



**Research & Vehicle Technology**  
**“Infotainment Systems Product Development”**

**Feature – Custom Drive Mode**  
**InterfaceClient**

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

Version 1.0

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## Revision History

| Date           | Ver | Notes           |  |
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| April 30, 2021 | 1.0 | Initial Release |  |
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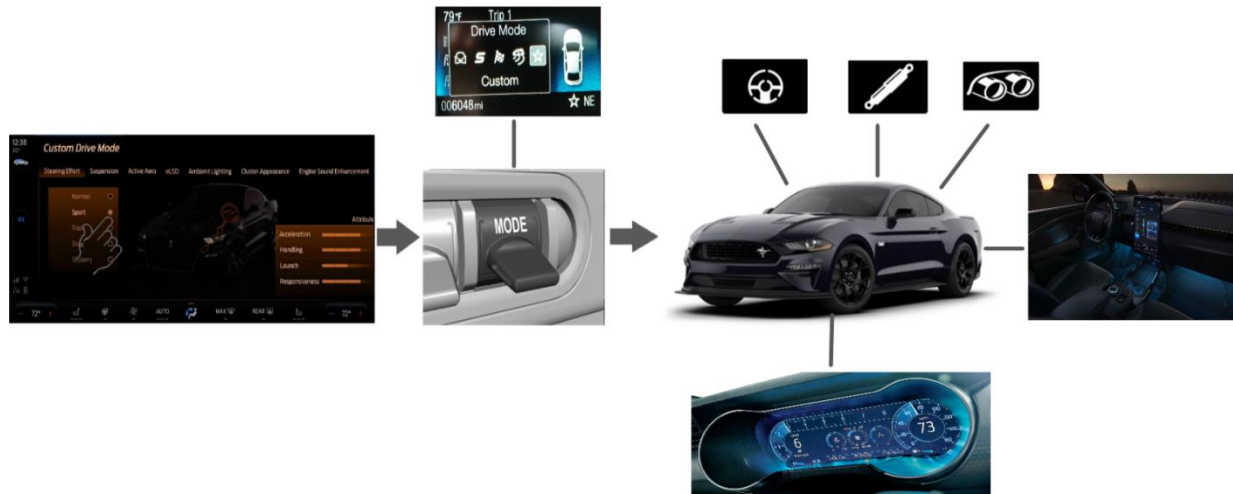
# Table of Contents

|  |    |
|--|----|
| REVISION HISTORY .....   | 2  |
| 1 OVERVIEW .....   | 4  |
| 1.1 Terms and Definitions .....                                    | 4  |
| 2 ARCHITECTURAL DESIGN.....  | 6  |
| 2.1 CDM-CLD-REQ-407936/A-Custom Drive Mode Server .....            | 6  |
| 2.2 CDM-CLD-REQ-407937/A-Custom Drive Mode InterfaceClient.....    | 6  |
| 2.3 Physical Mapping of Classes .....                              | 6  |
| 2.4 CDMInterfaceClient Interface.....                              | 6  |
| 2.4.1 CDM-IIR-REQ-407938/A-CDMInterfaceClient_Tx .....             | 6  |
| 2.4.2 CDM-IIR-REQ-407939/A-CDMInterfaceClient_Rx.....              | 7  |
| 3 GENERAL REQUIREMENTS .....                                       | 9  |
| 3.1 CDM-REQ-407904/A-CDMInterfaceClient Feature Configuration..... | 9  |
| 3.2 CDM-REQ-407942/A-Powermode Conditions .....                    | 9  |
| 4 FUNCTIONAL DEFINITION .....                                      | 10 |
| 4.1 CDM-FUN-REQ-407935/A-CDM Profile Menu .....                    | 10 |
| 4.1.1 Use Cases .....  | 10 |
| 4.1.2 Requirements .....   | 11 |
| 4.1.3 White Box View .....   | 15 |
| 5 APPENDIX: REFERENCE DOCUMENTS.....                               | 22 |



# 1 Overview

The Custom Drive Mode (CDM) feature will allow a customer to create and save a drive mode with personalized settings in order to enhance their driving experience. The center stack display will allow the user to configure a set of customizable functions such as steering effort, suspension setting, exhaust sound, and other functions via a dedicated CDM HMI Menu. The customizable function set available for each vehicle is dependent on the equipped content. The CDM feature is supported by an already existing Selectable Drive Mode (SDM) feature which will handle the users request to activate their CDM. The user can activate their CDM at any time by selecting "Custom Mode" from the SDM selection menu via the SDM switch. When the user selects "Custom Mode" from the SDM selection menu, the vehicle will apply all the settings the user has configured for their CDM Profile.



## 1.1 Terms and Definitions

| Abbreviation | Description                            |
|--------------|--|
| CAN          | Controller Area Network                |
| CCS          | Customer Connectivity Setting          |
| CHCM         | Chassis Control Module                 |
| DID          | Data Identifier                        |
| DLCM         | Drive Line Control Module              |
| ECG          | Enhanced Central Gateway               |
| EPS          | Electric Powered Steering              |
| FD1          | FD1 CAN Network                        |
| FNV2.0       | Fully Networked Vehicle 2nd Generation |
| IPC          | Instrument Panel Cluster               |
| PCM          | Powertrain Control Module              |
| PSCM         | Power Steering Control module          |
| S/S          | Stop / Start                           |
| SDM          | Selectable Drive Mode                  |
| SOA          | Service Oriented Architecture          |
| SPSS         | Subsystem Part Specific Specification  |
| TCCM         | Transfer Case Control Module           |
| VDM          | Vehicle Dynamics Module                |



| Term                      | Description  |
|---------------------------|--|
| Feature Object            | A feature that the customer can configure as part of their custom drive mode                               |
| Feature Setting           | A selectable setting of a given Feature Object   |
| CDM Profile               | One of 6 available custom drive mode profiles the customer can configure to their individual settings      |
| CDM Profile Configuration | This defines the available feature objects, position settings, and position availability for a CDM profile |



## 2 Architectural Design

### 2.1 CDM-CLD-REQ-407936/A-Custom Drive Mode Server

The Custom Drive Mode Server (CDMServer) is responsible for the tasks listed below:

- Manage CDM Profile data (Saved Settings, Feature Object configuration, Setting List Order, Settings Availability, Restricted combinations, etc.)
- Transmit CDM Profile data to CDMInterfaceClient
- Receive setting change requests from CDMInterfaceClient
- Transmit active CDM Profile status to CDMInterfaceClient
- Receive active profile change request from CDMInterfaceClient

Please review the implementation guide/ block diagram to locate the Custom Drive Mode Server class.

### 2.2 CDM-CLD-REQ-407937/A-Custom Drive Mode InterfaceClient

The Custom Drive Mode InterfaceClient (CDMInterfaceClient) is responsible for the tasks listed below:

- Provide the customer with a graphic user interface
- Display CDM Profile data as communicated from CDMServer (Saved Settings, Feature Objects, Setting List Order, Settings Availability, Restricted combinations, etc.)
- Receive CDM Profile data from CDMServer
- Transmit setting change requests from user to CDMServer
- Receive active CDM Profile status from CDMServer
- Transmit profile change request from use to CDMServer

Please review the implementation guide/ block diagram to locate the Custom Drive Mode InterfaceClient class.

### 2.3 Physical Mapping of Classes

The table below shows an example of how the logical classes that make up the Custom Drive Modes feature can be mapped into physical modules. This mapping is an example only and does not necessarily carryover to other carlines or vehicle architectures.

| Logical Class       | Physical Module (ECU) |
|---------------------|-----------------------|
| CDMServer           | ECG                   |
| CDMInterfaceClient  | SYNC                  |
| CDMSDMServer        | ABS (SDM)             |
| CDMPServer          | PCM, ECM              |
| CDMCServer          | ABS (SDM)             |
| CDMInterfaceClient2 | IPC                   |

### 2.4 CDMInterfaceClient Interface

#### 2.4.1 CDM-IIR-REQ-407938/A-CDMInterfaceClient\_Tx

##### 2.4.1.1 MD-REQ-407928/A-getCdmProfile

This API is used to request transmission of Custom Drive Mode profiles from the CDMServer.

| Method Type |               | Fire & Forget |          |       |             |
|-------------|---------------|---------------|----------|-------|-------------|
| QoS Level   |               | Default       |          |       |             |
| Retained    |               | No            |          |       |             |
| R/O         | Name          | Type          | Literals | Value | Description |
|             | Request (_Rq) |               |          |       |             |



|                        |     |   |   |   |   |
|------------------------|-----|---|---|---|---|
| -                      | N/A | - | - | - | - |
| <b>Response (_Rsp)</b> |     |   |   |   |   |
| -                      | N/A | - | - | - | - |

#### 2.4.1.2 MD-REQ-407930/A-setCdmSetting

This API is used to request a change to a Custom Drive Mode setting on the CDMServer.

|                    |                  |                  |                 |              |  |
|--------------------|------------------|------------------|-----------------|--------------|--|
| <b>Method Type</b> |                  | One-Shot (Synch) |                 |              |  |
| <b>QoS Level</b>   |                  | Default          |                 |              |  |
| <b>Retained</b>    |                  | No               |                 |              |  |
| <b>R/O</b>         | <b>Name</b>      | <b>Type</b>      | <b>Literals</b> | <b>Value</b> | <b>Description</b>                             |
| <b>Request</b>     |                  |                  |                 |              |  |
| R                  | CdmProfileNumber | uint8            | -               | 1 to 6       | The CDM profile being requested                |
| R                  | FeatureObjectID  | uint8            | -               | 1 to 9       | The Feature Object ID number being requested   |
| R                  | SettingNumber    | uint8            | -               | 1 to 30      | The setting number being requested to be saved |
| <b>Response</b>    |                  |                  |                 |              |  |
| -                  | N/A              | -                | -               | -            | -  |

#### 2.4.1.3 MD-REQ-407931/A-setActiveCdmProfile

This API is used to request a change of the active Custom Drive Mode Profile on the CDMServer.

|                    |                  |                  |                 |              |                                 |
|--------------------|------------------|------------------|-----------------|--------------|---------------------------------|
| <b>Method Type</b> |                  | One-Shot (Synch) |                 |              |                                 |
| <b>QoS Level</b>   |                  | Default          |                 |              |                                 |
| <b>Retained</b>    |                  | No               |                 |              |                                 |
| <b>R/O</b>         | <b>Name</b>      | <b>Type</b>      | <b>Literals</b> | <b>Value</b> | <b>Description</b>              |
| <b>Request</b>     |                  |                  |                 |              |                                 |
| R                  | CdmProfileNumber | uint8            | -               | 1 to 6       | The CDM profile being requested |
| <b>Response</b>    |                  |                  |                 |              |                                 |
| -                  | -                | -                | -               | -            | N/A                             |

#### 2.4.2 CDM-IIR-REQ-407939/A-CDMInterfaceClient\_Rx

##### 2.4.2.1 MD-REQ-027149/A-IgnitionStatus\_St (TcSE ROIN-225464-1)

Message Type: Status

Signal used to indicate ignition state.

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



Invalid 0xF

**2.4.2.2 MD-REQ-407929/A-cdmProfileBroadcast**

This API is used to broadcast Custom Drive Mode profiles to the CDMInterfaceClient.

| Method Type |                  | Fire & Forget       |             |          |             |  |
|-------------|------------------|---------------------|-------------|----------|-------------|--|
| QoS Level   |                  | Default             |             |          |             |  |
| Retained    |                  | Yes                 |             |          |             |  |
| R/O         | Name             |                     | Type        | Literals | Value       | Description  |
| Request     |                  |                     |             |          |             |  |
| -           | -                |                     | -           | -        | -           | N/A  |
| Response    |                  |                     |             |          |             |  |
| R           | CdmProfileNumber |                     | uint8       | -        | 1 to 6      | The CDM profile being requested  |
| Rep         | SettingsData     |                     | settingData | -        | -           | Repeated Setting data for each Feature Object                                  |
| R           | settingData      | FeatureObjectID     | uint8       | -        | 1 to 10     | Feature Object ID  |
|             |                  | SavedSetting        | uint8       | -        | 1 to 30     | The saved setting for the respective Feature Object                            |
|             |                  | SettingListOrder    | uint8[]     | -        | Array of 10 | The list of Feature Object Settings in order of their list position            |
|             |                  | SettingAvailability | uint8[]     | -        | Array of 10 | The list of Setting Availability for each setting provided in SettingListOrder |

**2.4.2.3 MD-REQ-407932/A-cdmActiveProfileBroadcast**

This API is used to broadcast the active Custom Drive Mode Profile to the CDMInterfaceClient.

| Method Type |                  | OnChange |          |        |                        |
|-------------|------------------|----------|----------|--------|------------------------|
| QoS Level   |                  | Default  |          |        |                        |
| Retained    |                  | Yes      |          |        |                        |
| R/O         | Name             | Type     | Literals | Value  | Description            |
| Request     |                  |          |          |        |                        |
| -           | -                | -        | -        | -      | N/A                    |
| Response    |                  |          |          |        |                        |
| R           | ActiveCdmProfile | uint8    | -        | 1 to 6 | The active CDM profile |





### 3 General Requirements

#### 3.1 CDM-REQ-407904/A-CDMInterfaceClient Feature Configuration

The CDMInterfaceClient shall have a configurable parameter/DID (DE08 Byte 15 Bit 3 – ‘Custom Mode’) to allow the feature to be enabled/disabled.

- When the parameter indicates that Custom Drive Mode is enabled, all the functionality and signals defined in this SPSS shall be supported.
- When the parameter indicates that Custom Drive Mode is disabled, none of the functionality defined in this SPSS shall be supported.
  - The default value for this parameter shall be Disabled.

#### 3.2 CDM-REQ-407942/A-Powermode Conditions

The CDMInterfaceClient shall only perform the CDM functionality when the following preconditions are met:

- IgnitionStatus\_St = “(0x4) Run”



## 4 Functional Definition

### 4.1 CDM-FUN-REQ-407935/A-CDM Profile Menu

#### 4.1.1 Use Cases

##### 4.1.1.1 CDM-UC-REQ-407923/A-Change CDM Settings

|                                    |  |
|------------------------------------|--|
| <b>Actors</b>                      | CDMServer, CDMInterfaceClient  |
| <b>Pre-conditions</b>              | Powermode conditions are met   |
| <b>Scenario Description</b>        | User enters "Custom Drive Mode" settings menu on the CDMInterfaceClient<br>User selects settings for each Feature Object in the CDM Menu |
| <b>Post-conditions</b>             | User-selected settings are saved for active CDM Profile  |
| <b>List of Exception Use Cases</b> |  |
| <b>Interfaces</b>                  | CAN, SoA   |

##### 4.1.1.2 CDM-UC-REQ-407924/A-Select Active CDM Profile

|                                    |  |
|------------------------------------|--|
| <b>Actors</b>                      | CDMServer, CDMInterfaceClient  |
| <b>Pre-conditions</b>              | Powermode conditions are met   |
| <b>Scenario Description</b>        | User enters "Custom Drive Mode" settings menu on the CDMInterfaceClient<br>User selects CDM Profile Button in the CDM Menu and selects a CDM Profile<br>Settings for the selected CDM Profile are loaded |
| <b>Post-conditions</b>             | Selected CDM Profile becomes active  |
| <b>List of Exception Use Cases</b> |  |
| <b>Interfaces</b>                  | CAN, SoA   |

##### 4.1.1.3 CDM-UC-REQ-407925/A-Activate CDM in Selectable Drive Modes

|                                    |  |
|------------------------------------|--|
| <b>Actors</b>                      | CDMServer, CDMInterfaceClient  |
| <b>Pre-conditions</b>              | Powermode conditions are met   |
| <b>Scenario Description</b>        | User enters "Selectable Drive Modes" menu on the CDMInterfaceClient and<br>selects "Custom Drive Mode" |
| <b>Post-conditions</b>             | CDM settings for active CDM Profile are applied on the vehicle   |
| <b>List of Exception Use Cases</b> |  |
| <b>Interfaces</b>                  | CAN, SoA   |

##### 4.1.1.4 CDM-UC-REQ-407926/A-View Selected CDM Settings

|                             |  |
|-----------------------------|--|
| <b>Actors</b>               | CDMServer, CDMInterfaceClient  |
| <b>Pre-conditions</b>       | Powermode conditions are met   |
| <b>Scenario Description</b> | User enters "Custom Drive Mode" settings menu on the CDMInterfaceClient<br>CDM Menu is opened and displays all the configurable Feature Objects and their<br>selected settings |



|                                    |                    |
|------------------------------------|--------------------|
| <b>Post-conditions</b>             | CDM Menu is opened |
| <b>List of Exception Use Cases</b> |                    |
| <b>Interfaces</b>                  | CAN, SoA           |

#### 4.1.1.5 CDM-UC-REQ-407927/A-Reset CDM Settings to pre-set base mode

|                                    |  |
|------------------------------------|--|
| <b>Actors</b>                      | CDMServer, CDMInterfaceClient  |
| <b>Pre-conditions</b>              | Powermode conditions are met   |
| <b>Scenario Description</b>        | User enters "Custom Drive Mode" settings menu on the CDMInterfaceClient<br>Driver changes selected setting for "Base Drive Mode" to one of the available settings<br>All Feature Objects are updated to the default setting associated with selected Base Drive Mode |
| <b>Post-conditions</b>             | Active CDM Profile settings are updated and saved  |
| <b>List of Exception Use Cases</b> |  |
| <b>Interfaces</b>                  | CAN, SoA   |

#### 4.1.1.6 CDM-UC-REQ-416071/A-Get CDM Settings

|                                    |  |
|------------------------------------|--|
| <b>Actors</b>                      | CDMServer, CDMInterfaceClient  |
| <b>Pre-conditions</b>              | Retrieve conditions not met  |
| <b>Scenario Description</b>        | Retrieve conditions are met<br>CDMInterfaceClient requests all CDM Profile Data from CDMServer<br>CDMServer sends CDM Profile Data to CDMInterfaceClient |
| <b>Post-conditions</b>             | CDMInterfaceClient caches data and displays CDM Profile (if screen shown)  |
| <b>List of Exception Use Cases</b> |  |
| <b>Interfaces</b>                  | SoA  |

### 4.1.2 Requirements

#### 4.1.2.1 CDM-REQ-407905/A-Enable CDM Menu

When the CDM Feature Configuration is set to "Enabled", the CDMInterfaceClient shall enable the CDM Menu.

#### 4.1.2.2 CDM-REQ-407906/A-CDM Feature Object Matrix

The CDMInterfaceClient shall be able display a dropdown menu switch on the CDM Menu for all available Feature Objects, for up to 6 CDM Profiles. A CDM Profile consists of a single selected/saved setting for each Feature Object.

The Feature Object matrix below defines the encodings for all available Feature Objects, their respective IDs, and available settings for each Feature Object. This matrix shall be saved by the CDMInterfaceClient.

| CDM Feature Object Matrix |   |   |   |   |   |   |   |   |   |    |
|---------------------------|---|---|---|---|---|---|---|---|---|----|
| Feature Object ID         | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |



| Feature Object | Drive Mode | Powertrain | Exhaust | Stop/Start | Steering | Suspension | Chassis  | Traction Control | Display   | Stabilizer Bar |
|----------------|------------|------------|---------|------------|----------|------------|----------|------------------|-----------|----------------|
| Setting 1      | Normal     | Normal     | Normal  | On         | Normal   | Normal     | Normal   | On               | Normal    | Off            |
| Setting 2      | Sport      | Sport      | Sport   | Off        | Sport    | Sport      | Sport    | Off              | Sport     | On             |
| Setting 3      | Comfort    | Comfort    | Track   | Null       | Comfort  | Track      | Comfort  | Null             | Comfort   | Null           |
| Setting 4      | Eco        | Eco        | Quiet   | Null       | Off-Road | Drag       | Eco      | Null             | Eco       | Null           |
| Setting 5      | Slippery   | Slippery   | Null    | Null       | Null     | Off-Road   | Slippery | Null             | Slippery  | Null           |
| Setting 6      | Track      | Track      | Null    | Null       | Null     | Null       | Track    | Null             | Track     | Null           |
| Setting 7      | Drag       | Drag       | Null    | Null       | Null     | Null       | Drag     | Null             | Drag      | Null           |
| Setting 8      | Null       | Null       | Null    | Null       | Null     | Null       | Null     | Null             | Heritage1 | Null           |
| Setting 9      | Null       | Null       | Null    | Null       | Null     | Null       | Null     | Null             | Heritage2 | Null           |
| Setting 10     | Null       | Null       | Null    | Null       | Null     | Null       | Null     | Null             | Heritage3 | Null           |
| Setting 11     | Null       | Null       | Null    | Null       | Null     | Null       | Null     | Null             | Null      | Null           |
| Setting 12     | Null       | Null       | Null    | Null       | Null     | Null       | Null     | Null             | Null      | Null           |
| Setting 13     | Null       | Null       | Null    | Null       | Null     | Null       | Null     | Null             | Null      | Null           |
| Setting 14     | Null       | Null       | Null    | Null       | Null     | Null       | Null     | Null             | Null      | Null           |
| Setting 15     | Null       | Null       | Null    | Null       | Null     | Null       | Null     | Null             | Null      | Null           |
| Setting 16     | Null       | Null       | Null    | Null       | Null     | Null       | Null     | Null             | Null      | Null           |
| Setting 17     | Null       | Null       | Null    | Null       | Null     | Null       | Null     | Null             | Null      | Null           |
| Setting 18     | Null       | Null       | Null    | Null       | Null     | Null       | Null     | Null             | Null      | Null           |
| Setting 19     | Null       | Null       | Null    | Null       | Null     | Null       | Null     | Null             | Null      | Null           |
| Setting 20     | Null       | Null       | Null    | Null       | Null     | Null       | Null     | Null             | Null      | Null           |
| Setting 21     | Null       | Null       | Null    | Null       | Null     | Null       | Null     | Null             | Null      | Null           |
| Setting 22     | Null       | Null       | Null    | Null       | Null     | Null       | Null     | Null             | Null      | Null           |
| Setting 23     | Null       | Null       | Null    | Null       | Null     | Null       | Null     | Null             | Null      | Null           |
| Setting 24     | Null       | Null       | Null    | Null       | Null     | Null       | Null     | Null             | Null      | Null           |
| Setting 25     | Null       | Null       | Null    | Null       | Null     | Null       | Null     | Null             | Null      | Null           |
| Setting 26     | Null       | Null       | Null    | Null       | Null     | Null       | Null     | Null             | Null      | Null           |
| Setting 27     | Null       | Null       | Null    | Null       | Null     | Null       | Null     | Null             | Null      | Null           |
| Setting 28     | Null       | Null       | Null    | Null       | Null     | Null       | Null     | Null             | Null      | Null           |
| Setting 29     | Null       | Null       | Null    | Null       | Null     | Null       | Null     | Null             | Null      | Null           |
| Setting 30     | Null       | Null       | Null    | Null       | Null     | Null       | Null     | Null             | Null      | Null           |

#### 4.1.2.3 CDM-REQ-407907/A-Receive CDM Profiles

The CDMInterfaceClient shall receive the saved Feature Object configurations from the CDMServer via cdmProfileBroadcast. The CDMInterfaceClient shall locally cache the latest values for each Feature Object. The cdmProfileBroadcast API is composed of the parameters defined in the table below:

| Parameter        | Description  |   |
|------------------|--|---|
| CdmProfileNumber | This parameter indicates the CDM Profile Number being communicated. This value ranges from 1-x, x being the configured number of CDM Profiles. |   |
| SettingsData     | FeatureObjectIdx   | This parameter indicates the Feature Object ID for the settingsData that is being communicated  |
|                  | SavedSetting   | This parameter indicates the saved setting for the respective Feature Object  |
|                  | SettingListOrder   | This parameter indicates the list of Feature Object Settings in order of their list position.<br>The list order is sent in this manner to allow the CDMServer to control the order of each Feature Object list displayed on the CDMInterfaceClient. |
|                  | SettingAvailability  | This parameter indicates the list of Setting Availability for each setting provided in SettingListOrder.  |



|  |  |  |
|--|--|--|
|  |  | The Setting Availability list is sent in this manner to allow the CDMServer to control which of the settings are displayed as available/unavailable on the CDMInterfaceClient. |
|--|--|--|

**Note:** SettingsData is a 'repeated' field and shall be sent/repeated for each Feature Object ID (for each CDM Profile) that is to be communicated by the CDMServer.

**Note:** The cached Feature Object configurations shall be stored in temporary memory by the CDMInterfaceClient, to be used only within the current sleep cycle.

#### 4.1.2.4 CDM-REQ-407909/A-Update CDM Menu for New Active Profile

When the CDMInterfaceClient receives a new active CDM Profile Number from signal cdmActiveProfileBroadcast(ActiveCdmProfile), the CDMInterfaceClient shall update the CDM Menu with the following changes:

- Update the selected Profile Number in the CDM Profile Button to the CDM Profile Number received, AND
- Update all Feature Object Buttons with the relative/correct Saved Setting, Setting List Order, and Setting Availability for the CDM Profile Number received

Note: Feature Object buttons shall be updated with the cached Feature Object configuration data for the corresponding profile.

#### 4.1.2.5 CDM-REQ-407910/A-Enable CDM Profile Button

When the CDMInterfaceClient receives a CDM Profile Number greater than "1" (CdmProfileNumber > 1), the CDMInterfaceClient shall enable a CDM Profile Button in the CDM Menu which allows the user to select from any of the received CDM Profile Numbers. The CDM Profile Button shall list all received CDM Profile Numbers in ascending order.

If the CDMInterfaceClient only receives a CDM Profile Number of "1", the CDMInterfaceClient shall disable the CDM Profile Button.

#### 4.1.2.6 CDM-REQ-407911/A-Enable Feature Object Button

The CDMInterfaceClient shall enable a dropdown button on the CDM Menu for each received Feature Object ID from cdmProfileBroadcast.

#### 4.1.2.7 CDM-REQ-407912/A-Feature Object Button Settings

When a Feature Object Button is selected by the user, the CDM Menu shall open a drop-down menu for the selected Feature Object Button that lists up to 10 selectable settings. The settings enabled at each position in the drop-down menu are indicated via cdmProfileBroadcast(SettingListOrder). If a SettingListOrder index value is "0", the corresponding position in the dropdown menu shall be removed.

#### 4.1.2.8 CDM-REQ-407913/A-Communicate New Feature Object Setting Selection

When the user selects a new setting from a Feature Object Button, the CDMInterfaceClient shall communicate the selected setting, corresponding Feature Object ID, and corresponding CDM Profile Number to the CDMServer via setCdmSetting(CdmProfileNumber, FeatureObjectID, SettingNumber).

#### 4.1.2.9 CDM-REQ-407914/A-Communicate New CDM Profile Selection

When the user selects a new CDM Profile Number from the CDM Profile Button, the CDMInterfaceClient shall communicate the selected CDM Profile Number to the CDMServer via setActiveCdmProfile(CdmProfileNumber).

#### 4.1.2.10 CDM-REQ-407915/A-Retrieve CDM Profiles

When any of the below conditions are met, the CDMInterfaceClient shall send getCdmProfile to the CDMServer in order to request the latest saved Feature Objects for all CDM Profiles:

- After display reset OR
- After display recovers from error state during Ignition\_Status = "Run" OR
- After ECU Wakeup OR



- If Feature Object configuration cache is lost or corrupted
- Upon entering the CDM Menu when CDMInterfaceClient does not have any data cached
  - In this case getCdmProfile shall be called every 5s for 30s max, or until cdmProfileBroadcast is received

#### 4.1.2.11 CDM-REQ-407916/A-Indicate Selected Setting on Feature Object Buttons

The CDM Menu shall indicate the selected setting for every Feature Object on the Feature Object Button graphic itself.

#### 4.1.2.12 CDM-REQ-407917/A-Highlight Selected Settings in Feature Object Dropdown Menu

When a Feature Object Button dropdown menu is open, the CDM Menu shall always highlight the selected setting/position in the dropdown menu.

#### 4.1.2.13 CDM-REQ-407918/A-Disable Unavailable Settings

The CDM Menu shall grey out/disable settings in the Feature Object Button dropdown menu for all positions that meet the following conditions:

- Feature Object position is Enabled (SettingListOrder != "0"), AND
- Feature Object position is Not Available (SettingAvailability = "0")

#### 4.1.2.14 CDM-REQ-407919/A-Update CDM Menu

When the CDMInterfaceClient receives a new cdmProfileBroadcast or cdmActiveProfileBroadcast, the CDMInterfaceClient shall update the CDM Menu if there is any change in the following content:

- Enabled Feature Object Buttons
- Selected Feature Object Settings
- Settings List Order
- Setting Availability
- Enabled CDM Profiles
- Active CDM Profile

#### 4.1.2.15 CDM-REQ-407920/A-Reset CDM Menu

The CDMInterfaceClient shall clear the Feature Object configuration cache and reset the CDM Menu at shutdown.

#### 4.1.2.16 CDM-REQ-407921/A-CDM Menu Loading Screen

If the CDM Menu is enabled and the user opens the CDM Menu while the CDMInterfaceClient does not have any cached Feature Object configuration data, the CDMInterfaceClient shall display a 'loading screen' until it receives and caches the CDM Profiles from the CDMServer.

#### 4.1.2.17 CDM-REQ-407922/A-Update CDM Menu Response Time

When the CDMInterfaceClient receives cdmProfileBroadcast or cdmActiveProfileBroadcast, the CDMInterfaceClient shall update the CDM Menu within a worst case of 100 msec.

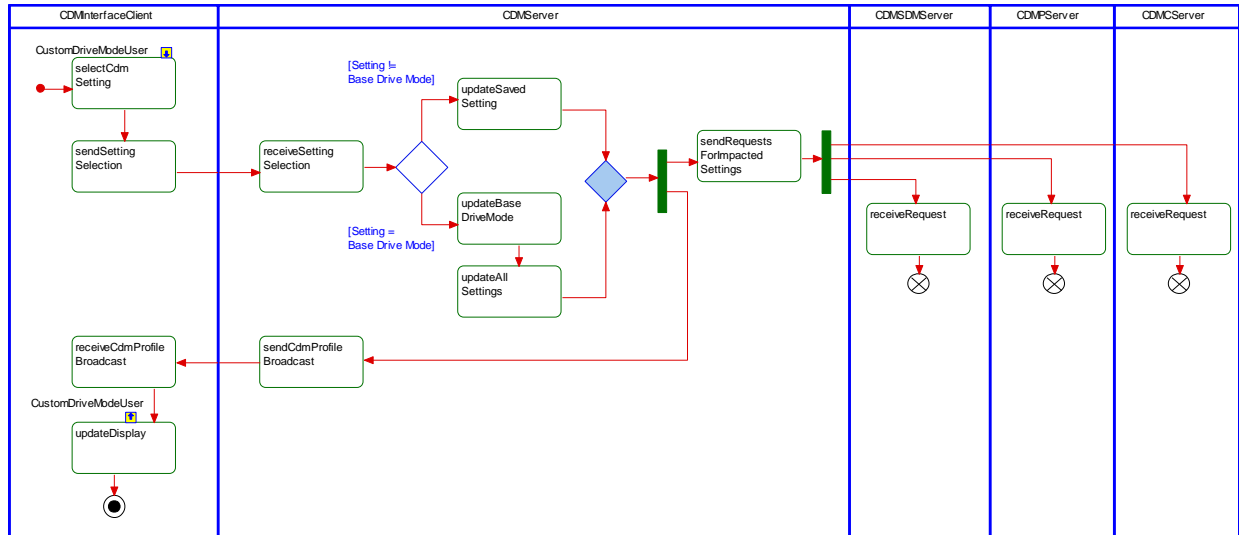


## 4.1.3 White Box View

## 4.1.3.1 Activity Diagrams

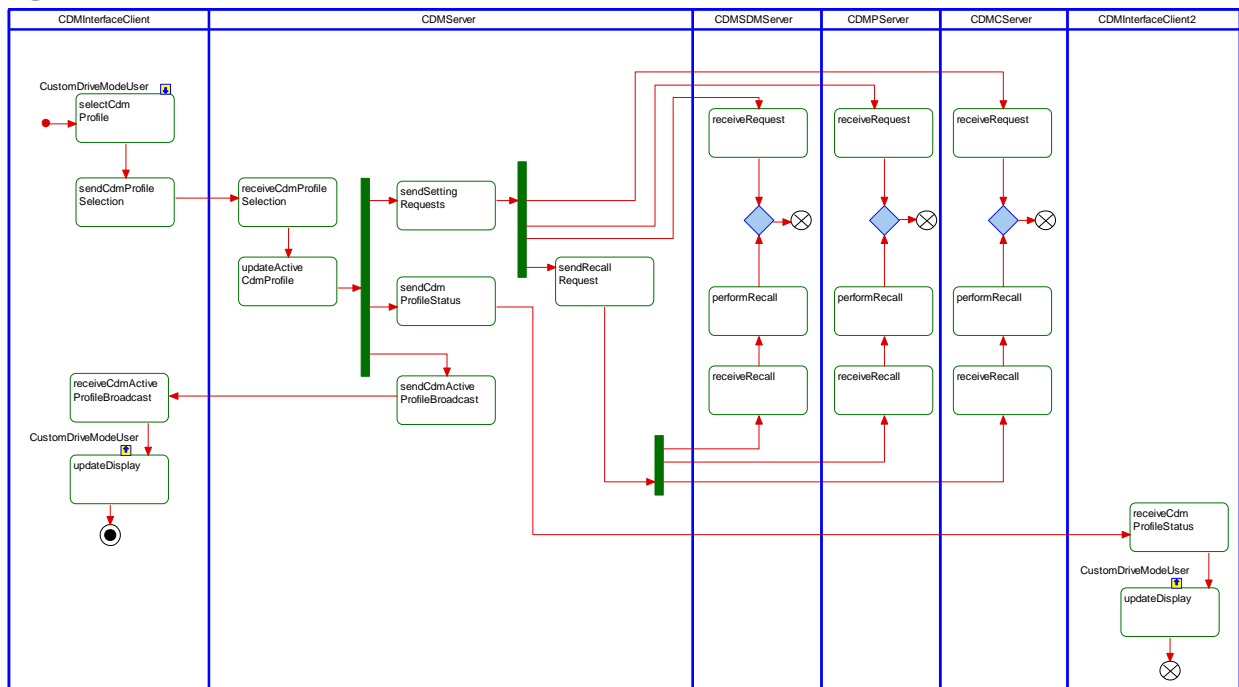
## 4.1.3.1.1 CDM-ACT-REQ-416068/A-Change CDM Settings

## Activity Diagram



## 4.1.3.1.2 CDM-ACT-REQ-416069/A-Select Active CDM Profile

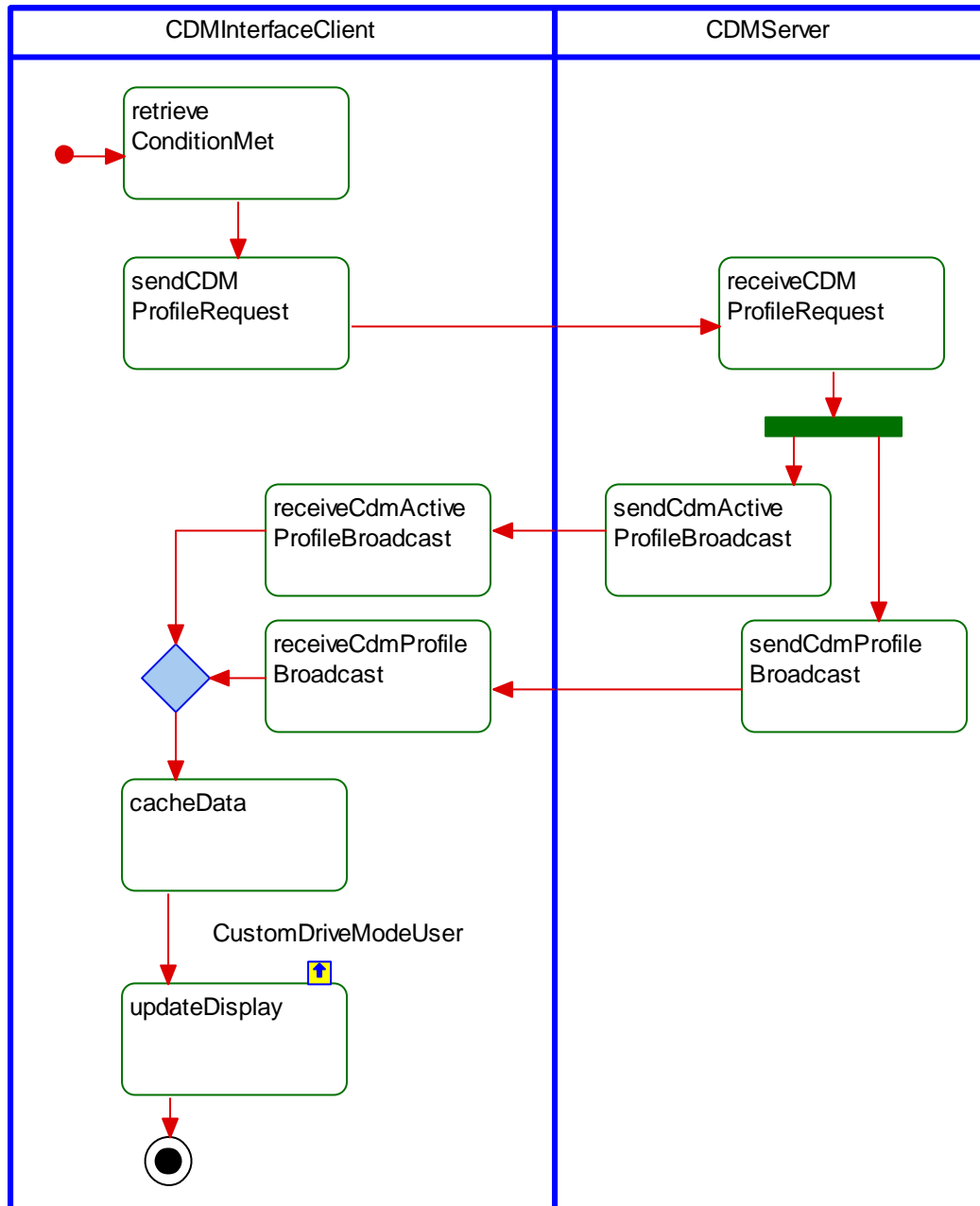
## Activity Diagram





## 4.1.3.1.3 CDM-ACT-REQ-416070/A-Get CDM Settings

## Activity Diagram



## 4.1.3.2 Sequence Diagrams

## 4.1.3.2.1 CDM-SD-REQ-416065/A-Change CDM Settings

## Constraints

## Pre-Condition

Powermode conditions are met

## Scenarios

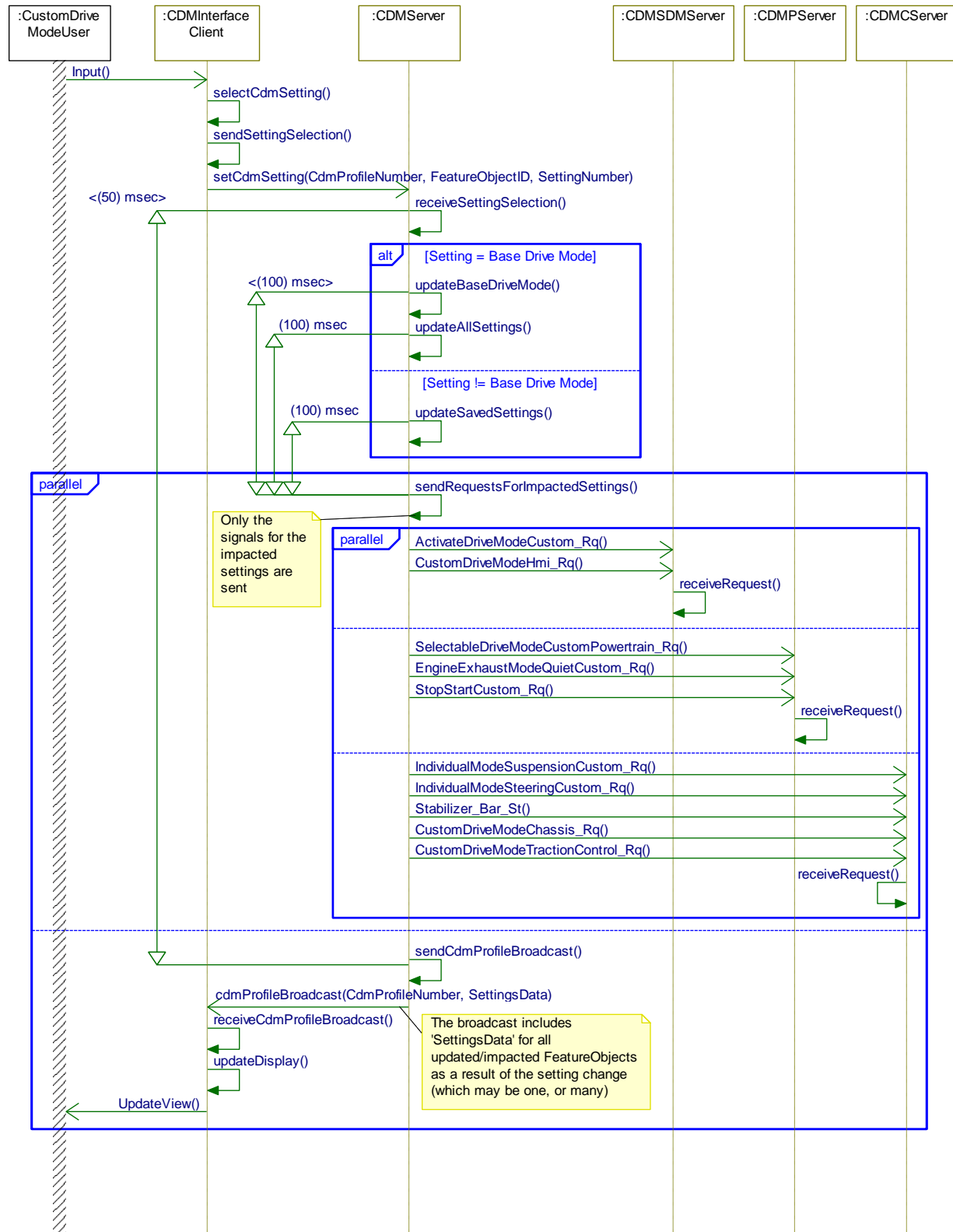
## Normal Usage

User enters "Custom Drive Mode" settings menu on the CDMInterfaceClient  
User selects settings for each Feature Object in the CDM Menu



**Post-Condition**

User-selected settings are saved for active CDM Profile

**Sequence Diagram**

**4.1.3.2.2 CDM-SD-REQ-416066/A-Select Active CDM Profile****Constraints****Pre-Condition**

Powermode conditions are met

**Scenarios****Normal Usage**

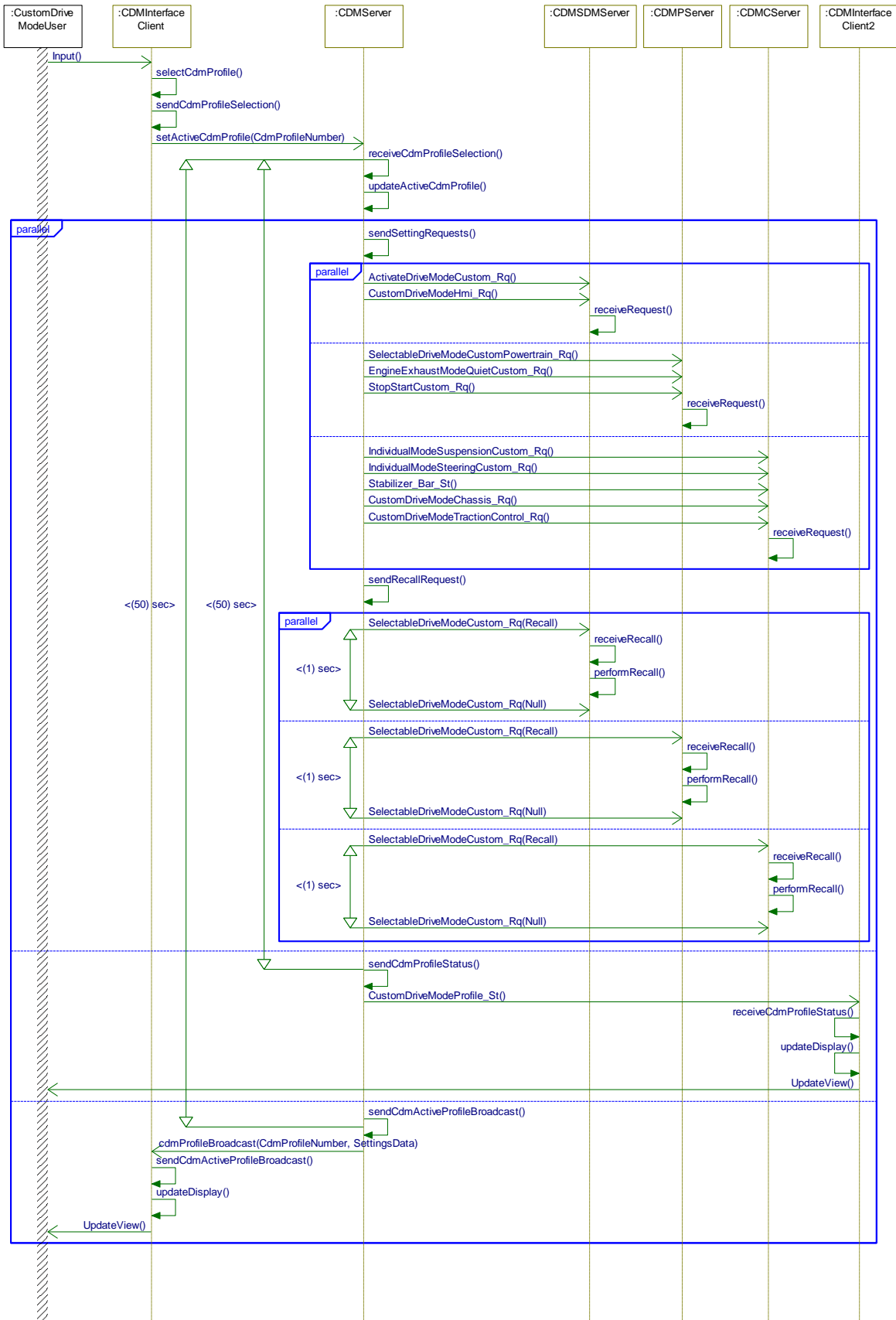
User enters "Custom Drive Mode" settings menu on the CDMInterfaceClient  
User selects CDM Profile Button in the CDM Menu and selects a CDM Profile  
Settings for the selected CDM Profile are loaded

**Post-Condition**

Selected CDM Profile becomes active



## Sequence Diagram



**4.1.3.2.3 CDM-SD-REQ-416067/A-Get CDM Settings****Constraints****Pre-Condition**

Retrieve conditions not met

**Scenarios****Normal Usage**

Retrieve conditions are met

CDMInterfaceClient requests all CDM Profile Data from CDMServer

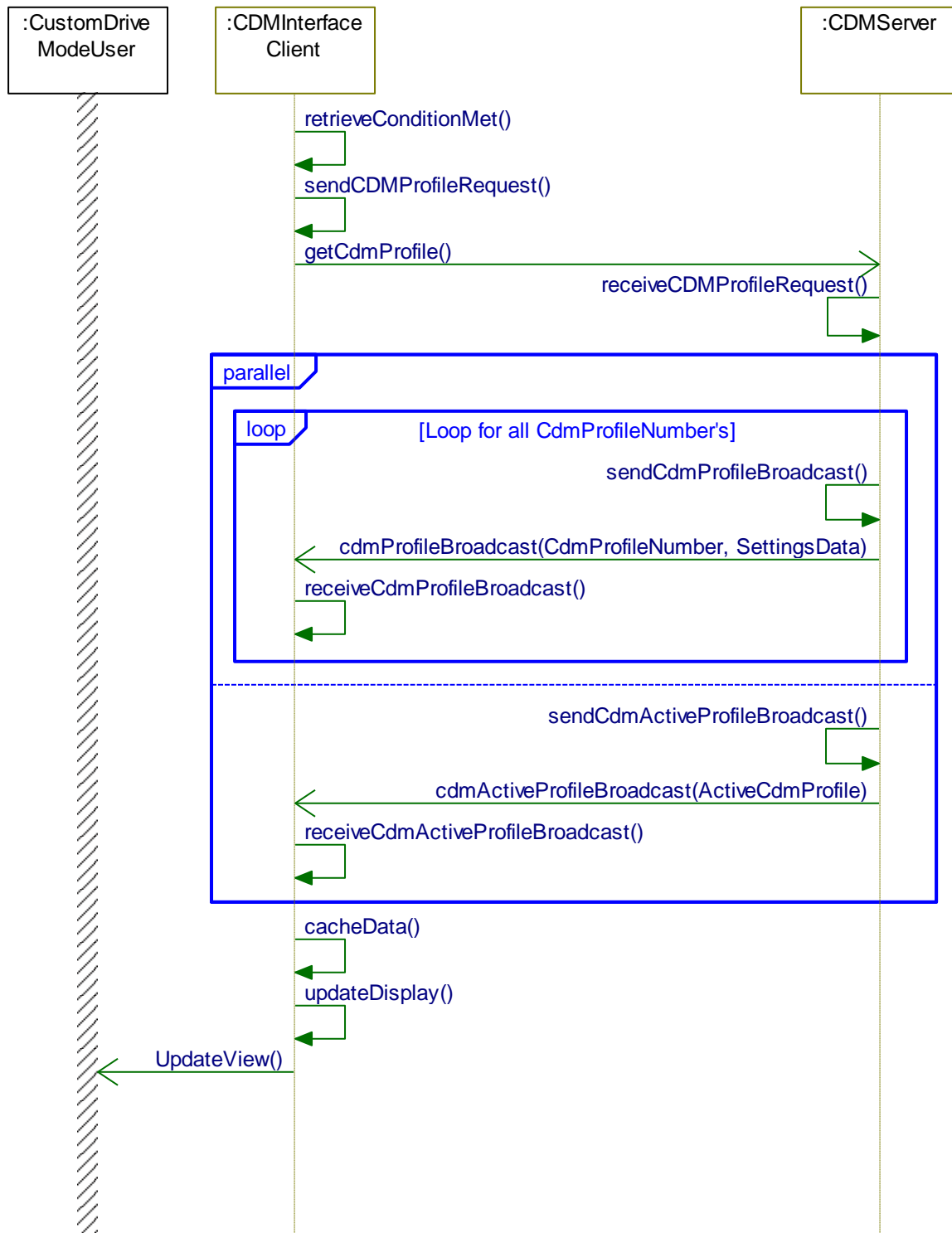
CDMServer sends CDM Profile Data to CDMInterfaceClient

**Post-Condition**

CDMInterfaceClient caches data and displays CDM Profile (if screen shown)



## Sequence Diagram





## 5 Appendix: Reference Documents

| Reference # | Document Title |
|-------------|----------------|
| 1           |                |
| 2           |                |
| 3           |                |
| 4           |                |
| 5           |                |
| 6           |                |
| 7           |                |
| 8           |                |
| 9           |                |
| 10          |                |
| 11          |                |
| 12          |                |
| 13          |                |
| 14          |                |
| 15          |                |
| 16          |                |
| 17          |                |