Cabin and Battery Overheat Management(CBOM)

<<Feature>>

(F003090)

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| --- | --- | --- | --- |
| Document Approval | | | |
| Person | Role | Email | Date |
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# Introduction

## Document Purpose

The Feature Implementation Specification (FIS) specifies the deployment of the logical functions of a feature to an electrical architecture. The FIS specifies all interactions between the ECUs of the electrical architecture required for the feature including the technical signals and the interfaces. It also gives interface and integration requirements, which are specific to the feature for the electrical architecture.

To get more information about the concept of feature, function and component level abstraction refer to the [Ford RE Wiki](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Engineering+for+SW+Enabled+Features).

## Document Scope

This FIS describes the deployment of the feature <Feature> to the following electrical architecture(s):

*No Electrical Architecture found.*

## Document Audience

The FIS is authored by - . All Stakeholders, i.e., all people who have a valid interest in the feature implementation should read and, if possible, review the FIS. It needs to be guaranteed, that all stakeholders have access to the currently valid version of the FIS.

### Stakeholder List

For the latest list of the function stakeholders and their roles & responsibilities refer to <Put VSEM Link here>.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name** | **CDSID** | **Contact Info** | **Role** | **Stakeholder Group** |
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| Ian Lawler | iparker9 |  |  |  |

## Document Organization

### Document Context

Refer to the [Specification Structure page](http://wiki.ford.com/display/RequirementsEngineering/Specification+templates) in the [Ford RE Wiki](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Engineering+for+SW+Enabled+Features) to understand how the FIS relates to other Ford Requirements Documents and Specifications.

### Document Structure

The structure of this document is explained below:

**Section 1** – Introduction – Giving an explanation how to use this document including responsibilities and the scope of the document. Additionally it contains the revision history and a list of unsettled but known issues that have to be consolidated in future versions. It explains the terminology and gives a clarification of the definitions, concepts and abbreviations used in the document.

**Section 2** – Feature Implementation Description – Giving an overview of the platform and listing assumptions, constraints or dependencies

**Section 3** – Feature Implementation Architecture – Describing 3 Architecture Views:

* Functional Architecture – Showing the logical architecture of functions
* Physical Architecture – Showing the physical architecture (first of all the E/E Architecture), which the Logical Functions get allocated to.
* Software Architecture – Showing the software architecture relevant for the feature (for features with in-house development only)
* Function Deployment – Presenting the allocation of logical functions and signals to the electrical and other components

**Section 4** – Deployment Specific Modeling –Modeling techniques providing additional detail on e.g. interface behavior

**Section 5** – Deployment Specific Requirements – Deployment specific requirements for ECUs, Network Communication, and Process

**Section 6** – List of Open Concerns

**Section 7** – Revision History

**Section 8** – Appendix - Presenting additional data mainly in a tabular form, e.g., a data dictionary

## Document Conventions

### Requirements Templates

Refer to “[How to use the Specification Templates](http://wiki.ford.com/display/RequirementsEngineering/How+to+use+the+Specification+Templates?src=contextnavpagetreemode)” on how to use the specification templates and the VBA macros to create/edit the requirements in the specifications.

The VBA macro enable the import of the specification to VSEM (refer to ["How to import specifications into VSEM as separate requirements"](http://wiki.ford.com/pages/viewpage.action?pageId=104991616&src=contextnavpagetreemode)).

#### Identification of requirements

The unique requirement ID given in the headline of any requirement follows the requirement throughout the development process. The requirement ID format follows a well-defined syntax.

All identifiers in an FIS shall be composed of 4 parts:

* A leading prefix, which indicates the type of requirement (R=Requirement, UC=Use Case, SC=Scenario, …)
* A prefix, which indicates the abstraction level (F=Feature, FNC=Function, CMP = component).
* Followed by a name, indicating the scope, which the requirement belongs to (e.g. feature or function name )
* Ending with the actual requirement number

*Example:*

*R\_CMP\_LockArbitrator\_00004* This is the fourth requirement on component level for the function Lock Arbitrator.

#### Requirements Attributes

Additionally attributes can be added to each requirement. This helps to classify requirements. A [list of available attributes](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes?src=contextnavpagetreemode) is given in the RE Wiki.

## References

### Ford Documents

The list of all Ford internal documents, which are directly related.

| **Reference** | **Title** | **Doc. ID** | **Revision** | **Document Location** |
| --- | --- | --- | --- | --- |
| Ford GIS Standard | Ford GIS Standard |  |  |  |

Table 1‑2: Ford internal Documents

### External Documents and Publications

The list of external documents could include books, reports and online sources.

| **Reference** | **Document / Publication** |
| --- | --- |
| IEEE Std 1012-2004 IEEE Standard for Software Verification and Validation |  |
| ISO/IEC 19500-2:2003 |  |
| UML Testing Profile (UTP), v1.2 |  |
| Wikipedia |  |

Table 1‑3: External documents and publications

## Glossary

### Definitions

| **Definition** | **Description** |
| --- | --- |
|  |  |
| AC | Air Conditioning |
| CabinHotTemperature | cabin temperature that will initiate cooling >45-50C |
| COOLING\_CYCLE \_TIME\_THRESHOLD | Fan and AC cooling time 3 minutes |
| Fan\_Only | Fan only run model |
| FAN\_ON\_DURATION | time fan will run before AC is enabled. (default 5 minutes) |
| Fan\_On\_Duration | When in Fan and AC mode, the AC will turn on after5 minutes |
| Fan\_ON\_TIME\_THRESHOLD | Fan runs for 5 minutes and continues with AC for another 5 minutes |
| HIGH | BEV Key On |
| High speed | Approximately more than 52 mph (83 kph) |
| HMI | Human Machine Interface |
| HPCM | Hybrid Powertrain Control Module |
| HVHotTemperature | HV battery hot temperature that is above 38-40C |
| HVNormalTemperature | HV battery normal temperature |
| InteriorTemperature | HV Battery Temperature or Cabin Temperature |
| ITS | Interior Temperature Status |
| ITS\_HOT | Interior Temperature HOT when cabin temperature is >45-50C |
| ITS\_NORMAL | Interior Temperature NORMAL when cabin temperature is <45-50C |
| KEYOFF\_TIMER | Set time for KEYOFF setting to keep engine off |
| LOW | BEV Key Off |
| Low speed | Approximately 12 to 36 mph (19 to 58 kph ) |
| Medium speed | Approximately 36 mph to 52 mph (58 to 83 kph) |
| Minimum SOC | 20% |
| MONITOR\_PERIODICITY | Climate control run time monitor(default time of 1s) |
| ON\_events | Climate system run time |
| OperationDuration | TMOS\_ACTIVATION\_TIME (<=to 5 minutes with just fan then 2-3 minutes with fan and AC ) |
| PlugIn mode | HV battery |
| PRNDL | Park Reverse Neutral Drive Lower Gear |
| term | A representation of a Concept expressed in Natural Language. In the vocabulary of a Domain of Discourse a term enables common understanding of domain concepts. |
| term glossary | A term glossary is a table of agreed upon definitions for terms used in project development that may provide clarity or avoid confusion to stakeholders. |
| TLA | Three Letter Acronym |
| VEHICLE\_OFF | VEHICLE\_OFF mode shall be defined as VEHICLE\_STATUS signal = OFF |
| VEHICLE\_ON | Feature operating mode condition shall be enabled when VEHICLE\_STATUS signal = ON |
| Very Low Speed | Approximately 0 to 12 mph (0 to 19 kph) |
| WakeUp\_Cycle\_Time<=60 Minutes | TMOS wakeup cycle time <= 60 minutes |

Table 1‑4: Definitions used in this document

### Abbreviations

| **Abbr.** | **Stands for** | **Description** |
| --- | --- | --- |
| ATLA | Another Three Letter Acronym |  |
| OAT | Outside Air Temperature |  |
| RCCM | Remote Climate Control System |  |
| SIS | Strategy Implementation System |  |
| SOC | State of Charge |  |
| SYNC | Synchronize |  |
| TMOS | Thermal Management Optimization Strategy |  |

Table 1‑5: Abbreviations used in this document.

# Feature Implementation Overview

## Description

F003090 Cabin and Battery Overheat Management(CBOM)

•It is a cabin overheat protection feature.

•It balances the capacity of the system to maintain cooler battery and cabin temperatures.

•It optimizes vehicle range.

## Input Requirements/Documents

|  |  |  |  |
| --- | --- | --- | --- |
| **Reference**  (Reference as listed in ch. “References”) | **Section/Requirement** | **Description** | **Derived Requirement**  (optional – reference to requirement in ch. “Feature Implementation Requirements”) |
| **Feature/Function Requirements** | | | |
|  | <Example:  id + title of relevant Function Spec> | <Example: “Function requirements of Logical Function …”> | <Note: If you reference a requirement in this column, then that requirement should have a trace link in its [“Source”/”Source Req.” attribute](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) field pointing back to the input requirement (or to a requirement inside the input document) given in this table row> |
|  |  |  |  |
| **Ford Engineering Standards** | | | |
|  | <Example: some SDS (requirement)> |  |  |
|  |  |  |  |
| **Legal Regulations** | | | |
|  | Compliance with FMVSS101 | The Feature shall comply with FMVSS101. |  |
|  |  |  |  |
| **Industry Standards** | | | |
|  | ISO 26262 | The system should be developed according to Ford's implementation of Functional Safety. |  |
|  |  |  |  |
| **Other Sources** | | | |
|  |  |  |  |
|  | Vehicle Idle Mode | The feature equipped vehicle shall have a set idle condition |  |
|  | Example AR |  |  |
|  | Battery Pack Temperature | Battery pack temperature shall be thermally managed for optimal performance. |  |
|  | HMI Enable/Disable Functionality | HMI shall enable and disable the feature(Touch buttons and screen) |  |
|  | Cabin Temperature | Vehicle cabin thermal management will be enabled based on user selected cooling options |  |
|  | Battery SOC | Battery shall be maintained above a minimum level before the TMOS feature will be enabled |  |
|  | Cabin Cooling | The feature equipped vehicle shall have capability to cool the cabin |  |
|  | Sleep Mode | The feature equipped vehicle shall have a sleep and wakeup modes based on cabin temperature |  |
|  |  |  |  |

Table 6: Input Requirements/Documents

## Lessons Learned

No lessons learned specified.

## Assumptions

No Assumptions specified.

# Feature Implementation Architecture

## Functional Architecture

### Description

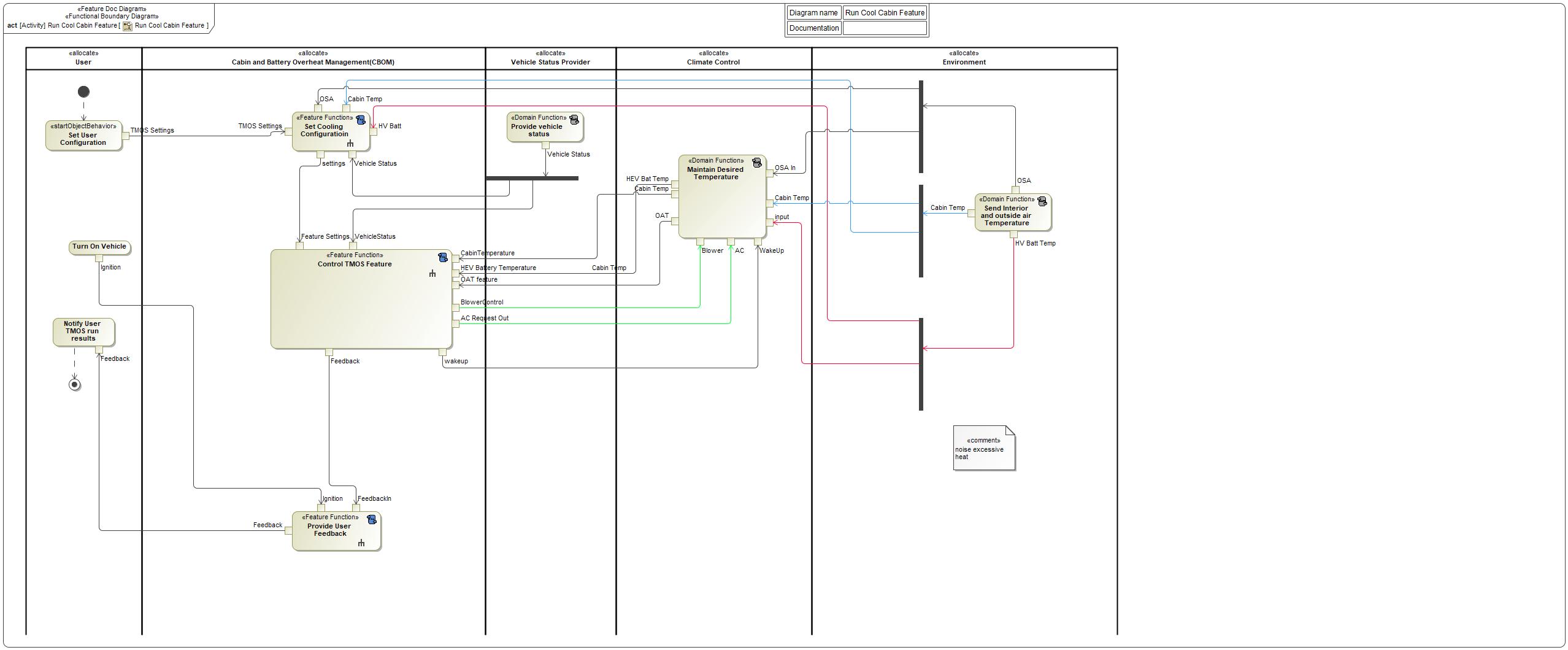


Figure 8: Run Cool Cabin Feature

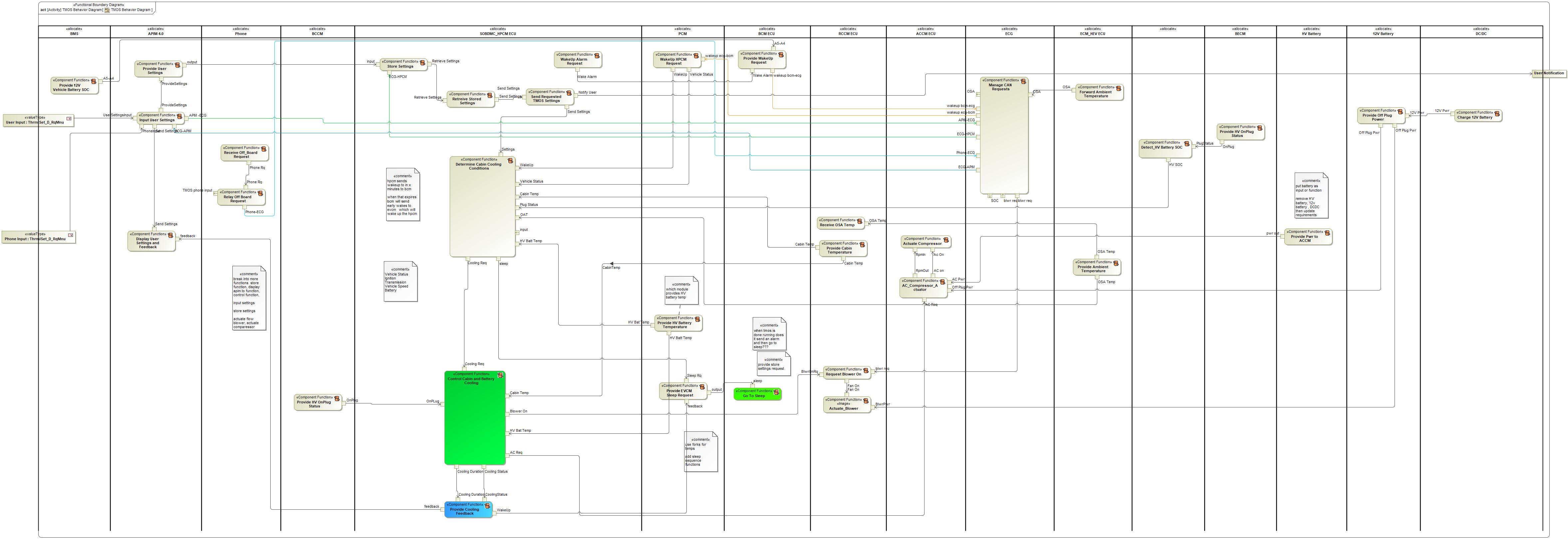


Figure 8: TMOS Behavior Diagram

### Function List

The following functions from the [Global Feature & Function List](https://www.vsemweb.ford.com:443/tc/launchapp?-attach=true&-s=226TCSession&-o=ZmZNi0JHx3NrTDAAAAAAAAAAAAA) are referenced in this Feature Implementation Specification:

| **Function ID** | Function Name | Function Description |
| --- | --- | --- |
|  | (action) Store Settings |  |
|  | (action) Go To Sleep | Go To Sleep System function stores TMOS run feedback information and provides a wake up or sleep request. |

Table 17: List of Functions on TMOS Behavior Diagram

### Signal List

|  |  |  |
| --- | --- | --- |
| **Signal Name** | **Description** | **Details** |
| **AC ControlRequest** | Signal that requests AC compressor on or off | Satisfies:  *No reqs. satisfied* |
| **AmbientTemperature** | Signal that sends ambient temperature in degrees C | Satisfies:  *No reqs. satisfied* |
| **BatteryStatusHV** | Signal for HV battery SOC | Satisfies:  *No reqs. satisfied* |
| **BlowerControl** | Signal that requests blower turn ON or OFF | Satisfies:  *No reqs. satisfied* |
| **BlowerControlSettings** | Signal that requests blower fan state of FANON, FANONAC, or FANOFF | Satisfies:  *No reqs. satisfied* |
| **CabinTemperature** | Signal that sends cabin temperature in degrees C | Satisfies:  *No reqs. satisfied* |
| **Compressor\_Control\_Out** | Signal that requests compressor on or off | Satisfies:  *No reqs. satisfied* |
| **Cooling Request** | Signal to request TMOS feature begin cooling cycle | Satisfies:  *No reqs. satisfied* |
| **CoolingCycleTime** | Logical signal for cooling cycle time during CBOM run | Satisfies:  *No reqs. satisfied* |
| **CoolingDuration** | Signal that sends Cooling Time | Satisfies:  *No reqs. satisfied* |
| **CoolingStatusUpdated** | CBOM Cooling status feedback signal to HMI | Satisfies:  *No reqs. satisfied* |
| **DataStoreStatus** | Signal that sends STORED, STORING, or FAILED\_TO\_STORE status | Satisfies:  *No reqs. satisfied* |
| **DisplayUserRequest** | Displays user request to HMI | Satisfies:  *No reqs. satisfied* |
| **FanCycleTime** | Logical signal for fan cycle time | Satisfies:  *No reqs. satisfied* |
| **Feature Settings** | Signal that sends Feature Settings TMOS Settings and System Settings | Satisfies:  *No reqs. satisfied* |
| **FeedbackInformation** | Signal that provides FeedbackInformation Cooling Status or CoolingDuration | Satisfies:  *No reqs. satisfied* |
| **HVBatteryTemperature** | High Voltage Battery Temperature | Satisfies:  *No reqs. satisfied* |
| **IgnitionStatusUpdated** | BEV ignition status signal | Satisfies:  *No reqs. satisfied* |
| **Interior Temperature Status** | Signal that provides cabin temperature as HOT or NORMAL | Satisfies:  *No reqs. satisfied* |
| **InteriorStatus** | Signal providing cabin temperature status of CABIN\_HOT or CABIN\_NORMAL | Satisfies:  *No reqs. satisfied* |
| **OffboardClientRequest** | Hand Held Device Signal that sends YES or NO | Satisfies:  *No reqs. satisfied* |
| **PlugInStatus** | Signal that determines if HV battery is plugged in | Satisfies:  *No reqs. satisfied* |
| **TMOS Settings** | Signal that provides FAN\_OFF, FAN\_ON, FAN\_AND\_AC\_ON, or NONE | Satisfies:  *No reqs. satisfied* |
| **TransmissionStatusUpdated** | Signal for transmission status | Satisfies:  *No reqs. satisfied* |
| **Vehicle Speed** | Signal that provides vehicle speed to feature | Satisfies:  *No reqs. satisfied* |
| **Vehicle Status** | Signal that provides BatteryStatus, IgnitionStatus, TransmissionStatus, VehicleSpeed, WakeUpSignal | Satisfies:  *No reqs. satisfied* |
| **VehicleSpeed** | Signal for vehicle status of vehicle speed | Satisfies:  *No reqs. satisfied* |
| **WakeUpAmbientTemp** | Signal that provides LastKnownAmbientTemp | Satisfies:  *No reqs. satisfied* |
| **WakeUpSignal** | Signal that sends WAKEUP or SLEEP | Satisfies:  *No reqs. satisfied* |
| **blower ON** | Signal that requests blower on | Satisfies:  *No reqs. satisfied* |

## Physical Architecture

### E/E Architecture

#### E/E Architecture Variants

*No E/E Architecture Variant found.*

##### E/E Architecture “Architecture Variant 1”: Vehicle

This E/E Architecture variant … <add some explanatory text here>

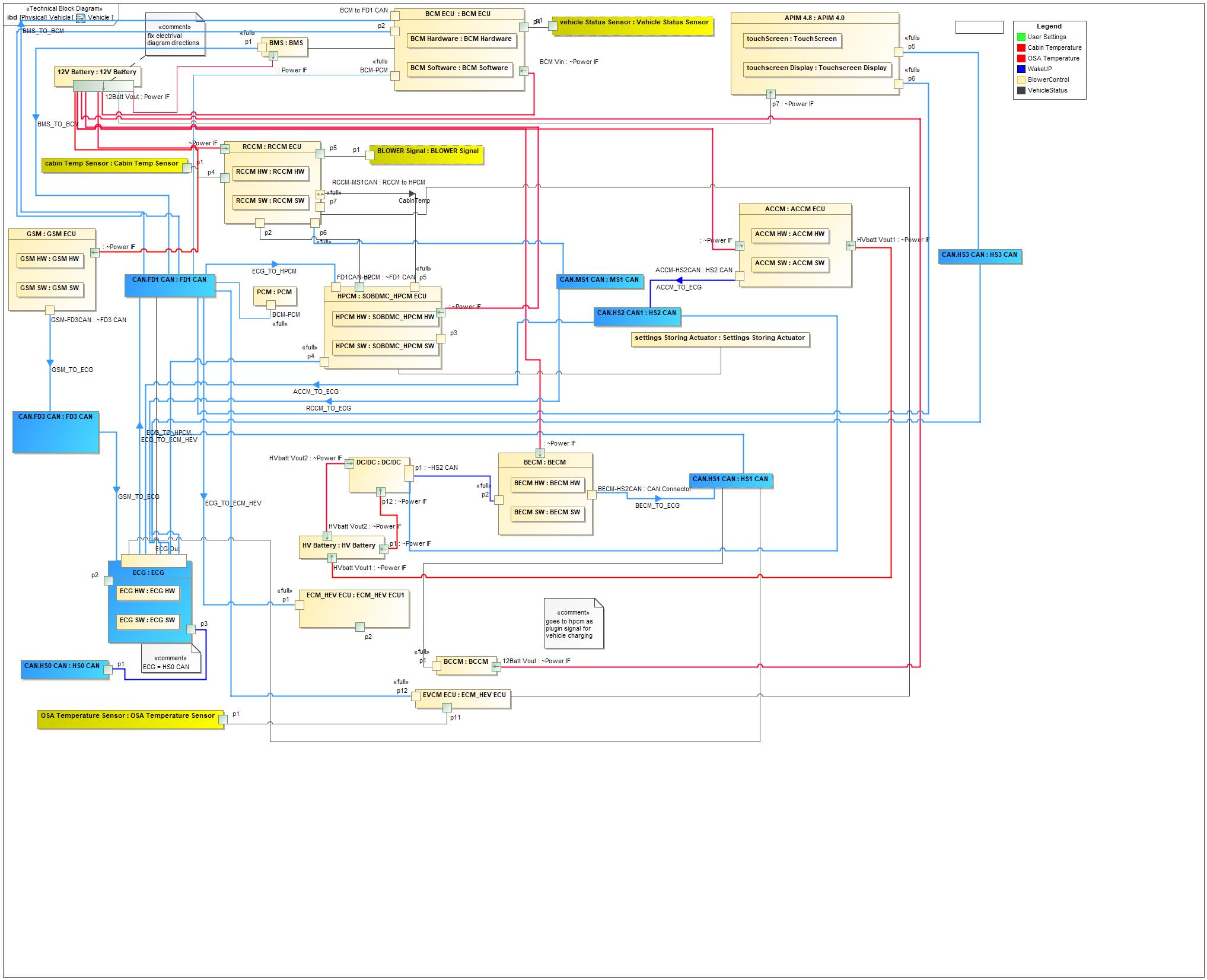


Figure 1: Vehicle

##### E/E Architecture “Architecture Variant 1”: Data Analytics

This E/E Architecture variant … <add some explanatory text here>

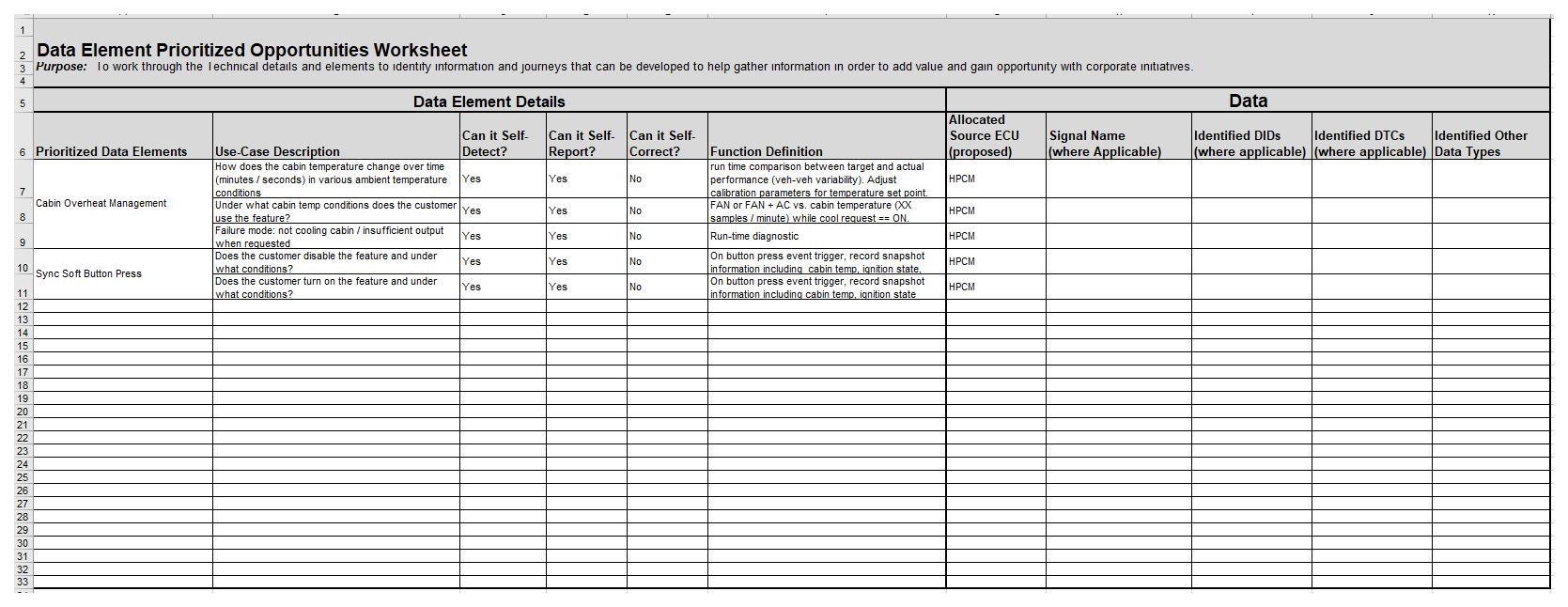


Figure 2: Data Analytics

##### E/E Architecture “Architecture Variant 1”: DataElements

This E/E Architecture variant … <add some explanatory text here>

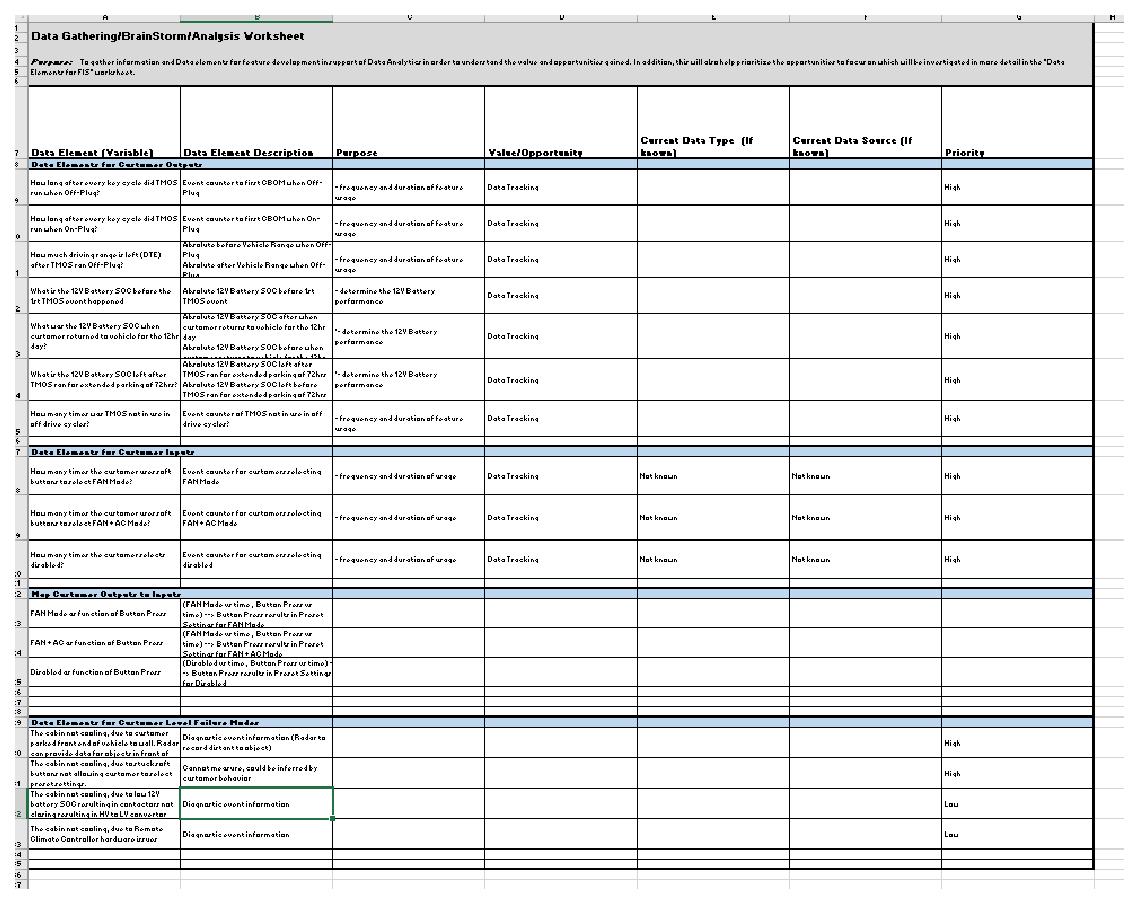


Figure 3: DataElements

##### E/E Architecture “Architecture Variant 1”: DataGatheringBrainstorming

This E/E Architecture variant … <add some explanatory text here>

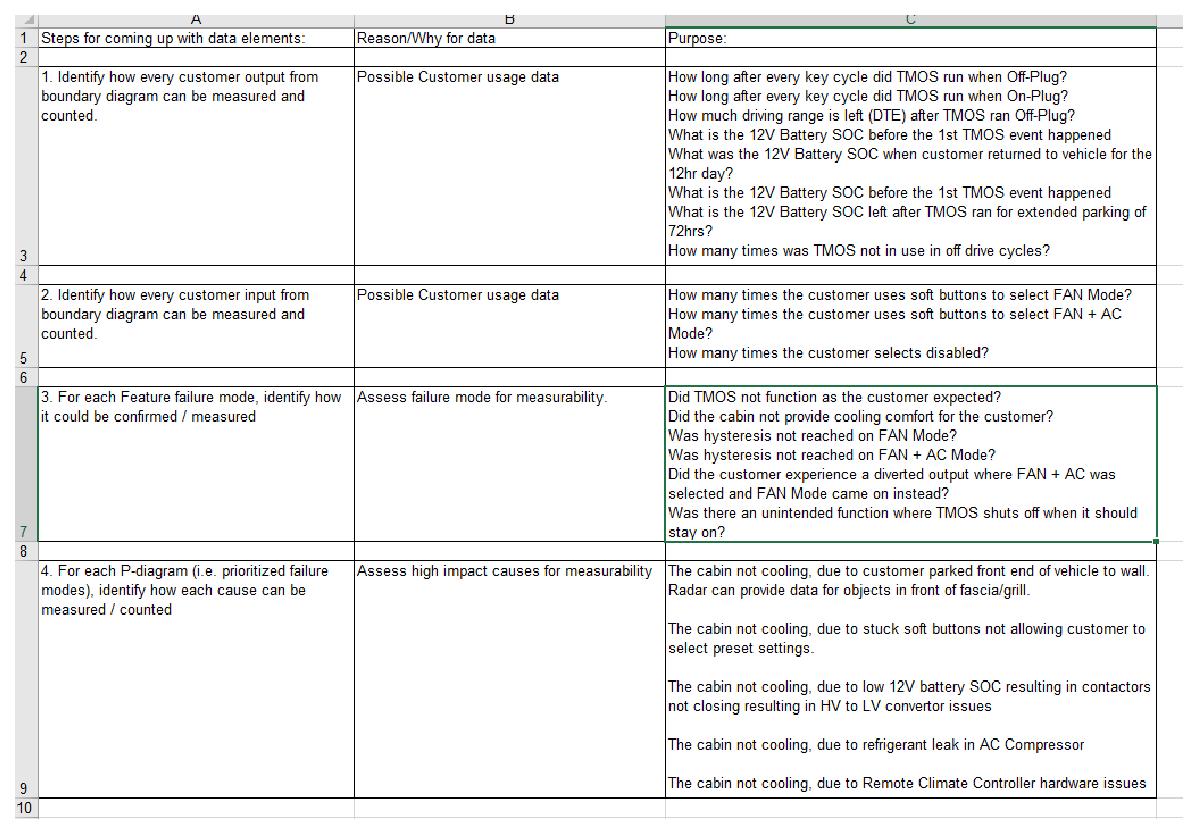


Figure 4: DataGatheringBrainstorming

#### E/E Components

|  |  |
| --- | --- |
| Component Name | **Description** |
| 12V Battery | 12V Battery used during off plug conditions |
| ACCM (ACCM ECU) | Air Conditioning Climate Module |
| ACCM HW | ACCM module hardware model element |
| ACCM SW | ACCM module software element |
| APIM 4.8 (APIM 4.0) | SYNC Display Screen |
| BCCM | Battery Charge Control Module |
| BCM ECU | Battery Control Module ECU |
| BCM Hardware | Battery Control Module Hardware Elements |
| BCM Software | Battery Control Module Software Elements |
| BECM | Battery Energy Control Module |
| BECM HW | Battery Energy Control Module Hardware Element |
| BECM SW | Battery Energy Control Module Software Element |
| BMS | Battery Monitoring System |
| cabin Temp Sensor (Cabin Temp Sensor) | Cabin temperature Sensor |
| DC/DC | DC to DC Converter |
| ECG (ECG ) | Enhanced Central Gateway |
| ECG HW | Enhanced Central Gateway Hardware Element |
| ECG SW | Enhanced Central Gateway Software Element |
| ECM\_HEV ECU (ECM\_HEV ECU1) | Engine Control Module Hybrid Electric Vehicle |
| EVCM ECU (ECM\_HEV ECU) | Engine Control Module Hybrid Electric Vehicle |
| FD1 CAN |  |
| FD3 CAN |  |
| GSM (GSM ECU) | Gear Selector Module |
| GSM HW | Gear Selector Module Hardware Element |
| GSM SW | Gear Selector Module Software Element |
| HPCM (SOBDMC\_HPCM ECU) | Hybrid Powertrain Control Module |
| HPCM HW (SOBDMC\_HPCM HW) | Hybrid Powertrain Control Module Hardware |
| HPCM SW (SOBDMC\_HPCM SW) | Hybrid Powertrain Control Module Software |
| HS0 CAN |  |
| HS2 CAN1 (HS2 CAN) |  |
| HS3 CAN |  |
| HV Battery | High Voltage Battery |
| MS1 CAN |  |
| OSA Temperature Sensor | Outside Air Temperature Sensor |
| PCM | Powertrain Control Module |
| RCCM (RCCM ECU) | Remote Climate Control Module |
| RCCM HW | Remote Climate Control Module Hardware |
| RCCM SW | Remote Climate Control Module Software |
| settings Storing Actuator (Settings Storing Actuator) | TMOS settings storing actuator |
| touchScreen (TouchScreen) | SYNC Screen |
| touchscreen Display (Touchscreen Display) | SYNC Display Screen |

Table 3‑2: Electrical Components

#### E/E Connections

*No E/E Connections found.*

#### Signal List

|  |  |  |
| --- | --- | --- |
| **Signal Name** | **Description** | **Details** |
| **Charge 12V Battery** | Signal requesting 12 volt battery to be charged | Satisfies:  *No reqs. satisfied* |
| **ElCmprenbl\_B\_Rq** | Signal enabling electric compressor | Satisfies:  *No reqs. satisfied* |
| **ElCmprenbl\_B\_Rq** | Electric Compressor enable/disable signal | Satisfies:  *No reqs. satisfied* |
| **Blower On Request** | Signal requesting blower on | Satisfies:  *No reqs. satisfied* |
| **CabnAmb\_Te\_Actl** | Cabin ambient temperature sensor | Satisfies:  *No reqs. satisfied* |
| **BCM-PCM\_WakeUp** | Signal from BCM to All Wheel Drive\_Driveline Control Module | Satisfies:  *No reqs. satisfied* |
| **RCCM-BLWR** | Technology signal for blower on request from RCCM | Satisfies:  *No reqs. satisfied* |
| **ECM\_HEV-RCCM\_cabinAmb?** | Signal from ECM\_HEV to RCCM | Satisfies:  *No reqs. satisfied* |
| **ThrmlSet\_D\_RqMnu** | Technology signal for CBOM settings APIM to RCCM | Satisfies:  *No reqs. satisfied* |
| **PlgStatEvnt\_B\_Stat** | Signal for High Voltage Battery Plugged in or Off Plug status | Satisfies:  *No reqs. satisfied* |
| **CabnAmb\_Te\_Actl** | Cabin ambient temperature sensor signal | Satisfies:  *No reqs. satisfied* |
| **BLWR-PWR** | Technology signal for blower power from 12v battery | Satisfies:  *No reqs. satisfied* |
| **Battery Power Mode** | Signal providing SOC | Satisfies:  *No reqs. satisfied* |
| **CabnAmb\_Te\_Actl** | Cabin air temperature signal | Satisfies:  *No reqs. satisfied* |
| **AirAmb\_Te\_Actl** | Signal to detect outside air temperature | Satisfies:  *No reqs. satisfied* |
| **CabinTemp-RCCM** | Signal sensing cabin temperature sent to RCCM | Satisfies:  *No reqs. satisfied* |
| **HMI-CustFeedback** | Feedback signal from HMI to HMI Display Screen | Satisfies:  *No reqs. satisfied* |
| **CabinThrmlSustn\_B\_Rq** | Technology signal for cabin sustain awake signal | Satisfies:  *No reqs. satisfied* |
| **ElCmpr\_N\_Rq** | Signal requesting electric compressor rpm | Satisfies:  *No reqs. satisfied* |
| **BCM-BMS\_BatteryPowerMode** | Signal from Body Control Module to Battery Management Module | Satisfies:  *No reqs. satisfied* |
| **ElCmpr\_N\_Rq** | Electric Compressor RPM signal | Satisfies:  *No reqs. satisfied* |
| **AirAmb\_Te\_Actl** | OSA temperature signal | Satisfies:  *No reqs. satisfied* |
| **ECG-BCM** | Signal from ECG to BCM | Satisfies:  *No reqs. satisfied* |
| **ignition\_Status** | Signal to detect vehicle ignition status for vehicle | Satisfies:  *No reqs. satisfied* |
| **PCM-HPCM\_WakeUp** | Signal from PCM to HPCM | Satisfies:  *No reqs. satisfied* |
| **A5\_2\_A4\_BatteryPowerMode** | Signal from BMS to BCM | Satisfies:  *No reqs. satisfied* |
| **RCCM-ECG** | Signal from RCCM to ECG | Satisfies:  *No reqs. satisfied* |
| **BCM-HMI** | Signal from BCM to HMI | Satisfies:  *No reqs. satisfied* |
| **HMI-HPCM\_HvacTMOSActv\_B\_Rq** | Signal from HMI to HPCM | Satisfies:  *No reqs. satisfied* |
| **ThrmlSet\_D\_Rq** | Technology signal for CBOM settings RCCM to APIM | Satisfies:  *No reqs. satisfied* |
| **BCM-HPCM\_WakeUp** | Signal from BCM to HPCM | Satisfies:  *No reqs. satisfied* |
| **CabnThrml\_Te\_Actl** | Technology signal for cabin temperature | Satisfies:  *No reqs. satisfied* |
| **HVbattTemp\_Te\_Actl** | Technology signal for HV battery temperature | Satisfies:  *No reqs. satisfied* |
| **HPCM-BCM\_WakeUp** | Technology signal for HPCM to BCM wakeup signal | Satisfies:  *No reqs. satisfied* |
| **ECG-HPCM** | Signal from ECG to HPCM | Satisfies:  *No reqs. satisfied* |
| **GSM-ECG\_gearselection** | Signal from GSM to ECG | Satisfies:  *No reqs. satisfied* |

### Software Component Architecture

#### Description

This Software Component Architecture … <add some explanatory text here>

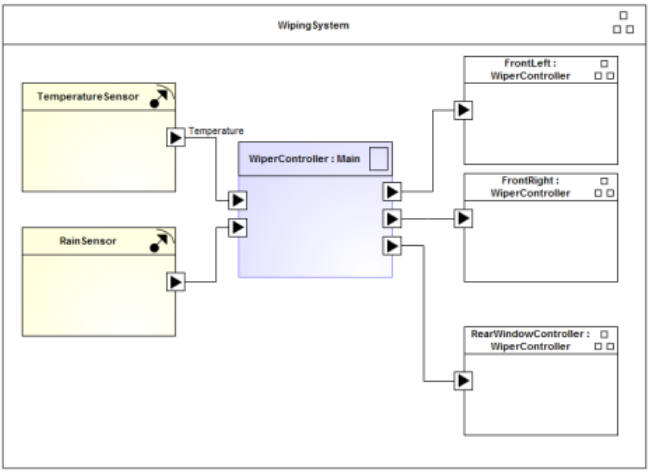


Figure 3‑4: AUTOSAR compliant SW Component Architecture

## Function Deployment

### Deployment Variants

|  |  |  |
| --- | --- | --- |
| **Deployment Variant Name** | Variant Description | Variant Condition (optional) |
| “Variant 1” (e.g. for CGEA1-3) | Some explanatory text characterizing the variant |  |
| “Variant 2” (e.g. for FNV) |  |  |
|  |  |  |
|  |  |  |

#### Deployment “Variant 1”

This deployment variant … <add some explanatory text here>

No description specified.

### Function Allocation

| Component | Technology Function Name | Logical Function Name |
| --- | --- | --- |
|
| HV Battery | Provide Pwr to ACCM | * Control Cabin Cooling |
| Detect\_HV Battery SOC | * Check Cabin Status |
|  |
| RCCM ECU | Request Blower On | * Control Cabin Cooling |
| Actuate\_Blower | * Control Cabin Cooling |
| Provide Cabin Temperature | * Check Cabin Status |
| Receive OSA Temp | * Check Cooling Conditions |
|  |
| BCCM | Provide HV OnPlug Status | * Check Cabin Status |
|  |
| DC/DC | Charge 12V Battery | * Check Cabin Status |
|  |
| ACCM ECU | AC\_Compressor\_Actuator | * Control Cabin Cooling |
| Actuate Compressor | * Control Cabin Cooling |
|  |
| ECM\_HEV ECU | Forward Ambient Temperature | * Check Cabin Status |
| Provide Ambient Temperature | * Check Cabin Status |
|  |
| APIM 4.0 | Display User Settings and Feedback | * Provide Feedback * Send\_Display\_Message |
| Provide User Settings | * Detect User Input |
| Input User Settings | * Detect User Input |
|  |
| BMS | Provide 12V Vehicle Battery SOC | * Check Cooling Conditions |
| Charge 12V Battery | * Check Cabin Status |
|  |
| SOBDMC\_HPCM ECU | Store Settings | * Store Configuration Settings |
| Retreive Stored Settings | * Retrieve\_TMOS\_Run\_Results |
| Determine Cabin Cooling Conditions | * Check Cooling Conditions |
| Provide Cooling Feedback | * Receive\_Run\_Display\_Request * Store Cooling Cycle Data |
| WakeUp Alarm Request | * Check Cabin Status |
| Send Requested TMOS Settings | * Detect User Input |
| Control Cabin and Battery Cooling | * Control Cabin Cooling |
|  |
| BECM | Provide HV OnPlug Status | * Check Cabin Status |
|  |
| BCM ECU | Provide WakeUp Request | * Check Cooling Conditions |
| Go To Sleep | * Control Cabin Cooling |
| WakeUp HPCM Request | * Check Cabin Status |
|  |
| GSM ECU | Control Cabin and Battery Cooling | * Control Cabin Cooling |
|  |
| PCM | WakeUp HPCM Request | * Check Cabin Status |
| Provide HV Battery Temperature | * Check Cabin Status |
| Provide EVCM Sleep Request | * Receive\_Run\_Display\_Request |
|  |
| 12V Battery | Provide Off Plug Power | * Check Cabin Status |
|  |

Table 3‑5: Function Allocation Table (Basic)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Component | | Technology Function Name | TSR | |
| Name | ASIL |  | ID | ASIL |
| HV Battery |  | Provide Pwr to ACCM | * ACCM Power |  |
|  | Detect\_HV Battery SOC | * Battery Charge By DCDC * Battery SOC |  |
|  |  |  |
| RCCM ECU |  | Request Blower On | * Blower Request On * Blower Run Time * Compressor Duration |  |
|  | Actuate\_Blower | * Blower Request Off * Blower Request On * HPCM before Sleep Condition * Blower off request |  |
|  | Provide Cabin Temperature | * Cabin Temp Interval * Cabin Temperature Provider * Vehicle Status |  |
|  | Receive OSA Temp | * OSA Temperature ECM\_HEV to HPCM * OSA Temperture Provided to RCCM |  |
|  |  |  |
| BCCM |  | Provide HV OnPlug Status | * Vehicle Status |  |
|  |  |  |
| DC/DC |  | Charge 12V Battery | * Vehicle Status |  |
|  |  |  |
| ACCM ECU |  | AC\_Compressor\_Actuator | * ACCM Power * Compressor Request |  |
|  | Actuate Compressor | * Compressor Duration * Compressor Request * Fan Run Time before Compressor Activation |  |
|  |  |  |
| ECM\_HEV ECU |  | Forward Ambient Temperature | * OSA Temperture Provided to RCCM * OSA Temperature ECM\_HEV to HPCM * OSA Detection |  |
|  | Provide Ambient Temperature | * OSA Detection * Vehicle Status |  |
|  |  |  |
| APIM 4.0 |  | Display User Settings and Feedback | * Detect TMOS Settings from APIM * Cooling Status Feedback |  |
|  | Provide User Settings | * Detect TMOS Settings from APIM |  |
|  | Input User Settings | * APIM User Input * APIM Phone Input |  |
|  |  |  |
| BMS |  | Provide 12V Vehicle Battery SOC | * Battery SOC |  |
|  | Charge 12V Battery | * Vehicle Status |  |
|  |  |  |
| SOBDMC\_HPCM ECU |  | Store Settings | * HPCM Settings Storage and Sleep Conditions * Store Settings |  |
|  | Retreive Stored Settings | * HPCM Settings Retrieval |  |
|  | Determine Cabin Cooling Conditions | * Check Cooling Conditions * Provide Temperature Status At WakeUp Time * Vehicle Status Forward |  |
|  | Provide Cooling Feedback | * APIM feedback to User * Blower Run Time * Cooling Status Feedback * Usage Time |  |
|  | WakeUp Alarm Request | * WakeUp Step 1 |  |
|  | Send Requested TMOS Settings | * TMOS Run Condition 1 * TMOS Run Condition 2 * TMOS Run Condition 3 * TMOS Run Condition 4 |  |
|  | Control Cabin and Battery Cooling | * TMOS Run Condition 1 * TMOS Run Condition 2 * TMOS Run Condition 3 * TMOS Run Condition 4 * TMOS Run Feedback |  |
|  |  |  |
| BECM |  | Provide HV OnPlug Status | * Vehicle Status |  |
|  |  |  |
| BCM ECU |  | Provide WakeUp Request | * WakeUp Step 1 |  |
|  | Go To Sleep | * ECU Sleep Request * Sleep Request After TMOS Run |  |
|  | WakeUp HPCM Request | * WakeUp Time * WakeUp Timer * Sleep Mode Sequence * WakeUp Step 2 |  |
|  |  |  |
| GSM ECU |  | Control Cabin and Battery Cooling | * TMOS Run Condition 1 * TMOS Run Condition 2 * TMOS Run Condition 3 * TMOS Run Condition 4 * TMOS Run Feedback |  |
|  |  |  |
| PCM |  | WakeUp HPCM Request | * WakeUp Time * WakeUp Timer * Sleep Mode Sequence * WakeUp Step 2 |  |
|  | Provide HV Battery Temperature | * Vehicle Status |  |
|  | Provide EVCM Sleep Request | * Sleep Mode Sequence |  |
|  |  |  |
| 12V Battery |  | Provide Off Plug Power | * Vehicle Status * Battery Plug State |  |
|  |  |  |

Table 3‑6: Function Allocation Table (Functional Safety Extension)

# Feature Implementation Modeling

## Component Interaction Diagrams

### Scenario: “System Startup / Shutdown”

### Scenario: “Normal Operation”

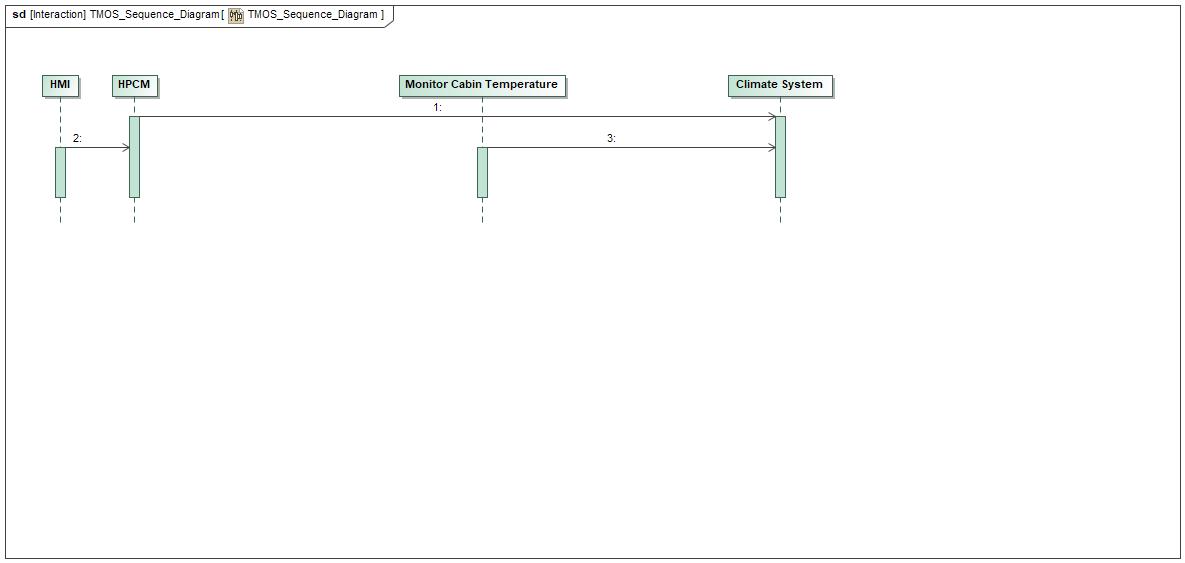


Figure 8: TMOS\_Sequence\_Diagram

## Component Interface Behavior Diagrams

*Not supported by MagicDraw report generation.*

# Feature Implementation Requirements

## Functional Safety

### ASIL Decomposition of Technical Safety Requirements

<Place the input TSR here above the decomposition table>

| **Input TSR** | <Provide the ID of the TSR which shall be decomposed. That TSR is given above> | |
| --- | --- | --- |
| **Decomposition Rationale** | <Give a reason why the decomposition was performed> | |
| **Method for Decomposition** | Choose a Method | |
| **TSR 1 after Decomposition** | **TSR ID** | <Provide the ID of the decomposed TSR> |
| **TSR Title** | <Provide the title of the decomposed TSR> |
| **ASIL** |  |
| **Rationale** | <Provide a reason and thought behind that particular requirement. Should include how the requirement is able to independently fulfill the needs of the parent requirement> |
| **Satisfied by** | <Provide an Technology Function, physical signal, or physical component satisfying the requirement. This element shall be independent of the element satisfied by the other half of the ASIL decomposition.> |
| **TSR 2 after Decomposition** | **TSR ID** | <Provide the ID of the decomposed TSR> |
| **TSR Title** | <Provide the title of the decomposed TSR> |
| **ASIL** |  |
| **Rationale** | <Provide a reason and thought behind that particular requirement. Should include how the requirement is able to independently fulfill the needs of the parent requirement> |
| **Satisfied by** | <Provide an Technology Function, physical signal, or physical component satisfying the requirement. This element shall be independent of the element satisfied by the other half of the ASIL decomposition.> |
| **TSR for Independence**  *Note: should consider commonly used input, output and processing*  *Note: additional row should be added if additional* *requirements for Independence are necessary* | **TSR ID** |  |
| **TSR Title** |  |
| **ASIL** |  |
| **Rationale** |  |

Table 5‑1: ASIL Decomposition Table

## Requirements on Components

### BMS

BMS

#### Technology Function 757036586.jpg **Provide 12V Vehicle Battery SOC**

##### Function Interfaces

###### Inputs

(No inputs have been defined)

###### Outputs

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | |
| **Logical Signal Name** | **Technical Signal Name** | | | **Mapping Details** *(Conditional)* | **Publisher Interface** | **Connection**  (*Optional)* |
| Review in model  Power Status | Power Status | | |  |  |  |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | |

Table 5‑3: Output Signal mappings of Function Provide 12V Vehicle Battery SOC

###### Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Parameter Name** | **Technical Parameter Name** | **Mapping Details** *(Conditional)* | **Method** | **Method Details** |
| Name should be a Word reference to the “*Logical Parameters*” name bookmark in the Data Dictionary | Name should be a Word reference to the “*Technical Parameters*” name bookmark in the Data Dictionary | If mapping is not 1:1 you might reference a Mapping description object from the *Mappings* section | Choose an item. | Depends on Method selection. For Method 2 a DID including start bit and length could be given. For Central Car Config a signal could be referenced |
|  |  |  |  |  |

Table 5‑4: Parameter mappings of Function “MyLogicalFunctionA\_Component1”

###### Interface Requirements

##### Function Requirements

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Modification** | **Requirement ID**  (of Technology Function) | **Comment** |
| REQ\_abc |  | Removed | -- |  |
| REQ\_def |  | Replaced | REQ\_xyz |  |
| -- |  | Added | REQ\_123 |  |

Table 5‑5: Component Specific Requirements

|  |  |  |
| --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Comment** |
|  |  |  |
|  |  |  |
| … |  |  |

Table 5‑6: Inherited Requirements

###### Component Specific Requirements

Battery SOC

While vehicle is running, "Provide 12V Vehicle Battery SOC" component function shall provide a signal "Battery SOC" to the BCM module

Satisfied by:

* Functions:
  + Detect\_HV Battery SOC
  + Provide 12V Vehicle Battery SOC

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Observation of a non critical battery state of charge in SYNC Screen | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * 1018784892.jpg Battery SOC Detection * 1018784892.jpg Battery SOC Wake Up Conditions | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | Ready for Review |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

#### Technology Function -308310689.jpg **Charge 12V Battery**

##### Function Interfaces

###### Inputs

(No inputs have been defined)

###### Outputs

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | |
| **Logical Signal Name** | **Technical Signal Name** | | | **Mapping Details** *(Conditional)* | **Publisher Interface** | **Connection**  (*Optional)* |
| Review in model  12V Pwr | 12V Pwr | | |  |  |  |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | |

Table 5‑3: Output Signal mappings of Function Charge 12V Battery

###### Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Parameter Name** | **Technical Parameter Name** | **Mapping Details** *(Conditional)* | **Method** | **Method Details** |
| Name should be a Word reference to the “*Logical Parameters*” name bookmark in the Data Dictionary | Name should be a Word reference to the “*Technical Parameters*” name bookmark in the Data Dictionary | If mapping is not 1:1 you might reference a Mapping description object from the *Mappings* section | Choose an item. | Depends on Method selection. For Method 2 a DID including start bit and length could be given. For Central Car Config a signal could be referenced |
|  |  |  |  |  |

Table 5‑4: Parameter mappings of Function “MyLogicalFunctionA\_Component1”

###### Interface Requirements

##### Function Requirements

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Modification** | **Requirement ID**  (of Technology Function) | **Comment** |
| REQ\_abc |  | Removed | -- |  |
| REQ\_def |  | Replaced | REQ\_xyz |  |
| -- |  | Added | REQ\_123 |  |

Table 5‑5: Component Specific Requirements

|  |  |  |
| --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Comment** |
|  |  |  |
|  |  |  |
| … |  |  |

Table 5‑6: Inherited Requirements

###### Component Specific Requirements

Vehicle Status

The BMS module shall provide the BCM module with the vehicle status signals "Battery Status", "Ignition Status", "Transmission Status", "Vehicle Speed", and "WakeUp"

Satisfied by:

* Functions:
  + Charge 12V Battery
  + Provide Ambient Temperature
  + Provide Cabin Temperature
  + Provide HV Battery Temperature
  + Provide HV OnPlug Status
  + Provide Off Plug Power

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Observation of TMOS running and checking vehicle status | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * -860569925.jpg Provide Vehicle Status * -860569925.jpg Key On Summary Conditions * -860569925.jpg Check Vehicle Status Subfunction | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

### DC/DC

DC/DC

#### Technology Function -308310689.jpg **Charge 12V Battery**

##### Function Interfaces

###### Inputs

(No inputs have been defined)

###### Outputs

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | |
| **Logical Signal Name** | **Technical Signal Name** | | | **Mapping Details** *(Conditional)* | **Publisher Interface** | **Connection**  (*Optional)* |
| Review in model  12V Pwr | 12V Pwr | | |  |  |  |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | |

Table 5‑3: Output Signal mappings of Function Charge 12V Battery

###### Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Parameter Name** | **Technical Parameter Name** | **Mapping Details** *(Conditional)* | **Method** | **Method Details** |
| Name should be a Word reference to the “*Logical Parameters*” name bookmark in the Data Dictionary | Name should be a Word reference to the “*Technical Parameters*” name bookmark in the Data Dictionary | If mapping is not 1:1 you might reference a Mapping description object from the *Mappings* section | Choose an item. | Depends on Method selection. For Method 2 a DID including start bit and length could be given. For Central Car Config a signal could be referenced |
|  |  |  |  |  |

Table 5‑4: Parameter mappings of Function “MyLogicalFunctionA\_Component1”

###### Interface Requirements

##### Function Requirements

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Modification** | **Requirement ID**  (of Technology Function) | **Comment** |
| REQ\_abc |  | Removed | -- |  |
| REQ\_def |  | Replaced | REQ\_xyz |  |
| -- |  | Added | REQ\_123 |  |

Table 5‑5: Component Specific Requirements

|  |  |  |
| --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Comment** |
|  |  |  |
|  |  |  |
| … |  |  |

Table 5‑6: Inherited Requirements

###### Component Specific Requirements

Vehicle Status

The BMS module shall provide the BCM module with the vehicle status signals "Battery Status", "Ignition Status", "Transmission Status", "Vehicle Speed", and "WakeUp"

Satisfied by:

* Functions:
  + Charge 12V Battery
  + Provide Ambient Temperature
  + Provide Cabin Temperature
  + Provide HV Battery Temperature
  + Provide HV OnPlug Status
  + Provide Off Plug Power

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Observation of TMOS running and checking vehicle status | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * -860569925.jpg Provide Vehicle Status * -860569925.jpg Key On Summary Conditions * -860569925.jpg Check Vehicle Status Subfunction | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

### GSM ECU

GSM ECU

#### Technology Function -632676878.jpg **Control Cabin and Battery Cooling**

##### Function Interfaces

###### Inputs

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | |
| **Logical Signal Name** | **Technical Signal Name** | | | **Mapping Details** *(Conditional)* | **Subscriber Interface** | **Connection**  (*Optional)* |
| Review in model  Cabin Temp  CabinTemperature  CabinTemperature  CabinTemperature | Cabin Temp | | |  |  |  |
| Review in model  Cooling Re  Feature Settings | Cooling Re | | |  |  |  |
| Review in model  sleep  HVBatteryTemperature | sleep | | |  |  |  |
| Review in model  OnPLug  PlugInStatus | OnPLug | | |  |  |  |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | |

Table 5‑2: Input Signal mappings of Function Control Cabin and Battery Cooling

###### Outputs

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | |
| **Logical Signal Name** | **Technical Signal Name** | | | **Mapping Details** *(Conditional)* | **Publisher Interface** | **Connection**  (*Optional)* |
| Review in model  AC Req  Compressor\_Control\_Out  Compressor\_Control\_Out | AC Req | | |  |  |  |
| Review in model  Blower On  BlowerControl | Blower On | | |  |  |  |
| Review in model  Cooling Duration | Cooling Duration | | |  |  |  |
| Review in model  Cooling Status | Cooling Status | | |  |  |  |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | |

Table 5‑3: Output Signal mappings of Function Control Cabin and Battery Cooling

###### Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Parameter Name** | **Technical Parameter Name** | **Mapping Details** *(Conditional)* | **Method** | **Method Details** |
| Name should be a Word reference to the “*Logical Parameters*” name bookmark in the Data Dictionary | Name should be a Word reference to the “*Technical Parameters*” name bookmark in the Data Dictionary | If mapping is not 1:1 you might reference a Mapping description object from the *Mappings* section | Choose an item. | Depends on Method selection. For Method 2 a DID including start bit and length could be given. For Central Car Config a signal could be referenced |
|  |  |  |  |  |

Table 5‑4: Parameter mappings of Function “MyLogicalFunctionA\_Component1”

###### Interface Requirements

##### Function Requirements

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Modification** | **Requirement ID**  (of Technology Function) | **Comment** |
| REQ\_abc |  | Removed | -- |  |
| REQ\_def |  | Replaced | REQ\_xyz |  |
| -- |  | Added | REQ\_123 |  |

Table 5‑5: Component Specific Requirements

|  |  |  |
| --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Comment** |
|  |  |  |
|  |  |  |
| … |  |  |

Table 5‑6: Inherited Requirements

###### Component Specific Requirements

TMOS Run Condition 2

When "Determine Cabin Cooling Conditions" component function receives the signal "CabnThrml\_Te\_Actll"<45-50C and "HVBat\_Te\_Actl">38-40C it shall send the signal "GoToSeep" to the BCM module

Satisfied by:

* Functions:
  + Control Cabin and Battery Cooling
  + Send Requested TMOS Settings

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Compare temperatures with TMOS run requirement | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * 1815969264.jpg Control TMOS functionality * 1815969264.jpg Check Cabin Status | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

TMOS Run Feedback

When the HPCM module receives the signals "Cooling Status" and "Cooling Duration" it shall forward them to the APIM module display

Satisfied by:

* Functions:
  + Control Cabin and Battery Cooling

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Observation of Cooling Status and Cooling Duration on SYNC Display Screen | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * 1815969264.jpg TMOS Run Display Message Request * 1815969264.jpg HMI Controller Requirements * 1815969264.jpg Operation Run Time | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

TMOS Run Condition 1

When "Determine Cabin Cooling Conditions" component function receives the signals "CabnThrml\_Te\_Actl" > 45-50C and "HVBat\_Te\_Actl">38-40C, and vehicle is in park, it shall activate TMOS feature

Satisfied by:

* Functions:
  + Control Cabin and Battery Cooling
  + Send Requested TMOS Settings

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Compare temperatures with TMOS run requirement | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * 1815969264.jpg Control TMOS functionality * 1815969264.jpg Check Cabin Status | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

TMOS Run Condition 4

When "Determine Cabin Cooling Conditions" component function receives the signal "CabnThrml\_Te\_Actl<45-50C and "HVBat\_Te\_Actl<38-40C it shall send the signal "GoToSleep" to the BCM module

Satisfied by:

* Functions:
  + Control Cabin and Battery Cooling
  + Send Requested TMOS Settings

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Compare temperatures with TMOS run requirement | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * 1815969264.jpg Control TMOS functionality * 1815969264.jpg Check Cabin Status | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

TMOS Run Condition 3

When "Determine Cabin Cooling Conditions" component function receives the signal "CabnThrml\_Te\_Actl>45-50C and "HVBat\_Te\_Actl"<38-40C it shall send the signal "GoToSleep" to the BCM module

Satisfied by:

* Functions:
  + Control Cabin and Battery Cooling
  + Send Requested TMOS Settings

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Compare temperatures with TMOS run requirement | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * 1815969264.jpg Control TMOS functionality * 1815969264.jpg Check Cabin Status | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

### SOBDMC\_HPCM ECU

SOBDMC\_HPCM ECU

#### Technology Function 641223016.jpg **Store Settings**

##### Function Interfaces

###### Inputs

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | |
| **Logical Signal Name** | **Technical Signal Name** | | | **Mapping Details** *(Conditional)* | **Subscriber Interface** | **Connection**  (*Optional)* |
| Review in model  ECG-APIM  Feature Settings | ECG-APIM | | |  |  |  |
| Review in model  input  Feature Settings | input | | |  |  |  |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | |

Table 5‑2: Input Signal mappings of Function Store Settings

###### Outputs

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | |
| **Logical Signal Name** | **Technical Signal Name** | | | **Mapping Details** *(Conditional)* | **Publisher Interface** | **Connection**  (*Optional)* |
| Review in model  Retrieve Settings  Feature Settings | Retrieve Settings | | |  |  |  |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | |

Table 5‑3: Output Signal mappings of Function Store Settings

###### Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Parameter Name** | **Technical Parameter Name** | **Mapping Details** *(Conditional)* | **Method** | **Method Details** |
| Name should be a Word reference to the “*Logical Parameters*” name bookmark in the Data Dictionary | Name should be a Word reference to the “*Technical Parameters*” name bookmark in the Data Dictionary | If mapping is not 1:1 you might reference a Mapping description object from the *Mappings* section | Choose an item. | Depends on Method selection. For Method 2 a DID including start bit and length could be given. For Central Car Config a signal could be referenced |
|  |  |  |  |  |

Table 5‑4: Parameter mappings of Function “MyLogicalFunctionA\_Component1”

###### Interface Requirements

##### Function Requirements

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Modification** | **Requirement ID**  (of Technology Function) | **Comment** |
| REQ\_abc |  | Removed | -- |  |
| REQ\_def |  | Replaced | REQ\_xyz |  |
| -- |  | Added | REQ\_123 |  |

Table 5‑5: Component Specific Requirements

|  |  |  |
| --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Comment** |
|  |  |  |
|  |  |  |
| … |  |  |

Table 5‑6: Inherited Requirements

###### Component Specific Requirements

Store Settings

When "Store Settings" component funcion receives the signal "ThrmlSet\_D\_Rq", it shall store the settings in HPCM

Satisfied by:

* Functions:
  + Store Settings

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Feedback message sent to HMI showing TMOS run summary | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * 1815969264.jpg HMI Controller Requirements * 1512842653.jpg Cycle Data Storage * 1512842653.jpg Store Configuration Settings * 1512842653.jpg Settings Storage and Activation | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

HPCM Settings Storage and Sleep Conditions

When "Store Settings" component function has stored TMOS options "ThrmlSet\_D\_Rq=FAN", "ThrmlSet\_D\_Rq=OFF", or "ThrmlSet\_D\_Rq=FAN\_PLUS\_AC" from APIM, Modules HPCM, and BCM shall go to sleep

Satisfied by:

* Functions:
  + Store Settings

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Test to confirm BCM has gone to sleep after storage of TMOS options | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * 1512842653.jpg Go To Sleep Condition * 1512842653.jpg Go2Sleep | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

#### Technology Function -468587447.jpg **Retreive Stored Settings**

##### Function Interfaces

###### Inputs

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | |
| **Logical Signal Name** | **Technical Signal Name** | | | **Mapping Details** *(Conditional)* | **Subscriber Interface** | **Connection**  (*Optional)* |
| Review in model  Retrieve Settings  Feature Settings | Retrieve Settings | | |  |  |  |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | |

Table 5‑2: Input Signal mappings of Function Retreive Stored Settings

###### Outputs

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | |
| **Logical Signal Name** | **Technical Signal Name** | | | **Mapping Details** *(Conditional)* | **Publisher Interface** | **Connection**  (*Optional)* |
| Review in model  Send Settings  Feature Settings | Send Settings | | |  |  |  |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | |

Table 5‑3: Output Signal mappings of Function Retreive Stored Settings

###### Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Parameter Name** | **Technical Parameter Name** | **Mapping Details** *(Conditional)* | **Method** | **Method Details** |
| Name should be a Word reference to the “*Logical Parameters*” name bookmark in the Data Dictionary | Name should be a Word reference to the “*Technical Parameters*” name bookmark in the Data Dictionary | If mapping is not 1:1 you might reference a Mapping description object from the *Mappings* section | Choose an item. | Depends on Method selection. For Method 2 a DID including start bit and length could be given. For Central Car Config a signal could be referenced |
|  |  |  |  |  |

Table 5‑4: Parameter mappings of Function “MyLogicalFunctionA\_Component1”

###### Interface Requirements

##### Function Requirements

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Modification** | **Requirement ID**  (of Technology Function) | **Comment** |
| REQ\_abc |  | Removed | -- |  |
| REQ\_def |  | Replaced | REQ\_xyz |  |
| -- |  | Added | REQ\_123 |  |

Table 5‑5: Component Specific Requirements

|  |  |  |
| --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Comment** |
|  |  |  |
|  |  |  |
| … |  |  |

Table 5‑6: Inherited Requirements

###### Component Specific Requirements

HPCM Settings Retrieval

When HPCM module receives the signal "WakeUp" from the BCM module, it shall provide a request signal "get user settings" to retrieve user settings from storage

Satisfied by:

* Functions:
  + Retreive Stored Settings

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Observation of user settings running with feature | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * 830584505.jpg SIS Controller Storage * 830584505.jpg Retrieve TMOS Run Request * 1512842653.jpg Settings Storage and Activation | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

#### Technology Function -1196954296.jpg **Determine Cabin Cooling Conditions**

##### Function Interfaces

###### Inputs

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | |
| **Logical Signal Name** | **Technical Signal Name** | | | **Mapping Details** *(Conditional)* | **Subscriber Interface** | **Connection**  (*Optional)* |
| Review in model  WakeUp | WakeUp | | |  |  |  |
| Review in model  Cabin Temp  CabinTemperature  CabinTemperature  CabinTemperature | Cabin Temp | | |  |  |  |
| Review in model  HV Batt Temp  HVBatteryTemperature | HV Batt Temp | | |  |  |  |
| Review in model  Settings  Feature Settings | Settings | | |  |  |  |
| Review in model  OAT  AmbientTemperature  AmbientTemperature | OAT | | |  |  |  |
| Review in model  Vehicle Status  IgnitionStatusUpdated | Vehicle Status | | |  |  |  |
| Review in model  input | input | | |  |  |  |
| Review in model  Plug Status  PlugInStatus | Plug Status | | |  |  |  |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | |

Table 5‑2: Input Signal mappings of Function Determine Cabin Cooling Conditions

###### Outputs

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | |
| **Logical Signal Name** | **Technical Signal Name** | | | **Mapping Details** *(Conditional)* | **Publisher Interface** | **Connection**  (*Optional)* |
| Review in model  Cooling Req  Feature Settings | Cooling Req | | |  |  |  |
| Review in model  sleep | sleep | | |  |  |  |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | |

Table 5‑3: Output Signal mappings of Function Determine Cabin Cooling Conditions

###### Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Parameter Name** | **Technical Parameter Name** | **Mapping Details** *(Conditional)* | **Method** | **Method Details** |
| Name should be a Word reference to the “*Logical Parameters*” name bookmark in the Data Dictionary | Name should be a Word reference to the “*Technical Parameters*” name bookmark in the Data Dictionary | If mapping is not 1:1 you might reference a Mapping description object from the *Mappings* section | Choose an item. | Depends on Method selection. For Method 2 a DID including start bit and length could be given. For Central Car Config a signal could be referenced |
|  |  |  |  |  |

Table 5‑4: Parameter mappings of Function “MyLogicalFunctionA\_Component1”

###### Interface Requirements

##### Function Requirements

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Modification** | **Requirement ID**  (of Technology Function) | **Comment** |
| REQ\_abc |  | Removed | -- |  |
| REQ\_def |  | Replaced | REQ\_xyz |  |
| -- |  | Added | REQ\_123 |  |

Table 5‑5: Component Specific Requirements

|  |  |  |
| --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Comment** |
|  |  |  |
|  |  |  |
| … |  |  |

Table 5‑6: Inherited Requirements

###### Component Specific Requirements

Provide Temperature Status At WakeUp Time

When awakeded, the HPCM module shall provide the status of HV Battery signal "Batt Temp" and Cabin Temperature signal "CabnThrml\_Te\_Actl" and determine if cooling is needed

Satisfied by:

* Functions:
  + Determine Cabin Cooling Conditions

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Test to determine if Check cooling conditions is functioning properly | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * -1415059318.jpg OAT Wake Up Conditions | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

Vehicle Status Forward

When BCM module is awakened, it shall forward the vehicle status signals "Battery Status", "Ignition Status", Transmission Status", "Vehicle Speed", and "WakeUp" to the HPCM module

Satisfied by:

* Functions:
  + Determine Cabin Cooling Conditions

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Test to confirm vehicle status is provided to HPCM | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * -860569925.jpg Provide Vehicle Status | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

Check Cooling Conditions

When the "Determine Cabin Cooling Conditions" component function is awakened, it shall check signals "CabnThrml\_Te\_Actl", "AirAmb\_Te\_Actl", and "HV\_Amb\_Te\_Actl" and if cooling is needed retrieve signals "ThrmlSet\_D\_Rq= FAN", "ThrmlSet\_D\_Rq=FAN PLUS AC", or "ThrmlSet\_D\_Rq=OFF" from storage

Satisfied by:

* Functions:
  + Determine Cabin Cooling Conditions

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Run Feature and measure cabin temperature, HV battery temperature, and ambient temperature | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * -1415059318.jpg check cabin cooling conditions * -1415059318.jpg Blower and AC Operation Conditions * -1415059318.jpg OAT Wake Up Conditions * -1415059318.jpg Verify Cabin Temperature * 1815969264.jpg Control TMOS functionality * -1415059318.jpg Fan and AC Cooling Request * -1415059318.jpg Temperature Sensor Read Conditions * -1415059318.jpg AC Activation Wake Up Conditon | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

#### Technology Function 1764645338.jpg **Provide Cooling Feedback**

##### Function Interfaces

###### Inputs

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | |
| **Logical Signal Name** | **Technical Signal Name** | | | **Mapping Details** *(Conditional)* | **Subscriber Interface** | **Connection**  (*Optional)* |
| Review in model  Cooling Duration | Cooling Duration | | |  |  |  |
| Review in model  CoolingStatus | CoolingStatus | | |  |  |  |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | |

Table 5‑2: Input Signal mappings of Function Provide Cooling Feedback

###### Outputs

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | |
| **Logical Signal Name** | **Technical Signal Name** | | | **Mapping Details** *(Conditional)* | **Publisher Interface** | **Connection**  (*Optional)* |
| Review in model  feedback  CoolingStatusUpdated | feedback | | |  |  |  |
| Review in model  WakeUp | WakeUp | | |  |  |  |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | |

Table 5‑3: Output Signal mappings of Function Provide Cooling Feedback

###### Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Parameter Name** | **Technical Parameter Name** | **Mapping Details** *(Conditional)* | **Method** | **Method Details** |
| Name should be a Word reference to the “*Logical Parameters*” name bookmark in the Data Dictionary | Name should be a Word reference to the “*Technical Parameters*” name bookmark in the Data Dictionary | If mapping is not 1:1 you might reference a Mapping description object from the *Mappings* section | Choose an item. | Depends on Method selection. For Method 2 a DID including start bit and length could be given. For Central Car Config a signal could be referenced |
|  |  |  |  |  |

Table 5‑4: Parameter mappings of Function “MyLogicalFunctionA\_Component1”

###### Interface Requirements

##### Function Requirements

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Modification** | **Requirement ID**  (of Technology Function) | **Comment** |
| REQ\_abc |  | Removed | -- |  |
| REQ\_def |  | Replaced | REQ\_xyz |  |
| -- |  | Added | REQ\_123 |  |

Table 5‑5: Component Specific Requirements

|  |  |  |
| --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Comment** |
|  |  |  |
|  |  |  |
| … |  |  |

Table 5‑6: Inherited Requirements

###### Component Specific Requirements

APIM feedback to User

When "Display User Settings and Feedback" component function receives the signals "Cooling Status" and "Cooling Duration" from the HPCM module it shall display the status and duration of the cooling cycle

Satisfied by:

* Functions:
  + Provide Cooling Feedback

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Observation of Cooling Status and Cooling Duration in SYNC Display Screen | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * -1239765822.jpg Provide Feedback * -1239765822.jpg Send HMI TMOS Message * -1239765822.jpg Cooling Status and Duration Feedback * -1239765822.jpg Cooling Successful Status * -1239765822.jpg Failed To Cool Status * 1815969264.jpg TMOS Run Display Message Request * -1239765822.jpg Run Summary Display * -1239765822.jpg Cooling Feedback | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | Ready for Review |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

Blower Run Time

When "Control Cabin and Battery Cooling" component function receives the signal "Cabn\_Amb\_Te\_Aclt" > than 50C for 5 minutes, it shall send the signal "blower off" to the RCCM module when TMOS setting is set to "FAN"

Satisfied by:

* Functions:
  + Provide Cooling Feedback
  + Request Blower On

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Observation of blower off after 5 minutes when Cabn\_Amb\_Te\_Actl is greater than 50C | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * -1239765822.jpg Request Fan Off Subfunction * -1239765822.jpg Request Fan+AC Subfunction | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

Usage Time

When HPCM module receives cooling request signal "run TMOS", it shall track the cooling duration time

Satisfied by:

* Functions:
  + Provide Cooling Feedback

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Observation of feedback on SYNC Display Screen | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * -1239765822.jpg Cooling Duration Tracking * -1239765822.jpg Track Usage Time * -1239765822.jpg Monitor TMOS Cycle Time | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

Cooling Status Feedback

When "Provide Cooling Feedback" component function completes TMOS cooling, it shall provide the APIM with the Cooling Status signal of "HMI-CustFeedback=FAILED\_TO\_COOL" or "HMI-CustFeedback= COOLING\_SUCCESSFUL"

Satisfied by:

* Functions:
  + Display User Settings and Feedback
  + Provide Cooling Feedback

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Observation of TMOS run feedback in SYNC Display Screen | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * -1239765822.jpg Cabin Cooling Successful Condition * -1239765822.jpg Cooling Status and Duration Feedback * -1239765822.jpg Failed To Cool Status * -1239765822.jpg Battery Cooling Successful Condition * -1239765822.jpg Request Climate System Off Condition | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

#### Technology Function 720614772.jpg **WakeUp Alarm Request**

##### Function Interfaces

###### Inputs

(No inputs have been defined)

###### Outputs

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | |
| **Logical Signal Name** | **Technical Signal Name** | | | **Mapping Details** *(Conditional)* | **Publisher Interface** | **Connection**  (*Optional)* |
| Review in model  Wake Alarm | Wake Alarm | | |  |  |  |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | |

Table 5‑3: Output Signal mappings of Function WakeUp Alarm Request

###### Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Parameter Name** | **Technical Parameter Name** | **Mapping Details** *(Conditional)* | **Method** | **Method Details** |
| Name should be a Word reference to the “*Logical Parameters*” name bookmark in the Data Dictionary | Name should be a Word reference to the “*Technical Parameters*” name bookmark in the Data Dictionary | If mapping is not 1:1 you might reference a Mapping description object from the *Mappings* section | Choose an item. | Depends on Method selection. For Method 2 a DID including start bit and length could be given. For Central Car Config a signal could be referenced |
|  |  |  |  |  |

Table 5‑4: Parameter mappings of Function “MyLogicalFunctionA\_Component1”

###### Interface Requirements

##### Function Requirements

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Modification** | **Requirement ID**  (of Technology Function) | **Comment** |
| REQ\_abc |  | Removed | -- |  |
| REQ\_def |  | Replaced | REQ\_xyz |  |
| -- |  | Added | REQ\_123 |  |

Table 5‑5: Component Specific Requirements

|  |  |  |
| --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Comment** |
|  |  |  |
|  |  |  |
| … |  |  |

Table 5‑6: Inherited Requirements

###### Component Specific Requirements

WakeUp Step 1

When BCM module receives the alarm signal "wake up" it shall provide PCM module early wakes to the powertrain system which will wake up the HPCM

Satisfied by:

* Functions:
  + Provide WakeUp Request
  + WakeUp Alarm Request

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Test to confirm AWD\_DLCM receives wakeup signal form BCM | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * 1123627672.jpg Wakeup Conditions | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

#### Technology Function 1018248968.jpg **Send Requested TMOS Settings**

##### Function Interfaces

###### Inputs

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | |
| **Logical Signal Name** | **Technical Signal Name** | | | **Mapping Details** *(Conditional)* | **Subscriber Interface** | **Connection**  (*Optional)* |
| Review in model  Send Settings  Feature Settings | Send Settings | | |  |  |  |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | |

Table 5‑2: Input Signal mappings of Function Send Requested TMOS Settings

###### Outputs

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | |
| **Logical Signal Name** | **Technical Signal Name** | | | **Mapping Details** *(Conditional)* | **Publisher Interface** | **Connection**  (*Optional)* |
| Review in model  Send Settings  Feature Settings | Send Settings | | |  |  |  |
| Review in model  Notify User | Notify User | | |  |  |  |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | |

Table 5‑3: Output Signal mappings of Function Send Requested TMOS Settings

###### Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Parameter Name** | **Technical Parameter Name** | **Mapping Details** *(Conditional)* | **Method** | **Method Details** |
| Name should be a Word reference to the “*Logical Parameters*” name bookmark in the Data Dictionary | Name should be a Word reference to the “*Technical Parameters*” name bookmark in the Data Dictionary | If mapping is not 1:1 you might reference a Mapping description object from the *Mappings* section | Choose an item. | Depends on Method selection. For Method 2 a DID including start bit and length could be given. For Central Car Config a signal could be referenced |
|  |  |  |  |  |

Table 5‑4: Parameter mappings of Function “MyLogicalFunctionA\_Component1”

###### Interface Requirements

##### Function Requirements

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Modification** | **Requirement ID**  (of Technology Function) | **Comment** |
| REQ\_abc |  | Removed | -- |  |
| REQ\_def |  | Replaced | REQ\_xyz |  |
| -- |  | Added | REQ\_123 |  |

Table 5‑5: Component Specific Requirements

|  |  |  |
| --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Comment** |
|  |  |  |
|  |  |  |
| … |  |  |

Table 5‑6: Inherited Requirements

###### Component Specific Requirements

TMOS Run Condition 2

When "Determine Cabin Cooling Conditions" component function receives the signal "CabnThrml\_Te\_Actll"<45-50C and "HVBat\_Te\_Actl">38-40C it shall send the signal "GoToSeep" to the BCM module

Satisfied by:

* Functions:
  + Control Cabin and Battery Cooling
  + Send Requested TMOS Settings

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Compare temperatures with TMOS run requirement | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * 1815969264.jpg Control TMOS functionality * 1815969264.jpg Check Cabin Status | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

TMOS Run Condition 1

When "Determine Cabin Cooling Conditions" component function receives the signals "CabnThrml\_Te\_Actl" > 45-50C and "HVBat\_Te\_Actl">38-40C, and vehicle is in park, it shall activate TMOS feature

Satisfied by:

* Functions:
  + Control Cabin and Battery Cooling
  + Send Requested TMOS Settings

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Compare temperatures with TMOS run requirement | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * 1815969264.jpg Control TMOS functionality * 1815969264.jpg Check Cabin Status | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

TMOS Run Condition 4

When "Determine Cabin Cooling Conditions" component function receives the signal "CabnThrml\_Te\_Actl<45-50C and "HVBat\_Te\_Actl<38-40C it shall send the signal "GoToSleep" to the BCM module

Satisfied by:

* Functions:
  + Control Cabin and Battery Cooling
  + Send Requested TMOS Settings

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Compare temperatures with TMOS run requirement | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * 1815969264.jpg Control TMOS functionality * 1815969264.jpg Check Cabin Status | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

TMOS Run Condition 3

When "Determine Cabin Cooling Conditions" component function receives the signal "CabnThrml\_Te\_Actl>45-50C and "HVBat\_Te\_Actl"<38-40C it shall send the signal "GoToSleep" to the BCM module

Satisfied by:

* Functions:
  + Control Cabin and Battery Cooling
  + Send Requested TMOS Settings

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Compare temperatures with TMOS run requirement | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * 1815969264.jpg Control TMOS functionality * 1815969264.jpg Check Cabin Status | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

#### Technology Function -632676878.jpg **Control Cabin and Battery Cooling**

##### Function Interfaces

###### Inputs

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | |
| **Logical Signal Name** | **Technical Signal Name** | | | **Mapping Details** *(Conditional)* | **Subscriber Interface** | **Connection**  (*Optional)* |
| Review in model  Cabin Temp  CabinTemperature  CabinTemperature  CabinTemperature | Cabin Temp | | |  |  |  |
| Review in model  Cooling Re  Feature Settings | Cooling Re | | |  |  |  |
| Review in model  sleep  HVBatteryTemperature | sleep | | |  |  |  |
| Review in model  OnPLug  PlugInStatus | OnPLug | | |  |  |  |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | |

Table 5‑2: Input Signal mappings of Function Control Cabin and Battery Cooling

###### Outputs

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | |
| **Logical Signal Name** | **Technical Signal Name** | | | **Mapping Details** *(Conditional)* | **Publisher Interface** | **Connection**  (*Optional)* |
| Review in model  AC Req  Compressor\_Control\_Out  Compressor\_Control\_Out | AC Req | | |  |  |  |
| Review in model  Blower On  BlowerControl | Blower On | | |  |  |  |
| Review in model  Cooling Duration | Cooling Duration | | |  |  |  |
| Review in model  Cooling Status | Cooling Status | | |  |  |  |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | |

Table 5‑3: Output Signal mappings of Function Control Cabin and Battery Cooling

###### Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Parameter Name** | **Technical Parameter Name** | **Mapping Details** *(Conditional)* | **Method** | **Method Details** |
| Name should be a Word reference to the “*Logical Parameters*” name bookmark in the Data Dictionary | Name should be a Word reference to the “*Technical Parameters*” name bookmark in the Data Dictionary | If mapping is not 1:1 you might reference a Mapping description object from the *Mappings* section | Choose an item. | Depends on Method selection. For Method 2 a DID including start bit and length could be given. For Central Car Config a signal could be referenced |
|  |  |  |  |  |

Table 5‑4: Parameter mappings of Function “MyLogicalFunctionA\_Component1”

###### Interface Requirements

##### Function Requirements

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Modification** | **Requirement ID**  (of Technology Function) | **Comment** |
| REQ\_abc |  | Removed | -- |  |
| REQ\_def |  | Replaced | REQ\_xyz |  |
| -- |  | Added | REQ\_123 |  |

Table 5‑5: Component Specific Requirements

|  |  |  |
| --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Comment** |
|  |  |  |
|  |  |  |
| … |  |  |

Table 5‑6: Inherited Requirements

###### Component Specific Requirements

TMOS Run Condition 2

When "Determine Cabin Cooling Conditions" component function receives the signal "CabnThrml\_Te\_Actll"<45-50C and "HVBat\_Te\_Actl">38-40C it shall send the signal "GoToSeep" to the BCM module

Satisfied by:

* Functions:
  + Control Cabin and Battery Cooling
  + Send Requested TMOS Settings

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Compare temperatures with TMOS run requirement | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * 1815969264.jpg Control TMOS functionality * 1815969264.jpg Check Cabin Status | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

TMOS Run Feedback

When the HPCM module receives the signals "Cooling Status" and "Cooling Duration" it shall forward them to the APIM module display

Satisfied by:

* Functions:
  + Control Cabin and Battery Cooling

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Observation of Cooling Status and Cooling Duration on SYNC Display Screen | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * 1815969264.jpg TMOS Run Display Message Request * 1815969264.jpg HMI Controller Requirements * 1815969264.jpg Operation Run Time | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

TMOS Run Condition 1

When "Determine Cabin Cooling Conditions" component function receives the signals "CabnThrml\_Te\_Actl" > 45-50C and "HVBat\_Te\_Actl">38-40C, and vehicle is in park, it shall activate TMOS feature

Satisfied by:

* Functions:
  + Control Cabin and Battery Cooling
  + Send Requested TMOS Settings

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Compare temperatures with TMOS run requirement | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * 1815969264.jpg Control TMOS functionality * 1815969264.jpg Check Cabin Status | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

TMOS Run Condition 4

When "Determine Cabin Cooling Conditions" component function receives the signal "CabnThrml\_Te\_Actl<45-50C and "HVBat\_Te\_Actl<38-40C it shall send the signal "GoToSleep" to the BCM module

Satisfied by:

* Functions:
  + Control Cabin and Battery Cooling
  + Send Requested TMOS Settings

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Compare temperatures with TMOS run requirement | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * 1815969264.jpg Control TMOS functionality * 1815969264.jpg Check Cabin Status | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

TMOS Run Condition 3

When "Determine Cabin Cooling Conditions" component function receives the signal "CabnThrml\_Te\_Actl>45-50C and "HVBat\_Te\_Actl"<38-40C it shall send the signal "GoToSleep" to the BCM module

Satisfied by:

* Functions:
  + Control Cabin and Battery Cooling
  + Send Requested TMOS Settings

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Compare temperatures with TMOS run requirement | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * 1815969264.jpg Control TMOS functionality * 1815969264.jpg Check Cabin Status | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

### ACCM ECU

ACCM ECU

#### Technology Function -284668240.jpg **AC\_Compressor\_Actuator**

##### Function Interfaces

###### Inputs

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | |
| **Logical Signal Name** | **Technical Signal Name** | | | **Mapping Details** *(Conditional)* | **Subscriber Interface** | **Connection**  (*Optional)* |
| Review in model  AC Req  Compressor\_Control\_Out  Compressor\_Control\_Out | AC Req | | |  |  |  |
| Review in model  Off Plug Pwr | Off Plug Pwr | | |  |  |  |
| Review in model  AC Pwr | AC Pwr | | |  |  |  |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | |

Table 5‑2: Input Signal mappings of Function AC\_Compressor\_Actuator

###### Outputs

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | |
| **Logical Signal Name** | **Technical Signal Name** | | | **Mapping Details** *(Conditional)* | **Publisher Interface** | **Connection**  (*Optional)* |
| Review in model  AC on  Compressor\_Control\_Out  Compressor\_Control\_Out | AC on | | |  |  |  |
| Review in model  RpmOut  Compressor\_Control\_Out  Compressor\_Control\_Out | RpmOut | | |  |  |  |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | |

Table 5‑3: Output Signal mappings of Function AC\_Compressor\_Actuator

###### Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Parameter Name** | **Technical Parameter Name** | **Mapping Details** *(Conditional)* | **Method** | **Method Details** |
| Name should be a Word reference to the “*Logical Parameters*” name bookmark in the Data Dictionary | Name should be a Word reference to the “*Technical Parameters*” name bookmark in the Data Dictionary | If mapping is not 1:1 you might reference a Mapping description object from the *Mappings* section | Choose an item. | Depends on Method selection. For Method 2 a DID including start bit and length could be given. For Central Car Config a signal could be referenced |
|  |  |  |  |  |

Table 5‑4: Parameter mappings of Function “MyLogicalFunctionA\_Component1”

###### Interface Requirements

##### Function Requirements

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Modification** | **Requirement ID**  (of Technology Function) | **Comment** |
| REQ\_abc |  | Removed | -- |  |
| REQ\_def |  | Replaced | REQ\_xyz |  |
| -- |  | Added | REQ\_123 |  |

Table 5‑5: Component Specific Requirements

|  |  |  |
| --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Comment** |
|  |  |  |
|  |  |  |
| … |  |  |

Table 5‑6: Inherited Requirements

###### Component Specific Requirements

ACCM Power

The HEV Battery shall supply the ACCM module with power to run the compressor when vehicle is in PlugIn mode

Satisfied by:

* Functions:
  + AC\_Compressor\_Actuator
  + Provide Pwr to ACCM

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Observation of compressor on when vehicle is in plugin mode | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * 1865307541.jpg Activate Compressor On | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | Ready for Review |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

Compressor Request

When "Control Cabin and Battery Cooling" component function receives the signal "ThrmlSet\_D\_Rq=FAN\_PLUS\_AC", it shall provide a signal "ElCmprenbl\_B\_Rq=ENABLE" to the ACCM module to request that the compressor be activated

Satisfied by:

* Functions:
  + Actuate Compressor
  + AC\_Compressor\_Actuator

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** | Enable Compressor ON or OFF | | | | | | |
| **Acceptance Criteria** | Observation of compressor on | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * 1865307541.jpg Compressor Function * 1865307541.jpg Achieved Cabin\_Normal Temperature * 1865307541.jpg Climate Controller Requirements * -1239765822.jpg Request Fan+AC Subfunction * 1865307541.jpg Cool Request Detection * 1865307541.jpg Request Cooling With AC * 1865307541.jpg Fan On and AC Request * -1415059318.jpg AC Activation Wake Up Conditon | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

#### Technology Function 136564500.jpg **Actuate Compressor**

##### Function Interfaces

###### Inputs

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | |
| **Logical Signal Name** | **Technical Signal Name** | | | **Mapping Details** *(Conditional)* | **Subscriber Interface** | **Connection**  (*Optional)* |
| Review in model  Ac On'  Compressor\_Control\_Out  Compressor\_Control\_Out | Ac On' | | |  |  |  |
| Review in model  RpmIn  Compressor\_Control\_Out  Compressor\_Control\_Out | RpmIn | | |  |  |  |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | |

Table 5‑2: Input Signal mappings of Function Actuate Compressor

###### Outputs

(No outputs have been defined)

###### Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Parameter Name** | **Technical Parameter Name** | **Mapping Details** *(Conditional)* | **Method** | **Method Details** |
| Name should be a Word reference to the “*Logical Parameters*” name bookmark in the Data Dictionary | Name should be a Word reference to the “*Technical Parameters*” name bookmark in the Data Dictionary | If mapping is not 1:1 you might reference a Mapping description object from the *Mappings* section | Choose an item. | Depends on Method selection. For Method 2 a DID including start bit and length could be given. For Central Car Config a signal could be referenced |
|  |  |  |  |  |

Table 5‑4: Parameter mappings of Function “MyLogicalFunctionA\_Component1”

###### Interface Requirements

##### Function Requirements

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Modification** | **Requirement ID**  (of Technology Function) | **Comment** |
| REQ\_abc |  | Removed | -- |  |
| REQ\_def |  | Replaced | REQ\_xyz |  |
| -- |  | Added | REQ\_123 |  |

Table 5‑5: Component Specific Requirements

|  |  |  |
| --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Comment** |
|  |  |  |
|  |  |  |
| … |  |  |

Table 5‑6: Inherited Requirements

###### Component Specific Requirements

Compressor Request

When "Control Cabin and Battery Cooling" component function receives the signal "ThrmlSet\_D\_Rq=FAN\_PLUS\_AC", it shall provide a signal "ElCmprenbl\_B\_Rq=ENABLE" to the ACCM module to request that the compressor be activated

Satisfied by:

* Functions:
  + Actuate Compressor
  + AC\_Compressor\_Actuator

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** | Enable Compressor ON or OFF | | | | | | |
| **Acceptance Criteria** | Observation of compressor on | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * 1865307541.jpg Compressor Function * 1865307541.jpg Achieved Cabin\_Normal Temperature * 1865307541.jpg Climate Controller Requirements * -1239765822.jpg Request Fan+AC Subfunction * 1865307541.jpg Cool Request Detection * 1865307541.jpg Request Cooling With AC * 1865307541.jpg Fan On and AC Request * -1415059318.jpg AC Activation Wake Up Conditon | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

Fan Run Time before Compressor Activation

When "Control Cabin and Battery Temperature" component function receives the signal "Cabn\_Amb\_Te\_Actl" >= 50C for 5 minutes and TMOS signal "ThrmlSet\_D\_Rq=FAN\_PLUS\_AC" it shall send the signal "ElCmprenbl\_B\_Rq=ENABLE" to the ACCM

Satisfied by:

* Functions:
  + Actuate Compressor

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Observation of compressor enabled after 5 minutes and Cabn\_Amb\_Te\_Actl is greater than 50C | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * 1865307541.jpg Compressor Function * 1865307541.jpg Activate Compressor On | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

Compressor Duration

When "Determine Cabin Cooling Conditions" component function receives the signal "CabnThrml\_Te\_Actll" >50C after 7 to 8 minutes with TMOS setting signal "ThrmlSet\_D\_Rq=FAN\_PLUS\_AC\_ON" it shall provide the ACCM with the signal "ELCmprenbl\_B\_Rq=DISABLE" and the RCCM with the signal "Blower Off"

Satisfied by:

* Functions:
  + Actuate Compressor
  + Request Blower On

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Observation of compressor off after 7 to 8 minutes | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * 1865307541.jpg Compressor Function | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

### HV Battery

HV Battery

#### Technology Function 1392182823.jpg **Provide Pwr to ACCM**

##### Function Interfaces

###### Inputs

(No inputs have been defined)

###### Outputs

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | |
| **Logical Signal Name** | **Technical Signal Name** | | | **Mapping Details** *(Conditional)* | **Publisher Interface** | **Connection**  (*Optional)* |
| Review in model  pwr out | pwr out | | |  |  |  |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | |

Table 5‑3: Output Signal mappings of Function Provide Pwr to ACCM

###### Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Parameter Name** | **Technical Parameter Name** | **Mapping Details** *(Conditional)* | **Method** | **Method Details** |
| Name should be a Word reference to the “*Logical Parameters*” name bookmark in the Data Dictionary | Name should be a Word reference to the “*Technical Parameters*” name bookmark in the Data Dictionary | If mapping is not 1:1 you might reference a Mapping description object from the *Mappings* section | Choose an item. | Depends on Method selection. For Method 2 a DID including start bit and length could be given. For Central Car Config a signal could be referenced |
|  |  |  |  |  |

Table 5‑4: Parameter mappings of Function “MyLogicalFunctionA\_Component1”

###### Interface Requirements

##### Function Requirements

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Modification** | **Requirement ID**  (of Technology Function) | **Comment** |
| REQ\_abc |  | Removed | -- |  |
| REQ\_def |  | Replaced | REQ\_xyz |  |
| -- |  | Added | REQ\_123 |  |

Table 5‑5: Component Specific Requirements

|  |  |  |
| --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Comment** |
|  |  |  |
|  |  |  |
| … |  |  |

Table 5‑6: Inherited Requirements

###### Component Specific Requirements

ACCM Power

The HEV Battery shall supply the ACCM module with power to run the compressor when vehicle is in PlugIn mode

Satisfied by:

* Functions:
  + AC\_Compressor\_Actuator
  + Provide Pwr to ACCM

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Observation of compressor on when vehicle is in plugin mode | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * 1865307541.jpg Activate Compressor On | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | Ready for Review |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

#### Technology Function 449908900.jpg **Detect\_HV Battery SOC**

##### Function Interfaces

###### Inputs

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | |
| **Logical Signal Name** | **Technical Signal Name** | | | **Mapping Details** *(Conditional)* | **Subscriber Interface** | **Connection**  (*Optional)* |
| Review in model  SOC | SOC | | |  |  |  |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | |

Table 5‑2: Input Signal mappings of Function Detect\_HV Battery SOC

###### Outputs

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | |
| **Logical Signal Name** | **Technical Signal Name** | | | **Mapping Details** *(Conditional)* | **Publisher Interface** | **Connection**  (*Optional)* |
| Review in model  HV SOC  PlugInStatus | HV SOC | | |  |  |  |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | |

Table 5‑3: Output Signal mappings of Function Detect\_HV Battery SOC

###### Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Parameter Name** | **Technical Parameter Name** | **Mapping Details** *(Conditional)* | **Method** | **Method Details** |
| Name should be a Word reference to the “*Logical Parameters*” name bookmark in the Data Dictionary | Name should be a Word reference to the “*Technical Parameters*” name bookmark in the Data Dictionary | If mapping is not 1:1 you might reference a Mapping description object from the *Mappings* section | Choose an item. | Depends on Method selection. For Method 2 a DID including start bit and length could be given. For Central Car Config a signal could be referenced |
|  |  |  |  |  |

Table 5‑4: Parameter mappings of Function “MyLogicalFunctionA\_Component1”

###### Interface Requirements

##### Function Requirements

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Modification** | **Requirement ID**  (of Technology Function) | **Comment** |
| REQ\_abc |  | Removed | -- |  |
| REQ\_def |  | Replaced | REQ\_xyz |  |
| -- |  | Added | REQ\_123 |  |

Table 5‑5: Component Specific Requirements

|  |  |  |
| --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Comment** |
|  |  |  |
|  |  |  |
| … |  |  |

Table 5‑6: Inherited Requirements

###### Component Specific Requirements

Battery SOC

While vehicle is running, "Provide 12V Vehicle Battery SOC" component function shall provide a signal "Battery SOC" to the BCM module

Satisfied by:

* Functions:
  + Detect\_HV Battery SOC
  + Provide 12V Vehicle Battery SOC

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Observation of a non critical battery state of charge in SYNC Screen | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * 1018784892.jpg Battery SOC Detection * 1018784892.jpg Battery SOC Wake Up Conditions | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | Ready for Review |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

Battery Charge By DCDC

When DC/DC converter is awakened it shall charge the 12V Battery if TMOS signal "FAN\_ON" is selected

Satisfied by:

* Functions:
  + Detect\_HV Battery SOC

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** |  | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** |  |
| **Source Req.** | * 1018784892.jpg Battery SOC Detection * 1018784892.jpg Battery SOC Wake Up Conditions | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** |  | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

### RCCM ECU

RCCM ECU

#### Technology Function 203291696.jpg **Request Blower On**

##### Function Interfaces

###### Inputs

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | |
| **Logical Signal Name** | **Technical Signal Name** | | | **Mapping Details** *(Conditional)* | **Subscriber Interface** | **Connection**  (*Optional)* |
| Review in model  blwr req  BlowerControl | blwr req | | |  |  |  |
| Review in model  BlwrOnRq  BlowerControl | BlwrOnRq | | |  |  |  |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | |

Table 5‑2: Input Signal mappings of Function Request Blower On

###### Outputs

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | |
| **Logical Signal Name** | **Technical Signal Name** | | | **Mapping Details** *(Conditional)* | **Publisher Interface** | **Connection**  (*Optional)* |
| Review in model  Fan On  BlowerControl | Fan On | | |  |  |  |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | |

Table 5‑3: Output Signal mappings of Function Request Blower On

###### Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Parameter Name** | **Technical Parameter Name** | **Mapping Details** *(Conditional)* | **Method** | **Method Details** |
| Name should be a Word reference to the “*Logical Parameters*” name bookmark in the Data Dictionary | Name should be a Word reference to the “*Technical Parameters*” name bookmark in the Data Dictionary | If mapping is not 1:1 you might reference a Mapping description object from the *Mappings* section | Choose an item. | Depends on Method selection. For Method 2 a DID including start bit and length could be given. For Central Car Config a signal could be referenced |
|  |  |  |  |  |

Table 5‑4: Parameter mappings of Function “MyLogicalFunctionA\_Component1”

###### Interface Requirements

##### Function Requirements

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Modification** | **Requirement ID**  (of Technology Function) | **Comment** |
| REQ\_abc |  | Removed | -- |  |
| REQ\_def |  | Replaced | REQ\_xyz |  |
| -- |  | Added | REQ\_123 |  |

Table 5‑5: Component Specific Requirements

|  |  |  |
| --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Comment** |
|  |  |  |
|  |  |  |
| … |  |  |

Table 5‑6: Inherited Requirements

###### Component Specific Requirements

Blower Run Time

When "Control Cabin and Battery Cooling" component function receives the signal "Cabn\_Amb\_Te\_Aclt" > than 50C for 5 minutes, it shall send the signal "blower off" to the RCCM module when TMOS setting is set to "FAN"

Satisfied by:

* Functions:
  + Provide Cooling Feedback
  + Request Blower On

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Observation of blower off after 5 minutes when Cabn\_Amb\_Te\_Actl is greater than 50C | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * -1239765822.jpg Request Fan Off Subfunction * -1239765822.jpg Request Fan+AC Subfunction | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

Compressor Duration

When "Determine Cabin Cooling Conditions" component function receives the signal "CabnThrml\_Te\_Actll" >50C after 7 to 8 minutes with TMOS setting signal "ThrmlSet\_D\_Rq=FAN\_PLUS\_AC\_ON" it shall provide the ACCM with the signal "ELCmprenbl\_B\_Rq=DISABLE" and the RCCM with the signal "Blower Off"

Satisfied by:

* Functions:
  + Actuate Compressor
  + Request Blower On

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Observation of compressor off after 7 to 8 minutes | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * 1865307541.jpg Compressor Function | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

Blower Request On

When the signal "ThrmlSet\_D\_Rq=FAN" or ThrmlSet\_D\_Rq=FAN\_PLUS\_AC" is requested from "Control Cabin and Battery Cooling" component function, The RCCM module shall provide signal "BlwrOn" to the Blower Motor to activate the fan

Satisfied by:

* Functions:
  + Actuate\_Blower
  + Request Blower On

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Observation of blower motor running | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * -738163211.jpg Request Cooling With Fan On * -738163211.jpg Fan On Cooling Request * -1239765822.jpg Request Fan+AC Subfunction * -738163211.jpg Activate Fan * 1865307541.jpg Cool Request Detection * 1865307541.jpg Request Cooling With AC * 1865307541.jpg Fan On and AC Request * -738163211.jpg Blower Activation | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | Ready for Review |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

#### Technology Function -17226595.jpg **Actuate\_Blower**

##### Function Interfaces

###### Inputs

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | |
| **Logical Signal Name** | **Technical Signal Name** | | | **Mapping Details** *(Conditional)* | **Subscriber Interface** | **Connection**  (*Optional)* |
| Review in model  Fan On  BlowerControl | Fan On | | |  |  |  |
| Review in model  BlwrPwr | BlwrPwr | | |  |  |  |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | |

Table 5‑2: Input Signal mappings of Function Actuate\_Blower

###### Outputs

(No outputs have been defined)

###### Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Parameter Name** | **Technical Parameter Name** | **Mapping Details** *(Conditional)* | **Method** | **Method Details** |
| Name should be a Word reference to the “*Logical Parameters*” name bookmark in the Data Dictionary | Name should be a Word reference to the “*Technical Parameters*” name bookmark in the Data Dictionary | If mapping is not 1:1 you might reference a Mapping description object from the *Mappings* section | Choose an item. | Depends on Method selection. For Method 2 a DID including start bit and length could be given. For Central Car Config a signal could be referenced |
|  |  |  |  |  |

Table 5‑4: Parameter mappings of Function “MyLogicalFunctionA\_Component1”

###### Interface Requirements

##### Function Requirements

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Modification** | **Requirement ID**  (of Technology Function) | **Comment** |
| REQ\_abc |  | Removed | -- |  |
| REQ\_def |  | Replaced | REQ\_xyz |  |
| -- |  | Added | REQ\_123 |  |

Table 5‑5: Component Specific Requirements

|  |  |  |
| --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Comment** |
|  |  |  |
|  |  |  |
| … |  |  |

Table 5‑6: Inherited Requirements

###### Component Specific Requirements

HPCM before Sleep Condition

When "Determine Cabin Cooling Conditions" component function receives the signal "AirAmb\_Te\_Actl" from module ECM\_HEV, the ECM\_HEV will receive the signal "go to sleep"

Satisfied by:

* Functions:
  + Actuate\_Blower

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Test to confirm ECM\_HEV goes to sleep | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * 1512842653.jpg Go To Sleep Condition * -1415059318.jpg check cabin cooling conditions * 1512842653.jpg Go2Sleep | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

Blower Request Off

The RCCM module shall provide signal "BlwrOff" to the Blower Motor to deactivate the fan

Satisfied by:

* Functions:
  + Actuate\_Blower

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** |  | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** |  |
| **Source Req.** | * -1239765822.jpg Request Fan Off Subfunction * -738163211.jpg Blower Activation | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** |  | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

Blower off request

When RCCM module receives a cabin temperature signal "CabnThrml\_Te\_Actl" <CabinNormalTemperature, the HPCM module shall send signal "blower off" to the Blower Motor

Satisfied by:

* Functions:
  + Actuate\_Blower

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Observation that blower turns off when CabinNormalTemperature signal is received | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * -1239765822.jpg Request Fan Off Subfunction * 1381974034.jpg Request Fan Only Subfunction * -738163211.jpg Blower Activation | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | Ready for Review |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

Blower Request On

When the signal "ThrmlSet\_D\_Rq=FAN" or ThrmlSet\_D\_Rq=FAN\_PLUS\_AC" is requested from "Control Cabin and Battery Cooling" component function, The RCCM module shall provide signal "BlwrOn" to the Blower Motor to activate the fan

Satisfied by:

* Functions:
  + Actuate\_Blower
  + Request Blower On

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Observation of blower motor running | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * -738163211.jpg Request Cooling With Fan On * -738163211.jpg Fan On Cooling Request * -1239765822.jpg Request Fan+AC Subfunction * -738163211.jpg Activate Fan * 1865307541.jpg Cool Request Detection * 1865307541.jpg Request Cooling With AC * 1865307541.jpg Fan On and AC Request * -738163211.jpg Blower Activation | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | Ready for Review |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

#### Technology Function -575039964.jpg **Provide Cabin Temperature**

##### Function Interfaces

###### Inputs

(No inputs have been defined)

###### Outputs

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | |
| **Logical Signal Name** | **Technical Signal Name** | | | **Mapping Details** *(Conditional)* | **Publisher Interface** | **Connection**  (*Optional)* |
| Review in model  Cabin Temp  CabinTemperature  CabinTemperature  CabinTemperature | Cabin Temp | | |  |  |  |
| Review in model  Cabin Temp  CabinTemperature  CabinTemperature  CabinTemperature | Cabin Temp | | |  |  |  |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | |

Table 5‑3: Output Signal mappings of Function Provide Cabin Temperature

###### Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Parameter Name** | **Technical Parameter Name** | **Mapping Details** *(Conditional)* | **Method** | **Method Details** |
| Name should be a Word reference to the “*Logical Parameters*” name bookmark in the Data Dictionary | Name should be a Word reference to the “*Technical Parameters*” name bookmark in the Data Dictionary | If mapping is not 1:1 you might reference a Mapping description object from the *Mappings* section | Choose an item. | Depends on Method selection. For Method 2 a DID including start bit and length could be given. For Central Car Config a signal could be referenced |
|  |  |  |  |  |

Table 5‑4: Parameter mappings of Function “MyLogicalFunctionA\_Component1”

###### Interface Requirements

##### Function Requirements

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Modification** | **Requirement ID**  (of Technology Function) | **Comment** |
| REQ\_abc |  | Removed | -- |  |
| REQ\_def |  | Replaced | REQ\_xyz |  |
| -- |  | Added | REQ\_123 |  |

Table 5‑5: Component Specific Requirements

|  |  |  |
| --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Comment** |
|  |  |  |
|  |  |  |
| … |  |  |

Table 5‑6: Inherited Requirements

###### Component Specific Requirements

Vehicle Status

The BMS module shall provide the BCM module with the vehicle status signals "Battery Status", "Ignition Status", "Transmission Status", "Vehicle Speed", and "WakeUp"

Satisfied by:

* Functions:
  + Charge 12V Battery
  + Provide Ambient Temperature
  + Provide Cabin Temperature
  + Provide HV Battery Temperature
  + Provide HV OnPlug Status
  + Provide Off Plug Power

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Observation of TMOS running and checking vehicle status | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * -860569925.jpg Provide Vehicle Status * -860569925.jpg Key On Summary Conditions * -860569925.jpg Check Vehicle Status Subfunction | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

Cabin Temp Interval

When HPCM module is awake it shall receive the signal "CabnThrml\_Te\_Actl" at a regular interval from the RCCM module

Satisfied by:

* Functions:
  + Provide Cabin Temperature

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Test RCCM for Cabn\_Amb\_Te\_Actl signal | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * -2093158110.jpg Cabin Temperature Monitor * -1415059318.jpg Temperature Sensor Read Conditions * 1815969264.jpg Check Cabin Status * -2093158110.jpg Provide OAT Temperature | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

Cabin Temperature Provider

The "Provide Cabin Temperature" component function shall provide the signal "CabnThrml\_Te\_Actll" for cabin temperature to the HPCM module

Satisfied by:

* Functions:
  + Provide Cabin Temperature

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Test RCCM for Cabn\_Amb\_Te\_Actl signal | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * -2093158110.jpg Provide Cabin Temperature * -2093158110.jpg Cabin Temperature Monitor * -1415059318.jpg Verify Cabin Temperature * -1415059318.jpg Temperature Sensor Read Conditions | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

#### Technology Function -811524922.jpg **Receive OSA Temp**

##### Function Interfaces

###### Inputs

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | |
| **Logical Signal Name** | **Technical Signal Name** | | | **Mapping Details** *(Conditional)* | **Subscriber Interface** | **Connection**  (*Optional)* |
| Review in model  OSA Temp  AmbientTemperature  AmbientTemperature | OSA Temp | | |  |  |  |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | |

Table 5‑2: Input Signal mappings of Function Receive OSA Temp

###### Outputs

(No outputs have been defined)

###### Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Parameter Name** | **Technical Parameter Name** | **Mapping Details** *(Conditional)* | **Method** | **Method Details** |
| Name should be a Word reference to the “*Logical Parameters*” name bookmark in the Data Dictionary | Name should be a Word reference to the “*Technical Parameters*” name bookmark in the Data Dictionary | If mapping is not 1:1 you might reference a Mapping description object from the *Mappings* section | Choose an item. | Depends on Method selection. For Method 2 a DID including start bit and length could be given. For Central Car Config a signal could be referenced |
|  |  |  |  |  |

Table 5‑4: Parameter mappings of Function “MyLogicalFunctionA\_Component1”

###### Interface Requirements

##### Function Requirements

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Modification** | **Requirement ID**  (of Technology Function) | **Comment** |
| REQ\_abc |  | Removed | -- |  |
| REQ\_def |  | Replaced | REQ\_xyz |  |
| -- |  | Added | REQ\_123 |  |

Table 5‑5: Component Specific Requirements

|  |  |  |
| --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Comment** |
|  |  |  |
|  |  |  |
| … |  |  |

Table 5‑6: Inherited Requirements

###### Component Specific Requirements

OSA Temperture Provided to RCCM

When ECM\_HEV module recieves the signal "AirAmb\_Te\_Actl" it shall provide the signal to the RCCM module

Satisfied by:

* Functions:
  + Forward Ambient Temperature
  + Receive OSA Temp

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Test to determine that RCCM receives the signal | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * -2093158110.jpg Provide OAT Temperature | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

OSA Temperature ECM\_HEV to HPCM

When ECM\_HEV module receives the signal "AirAmb\_Te\_Actl", it shall provide the signal to the HPCM module

Satisfied by:

* Functions:
  + Forward Ambient Temperature
  + Receive OSA Temp

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Test to confirm that OSA temperature is provided to HPCM | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * -2093158110.jpg Provide OAT Temperature | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

### 12V Battery

12V Battery

#### Technology Function -898457329.jpg **Provide Off Plug Power**

##### Function Interfaces

###### Inputs

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | |
| **Logical Signal Name** | **Technical Signal Name** | | | **Mapping Details** *(Conditional)* | **Subscriber Interface** | **Connection**  (*Optional)* |
| Review in model  12V Pwr | 12V Pwr | | |  |  |  |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | |

Table 5‑2: Input Signal mappings of Function Provide Off Plug Power

###### Outputs

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | |
| **Logical Signal Name** | **Technical Signal Name** | | | **Mapping Details** *(Conditional)* | **Publisher Interface** | **Connection**  (*Optional)* |
| Review in model  Off Plug Pwr | Off Plug Pwr | | |  |  |  |
| Review in model  Off Plug Pwr | Off Plug Pwr | | |  |  |  |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | |

Table 5‑3: Output Signal mappings of Function Provide Off Plug Power

###### Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Parameter Name** | **Technical Parameter Name** | **Mapping Details** *(Conditional)* | **Method** | **Method Details** |
| Name should be a Word reference to the “*Logical Parameters*” name bookmark in the Data Dictionary | Name should be a Word reference to the “*Technical Parameters*” name bookmark in the Data Dictionary | If mapping is not 1:1 you might reference a Mapping description object from the *Mappings* section | Choose an item. | Depends on Method selection. For Method 2 a DID including start bit and length could be given. For Central Car Config a signal could be referenced |
|  |  |  |  |  |

Table 5‑4: Parameter mappings of Function “MyLogicalFunctionA\_Component1”

###### Interface Requirements

##### Function Requirements

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Modification** | **Requirement ID**  (of Technology Function) | **Comment** |
| REQ\_abc |  | Removed | -- |  |
| REQ\_def |  | Replaced | REQ\_xyz |  |
| -- |  | Added | REQ\_123 |  |

Table 5‑5: Component Specific Requirements

|  |  |  |
| --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Comment** |
|  |  |  |
|  |  |  |
| … |  |  |

Table 5‑6: Inherited Requirements

###### Component Specific Requirements

Vehicle Status

The BMS module shall provide the BCM module with the vehicle status signals "Battery Status", "Ignition Status", "Transmission Status", "Vehicle Speed", and "WakeUp"

Satisfied by:

* Functions:
  + Charge 12V Battery
  + Provide Ambient Temperature
  + Provide Cabin Temperature
  + Provide HV Battery Temperature
  + Provide HV OnPlug Status
  + Provide Off Plug Power

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Observation of TMOS running and checking vehicle status | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * -860569925.jpg Provide Vehicle Status * -860569925.jpg Key On Summary Conditions * -860569925.jpg Check Vehicle Status Subfunction | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

Battery Plug State

When the vehicle is in onplug mode, The "Provide HV OnPlug Status" component function shall provide a signal "PlgStatEvnt\_B\_Stat=On Plug" to the HPCM module

Satisfied by:

* Functions:
  + Provide Off Plug Power

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Observation of compressor and fan running simultaneously | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * 1018784892.jpg Battery SOC Wake Up Conditions | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | Ready for Review |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

### PCM

PCM

#### Technology Function -949365084.jpg **WakeUp HPCM Request**

##### Function Interfaces

###### Inputs

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | |
| **Logical Signal Name** | **Technical Signal Name** | | | **Mapping Details** *(Conditional)* | **Subscriber Interface** | **Connection**  (*Optional)* |
| Review in model  wakeup ecg-bcm | wakeup ecg-bcm | | |  |  |  |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | |

Table 5‑2: Input Signal mappings of Function WakeUp HPCM Request

###### Outputs

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | |
| **Logical Signal Name** | **Technical Signal Name** | | | **Mapping Details** *(Conditional)* | **Publisher Interface** | **Connection**  (*Optional)* |
| Review in model  WakeUp | WakeUp | | |  |  |  |
| Review in model  Vehicle Status  IgnitionStatusUpdated | Vehicle Status | | |  |  |  |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | |

Table 5‑3: Output Signal mappings of Function WakeUp HPCM Request

###### Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Parameter Name** | **Technical Parameter Name** | **Mapping Details** *(Conditional)* | **Method** | **Method Details** |
| Name should be a Word reference to the “*Logical Parameters*” name bookmark in the Data Dictionary | Name should be a Word reference to the “*Technical Parameters*” name bookmark in the Data Dictionary | If mapping is not 1:1 you might reference a Mapping description object from the *Mappings* section | Choose an item. | Depends on Method selection. For Method 2 a DID including start bit and length could be given. For Central Car Config a signal could be referenced |
|  |  |  |  |  |

Table 5‑4: Parameter mappings of Function “MyLogicalFunctionA\_Component1”

###### Interface Requirements

##### Function Requirements

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Modification** | **Requirement ID**  (of Technology Function) | **Comment** |
| REQ\_abc |  | Removed | -- |  |
| REQ\_def |  | Replaced | REQ\_xyz |  |
| -- |  | Added | REQ\_123 |  |

Table 5‑5: Component Specific Requirements

|  |  |  |
| --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Comment** |
|  |  |  |
|  |  |  |
| … |  |  |

Table 5‑6: Inherited Requirements

###### Component Specific Requirements

WakeUp Time

When WakeUp timer expires, the BCM module shall send the signal "WakeUpHPCM" to the PCM module.

Satisfied by:

* Functions:
  + WakeUp HPCM Request

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Test to confirm AWD\_DLCM received wake up signal | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * 185210174.jpg Settings Wake Up Tasks * 1123627672.jpg Wakeup Conditions | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

WakeUp Timer

The HPCM module shall send a signal "Wake Up" every X number of minutes to the BCM module

Satisfied by:

* Functions:
  + WakeUp HPCM Request

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Test to confirm BCM receives wakeup signal from HPCM | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * 185210174.jpg Settings Wake Up Tasks * 185210174.jpg Wake Up Time * 1123627672.jpg Wakeup Conditions | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

WakeUp Step 2

When the PCM receives a signal "WakeUpHPCM" from the BCM it shall forward the signal to the HPCM

Satisfied by:

* Functions:
  + WakeUp HPCM Request

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Test to confirm HPCM received wakeup signal | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * 185210174.jpg Settings Wake Up Tasks * 185210174.jpg WAKE Up Frequency | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

Sleep Mode Sequence

When "Determine Cabin Cooling Conditions" component function receives the signal "WakeUp" it shall query the RCCM module for the signal "Cabn\_Amb\_Te\_Actl" for the cabin temperature. If "CabnThrml\_Te\_Actl"<50C, the HPCM shall go back to sleep.

Satisfied by:

* Functions:
  + Provide EVCM Sleep Request
  + WakeUp HPCM Request

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Test of Cabn\_Amb\_Te\_Actl | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * 1512842653.jpg Go To Sleep Condition * 1512842653.jpg Go2Sleep | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

#### Technology Function 307910044.jpg **Provide HV Battery Temperature**

##### Function Interfaces

###### Inputs

(No inputs have been defined)

###### Outputs

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | |
| **Logical Signal Name** | **Technical Signal Name** | | | **Mapping Details** *(Conditional)* | **Publisher Interface** | **Connection**  (*Optional)* |
| Review in model  HV Bat Temp  HVBatteryTemperature | HV Bat Temp | | |  |  |  |
| Review in model  HV Batt Temp  HVBatteryTemperature | HV Batt Temp | | |  |  |  |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | |

Table 5‑3: Output Signal mappings of Function Provide HV Battery Temperature

###### Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Parameter Name** | **Technical Parameter Name** | **Mapping Details** *(Conditional)* | **Method** | **Method Details** |
| Name should be a Word reference to the “*Logical Parameters*” name bookmark in the Data Dictionary | Name should be a Word reference to the “*Technical Parameters*” name bookmark in the Data Dictionary | If mapping is not 1:1 you might reference a Mapping description object from the *Mappings* section | Choose an item. | Depends on Method selection. For Method 2 a DID including start bit and length could be given. For Central Car Config a signal could be referenced |
|  |  |  |  |  |

Table 5‑4: Parameter mappings of Function “MyLogicalFunctionA\_Component1”

###### Interface Requirements

##### Function Requirements

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Modification** | **Requirement ID**  (of Technology Function) | **Comment** |
| REQ\_abc |  | Removed | -- |  |
| REQ\_def |  | Replaced | REQ\_xyz |  |
| -- |  | Added | REQ\_123 |  |

Table 5‑5: Component Specific Requirements

|  |  |  |
| --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Comment** |
|  |  |  |
|  |  |  |
| … |  |  |

Table 5‑6: Inherited Requirements

###### Component Specific Requirements

Vehicle Status

The BMS module shall provide the BCM module with the vehicle status signals "Battery Status", "Ignition Status", "Transmission Status", "Vehicle Speed", and "WakeUp"

Satisfied by:

* Functions:
  + Charge 12V Battery
  + Provide Ambient Temperature
  + Provide Cabin Temperature
  + Provide HV Battery Temperature
  + Provide HV OnPlug Status
  + Provide Off Plug Power

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Observation of TMOS running and checking vehicle status | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * -860569925.jpg Provide Vehicle Status * -860569925.jpg Key On Summary Conditions * -860569925.jpg Check Vehicle Status Subfunction | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

#### Technology Function -1021831036.jpg **Provide EVCM Sleep Request**

##### Function Interfaces

###### Inputs

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | |
| **Logical Signal Name** | **Technical Signal Name** | | | **Mapping Details** *(Conditional)* | **Subscriber Interface** | **Connection**  (*Optional)* |
| Review in model  Sleep Rq | Sleep Rq | | |  |  |  |
| Review in model  feedback | feedback | | |  |  |  |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | |

Table 5‑2: Input Signal mappings of Function Provide EVCM Sleep Request

###### Outputs

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | |
| **Logical Signal Name** | **Technical Signal Name** | | | **Mapping Details** *(Conditional)* | **Publisher Interface** | **Connection**  (*Optional)* |
| Review in model  output | output | | |  |  |  |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | |

Table 5‑3: Output Signal mappings of Function Provide EVCM Sleep Request

###### Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Parameter Name** | **Technical Parameter Name** | **Mapping Details** *(Conditional)* | **Method** | **Method Details** |
| Name should be a Word reference to the “*Logical Parameters*” name bookmark in the Data Dictionary | Name should be a Word reference to the “*Technical Parameters*” name bookmark in the Data Dictionary | If mapping is not 1:1 you might reference a Mapping description object from the *Mappings* section | Choose an item. | Depends on Method selection. For Method 2 a DID including start bit and length could be given. For Central Car Config a signal could be referenced |
|  |  |  |  |  |

Table 5‑4: Parameter mappings of Function “MyLogicalFunctionA\_Component1”

###### Interface Requirements

##### Function Requirements

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Modification** | **Requirement ID**  (of Technology Function) | **Comment** |
| REQ\_abc |  | Removed | -- |  |
| REQ\_def |  | Replaced | REQ\_xyz |  |
| -- |  | Added | REQ\_123 |  |

Table 5‑5: Component Specific Requirements

|  |  |  |
| --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Comment** |
|  |  |  |
|  |  |  |
| … |  |  |

Table 5‑6: Inherited Requirements

###### Component Specific Requirements

Sleep Mode Sequence

When "Determine Cabin Cooling Conditions" component function receives the signal "WakeUp" it shall query the RCCM module for the signal "Cabn\_Amb\_Te\_Actl" for the cabin temperature. If "CabnThrml\_Te\_Actl"<50C, the HPCM shall go back to sleep.

Satisfied by:

* Functions:
  + Provide EVCM Sleep Request
  + WakeUp HPCM Request

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Test of Cabn\_Amb\_Te\_Actl | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * 1512842653.jpg Go To Sleep Condition * 1512842653.jpg Go2Sleep | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

### BCM ECU

BCM ECU

#### Technology Function -188590168.jpg **Provide WakeUp Request**

##### Function Interfaces

###### Inputs

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | |
| **Logical Signal Name** | **Technical Signal Name** | | | **Mapping Details** *(Conditional)* | **Subscriber Interface** | **Connection**  (*Optional)* |
| Review in model  Pwr Status | Pwr Status | | |  |  |  |
| Review in model  Wake Alarm | Wake Alarm | | |  |  |  |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | |

Table 5‑2: Input Signal mappings of Function Provide WakeUp Request

###### Outputs

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | |
| **Logical Signal Name** | **Technical Signal Name** | | | **Mapping Details** *(Conditional)* | **Publisher Interface** | **Connection**  (*Optional)* |
| Review in model  wakeup | wakeup | | |  |  |  |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | |

Table 5‑3: Output Signal mappings of Function Provide WakeUp Request

###### Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Parameter Name** | **Technical Parameter Name** | **Mapping Details** *(Conditional)* | **Method** | **Method Details** |
| Name should be a Word reference to the “*Logical Parameters*” name bookmark in the Data Dictionary | Name should be a Word reference to the “*Technical Parameters*” name bookmark in the Data Dictionary | If mapping is not 1:1 you might reference a Mapping description object from the *Mappings* section | Choose an item. | Depends on Method selection. For Method 2 a DID including start bit and length could be given. For Central Car Config a signal could be referenced |
|  |  |  |  |  |

Table 5‑4: Parameter mappings of Function “MyLogicalFunctionA\_Component1”

###### Interface Requirements

##### Function Requirements

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Modification** | **Requirement ID**  (of Technology Function) | **Comment** |
| REQ\_abc |  | Removed | -- |  |
| REQ\_def |  | Replaced | REQ\_xyz |  |
| -- |  | Added | REQ\_123 |  |

Table 5‑5: Component Specific Requirements

|  |  |  |
| --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Comment** |
|  |  |  |
|  |  |  |
| … |  |  |

Table 5‑6: Inherited Requirements

###### Component Specific Requirements

WakeUp Step 1

When BCM module receives the alarm signal "wake up" it shall provide PCM module early wakes to the powertrain system which will wake up the HPCM

Satisfied by:

* Functions:
  + Provide WakeUp Request
  + WakeUp Alarm Request

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Test to confirm AWD\_DLCM receives wakeup signal form BCM | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * 1123627672.jpg Wakeup Conditions | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

#### Technology Function 1063686669.jpg **Go To Sleep**

##### Function Interfaces

###### Inputs

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | |
| **Logical Signal Name** | **Technical Signal Name** | | | **Mapping Details** *(Conditional)* | **Subscriber Interface** | **Connection**  (*Optional)* |
| Review in model  sleep | sleep | | |  |  |  |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | |

Table 5‑2: Input Signal mappings of Function Go To Sleep

###### Outputs

(No outputs have been defined)

###### Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Parameter Name** | **Technical Parameter Name** | **Mapping Details** *(Conditional)* | **Method** | **Method Details** |
| Name should be a Word reference to the “*Logical Parameters*” name bookmark in the Data Dictionary | Name should be a Word reference to the “*Technical Parameters*” name bookmark in the Data Dictionary | If mapping is not 1:1 you might reference a Mapping description object from the *Mappings* section | Choose an item. | Depends on Method selection. For Method 2 a DID including start bit and length could be given. For Central Car Config a signal could be referenced |
|  |  |  |  |  |

Table 5‑4: Parameter mappings of Function “MyLogicalFunctionA\_Component1”

###### Interface Requirements

##### Function Requirements

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Modification** | **Requirement ID**  (of Technology Function) | **Comment** |
| REQ\_abc |  | Removed | -- |  |
| REQ\_def |  | Replaced | REQ\_xyz |  |
| -- |  | Added | REQ\_123 |  |

Table 5‑5: Component Specific Requirements

|  |  |  |
| --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Comment** |
|  |  |  |
|  |  |  |
| … |  |  |

Table 5‑6: Inherited Requirements

###### Component Specific Requirements

Sleep Request After TMOS Run

The HPCM module shall provide a sleep request signal "SLEEP" to the BCM when TMOS feature has completed a cooling cycle

Satisfied by:

* Functions:
  + Go To Sleep

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Test to confirm BCM receives sleep request | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * 1512842653.jpg Go To Sleep Condition * 830584505.jpg SIS Controller Storage * -909553606.jpg check HV battery cooling conditions * -909553606.jpg Provide Feedback Sleep Request * 1512842653.jpg Go2Sleep | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

ECU Sleep Request

When HPCM module sends the RCCM signal "Blower Off" and the ACCM signal "Compressor On", all ECU's shall go to sleep

Satisfied by:

* Functions:
  + Go To Sleep

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** |  | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** |  |
| **Source Req.** | * 1512842653.jpg Go To Sleep Condition | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** |  | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

#### Technology Function -949365084.jpg **WakeUp HPCM Request**

##### Function Interfaces

###### Inputs

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | |
| **Logical Signal Name** | **Technical Signal Name** | | | **Mapping Details** *(Conditional)* | **Subscriber Interface** | **Connection**  (*Optional)* |
| Review in model  wakeup ecg-bcm | wakeup ecg-bcm | | |  |  |  |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | |

Table 5‑2: Input Signal mappings of Function WakeUp HPCM Request

###### Outputs

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | |
| **Logical Signal Name** | **Technical Signal Name** | | | **Mapping Details** *(Conditional)* | **Publisher Interface** | **Connection**  (*Optional)* |
| Review in model  WakeUp | WakeUp | | |  |  |  |
| Review in model  Vehicle Status  IgnitionStatusUpdated | Vehicle Status | | |  |  |  |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | |

Table 5‑3: Output Signal mappings of Function WakeUp HPCM Request

###### Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Parameter Name** | **Technical Parameter Name** | **Mapping Details** *(Conditional)* | **Method** | **Method Details** |
| Name should be a Word reference to the “*Logical Parameters*” name bookmark in the Data Dictionary | Name should be a Word reference to the “*Technical Parameters*” name bookmark in the Data Dictionary | If mapping is not 1:1 you might reference a Mapping description object from the *Mappings* section | Choose an item. | Depends on Method selection. For Method 2 a DID including start bit and length could be given. For Central Car Config a signal could be referenced |
|  |  |  |  |  |

Table 5‑4: Parameter mappings of Function “MyLogicalFunctionA\_Component1”

###### Interface Requirements

##### Function Requirements

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Modification** | **Requirement ID**  (of Technology Function) | **Comment** |
| REQ\_abc |  | Removed | -- |  |
| REQ\_def |  | Replaced | REQ\_xyz |  |
| -- |  | Added | REQ\_123 |  |

Table 5‑5: Component Specific Requirements

|  |  |  |
| --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Comment** |
|  |  |  |
|  |  |  |
| … |  |  |

Table 5‑6: Inherited Requirements

###### Component Specific Requirements

WakeUp Time

When WakeUp timer expires, the BCM module shall send the signal "WakeUpHPCM" to the PCM module.

Satisfied by:

* Functions:
  + WakeUp HPCM Request

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Test to confirm AWD\_DLCM received wake up signal | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * 185210174.jpg Settings Wake Up Tasks * 1123627672.jpg Wakeup Conditions | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

WakeUp Timer

The HPCM module shall send a signal "Wake Up" every X number of minutes to the BCM module

Satisfied by:

* Functions:
  + WakeUp HPCM Request

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Test to confirm BCM receives wakeup signal from HPCM | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * 185210174.jpg Settings Wake Up Tasks * 185210174.jpg Wake Up Time * 1123627672.jpg Wakeup Conditions | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

WakeUp Step 2

When the PCM receives a signal "WakeUpHPCM" from the BCM it shall forward the signal to the HPCM

Satisfied by:

* Functions:
  + WakeUp HPCM Request

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Test to confirm HPCM received wakeup signal | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * 185210174.jpg Settings Wake Up Tasks * 185210174.jpg WAKE Up Frequency | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

Sleep Mode Sequence

When "Determine Cabin Cooling Conditions" component function receives the signal "WakeUp" it shall query the RCCM module for the signal "Cabn\_Amb\_Te\_Actl" for the cabin temperature. If "CabnThrml\_Te\_Actl"<50C, the HPCM shall go back to sleep.

Satisfied by:

* Functions:
  + Provide EVCM Sleep Request
  + WakeUp HPCM Request

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Test of Cabn\_Amb\_Te\_Actl | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * 1512842653.jpg Go To Sleep Condition * 1512842653.jpg Go2Sleep | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

### APIM 4.0

APIM 4.0

#### Technology Function -2027259084.jpg **Display User Settings and Feedback**

##### Function Interfaces

###### Inputs

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | |
| **Logical Signal Name** | **Technical Signal Name** | | | **Mapping Details** *(Conditional)* | **Subscriber Interface** | **Connection**  (*Optional)* |
| Review in model  Send Settings  Feature Settings | Send Settings | | |  |  |  |
| Review in model  feedback  CoolingStatusUpdated | feedback | | |  |  |  |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | |

Table 5‑2: Input Signal mappings of Function Display User Settings and Feedback

###### Outputs

(No outputs have been defined)

###### Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Parameter Name** | **Technical Parameter Name** | **Mapping Details** *(Conditional)* | **Method** | **Method Details** |
| Name should be a Word reference to the “*Logical Parameters*” name bookmark in the Data Dictionary | Name should be a Word reference to the “*Technical Parameters*” name bookmark in the Data Dictionary | If mapping is not 1:1 you might reference a Mapping description object from the *Mappings* section | Choose an item. | Depends on Method selection. For Method 2 a DID including start bit and length could be given. For Central Car Config a signal could be referenced |
|  |  |  |  |  |

Table 5‑4: Parameter mappings of Function “MyLogicalFunctionA\_Component1”

###### Interface Requirements

##### Function Requirements

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Modification** | **Requirement ID**  (of Technology Function) | **Comment** |
| REQ\_abc |  | Removed | -- |  |
| REQ\_def |  | Replaced | REQ\_xyz |  |
| -- |  | Added | REQ\_123 |  |

Table 5‑5: Component Specific Requirements

|  |  |  |
| --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Comment** |
|  |  |  |
|  |  |  |
| … |  |  |

Table 5‑6: Inherited Requirements

###### Component Specific Requirements

Cooling Status Feedback

When "Provide Cooling Feedback" component function completes TMOS cooling, it shall provide the APIM with the Cooling Status signal of "HMI-CustFeedback=FAILED\_TO\_COOL" or "HMI-CustFeedback= COOLING\_SUCCESSFUL"

Satisfied by:

* Functions:
  + Display User Settings and Feedback
  + Provide Cooling Feedback

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Observation of TMOS run feedback in SYNC Display Screen | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * -1239765822.jpg Cabin Cooling Successful Condition * -1239765822.jpg Cooling Status and Duration Feedback * -1239765822.jpg Failed To Cool Status * -1239765822.jpg Battery Cooling Successful Condition * -1239765822.jpg Request Climate System Off Condition | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

Detect TMOS Settings from APIM

When "Store Settings" component function receives TMOS user settings signals "FAN", "OFF", or "FAN\_PLUS\_AC" from the APIM module, it shall store the settings

Satisfied by:

* Functions:
  + Display User Settings and Feedback
  + Provide User Settings

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Observation of feedback on HMI screen | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * -35011051.jpg Feature Settings in SYNC | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

#### Technology Function 1019980849.jpg **Provide User Settings**

##### Function Interfaces

###### Inputs

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | |
| **Logical Signal Name** | **Technical Signal Name** | | | **Mapping Details** *(Conditional)* | **Subscriber Interface** | **Connection**  (*Optional)* |
| Review in model  User Input  Feature Settings | User Input | | |  |  |  |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | |

Table 5‑2: Input Signal mappings of Function Provide User Settings

###### Outputs

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | |
| **Logical Signal Name** | **Technical Signal Name** | | | **Mapping Details** *(Conditional)* | **Publisher Interface** | **Connection**  (*Optional)* |
| Review in model  output  Feature Settings | output | | |  |  |  |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | |

Table 5‑3: Output Signal mappings of Function Provide User Settings

###### Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Parameter Name** | **Technical Parameter Name** | **Mapping Details** *(Conditional)* | **Method** | **Method Details** |
| Name should be a Word reference to the “*Logical Parameters*” name bookmark in the Data Dictionary | Name should be a Word reference to the “*Technical Parameters*” name bookmark in the Data Dictionary | If mapping is not 1:1 you might reference a Mapping description object from the *Mappings* section | Choose an item. | Depends on Method selection. For Method 2 a DID including start bit and length could be given. For Central Car Config a signal could be referenced |
|  |  |  |  |  |

Table 5‑4: Parameter mappings of Function “MyLogicalFunctionA\_Component1”

###### Interface Requirements

##### Function Requirements

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Modification** | **Requirement ID**  (of Technology Function) | **Comment** |
| REQ\_abc |  | Removed | -- |  |
| REQ\_def |  | Replaced | REQ\_xyz |  |
| -- |  | Added | REQ\_123 |  |

Table 5‑5: Component Specific Requirements

|  |  |  |
| --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Comment** |
|  |  |  |
|  |  |  |
| … |  |  |

Table 5‑6: Inherited Requirements

###### Component Specific Requirements

Detect TMOS Settings from APIM

When "Store Settings" component function receives TMOS user settings signals "FAN", "OFF", or "FAN\_PLUS\_AC" from the APIM module, it shall store the settings

Satisfied by:

* Functions:
  + Display User Settings and Feedback
  + Provide User Settings

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Observation of feedback on HMI screen | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * -35011051.jpg Feature Settings in SYNC | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

#### Technology Function -564108767.jpg **Input User Settings**

##### Function Interfaces

###### Inputs

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | |
| **Logical Signal Name** | **Technical Signal Name** | | | **Mapping Details** *(Conditional)* | **Subscriber Interface** | **Connection**  (*Optional)* |
| Review in model  UserSettingsInput  Feature Settings | UserSettingsInput | | |  |  |  |
| Review in model  ECG-APIM  Feature Settings | ECG-APIM | | |  |  |  |
| Review in model  PhoneInput  Feature Settings | PhoneInput | | |  |  |  |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | |

Table 5‑2: Input Signal mappings of Function Input User Settings

###### Outputs

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | |
| **Logical Signal Name** | **Technical Signal Name** | | | **Mapping Details** *(Conditional)* | **Publisher Interface** | **Connection**  (*Optional)* |
| Review in model  Send Settings  Feature Settings | Send Settings | | |  |  |  |
| Review in model  User Input  Feature Settings | User Input | | |  |  |  |
| Review in model  APIM -ECG  Feature Settings | APIM -ECG | | |  |  |  |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | |

Table 5‑3: Output Signal mappings of Function Input User Settings

###### Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Parameter Name** | **Technical Parameter Name** | **Mapping Details** *(Conditional)* | **Method** | **Method Details** |
| Name should be a Word reference to the “*Logical Parameters*” name bookmark in the Data Dictionary | Name should be a Word reference to the “*Technical Parameters*” name bookmark in the Data Dictionary | If mapping is not 1:1 you might reference a Mapping description object from the *Mappings* section | Choose an item. | Depends on Method selection. For Method 2 a DID including start bit and length could be given. For Central Car Config a signal could be referenced |
|  |  |  |  |  |

Table 5‑4: Parameter mappings of Function “MyLogicalFunctionA\_Component1”

###### Interface Requirements

##### Function Requirements

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Modification** | **Requirement ID**  (of Technology Function) | **Comment** |
| REQ\_abc |  | Removed | -- |  |
| REQ\_def |  | Replaced | REQ\_xyz |  |
| -- |  | Added | REQ\_123 |  |

Table 5‑5: Component Specific Requirements

|  |  |  |
| --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Comment** |
|  |  |  |
|  |  |  |
| … |  |  |

Table 5‑6: Inherited Requirements

###### Component Specific Requirements

APIM Phone Input

When "Input User Settings" component function receives the signals "ThrmlSet\_D\_RqMnu=FAN", OFF", "ThrmlSet\_D\_RqMnu=FAN\_PLUS\_AC", or "ThrmlSet\_D\_RqMnu=NONE" from the hand held device, It shall forward them to the HPCM

Satisfied by:

* Functions:
  + Input User Settings
  + Receive Off\_Board Request
  + Relay Off Board Request

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Observation of TMOS user settings in Phone????? | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * 666096180.jpg Phone Placeholder 1 * 666096180.jpg Display Settings Control * 1815969264.jpg Control TMOS functionality * 666096180.jpg Phone Placeholder 2 * 666096180.jpg Detect User Input * 666096180.jpg Ford Pass Lincoln Way * 666096180.jpg Phone Placeholder 3 * 666096180.jpg Feature Settings Remote Activation | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | Ready for Review |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

APIM User Input

When "Input User Settings" component function receives the signals "ThrmlSet\_D\_RqMnu=FAN", OFF", "ThrmlSet\_D\_RqMnu=FAN\_PLUS\_AC", from touch screen selections, It shall forward them to the HPCM

Satisfied by:

* Functions:
  + Input User Settings

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Observation of TMOS user request in SYNC Display Screen | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * 666096180.jpg Display Settings Control * 1815969264.jpg Control TMOS functionality * 666096180.jpg Detect User Input | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | Ready for Review |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

### BCCM

BCCM

#### Technology Function 1176638447.jpg **Provide HV OnPlug Status**

##### Function Interfaces

###### Inputs

(No inputs have been defined)

###### Outputs

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | |
| **Logical Signal Name** | **Technical Signal Name** | | | **Mapping Details** *(Conditional)* | **Publisher Interface** | **Connection**  (*Optional)* |
| Review in model  OnPlug  PlugInStatus | OnPlug | | |  |  |  |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | |

Table 5‑3: Output Signal mappings of Function Provide HV OnPlug Status

###### Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Parameter Name** | **Technical Parameter Name** | **Mapping Details** *(Conditional)* | **Method** | **Method Details** |
| Name should be a Word reference to the “*Logical Parameters*” name bookmark in the Data Dictionary | Name should be a Word reference to the “*Technical Parameters*” name bookmark in the Data Dictionary | If mapping is not 1:1 you might reference a Mapping description object from the *Mappings* section | Choose an item. | Depends on Method selection. For Method 2 a DID including start bit and length could be given. For Central Car Config a signal could be referenced |
|  |  |  |  |  |

Table 5‑4: Parameter mappings of Function “MyLogicalFunctionA\_Component1”

###### Interface Requirements

##### Function Requirements

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Modification** | **Requirement ID**  (of Technology Function) | **Comment** |
| REQ\_abc |  | Removed | -- |  |
| REQ\_def |  | Replaced | REQ\_xyz |  |
| -- |  | Added | REQ\_123 |  |

Table 5‑5: Component Specific Requirements

|  |  |  |
| --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Comment** |
|  |  |  |
|  |  |  |
| … |  |  |

Table 5‑6: Inherited Requirements

###### Component Specific Requirements

Vehicle Status

The BMS module shall provide the BCM module with the vehicle status signals "Battery Status", "Ignition Status", "Transmission Status", "Vehicle Speed", and "WakeUp"

Satisfied by:

* Functions:
  + Charge 12V Battery
  + Provide Ambient Temperature
  + Provide Cabin Temperature
  + Provide HV Battery Temperature
  + Provide HV OnPlug Status
  + Provide Off Plug Power

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Observation of TMOS running and checking vehicle status | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * -860569925.jpg Provide Vehicle Status * -860569925.jpg Key On Summary Conditions * -860569925.jpg Check Vehicle Status Subfunction | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

### ECM\_HEV ECU

ECM\_HEV ECU

#### Technology Function 1982126776.jpg **Forward Ambient Temperature**

##### Function Interfaces

###### Inputs

(No inputs have been defined)

###### Outputs

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | |
| **Logical Signal Name** | **Technical Signal Name** | | | **Mapping Details** *(Conditional)* | **Publisher Interface** | **Connection**  (*Optional)* |
| Review in model  OSA  AmbientTemperature  AmbientTemperature | OSA | | |  |  |  |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | |

Table 5‑3: Output Signal mappings of Function Forward Ambient Temperature

###### Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Parameter Name** | **Technical Parameter Name** | **Mapping Details** *(Conditional)* | **Method** | **Method Details** |
| Name should be a Word reference to the “*Logical Parameters*” name bookmark in the Data Dictionary | Name should be a Word reference to the “*Technical Parameters*” name bookmark in the Data Dictionary | If mapping is not 1:1 you might reference a Mapping description object from the *Mappings* section | Choose an item. | Depends on Method selection. For Method 2 a DID including start bit and length could be given. For Central Car Config a signal could be referenced |
|  |  |  |  |  |

Table 5‑4: Parameter mappings of Function “MyLogicalFunctionA\_Component1”

###### Interface Requirements

##### Function Requirements

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Modification** | **Requirement ID**  (of Technology Function) | **Comment** |
| REQ\_abc |  | Removed | -- |  |
| REQ\_def |  | Replaced | REQ\_xyz |  |
| -- |  | Added | REQ\_123 |  |

Table 5‑5: Component Specific Requirements

|  |  |  |
| --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Comment** |
|  |  |  |
|  |  |  |
| … |  |  |

Table 5‑6: Inherited Requirements

###### Component Specific Requirements

OSA Temperture Provided to RCCM

When ECM\_HEV module recieves the signal "AirAmb\_Te\_Actl" it shall provide the signal to the RCCM module

Satisfied by:

* Functions:
  + Forward Ambient Temperature
  + Receive OSA Temp

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Test to determine that RCCM receives the signal | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * -2093158110.jpg Provide OAT Temperature | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

OSA Temperature ECM\_HEV to HPCM

When ECM\_HEV module receives the signal "AirAmb\_Te\_Actl", it shall provide the signal to the HPCM module

Satisfied by:

* Functions:
  + Forward Ambient Temperature
  + Receive OSA Temp

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Test to confirm that OSA temperature is provided to HPCM | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * -2093158110.jpg Provide OAT Temperature | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

OSA Detection

The ECM\_HEV module shall receives the signal "AirAmb\_Te\_Actl" from the ambient temperature sensor

Satisfied by:

* Functions:
  + Forward Ambient Temperature
  + Provide Ambient Temperature

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Test to confirm that ECM\_HEV has detected the ambient temperature | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * -2093158110.jpg Provide OAT Temperature | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

#### Technology Function 806159091.jpg **Provide Ambient Temperature**

##### Function Interfaces

###### Inputs

(No inputs have been defined)

###### Outputs

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | |
| **Logical Signal Name** | **Technical Signal Name** | | | **Mapping Details** *(Conditional)* | **Publisher Interface** | **Connection**  (*Optional)* |
| Review in model  OSA Temp  AmbientTemperature  AmbientTemperature | OSA Temp | | |  |  |  |
| Review in model  OSA Temp  AmbientTemperature  AmbientTemperature | OSA Temp | | |  |  |  |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | |

Table 5‑3: Output Signal mappings of Function Provide Ambient Temperature

###### Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Parameter Name** | **Technical Parameter Name** | **Mapping Details** *(Conditional)* | **Method** | **Method Details** |
| Name should be a Word reference to the “*Logical Parameters*” name bookmark in the Data Dictionary | Name should be a Word reference to the “*Technical Parameters*” name bookmark in the Data Dictionary | If mapping is not 1:1 you might reference a Mapping description object from the *Mappings* section | Choose an item. | Depends on Method selection. For Method 2 a DID including start bit and length could be given. For Central Car Config a signal could be referenced |
|  |  |  |  |  |

Table 5‑4: Parameter mappings of Function “MyLogicalFunctionA\_Component1”

###### Interface Requirements

##### Function Requirements

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Modification** | **Requirement ID**  (of Technology Function) | **Comment** |
| REQ\_abc |  | Removed | -- |  |
| REQ\_def |  | Replaced | REQ\_xyz |  |
| -- |  | Added | REQ\_123 |  |

Table 5‑5: Component Specific Requirements

|  |  |  |
| --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Comment** |
|  |  |  |
|  |  |  |
| … |  |  |

Table 5‑6: Inherited Requirements

###### Component Specific Requirements

Vehicle Status

The BMS module shall provide the BCM module with the vehicle status signals "Battery Status", "Ignition Status", "Transmission Status", "Vehicle Speed", and "WakeUp"

Satisfied by:

* Functions:
  + Charge 12V Battery
  + Provide Ambient Temperature
  + Provide Cabin Temperature
  + Provide HV Battery Temperature
  + Provide HV OnPlug Status
  + Provide Off Plug Power

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Observation of TMOS running and checking vehicle status | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * -860569925.jpg Provide Vehicle Status * -860569925.jpg Key On Summary Conditions * -860569925.jpg Check Vehicle Status Subfunction | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

OSA Detection

The ECM\_HEV module shall receives the signal "AirAmb\_Te\_Actl" from the ambient temperature sensor

Satisfied by:

* Functions:
  + Forward Ambient Temperature
  + Provide Ambient Temperature

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Test to confirm that ECM\_HEV has detected the ambient temperature | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * -2093158110.jpg Provide OAT Temperature | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

### BECM

BECM

#### Technology Function 1176638447.jpg **Provide HV OnPlug Status**

##### Function Interfaces

###### Inputs

(No inputs have been defined)

###### Outputs

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | |
| **Logical Signal Name** | **Technical Signal Name** | | | **Mapping Details** *(Conditional)* | **Publisher Interface** | **Connection**  (*Optional)* |
| Review in model  OnPlug  PlugInStatus | OnPlug | | |  |  |  |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | |

Table 5‑3: Output Signal mappings of Function Provide HV OnPlug Status

###### Parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Logical Parameter Name** | **Technical Parameter Name** | **Mapping Details** *(Conditional)* | **Method** | **Method Details** |
| Name should be a Word reference to the “*Logical Parameters*” name bookmark in the Data Dictionary | Name should be a Word reference to the “*Technical Parameters*” name bookmark in the Data Dictionary | If mapping is not 1:1 you might reference a Mapping description object from the *Mappings* section | Choose an item. | Depends on Method selection. For Method 2 a DID including start bit and length could be given. For Central Car Config a signal could be referenced |
|  |  |  |  |  |

Table 5‑4: Parameter mappings of Function “MyLogicalFunctionA\_Component1”

###### Interface Requirements

##### Function Requirements

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Modification** | **Requirement ID**  (of Technology Function) | **Comment** |
| REQ\_abc |  | Removed | -- |  |
| REQ\_def |  | Replaced | REQ\_xyz |  |
| -- |  | Added | REQ\_123 |  |

Table 5‑5: Component Specific Requirements

|  |  |  |
| --- | --- | --- |
| **Requirement ID**  (of Logical Function) | **Requirement Title** | **Comment** |
|  |  |  |
|  |  |  |
| … |  |  |

Table 5‑6: Inherited Requirements

###### Component Specific Requirements

Vehicle Status

The BMS module shall provide the BCM module with the vehicle status signals "Battery Status", "Ignition Status", "Transmission Status", "Vehicle Speed", and "WakeUp"

Satisfied by:

* Functions:
  + Charge 12V Battery
  + Provide Ambient Temperature
  + Provide Cabin Temperature
  + Provide HV Battery Temperature
  + Provide HV OnPlug Status
  + Provide Off Plug Power

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: | | | | | | | |
| **Rationale** |  | | | | | | |
| **Acceptance Criteria** | Observation of TMOS running and checking vehicle status | | | | | | |
| **Notes** |  | | | | | | |
| **Source** |  | | | | | **Owner** | Lynn Collins |
| **Source Req.** | * -860569925.jpg Provide Vehicle Status * -860569925.jpg Key On Summary Conditions * -860569925.jpg Check Vehicle Status Subfunction | | | | | **V&V Method** |  |
| **Type** |  | | | **Priority** | 2 - Medium | **Status** | In-Progress |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0 | End of Requirement | | | | |

## Requirements on Connections

### Networks

#### “CAN Bus xxx”

##### Protocol Requirements

##### Electrical Requirements

#### “LIN Bus xxx”

##### Protocol Requirements

###### Schedule Table

##### Electrical Requirements

#### “Ethernet xxx”

### HW I/Os

#### “HW I/O xxx”

## Requirements on Development Process

# Open Concerns

| ID | Concern Description | e-Tracker Reference | Status | Solution |
| --- | --- | --- | --- | --- |
| 1 | How to fully capture Wake/Sleep requirements. Currently we have a mismatch between what is captured in old EuCD SRD requirements and what is captured in AIS Publisher Interfaces (Publishing Network Sleep Inhibitor, Network Wake Up) |  | Open | Extend AIS attributes? |
| 2 | Clarify how to export Message list entries from CMDB in VSEM |  | Open |  |
| 3 |  |  |  |  |
| 4 |  |  |  |  |

Table 6‑1: Open Concerns

# Revision History

No Revision History found.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Revision | Date | Description | Approved by | Responsible |
| A |  | Initial version |  | Jbaden1 |
|  |  |  |  |  |

## Template Revisions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Version | Rev. | Date | Description | Responsible |
| 0 | 2 | 2015-08-05 | * TOC corrected * Document Properties adapted to match needs of VBA macros | Awegman1 |
| 1 | 0 | 2015-11-16 | * Revision History moved to chapter 7 * Table-Styles removed | Awegman1 |
| 1 | 1 | 2016-03-02 | * Rework according to PCL example | Jbaden1 |
| 1 | 2 | 2016-03-22 | * V1.3: Footer formating corrected (Issue 19) * “Constraints” chapter renamed to “Input Requirements” (Issue 20) | Jbaden1 |
| 1 | 3 | 2016-04-20 | * Broken Wiki links repaired | Jbaden1 |
| 2 | 0 | 2016-05-23 | * Prepared for Specification\_Macros.dotm v2.0 * Additional explanations added to ch. 2.2 “Input Requirements” (ARL and SDS requirements often go here) | Jbaden1 |
| 2 | 1 | 2016-07-08 | * Template version added to footer | Jbaden1 |
| 2 | 2 | 2016-07-15 | * Sample SysML diagrams added * Data Dictionary reworked * Alignment with relevant sections in SRD templated | Jbaden1 |
| 3 | 0 | 2016-09-05 | * Lessons learned from IPRB incorporated | Jbaden1 |
| 4 | 0 | 2016-09-27 | * Alignment with QPIP Feature Function Ownership workstream. Platform Spec renamed to Feature Implementation Spec | Jbaden1 |
| 4 | 1 | 2016-11-04 | * Chapters “Purpose” and “Scope” reworked. | Jbaden1 |
| 4 | 1 | 2016-11-10 | * Subsection for “Logical Service Interfaces” added. | Jbaden1 |
| 5 | 0 | 2017-01-13 | * Meta data updated for specification macros, version 3.1 * SW Unit chapter removed for the time being * Green boxes added for user hints | Jbaden1 |
| 5 | 1 | 2017-01-18 | * Minor editorial changes (e.g. hyperlinks highlighted in comments) | Jbaden1 |
| 5 | 1b | 2017-01-20 | * Some editorial corrections * Substructure of old Network Communication (now Connections) moved to Requirements on Connections | Jbaden1 |
| 6 | 0 | 2018-07-24 | * CR53: * Add new cover sheet * Add disclaimer section * Add the following meta-data to the doc properties for the the new cover sheet   + DocGis1ItemNumber   + DocGis2Classification   + DocType   + DocStatus   + DocIssueDate   + DocReleaseDate * CR63: Update FuSa sharepoint references in templates | Jbaden1 |
| 6 | 0 | 2018-08-06 | * CR81: Incorporate lessons learned from System Service Spec pilot (Vehicle Speed) into AFS and FIS | Jbaden1 |
| 6 | 0 | 2018-09-28 | * Broken links to RE Wiki repaired | Jbaden1 |
| 6 | 0 | 2018-10-31 | * Minor corrections on cover sheet and in footer to be more GIS compliant and VSEM aligned * “Overview” and “Description” exchanged in headings (following common sense) | Jbaden1 |
| 6 | 0 | 2018-11-30 | * Update of Functional Safety sections after review by Functional Safety Team * Initial support for variant handling | Jbaden1 |
| 6 | 0 | 2018-12-01 | * Variant condition fields added consistently * Links updated | Jbaden1 |
| 6 | 0 | 2018-12-11 | * Variant condition fields removed from mapping/allocation tables * Mapping tables simplified * Explanatory text for “Variants” sections revised | Jbaden1 |
| 6 | 0a | 2019-01-04 | * Chapter heading “Inherited Function Requirements” removed. Corresponding table renamed to “Requirements not cascaded”. * E/E Connection table got another column for allocated messages * Naming conventions for Implemented Functions corrected (FncName\_CmpName instead of FncName\_on\_CmpName) * Editorial corrections on the cover sheet * Explanatory text added to “Ethernet” section in chapter “Requirements on Connections” * AIS templates updated. Linked to Wiki page | Jbaden1 |
| 6 | 0a | 2019-01-04 | * Minor restructuring in FuSa chapter – after aligning with ECU Functional Spec * Bugfix: table 13 renamed from FTTI table to FHT table, includes a bug fix: each FSR is allocated to only one ECU/component | Jbaden1 |
| 6 | 0b | 2019-02-04 | * Change: Chapter “Interface Requirements” added to “Implemented Function xxx” section (to have a single chapter for to collect subscriber/publisher interface and mapping requirements which to not conform to the corresponding Data Dictionary objects) * Change: “CAN Interface” subsection renamed to “AIS Interfaces” again. Although several Subscriber/Publisher interface attributes are probably CAN bus specific, other attributes seem to be well suited for other networks than CAN. * Change: Chapter “ECU Specific Requirements” renamed to “Component Specific Requirements” in chapter “Implemented Function xxx”. Table “Requirements not cascaded” renamed to “Component Specific Requirements” and refined to describe changes from Logical Function requirements set more formally. This is also to help during VSEM import to identify those requirements of the Logical Function which cannot be simply carried over to the ECU. * Change: Explanatory text in section “Implemented Function xxx” improved. | Jbaden1 |
| 6 | 0c | 2019-02-05 | * Change: Layout of AIS Interfaces in Data Dictionary reworked to enable Excel Import | Jbaden1 |
| 6 | 0c | 2019-02-20 | * Bugfix: In AIS Interfaces none-picklist fields formatted as invisible | Jbaden1 |
| 6 | 1a | 2019-02-05 | Functional Safety related changes:   * Table “Architectural Redundancy Summary” updated * Section “Functional Flows for FTTI ‘xyz’” added to chapter “Component Interaction Diagrams” * Fault Tolerant Time Summary section added to Functional Safety chapter * Chapter “HW Metrics” added | Jbaden1 |
| 6 | 1a | 2019-04-02 | Headings of “Architectural Redundancy Summary” table clarified | Jbaden1 |
| 6 | 1a | 2019-04-10 | * ASIL Decomposition table moved from Function Spec into the Feature Implementation Spec (ASIL Decomposition of Technical Safety Requirements) * 2 alternative versions of the Function Allocation Table (Standard variant vs. Functional Safety variant) placed next to each other. | Jbaden1 |
| 6 | 1a | 2019-05-31 | * Function Allocation Table split into a base (non FuSa) part and a FuSa part to allow a more flexible mapping of MBSE functions (Logical and Technology) to RE functions (Atomic Logical and Implemented). | Jbaden1 |
| 6 | 1a | 2019-05-31 | * “Input Requirement” section reworked (symmetrically to all other templates). * Sections “Functional Flows for FTTI xyz” and “Fault Tolerant Time Summary” removed, because guidance is not available yet. * “Reference” and “Glossary” section moved back to introduction, i.e., to the very beginning of the document (such that also section 2 can already rely on it). * Some mostly editorial changes per request from FuSa team. | Jbaden1 |
| 6 | 1a | 2019-07-02 | * "Important" box added on cover sheet which points to the macros * “Input Requirements” section renamed to Input Information (after discussion with FuSa team) | Jbaden1 |
| 6 | 1a | 2019-07-17 | * Chapter “Message List” removed from CAN and LIN specific chapters of section “Requirements on Connections” | Jbaden1 |
| 6 | 1a | 2019-10-08 | * Chapter “ASIL Decomposition of Technical Safety Requirements”: Input TSRs are specified in the chapter right above the decomposition table. | Jbaden1 |
| 6 | 1a | 2019-10-09 | * Chapter “Service Oriented Communication” moved to section “Messages” in the Data Dictionary. Details from Central SW Wiki about FNV2 SOA added | Jbaden1 |
| 6 | 1a | 2019-10-25 | * Minor updates for HW IOs/Signals * Subsection “Functional Safety” removed from chapter “Feature Implementation Modeling”. Per requrest from FuSa team since no guidance is available how to model e.g. FHT timing diagram. | Jbaden1 |
| 6 | 1a | 2019-05-11 | * Copyright notice shortened and moved to cover sheet and added to footer (to be compliant [with Ford copyright guidelines](http://www.fgti.ford.com/client/NewFGTI/CopyrightNotice.html)) * Term “Disclaimer” no longer used for what is actually only a copyright notice | Jbaden1 |
| 6 | 1a | 2019-22-11 | * Some minor modifications for the SOA APIs/MQTT Messages in the section “Messages” of the Data Dictionary (section references Service Contracts via the API name) * Some minor updates of the Input/Output mapping tables in section “Requirements on Components” for mappings to SOA APIs and EDAS signals. | Jbaden1 |
| 6 | 1a | 2019-12-05 | * Upstream Documents section added to “Input Requirements/Documents” table * Custom style table formatting removed | Jbaden1 |
| 6 | 1a | 2020-01-07 | * Some fine tuning for naming conventions of E/E components and connections. * List of HW I/O signal types reduced to RF-A, RF-D, D, A, Networked and PWM. * Protocol column added to the E/E connection table | Jbaden1 |
| 6 | 1a | 2020-01-07 | * “HW Metric” and “Architecture Redundancy Summary” sections removed per request from the Functional Architecture Team (based on Governance Board decision [FSTGB-97](mailto:TrackLite%20%23%20FSTGB-97:%20https://www.tracklite.ford.com/prweb/PRAuth/TrackLiteSSO?pyActivity=@baseclass.RedirectAndRunWraper&ThreadName=WorkLinkThread&bPurgeTargetThread=true&AccessGroupName=FSTGB:ProjectAdministrators&Location=pyActivity%3DWork-.Open%26Action%3DReview%26HarnessPurpose%3DReview%26InsHandle%3DFORD-FSTGB-WORK+FSTGB-97)) * “Functional Safety” chapter moved to “Feature Implementation Requirements” section. “Function Allocation” chapter seemed no longer appropriate. | Jbaden1 |
| 6 | 1a | 2020-01-07 | * Ordering of fields in AIS interfaces tables modified to conform with the Macro Template and the Importer Sheet * Page Header: no longer in bold letters | Jbaden1 |
| 6 | 1a | 2020-03-09 | * Missing doc property “LatestSigMappingID” and “LatestAisInterfaceID” added * doc property “CopyrightDate” re-formatted to text and copyright date field in footer corrected * Version numbering re-initialized as 0.1 * Init value of version/revision date set to “yyyy/mm/dd” instead of “yyyy-mm-dd” to be in line with the “Edit Document Property” dialog * Type of “Latest….ID” doc properties changed from Text to Number | Jbaden1 |
| 6 | 1a | 2020-03-11 | * “Mapping” table removed from template. Has been migrated to macro. | Jbaden1 |
| 6 | 1a | 2020-03-13 | * Separate chapter “Technical Safety Requirements” removed. Content already covered by Allocation Table in chapter Function Allocation. * “Implemented Function” replaced by term “Technology Function” | Jbaden1 |

# Appendix

## Data Dictionary

### Logical Signals

AC ControlRequest

Signal that requests AC compressor on or off

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of AC ControlRequest

AmbientTemperature

Signal that sends ambient temperature in degrees C

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of AmbientTemperature

BatteryStatusHV

Signal for HV battery SOC

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of BatteryStatusHV

BlowerControl

Signal that requests blower turn ON or OFF

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of BlowerControl

BlowerControlSettings

Signal that requests blower fan state of FANON, FANONAC, or FANOFF

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of BlowerControlSettings

CabinTemperature

Signal that sends cabin temperature in degrees C

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of CabinTemperature

Compressor\_Control\_Out

Signal that requests compressor on or off

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of Compressor\_Control\_Out

Cooling Request

Signal to request TMOS feature begin cooling cycle

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of Cooling Request

CoolingCycleTime

Logical signal for cooling cycle time during CBOM run

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of CoolingCycleTime

CoolingDuration

Signal that sends Cooling Time

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of CoolingDuration

CoolingStatusUpdated

CBOM Cooling status feedback signal to HMI

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of CoolingStatusUpdated

DataStoreStatus

Signal that sends STORED, STORING, or FAILED\_TO\_STORE status

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of DataStoreStatus

DisplayUserRequest

Displays user request to HMI

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of DisplayUserRequest

FanCycleTime

Logical signal for fan cycle time

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of FanCycleTime

Feature Settings

Signal that sends Feature Settings TMOS Settings and System Settings

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of Feature Settings

FeedbackInformation

Signal that provides FeedbackInformation Cooling Status or CoolingDuration

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of FeedbackInformation

HVBatteryTemperature

High Voltage Battery Temperature

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of HVBatteryTemperature

IgnitionStatusUpdated

BEV ignition status signal

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of IgnitionStatusUpdated

Interior Temperature Status

Signal that provides cabin temperature as HOT or NORMAL

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of Interior Temperature Status

InteriorStatus

Signal providing cabin temperature status of CABIN\_HOT or CABIN\_NORMAL

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of InteriorStatus

OffboardClientRequest

Hand Held Device Signal that sends YES or NO

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of OffboardClientRequest

PlugInStatus

Signal that determines if HV battery is plugged in

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of PlugInStatus

TMOS Settings

Signal that provides FAN\_OFF, FAN\_ON, FAN\_AND\_AC\_ON, or NONE

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of TMOS Settings

TransmissionStatusUpdated

Signal for transmission status

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of TransmissionStatusUpdated

Vehicle Speed

Signal that provides vehicle speed to feature

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of Vehicle Speed

Vehicle Status

Signal that provides BatteryStatus, IgnitionStatus, TransmissionStatus, VehicleSpeed, WakeUpSignal

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of Vehicle Status

VehicleSpeed

Signal for vehicle status of vehicle speed

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of VehicleSpeed

WakeUpAmbientTemp

Signal that provides LastKnownAmbientTemp

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of WakeUpAmbientTemp

WakeUpSignal

Signal that sends WAKEUP or SLEEP

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of WakeUpSignal

blower ON

Signal that requests blower on

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of blower ON

### Logical Parameters

### Technical Signals

Charge 12V Battery

Signal requesting 12 volt battery to be charged

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Init Default Value** | |  |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of Charge 12V Battery

ElCmprenbl\_B\_Rq

Signal enabling electric compressor

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Init Default Value** | |  |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of ElCmprenbl\_B\_Rq

ElCmprenbl\_B\_Rq

Electric Compressor enable/disable signal

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Init Default Value** | |  |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of ElCmprenbl\_B\_Rq

Blower On Request

Signal requesting blower on

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Init Default Value** | |  |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of Blower On Request

CabnAmb\_Te\_Actl

Cabin ambient temperature sensor

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Init Default Value** | |  |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of CabnAmb\_Te\_Actl

BCM-PCM\_WakeUp

Signal from BCM to All Wheel Drive\_Driveline Control Module

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Init Default Value** | |  |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of BCM-PCM\_WakeUp

RCCM-BLWR

Technology signal for blower on request from RCCM

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Init Default Value** | |  |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of RCCM-BLWR

ECM\_HEV-RCCM\_cabinAmb?

Signal from ECM\_HEV to RCCM

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Init Default Value** | |  |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of ECM\_HEV-RCCM\_cabinAmb?

ThrmlSet\_D\_RqMnu

Technology signal for CBOM settings APIM to RCCM

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Init Default Value** | |  |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of ThrmlSet\_D\_RqMnu

PlgStatEvnt\_B\_Stat

Signal for High Voltage Battery Plugged in or Off Plug status

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Init Default Value** | |  |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of PlgStatEvnt\_B\_Stat

CabnAmb\_Te\_Actl

Cabin ambient temperature sensor signal

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Init Default Value** | |  |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of CabnAmb\_Te\_Actl

BLWR-PWR

Technology signal for blower power from 12v battery

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Init Default Value** | |  |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of BLWR-PWR

Battery Power Mode

Signal providing SOC

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Init Default Value** | |  |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of Battery Power Mode

CabnAmb\_Te\_Actl

Cabin air temperature signal

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Init Default Value** | |  |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of CabnAmb\_Te\_Actl

AirAmb\_Te\_Actl

Signal to detect outside air temperature

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Init Default Value** | |  |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of AirAmb\_Te\_Actl

CabinTemp-RCCM

Signal sensing cabin temperature sent to RCCM

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Init Default Value** | |  |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of CabinTemp-RCCM

HMI-CustFeedback

Feedback signal from HMI to HMI Display Screen

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Init Default Value** | |  |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of HMI-CustFeedback

CabinThrmlSustn\_B\_Rq

Technology signal for cabin sustain awake signal

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Init Default Value** | |  |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of CabinThrmlSustn\_B\_Rq

ElCmpr\_N\_Rq

Signal requesting electric compressor rpm

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Init Default Value** | |  |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of ElCmpr\_N\_Rq

BCM-BMS\_BatteryPowerMode

Signal from Body Control Module to Battery Management Module

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Init Default Value** | |  |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of BCM-BMS\_BatteryPowerMode

ElCmpr\_N\_Rq

Electric Compressor RPM signal

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Init Default Value** | |  |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of ElCmpr\_N\_Rq

AirAmb\_Te\_Actl

OSA temperature signal

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Init Default Value** | |  |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of AirAmb\_Te\_Actl

ECG-BCM

Signal from ECG to BCM

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Init Default Value** | |  |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of ECG-BCM

ignition\_Status

Signal to detect vehicle ignition status for vehicle

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Init Default Value** | |  |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of ignition\_Status

PCM-HPCM\_WakeUp

Signal from PCM to HPCM

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Init Default Value** | |  |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of PCM-HPCM\_WakeUp

A5\_2\_A4\_BatteryPowerMode

Signal from BMS to BCM

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Init Default Value** | |  |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of A5\_2\_A4\_BatteryPowerMode

RCCM-ECG

Signal from RCCM to ECG

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Init Default Value** | |  |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of RCCM-ECG

BCM-HMI

Signal from BCM to HMI

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Init Default Value** | |  |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of BCM-HMI

HMI-HPCM\_HvacTMOSActv\_B\_Rq

Signal from HMI to HPCM

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Init Default Value** | |  |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of HMI-HPCM\_HvacTMOSActv\_B\_Rq

ThrmlSet\_D\_Rq

Technology signal for CBOM settings RCCM to APIM

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Init Default Value** | |  |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of ThrmlSet\_D\_Rq

BCM-HPCM\_WakeUp

Signal from BCM to HPCM

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Init Default Value** | |  |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of BCM-HPCM\_WakeUp

CabnThrml\_Te\_Actl

Technology signal for cabin temperature

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Init Default Value** | |  |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of CabnThrml\_Te\_Actl

HVbattTemp\_Te\_Actl

Technology signal for HV battery temperature

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Init Default Value** | |  |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of HVbattTemp\_Te\_Actl

HPCM-BCM\_WakeUp

Technology signal for HPCM to BCM wakeup signal

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Init Default Value** | |  |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of HPCM-BCM\_WakeUp

ECG-HPCM

Signal from ECG to HPCM

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Init Default Value** | |  |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of ECG-HPCM

GSM-ECG\_gearselection

Signal from GSM to ECG

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Init Default Value** | |  |
| **Encoding Type Name** | |  |
| Note: An encoding is either discrete or continuous. Delete fields below which are not needed, | | |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) | Value 1 |  |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | |  |

Table: Signal Details of GSM-ECG\_gearselection

#### GSDB Signals

#### HW I/Os

#### Diagnostic Interfaces

##### DTCs

<Some Description of the DTC.

Refer to VSEM document “[Diagnostic Fault Coverage and DTC Numbers](https://www.vsemweb.ford.com/tc/launchapp?-attach=true&-s=226TCSession&-o=yAUtrNhnx3NrTDAAAAAAAAAAAAA&servername=Production_Server)

[Design Consideration](https://www.vsemweb.ford.com/tc/launchapp?-attach=true&-s=226TCSession&-o=yAUtrNhnx3NrTDAAAAAAAAAAAAA&servername=Production_Server)”, what to fill into the attributes below>

|  |  |
| --- | --- |
| **Test Period Time** |  |
| **Test Run Criteria,** |  |
| **Enable Criteria (EC)** |  |
| **Applicable** |  |
| **FailureTypeBytes** |  |
| **Test Period Time** |  |
| **Test Run Criteria,** |  |

##### DIDs

### Technical Parameters

### Mappings

### Technical Interfaces

#### AIS Interfaces

##### Publisher Interfaces

##### Subscriber Interfaces

#### AUTOSAR Ports

### Messages/APIs

#### CAN Bus “<Bus Name>”

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CAN ID** | **Transmission Mode** | **Period** | **Signal Names** | **Transmitter(s)** | **Receiver(s)** |
|  |  |  |  |  |  |
|  |
|  |
|  |

#### LIN Bus “<Bus Name>”

#### AUTOSAR Interfaces

#### SOA Service Contracts

<Service contract purpose/behavior>

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Messaging Pattern | Frequency  (For Data Broadcast Only) | Message Data Element(s)  (Must Match GPB) or applicable CAN signal | Description of Data Element(s) | Topic Name |
| Choose an item. |  | GBP Data element / CAN Signal name 1 | Detailed encoding of data element 1 |  |
| … |  |  |
| GBP Data element / CAN Signal name 1 | Detailed encoding of data element 3 |  |

### Encoding Types

DisplayUserRequest

Displays user request to HMI

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **Unit** | |  |

Table: Encoding Details of DisplayUserRequest

ElCmprenbl\_B\_Rq

Signal enabling electric compressor

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **ENABLE** | Implementation signal for compressor request ENABLE |
| **DISABLE** | Implementation signal for compressor request DISABLE |
| **Unit** | |  |

Table: Encoding Details of ElCmprenbl\_B\_Rq

ElCmprenbl\_B\_Rq

Electric Compressor enable/disable signal

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **ENABLE** | signal to activate compressor |
| **DISABLE** | Signal to deactivate the compressor |
| **Unit** | |  |

Table: Encoding Details of ElCmprenbl\_B\_Rq

BlowerControlSettings

Signal that requests blower fan state of FANON, FANONAC, or FANOFF

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **FANON** | Logical signal that requests Blower FANON |
| **FANONAC** | Logical signal that requests Blower FANAC |
| **FANOFF** | Logical signal that requests Blower FANOFF |
| **Unit** | |  |

Table: Encoding Details of BlowerControlSettings

DataStoreStatus

Signal that sends STORED, STORING, or FAILED\_TO\_STORE status

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **STORED** | Logical signal that provides Data Store Status STORED |
| **STORING** | Logical signal that provides Data Store Status STORING |
| **FAILED\_TO\_STORE** | Logical signal that provides Data Store Status FAILED\_TO\_STORE |
| **Unit** | |  |

Table: Encoding Details of DataStoreStatus

CabnAmb\_Te\_Actl

Cabin ambient temperature sensor

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **Temp** | ambient temperature degrees Celsius |
| **Unit** | |  |

Table: Encoding Details of CabnAmb\_Te\_Actl

RCCM-BLWR

Technology signal for blower on request from RCCM

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **Unit** | |  |

Table: Encoding Details of RCCM-BLWR

BCM-PCM\_WakeUp

Signal from BCM to All Wheel Drive\_Driveline Control Module

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **Unit** | |  |

Table: Encoding Details of BCM-PCM\_WakeUp

ThrmlSet\_D\_RqMnu

Technology signal for CBOM settings APIM to RCCM

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **OFF** | CBOM feature enumeration OFF |
| **FAN** | CBOM feature enumeration FAN |
| **FAN PLUS AC** | CBOM feature enumeration FAN\_PLUS\_AC |
| **Unit** | |  |

Table: Encoding Details of ThrmlSet\_D\_RqMnu

WakeUpAmbientTemp

Signal that provides LastKnownAmbientTemp

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **LastKnownAmbTemp** | Logical signal that provides wake up ambient temp = LastKnownAmbTemp |
| **Unit** | |  |

Table: Encoding Details of WakeUpAmbientTemp

CoolingStatusUpdated

CBOM Cooling status feedback signal to HMI

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **FAILED\_TO\_COOL** | CBOM cooling status enumeration FAILED\_TO\_COOL |
| **COOLING\_SUCCESSFUL** | Cooling Status feedback enumeration COOLING\_SUCCESSFUL |
| **Unit** | |  |

Table: Encoding Details of CoolingStatusUpdated

PlgStatEvnt\_B\_Stat

Signal for High Voltage Battery Plugged in or Off Plug status

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **On Plug** | HV Battery status for on plug |
| **Off Plug** | HV Battery status for off plug |
| **Unit** | |  |

Table: Encoding Details of PlgStatEvnt\_B\_Stat

AirAmb\_Te\_Actl

Signal to detect outside air temperature

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **Temperature Celsius** | Implementation signal for OSA Temperature |
| **Unit** | |  |

Table: Encoding Details of AirAmb\_Te\_Actl

CabinTemp-RCCM

Signal sensing cabin temperature sent to RCCM

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **Temp** | ambient temperature degrees Celsius |
| **Unit** | |  |

Table: Encoding Details of CabinTemp-RCCM

CabinTemperature

Signal that sends cabin temperature in degrees C

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **CABIN\_TEMPERATURE** | Logical signal that provides cabin temperature |
| **Unit** | |  |

Table: Encoding Details of CabinTemperature

Cooling Request

Signal to request TMOS feature begin cooling cycle

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **Unit** | |  |

Table: Encoding Details of Cooling Request

CabinThrmlSustn\_B\_Rq

Technology signal for cabin sustain awake signal

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **ACTIVE** | cabin sustain signal enumeration ACTIVE |
| **INACTIVE** | Cabin sustain enumeration signal INACTIVE |
| **Unit** | |  |

Table: Encoding Details of CabinThrmlSustn\_B\_Rq

FeedbackInformation

Signal that provides FeedbackInformation Cooling Status or CoolingDuration

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **Cooling Status** | Logical signal that provides feedback information CoolingStatus |
| **Cooling Duration** | Logical signal that provides feedback information CoolingDuration |
| **Unit** | |  |

Table: Encoding Details of FeedbackInformation

BCM-BMS\_BatteryPowerMode

Signal from Body Control Module to Battery Management Module

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **Unit** | |  |

Table: Encoding Details of BCM-BMS\_BatteryPowerMode

AirAmb\_Te\_Actl

OSA temperature signal

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **Temperature Celsius** | Implementation signal for OSA Temperature |
| **Unit** | |  |

Table: Encoding Details of AirAmb\_Te\_Actl

PCM-HPCM\_WakeUp

Signal from PCM to HPCM

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **Unit** | |  |

Table: Encoding Details of PCM-HPCM\_WakeUp

ECG-BCM

Signal from ECG to BCM

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **Unit** | |  |

Table: Encoding Details of ECG-BCM

BCM-HMI

Signal from BCM to HMI

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **Unit** | |  |

Table: Encoding Details of BCM-HMI

VehicleSpeed

Signal for vehicle status of vehicle speed

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **Unit** | |  |

Table: Encoding Details of VehicleSpeed

OffboardClientRequest

Hand Held Device Signal that sends YES or NO

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **YES** | Logical signal that provides offboard client request YES |
| **NO** | Logical signal that provides offboard client request NO |
| **Unit** | |  |

Table: Encoding Details of OffboardClientRequest

HMI-HPCM\_HvacTMOSActv\_B\_Rq

Signal from HMI to HPCM

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **Unit** | |  |

Table: Encoding Details of HMI-HPCM\_HvacTMOSActv\_B\_Rq

BCM-HPCM\_WakeUp

Signal from BCM to HPCM

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **Unit** | |  |

Table: Encoding Details of BCM-HPCM\_WakeUp

CabnThrml\_Te\_Actl

Technology signal for cabin temperature

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **CabnTemp** | Cabin Temperature enumeration degrees C |
| **Unit** | |  |

Table: Encoding Details of CabnThrml\_Te\_Actl

HVbattTemp\_Te\_Actl

Technology signal for HV battery temperature

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **TempDeg** | High Voltage Battery Temperature |
| **Unit** | |  |

Table: Encoding Details of HVbattTemp\_Te\_Actl

PlugInStatus

Signal that determines if HV battery is plugged in

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **PluggedIn** | Logical signal that provides battery status PluggedIn |
| **UnPlugged** | Logical signal that provides battery status UnPlugged |
| **Unit** | |  |

Table: Encoding Details of PlugInStatus

Compressor\_Control\_Out

Signal that requests compressor on or off

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **ON** | Logical signal that requests compressor ON |
| **OFF** | Logical signal that requests compressor OFF |
| **Unit** | |  |

Table: Encoding Details of Compressor\_Control\_Out

Test Element

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **Unit** | |  |

Table: Encoding Details of Test Element

InteriorStatus

Signal providing cabin temperature status of CABIN\_HOT or CABIN\_NORMAL

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **ITS\_HOT** | Logical signal that provides interior status ITS\_HOT |
| **ITS\_NORMAL** | Logical signal that provides interior status ITS\_NORMAL |
| **Unit** | |  |

Table: Encoding Details of InteriorStatus

HPCM-BCM\_WakeUp

Technology signal for HPCM to BCM wakeup signal

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **Unit** | |  |

Table: Encoding Details of HPCM-BCM\_WakeUp

GSM-ECG\_gearselection

Signal from GSM to ECG

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **PARK** | Implementation signal for gear selection PARK |
| **REVERSE** | Implementation signal for gear selection REVERSE |
| **NEUTRAL** | Implementation signal for gear selection NEUTRAL |
| **DRIVE** | Implementation signal for gear selection DRIVE |
| **Unit** | |  |

Table: Encoding Details of GSM-ECG\_gearselection

Vehicle Status

Signal that provides BatteryStatus, IgnitionStatus, TransmissionStatus, VehicleSpeed, WakeUpSignal

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **Battery Status** | Logical signal that provides Vehicle Status=BatteryStatus |
| **Ignition Status** | Logical signal that provides Vehicle Status=IgnitionStatus |
| **Transmission Status** | Logical signal that provides Vehicle Status=TransmissionStatus |
| **Vehicle Speed** | Logical signal that provides Vehicle Status=VehicleSpeed |
| **WakeUpSignal** | Logical signal that provides Vehicle Status=WakeUpSignal |
| **PlugInStatus** | Logical signal that provides Vehicle Status=PlugInStatus |
| **Unit** | |  |

Table: Encoding Details of Vehicle Status

BatteryStatusHV

Signal for HV battery SOC

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **NORMAL** | HV Battery NORMAL SOC |
| **CRITICAL** | Logical signal that provides battery status Critical |
| **LOW** | Logical signal that provides battery status LOW |
| **Unit** | |  |

Table: Encoding Details of BatteryStatusHV

Charge 12V Battery

Signal requesting 12 volt battery to be charged

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **Unit** | |  |

Table: Encoding Details of Charge 12V Battery

AC ControlRequest

Signal that requests AC compressor on or off

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **ON** | Logical signal that requests AC compressor on |
| **OFF** | Logical signal that requests AC compressor OFF |
| **Unit** | |  |

Table: Encoding Details of AC ControlRequest

Blower On Request

Signal requesting blower on

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **Unit** | |  |

Table: Encoding Details of Blower On Request

FanCycleTime

Logical signal for fan cycle time

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **Unit** | |  |

Table: Encoding Details of FanCycleTime

TransmissionStatusUpdated

Signal for transmission status

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **PARK** | Transmission enumeration status for PARK |
| **REVERSE** | Transmission enumeration status for REVERSE |
| **NEUTRAL** | Transmission enumeration status for NEUTRAL |
| **DRIVE** | Transmission enumeration status for DRIVE |
| **Unit** | |  |

Table: Encoding Details of TransmissionStatusUpdated

ECM\_HEV-RCCM\_cabinAmb?

Signal from ECM\_HEV to RCCM

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **Unit** | |  |

Table: Encoding Details of ECM\_HEV-RCCM\_cabinAmb?

CabnAmb\_Te\_Actl

Cabin ambient temperature sensor signal

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **Temp** | ambient temperature degrees Celsius |
| **Unit** | |  |

Table: Encoding Details of CabnAmb\_Te\_Actl

BLWR-PWR

Technology signal for blower power from 12v battery

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **Unit** | |  |

Table: Encoding Details of BLWR-PWR

CabnAmb\_Te\_Actl

Cabin air temperature signal

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **Temp** | ambient temperature degrees Celsius |
| **Unit** | |  |

Table: Encoding Details of CabnAmb\_Te\_Actl

Battery Power Mode

Signal providing SOC

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **Unit** | |  |

Table: Encoding Details of Battery Power Mode

HMI-CustFeedback

Feedback signal from HMI to HMI Display Screen

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **FAILED TO COOL** | Implementation signal for TMOS feedback to user FAILED TO COOL |
| **COOLING\_SUCCESSFUL** | Implementation signal for TMOS feedback to user COOLING SUCCESSFUL |
| **Unit** | |  |

Table: Encoding Details of HMI-CustFeedback

BlowerControl

Signal that requests blower turn ON or OFF

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **ON** | Logical signal that requests Blower ON |
| **OFF** | Logical signal that requests Blower OFF |
| **Unit** | |  |

Table: Encoding Details of BlowerControl

HVBatteryTemperature

High Voltage Battery Temperature

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **HV\_BATTERY\_TEMPERATURE** | Logical signal that provides HV Battery Temperature |
| **Unit** | |  |

Table: Encoding Details of HVBatteryTemperature

Interior Temperature Status

Signal that provides cabin temperature as HOT or NORMAL

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **HOT** | Logical signal that provides interior temperature status HOT |
| **NORMAL** | Logical signal that provides interior temperature status NORMAL |
| **Unit** | |  |

Table: Encoding Details of Interior Temperature Status

ElCmpr\_N\_Rq

Signal requesting electric compressor rpm

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **RPM** | Implementation signal for compressor RPM |
| **Unit** | |  |

Table: Encoding Details of ElCmpr\_N\_Rq

CoolingCycleTime

Logical signal for cooling cycle time during CBOM run

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **Unit** | |  |

Table: Encoding Details of CoolingCycleTime

ElCmpr\_N\_Rq

Electric Compressor RPM signal

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **RPM** | compressor rpm |
| **Unit** | |  |

Table: Encoding Details of ElCmpr\_N\_Rq

IgnitionStatusUpdated

BEV ignition status signal

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **LOW** | BEV ignition enumeration LOW |
| **HIGH** | Ignition Status enumeration HIGH |
| **Unit** | |  |

Table: Encoding Details of IgnitionStatusUpdated

WakeUpSignal

Signal that sends WAKEUP or SLEEP

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **WAKEUP** | Logical signal that provides wake up signal WAKEUP |
| **SLEEP** | Logical signal that provides wake up signal SLEEP |
| **Unit** | |  |

Table: Encoding Details of WakeUpSignal

CoolingDuration

Signal that sends Cooling Time

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **CoolingTime** | Logical signal that provides cooling duration CoolingTime |
| **Unit** | |  |

Table: Encoding Details of CoolingDuration

Feature Settings

Signal that sends Feature Settings TMOS Settings and System Settings

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **TMOS Settings** | Logical signal that provides TMOS settings |
| **Unit** | |  |

Table: Encoding Details of Feature Settings

ignition\_Status

Signal to detect vehicle ignition status for vehicle

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **0x0 Unknown** | Ignition status enumeration for unknown ignition status |
| **0x1 Off** | Ignition status enumeration for off ignition status |
| **0x2 Accessory** | Ignition status enumeration for accessory ignition status |
| **0x3 Run** | Ignition status enumeration for run ignition status |
| **0x4 Start** | Ignition status enumeration for Start ignition status |
| **0xF Invalid** | Ignition status enumeration for invalid ignition status |
| **Unit** | |  |

Table: Encoding Details of ignition\_Status

A5\_2\_A4\_BatteryPowerMode

Signal from BMS to BCM

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **Unit** | |  |

Table: Encoding Details of A5\_2\_A4\_BatteryPowerMode

RCCM-ECG

Signal from RCCM to ECG

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **Unit** | |  |

Table: Encoding Details of RCCM-ECG

ThrmlSet\_D\_Rq

Technology signal for CBOM settings RCCM to APIM

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **OFF** | Implementation signal for TMOS user setting OFF |
| **FAN** | Implementation signal for TMOS user setting FAN ONLY MODE |
| **FAN PLUS AC** | Implementation signal for TMOS user setting FAN PLUS AC |
| **Unit** | |  |

Table: Encoding Details of ThrmlSet\_D\_Rq

AmbientTemperature

Signal that sends ambient temperature in degrees C

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **AMBIENT\_TEMPERATURE** | Logical signal that provides ambient temperature |
| **Unit** | |  |

Table: Encoding Details of AmbientTemperature

Vehicle Speed

Signal that provides vehicle speed to feature

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **Unit** | |  |

Table: Encoding Details of Vehicle Speed

ECG-HPCM

Signal from ECG to HPCM

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **Unit** | |  |

Table: Encoding Details of ECG-HPCM

CHM\_CONFIGURATION

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **OFF** |  |
| **FAN** |  |
| **AC** |  |
| **Unit** | |  |

Table: Encoding Details of CHM\_CONFIGURATION

blower ON

Signal that requests blower on

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **Unit** | |  |

Table: Encoding Details of blower ON

IGN-STATUS

**Note:** An encoding is either discrete or continuous. Delete those fields, which are not needed.

|  |  |  |
| --- | --- | --- |
| **Value**  (Continuous Encoding) | Min Value |  |
| Max Value |  |
| Resolution |  |
| Offset |  |
| **Value**  (Discrete  Encoding) |  |  |
| **ACC** |  |
| **RUN** |  |
| **OFF** |  |
| **Unit** | |  |

Table: Encoding Details of IGN-STATUS

Document ends here.