen information even though the screen didn't change. The Cluster has no knowledge if the feature is personalizable or not, so the Cluster shall always re-request the screen information when the Active Personality changes.

Ex. The Cluster infotainment active screen is displaying radio preset stations. While on the screen the ActivePersonality_St signal changes from Pers1 to Pers3. When changing to Pers3, the Cluster shall re-request the active screen information even though the screen didn't change. The Cluster has no knowledge if the feature is personalizable or not, so the Cluster shall always re-request the screen information when the Active Personality changes.

4.3.3.13 ENMEM-REQ-099700/C-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 the pressing of an unassociated Memory Seat button, shall not trigger the recall of any positional settings

For the latest EnhancedMemoryPositionClient requirements see the latest Driver Seat Module Spec. This requirement may be outdated.

4.3.3.14 ENMEM-REQ-198388/A-No Recall for Positional Settings When Vehicle in Motion

The EnhancedMemoryPositionClient shall not recall positional settings that are tied with Classic Memory when vehicle is not in park or vehicle speed is greater than 5kph for manual transmission.

For the latest EnhancedMemoryPositionClient requirements see the latest Driver Seat Module Spec. This requirement may be outdated.

4.3.3.15 ENMEM-SR-REQ-136618/F-Recall Event - Infotainment Audio

When the user is NOT in a Feature Volume Session:

For a recall event that results in a change to the Audio Settings (ex Occupancy mode, BTMBF...) if the recall event could cause distortion of audio then:

1. The Audio Setting Server (ex AHU, DSP AMP) shall mute the audio first,
2. Then update the Audio Settings (ex BTMBF, Occ Mode, SCV...), and
3. Then unmute when complete so there is no distortion of the audio.

When the user IS in a Feature Volume Session:

The above muting strategy shall not be implemented. The Audio Setting Server shall instead:



1. Maintain the initial profile's Phone / VR / TA volume setting while the Feature Volume session is active
2. Apply the recalled profile's Phone / VR / TA volume after the active Feature Volume session ends
 - a. If the user makes a volume change during the active Feature Volume session, the Audio Setting Server shall apply and save the changed volume to the recalled profile.

The maximum amount of time to update all audio settings during a recall event, from the time the audio is muted until the unmute, shall not exceed 200 msec. The audio shall gracefully resume operation after the unmute.

The Media Volume shall not be stored individually for different Driver Profiles.

When changing between profiles the current active audio source shall not change.

- Ex. The active audio source is AM and channel X for person 1. The user changes to person 3 and the active audio source remains AM on the same channel X for person 3.

4.3.3.16 ENMEMv2-SR-REQ-435084/A-Recall Event - Infotainment Audio v2

When the user is NOT in a Feature Volume Session:

For a recall event that results in a change to the Audio Settings (ex Occupancy mode, BTMBF...) if the recall event could cause distortion of audio then:

1. The Volume Setting Server (ex PDC) shall mute the audio first,
2. The Audio Setting Server (ex PAC, DSP_Phoenix) shall then update the Audio Settings (ex BTMBF, Occ Mode, SCV...),
3. Then the Volume Setting Server shall unmute when complete, so there is no distortion of the audio.

When the user IS in a Feature Volume Session:

The above muting strategy shall not be implemented. The Volume Setting Server shall instead:

1. Maintain the initial profile's Phone / Prompts / TA / Call Ring volume setting while the Feature Volume session is active
2. Apply the recalled profile's Phone / Prompts / TA / Call Ring volume after the active Feature Volume session ends
 - a. If the user makes a volume change during the active Feature Volume session, the Volume Setting Server shall apply and save the changed volume to the recalled profile.

The maximum amount of time to update all audio settings during a recall event, from the time the audio is muted until the unmute, shall not exceed 200 msec. The audio shall gracefully resume operation after the unmute.

The Media Volume shall not be stored individually for different Driver Profiles.

When changing between profiles the current active audio source shall not change.

- Ex. The active audio source is AM and channel X for person 1. The user changes to person 3 and the active audio source remains AM on the same channel X for person 3.

4.3.3.17 ENMEM-REQ-099674/C-Requesting Audio Preset Info After Profile Change

When the EnhancedMemoryInterfaceClient, and any Client displaying audio presets, receives a Driver Profile recall event via ActivePersonality_St, it shall wait at least T_PersPresetWait and then shall request the audio preset information from the AudioServer and shall update the audio preset HMI information to the new Driver Profile.

4.3.3.18 ENMEM-TMR-REQ-099763/C-T_PersPresetWait

Name	Description	Units	Range	Resolution	Default
T_PersPresetWait	Minimum time the EnhancedMemoryInterfaceClient, and any Client displaying audio presets, shall wait before requesting preset data from the AudioServer.	msec	100-300	5	200



4.3.3.19 ENMEM-SR-REQ-214221/A-Recall behavior when Valet Mode Enabled/Disabled

If EnhancedMemory_St = ProfilesOn when Valet Mode is enabled, the EnhancedMemoryInterfaceClient shall remember the last active personality profile prior to enabling Valet Mode.

When Valet Mode is then disabled, the EnhancedMemoryInterfaceClient shall recall the remembered personality profile after Enhanced Memory is re-enabled as defined in [REQ-214801](#).

If EnhancedMemory_St = ProfilesOff when Valet Mode is enabled, the active personality profile shall not be remembered and a recall shall not be performed when Valet Mode is disabled.

The EnhancedMemoryInterfaceClient shall remember the last active personality profile (prior to enabling Valet Mode) between different power mode cycles such as remembering (but not limited to):

- Between network bus sleep and wake-up events, and
- Between ignition cycles

All existing Valet Mode requirements/restrictions apply for Enhanced Memory and supersede any requirements in this specification.

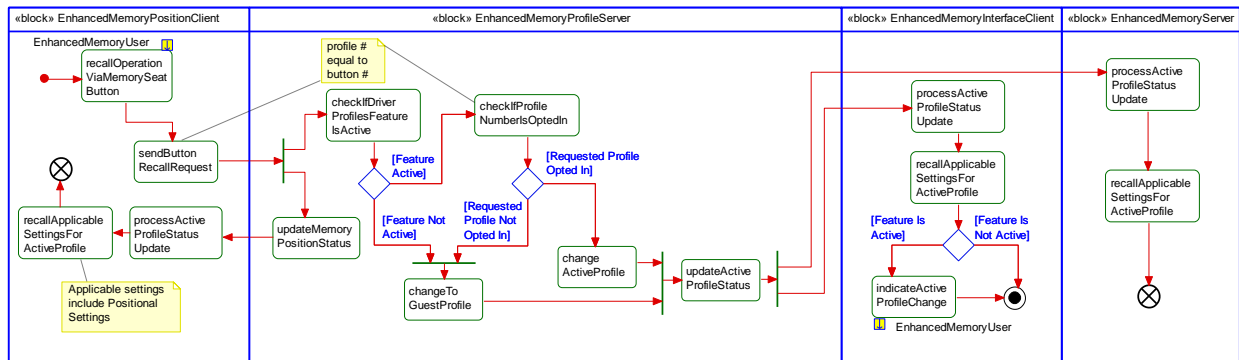
For any conflicts bring to the attention of the Ford D&R.

4.3.4 White Box View

4.3.4.1 Activity Diagrams

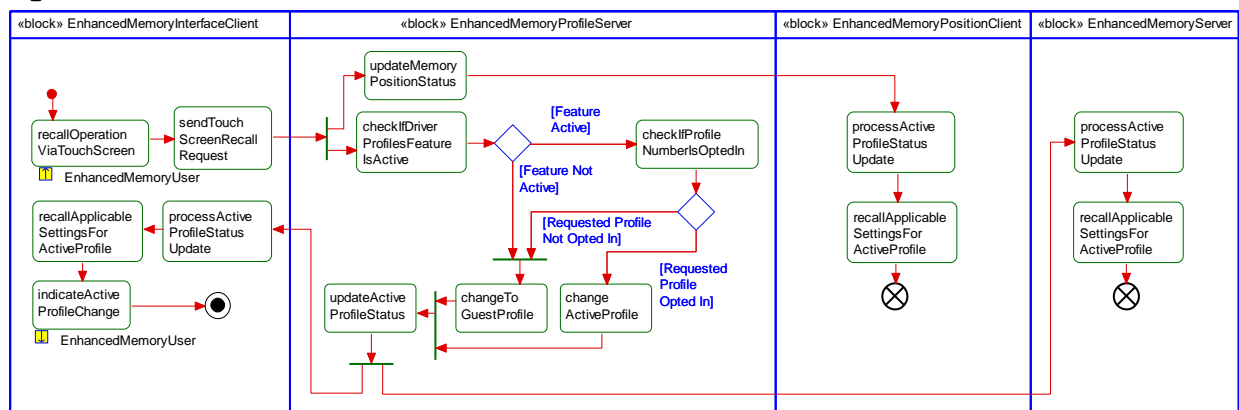
4.3.4.1.1 ENMEM-ACT-REQ-099387/B-Sign Into Driver Profile Via Memory Seat Button

Activity Diagram



4.3.4.1.2 ENMEM-ACT-REQ-099388/C-Sign Into Driver Profile Via HMI Menu

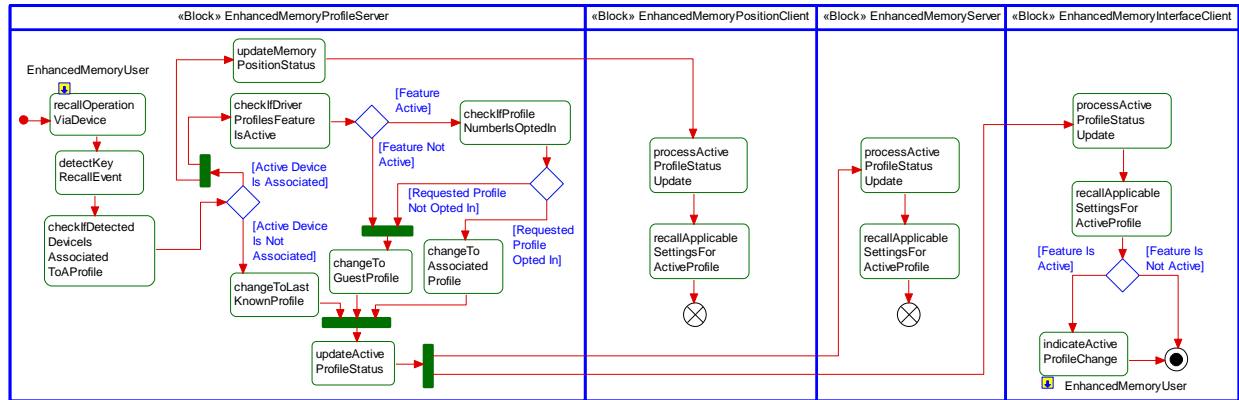
Activity Diagram





4.3.4.1.3 ENMEM-ACT-REQ-099384/E-Sign Into Driver Profile Via Keyfob/Phone/NFC Key

Activity Diagram



4.3.4.2 Sequence Diagrams

4.3.4.2.1 ENMEM-SD-REQ-099433/D-Sign Into Driver Profile Via Memory Seat Button

Constraints

Pre-Condition

The driver profiles feature is enabled
EnhancedMemoryPositionClient is present

Scenarios

Normal Usage

A memory seat button press is detected by the EnhancedMemoryPositionClient. A request is sent on the vehicle system interface to change the active personality to the profile associated to the pressed memory seat button. The active personality is set to the associated profile.

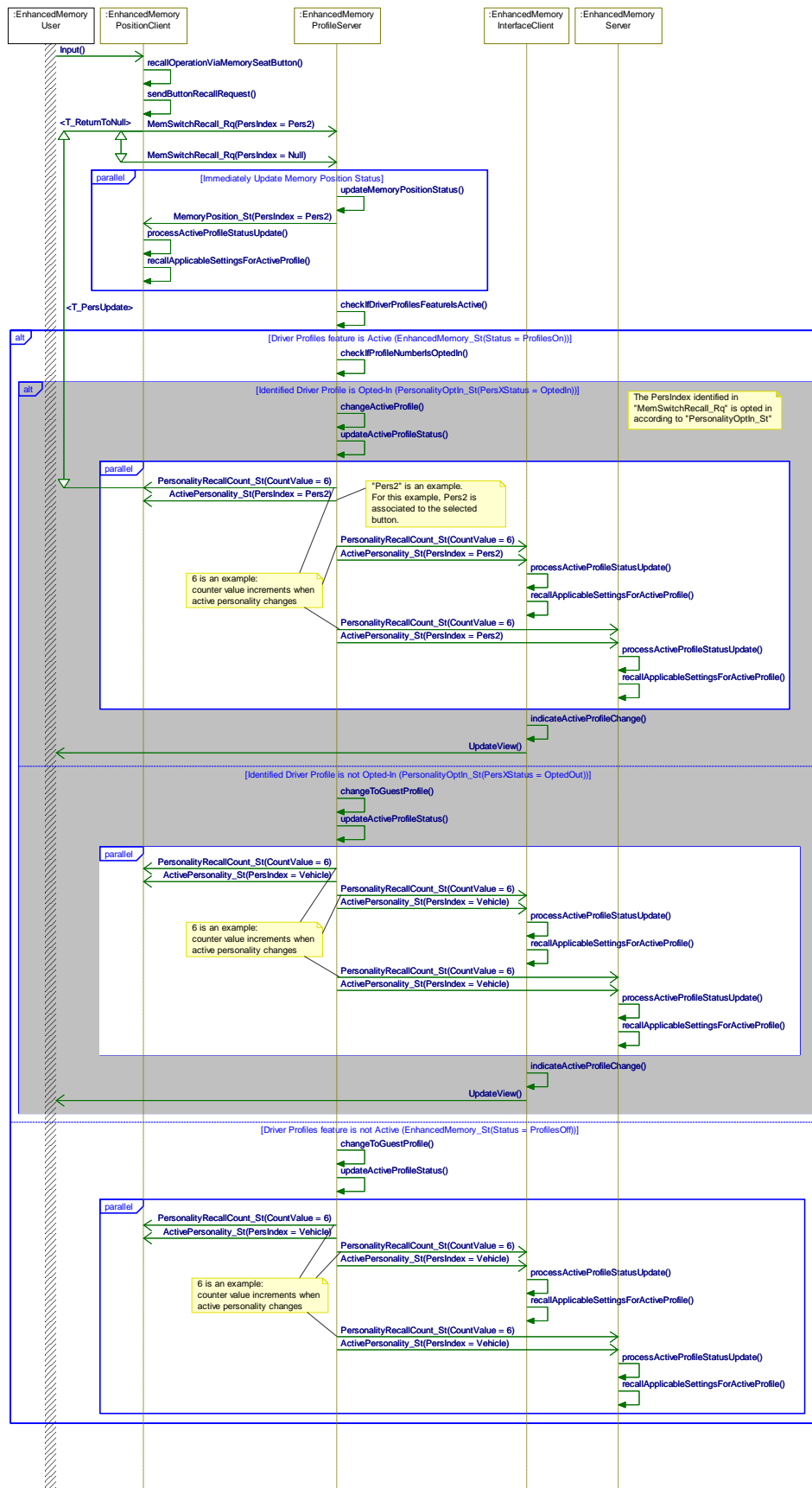
Post-Condition

All applicable user settings are recalled for the associated profile.
The associated profile is active.

Note: See sequence diagram below for alternate cases when drivers profile is off, or the requested profile is not OptedIn.



Sequence Diagram





4.3.4.2.2 ENMEM-SD-REQ-099434/C-Sign Into Driver Profile Via HMI Menu

Constraints

Pre-Condition

The infotainment system is active
The driver profiles feature is enabled

Scenarios

Normal Usage

An HMI selection for signing into a profile is detected by the EnhanceMemoryInterfaceClient. A request is sent on the vehicle system interface to change the active personality to the profile associated to the HMI selection. The active personality is set to the associated profile.

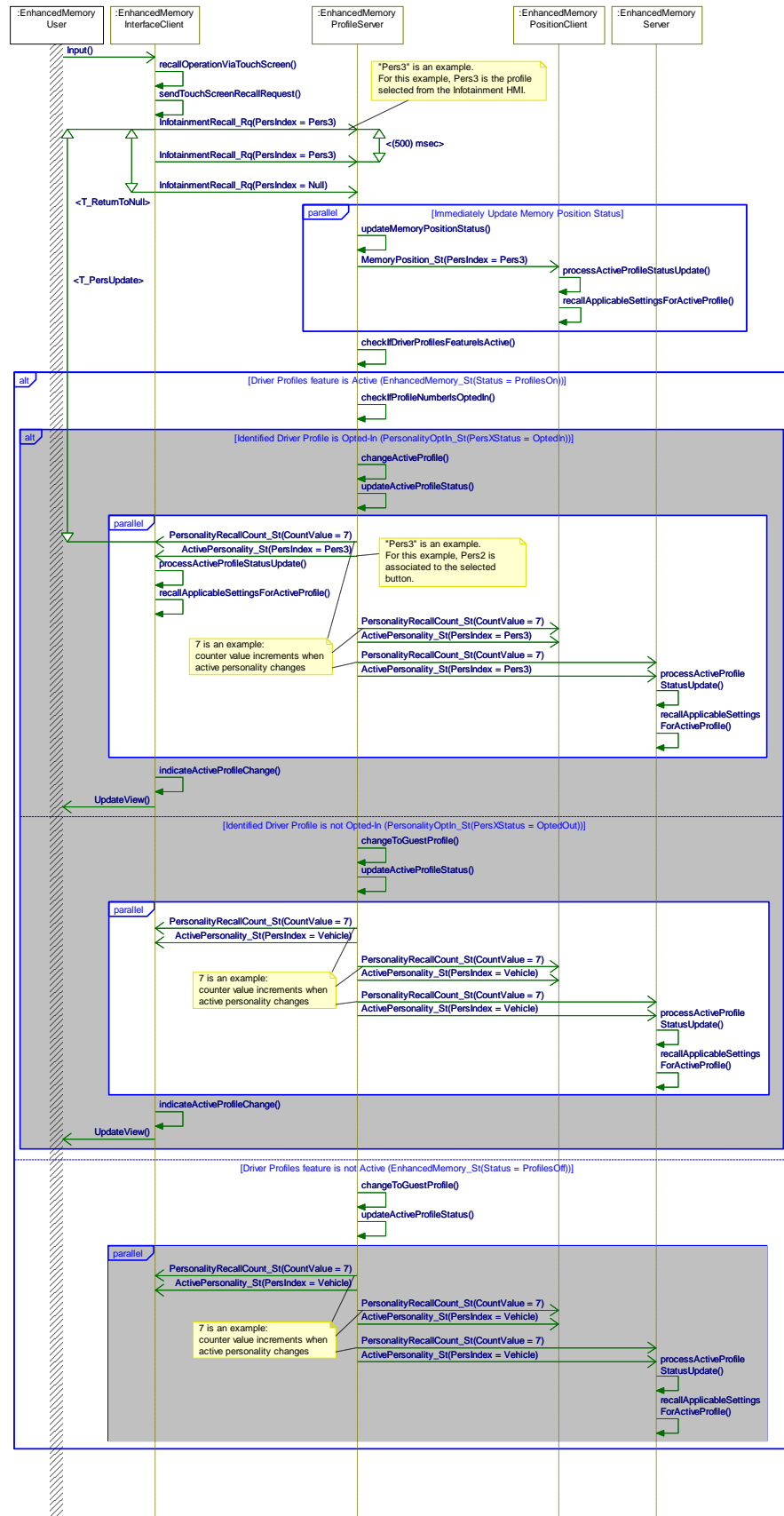
Post-Condition

All applicable user settings are recalled for the associated profile.
The associated profile is active.

Note: See sequence diagram below for alternate cases when drivers profile is off, or the requested profile is not OptedIn.



Sequence Diagram





4.3.4.2.3 ENMEM-SD-REQ-099432/E-Sign Into Driver Profile Via Keyfob/Phone/NFC Key

Constraints

Pre-Condition

A keyfob, phone or NFC key is associated to a personality profile
The driver profiles feature is enabled

Scenarios

Normal Usage

The associated keyfob, phone or NFC key is detected by the EnhancedMemoryProfileServer and the active personality is set to the Opted-In profile associated to the keyfob, phone or NFC key.

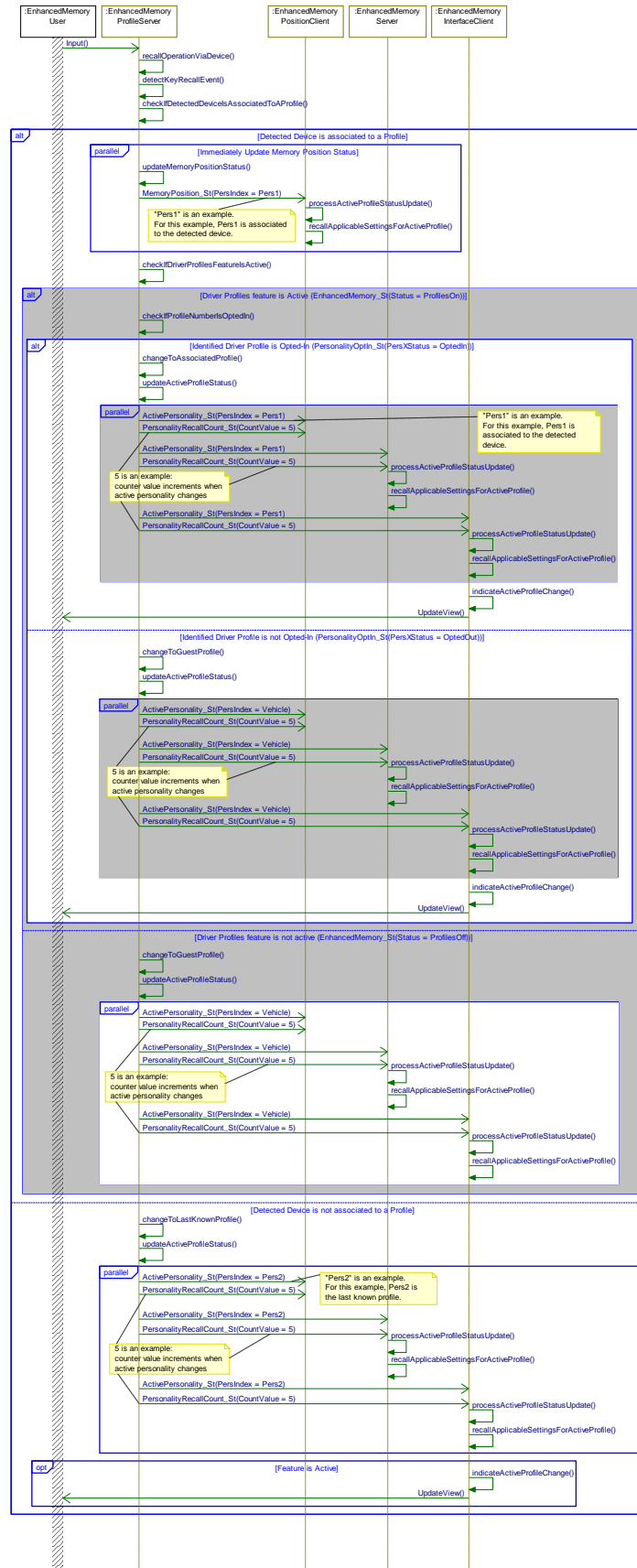
Post-Condition

All applicable user settings are recalled for the associated profile.
The associated profile is active.

Note: See sequence diagram below for alternate cases when keyfob/phone/NFC key is not associated to profile, driver's profile is off, or the requested profile is not OptedIn.



Sequence Diagram





4.4 ENMEM-FUN-REQ-095958/B-Store/Recall Occupant Position Settings

4.4.1 Use Cases

4.4.1.1 ENMEM-UC-REQ-095720/D-Memory Seat Button Storing with Driver Profiles OFF

Actors	Vehicle Occupant
Pre-conditions	The Driver Profiles feature is set to OFF EnhancedMemoryPositionClient is present Memory Seat Buttons are present
Scenario Description	The user initiates a “store position” operation via any Memory Seat button
Post-conditions	The current positional settings are stored for that particular pressed button and the user stays signed into the Guest Profile while the Driver Profiles feature is OFF
List of Exception Use Cases	
Interfaces	Personalization Interface

4.4.1.2 ENMEM-UC-REQ-095931/D-Memory Seat Button Storing of an Alternate Associated Profile

Actors	Vehicle Occupant
Pre-conditions	The Driver Profiles feature is set to ON EnhancedMemoryPositionClient is present Memory Seat Buttons are present
Scenario Description	The User initiates a “store position” operation via a Memory Seat button that is associated to an alternate Driver Profile (other than the active 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 profile.
List of Exception Use Cases	
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.

4.4.1.3 ENMEM-UC-REQ-095938/D-Memory Seat Button Storing of the Active Driver Profile

Actors	Vehicle Occupant
Pre-conditions	The Driver Profiles feature is set to ON EnhancedMemoryPositionClient is present Memory Seat Buttons are present
Scenario Description	The user initiates a “store position” operation via a 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

4.4.1.4 ENMEM-UC-REQ-166195/D-Memory Seat Button Storing of an Unassociated Button

Actors	Vehicle Occupant
Pre-conditions	The Driver Profiles feature is set to ON EnhancedMemoryPositionClient is present Memory Seat Buttons are present
Scenario Description	The user initiates a “store position” operation via a Memory Seat button on the driver door panel that has not been associated to any Driver Profile
Post-conditions	The current positional settings are stored to the unassociated 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 buttons that aren’t associated to a created Driver Profile.

4.4.1.5 ENMEM-UC-REQ-490737/A-Positional Storing via HMI of the Active Driver Profile

Actors	Vehicle Occupant
Pre-conditions	The Driver Profiles feature is set to ON EnhancedMemoryPositionClient is present Memory Seat Buttons are not 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

4.4.1.6 ENMEM-UC-REQ-490738/A-Positional Recalling via HMI of the Active Driver Profile

Actors	Vehicle Occupant
Pre-conditions	The Driver Profiles feature is set to ON EnhancedMemoryPositionClient is present Memory Seat Buttons are not present The Active Profile is not the Guest Profile
Scenario Description	The user initiates a “recall position” operation via soft button on HMI with a Driver Profile active



Post-conditions	The last saved positional settings are recalled to the active Driver Profile.
List of Exception Use Cases	
Interfaces	Personalization Interface

4.4.2 Requirements

4.4.2.1 ENMEM-REQ-099687/B-Classic Memory Subsystem Store Delay

After detecting a memory seat button press and hold store event,

- EnhancedMemoryPositionClient shall store the current Classic Memory positional settings to a Driver Profile designated by a memory seat button that was pressed and held
- EnhancedMemoryPositionClient then shall wait T_PersStore before send the recall request via MemSwitchRecall_Rq to the EnhancedMemoryProfileServer

4.4.2.2 ENMEM-TMR-REQ-099764/B-T_PersStore

Name	Description	Units	Range	Resolution	Default
T_PersStore	Minimum time the EnhancedMemoryPositionClient should wait before sending a recall request to the EnhancedMemoryProfileServer. Note: Use the default value	msec	150-350	5	250

4.4.2.3 ENMEM-HMI-REQ-490739/A-Recall Driver Profile Positional Settings via HMI Menu

The EnhancedMemoryInterfaceClient shall provide a Positional Recall button in the HMI for a positional settings recall when Memory Seat Buttons are Not Present and autoSaveFeatureStatusBroadcast(AutoSaveFeatureStatus = "Enable" or "Inactive").

4.4.2.4 ENMEM-HMI-REQ-490740/A-Positional Recall Button Availability

The EnhancedMemoryInterfaceClient shall make the Positional Recall Button active (available, not greyed-out, etc.) when all of the below conditions are met:

- Enhanced Memory Feature is ON (EnhancedMemory_St = On)
- Driver Profile Created (Opted-in) for the active profile
- Active Profile is not the Guest Profile
- VehicleSpeed_St is less than the Driving Restriction threshold
 - For driver restrictions related to vehicle in motion please see the Driver Restrictions SPSS (DRIVE-RESv2-FUR-REQ-025157-HMI Driving Restriction – General Applications (TcSE ROIN-279695-1)).
- Any of the following signals do not equal 'None':
 - MirrorAutoSaveDriver_St
 - MirrorAutoSavePassenger_St
 - PedalAutoSave_St
 - SteeringAutoSave_St
 - DriverSeatAutoSave_St
 - DriverMcsAutoSaveDriver_St

4.4.2.5 ENMEM-REQ-490741/A-Positional Recall Operation

The EnhancedMemoryInterfaceClient shall request a positional recall of the active Driver Profile via InfotainmentRecall_Rq after detecting a Positional Recall Button press event.



4.4.2.6 ENMEM-HMI-REQ-490742/A-Positional Recall Notification - Success

The EnhancedMemoryInterfaceClient shall display a notification to the user indicating that their positional settings were successfully recalled when ClassicMemory_Rq = Recall# is received where # matches that of the requested profile number. This shall only occur after the user has pressed the Positional Restore button and the request has been sent as per REQ-490741. This shall not be shown during a normal profile recall, profile creation, or any other reception of ClassicMemory_Rq = Recall#.

4.4.2.7 ENMEM-HMI-REQ-490743/A-Positional Recall Notification - Fail

The EnhancedMemoryInterfaceClient shall display a notification to the user indicating that their positional settings failed to be recalled when ClassicMemory_Rq = Recall# (where # matches that of the requested profile number) is not received within 2s after sending the request per REQ-490741.

This shall only occur after the user has pressed the Positional Restore button, and the request has been sent as per REQ-490741. This shall not be shown during a normal profile recall, profile creation, or any other reception of ClassicMemory_Rq = Recall#.

4.4.2.8 ENMEM-HMI-REQ-490744/A-Store Driver Profile Positional Settings via HMI Menu

The EnhancedMemoryInterfaceClient shall provide a Positional Store button in the HMI for a positional settings store when Memory Seat Buttons are not present and autoSaveFeatureStatusBroadcast(AutoSaveFeatureStatus = "Enable" or "Inactive").

4.4.2.9 ENMEM-HMI-REQ-490745/A-Positional Store Button Availability

The EnhancedMemoryInterfaceClient shall make the Positional Store button active (available, not greyed-out, etc.) when all of the below conditions are met:

- Enhanced Memory Feature is ON (EnhancedMemory_St = On)
- Driver Profile Created (Opted-in) for the active profile
- Active Profile is not the Guest Profile
- Any of the following signals do not equal 'None':
 - MirrorAutoSaveDriver_St
 - MirrorAutoSavePassenger_St
 - PedalAutoSave_St
 - SteeringAutoSave_St
 - DriverSeatAutoSave_St
 - DriverMcsAutoSaveDriver_St

4.4.2.10 ENMEM-REQ-490746/A-Positional Store Operation

The EnhancedMemoryInterfaceClient shall request a positional store of the active Driver Profile via InfotainmentPersStore_Rq after detecting a Positional Save Button press event.

4.4.2.11 ENMEM-HMI-REQ-490747/A-Positional Store Notification - Success

The EnhancedMemoryInterfaceClient shall display a notification to the user indicating that their positional settings were successfully stored when MemoryFeedback_Rq = Yes is received. This shall only occur after the user has pressed the Positional Store button, and the request has been sent as per REQ-490746. This shall not be shown during a memory seat button press and hold, profile creation, or any other reception of MemoryFeedback_Rq = Yes.

4.4.2.12 ENMEM-HMI-REQ-490748/A-Positional Recall Notification - Fail

The EnhancedMemoryInterfaceClient shall display a notification to the user indicating that their positional settings failed to be stored when MemoryFeedback_Rq = Yes is not received within 2s after sending the request per REQ-490746.

This shall only occur after the user has pressed the Positional Store button, and the request has been sent as per REQ-490746. This shall not be shown during a memory seat button press and hold, profile creation, or any other reception of MemoryFeedback_Rq = Yes.

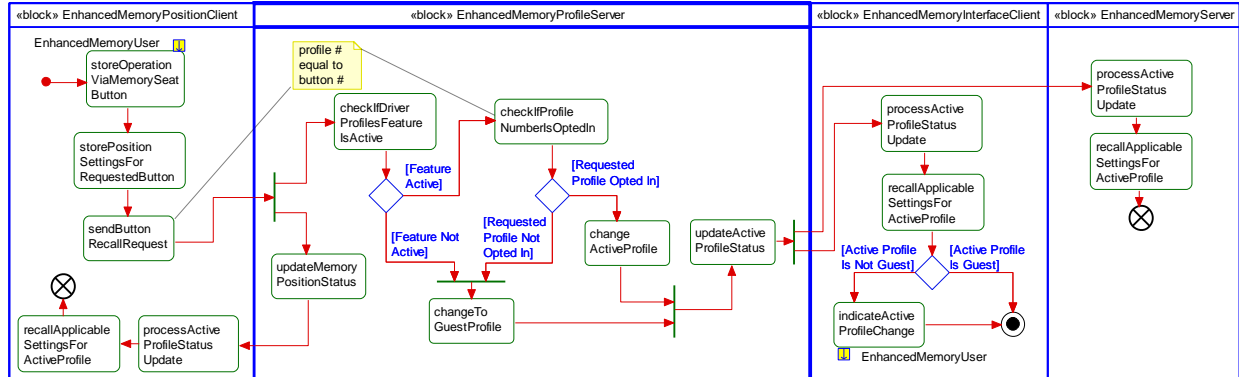


4.4.3 White Box View

4.4.3.1 Activity Diagrams

4.4.3.1.1 ENMEM-ACT-REQ-099389/B-Store Position Settings To Driver Profile

Activity Diagram



4.4.3.2 Sequence Diagrams

4.4.3.2.1 ENMEM-SD-REQ-099435/D-Store Position Settings To Driver Profile

Constraints

Pre-Condition

The driver profiles feature is enabled
EnhancedMemoryPositionClient is present

Scenarios

Normal Usage

A memory seat button store operation is detected by the EnhancedMemoryPositionClient.

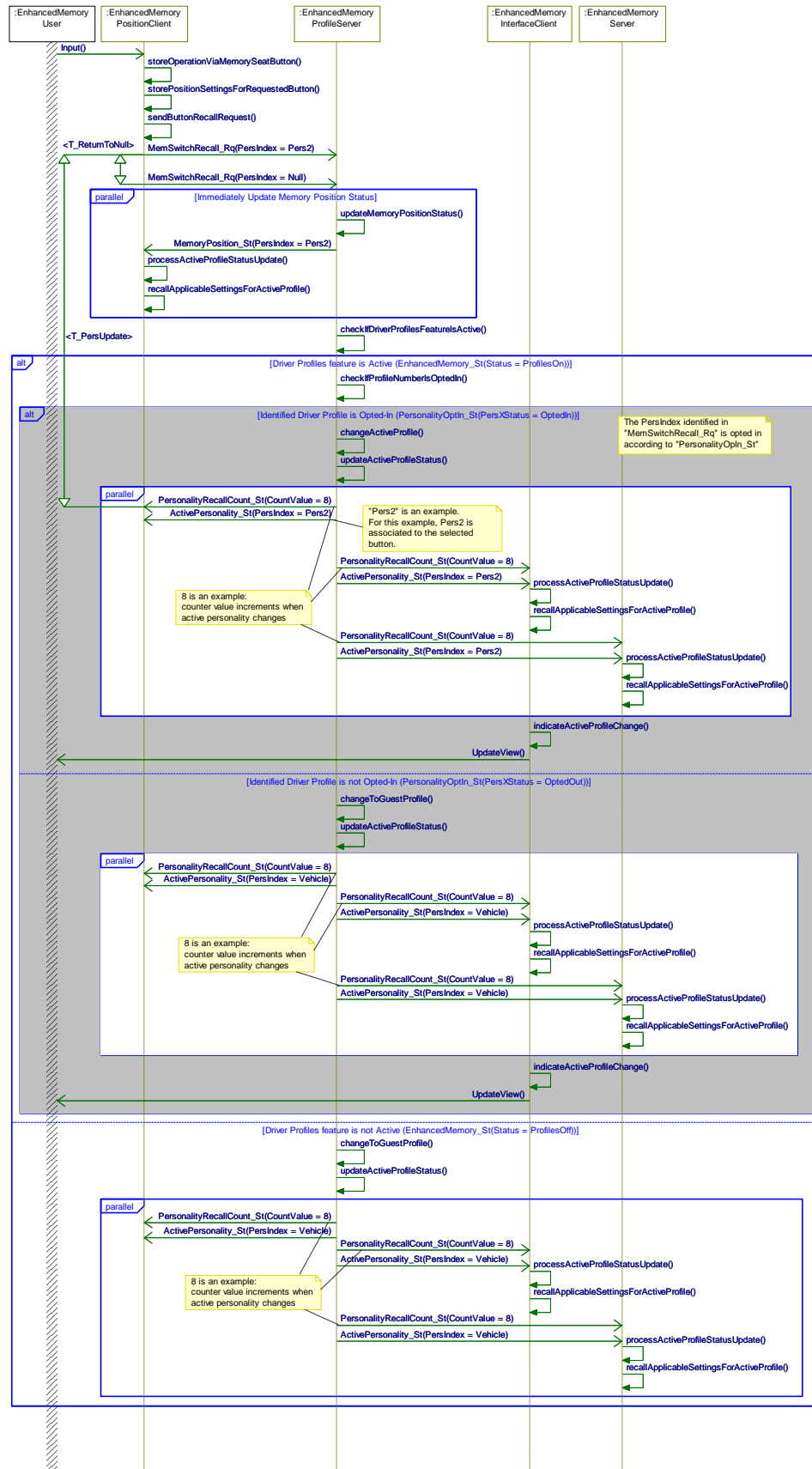
Post-Condition

All applicable user settings are stored to the associated profile.
The associated profile is active.

Note: See sequence diagram below for alternate cases when drivers profile is off, or the requested profile is not OptedIn.



Sequence Diagram





4.5 ENMEM-FUN-REQ-095959/A-Create/Edit Driver Profile

4.5.1 Use Cases

4.5.1.1 ENMEM-UC-REQ-095721/D-Create a Driver Profile (with EnhancedMemoryPositionClient)

Actors	Vehicle Occupant
Pre-conditions	The ignition status is in Run. The vehicle is in Park. EnhancedMemoryPositionClient present The Driver Profiles feature is set to ON The vehicle speed is less than 8 KPH The maximum number of profiles has not yet been reached
Scenario Description	The User accesses the Driver Profiles, chooses to create a new Driver Profile, and then chooses to associate a memory seat button to that profile
Post-conditions	A new profile is created with: <ul style="list-style-type: none">all applicable non-positional settings copied from the previous profile to the new profileall applicable positional settings copied from the currently active settings (from previous profile, or from recently changed but not saved settings) to the new profile The chosen memory seat button is associated to the new profile
Interfaces	Personalization Interface
Notes	

4.5.1.2 ENMEM-UC-REQ-352157/A-Create a Driver Profile (without EnhancedMemoryPositionClient)

Actors	Vehicle Occupant
Pre-conditions	The ignition status is in Run. The vehicle is in Park. EnhancedMemoryPositionClient not present The Driver Profiles feature is set to ON The vehicle speed is less than 8 KPH The maximum number of profiles has not yet been reached
Scenario Description	The User accesses the Driver Profiles and 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
Interfaces	Personalization Interface
Notes	

4.5.1.3 ENMEM-UC-REQ-134147/C-Create or Edit Driver Profile Name

Actors	Vehicle Occupant
Pre-conditions	The ignition status is in Run. The vehicle is in Park. The vehicle speed is less than 8 KPH 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	User must choose a name that is not identical to an existing Driver Profile name.

4.5.1.4 ENMEM-UC-REQ-198925/A-Attempt to Give a Driver Profile an Existing Name

Actors	Vehicle Occupant
Pre-conditions	The ignition status is in Run. The vehicle speed is less than 8 KPH 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	<ul style="list-style-type: none">• The user is informed by HMI indication that Driver Profile name already exists• The user is given opportunity to retry
Interfaces	Personalization Interface
Notes	

4.5.1.5 ENMEM-UC-REQ-197170/C-Attempt to Associate Already Associated Memory Seat Button

Actors	Vehicle Occupant
Pre-conditions	The ignition status is in Run. EnhancedMemoryPositionClient present The vehicle speed is less than 8 KPH Enhanced Memory HMI prompts the user to press a Memory Seat button during Create Driver Profile process
Scenario Description	The user presses a Memory Seat button that had been associated to other Driver Profile
Post-conditions	<ul style="list-style-type: none">• The user is informed by HMI indication that the chosen Memory Seat button is already associated to other Driver Profile• The user is given multiple opportunities to retry
Interfaces	Personalization Interface
Notes	See requirement "ENMEM-REQ-197965-No overwrite for Memory Seat Buttons already associated to Existing Driver Profiles"

4.5.1.6 ENMEM-UC-REQ-368046/A-Attempt to Associate Memory Seat Button from EnhancedMemoryInterfaceClient & EnhancedMemoryPositionClient

Actors	Vehicle Occupant
Pre-conditions	The ignition status is in Run. EnhancedMemoryPositionClient present The vehicle speed is less than 8 KPH



	Enhanced Memory HMI prompts the user to press a Memory Seat button
Scenario Description	The user presses a Memory Seat button on both the EnhancedMemoryInterfaceClient and the EnhancedMemoryPositionClient
Post-conditions	<ul style="list-style-type: none">• The button that is pressed and detected first by the EnhancedMemoryInterfaceClient is used to associate the memory seat button to the profile• The other button input is ignored
Interfaces	Personalization Interface
Notes	

4.5.1.7 ENMEM-UC-REQ-485455/A-Startup Profile Auto-Creation - User selects different Memory Seat Button than Pers1

Actors	Vehicle Occupant
Pre-conditions	The ignition status is in Run. EnhancedMemoryPositionClient present The vehicle speed is less than 8 KPH EnhancedMemoryInterfaceClient auto-assigns Pers1 as the PersIndex Enhanced Memory HMI prompts the user to press a Memory Seat button during Create Driver Profile process
Scenario Description	The user presses a Memory Seat button different than Pers1 during start of Create Driver Profile process
Post-conditions	The EnhancedMemoryInterfaceClient reassigns the new PersIndex to the created profile
Interfaces	Personalization Interface

4.5.1.8 ENMEM-UC-REQ-095908/E-Associate Keyfob/Phone/NFC Key to a Driver Profile

Actors	Vehicle Occupant
Pre-conditions	The ignition status is in Run. The vehicle speed is less than 8 KPH The user is in the process of creating or editing a Driver Profile Phone is registered, authenticated, and connected as a PaaK (refer to the Phone-As-A-Key SPSS) NFC key is created and authorized (refer to NFCES SPSS)
Scenario Description	The user accesses the Driver Profiles HMI, chooses to create or edit a new Driver Profile, and has chosen to associate a keyfob, phone, or NFC key to that profile.
Post-conditions	The chosen keyfob, phone or NFC key is now associated to the active Driver Profile.
List of Exception Use Cases	ENMEM-UC-REQ-095925-Attempt to Associate Already Associated Keyfob/Phone/NFC key
Interfaces	Personalization Interface
Notes	

4.5.1.9 ENMEM-UC-REQ-095925/D-Attempt to Associate Already Associated Keyfob/Phone/NFC Key

Actors	Vehicle Occupant
Pre-conditions	The ignition status is in Run.



	The vehicle speed is less than 8 KPH The user is in the process of associating a keyfob to a Driver Profile Phone is registered, authenticated, and connected as a PaaK (refer to the Phone-As-A-Key SPSS) NFC key is created and authorized (refer to NFCES SPSS)
Scenario Description	The user attempts to associate a keyfob/phone/NFC key that is already associated to another Driver Profile.
Post-conditions	<ul style="list-style-type: none">• The user is informed by HMI indication that the chosen keyfob/phone/NFC key is already associated to another Driver Profile• The user is given the option to overwrite the chosen keyfob/phone/NFC key
Interfaces	Personalization Interface
Notes	

4.5.1.10 ENMEM-UC-REQ-195889/E-Associate a Keyfob with Incorrect Method

Actor	Vehicle Occupant
Pre-conditions	Ignition is Run EnhancedMemoryPositionClient present The vehicle speed is less than 8 KPH At least one set of positional settings is set (one Memory Seat button is defined)
Scenario Description	The User tries to associate a keyfob to the saved positional setting Memory Seat button without using the Driver Profiles menu (ex. using Press & Hold or Set method)
Post-conditions	No chime, indicating a successful keyfob association, is given. The keyfob is not associated to any preset positional settings The keyfob is not associated to any existing Driver Profile
Interfaces	Personalization Interface
Notes	<ul style="list-style-type: none">- For vehicles with Enhanced Memory, keyfob association must be done through the Enhanced Memory keyfob association menu. If the user does not create a Driver Profile, the user cannot associate the keyfob to any Memory Seat button. When Driver Profiles are created, the user can only associate a keyfob via menu.- Phone association to a Driver Profile (via PaaK), and NFC key association to a Driver Profile (via NFCES) must also be done through the Driver Profiles menu. No other phone/NFC key association method shall be supported.

4.5.1.11 ENMEM-UC-REQ-095927/D-Disassociate Keyfob/Phone/NFC Key from a Driver Profile

Actors	Vehicle Occupant
Pre-conditions	The ignition status is in Run. The vehicle speed is less than 8 KPH User is in the process of editing a Driver Profile
Scenario Description	The User accesses the Driver Profiles HMI, chooses to edit a new Driver Profile, and has chosen to remove a keyfob, phone or NFC key association from that profile.
Post-conditions	The previous keyfob or phone association is now removed from the active Driver Profile. In the case of an NFC key, the selected/requested NFC key is now removed from the active Driver Profile.
Interfaces	Personalization Interface

**Note**

Disassociating a keyfob, phone or NFC key does not delete the profile, it only removes the link between the selected profile and the keyfob, phone or NFC key.

4.5.1.12 ENMEM-UC-REQ-194188/B-Disassociate Keyfobs from Driver Profiles after Keyfobs Are Erased from a Vehicle

Actors	Ford Dealership Technician and Vehicle Occupant
Pre-conditions	At least one key fob is associated to a Drive 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 Driver Profile menu
Post-conditions	All Driver Profiles remain the same after Keyfobs were reprogrammed All Keyfob reprogrammed to the vehicle will not be associated to any Driver Profile. HMI does not display Keyfob association indicator for any Driver Profile
Interfaces	Personalization Interface
Notes	Fob association will be erased at the same time Keyfobs are erased via diagnostic tool. For EnhancedMemoryInterfaceClient HMI Keyfob indication associated with this see requirement " <u>ENMEM-HMI-REQ-202226-Keyfob/Phone/NFC key HMI Indication</u> ".

4.5.1.13 ENMEM-UC-REQ-232959/B-Disassociate Phone from Driver Profiles after Phone is Erased/Revoked

Actors	Vehicle Occupant
Pre-conditions	At least one phone is associated to a Driver Profile
Scenario Description	Phones are Erased or Revoked by the user from outside the vehicle The user starts up the vehicle and selects the Driver Profile menu
Post-conditions	All Driver Profiles remain the same after phones have been removed HMI does not display Phone association indicator for any Driver Profile
Interfaces	Personalization Interface
Notes	- Phone association will be erased at the same time Phones are erased or revoked from outside the vehicle (see Phone-As-A-Key SPSS for such methods). - For EnhancedMemoryInterfaceClient HMI Phone indication, see " <u>ENMEM-HMI-REQ-202226-Keyfob/Phone/NFC key HMI Indication</u> ".

4.5.1.14 ENMEM-UC-REQ-427168/A-Disassociate NFC key from Driver Profiles after NFC key is remotely deleted

Actors	Vehicle Occupant
Pre-conditions	At least one NFC key is associated to a Driver Profile
Scenario Description	NFC key(s) is remotely deleted from outside the vehicle The user starts up the vehicle and selects the Driver Profile menu
Post-conditions	All Driver Profiles remain the same after NFC key(s) has been deleted HMI does not display NFC key association indicator for the respective Driver Profile
Interfaces	Personalization Interface
Notes	- NFC key association will be erased at the same time an NFC key is remotely deleted (see NFCES SPSS). - For EnhancedMemoryInterfaceClient HMI NFC key indication, see " <u>ENMEM-HMI-REQ-202226-Keyfob/Phone/NFC key HMI Indication</u> ".

**4.5.1.15 ENMEM-UC-REQ-095929/F-Delete a Driver Profile (with EnhancedMemoryPositionClient)**

Actors	Vehicle Occupant
Pre-conditions	The ignition status is in Run EnhancedMemoryPositionClient is present The vehicle speed is less than 8 KPH At least one Driver Profile has been created
Scenario Description	The user accesses the Driver Profiles HMI and chooses to delete a Driver Profile (need not to be the active Driver Profile)
Post-conditions	<ul style="list-style-type: none">The Driver Profile selected by the user now is deletedIf the active profile is deleted, Guest Profile is recalled automatically. Positional settings remain unchangedPositional settings that were associated to the deleted Driver Profile remain associated to the Memory Seat button. Pressing the disassociated Memory Seat button will recall the stored positional settingsThe keyfob, phone and/or any NFC key(s) that were previously associated to the deleted Driver Profile are automatically disassociated<ul style="list-style-type: none">Pressing/Tapping the disassociated keyfob, phone and/or NFC key(s) will no longer trigger a recall.Positional settings will also not respond to keyfob, phone or NFC key pressing/tappingHMI disables Edit menu and deletes the name, keyfob, phone and/or NFC key(s) association status for the deleted Driver Profile
Interfaces	Personalization Interface
Notes	Deleting a Driver Profile does not delete/erase/revoke a PaaK or NFC key, it only deletes the association between the phone/NFC key(s) and the once existing Driver Profile (refer to Phone-As-A-Key SPSS and NFCES SPSS on removal methods).

4.5.1.16 ENMEM-UC-REQ-352158/B-Delete a Driver Profile (without EnhancedMemoryPositionClient)

Actors	Vehicle Occupant
Pre-conditions	The ignition status is in Run EnhancedMemoryPositionClient is not present The vehicle speed is less than 8 KPH At least one Driver Profile has been created
Scenario Description	The user accesses the Driver Profiles HMI and chooses to delete a Driver Profile (need not to be the active Driver Profile)
Post-conditions	<ul style="list-style-type: none">The Driver Profile selected by the user now is deletedIf the active profile is deleted, Guest Profile is recalled automatically.The keyfob, phone and/or any NFC key(s) that were previously associated to the deleted Driver Profile are automatically disassociated<ul style="list-style-type: none">Pressing/Tapping the disassociated keyfob, phone and/or NFC key(s) will no longer trigger a recall.HMI disables Edit menu and deletes the name, profile number & keyfob, phone and/or NFC key association status for the deleted Driver Profile
Interfaces	Personalization Interface
Notes	Deleting a Driver Profile does not delete/erase/revoke a PaaK or NFC key, it only deletes the association between the phone/NFC key and the once existing Driver Profile (refer to Phone-As-A-Key SPSS and NFCES SPSS on removal methods).

**4.5.1.17 ENMEM-UC-REQ-195890/D-Delete All Driver Profiles via Master Reset (with EnhancedMemoryPositionClient)**

Actor	Vehicle Occupant
Pre-conditions	Infotainment system is ON EnhancedMemoryPositionClient is present At least one Driver Profile is created
Scenario Description	The user presses the Master Reset button
Post-conditions	<ul style="list-style-type: none">All Driver Profiles are deleted and Enhanced Memory feature is turned offUpon return to the Driver Profiles HMI Menu Enhanced Memory feature is OFF. All Driver Profile menus, except Enhanced Memory feature ON/OFF, are disabledAll keyfobs, phones and NFC keys are disassociated from Driver Profiles and Memory Seat buttonsPositional settings remain associated to the Memory Seat buttons
Interfaces	Personalization Interface
Notes	When performing Master Reset, the Enhanced Memory requirements for Deleting a Driver Profile also apply. See Vehicle Settings SPSS and applicable Master Reset documents for performing a Master Reset. See Master Reset requirements to see if there are any driver distraction requirements

4.5.1.18 ENMEM-UC-REQ-352159/B-Delete All Driver Profiles via Master Reset (without EnhancedMemoryPositionClient)

Actor	Vehicle Occupant
Pre-conditions	Infotainment system is ON EnhancedMemoryPositionClient is not present At least one Driver Profile is created
Scenario Description	The user presses the Master Reset button
Post-conditions	<ul style="list-style-type: none">All Driver Profiles are deleted and Enhanced Memory feature is turned offUpon return to the Driver Profiles HMI Menu Enhanced Memory feature is OFF. All Driver Profile menus, except Enhanced Memory feature ON/OFF, are disabledAll keyfobs, phones and NFC keys are disassociated from Driver Profiles
Interfaces	Personalization Interface
Notes	When performing Master Reset, the Enhanced Memory requirements for Deleting a Driver Profile also apply. See Vehicle Settings SPSS and applicable Master Reset documents for performing a Master Reset. See Master Reset requirements to see if there are any driver distraction requirements

**4.5.1.19 ENMEM-UC-REQ-096801/C-User Aborts or System Cancel Event Occurs During Driver Profile Creation Process**

Actors	Vehicle Occupant
Pre-conditions	The ignition status is in Run. EnhancedMemoryPositionClient is present The vehicle speed is less than 8 KPH The user is in the process of creating a Driver Profile
Scenario Description	<ul style="list-style-type: none">• The user cancels out of the pairing process or• A system event occurs that terminates the pairing process as shown in some examples below:<ul style="list-style-type: none">○ Vehicle gear shifts out of Park, Vehicle in motion (i.e. follow Driver Distraction requirements)○ System Timeout○ Ignition no longer in Run○ System shutdown
Post-conditions	<ul style="list-style-type: none">• 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
Interfaces	Personalization Interface
Notes	When EnhancedMemoryPositionClient is not present, the pairing process is not applicable.

4.5.1.20 ENMEM-UC-REQ-096802/E-User Aborts or System Cancel Event Occurs During Keyfob/Phone/NFC Key Association Process

Actors	Vehicle Occupant
Pre-conditions	The ignition status is in Run. The vehicle speed is less than 8 KPH The user is in the process of associating a keyfob, phone or NFC key to a Driver Profile Phone is registered, authenticated, and connected as a PaaK (refer to the Phone-As-A-Key SPSS) NFC key is created and authorized (refer to NFCES SPSS)
Scenario Description	<ul style="list-style-type: none">• The user cancels out of the pairing process or• A system event occurs that terminates the pairing process as shown in some examples below:<ul style="list-style-type: none">○ Vehicle gear shifts out of Park, Vehicle in motion (i.e. follow Driver Distraction requirements)○ System Timeout○ Ignition no longer in Run○ System shutdown
Post-conditions	<ul style="list-style-type: none">• The keyfob, phone or NFC key pairing process has been aborted and a keyfob, phone or NFC key was not successfully paired to the desired Driver Profile• HMI provides Abort notification and instruction to restart the keyfob, phone or NFC key association process
Interfaces	Personalization Interface
Notes	



4.5.2 Requirements

4.5.2.1 ENMEM-REQ-138622/B-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 a user created profile or 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 system strategy.

For the latest EnhancedMemoryProfileServer requirements see the latest Enhanced Memory Feature Spec. This requirement may be outdated.

4.5.2.2 ENMEM-SR-REQ-232984/A-Configurable Parameter to Enable PaaK HMI

The EnhancedMemoryInterfaceClient shall have a configurable parameter to determine whether the vehicle supports the PaaK feature. If the parameter indicates that the vehicle is to support “PaaK”, then the following functionality shall be enabled:

- Phone HMI Indication
- Phone Association via the Edit Menu
- Phone Disassociation via the Edit Menu
- The option during Driver Profile creation to enter Phone Association, either on its own or after Keyfob Association
- And all applicable PaaK screens as depicted in “H84a_SYNC3_EMDriverProfile”

4.5.2.3 ENMEM-REQ-427169/A-Configurable Parameter to Enable NFC HMI

The EnhancedMemoryInterfaceClient shall have a configurable parameter to determine whether the vehicle supports the NFC feature (same as the feature configuration required in NFCES SPSS). If the parameter indicates that NFC Key is ‘Enabled’, then the following functionality shall be enabled:

- NFC Key HMI Indication
- NFC Key Association via the Edit Menu
- NFC Key Disassociation via the Edit Menu
- The option during Driver Profile creation to enter NFC Key Association, either on its own or after Keyfob/Phone Association
- And all applicable NFC key screens depicted in H84a

4.5.2.4 ENMEM-REQ-138631/C-Missing Message DTC

When configured for Enhanced Memory:

- The EnhancedMemoryInterfaceClient shall set a “lost communication” DTC for any expected Enhanced Memory periodic messages that are not received for more than 5 seconds.
 - Messages from the EnhancedMemoryPositionClient shall not be used to set this DTC when the EnhancedMemoryInterfaceClient is configured for “EnhancedMemoryPositionClient = NotPresent”
- 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.

4.5.2.5 ENMEM-REQ-099681/C-Driver Profile Opt-In Status

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

4.5.2.6 ENMEM-REQ-099684/B-Driver Profile to Personality Mapping

The EnhancedMemoryInterfaceClient shall determine which Driver Profile value, reported in the ActivePersonality_St method, is mapped to which 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-099425-Create Driver Profile](#)” for a detailed example.

4.5.2.7 [ENMEM-REQ-116801/F-Retain Enhanced Memory 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, phones and/or NFC keys after a software reflash service is done at dealership.

The information to be retained shall include:

- Opted in and opted out (created and deleted) status of all Driver Profiles
- Driver Profile's keyed-in name
- The association of Driver Profile name to Memory Seat button number (when “EnhancedMemoryPositionClient = Present”), OR
- The association of Driver Profile name to Profile Number (when “EnhancedMemoryPositionClient = NotPresent”)

4.5.2.8 [ENMEM-SR-REQ-095961/C-Maximum Number of Driver Profiles](#)

The EnhancedMemoryInterfaceClient shall have configurable parameters to indicate the max number of possible Driver Profiles that the vehicle can support.

When configured for “EnhancedMemoryPositionClient = Present”, this parameter shall be set equal to the number of Memory Seat buttons, excluding SET button, on the driver door panel.

When configured for “EnhancedMemoryPositionClient = NotPresent”, this parameter shall be set equal to 3.

4.5.2.9 [ENMEM-REQ-198384/B-Alignment between Opt-in Driver Profile and Memory Seat Button](#)

When the EnhancedMemoryInterfaceClient is configured for “EnhancedMemoryPositionClient = Present”, the number in Personal Index of PersonalityOptIn_St shall align with the number of the pressed 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 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 Memory Seat button #2 during 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 Name
PersonalityOptIn_St	Pers1Status	NotOptedIn	0x0
	Pers2Status	OptedIn	0x1
	Pers3Status	NotOptedIn	0x0
	Pers4Status	NotOptedIn	0x0



4.5.2.10 ENMEM-REQ-352354/A-Alignment between Opt-in Driver Profile and Profile Number

When the EnhancedMemoryInterfaceClient is configured for “EnhancedMemoryPositionClient = NotPresent”, the number in Personal Index of 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

4.5.2.11 ENMEM-REQ-099699/E-Disable Driver Profile Creation and Editing When Key is Not in Run or Vehicle Speed is greater than 8KPH

The EnhancedMemoryInterfaceClient shall disable Driver Profile creation and editing if:

1. the Ignition Status is any value other than Run, or
2. the Gear Lever Position Status is any value other than Park (for Automatic Transmissions only, see relevant config. bit), or
3. the Vehicle Speed is greater than 8KPH
 - For driver restrictions related to vehicle in motion follow whatever is specified in the Driver Restrictions SPSS (DRIVE-RESv2-FUR-REQ-025157-HMI Driving Restriction – General Applications (TcSE ROIN-279695-1)).
 - If the vehicle in motion driver restrictions called out in the Enhanced Memory Spec (ex. 8KPH) differs from what is in Req-025157-HMI Driver Restriction, than Req-025157-HMI Driver Restriction shall take precedence.

4.5.2.12 ENMEM-REQ-116802/H-Profile Creation Interruption

If the profile creation process is interrupted prior to completion (For Example: Ignition cycle, vehicle transitions out of park, vehicle speed becomes greater than 8 KPH, user initiated HMI domain change*, Infotainment system reset, etc.), then the process shall be aborted. The EnhancedMemoryInterfaceClient shall:

- Set EnMemProfilePairing_Rq(ButtonPairing = ExitButtonPairing) if in Button Association Mode (only when configured for “EnhancedMemoryPositionClient = Present”)



- Set EnMemProfilePairing_Rq(KeyPairing = ExitKeyPairing) if in Keyfob or Phone Association Mode
- Set EnMemProfilePairing_Rq(NFCKeyPairing = ExitKeyPairing) if in NFC Key Association Mode
- Revert the Pers#Status for PersonalityOptIn_St back to "NotOptedIn" for the Memory Seat Button selected (if it was already set), or the Profile Number assigned (if it was already assigned)
- Not send Feature_Rq(Operation = Copy) if it was not yet sent
- Not perform a Driver Profile recall
- Erase mapping of Profile Number to selected Memory Seat Button or assigned Profile Number
- Erase Driver Profile name from internal memory
- Turn Enhanced Memory Feature Off if there is no other existing Driver Profiles
- Update the user as per ENMEM-HMI-REQ-212764

*A user initiated HMI domain change is one where the customer intentionally changes domain via the HMI. A non-user initiated domain change is one where a system behavior/function causes a domain change (ex. an incoming phone call). In the case of the non-user initiated domain change, the profile creation shall continue to proceed and the abort behavior detailed above shall not occur.

4.5.2.13 ENMEMv2-REQ-485456/A-Profile Creation Interruption v2

If the profile creation process is interrupted prior to completion (For Example: Ignition cycle, vehicle transitions out of park, vehicle speed becomes greater than 8 KPH, HMI domain change, Infotainment system reset, etc.), then the process shall be put on hold. The EnhancedMemoryInterfaceClient shall:

- Save the Pers#Status for PersonalityOptIn_St (if it was already set), or the Profile Number assigned (if it was already assigned)
- Save the Profile Number to selected Memory Seat Button or assigned Profile Number
- Save the Driver Profile name and Avatar
- Not send Feature_Rq(Operation = Copy) if it was not yet sent
- Not perform a Driver Profile recall
- Set EnMemProfilePairing_Rq(ButtonPairing = ExitButtonPairing) if in Button Association Mode (only when configured for "EnhancedMemoryPositionClient = Present")
- Set EnMemProfilePairing_Rq(KeyPairing = ExitKeyPairing) if in Keyfob or Phone Association Mode

4.5.2.14 ENMEM-REQ-485458/A-Tracking the Profile Creation process

In order to provide the user a means to resume their profile creation after interruption, the EnhancedMemoryInterfaceClient shall:

- Monitor and save each completed step of the Setup Wizard and Profile Creation process
- Save the last reached step prior to the interruption
- Maintain a flag (UserSetupCompleteFlag) to indicate whether the Setup Wizard has completed or not. If complete, the flag shall be set to True

4.5.2.15 ENMEM-REQ-485459/A-Resume Profile Creation after Interruption

The EnhancedMemoryInterfaceClient shall allow a user to resume their profile creation from:

- The Driver Profile Edit Menu
- Setup Wizard Reminders

These entry points shall follow/abide by the preconditions per REQ-099699.

4.5.2.16 ENMEM-HMI-REQ-202226/A-Keyfob HMI Indication

The EnhancedMemoryInterfaceClient shall monitor PersKeyPairing_St to maintain and display a Keyfob Association Icon for existing Driver Profiles:

- When PersKeyPairing_St = KeyAssociated, the icon shall be displayed
- When PersKeyPairing_St = KeyUnAssociated or Null, the icon shall not be displayed

4.5.2.17 ENMEM-HMI-REQ-233009/A-Phone HMI Indication

The EnhancedMemoryInterfaceClient shall monitor PersPhonePairing_St to maintain and display a Phone Association Icon for existing Driver Profiles:



- When PersPhonePairing_St = NoPhonesAssociated, the icon shall not be displayed
- When PersPhonePairing_St = OnePhoneAssociated, the icon shall be displayed

4.5.2.18 ENMEM-HMI-REQ-427170/A-NFC Key HMI Indication

The EnhancedMemoryInterfaceClient shall monitor PersNFCKeyPairing_St to maintain and display an NFC Key Association Icon for existing Driver Profiles:

- The NFC Key Association Icon shall be displayed when:
 - At least one of the key indexes for the respective PersIndex does not equal to '0x00 Inactive'
 - Example: PersNFCKeyPairing_St(PersIndex = Pers1, PersNFCKey1Index = Index 1, PersNFCKey2Index = Inactive, PersNFCKey3Index = Inactive, PersNFCKey4Index = Inactive)
- The NFC Key Association Icon shall not be displayed when:
 - All of the key indexes for the respective PersIndex equals '0x00 Inactive'
 - Example: PersNFCKeyPairing_St(PersIndex = Pers1, PersNFCKey1Index = Inactive, PersNFCKey2Index = Inactive, PersNFCKey3Index = Inactive, PersNFCKey4Index = Inactive)

Note: During NFC Association/Disassociation, PersNFCKeyPairing_St remains at the requested PersIndex. The EnhancedMemoryInterfaceClient shall act on last known values for all other PersIndex values during this time.

4.5.2.19 Memory Seat Button & Profile Number Association

When an EnhancedMemoryPositionClient is present, in order to include Positional settings in Enhanced Memory, a Driver Profile is required to be associated to a Memory Seat button. This can be done via either the EnhancedMemoryPositionClient or the EnhancedMemoryInterfaceClient. When an EnhancedMemoryPositionClient is not present, there are not positional settings, and a Driver Profile is instead required to be associated to a Profile Number.

4.5.2.19.1 ENMEM-REQ-352357/A-Memory Seat Button vs Profile Number Association

When "EnhancedMemoryPositionClient = Present", the EnhancedMemoryInterfaceClient shall follow the Memory Seat Button Association requirements defined in REQ-099685, REQ-198930, REQ-198931, REQ-199236, REQ-199352, REQ-197965, and REQ-116803.

When "EnhancedMemoryPositionClient = NotPresent", the EnhancedMemoryInterfaceClient shall not follow any of the Memory Seat Button Association requirements and instead shall automatically assign a Personal Index (aka Profile Number) to each Driver Profile Name as they are created, in order of creation (ascending order, ex. 1, 2, 3, 4...). The EnhancedMemoryInterfaceClient shall never overwrite an existing Profile Number during profile creation.

4.5.2.19.2 ENMEM-REQ-099685/F-Request Enter Memory Seat Button Association Mode

When associating a Driver Memory Seat Button during the Profile Creation process, the EnhancedMemoryInterfaceClient will command the EnhancedMemoryPositionClient to enter a button pairing state where certain functions are to be disabled in the EnhancedMemoryPositionClient. This button pairing state is communicated to the EnhancedMemoryPositionClient via the EnMemProfilePairing_Rq(ButtonPairing) method.

This button pairing state shall also be re-entered between Driver Memory Seat Button Association attempts (limited to ENMEM-REQ-179346-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-116803-Request Exit Memory Seat Button Association Mode).

Once the button pairing state is entered (EnMemProfilePairing_Rq(ButtonPairing = EnterButtonPairing)), the EnhancedMemoryPositionClient shall prevent driver position recalls (seat, mirrors, etc.), and suppress the transmission of MemSwitchRecall_Rq and ClassicMemory_Rq (legacy signal) methods when a Driver Memory Seat button is pressed during this state.

The EnhancedMemoryPositionClient shall exit this button pairing state when indicated by EnMemProfilePairing_Rq(ButtonPairing = ExitButtonPairing) or when Ignition_Status transitions out of *Run*, whichever comes first.



4.5.2.19.3 ENMEM-REQ-198930/A-No Request for Memory Seat Button Association Mode When Editing

When editing the Drive Profile name, even if an unique Driver Profile name is successfully entered, EnhancedMemoryInterfaceClient shall not command the EnhancedMemoryPositionClient to enter button association mode.

4.5.2.19.4 ENMEM-REQ-198931/A-Retry and Error Handling Strategies for Seat Button Association Mode

- After sending the request for entering Memory Seat Button Association Mode (EnMemProfilePairing_Rq(ButtonPairing = EnterButtonPairing)), if there is no response (EnMemButtonPairing_St(ButtonPairing = ButtonPairingEntered, ButtonPairingFailed)) within 500 msec or communication data is invalid or corrupted, then the EnhancedMemoryInterfaceClient shall resend the request up to 3 times.
 - When multiple requests do not yield correct response, the EnhancedMemoryInterfaceClient shall abort Driver Profile creation process entirely by doing the following actions:
 - Set EnMemProfilePairing_Rq(ButtonPairing = ExitButtonPairing)
 - Erase Driver Profile name from internal memory
 - Turn Enhanced Memory Feature Off if there is no other existing Driver Profiles
 - The EnhancedMemoryInterfaceClient shall provide the user HMI notification about the abort process status
- After sending the request for exiting Memory Seat Button Association Mode (EnMemProfilePairing_Rq(ButtonPairing = ExitButtonPairing)), if there is no response (EnMemButtonPairing_St(ButtonPairing = ButtonPairingExited, ButtonPairingFailed)) within 500 msec or communication data is invalid or corrupted, then the EnhancedMemoryInterfaceClient shall resend the request up to 3 times.
 - When multiple requests do not yield correct response, the EnhancedMemoryInterfaceClient shall do the following actions:
 - Revert the Pers#Status for PersonalityOptIn_St back to NotOptedIn for the Memory Seat Button selected
 - Do not perform a Driver Profile recall
 - Do not store mapping of Profile Number to selected Memory Seat Button
 - Turn Enhanced Memory Feature Off if there is no other existing Driver Profiles
 - The EnhancedMemoryInterfaceClient shall provide the user HMI notification about the abort process status

4.5.2.19.5 ENMEMv2-REQ-485464/A-Retry and Error Handling Strategies for Seat Button Association Mode v2

- After sending the request for entering Memory Seat Button Association Mode (EnMemProfilePairing_Rq(ButtonPairing = EnterButtonPairing)), if there is no response (EnMemButtonPairing_St(ButtonPairing = ButtonPairingEntered, ButtonPairingFailed)) within 500 msec or communication data is invalid or corrupted, then the EnhancedMemoryInterfaceClient shall resend the request up to 3 times.
 - When multiple requests do not yield correct response, the EnhancedMemoryInterfaceClient shall:
 - Set EnMemProfilePairing_Rq(ButtonPairing = ExitButtonPairing)
 - Notify the user that they must use the EnhancedMemoryInterfaceClient to input their selection as their EnhancedMemoryPositionClient may be unresponsive
- After sending the request for exiting Memory Seat Button Association Mode (EnMemProfilePairing_Rq(ButtonPairing = ExitButtonPairing)), if there is no response (EnMemButtonPairing_St(ButtonPairing = ButtonPairingExited, ButtonPairingFailed)) within 500 msec or communication data is invalid or corrupted, then the EnhancedMemoryInterfaceClient shall resend the request up to 3 times.
 - When multiple requests do not yield correct response, the EnhancedMemoryInterfaceClient shall:
 - Notify the user that their EnhancedMemoryPositionClient may be unresponsive
 - This shall only be performed if EnMemButtonPairing_St(ButtonPairing = ButtonPairingEntered) was received prior to the Exit request.
 - If EnMemButtonPairing_St(ButtonPairing = ButtonPairingEntered) was not received, this notification shall not be shown.

4.5.2.19.6 ENMEM-REQ-198928/C-EnhancedMemoryPositionClient Button Press in Button Association Mode

In Memory Seat button association mode, button presses as well as press and hold actions of the EnhancedMemoryPositionClient are not meant to recall Driver Profiles or save positional settings. Instead, button press actions shall only serve as the indicator of a button being associated to a new Driver Profile.

- In Memory Seat button association mode, EnhancedMemoryPositionClient shall suppress the transmission of MemSwitchRecall_Rq when a Memory Seat button is pressed during this mode.



- When detecting a button press in Memory Seat button association mode, EnhancedMemoryPositionClient shall inform the EnhancedMemoryInterfaceClient which button is pressed via EnMemButtonPairing_St (ButtonPairing).

4.5.2.19.7 ENMEM-REQ-368047/A-EnhancedMemoryInterfaceClient Button Press in Button Association Mode

The EnhancedMemoryInterfaceClient shall allow the user to select a Memory Seat button via its HMI while the EnhancedMemoryPositionClient is in Memory Seat button association mode. A button press on the EnhancedMemoryInterfaceClient at this time 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.

4.5.2.19.8 ENMEM-REQ-368048/A-Memory Seat Button Press Handling

In 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).

4.5.2.19.9 ENMEM-REQ-198934/A-Button Press Error Strategy

The EnhancedMemoryPositionClient shall report ButtonPairingFailed via EnMemButtonPairing_St(ButtonPairing) whenever the user presses SET button during Memory Seat button association process.

Other customer button press errors, defined by Classic Memory feature specification, shall also trigger EnhancedMemoryPositionClient to report ButtonPairingFailed during Memory Seat button association process.

4.5.2.19.10 ENMEM-REQ-199236/A-No Recall in Button Association Mode

During Memory Seat Button Association Mode, all profile recall requests (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.

4.5.2.19.11 ENMEM-REQ-199352/B-Successful Memory Button Association

A successful Memory Seat button association event shall be defined as when in button association mode the EnhancedMemoryInterfaceClient receives a valid button press status (from either the EnhancedMemoryPositionClient or the EnhancedMemoryInterfaceClient) and internally determines that the pressed button is not associated to any existing Driver Profiles.

A valid memory button press from the EnhancedMemoryPositionClient shall be defined as EnMemButtonPairing_St(ButtonPairing) with encoding value in the range from 1 to 4 (i.e. Button1Pressed, Button2Pressed, Button3Pressed, Button4Pressed)

A valid memory button press from the EnhancedMemoryInterfaceClient shall be defined as an HMI input with a value in the range from 1 to 4 (i.e. Button1Pressed, Button2Pressed, Button3Pressed, Button4Pressed)

The EnhancedMemoryInterfaceClient HMI shall display a retry popup when:

- EnMemButtonPairing_St(ButtonPairing) is not in valid range
- The HMI input value is not in range
- EnMemButtonPairing_St(ButtonPairing) is in failure state
- Pressed button is already associated to another Driver Profile

4.5.2.19.12 ENMEM-REQ-197965/A-No overwrite for Memory Seat Buttons already associated to Existing Driver Profiles

The EnhancedMemoryInterfaceClient shall not permit a user to overwrite a Memory Seat Button already associated to an existing Driver Profile, to a newly created Driver Profile.

4.5.2.19.13 ENMEM-REQ-116803/D-Request Exit Memory Seat Button Association Mode

EnhancedMemoryInterfaceClient shall command the EnhancedMemoryPositionClient to exit Button Association Mode via EnMemProfilePairing_Rq(ButtonPairing = ExitButtonPairing) 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), and no selection of a Memory Seat button via the EnhancedMemoryInterfaceClient HMI
- 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-099699)
 - 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

4.5.2.19.14 ENMEM-REQ-198935/A-Exit Memory Seat Button Association Mode

EnhancedMemoryPositionClient shall exit Button Association Mode and set EnMemButtonPairing_St(ButtonPairing = ButtonPairingExited) for the following cases:

- When receiveing EnMemProfilePairing_Rq(ButtonPairing = ExitButtonPairing)
- The Association timer, T_SeatAssocOneTime2, as defined in ENMEM-TMR-REQ-197339, has expired
- Communication with EnhancedMemoryInterfaceClient is lost

4.5.2.19.15 ENMEM-REQ-197340/A-Button Pairing Timer Expired

When T_SeatAssocOneTime2 expires, the EnhancedMemoryPositionClient shall exit Button Association Mode and update the status of EnMemButtonPairing_St(ButtonPairing) to ButtonPairingExited for a time of T_ReturnToNull, followed by Null.

4.5.2.19.16 ENMEM-TMR-REQ-197339/A-T_SeatAssocOneTime2

Name	Description	Units	Range	Resolution	Default
T_SeatAssocOneTime2	Maximum time the EnhancedMemoryPositionClient shall wait before exiting Button Association Mode. Note: Use the default value	sec	40-130	5	70

4.5.2.20 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 each feature.

4.5.2.20.1 ENMEM-REQ-198923/B-Copy Request

After a 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.



4.5.2.20.2 ENMEM-REQ-425794/A-Copy Request - CCPU to VIP

When the EnhancedMemoryInterfaceClient is required to send the Copy request (per REQ-198923), the EnhancedMemoryInterfaceClient's CCPU shall send FeatureCopyProfile_Rq to its VIP (internally) set to the PERS_# as per REQ-198922.

4.5.2.20.3 ENMEM-REQ-425795/A-Copy Request - VIP to FBMP Translation

When the EnhancedMemoryInterfaceClient's VIP receives a Copy request per REQ-425794, it shall send/translate the received internal signal to the FBMP request as follows:

- Feature_Rq(Operation = Copy, FeatureID = 0, Configuration = 0xFFFF, PersIndex = FeatureCopyProfile_Rq)

4.5.2.20.4 ENMEM-REQ-198922/B-Driver Profile Index for Copy Command

In the Copy request, via Feature_Rq(PersIndex), the PersIndex shall be the same number as the unassociated 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 the Memory Seat button X is pressed, indicated by EnMemButtonPairing_St(ButtonPairing=ButtonXPressed), the EnhancedMemoryInterfaceClient will then determine that Memory Seat button's association status internally.

- If the status is not associated, the EnhancedMemoryInterfaceClient will then set Feature_Rq(PersIndex) to PERS X
- If the status is associated, the EnhancedMemoryInterfaceClient will send EnMemProfilePairing_Rq(ButtonPairing=ExitButtonPairing) to the EnhancedMemoryPositionClient and the EnhancedMemoryInterfaceClient will display a retry prompt to the user.

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

4.5.2.20.5 ENMEM-REQ-198920/B-Execute Copy Operation

When receiving a Copy command via Feature_Rq(Operation = Copy), an 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.

4.5.2.20.6 ENMEM-REQ-198919/B-Performance Requirement for Copy Operation

All EnhancedMemoryServers shall perform the Copy operation within T_PersCopy.

4.5.2.20.7 ENMEM-REQ-099698/B-Wait Response From AudioServer While Copy Operation is Still in Progress

The AudioServer shall complete all Copy operations within T_PersCopy. In the case that an Enhanced Memory related Copy operation is still in progress at the time a request for preset data (GetTUPresetInfo_Rq) is received, then the AudioServer shall respond to the GetTUPresetInfo_Rq method with a CES response code of "Intermediate Result - Wait" until the Copy operation has been successfully completed. Upon completion of the Enhanced Memory related Copy operation, the AudioServer will provide the requested preset data.

4.5.2.20.8 ENMEMv2-REQ-435085/A-Wait Response From AudioServer While Copy Operation is Still in Progress v2

The AudioServer (PDC) shall complete all Copy operations within T_PersCopy.



- In the case that an Enhanced Memory related Copy operation is still in progress at the time an **external** request for preset list is received (see TUV2-SD-REQ-420989), then the AudioServer shall respond with a CES response code of "Intermediate Result - Wait" until the Copy operation has been successfully completed. Upon completion of the Enhanced Memory related Copy operation, the AudioServer will provide the requested preset data.
- In the case that an Enhanced Memory related Copy operation is still in progress at the time an **internal** request (ex. DI HMI component on CCPU) for preset list is received, then the AudioServer shall respond with a 'Wait' until the Copy operation has been successfully completed. Upon completion of the Enhanced Memory related Copy operation, the AudioServer will provide the requested preset data.

4.5.2.20.9 ENMEM-TMR-REQ-105579/B-T_PersCopy

Name	Description	Units	Range	Resolution	Default
T_PersCopy	Maximum time the EnhancedMemoryServers shall take to complete all Enhanced Memory related Copy operations for a given Driver Profile upon request. Note: Use the default value	msec	1500-4500	500	3000

4.5.2.20.10 ENMEM-REQ-199347/B-Request Exit Memory Button Association Mode After Copy

When configured for "EnhancedMemoryPositionClient = Present" and after sending the FBMP Copy request, the EnhancedMemoryInterfaceClient shall wait a minimum of T_PersCopy before sending a request (EnMemProfilePairing_Rq(ButtonPairing = ExitButtonPairing)) to exit Memory Seat button association mode.

When configured for "EnhancedMemoryPositionClient = NotPresent" the EnhancedMemoryInterfaceClient shall not send EnMemProfilePairing_Rq(ButtonPairing = ExitButtonPairing).

4.5.2.20.11 ENMEM-REQ-198918/B-Recall New Driver Profile After Copy

- When "EnhancedMemoryPositionClient = Present", after sending the Copy request and then sending an exit 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 FBMP 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 FBMP 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

4.5.2.20.12 ENMEM-TMR-REQ-099765/B-T_RecallDelay

Name	Description	Units	Range	Resolution	Default
T_RecallDelay	The time from when the EnhancedMemoryInterfaceClient sends the FBMP Copy command until it sends the recall request Note: Use the default value + or - 10%	msec	3000-7000	500	5000

4.5.2.20.13 ENMEM-TMR-REQ-134146/B-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



	Note: Use the default value				
--	-----------------------------	--	--	--	--

4.5.2.20.14 ENMEM-REQ-099683/E-Storing Positional Settings for the Copy Operation

When creating a Driver Profile, during the copy operation, the EnhancedMemoryPositionClient's 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 positional setting store operation shall be issued before the recall request. This shall only be performed when configured for "EnhancedMemoryPositionClient = Present."

- The EnhancedMemoryInterfaceClient shall send a store positional settings request via InfotainmentPersStore_Rq to the EnhancedMemoryPositionClient before sending the recall request for the new Driver Profile
- The EnhancedMemoryPositionClient shall store all current Classic Memory settings to the indicated 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).

Reference sequence diagram [ENMEM-SD-REQ-099425-Create Driver Profile](#) for details.

4.5.2.20.15 ENMEM-REQ-485465/A-Startup Profile Auto-Creation

Upon first boot (after a Master Reset, first battery connect, etc.) and after deleting last remaining profile, the EnhancedMemoryInterfaceClient shall automatically create a Driver Profile on PersIndex 1 by:

1. Turning on the Enhanced Memory Feature via EnhancedMemory_St = ProfilesOn
2. Setting PersonalityOptIn_St(Pers1Status = "OptedIn")
3. Setting the Driver Profile Name to 'Driver'
4. Internally assigning Driver to Pers1
5. Sending Feature_Rq(Operation = Copy, FeatureID = 0, Configuration = 0xFFFF, PersIndex = PERS_1) (per REQ-198922, REQ-198923)
6. Sending InfotainmentPersStore_Rq = Pers1 (per REQ-099683)
7. Recalling the profile via InfotainmentRecall_Rq = Pers1 after T_RecallDelay (per REQ-485466)

*Steps 5,6,7 shall be performed when the bus is ready/up and no sooner than 3s after IgnitionStatus = Run. If the above occurs when IgnitionStatus != Run, the EnhancedMemoryInterfaceClient shall cache/delay steps 5,6,7 until IgnitionStatus = Run.

This shall be followed by the regular Profile Creation process.

Note: In the Android framework, an Android User must always be active. Since the EnhancedMemoryInterfaceClient maintains a 1 to 1 association between an Android User and an Enhanced Memory Driver Profile, the EnhancedMemoryInterfaceClient must auto-create a Driver Profile upon initial startup. When the user experiences the Setup Wizard for the first time, this first profile would have already been created. The user's modifications during Setup Wizard/Profile Creation will update this first profile accordingly.

4.5.2.20.16 ENMEM-REQ-485466/A-Startup Profile Auto-Creation - Recall New Driver Profile After Copy

After sending the Copy request, the EnhancedMemoryInterfaceClient shall wait a minimum of T_RecallDelay from the time the FBMP Copy request was first sent, before sending a request to update to the new Driver Profile via InfotainmentRecall_Rq = Pers1

The value of T_RecallDelay shall be a configurable value.

4.5.2.20.17 ENMEM-REQ-485467/A-Startup Profile Auto-Creation - Reassign PersIndex

If during the initial/first Profile Creation process the user chooses to assign a memory seat button different than the one automatically assigned (Pers1), the EnhancedMemoryInterfaceClient shall:

- internally reassign the Android User to the newly selected PersIndex/Driver Profile
- update PersonalityOptIn_St(Pers1Status = "NotOptedIn")



- update PersonalityOptIn_St(Pers#Status = "OptedIn"), where # is the newly selected PersIndex

4.5.2.21 Keyfob/Phone/NFC Key Association

The pairing of a Keyfob, Phone, or NFC Key is an optional operation in the Enhanced Memory feature set. This can be done during or after profile creation. This can only be completed through the Enhanced Memory feature and is not available when Enhanced Memory is not OptedIn

4.5.2.21.1 ENMEM-REQ-099672/D-Configurable Parameter for Key/Phone/NFC Key Pairing

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 MemSwch_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 MemSwch_D_RqAssoc method shall be ignored since keyfob association will instead be coordinated via the EnMemProfilePairing_Rq(KeyPairing) method.
 - Phone association shall only be supported when the parameter indicates that the vehicle is to support "Enhanced Memory" and shall be coordinated via the EnMemProfilePairing_Rq(KeyPairing) method
 - NFC Key Association shall only be supported when the parameter indicates that the vehicle is to support "Enhanced Memory" and shall be coordinated via the EnMemProfilePairing_Rq(NFCKeyPairing) method

4.5.2.21.2 ENMEM-REQ-099697/B-Configurable Parameter to Disable Classic Keyfob Pairing

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 MemSwch_D_RqAssoc method shall be sent with null values to the EnhancedMemoryProfileServer and any associated chimes/tones for key pairing shall be suppressed.

4.5.2.21.3 ENMEM-REQ-427323/A-Maximum Number of NFC Key Associations per Profile

The EnhancedMemoryInterfaceClient shall have configurable parameter to indicate the max number of NFC Key Associations to allow per Driver Profile (when NFC Key is enabled per REQ-427169).

- When the parameter indicates that 1 association shall be allowed, the EnhancedMemoryInterfaceClient shall allow/offer 1 association per profile
- When the parameter indicates that 2 associations shall be allowed, the EnhancedMemoryInterfaceClient shall allow/offer 2 associations per profile
- Etc.
 - The default value for this configuration shall be "4 Associations"

4.5.2.21.4 ENMEM-REQ-099686/C-Keyfob Pairing Mode

To associate a Driver Profile to a keyfob, the EnhancedMemoryInterfaceClient shall communicate to the EnhancedMemoryProfileServer that the Key Pairing mode has been entered via the EnMemProfilePairing_Rq (PersIndex=PersX, KeyPairing=EnterKeyPairing) method.

- Once EnMemProfilePairing_Rq (PersIndex=PersX, KeyPairing=EnterKeyPairing) is sent, the EnhancedMemoryProfileServer shall respond with EnMemKeyPairing_St(KeyPairing = KeyPairingEntered) upon successful entering of the Keyfob Pairing Mode.
- The EnhancedMemoryProfileServer shall begin looking for a "Lock" button press from PersX keyfob to associate to the requested Driver Profile. If the Keyfob detected is not already associated to another Driver Profile, the EnhancedMemoryProfileServer shall transmit EnMemKeyPairing_St(KeyPairing = KeyAssociateSuccess) after associating the detected keyfob to the requested Driver Profile.
- The EnhancedMemoryProfileServer shall update the status of PersKeyPairing_St(PersXKeyStatus=Key Associated).
- The EnhancedMemoryProfileServer shall exit Key Pairing mode when indicated by:
 - EnMemProfilePairing_Rq(KeyPairing = ExitKeyPairing)
 - EnMemKeyPairing_St(KeyPairing = KeyAssociateSuccess)



- Ignition_Status transitions out of *Run*,
- Gear Lever Position transitions out of *Park*,
- Vehicle speed exceeds 8kph, whichever comes first.

Reference sequence diagram [ENMEM-SD-REQ-099422-Associate Key Fob](#) for details

4.5.2.21.5 ENMEM-REQ-233118/B-Phone Pairing Mode

To associate a Driver Profile to a phone, the EnhancedMemoryInterfaceClient shall communicate to the EnhancedMemoryProfileServer that the Phone Pairing mode has been entered via the EnMemProfilePairing_Rq (PersIndex=PersX, KeyPairing=EnterPhonePairing) method.

- Once EnMemProfilePairing_Rq (PersIndex=PersX, KeyPairing=EnterPhonePairing) is sent, the EnhancedMemoryProfileServer shall respond with EnMemKeyPairing_St(KeyPairing = KeyPairingEntered) upon successful entering of the Phone Pairing Mode.
- The EnhancedMemoryProfileServer shall begin looking for a “Lock” button press from PersX Phone to associate to the requested Driver Profile. If the Phone detected is not already associated to another Driver Profile, the EnhancedMemoryProfileServer shall transmit EnMemKeyPairing_St(KeyPairing = KeyAssociateSuccess) after associating the detected Phone to the requested Driver Profile.
- The EnhancedMemoryProfileServer shall update the status of PersPhonePairing_St(PersXPhoneStatus=OnePhoneAssociated).
- The EnhancedMemoryProfileServer shall exit Phone Pairing mode when indicated by:
 - EnMemProfilePairing_Rq(KeyPairing = ExitKeyPairing)
 - EnMemKeyPairing_St(KeyPairing = KeyAssociateSuccess)
 - Ignition_Status transitions out of *Run*,
 - Gear Lever Position transitions out of *Park*,
 - Vehicle speed exceeds 8kph, whichever comes first.

Reference sequence diagram [ENMEM-SD-REQ-233258-Associate Phone](#) for details

4.5.2.21.6 ENMEM-REQ-427324/A-NFC Key Pairing Mode

To associate a Driver Profile to an NFC key, the EnhancedMemoryInterfaceClient shall communicate to the EnhancedMemoryProfileServer that the NFC Key Pairing mode has been entered via the EnMemProfilePairing_Rq (PersIndex=PersX, NFCKeyPairing=EnterKeyPairing) method.

- Once EnMemProfilePairing_Rq (PersIndex=PersX, NFCKeyPairing=EnterKeyPairing) is sent, the EnhancedMemoryProfileServer shall respond with EnMemKeyPairing_St(KeyPairing = KeyPairingEntered) upon successful entering of the NFC Key Pairing Mode.
- The EnhancedMemoryProfileServer shall begin looking for an “NFC Tap” event from PersX NFC Key to associate to the requested Driver Profile. If the NFC key detected is not already associated to another Driver Profile, the EnhancedMemoryProfileServer shall transmit EnMemKeyPairing_St(KeyPairing = KeyAssociateSuccess) after associating the detected NFC key to the requested Driver Profile.
- The EnhancedMemoryProfileServer shall update the status of PersNFCKeyPairing_St(PersNFCKeyXIndex) with the assigned/saved index value for PersX.
- The EnhancedMemoryProfileServer shall exit NFC Key Pairing mode when indicated by:
 - EnMemProfilePairing_Rq(NFCKeyPairing = ExitKeyPairing)
 - EnMemKeyPairing_St(KeyPairing = KeyAssociateSuccess)
 - Ignition_Status transitions out of *Run*,
 - Gear Lever Position transitions out of *Park*,
 - Vehicle speed exceeds 8kph, whichever comes first.

Reference sequence diagram [ENMEM-SD-REQ-427617-Associate NFC Key](#) for details.



4.5.2.21.7 ENMEM-REQ-427325/A-NFC Key Association Status

The EnhancedMemoryInterfaceClient shall receive the NFC Key Association statuses from the EnhancedMemoryProfileServer via PersNFCKeyPairing_St, which is comprised of:

- a PersIndex, that indicates for which Pers the PersNFCKeyXStatus signals correspond to
- a set of PersNFCKeyXStatus signals, that indicate the possible NFC Key Association statuses via a non-zero KeyIndex

The EnhancedMemoryProfileServer publishes PersNFCKeyPairing_St event periodically, cycling through each of the PersIndex values and their corresponding PersNFCKeyXStatus associations every 250ms.

Note: During NFC Association/Disassociation, PersNFCKeyPairing_St remains at the requested PersIndex. The EnhancedMemoryInterfaceClient shall act on last known values for all other PersIndex values during this time.

For the latest EnhancedMemoryProfileServer requirements see the latest Enhanced Memory Feature Spec. This requirement may be outdated.

4.5.2.21.8 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.

4.5.2.21.9 ENMEM-REQ-234278/B-Detection of a Keyfob/Phone/NFC Key in Opposite Pairing Mode

When a keyfob, phone, or NFC key is detected during an opposing/different Association process (ex. when a phone is detected during the Keyfob Association process), the EnhancedMemoryProfileServer shall update the status of EnMemKeyPairing_St(KeyPairing) to WrongDeviceSelected for 1 second, and then return to KeyPairingEntered to resume the ongoing association mode operation.

4.5.2.21.10 ENMEM-HMI-REQ-234279/B-Wrong Device Detected HMI

In the Keyfob, Phone or NFC 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 temporary notification to the user that the wrong device was selected
- This notification shall be triggered, not sustained, by the above signal value (See H31a_SYNC3_EMDriverProfile for notification duration).

4.5.2.21.11 ENMEM-REQ-198044/C-Detection of Associated Keyfob/Phone/NFC Key

When a keyfob, phone or NFC key is detected in their respective Keyfob, Phone or NFC Key Association processes, the EnhancedMemoryProfileServer shall check if the detected keyfob, phone or NFC key is already associated to an existing Driver Profile.

In the case where the detected keyfob, phone or NFC key is already associated to an existing Driver Profile, the EnhancedMemoryProfileServer shall update the status of EnMemKeyPairing_St(KeyPairing) to KeyAlreadyInUse.



4.5.2.21.12 ENMEM-SR-REQ-198055/D-Enhanced Memory HMI Option for Associated Keyfob/Phone/NFC Key

In the Keyfob, Phone or NFC Key Association process,

- The EnhancedMemoryInterfaceClient shall monitor EnMemKeyPairing_St to determine when a user attempts to associate an already associated keyfob, phone or NFC key to a new Driver Profile.
- When receiving KeyAlreadyInUse via EnMemKeyPairing_St(KeyPairing):
 - EnhancedMemoryInterfaceClient shall provide notification to the user that the keyfob, phone or NFC key is already associated to an existing Driver Profile
 - EnhancedMemoryInterfaceClient shall provide the user an option to over-write the associated keyfob, phone or NFC key, or to cancel the association process
 - When the user opts to over-write the associated keyfob or phone, the EnhancedMemoryInterfaceClient shall set EnMemProfilePairing_Rq(KeyPairing) to OverwriteKey.
 - When the user opts to over-write the associated NFC key, the EnhancedMemoryInterfaceClient shall set EnMemProfilePairing_Rq(NFCKeyPairing) to OverwriteKey.

4.5.2.21.13 ENMEM-REQ-198100/B-Overwrite Associated Keyfob

When receiving OverwriteKey via EnMemProfilePairing_Rq(KeyPairing):

- EnhancedMemoryProfileServer shall erase the existing keyfob association and associate the new keyfob to the Driver Profile denoted by EnMemProfilePairing_Rq (PersIndex)
- EnhancedMemoryProfileServer shall update PersKeyPairing_St accordingly:
 - The Driver Profile whose keyfob association was erased shall be updated from KeyAssociated to KeyUnAssociated
 - The Driver Profile with the newly associated keyfob shall be updated from KeyUnAssociated to KeyAssociated

4.5.2.21.14 ENMEM-REQ-233161/A-Overwrite Associated Phone

When receiving OverwritePhone via EnMemProfilePairing_Rq(KeyPairing):

- EnhancedMemoryProfileServer shall erase the existing phone association and associate the new phone to the Driver Profile denoted by EnMemProfilePairing_Rq (PersIndex)
- EnhancedMemoryProfileServer shall update PersPhonePairing_St accordingly:
 - The Driver Profile whose phone association was erased shall be updated from OnePhoneAssociated to NoPhonesAssociated
 - The Driver Profile with the newly associated phone shall be updated from NoPhonesAssociated to OnePhoneAssociated

4.5.2.21.15 ENMEM-REQ-427327/A-Overwrite NFC Key

When receiving OverwriteKey via EnMemProfilePairing_Rq(NFCKeyPairing):

- EnhancedMemoryProfileServer shall erase the existing NFC key association and associate the new NFC key to the Driver Profile denoted by EnMemProfilePairing_Rq(PersIndex)
- EnhancedMemoryProfileServer shall update PersNFCKeyPairing_St accordingly:
 - The Driver Profile whose NFC key association was erased shall set PersNFCKeyPairing_St(PersNFCKeyXIndex = Inactive)
 - The Driver Profile with the newly associated NFC key shall set PersNFCKeyPairing_St(PersNFCKeyXIndex) to the assigned/saved index value for PersX.
 - In this case, the key index is reallocated from the original PersX KeyX to the new PersX KeyX (the Key number/position need not be the same).

**4.5.2.21.16ENMEM-REQ-099690/E-Keyfob/Phone/NFC Key Pairing Failed**

Any fault of the EnhancedMemoryProfileServer that prevents Keyfob, Phone or NFC Key Pairing shall result in the EnhancedMemoryProfileServer communicating to the EnhancedMemoryInterfaceClient that the keyfob, phone or NFC key was not able to be associated by updating the status of EnMemKeyPairing_St(KeyPairing) to KeyAssociateFailed.

When the EnhancedMemoryInterfaceClient receives EnMemKeyPairing_St(KeyPairing = KeyAssociateFailed), the EnhancedMemoryInterfaceClient HMI shall notify the user that the Keyfob, Phone or NFC Key Pairing process has failed and shall exit the Keyfob, Phone or NFC Key Pairing process.

4.5.2.21.17ENMEM-REQ-194169/C-Keyfob/Phone/NFC Key Pairing Timer Expired

When T_FobAssocTotal2 expires, the EnhancedMemoryProfileServer shall exit Keyfob, Phone or NFC Key Pairing Mode and update the status of EnMemKeyPairing_St(KeyPairing) to KeyAssociateFailed for 1 second, followed by Null.

4.5.2.21.18ENMEM-TMR-REQ-194101/D-T_FobAssocTotal2

Name	Description	Units	Range	Resolution	Default
T_FobAssocTotal2	After entering Keyfob, Phone or NFC Key Pairing Mode, the maximum time the EnhancedMemoryProfileServer shall wait before exiting Keyfob, Phone or NFC Key Pairing Mode.	msec	300000 - 420000	60000	360000

4.5.2.21.19ENMEM-REQ-116804/G-Keyfob/Phone/NFC Key Pairing Error

If the Keyfob or Phone Pairing process is not active (not in process of pairing a keyfob or phone to a profile) and the EnhancedMemoryInterfaceClient receives EnMemKeyPairing_St(KeyPairing != Null), then the EnhancedMemoryInterfaceClient shall send EnMemProfilePairing_Rq(KeyPairing = ExitKeyPairing).

If the NFC Key Pairing process is not active (not in process of pairing an NFC key to a profile) and the EnhancedMemoryInterfaceClient receives EnMemKeyPairing_St(KeyPairing != Null), then the EnhancedMemoryInterfaceClient shall send EnMemProfilePairing_Rq(NFCKeyPairing = ExitKeyPairing).

The EnhancedMemoryInterfaceClient shall abort the process by sending either EnMemProfilePairing_Rq(KeyPairing = ExitKeyPairing) (if in Keyfob or Phone Pairing process) or EnMemProfilePairing_Rq(NFCKeyPairing = ExitKeyPairing) (if in NFC Key Pairing process) to the EnhancedMemoryProfileServer in the event the EnhancedMemoryInterfaceClient detects that:

- the vehicle is in motion (>8 kph), or
- the vehicle transitions out of Run or Park, or
- the user exits Keyfob, Phone or NFC Key Pairing Mode via the HMI in the middle of the Pairing process
 - including a user initiated HMI domain change* (see REQ-11680)

*In the case of a non-user initiated domain change, the Keyfob, Phone or NFC Key Pairing process shall continue to proceed and the abort shall not occur (see REQ-116802).

If the EnhancedMemoryInterfaceClient receives EnMemKeyPairing_St(KeyPairing = Null) after already entering Keyfob, Phone or NFC Key Pairing Mode, then the EnhancedMemoryInterfaceClient shall treat the Null as KeyPairingExited.

4.5.2.21.20ENMEM-SR-REQ-212303/D-PersIndex used for Keyfob/Phone/NFC Key Association

When requesting to enter Keyfob, Phone or 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, (indicated by EnMemButtonPairing_St(ButtonPairing)) when configured for "EnhancedMemoryPositionClient = Present", OR
- The Profile Number created during the Create Driver Profile process, when configured for "EnhancedMemoryPositionClient = NotPresent", OR
- The PersIndex of the selected Driver Profile Edit button when attempting associate a keyfob, phone or NFC key



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

4.5.2.22 Delete Driver Profiles

The Delete Profile operation is used to erase a user's Profile Name, Keyfob Icon, Phone Icon, NFC Key Icon, Memory Seat Button Association, Profile Number Association, Keyfob Association, Phone Association and NFC Key Association(s). This is a permanent operation and cannot be undone.

4.5.2.22.1 ENMEM-REQ-134465/E-Delete Driver Profile

When a created Driver Profile is deleted the EnhancedMemoryInterfaceClient shall:

1. If a keyfob is associated to the profile being deleted, the EnhancedMemoryInterfaceClient shall send a keyfob disassociation request, via EnMemProfilePairing_Rq(KeyPairing=DisassociateKey), without requiring a separate disassociation request from the user
2. If a phone is associated to the profile being deleted, the EnhancedMemoryInterfaceClient shall send a phone disassociation request, via EnMemProfilePairing_Rq(KeyPairing=DisassociatePhone), without requiring a separate disassociation request from the user
3. If an NFC key (or multiple NFC keys) is associated to the profile being deleted, the EnhancedMemoryInterfaceClient shall send an NFC key disassociation request, via EnMemProfilePairing_Rq(NFCKeyPairing=DisassociateKeyX), for each associated NFC key, without requiring a separate disassociation request from the user
4. If the profile being deleted is the active profile, the EnhancedMemoryInterfaceClient shall send an infotainment recall request to recall Vehicle via InfotainmentRecall_Rq
5. The EnhancedMemoryInterfaceClient shall update the PersonalityOptIn_St to indicate that the deleted Driver Profile is "Opted-Out"
6. If the profile being deleted is the last available profile, the EnhancedMemoryInterfaceClient shall set the Enhanced Memory feature status to Off via EnhancedMemory_St(Status=ProfilesOff).

Reference sequence diagram ENMEM-SD-REQ-099427- Delete Driver Profile for details

4.5.2.22.2 ENMEMv2-REQ-485470/A-Delete Driver Profile v2

When a created Driver Profile is deleted the EnhancedMemoryInterfaceClient shall:

1. If a keyfob is associated to the profile being deleted, the EnhancedMemoryInterfaceClient shall send a keyfob disassociation request, via EnMemProfilePairing_Rq(KeyPairing=DisassociateKey), without requiring a separate disassociation request from the user
2. If a phone is associated to the profile being deleted, the EnhancedMemoryInterfaceClient shall send a phone disassociation request, via EnMemProfilePairing_Rq(KeyPairing=DisassociatePhone), without requiring a separate disassociation request from the user
3. If the profile being deleted is the active profile, the EnhancedMemoryInterfaceClient shall send an infotainment recall request to recall Vehicle via InfotainmentRecall_Rq
4. The EnhancedMemoryInterfaceClient shall update the PersonalityOptIn_St to indicate that the deleted Driver Profile is "Opted-Out"
5. If the profile being deleted is the last available profile, the EnhancedMemoryInterfaceClient shall perform the Startup Profile Auto-Creation as per REQ-485465 (and prompt/remind the customer to complete their profile creation via Setup Wizard, see Setup Wizard HMI for details).
 - a. When this occurs as a result of a Master Reset, this shall only be performed after reboot.

4.5.2.22.3 ENMEM-HMI-REQ-197502/C-Enhanced Memory HMI Indications for Delete a Driver Profile

When a Driver Profile is deleted:

- The EnhancedMemoryInterfaceClient shall remove and disable the Edit Driver Profile functionality
- The EnhancedMemoryInterfaceClient shall remove the name for the deleted Driver Profile
- The EnhancedMemoryInterfaceClient shall update the keyfob association icon status based on PersKeyPairing_St for the deleted Driver Profile
- The EnhancedMemoryInterfaceClient shall update the phone association icon status based on PersPhonePairing_St for the deleted Driver Profile
- The EnhancedMemoryInterfaceClient shall update the NFC key association icon status based on PersNFCKeyPairing_St for the deleted Driver Profile



4.5.2.22.4 ENMEM-REQ-105569/F-Driver Profiles Deleted During Master Reset

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

When a Master Reset operation is executed:

1. The EnhancedMemoryInterfaceClient shall delete all internal Driver Profile data (i.e. Profile Name, Button Association, Profile Number Association) for all Driver Profiles
2. If a keyfob is associated to a Driver Profile(s) the following actions shall be performed:
 - The EnhancedMemoryInterfaceClient shall request to disassociate the keyfob via EnMemProfilePairingRq(KeyPairing=DisassociateKey)
 - The EnhancedMemoryProfileServer shall respond with a successful keyfob disassociation via EnMemKeyPairing_St(KeyPairing=KeyDisassociated)
 - The EnhancedMemoryProfileServer shall update the status of PersKeyPairing_St to KeyNotAssociated for the Driver Profile deleted
 - If there is more than one profile with keys paired, the EnhancedMemoryInterfaceClient shall repeat bullet 1 above for all profiles with keys paired until all the keyfobs are dissociated from all profiles
3. If a phone is associated to a Driver Profile(s) the following actions shall be performed:
 - The EnhancedMemoryInterfaceClient shall request to disassociate the phone via EnMemProfilePairingRq(KeyPairing=DisassociatePhone)
 - The EnhancedMemoryProfileServer shall respond with a successful phone disassociation via EnMemKeyPairing_St(KeyPairing=KeyDisassociated)
 - The EnhancedMemoryProfileServer shall update the status of PersPhonePairing_St to NoPhonesAssociated for the Driver Profile deleted
 - If there is more than one profile with phones paired, the EnhancedMemoryInterfaceClient shall repeat bullet 1 above for all profiles with phones paired until all the phones are dissociated from all profiles
4. If an NFC key is associated to a Driver Profile(s) the following actions shall be performed:
 - The EnhancedMemoryInterfaceClient shall request to disassociate the NFC key via EnMemProfilePairingRq(PersIndex = #, NFCKeyPairing = DisassociateKey#)
 - The EnhancedMemoryProfileServer shall respond with a successful NFC key disassociation via EnMemKeyPairing_St(KeyPairing=KeyDisassociated)
 - The EnhancedMemoryProfileServer shall update the key index of PersNFCKeyPairing_St(PersNFCKey#Index = Inactive) for the disassociated key of the deleted Driver Profile
 - If there is more than one NFC key associated to a profile, the EnhancedMemoryInterfaceClient shall repeat bullet 1 for all associated NFC keys (PersNFCKey1Index to PersNFCKey4Index)
 - If there is more than one profile with NFC keys paired, the EnhancedMemoryInterfaceClient shall repeat bullet 1 above for all profiles with NFC keys paired until all the NFC keys are dissociated from all profiles (PersIndex = 1,2,3,4)
5. The EnhancedMemoryInterfaceClient shall send a recall request for Vehicle Profile via InfotainmentRecall_Rq(PersIndex = Vehicle)
6. The EnhancedMemoryInterfaceClient shall OptOut of all profiles and set all active personalities in PersonalityOptIn_St to NotOptedIn
7. The EnhancedMemoryInterfaceClient shall set the Enhanced Memory feature status to Off via EnhancedMemory_St(Status = ProfileOff)
8. The EnhancedMemoryProfileServer shall send a recall request for Vehicle to the EnhancedMemoryPositionClient via MemoryPosition_St. Note: this step does not apply to the EnhancedMemoryInterfaceClient and is don't care for the EnhancedMemoryInterfaceClient
9. The EnhancedMemoryInterfaceClient shall send a Factory Reset request to the EnhancedMemoryServers via FactoryReset_Rq(Type = Reset) to perform Master Reset on the EnhancedMemoryServers that support Master Reset (ex. AHU resets SDARS presets - see SDARS SPSS for details). If the EnhancedMemoryServer supports FactoryReset_Rq, all profiles shall reset (ex. SDARS presets reset for all profiles).
10. The EnhancedMemoryInterfaceClient performs a reboot for Master Reset following VS-FUN-REQ-025341-Master Reset to Factory Defaults.
 - Note: the EnhancedMemoryInterfaceClient/Infotainment System Master shall send the FactoryReset_Rq before shutting down the Infotainment System (i.e. sends FactoryReset_Rq(Type = Reset) while HMI_HMIMode_St = On).

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



4.5.2.23 Keyfob/Phone/NFC Key Disassociation

The Keyfob, Phone and NFC Key Disassociation processes can be completed manually via the HMI. It will be automatically performed when the user delete's a profile or performs a Master Reset.

4.5.2.23.1 ENMEM-REQ-197506/B-Disassociate the Keyfob per User Request

When a user requests to disassociate a keyfob from a Driver Profile, the EnhancedMemoryInterfaceClient shall send EnMemProfilePairing_Rq(KeyPairing = DisassociateKey) to the EnhancedMemoryProfileServer for the requested Driver Profile. The EnhancedMemoryProfileServer shall then respond with EnMemKeyPairing_St (PersIndex = Pers#, KeyPairing = KeyDisassociated) upon successful disassociation of the keyfob.

4.5.2.23.2 ENMEM-REQ-233209/A-Disassociate the Phone per User Request

When a user requests to disassociate a phone from a Driver Profile, the EnhancedMemoryInterfaceClient shall send EnMemProfilePairing_Rq(KeyPairing = DisassociatePhone) to the EnhancedMemoryProfileServer for the requested Driver Profile. The EnhancedMemoryProfileServer shall then respond with EnMemKeyPairing_St (PersIndex = Pers#, KeyPairing = KeyDisassociated) upon successful disassociation of the phone.

4.5.2.23.3 ENMEM-REQ-427464/A-Disassociate the NFC Key per User Request

When a user requests to disassociate an NFC key from a Driver Profile, the EnhancedMemoryInterfaceClient shall send EnMemProfilePairing_Rq(PersIndex= # , NFCKeyPairing = DisassociateKey#) to the EnhancedMemoryProfileServer for the requested key of the requested Driver Profile. The EnhancedMemoryProfileServer shall then respond with EnMemKeyPairing_St (PersIndex = Pers#, KeyPairing = KeyDisassociated) upon successful disassociation of the NFC key.

4.5.2.23.4 ENMEM-REQ-197505/A-Keyfob Disassociation Status

The EnhancedMemoryProfileServer shall send PersKeyPairing_St(PersXKeyStatus = KeyNotAssociated) to the EnhancedMemoryInterfaceClient for the applicable personality when:

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

4.5.2.23.5 ENMEM-REQ-233210/A-Phone Disassociation Status

The EnhancedMemoryProfileServer shall send PersPhonePairing_St(PersXPhoneStatus = NoPhonesAssociated) to the EnhancedMemoryInterfaceClient for the applicable personality when:

- a phone is successfully disassociated from a Driver Profile
- a phone is erased or revoked from outside the vehicle (see Phone-As-A-Key SPSS for such methods).

4.5.2.23.6 ENMEM-REQ-427465/A-NFC Key Disassociation Status

The EnhancedMemoryProfileServer shall send PersNFCKeyPairing_St(PersNFCKey#Index = Inactive) to the EnhancedMemoryInterfaceClient for the applicable key and personality when:

- an NFC key is successfully disassociated from a Driver Profile
- an NFC key is deleted from outside the vehicle (see NFCES SPSS for such methods)

4.5.2.23.7 ENMEM-HMI-REQ-202226/A-Keyfob HMI Indication

The EnhancedMemoryInterfaceClient shall monitor PersKeyPairing_St to maintain and display a Keyfob Association Icon for existing Driver Profiles:

- When PersKeyPairing_St = KeyAssociated, the icon shall be displayed
- When PersKeyPairing_St = KeyUnAssociated or Null, the icon shall not be displayed

4.5.2.23.8 ENMEM-HMI-REQ-233009/A-Phone HMI Indication

The EnhancedMemoryInterfaceClient shall monitor PersPhonePairing_St to maintain and display a Phone Association Icon for existing Driver Profiles:

- When PersPhonePairing_St = NoPhonesAssociated, the icon shall not be displayed
- When PersPhonePairing_St = OnePhoneAssociated, the icon shall be displayed

4.5.2.23.9 ENMEM-HMI-REQ-427170/A-NFC Key HMI Indication

The EnhancedMemoryInterfaceClient shall monitor PersNFCKeyPairing_St to maintain and display an NFC Key Association Icon for existing Driver Profiles:



- The NFC Key Association Icon shall be displayed when:
 - At least one of the key indexes for the respective PersIndex does not equal to '0x00 Inactive'
 - Example: PersNFCKeyPairing_St(PersIndex = Pers1, PersNFCKey1Index = Index 1, PersNFCKey2Index = Inactive, PersNFCKey3Index = Inactive, PersNFCKey4Index = Inactive)
- The NFC Key Association Icon shall not be displayed when:
 - All of the key indexes for the respective PersIndex equals '0x00 Inactive'
 - Example: PersNFCKeyPairing_St(PersIndex = Pers1, PersNFCKey1Index = Inactive, PersNFCKey2Index = Inactive, PersNFCKey3Index = Inactive, PersNFCKey4Index = Inactive)

Note: During NFC Association/Disassociation, PersNFCKeyPairing_St remains at the requested PersIndex. The EnhancedMemoryInterfaceClient shall act on last known values for all other PersIndex values during this time.

4.5.2.24 Displaying NFC Key Association/Name

The multiple NFC Key Associations are shown within NFC screens of the Enhanced Memory/Personalization Edit Menu. The Associations are shown based on the KeyIndexes the EnhancedMemoryInterfaceClient receives from the EnhancedMemoryProfileServer, but the Names of those keys are requested from the EnhancedMemoryNFCServer via an NFC Key List. The List is then compared to the received KeyIndexes, which determines which Key Name to show (or FESN if no Key Name is available).

4.5.2.24.1 ENMEM-REQ-427472/A-Max NFC Key Associations Reached

The EnhancedMemoryInterfaceClient shall only allow a user to associate up to the max number of NFC Key Associations allowed (see REQ-427323). When the max has been reached, the EnhancedMemoryInterfaceClient shall not allow the user to request additional NFC Key associations (ex. hide/grey-out the Add button) and shall prevent NFC Key Association from being entered/requested.

4.5.2.24.2 ENMEM-REQ-427473/A-Display NFC Key Association

The EnhancedMemoryInterfaceClient shall receive the NFC Key Association statuses from the EnhancedMemoryProfileServer via PersNFCKeyPairing_St (see REQ-427325). The EnhancedMemoryInterfaceClient shall display the NFC Key Associations to the user for each PersNFCKeyXStatus that does not equal 'Inactive.' If a PersNFCKeyXStatus = Inactive, that NFC Key status shall not be displayed.

4.5.2.24.3 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.

4.5.2.24.4 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"



4.5.2.24.5 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.

4.5.2.24.6 ENMEM-REQ-427480/A-Update Association when NFC Key is Deleted

In the event an NFC Key is deleted (not by the Enhanced Memory feature), the EnhancedMemoryNFCServer will remove the NFC Key from its NFC Key List and notify the EnhancedMemoryProfileServer of the deletion. This shall result in the EnhancedMemoryProfileServer updating PersNFCKeyPairing_St() for the impacted PersIndex and key, from which the EnhancedMemoryInterfaceClient shall perform REQ-427475 and update its display (if the NFC Device screen for the impacted PersIndex is the active screen).

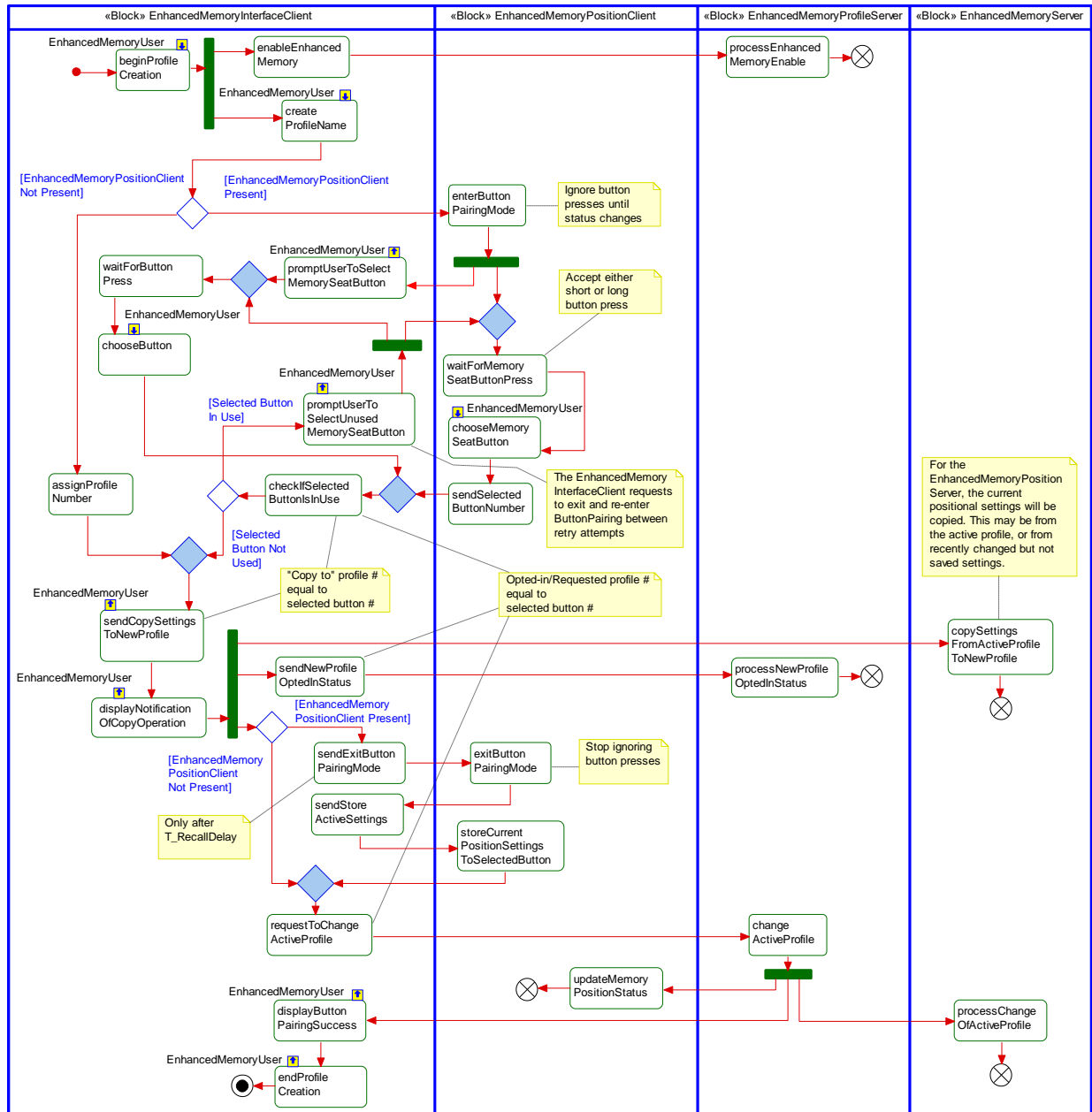


4.5.3 White Box View

4.5.3.1 Activity Diagrams

4.5.3.1.1 ENMEM-ACT-REQ-099377/E-Create Driver Profile

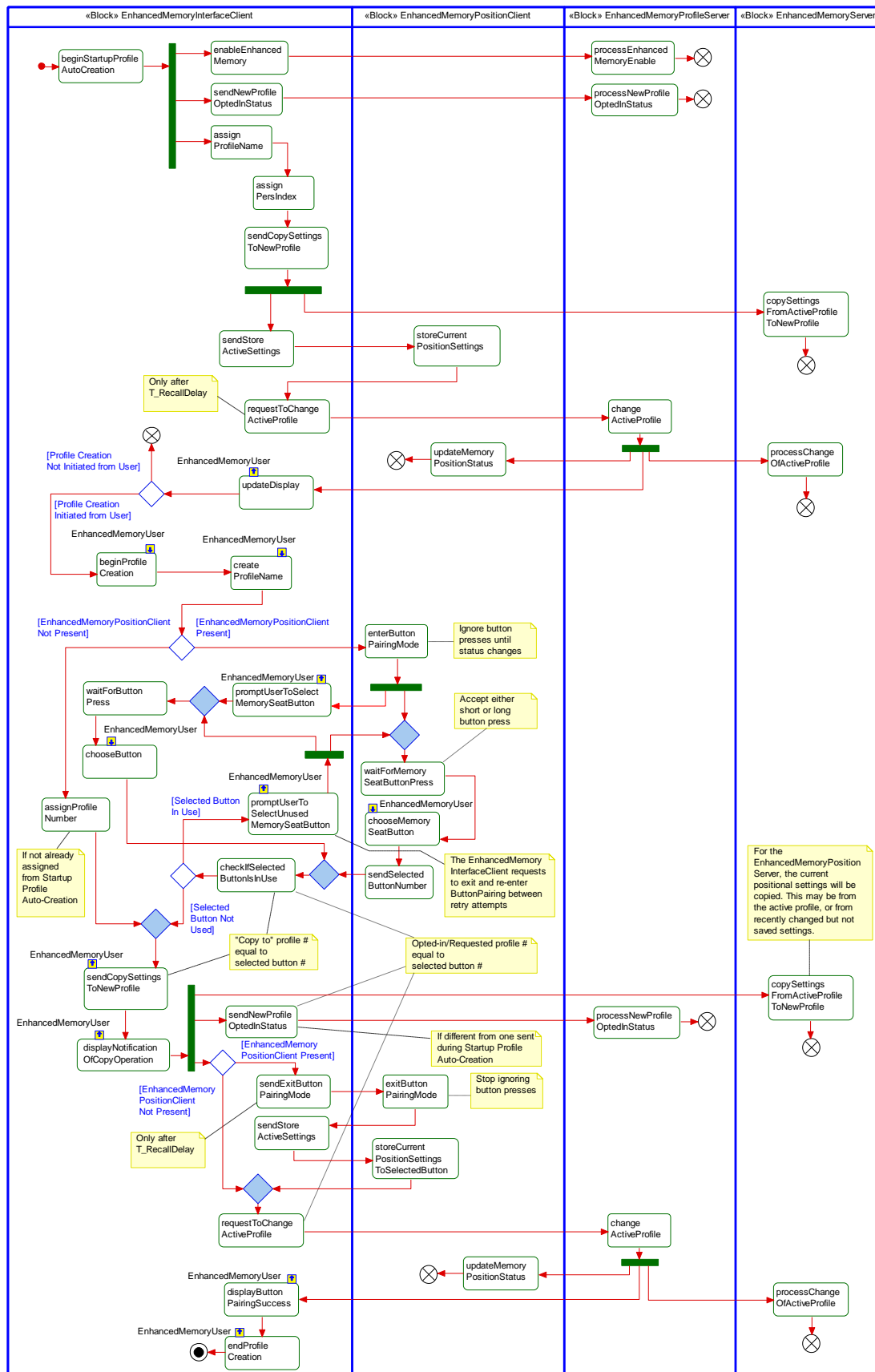
Activity Diagram





4.5.3.1.2 ENMEMv2-ACT-REQ-485472/A-Create Driver Profile v2

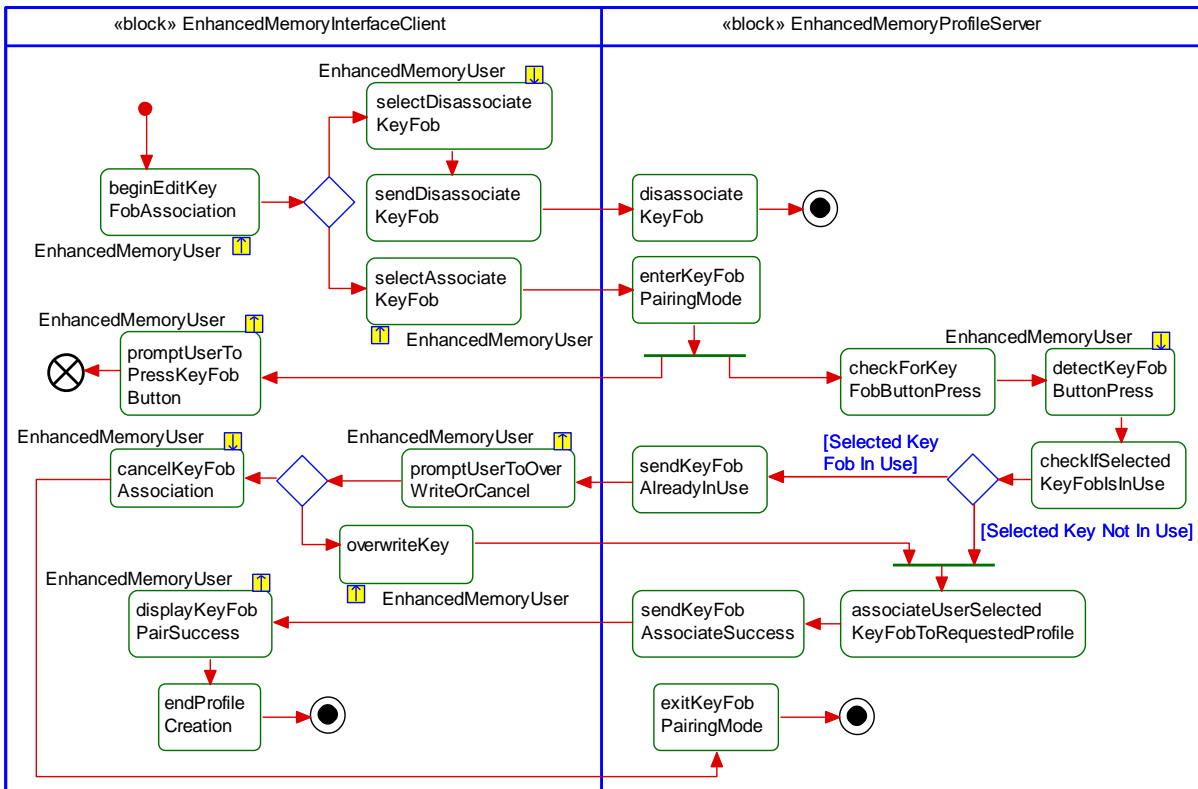
Activity Diagram





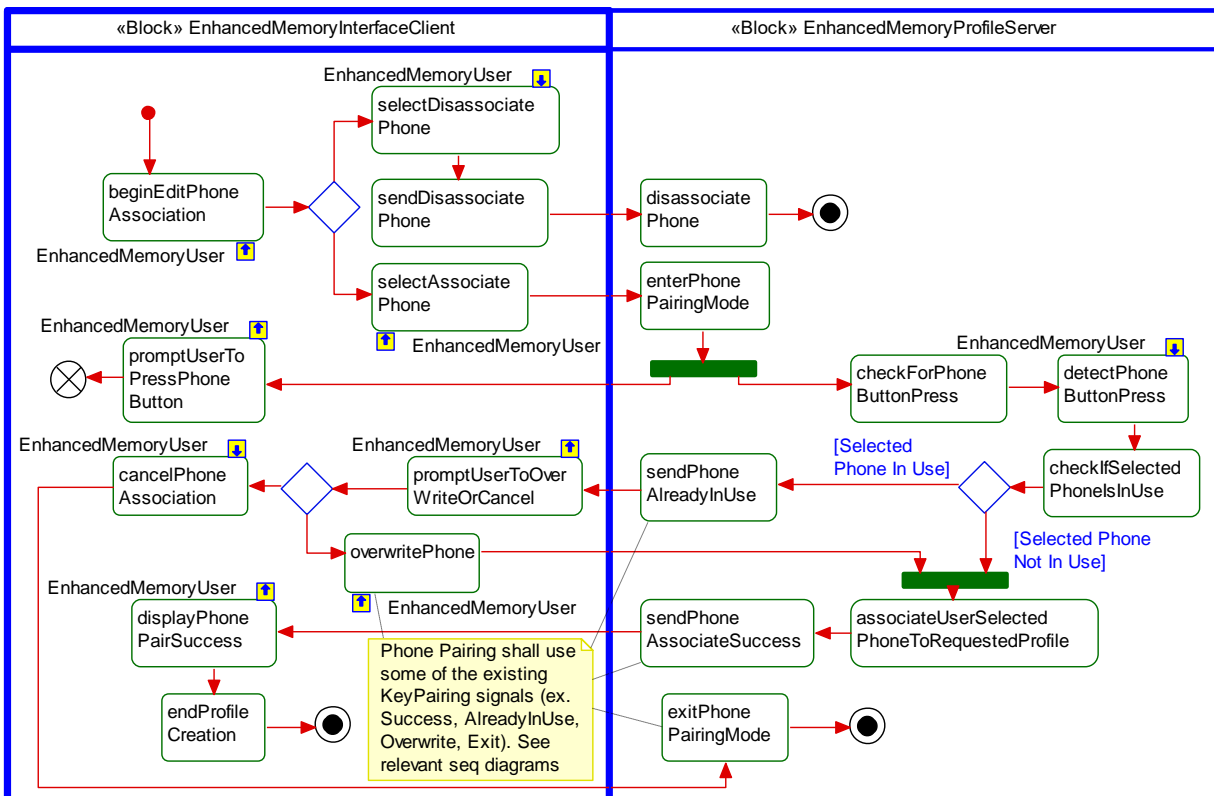
4.5.3.1.3 ENMEM-ACT-REQ-099376/B-Associate Key Fob To Driver Profile

Activity Diagram



4.5.3.1.4 ENMEM-ACT-REQ-233257/A-Associate Phone To Driver Profile

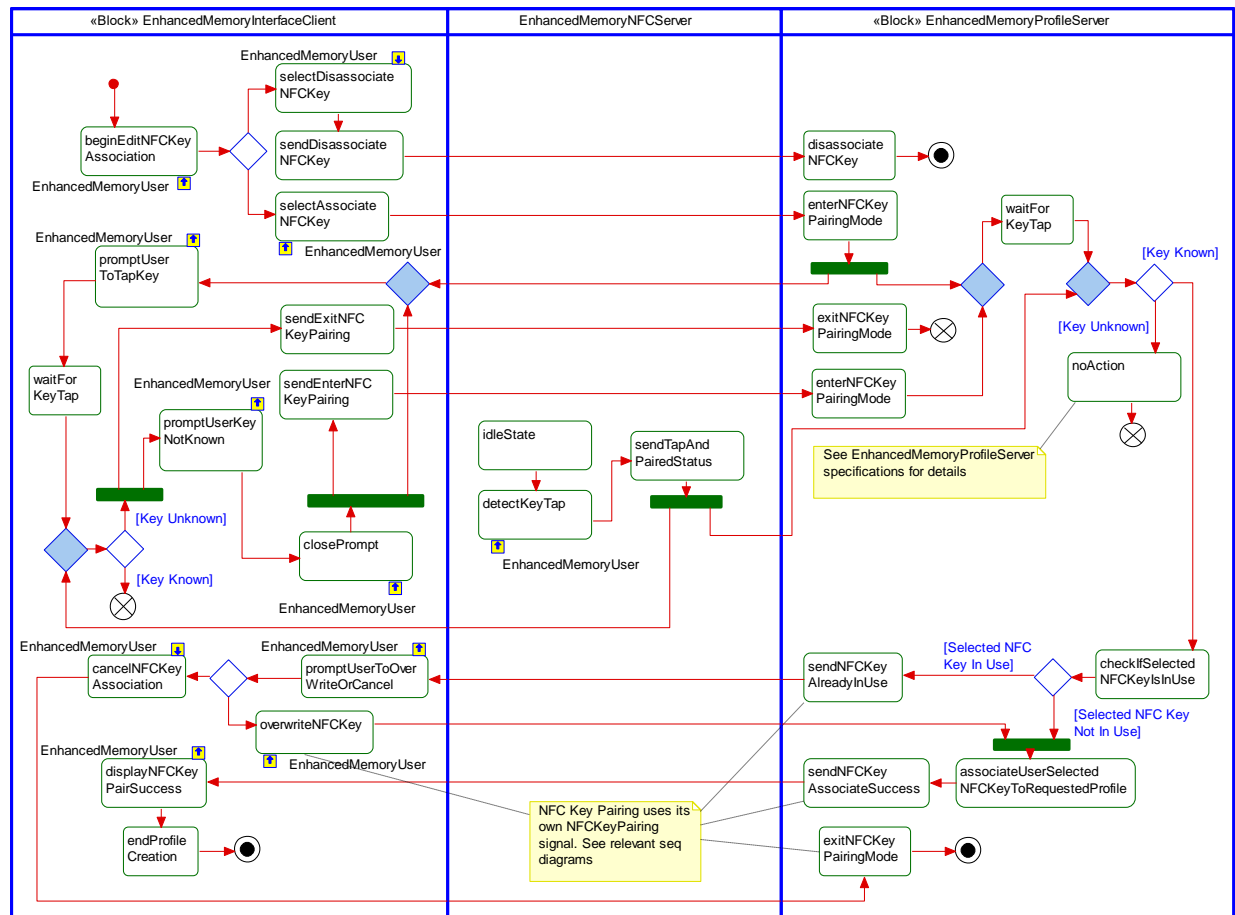
Activity Diagram





4.5.3.1.5 ENMEM-ACT-REQ-427617/A-Associate NFC Key To Driver Profile

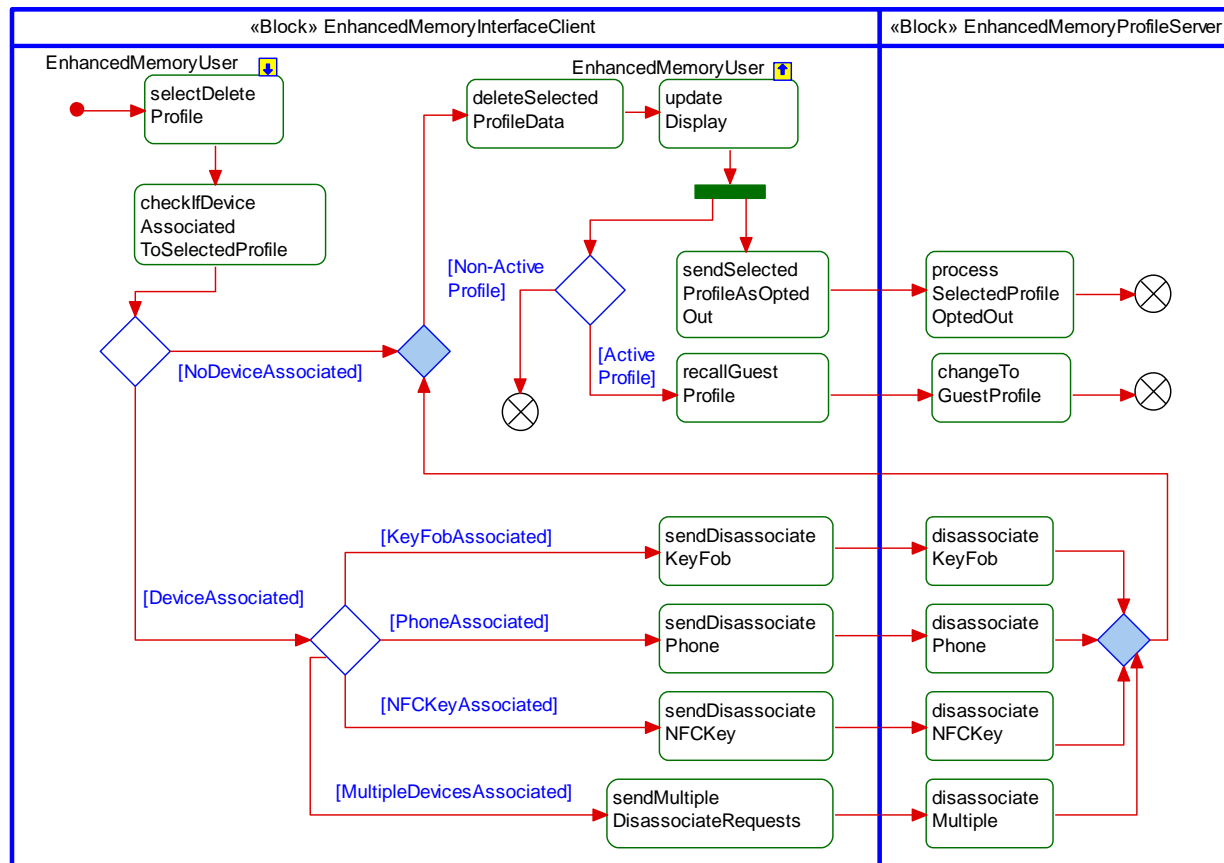
Activity Diagram





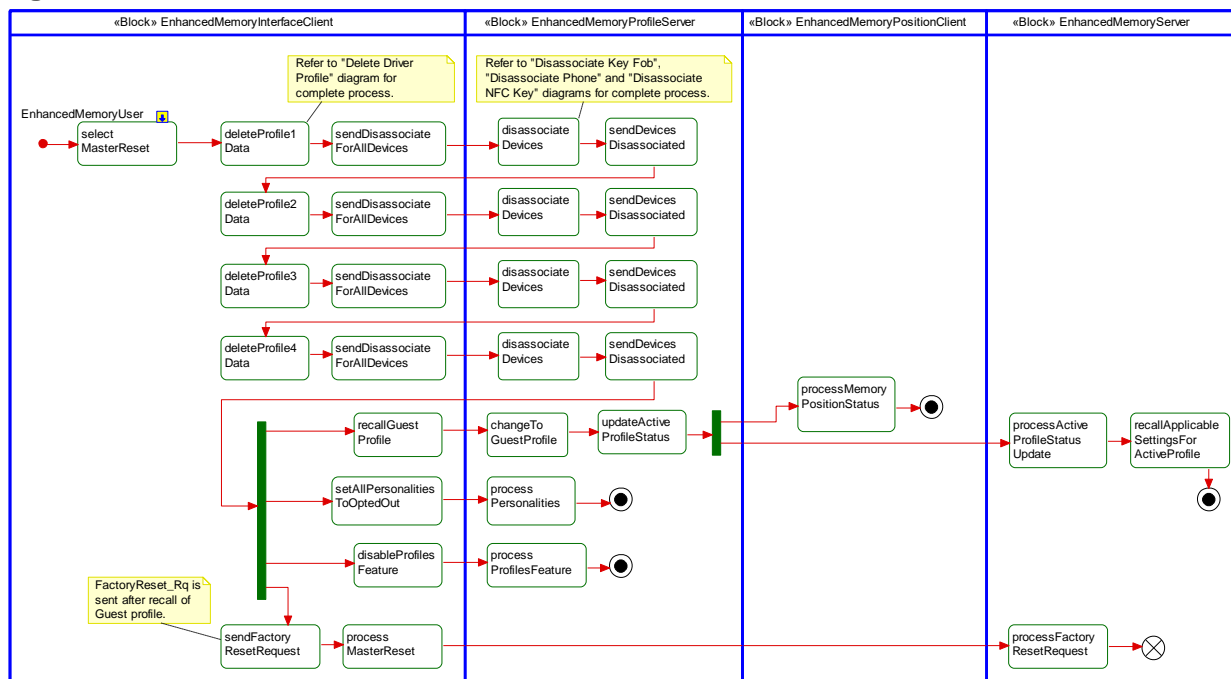
4.5.3.1.6 ENMEM-ACT-REQ-099379/E-Delete Driver Profile

Activity Diagram



4.5.3.1.7 ENMEM-ACT-REQ-197508/C-Master Reset

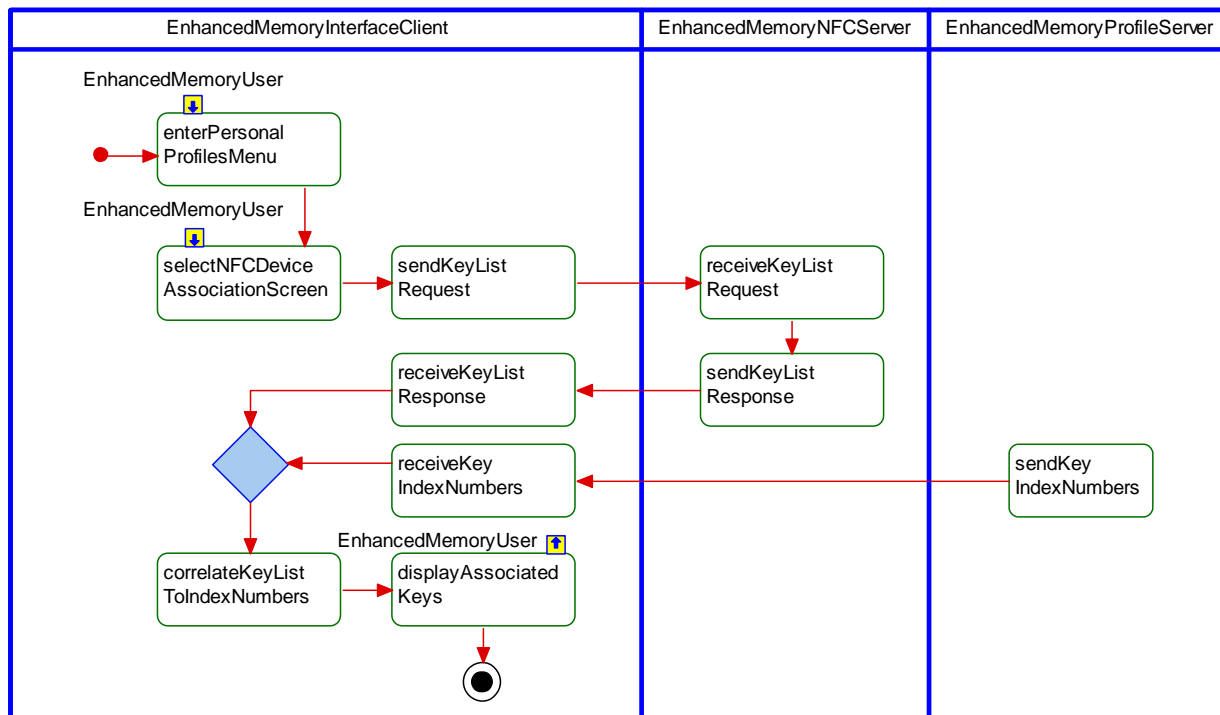
Activity Diagram





4.5.3.1.8 ENMEM-ACT-REQ-427798/A-Display NFC Key Associations

Activity Diagram



4.5.3.2 Sequence Diagrams

4.5.3.2.1 ENMEM-SD-REQ-099425/H-Create Driver Profile

Constraints

Pre-Condition

Ignition Status = Run
Vehicle is in Park
Vehicle speed is less than 8 KPH.
Maximum number of personality profiles has not yet been reached

Scenarios

Normal Usage

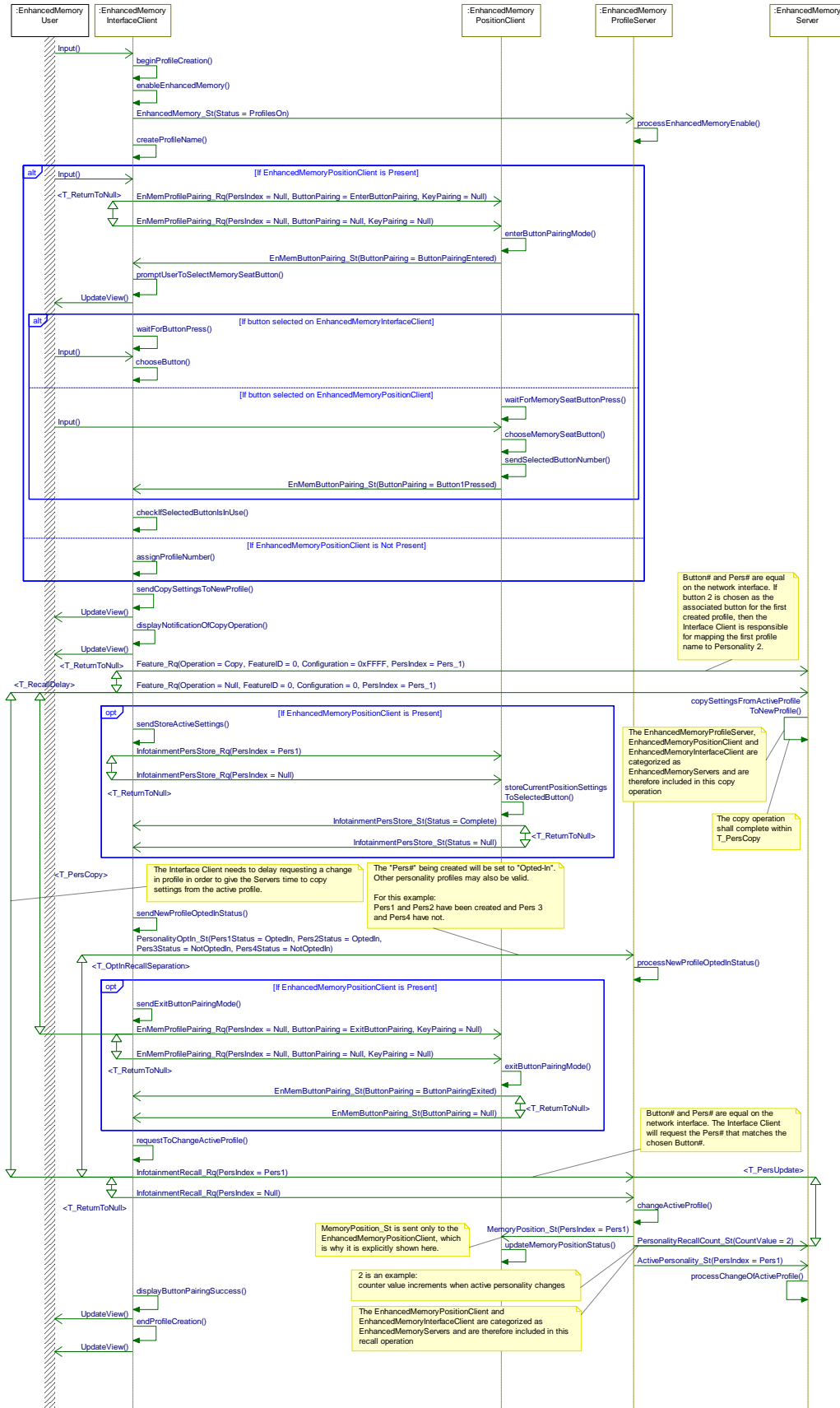
The driver chooses to create a new personality profile and memory seat button to associate to that profile.

Post-Condition

Driver profiles feature is enabled
A new profile is created
The chosen memory seat button is associated to the new profile



Sequence Diagram



**4.5.3.2.2 ENMEMv2-SD-REQ-485473/A-Create Driver Profile v2****Constraints****Pre-Condition**

Ignition Status = Off

No personality profiles created

Scenarios**Normal Usage**

The driver turns the ignition to Run

Post-Condition

EnhancedMemoryInterfaceClient auto-creates the first Driver Profile

Driver profiles feature is enabled

A new profile is created

The user is able to continue profile creation



```

sequenceDiagram
    participant User as EnhancedMemoryUser
    participant Client as EnhancedMemoryInterfaceClient
    participant PosClient as EnhancedMemoryPositionClient
    participant PosServer as EnhancedMemoryPositionServer
    participant Server as EnhancedMemoryServer

    Note over User, Client: Profile Creation
    User->>Client: logStartProfileAutoCreation()
    Note over User: Only applicable for first time profile creation (Startup, post Master Reset, etc.)
    Client->>Client: create()EnhancedMemory()
    Client->>PosClient: sendProfileActiveSettings()
    PosClient->>PosServer: processEnhancedMemoryEnables()
    PosServer->>PosClient: processNewProfileOpends()
    PosClient->>Client: sendNewProfileOpends()
    Client->>Client: PersonalityOpds, S1PersonStatus = Opends, PersonStatus = NotOpends, PersonOpds = NotOpends, PersonStatus = NotOpends
    Client->>Client: assignPersonIndex()
    Client->>Client: copyCopySettingsTakeNewProfile()

    Note over User, Client: Profile Management
    Client->>Client: Feature_RgOperation = Copy, FeatureID = 0, Configuration = 0xFFFF, PersonIndex = Person_1
    Client->>Client: <T_ReturnToMain>
    Note over Client: The EnhancedMemoryInterfaceClient, EnhancedMemoryPositionClient and EnhancedMemoryServer are categorized as EnhancedMemorySensors and are therefore included in this copy operation
    Client->>Client: <T_ReturnToMain>
    Note over Client: The copy operation shall complete within T_PersonCopy
    Client->>Client: copySettingsOfMainProfileTakeNewProfile()
    Note over Client: The EnhancedMemoryInterfaceClient, EnhancedMemoryPositionClient and EnhancedMemoryServer are categorized as EnhancedMemorySensors and are therefore included in this copy operation
    Client->>Client: <T_ReturnToMain>
    Note over Client: MemoryPosition_S1 is sent only to the EnhancedMemoryPositionClient (when present), which is why it is explicitly shown here.
    Note over Client: 2 is an example counter value increments when active personality changes
    Client->>Client: sendProfileActiveSettings()
    Client->>PosClient: InherentPersonStore_RgPersonIndex = Person_1
    PosClient->>PosServer: storeCurrentPositionSettings()
    PosServer->>PosClient: <T_ReturnToMain>
    PosClient->>Client: InherentPersonStore_S1Status = Complete
    Client->>Client: InherentPersonStore_S1Status = Null
    Client->>Client: requestToChangeActiveProfile()
    Client->>PosClient: InherentPersonRecall_RgPersonIndex = Person_1
    PosClient->>PosServer: <T_PersonUpdate>
    PosServer->>PosClient: changeActiveProfile()
    PosClient->>Client: <T_ReturnToMain>
    Note over Client: MemoryPosition_S1 is sent only to the EnhancedMemoryPositionClient (when present), which is why it is explicitly shown here.
    Note over Client: 2 is an example counter value increments when active personality changes
    Client->>Client: sendMemoryPositionStatus()
    Client->>PosClient: PersonalityRecallCount_S1CountValue = 26
    PosClient->>PosServer: ActualPersonality_S1PersonIndex = Person_1
    PosServer->>PosClient: processChangeOfActiveProfile()
    Client->>Client: updateDisplay()

    Note over User, Client: Profile Copying
    Client->>Client: logProfileCreation()
    Note over User: Entry point when user initiates profile creation from Setup Wizard after Startup Profile Auto-Creation, or upon new profile creation
    Client->>Client: createProfileName()
    Client->>Client: <T_ReturnToMain>
    Note over Client: If EnhancedMemoryPositionClient is Present
    Client->>Client: EnhMainProfilePairing_RgPersonIndex = Null, ButtonPairing = EnhMainProfilePairing_KeyPairing = Null
    Client->>Client: EnhMainProfilePairing_RgPersonIndex = Null, ButtonPairing = Null, KeyPairing = Null
    Client->>Client: sendEnhMainProfilePairing()
    Client->>PosClient: EnhMainProfilePairing_S1ButtonPairing = ButtonPairingIndex
    PosClient->>PosServer: createEnhMainProfilePairing()
    PosServer->>PosClient: <T_ReturnToMain>
    PosClient->>Client: EnhMainProfilePairing_S1ButtonPairing = ButtonPairingIndex
    Client->>Client: requestToSelectMemorySubButton()
    Client->>Client: UpdateView()
    Note over Client: If button selected on EnhancedMemoryInterfaceClient
    Client->>Client: selectButtonPress()
    Client->>Client: chooseButton()
    Note over Client: If button selected on EnhancedMemoryPositionClient
    Client->>Client: sendMemorySubButtonPress()
    Client->>PosClient: chooseMemorySubButton()
    PosClient->>PosServer: selectMemorySubButton()
    PosServer->>PosClient: <T_ReturnToMain>
    PosClient->>Client: EnhMainProfilePairing_S1ButtonPairing = ButtonPairingIndex
    Client->>Client: checkSelectedButtonIsValid()
    Note over Client: If EnhancedMemoryPositionClient is Not Present
    Client->>Client: selectProfileNumber()
    Client->>Client: sendCopySettingsTakeNewProfile()
    Client->>Client: UpdateView()
    Note over Client: If button 3 is chosen as the associated button for the first created profile, then the Interface Client is responsible for mapping the first profile name to Personality 2.
    Client->>Client: <T_ReturnToMain>
    Note over Client: Feature_RgOperation = Copy, FeatureID = 0, Configuration = 0xFFFF, PersonIndex = Person_1
    Client->>Client: Feature_RgOperation = Null, FeatureID = 0, Configuration = 0, PersonIndex = Person_1
    Client->>Client: <T_ReturnToMain>
    Note over Client: If EnhancedMemoryPositionClient is Present
    Client->>Client: sendProfileActiveSettings()
    Client->>PosClient: InherentPersonStore_RgPersonIndex = Person_1
    PosClient->>PosServer: storeCurrentPositionSettingsTakeNewProfile()
    PosServer->>PosClient: <T_ReturnToMain>
    PosClient->>Client: InherentPersonStore_S1Status = Complete
    Client->>Client: InherentPersonStore_S1Status = Null
    Note over Client: The Interface Client needs to delay requesting a change in profile in order to give the Sensor time to copy settings from the active profile.
    Note over Client: The 'Person' being created will be set to 'Opends'. Other personality profiles may also be valid. For this example Person1 and Person2 have been created and Person3 and Person4 have not.
    Client->>Client: sendNewProfileOpends()
    Client->>PosClient: PersonalityOpds, S1PersonStatus = Opends, PersonStatus = Opends, PersonStatus = NotOpends, PersonOpds = Opends, PersonStatus = NotOpends, PersonOpds = NotOpends
    PosClient->>PosServer: processNewProfileOpends()
    PosServer->>PosClient: <T_ReturnToMain>
    Note over Client: If EnhancedMemoryPositionClient is Present
    Client->>Client: sendEnhMainProfilePairing()
    Client->>PosClient: EnhMainProfilePairing_RgPersonIndex = Null, ButtonPairing = EnhMainProfilePairing_KeyPairing = Null
    Client->>Client: EnhMainProfilePairing_RgPersonIndex = Null, ButtonPairing = Null, KeyPairing = Null
    Client->>Client: sendEnhMainProfilePairing()
    Client->>PosClient: EnhMainProfilePairing_S1ButtonPairing = ButtonPairingIndex
    PosClient->>PosServer: createEnhMainProfilePairing()
    PosServer->>PosClient: <T_ReturnToMain>
    PosClient->>Client: EnhMainProfilePairing_S1ButtonPairing = ButtonPairingIndex
    Client->>Client: requestToChangeActiveProfile()
    Client->>PosClient: InherentPersonRecall_RgPersonIndex = Person_1
    PosClient->>PosServer: <T_PersonUpdate>
    PosServer->>PosClient: changeActiveProfile()
    PosClient->>Client: <T_ReturnToMain>
    Note over Client: MemoryPosition_S1 is sent only to the EnhancedMemoryPositionClient, which is why it is explicitly shown here.
    Note over Client: 2 is an example counter value increments when active personality changes
    Client->>Client: sendMemoryPositionStatus()
    Client->>PosClient: PersonalityRecallCount_S1CountValue = 26
    PosClient->>PosServer: ActualPersonality_S1PersonIndex = Person_1
    PosServer->>PosClient: processChangeOfActiveProfile()
    Client->>Client: updateDisplay()
    Client->>Client: logProfileCreation()
    Client->>Client: createProfileName()
    Client->>Client: <T_ReturnToMain>
    Note over Client: If EnhancedMemoryPositionClient is Present
    Client->>Client: EnhMainProfilePairing_RgPersonIndex = Null, ButtonPairing = EnhMainProfilePairing_KeyPairing = Null
    Client->>Client: EnhMainProfilePairing_RgPersonIndex = Null, ButtonPairing = Null, KeyPairing = Null
    Client->>Client: sendEnhMainProfilePairing()
    Client->>PosClient: EnhMainProfilePairing_S1ButtonPairing = ButtonPairingIndex
    PosClient->>PosServer: createEnhMainProfilePairing()
    PosServer->>PosClient: <T_ReturnToMain>
    PosClient->>Client: EnhMainProfilePairing_S1ButtonPairing = ButtonPairingIndex
    Client->>Client: requestToChangeActiveProfile()
    Client->>PosClient: InherentPersonRecall_RgPersonIndex = Person_1
    PosClient->>PosServer: <T_PersonUpdate>
    PosServer->>PosClient: changeActiveProfile()
    PosClient->>Client: <T_ReturnToMain>
    Note over Client: MemoryPosition_S1 is sent only to the EnhancedMemoryPositionClient, which is why it is explicitly shown here.
    Note over Client: 2 is an example counter value increments when active personality changes
    Client->>Client: sendMemoryPositionStatus()
    Client->>PosClient: PersonalityRecallCount_S1CountValue = 26
    PosClient->>PosServer: ActualPersonality_S1PersonIndex = Person_1
    PosServer->>PosClient: processChangeOfActiveProfile()
    Client->>Client: updateDisplay()
  
```



4.5.3.2.3 ENMEM-SD-REQ-197169/D-User Chooses a Seat Button That is Already Associated to Another Driver Profile

Constraints

Pre-Condition

Ignition Status = Run

EnhancedMemoryPositionClient is present

Vehicle speed is less than 8 KPH

Vehicle HMI prompts the user to press a seat button at door panel during creating Driver profile process

Scenarios

Normal Usage

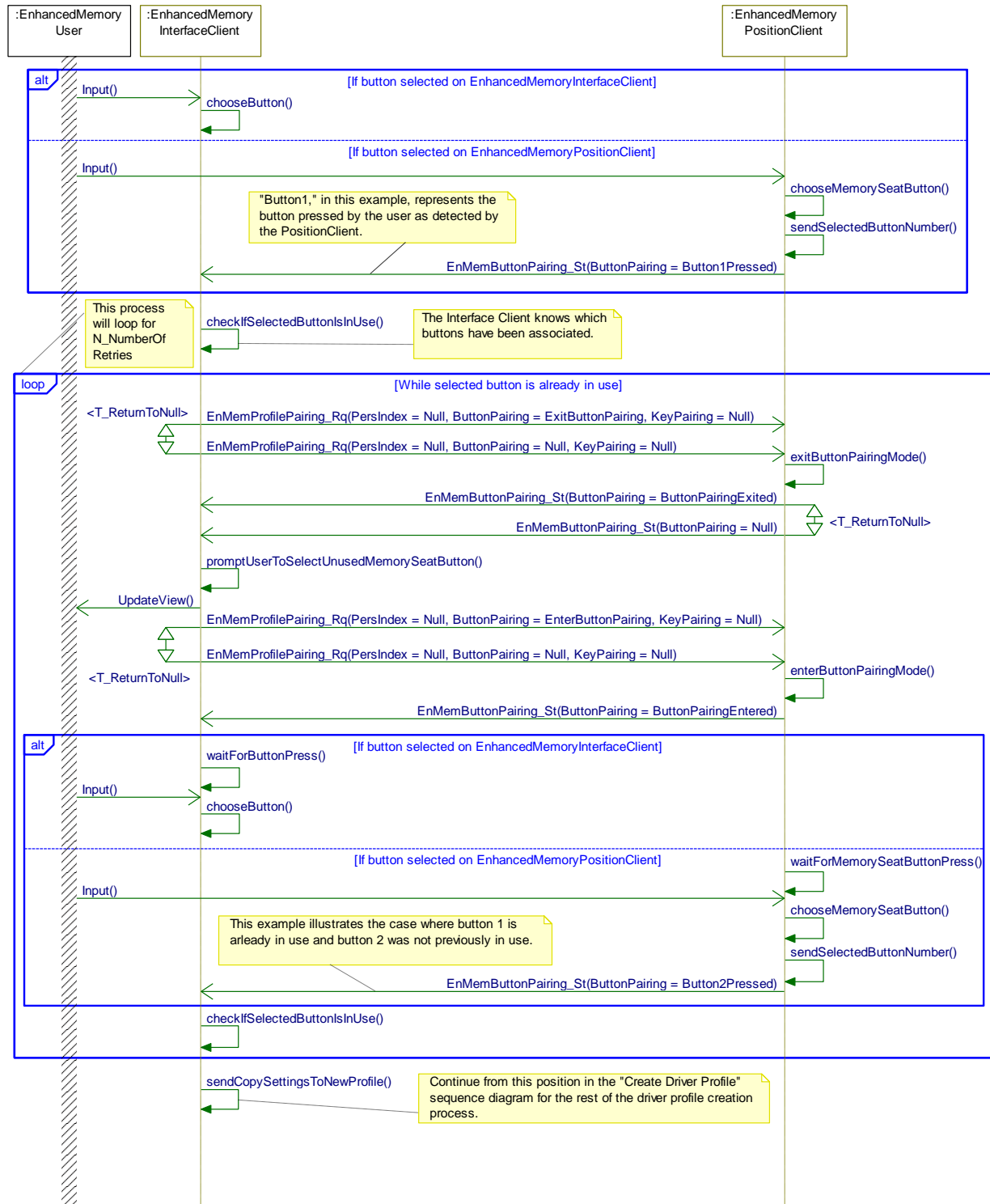
The user presses a button that is already associated to another Driver profile

Post-Condition

Vehicle HMI provides indication that the button is already associated to another profile and provides the user opportunities to retry



Sequence Diagram



4.5.3.2.4 ENMEM-SD-REQ-099422/D-Associate Key Fob

Constraints

Pre-Condition

Ignition Status = Run

Vehicle is in Park

Vehicle speed is less than 8 KPH.

**Scenarios****Normal Usage**

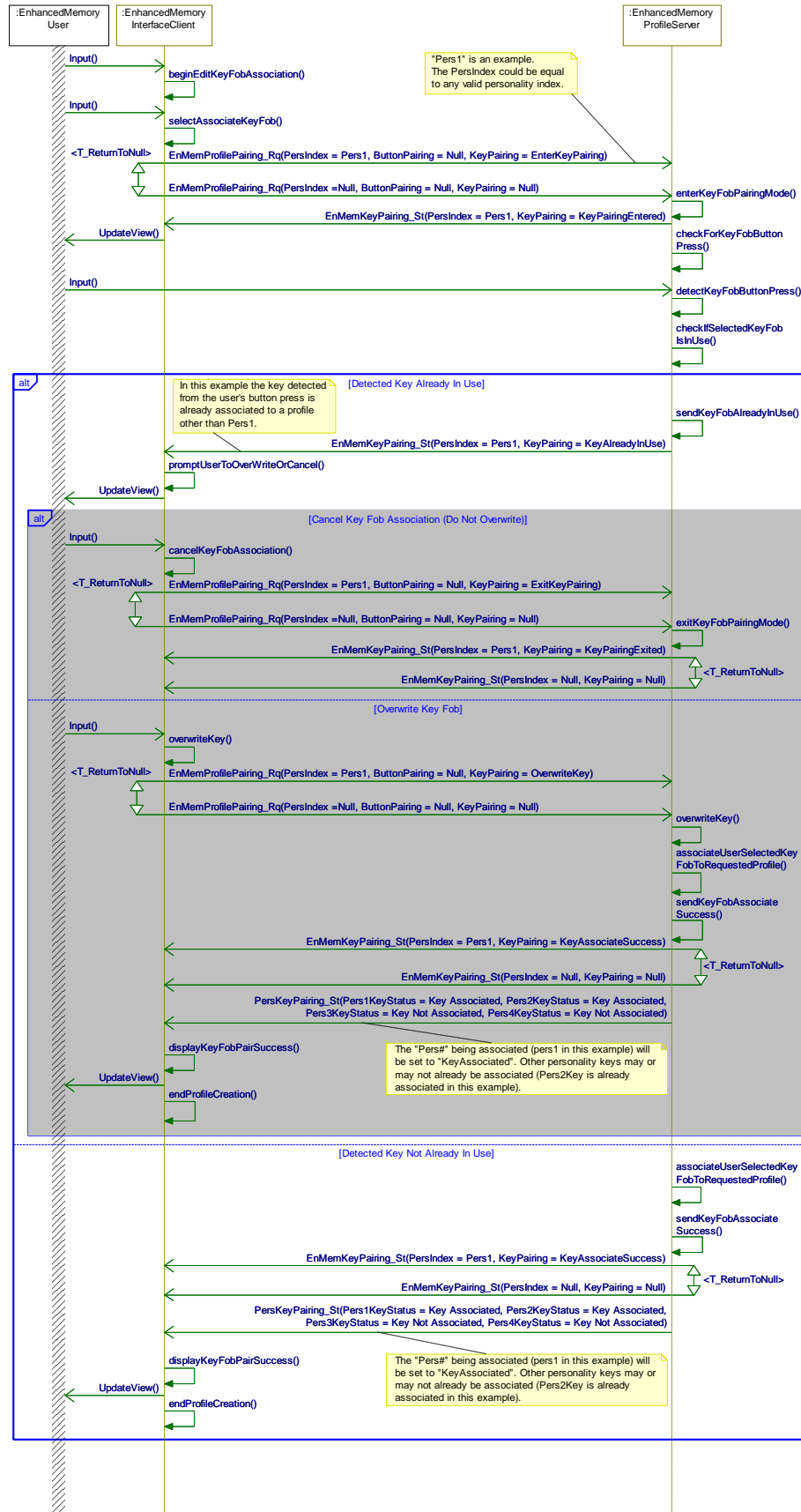
The driver chooses to associate a key fob to a selected personality profile.

Post-Condition

The selected key fob is associated to the selected personality profile.



Sequence Diagram



**4.5.3.2.5 ENMEM-SD-REQ-233258/B-Associate Phone****Constraints****Pre-Condition**

Ignition Status = Run

Vehicle is in Park

Vehicle speed is less than 8 KPH.

Scenarios**Normal Usage**

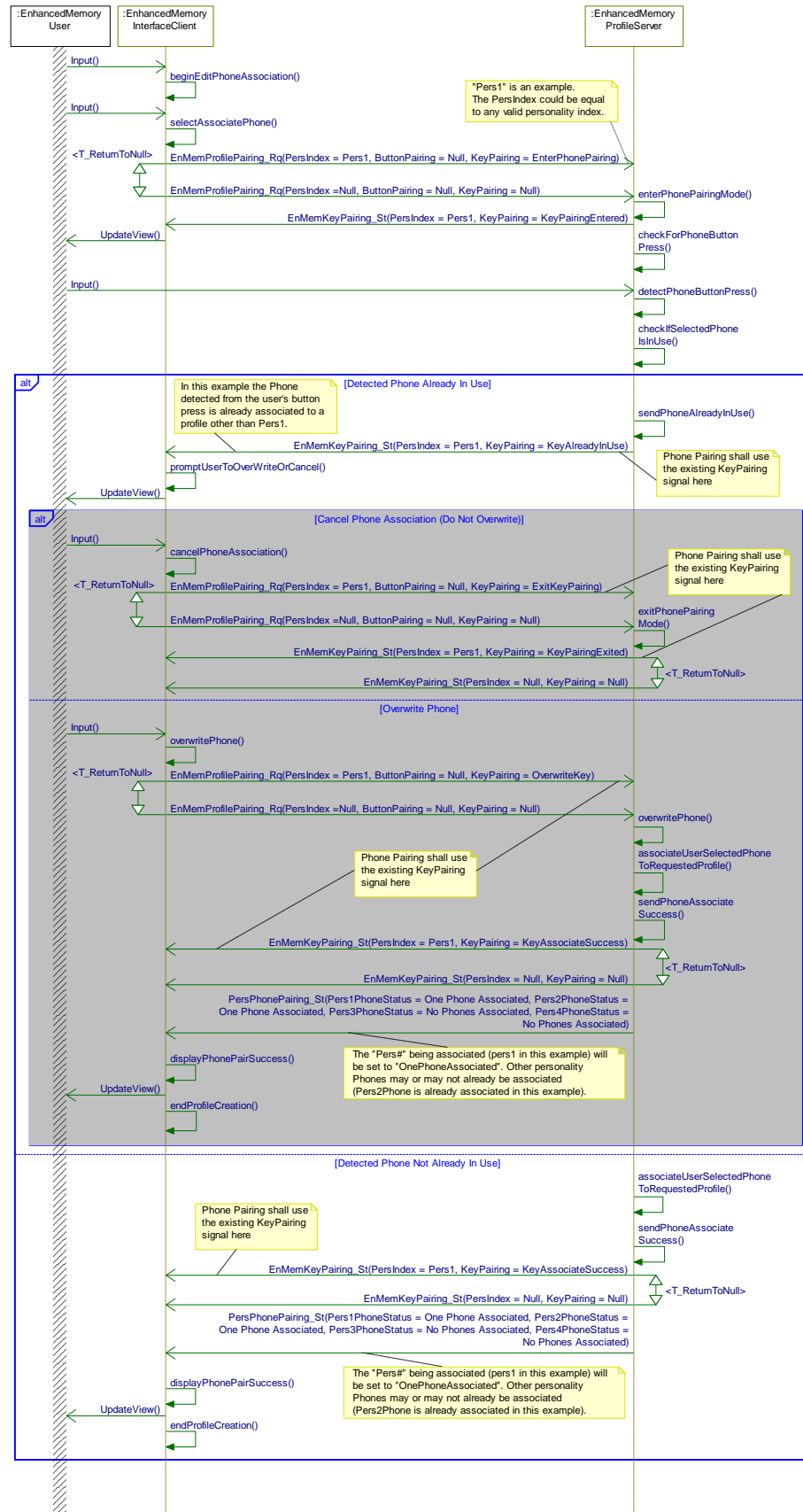
The driver chooses to associate a phone to a selected personality profile.

Post-Condition

The selected phone is associated to the selected personality profile.



Sequence Diagram



**4.5.3.2.6 ENMEM-SD-REQ-427618/A-Associate NFC Key****Constraints****Pre-Condition**

Ignition Status = Run

Vehicle is in Park

Vehicle speed is less than 8 KPH.

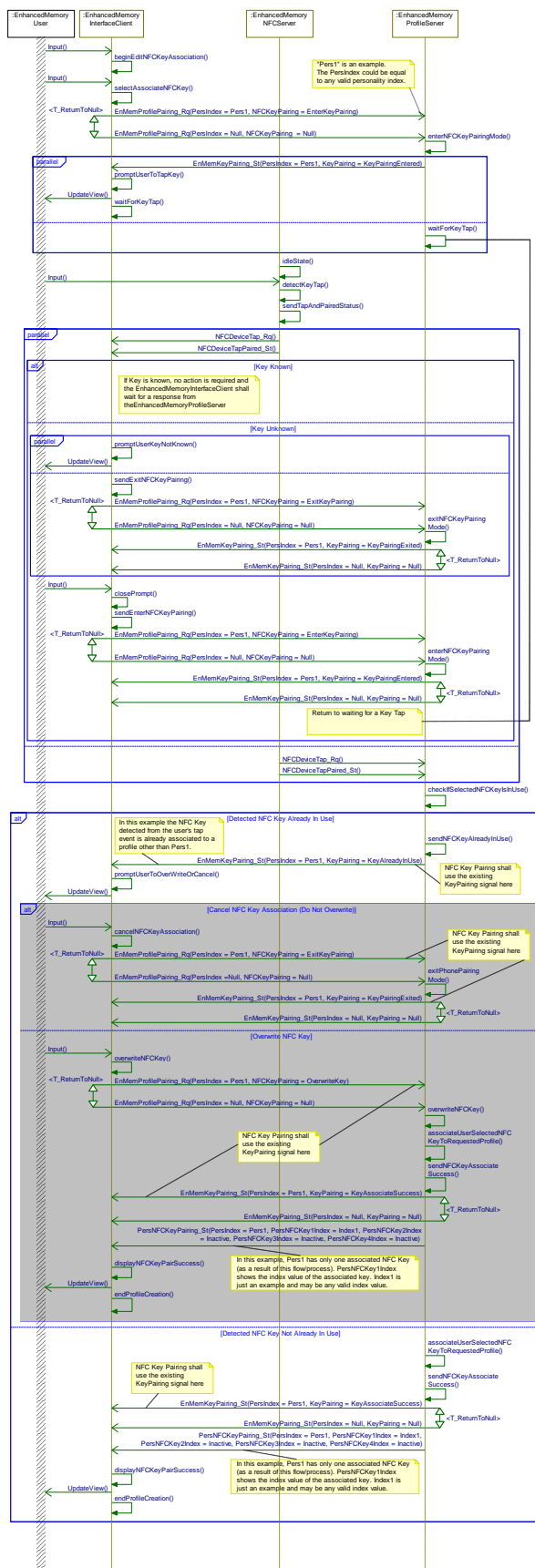
Scenarios**Normal Usage**

The driver chooses to associate an NFC key to a selected personality profile.

Post-Condition

The selected NFC key is associated to the selected personality profile.

Sequence Diagram





4.5.3.2.7 ENMEM-SD-REQ-099423/B-Disassociate Key Fob

Constraints

Pre-Condition

Ignition Status = Run

Vehicle speed is less than 8 KPH.

Scenarios

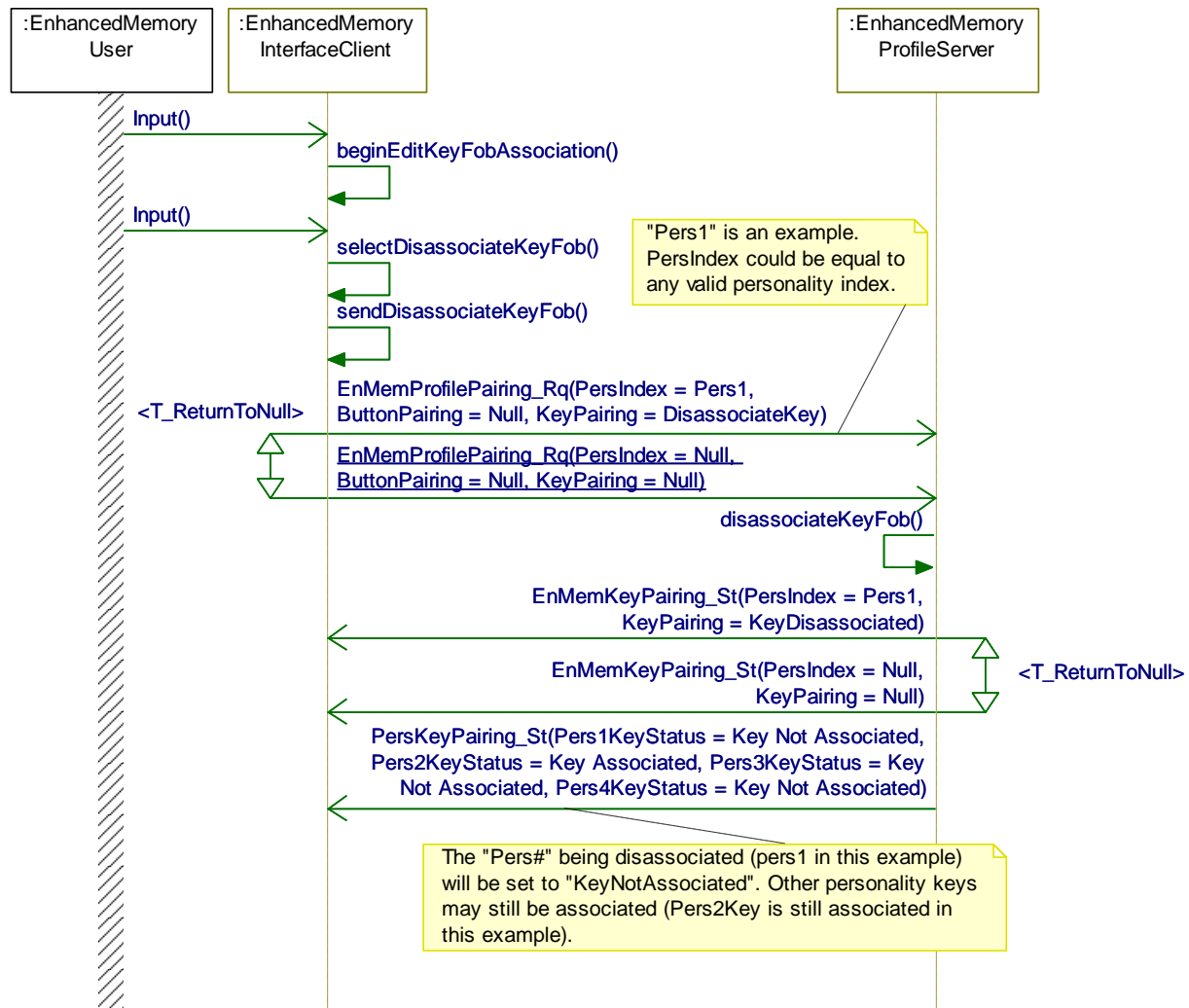
Normal Usage

The driver chooses to disassociate a key fob from a selected personality profile.

Post-Condition

The selected key fob is disassociated from the selected personality profile.

Sequence Diagram



4.5.3.2.8 ENMEM-SD-REQ-233259/A-Disassociate Phone

Constraints

Pre-Condition

Ignition Status = Run

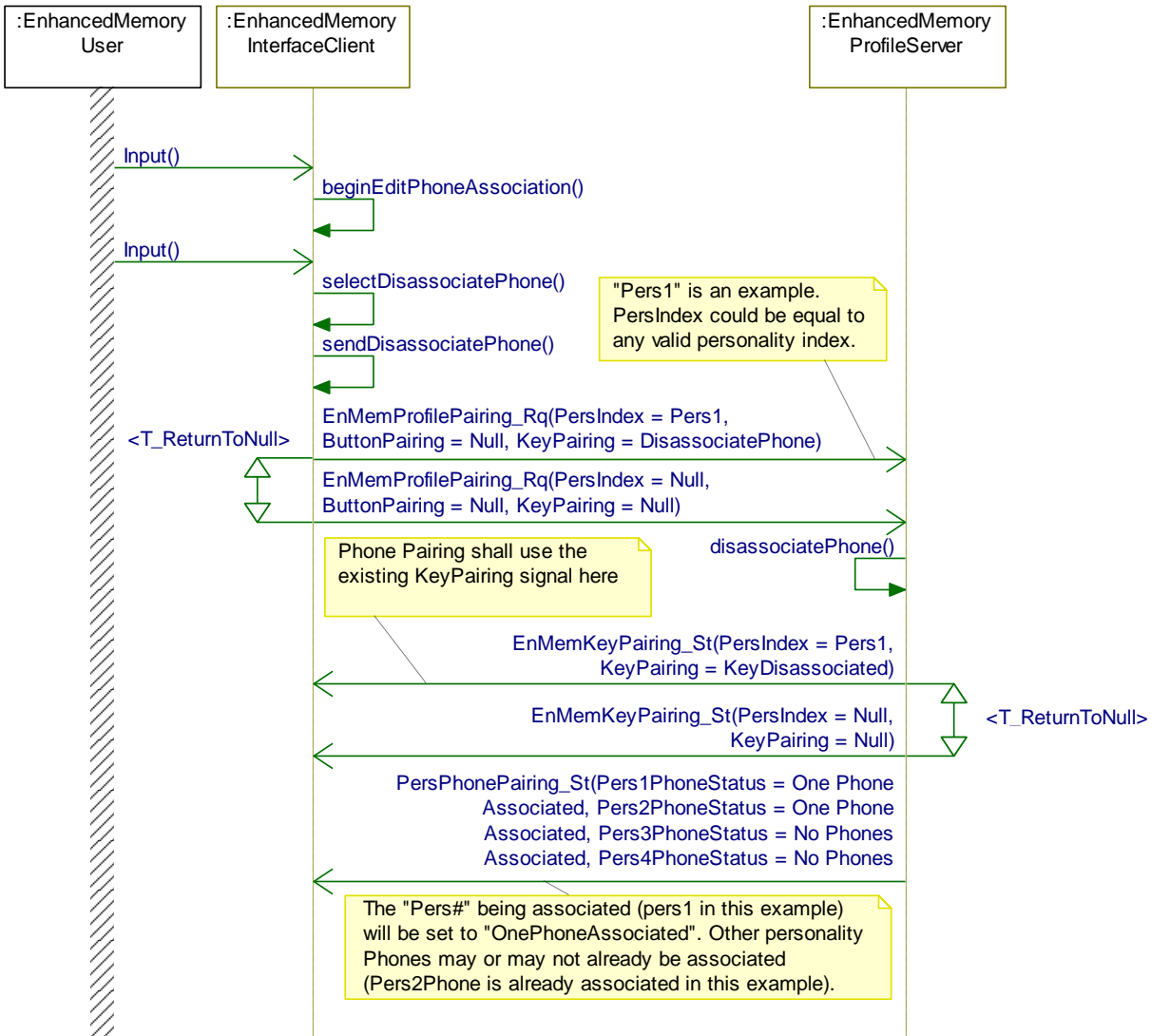
Vehicle speed is less than 8 KPH.

**Scenarios****Normal Usage**

The driver chooses to disassociate a phone from a selected personality profile.

Post-Condition

The selected phone is disassociated from the selected personality profile.

Sequence Diagram**4.5.3.2.9 ENMEM-SD-REQ-427619/A-Disassociate NFC Key****Constraints****Pre-Condition**

Ignition Status = Run

Vehicle speed is less than 8 KPH.

Scenarios**Normal Usage**

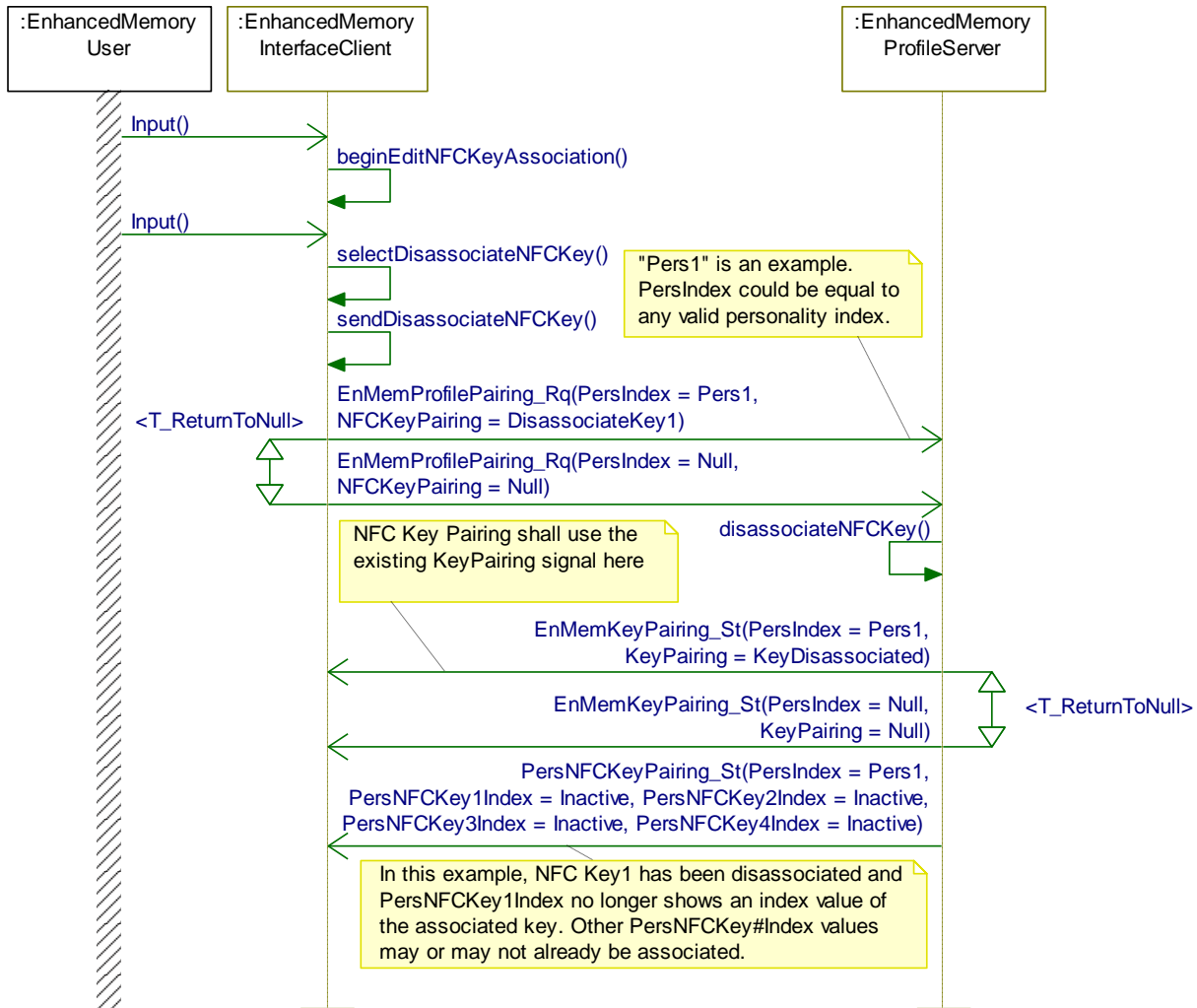
The driver chooses to disassociate an NFC key from a selected personality profile.

Post-Condition

The selected NFC key is disassociated from the selected personality profile.



Sequence Diagram



4.5.3.2.10 ENMEM-SD-REQ-099427/E-Delete Driver Profile

Constraints

Pre-Condition

Ignition Status = Run
Vehicle speed is less than 8 KPH.
Infotainment system is active

Scenarios

Normal Usage

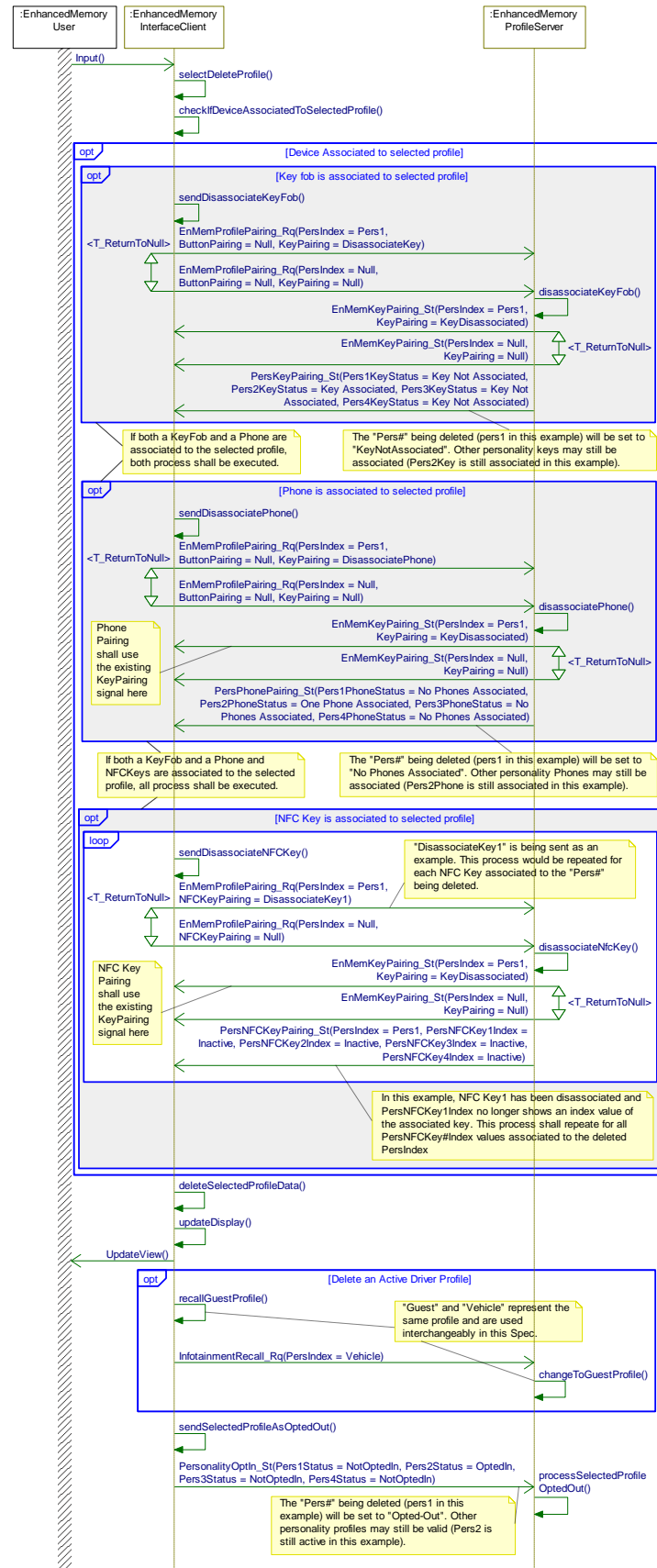
The driver chooses to delete a personality profile.

Post-Condition

The selected profile is deleted.
Any keyfobs associated to the deleted profile are disassociated.
Any phones associated to the deleted profile are disassociated.
Any NFC keys associated to the deleted profile are disassociated.



Sequence Diagram



**4.5.3.2.11 ENMEM-SD-REQ-197509/C-Master Reset****Constraints****Pre-Condition**

Ignition Status = Run

Vehicle speed is less than 8KPH

Infotainment system is on

Driver profiles feature is enabled

Scenarios**Normal Usage**

The driver performs a Master Reset

Post-Condition

The Driver Profiles feature is disabled (set to off).

All Driver Profiles are deleted.

All associated keyfobs are disassociated.

All associated phones are disassociated.

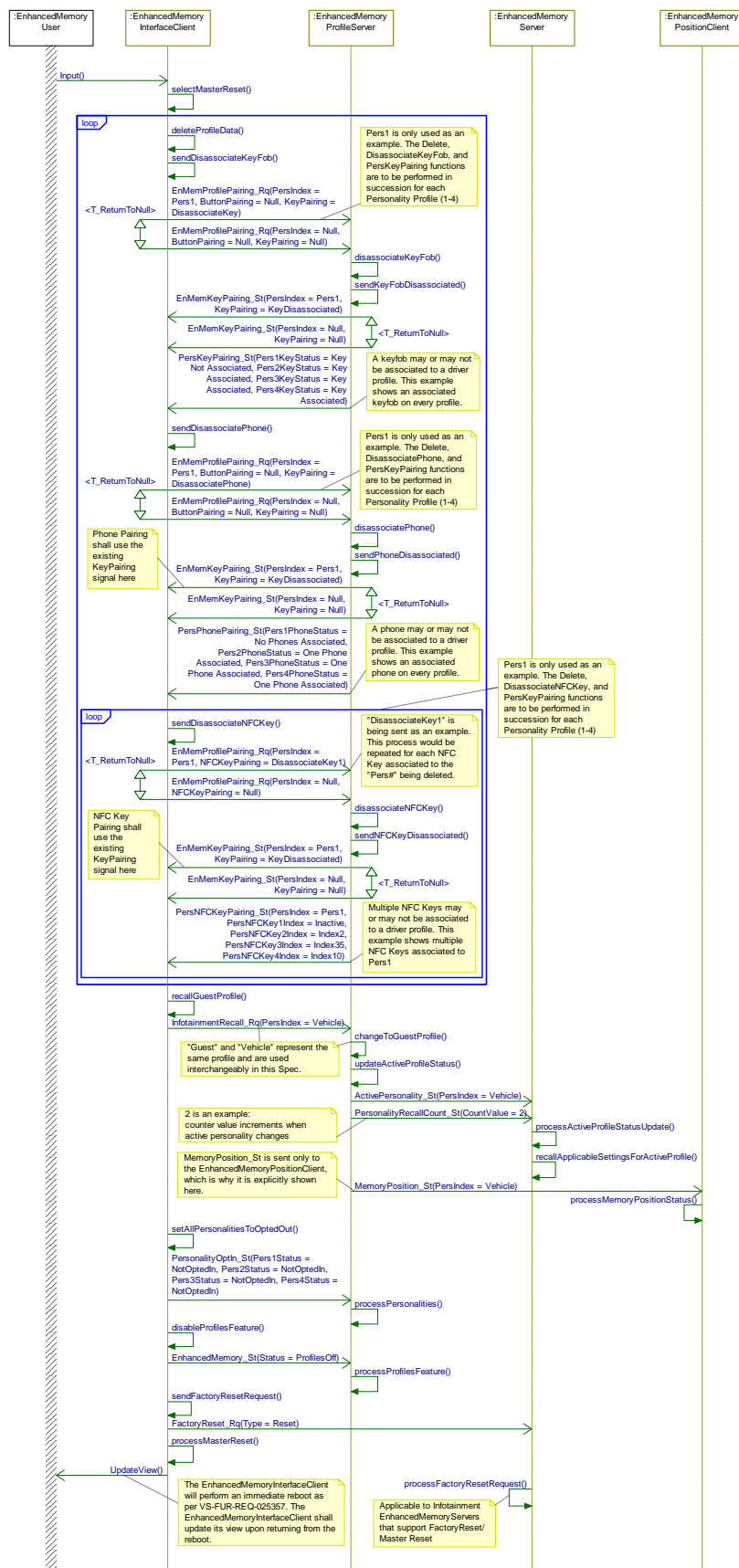
All associated NFC keys are disassociated.

The active Driver Profile is set to "Guest".

Applicable personalized infotainment settings are reset to factory default values for all profiles.



Sequence Diagram





4.5.3.2.12 ENMEM-SD-REQ-427797/A-Display NFC Key Associations

Constraints

Pre-Condition

Ignition Status = Run

Vehicle speed is less than 8 KPH.

Scenarios

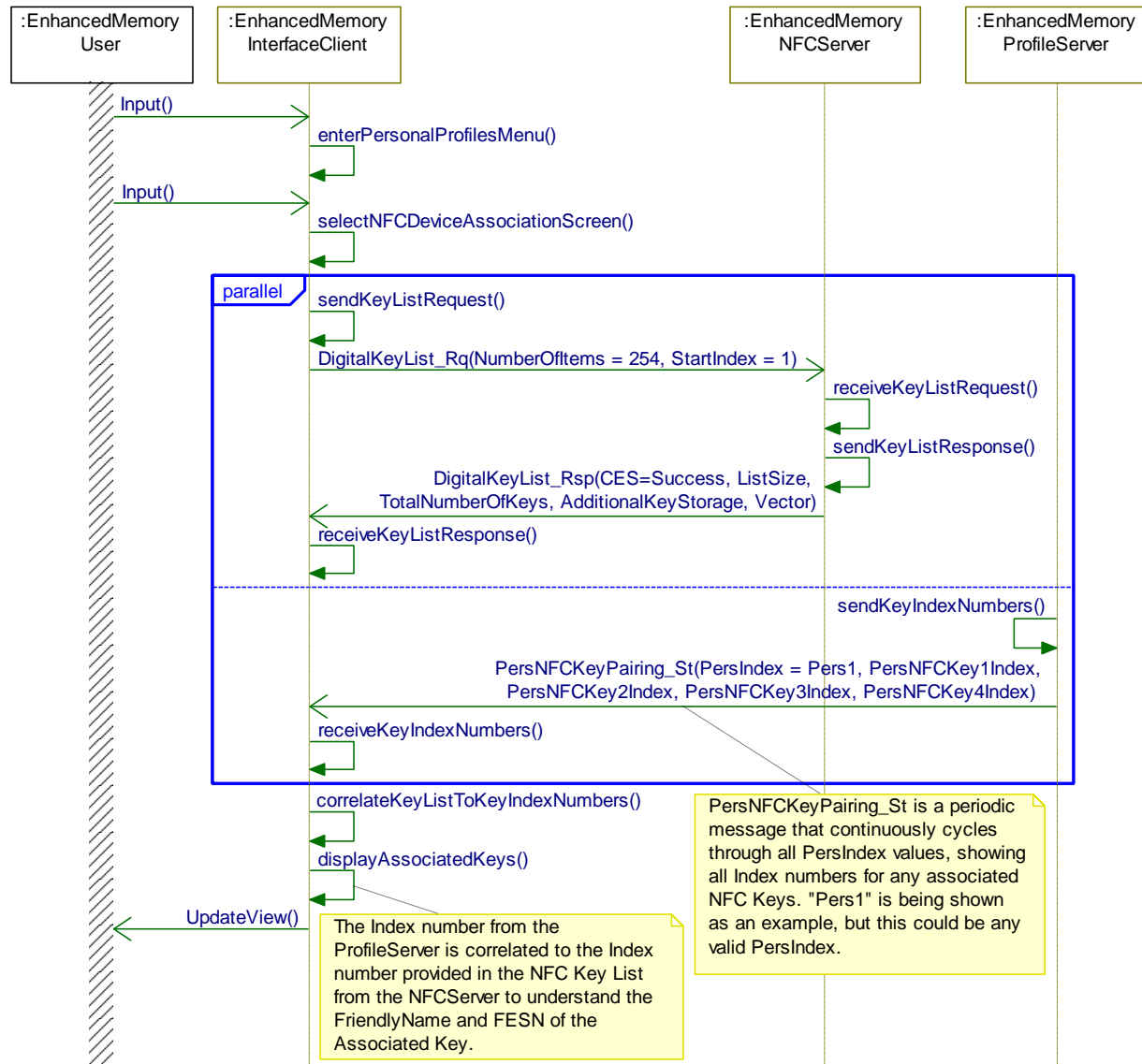
Normal Usage

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

Post-Condition

The associated NFC keys are displayed.

Sequence Diagram





4.6 ENMEM-FUN-REQ-195573/C-EnhancedMemoryInterfaceClient HMI Requirements - APIM

4.6.1 Requirements

4.6.1.1 ENMEM-HMI-REQ-195574/C-HMI Timeout for Overall Keyfob/Phone/NFC Key Pairing Process

On the HMI screen flows when the user starts the keyfob, phone or NFC key pairing process to a particular profile, the HMI shall timeout and exit the process after T_FobAssocTotal.

When the HMI screen flow is exited, the EnhancedMemoryInterfaceClient shall send either EnMemProfilePairing_Rq(KeyPairing = ExitKeyPairing) (if in Keyfob or Phone Pairing process) or EnMemProfilePairing_Rq(NFCKeyPairing = ExitKeyPairing) (if in NFC Key Pairing process) to the EnhancedMemoryProfileServer.

4.6.1.2 ENMEM-TMR-REQ-194098/D-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. Note: use the default value	sec	180-600	60	300

4.6.1.3 ENMEM-HMI-REQ-195576/C-HMI Timeout for One Keyfob/Phone/NFC Key Pairing Attempt

On the HMI screen flows when the user starts the keyfob, phone or NFC key pairing process to a particular profile, the HMI shall timeout and offer a retry after T_FobAssocOneTime.

When the HMI screen flow is entered for the keyfob pairing process, the EnhancedMemoryInterfaceClient shall send EnMemProfilePairing_Rq(KeyPairing = EnterKeyPairing) to the EnhancedMemoryProfileServer.

When the HMI screen flow is entered for the phone pairing process, the EnhancedMemoryInterfaceClient shall send EnMemProfilePairing_Rq(KeyPairing = EnterPhonePairing) to the EnhancedMemoryProfileServer.

When the HMI screen flow is entered for the NFC key pairing process, the EnhancedMemoryInterfaceClient shall send EnMemProfilePairing_Rq(NFCKeyPairing = EnterKeyPairing) to the EnhancedMemoryProfileServer.

When the timer expires and the HMI screen flow is exited the EnhancedMemoryInterfaceClient shall send either EnMemProfilePairing_Rq(KeyPairing = ExitKeyPairing) (if in Keyfob or Phone Pairing process) or EnMemProfilePairing_Rq(NFCKeyPairing = ExitKeyPairing) (if in NFC Key Pairing process) to the EnhancedMemoryProfileServer.

4.6.1.4 ENMEM-TMR-REQ-194099/D-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. Note: use the default value	sec	10-60	5	15

4.6.1.5 ENMEM-HMI-REQ-195575/C-Number of Retries on HMI for Keyfob/Phone/NFC Key Pairing

On the HMI screen flows, when the user fails to associate a Memory Seat button, keyfob, phone or NFC key to a Driver Profile and the screen flow timeout occurs, the HMI shall offer the user a retry. The number of retries offered is defined by N_NumberOfRetries.



4.6.1.6 ENMEM-REQ-179346/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 Memory Seat button, keyfob, phone or NFC key to a Driver Profile before the association process is declared unsuccessful and terminated Note: Use default value		2-5	1	3

4.6.1.7 ENMEM-HMI-REQ-197344/B-HMI Timeout for One Button Pairing Attempt

The following shall apply when EnhancedMemoryInterfaceClient is configured for "EnhancedMemoryPositionClient = Present":

On the HMI screen flows when the user starts the button pairing process upon profile creation, the HMI shall timeout and offer a retry after T_SeatAssocOneTime.

When the HMI screen flow is entered for the pairing process, the EnhancedMemoryInterfaceClient shall send EnMemProfilePairing_Rq (ButtonPairing = EnterButtonPairing) to the EnhancedMemoryPositionClient. When the timer expires and the HMI screen flow is exited the EnhancedMemoryInterfaceClient shall send EnMemProfilePairing_Rq (ButtonPairing = ExitButtonPairing) to the EnhancedMemoryPositionClient.

4.6.1.8 ENMEM-TMR-REQ-197338/B-T_SeatAssocOneTime

Name	Description	Units	Range	Resolution	Default
T_SeatAssocOneTime	Maximum time the EnhancedMemoryInterfaceClient shall allow for the button pairing process. Note: use the default value	sec	30-120	5	60

4.6.1.9 ENMEM-HMI-REQ-099692/B-Driver Profile Sign-In 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.

4.6.1.10 ENMEM-HMI-REQ-202226/A-Keyfob HMI Indication

The EnhancedMemoryInterfaceClient shall monitor PersKeyPairing_St to maintain and display a Keyfob Association Icon for existing Driver Profiles:

- When PersKeyPairing_St = KeyAssociated, the icon shall be displayed
- When PersKeyPairing_St = KeyUnAssociated or Null, the icon shall not be displayed

4.6.1.11 ENMEM-HMI-REQ-233009/A-Phone HMI Indication

The EnhancedMemoryInterfaceClient shall monitor PersPhonePairing_St to maintain and display a Phone Association Icon for existing Driver Profiles:

- When PersPhonePairing_St = NoPhonesAssociated, the icon shall not be displayed
- When PersPhonePairing_St = OnePhoneAssociated, the icon shall be displayed

4.6.1.12 ENMEM-HMI-REQ-427170/A-NFC Key HMI Indication

The EnhancedMemoryInterfaceClient shall monitor PersNFCKeyPairing_St to maintain and display an NFC Key Association Icon for existing Driver Profiles:

- The NFC Key Association Icon shall be displayed when:
 - At least one of the key indexes for the respective PersIndex does not equal to '0x00 Inactive'
 - Example: PersNFCKeyPairing_St(PersIndex = Pers1, PersNFCKey1Index = Index 1, PersNFCKey2Index = Inactive, PersNFCKey3Index = Inactive, PersNFCKey4Index = Inactive)



- The NFC Key Association Icon shall not be displayed when:
 - All of the key indexes for the respective PersIndex equals '0x00 Inactive'
 - Example: PersNFCKeyPairing_St(PersIndex = Pers1, PersNFCKey1Index = Inactive, PersNFCKey2Index = Inactive, PersNFCKey3Index = Inactive, PersNFCKey4Index = Inactive)

Note: During NFC Association/Disassociation, PersNFCKeyPairing_St remains at the requested PersIndex. The EnhancedMemoryInterfaceClient shall act on last known values for all other PersIndex values during this time.

4.6.1.13 ENMEM-HMI-REQ-202357/B-Logical Signal to HMI Mapping

In order to help establish a link between the Enhanced Memory SPSS and the Enhanced Memory HMI Specification, a third document "EnhancedMemory_SPSS_HMI_Mapping" was created. This document identifies where certain logic signals, timers, and other variables (that are defined in this SPSS) can be found in the HMI Specification.

4.6.1.14 ENMEM-HMI-REQ-197850/D-Enhanced Memory HMI Indications for Driver Profile

The Enhanced Memory HMI indication of an existing Driver Profile shall include the number of the associated Memory Seat button (when configured for "EnhancedMemoryPositionClient = Present"), the User's keyed in Profile Name, and an associated keyfob icon, associated phone icon and/or an associated NFC key icon shown only when one has been associated.

4.6.1.15 ENMEM-REQ-199352/B-Successful Memory Button Association

A successful Memory Seat button association event shall be defined as when in button association mode the EnhancedMemoryInterfaceClient receives a valid button press status (from either the EnhancedMemoryPositionClient or the EnhancedMemoryInterfaceClient) and internally determines that the pressed button is not associated to any existing Driver Profiles.

A valid memory button press from the EnhancedMemoryPositionClient shall be defined as EnMemButtonPairing_St(ButtonPairing) with encoding value in the range from 1 to 4 (i.e. Button1Pressed, Button2Pressed, Button3Pressed, Button4Pressed)

A valid memory button press from the EnhancedMemoryInterfaceClient shall be defined as an HMI input with a value in the range from 1 to 4 (i.e. Button1Pressed, Button2Pressed, Button3Pressed, Button4Pressed)

The EnhancedMemoryInterfaceClient HMI shall display a retry popup when:

5. EnMemButtonPairing_St(ButtonPairing) is not in valid range
6. The HMI input value is not in range
7. EnMemButtonPairing_St(ButtonPairing) is in failure state
8. Pressed button is already associated to another Driver Profile

4.6.1.16 ENMEM-SR-REQ-198055/D-Enhanced Memory HMI Option for Associated Keyfob/Phone/NFC Key

In the Keyfob, Phone or NFC Key Association process,

- The EnhancedMemoryInterfaceClient shall monitor EnMemKeyPairing_St to determine when a user attempts to associate an already associated keyfob, phone or NFC key to a new Driver Profile.
- When receiving KeyAlreadyInUse via EnMemKeyPairing_St(KeyPairing):
 - EnhancedMemoryInterfaceClient shall provide notification to the user that the keyfob, phone or NFC key is already associated to an existing Driver Profile
 - EnhancedMemoryInterfaceClient shall provide the user an option to over-write the associated keyfob, phone or NFC key, or to cancel the association process
 - When the user opts to over-write the associated keyfob or phone, the EnhancedMemoryInterfaceClient shall set EnMemProfilePairing_Rq(KeyPairing) to OverwriteKey.
 - When the user opts to over-write the associated NFC key, the EnhancedMemoryInterfaceClient shall set EnMemProfilePairing_Rq(NFCKeyPairing) to OverwriteKey.

4.6.1.17 ENMEM-HMI-REQ-197502/C-Enhanced Memory HMI Indications for Delete a Driver Profile

When a Driver Profile is deleted:



- The EnhancedMemoryInterfaceClient shall remove and disable the Edit Driver Profile functionality
- The EnhancedMemoryInterfaceClient shall remove the name for the deleted Driver Profile
- The EnhancedMemoryInterfaceClient shall update the keyfob association icon status based on PersKeyPairing_St for the deleted Driver Profile
- The EnhancedMemoryInterfaceClient shall update the phone association icon status based on PersPhonePairing_St for the deleted Driver Profile
- The EnhancedMemoryInterfaceClient shall update the NFC key association icon status based on PersNFCKeyPairing_St for the deleted Driver Profile

4.6.1.18 ENMEM-HMI-REQ-205014/A-Opt-In HMI Display

The Opt-In HMI display shall be displayed when all of the following conditions are met:

- The user presses "Driver Profiles" on the HMI Menu
- EnhancedMemory_St(Status = ProfilesOff)
- No Driver Profile's have been created (indicated by PersonalityOptIn_St)

After displaying the Opt-In HMI, the following actions shall apply:

- Upon receiving a user's "Opt-In" selection, the EnhancedMemoryInterfaceClient shall set EnhancedMemory_St(Status = ProfilesOn) and begin the Create a Driver Profile process.
- Upon receiving a user's "Not Opt-In" selection, the EnhancedMemoryInterfaceClient shall return to the previous Menu leaving EnhancedMemory_St(Status = ProfilesOff)

4.6.1.19 ENMEM-HMI-REQ-207327/B-Driver Profile Name Restrictions

- The Driver Profile Names created and maintained by the EnhancedMemoryInterfaceClient shall be unique.
- In the event when an existing name is entered by the user, the EnhancedMemoryInterfaceClient shall:
 - provide notification to the user that the name already exists
 - not allow the existing name to be overwritten
 - provide the user retry opportunities until a unique name is entered before proceeding to next step

4.6.1.20 ENMEM-HMI-REQ-212764/A-Enhanced Memory HMI Notification of Profile Creation Abort

When Driver Profile creation is interrupted and aborted, per ENMEM-REQ-116802, the EnhancedMemoryInterfaceClient shall notify the user that the process has been aborted.

4.6.1.21 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



4.6.1.22 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.

4.6.1.23 ENMEM-HMI-REQ-234279/B-Wrong Device Detected HMI

In the Keyfob, Phone or NFC 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 temporary notification to the user that the wrong device was selected
- This notification shall be triggered, not sustained, by the above signal value (See H31a_SYNC3_EMDriverProfile for notification duration).

4.6.1.24 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.)



5 Appendix: Reference Documents

Reference #	Document Title
1	Enhanced Memory APIM Implementation Guide
2	Vehicle Settings APIM SPSS - feature/functions tied to Enhanced Memory (ex. Ambient Lighting Variant 2, Language update....)
3	APIM Enhanced Memory HMI specification
4	FBMP SPSS (Feature Based Message Protocol SPSS spec)
5	APIM Infotainment Diagnostic Specification with enhanced memory updates
6	EnhancedMemory_SPSS_HMI_Mapping