Lincoln Embrace / Ford Welcome-Farewell
Feature Specification

Ford Motor Company

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1 INTRODUCTION

1.1 Purpose

This document specifies the electrical system function requirements for the determination of welcome/farewell states and the desired response(s) from different vehicle lighting elements during those states.

1.2 History

The "Welcome-Farewell" system is in place to anticipate the customer's interaction with the vehicle (approaching, entering, leaving etc.) and then respond accordingly by enabling or disabling visual lighting elements on the exterior and interior of the vehicle.

Welcome and Farewell Vision Statements:
The initial idea for Welcome and Farewell was formulated for Ford vehicles and the following vision statements were approved and circulated:

Welcome: "As you approach your Ford vehicle, you are welcomed by the lights. Opening the door reinforces the invitation. As the vehicle wakes up, the displays and switches illuminate with crisp, clear Ice Blue™ backlighting hinting at the exciting driving experience."

Farewell: "As you exit your Ford vehicle, interior lighting is turned on to aid in exiting. Exterior lighting remains on for a period of time to enable you to see obstacles and your pathway when leaving your vehicle."

Welcome Farewell evolution for "Lincoln Embrace":
Welcome Farewell implementation was evolved for Lincoln Vehicle specific applications, which included impacting additional lighting elements, a different signature color ("Lincoln White" vs. "Ice Blue") and responding to Customers over additional vehicle states not initially defined for Ford Welcome Farewell.

Vision statement:
- "Anticipating needs and preferences - As you approach the vehicle it anticipates you, welcomes you, and guides you with subtle and focused lighting where it is most needed.

- Fluid, seamless motions and sounds – Unlocking and entering the vehicle is a fluid and effortless experience with refined motions and sounds, ambient lighting, and crafted human interfaces.
- Warm and Inviting Comfort - The cabin is a warm and inviting space with seating that embraces and forms around you and appropriate ambient lighting to meet your needs and personal preferences."

1.3 Scope

The following set of features from the Global Feature & Function List is described in this FD.

Feature ID	Feature Name	Owner
F000416/A	Approach Detection	Elton Jamoua (EESE)
F000308/A	Welcome Mat	Ahmet Cinar (EESE)
F000309/A	Illuminated Door Handle Pockets	Elton Jamoua (EESE)
F000148/C	Auto Fold Mirrors	Ahmet Cinar (EESE)
Fn001857/J	Center Stack Animation/Graphic	Nicholar Frazier (SYNC)
Fn00335/C	Instrument Cluster Animation/Graphic - Needle	Scott Watkins (EESE)
F000317/A	Tail Lamp Static Fade	Terrence Wilson (Ext Lighting)
F000317/A	Rear Corner Lamp/Rear Side Marker Fade	Terrence Wilson (Ext Lighting)
F000315/A	Dynamic (Sequential) Signature DRL's	Terrence Wilson (Ext Lighting)
F000315/A	Fog/Fascia Lamp Static Fade	Terrence Wilson (Ext Lighting)
F000061/D	Pulsing Push to Start Switch	TBD
F000063/C	Static Sequential Ambient Lighting	Steven Antilla (Int Lighting)
F000061/D	Door Switch Backlighting	John Ricks (EESE)
F000059/C	Courtesy Lamps	Steven Antilla (Int Lighting)
F000061/D	I/P and Overhead Console Button Backlighting	Steven Antilla (Int Lighting)
F000061/D	Sync & Radio Control Button Backlighting	Dinh Tran (SYNC)
F000061/D	Headlamp Switch Backlighting	Steven Antilla (Int Lighting)
F000061/D	Instrument Cluster Backlighting	Scott Watkins (EESE)
F000059/C	Illuminated Scuff Plates	Steven Antilla (Int Lighting)
Fn003250/B	aHUD Animation	Aneesh Mathai (EESE)
F000315/A	Lit Lincoln Star	Farhan Ehsan (EESE)
F000317/A	Illuminated Deployable Runningboards	Farhan Ehsan (EESE)
F000316/A	Illuminated Seatbelt Buckles	Matt Majkowski (Int Lighting)
Fn000335/C	Instrument Cluster Animation/Graphic - Starfield	Scott Watkins (EESE)
F001002/A	Ford Welcome/Farewell	Farhan Ehsan (EESE)
F001003/A	Lincoln Welcome/Farewell	Farhan Ehsan (EESE)
F001004/A	Ford Signature Light	Frank Aust
F001005/A	Lincoln Signature Light	John Barrs (EESE)
F000052/C	Courtesy Lighting	John Barrs (EESE)
F000053/B	Courtesy Lighting Delay	John Barrs (EESE)
F000054/B	Illuminated Entry/Exit	John Barrs (EESE)

Table 1: Features described in this FD

1.4 Reference Specifications

Sub-system	Specification
Body Control Module (BCM)	FS-HU5T-14B476-AAG
Ford Welcome Farewell ARL	RQT-002004-021878 DNA WELCOME-FAREWELL STRATEGY REV. 1
Lincoln Embrace ARL	RQT-002004-022094 LINCOLN EMBRACE WELCOME AND FAREWELL BEHAVIOR REV. 1
Lit Belt Buckle Feature Spec	Illuminated Belt Buckle Spec
Combiner Heads up Display (cHUD)	cHUD Welcome – Goodbye Strategy – CGEA1.3
Approach Detection Functional Spec	Approach Detection ReqSTD-2013-04-11-16-09

Table 2: Reference Specification

1.5 Specification Format

This specification consists of 7 major sections.

- 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 Description: States briefly the background and the purpose of the feature. Defines the context and boundaries of the feature
- Section 3 – Feature Requirements: Lists functional and non-functional requirements of the feature.
- Section 4 - Functional Decomposition: Giving an overview of which functions are necessary to implement this feature. The feature requirements shall be cascaded to the functions
- Section 5 - Feature Variant design architecture
- Section 6 – Testing – Design verification method
- Section 7 – Data Dictionary
- Section 8 - Revision History: Change log of the document / template
- Section 9 - Appendix – Use Case details

1.5.1 Requirement Numbering

When a requirement is introduced it is given a tag including a requirement number. This tag follows the requirement throughout the development process. In this document requirements are identified using a tag consisting of two parts. The first part consists of the document ID in which the requirement was introduced or updated. The second part consists of the requirement number and the requirement version. A dash separates each part. A requirement tag shall be unique, i.e. there must not exist two different requirements with the same requirement tag. The same requirement may however be used more than once (i.e. the same requirement may exist several times, even within the same document).

Requirements are text denoted as "Caption, the font is Arial 10pt, BOLD" to identify a requirement. All Requirements are Level 4 Captions. Requirements are sequenced based upon the "Heading 4" numbering sequence

Example:

> **R: 1.4.4.1**   This example demonstrates requirement 1 in Section 1.4.4 of this document

2 FEATURE DESCRIPTION

2.1 Theory of Operation

Ford Welcome Farewell

The vehicle's Exterior, Interior lights, and Displays shall respond by either fading ON/OFF or turning ON/OFF based on user interaction with the vehicle – Approaching it with a valid PK, locking or unlocking a vehicle, opening or closing vehicle doors, and cycling the ignition between OFF and RUN/Start.

Lincoln Embrace

A variant of Ford Welcome Farewell which was adapted for Lincoln vehicles, with aesthetic level differences and the total number of lighting/display elements being impacted.

Feature Context Diagram
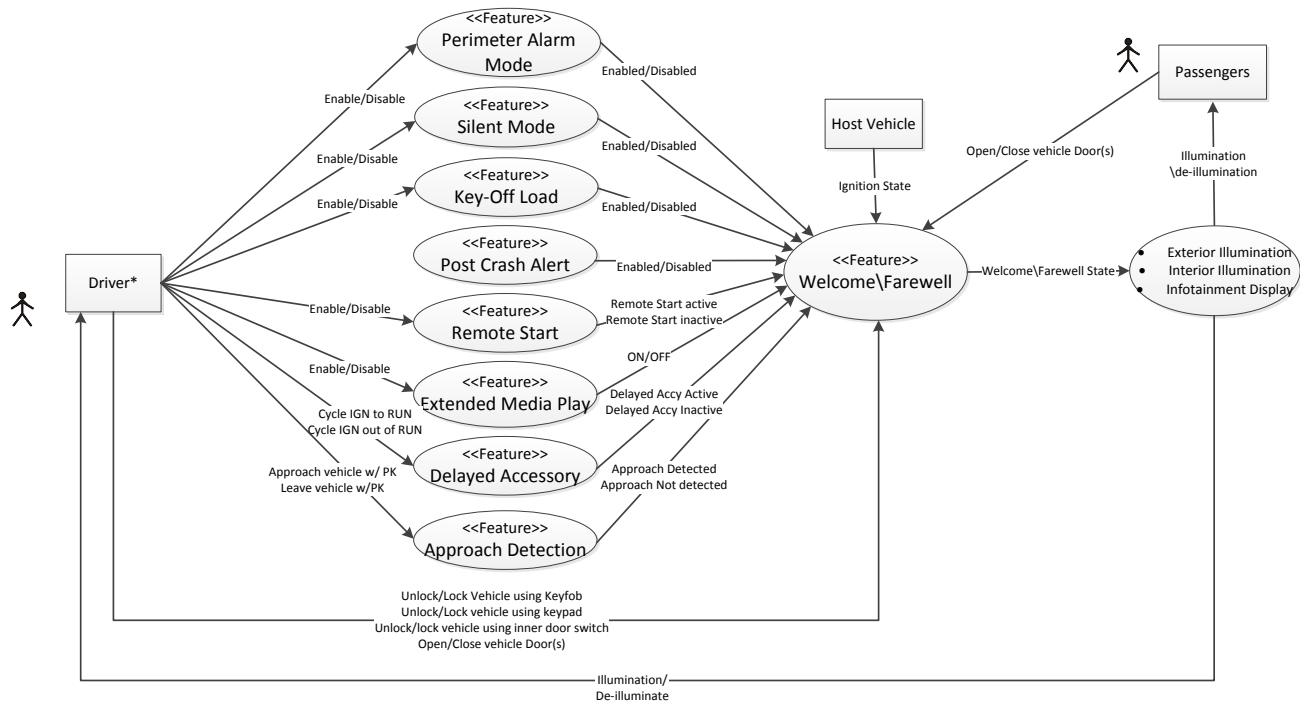
Figure 1:   Welcome Farewell Feature Context Diagram

2.2 Feature Interface

Interaction	Direction	Influence	Description	Value Range
Host Vehicle	Input	Ignition State Remote Start state Vehicle Lock status Vehicle Door ajar status		Off, Accessory, Crank, On, Locked/unlocked, Ajar/Closed
Welcome Farewell state detection	Input	Welcome/Farewell state	Using existing welcome farewell state determination	Welcome state, Farewell state, Run/Start State, Approach, Illuminated Entry, Illuminated Exit, Courtesy Lighting,

				Courtesy Lighting Delay
Driver	Input	Approach Vehicle, Remote start vehicle, Unlock/Lock Vehicle, Open/Close Door		Approach detected, Locked/Unlocked, Ajar/Closed
Passengers	Input	Open/Close Door		Ajar/Closed
Welcome Farewell Feature	Output	Illumination/De-illumination of exterior vehicle lights, interior vehicle lights, and infotainment screens	Using existing welcome farewell state determination to driver vehicle behavior	Fade ON/OFF Snap ON/OFF Display welcome screen Display farewell screen

Table 3: Feature Interface

2.3 Use Case Tree (Use Cases in Appendix 2)

For full list of "Ideal" Use-Cases refer to "RQT-002004-021878 DNA WELCOME-FAREWELL STRATEGY REV. 1" for Ford vehicles or "RQT-002004-022094 LINCOLN EMBRACE WELCOME AND FAREWELL BEHAVIOR REV. 1" for Lincoln vehicles. For full list of (event based) use cases, refer to "Ford WF and LE FMA XXXX16" document.

IGN OFF

1.0 APPROACH DETECTED

2.0 UNLOCK

3.0 OPEN DOOR

4.0 CLOSE ALL DOORS

5.0 IGN TO RUN/ START

6.0 IGN TO OFF

7.0 OPEN DOOR

8.0 CLOSE ALL DOORS

9.0 LOCK VEHICLE
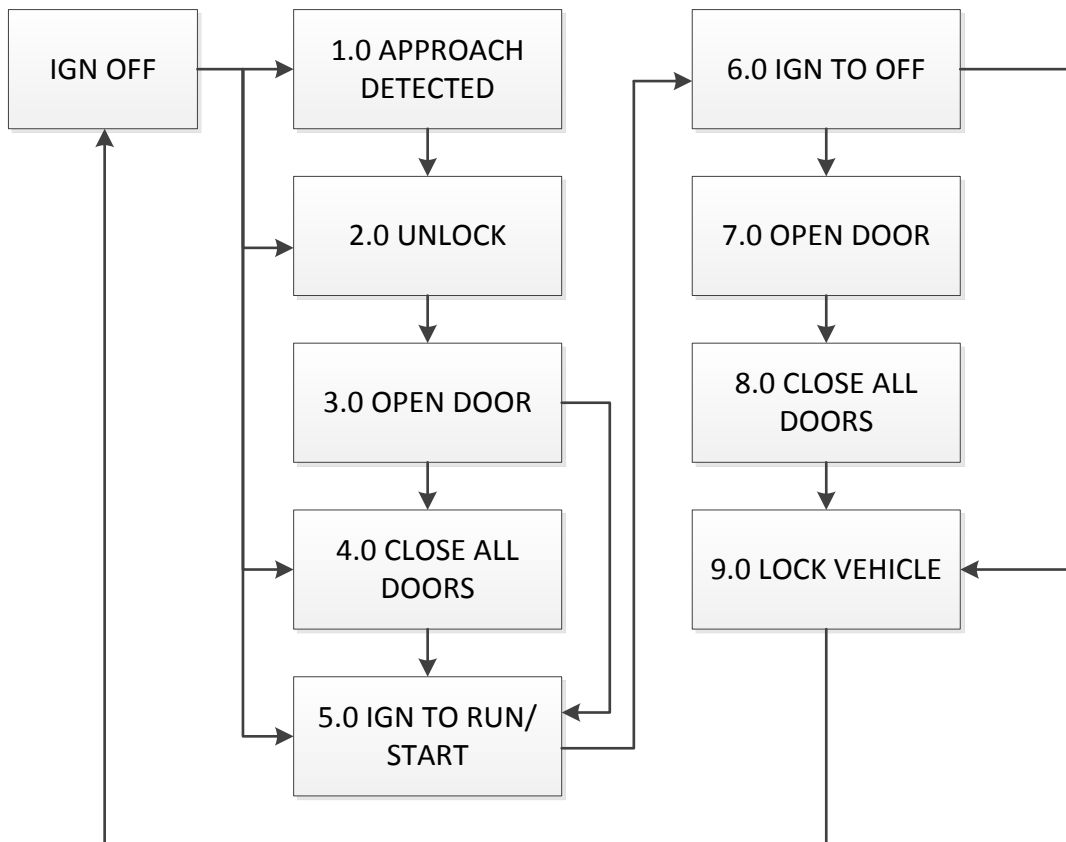
3 FEATURE REQUIREMENTS

3.1 Feature Level Requirements

3.1.1 Feature Classification

As per FMC1278 "Electromagnetic Compatibility Specification for Electrical/Electronic Components and Subsystems" the functional classification of the aforementioned feature is "Class B"

3.1.2 Feature Requirements

The feature is intended to be able to either "Welcome" or bid "Farewell" to the Driver based off of how he/she interacts with the vehicle. The manner in which the vehicle shall interact with the Driver is by controlling the Exterior Lights, Interior Lights, or Vehicle Displays (turn then ON or OFF)

Rqmt #	Requirement
R: 3.1.2-1	The feature shall smoothly fade ON or snap ON Exterior Lights and Interior Lights as the Driver approaches the vehicles with a functioning keyfob.
R: 3.1.2-2	The feature shall smoothly fade ON, snap ON, or keep ON (if previously illuminated) Exterior Lighting and Interior Lighting as the Driver is unlocking the vehicle from outside.
R: 3.1.2-3	The feature shall smoothly fade ON, snap ON, or keep ON (if previously illuminated) Exterior Lights and Interior Lights as the Driver or Passenger is entering the vehicle (via vehicle doors).
R: 3.1.2-4	The feature shall turn ON vehicle displays and "Welcome" the Driver or Passenger as they are entering the vehicle (via vehicle doors).
R: 3.1.2-5	The feature shall smoothly fade ON, snap ON, or keep ON (if previously illuminated) Exterior Lights and Interior Lighting as the Driver is settling into their seat (shutting open doors).
R: 3.1.2-6	The feature shall turn ON or keep ON (if previously ON) vehicle displays and "Welcome" (or continue to "Welcome") the Driver as he/she is settling into their seat.

R: 3.1.2-7	Exterior lighting, Interior Lighting, and Vehicle Displays shall behave as required by law/market-specific-regulations when the Driver cycles the ignition to Run/Start
R: 3.1.2-8	The feature shall smoothly fade ON or snap ON (if previously OFF) Exterior Lights and Interior Lights after the Driver cycles the Ignition to OFF.
R: 3.1.2-9	The feature shall smoothly fade ON, snap ON, or keep ON (if previously illuminated) Exterior Lights and Interior Lights as the Driver or Passenger is exiting the vehicle.
R: 3.1.2-10	The feature shall turn ON or keep ON (if previously ON) vehicle displays and bid "Farewell" to the Driver as they are exiting the vehicle.
R: 3.1.2-11	The feature shall smoothly fade ON, snap ON, or keep ON (if previously illuminated) Exterior Lights and Interior Lighting after the Driver has exited the vehicle.
R: 3.1.2-12	The feature shall stop bidding the Driver "Farewell" and turn OFF vehicle displays after they have exited the vehicle.
R: 3.1.2-13	The feature shall fade OFF or snap OFF Exterior Lighting and Interior Lighting after the Driver has left the vehicle and locked it from outside.
R: 3.1.2-14	The feature shall keep OFF or turn OFF (if re-enabled) vehicle displays after the Driver has left the vehicle and locked it from outside.
R: 3.1.2-15	For Ford vehicles: Feature shall meet all requirements published under ARL "RQT-002004-021878 DNA WELCOME-FAREWELL STRATEGY REV. 1"
R: 3.1.2-16	For Lincoln vehicles: Feature shall meet all requirements published under ARL "RQT-002004-022094 LINCOLN EMBRACE WELCOME AND FAREWELL BEHAVIOR REV. 1"

3.1.2.1   **Feature Enablers**

The following features are required to be enabled and functioning in order for the Welcome/Farewell (and Lincoln Embrace by extension) to behave as intended.

R: 3.1.2.1-1	"Approach Detection" is required to be enabled and behave as specified under the "Approach Detection ReqSTD-2013-04-11-16-09" document, as well as within section 2.2.19 "Approach Lighting" of BCM FS-HU5T-14B476-AAG
R: 3.1.2.1-2	"Illuminated Entry" is required to be enabled and behave as specified under BCM FS-HU5T-14B476-AAG section 2.2.4 "Illuminated Entry"
R: 3.1.2.1-3	"Courtesy Lighting" is required to be enabled and behave as specified under BCM FS-HU5T-14B476-AAG section 2.2.5 "Courtesy Lighting"
R: 3.1.2.1-4	"Courtesy Lighting Delay" is required to be enabled and behave as specified under BCM FS-HU5T-14B476-AAG section 2.2.6 "Courtesy Lighting Delay"
R: 3.1.2.1-5	"Illuminated Exit" is required to be enabled and behave as specified under BCM FS-HU5T-14B476-AAG section 2.2.7 "Illuminated Exit"
R: 3.1.2.1-6	"Courtesy and Demand Lamps Battery Saver" is required to be enabled and behave as specified under BCM FS-HU5T-14B476-AAG section 2.1.1 "Battery Saver"
R: 3.1.2.1-7	"Locking" is required to be enabled and behave as specified under BCM FS-HU5T-14B476-AAG section 2.4 "Locking"

3.1.2.2   **Welcome/Farewell State Definitions**

The Feature requires that the Driver's interactions with the vehicle be interpreted and categorized across 3 broad categories: "Welcome", "Ignition Run/Start", and "Farewell.

Each of the aforementioned categories are then divided into subcategories (sub-states) which match up to existing features on the vehicle.

Welcome States:
- Approach Detection: A valid key-fob/PK is detected approaching the vehicle while the feature is enabled, the ignition is off, and the vehicle is locked.

- Illuminated Entry: While the ignition is OFF, the vehicle is unlocked or the key-fob is used to open a closed power sliding door / power lift-gate / lift-gate glass.
- Courtesy Lighting: While the ignition is OFF, a vehicle door, lift-gate, or lift-gate glass transitions to ajar.
- Courtesy Lighting Delay: While the ignition is OFF, all ajar vehicle doors/lift-gate/lift-gate glass transition to closed.

Rqmt #	Requirement
R: 3.1.2.2-1	"Approach Detection" shall be a valid state within the "Welcome" portion of Welcome/Farewell feature: State relies on location of a functioning PK/Keyfob either being within or outside the detected range of "Approach Detection" feature as defined in "Approach Detection ReqSTD-2013-04-11-16-09" document
R: 3.1.2.2-2	"Illuminated Entry" shall be a valid state within the "Welcome" portion of Welcome/Farewell feature: Enabled only while the Ignition is in "OFF" state and vehicle is unlocked from the outside: using Keyfob/PK, using Keypad, using lock-cylinder. (**Note**: Shall not transition to this state is vehicle is unlocked using inner door switch)
R: 3.1.2.2-3	"Courtesy Lighting" shall be a valid state within the "Welcome" portion of Welcome/Farewell feature: Enabled only while Ignition is in "OFF" state and a vehicle door (Driver, Passenger, Rear Right, Rear Left, Lift-gate, or Lift-gate glass) transitions to Ajar.
R: 3.1.2.2-4	"Courtesy Lighting Delay" shall be a valid state within the "Welcome" portion of Welcome/Farewell feature: Enabled only while ignition is in "OFF" after all ajar vehicle doors (Driver, Passenger, Rear Right, Rear Left, Lift-gate, and Lift-gate glass if present) are closed.

"Ignition RUN/START" States:
- Vehicle ignition has transitioned out of "OFF" to "RUN"/"START" with the engine running.

	Requirement
R: 3.1.2.2-5	Welcome/Farewell shall monitor the ignition state of the vehicle.

Farewell States:
- Illuminated Exit: The ignition transitions from "RUN"/"START" to OFF"
- Courtesy Lighting: Identical to Welcome Courtesy Lighting, except it occurs after ignition has transitioned to OFF.
- Courtesy Lighting Delay: Identical to Welcome Courtesy Lighting Delay, except it occurs after ignition has transitioned to OFF.
- Security Locking: Occurs after the ignition has transitioned from "ON"/"RUN" to "OFF" and the vehicle is locked using Key-fob, Key-pad, or exterior lock cylinder (interior door lock/unlock switch is not included)

	Requirement
R: 3.1.2.2-6	"Illuminated Exit" shall be a valid state within the "Farewell" portion of Welcome/Farewell feature: Enabled when the ignition transitions from Run/Start to OFF
R: 3.1.2.2-7	"Courtesy Lighting" shall be a valid state within the "Farewell" portion of Welcome/Farewell feature: Enabled only while Ignition is in "OFF" state (in this case after ignition transitions to "OFF") and a vehicle door (Driver, Passenger, Rear Right, Rear Left, Lift-gate, or Lift-gate glass) transitions to Ajar.
R: 3.1.2.2-8	"Courtesy Lighting Delay" shall be a valid state within the "Farewell" portion of Welcome/Farewell feature: Enabled only while Ignition is in "OFF" state (in this case after ignition transitions to "OFF") after all ajar vehicle doors (Driver, Passenger, Rear Right, Rear Left, Lift-gate, and Lift-gate glass if present) are closed.
R: 3.1.2.2-9	

	"Vehicle Locking" shall be a valid state within the "Farewell" portion of Welcome/Farewell feature: Enabled only while ignition is in "OFF" state, all doors are closed, and vehicle is locked from the outside: using Keyfob/PK, using Keypad, using lock-cylinder. (**Note**: Shall not transition to this state is vehicle is locked using inner door switch)

***NOTE** – Courtesy Lighting and Courtesy Lighting Delay states occur and drive the same behavior during both "Welcome" and "Farewell" sequences.

3.1.2.3   Additional Concurrent Features interacting with Welcome/FarewellStates

There are additional vehicle functions that either use the same triggers to activate as a currently defined Welcome Farewell States while driving different behavior, or those that can be activated either during or prior to Welcome Farwell state transitions which impact how the lighting elements that are tied to the feature behave.

- Remote start: Feature shall behave as described in BCM FS HU5T-14B476-AAG, and while it is active shall impact Exterior Lighting
- Delayed Accessory: Feature shall behave as described in BCM FS HU5T-14B476-AAG, and while it is active shall impact Interior Lighting. Drives vehicle behavior after ignition transitions to OFF. Behavior is identical to Illuminate Exit state, except it can remain enabled for a longer duration, and cannot be re-enabled until ignition has been cycled from RUN to OFF.
- Extended Play: Feature impacts vehicle infotainment displays and associated control backlighting (currently tied to Sync screen). State occurs Same as Illuminated Exit, except the state lasts for 10 minutes after ignition OFF vs. 25 seconds tied to Illuminated Exit. Can be re-enabled by pressing media power button.

	Requirement
R: 3.1.2.3-1	Key-fob holder can activate Remote Start by meeting conditions listed under section 2.13.2 of BCM FS-HU5T-14B476-AAG. Feature shall stay active until it is aborted or until vehicle ignition is started. While feature is active, exterior lighting elements tied to feature shall remain active for duration that the feature is active – override Welcome/Farewell state transition based requirements.
R: 3.1.2.3-2	Key-fob holder can activate Delayed Accessory by meeting conditions listed under section 2.1.2 of BCM FS-HU5T-14B476-AAG. Feature shall keep specific lighting and features on the interior active after Ignition transitions to OFF for either 10 minutes or a front vehicle door transitioning to Ajar (whichever occurs first) – override Welcome/Farewell state transition based requirements.
R: 3.1.2.3-3	"Extended Play" shall be a valid state within the "Farewell" portion of Welcome/Farewell feature that is exclusive to the Center-stack Display and Controls: takes the place of "Illuminated Exit" during welcome farewell state transitions; however, timeout is extended to 10 minutes (vs. 25 seconds for Illuminated Exit). Feature can be re-enabled manually by Driver (hard button press), which shall then override Welcome/Farewell state transition based requirements.

3.1.2.4   Power Modes and Vehicle states required for Feature operation

The feature is expected to have functionality across all Power Modes and Vehicle Modes that would qualify under "normal" operation of vehicle – Vehicle isn't in an error, error recovery, diagnostic, or any related state which would inhibit normal function of the vehicle.

	Power Mode	Vehicle Mode
R: 3.1.2.4-1	OFF	Vehicle Asleep or Vehicle Awake
R: 3.1.2.4-2	ACCESSORY	Vehicle Asleep or Vehicle Awake
R: 3.1.2.4-3	RUN/START	Vehicle Awake.

3.1.2.5   **Feature Overrides/Inhibits**

Ford Welcome Farewell and Lincoln Embrace are intended to be low-priority features, where if a "conflicting" feature is activated it shall be given higher priority.

	Requirement
R: 3.1.2.5-1	Activating "Perimeter Alarm Mode" or "Panic Alarm" as per sections 2.5-4 or 2.5-7 of BCM FS-HU5T-14B476-AAG shall override Welcome/Farewell state transition based requirements for duration feature is active
R: 3.1.2.5-2	Activating "Silent Mode" as per section 3.2-1 of BCM FS-HU5T-14B476-AAG shall override Welcome/Farewell state transition based requirements for duration feature is active
R: 3.1.2.5-3	Activating "Key-Off-Load Mode" as per section 2.14.6-7 of BCM FS-HU5T-14B476-AAG shall override Welcome/Farewell state transition based requirements for duration feature is active.
R: 3.1.2.5-4	Activating "Post-Crash Alert" as per section 2.5-78 of BCM FS-HU5T-14B476-AAG shall override Welcome/Farewell state transition based requirements for duration feature is active.

3.2 Quality Requirements

3.2.1 **Reliability Requirements**
No additional reliability requirements for the intended implementation.

3.2.2 **Performance Requirements**

Rqmt #	**Requirement**
R: 3.2.2-1	The lighting elements controlled by this feature while it is active shall be steady burning (no flickering) when illuminated
R: 3.2.2-2	By default, if a lighting element is required to "Fade ON", it shall take 3 seconds to ramp up its illumination level from "OFF" level to the desired "ON" level – "ON" illumination level shall be specified by Vehicle Harmony group.
R: 3.2.2-3	By default, if a lighting element is required to "Fade OFF", it shall take 5 seconds to complete when starting at "ON" illumination level
R: 3.2.2-4	If a lighting element is required to "Fade ON" or "Fade OFF", it shall continuously ramp ON or OFF to its "ON" level - shall not "flicker" as defined by the Interior Harmony Group, identified during vehicle walk-around
R: 3.2.2-5	Exterior Lighting elements required to "Fade ON" or "Fade OFF" shall follow ramp in either direction following Stevens' Power Law curve until the illumination reaches the desired "ON" or "OFF" level respectively
R: 3.2.2-6	Interior Lighting elements required to "Fade ON" or "Fade OFF" shall transition in either direction following "Smooth Dimming" until the illumination reaches the desired "ON" or "OFF" level
R: 3.2.2-7	Exterior Lighting elements required to "Snap ON" or "Snap OFF" shall step up or down their illumination level to the desired "ON" or "OFF" level following a step function
R: 3.2.2-8	Interior Lighting elements required to "Snap ON" or "Snap OFF" shall step up or down their illumination level to the desired "ON" or "OFF" level following a step function
R: 3.2.2-9	Interior Lighting elements required to "Pulse" shall ramp up to their "ON" illumination level and then immediately transition between their "ON" and configurable illumination level (10% of "ON" illumination level by default) at a configurable frequency (set to 1Hz by default) – point back BCM FS

3.2.2.1 **Performance Latency Requirements**

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Rqm't Num	Latency
R: 3.2.2.1-1	0.250 seconds

Note: End-to-End Latency is defined as once the Publisher changes the internal value of their publishing signal, the Subscriber must begin to respond within this defined latency (some functionality shall take time to fully enable the required functionality).

3.2.3 **Safety Requirements**

The following requirements refer to the safety requirements as defined and managed by the ASO office. Each requirement points to a specific "Regulation Records" (RRs) as they're listed in FSMS, which in turn refer to sections from the applicable Regulation.

Links to RRs are used instead of pointing to the specific language that applies within the larger Regulatory document to protect against continual updates/re-interpretations – link to RR won't change, but content within RR shall/might eventually change. It is also strongly advised that the listed "RR" Author" be contacted to assure that the content within the RR is being interpreted correctly.

3.2.3.1 **NAFTA Requirements to abide by (or not violate)**

Rqmt #	RR ID/ Revision	Country/ Vehicle area	Regulation Number and Title	RR Author
R: 3.2.3.1-1	CAN-004804/1	Canada/ Exterior Lighting	SCHEDULE IV Part II(CMVSS 108 and 108.1)/LIGHTING SYSTEM, RETRO-REFLECTIVE DEVICES and HEADLAMP CONCEALMENT DEVICES	Adams-Campos,Kelley-KADAMSCA (kadamsca)
R: 3.2.3.1-2	CAN-004804/3	Canada/ Exterior Lighting	CMVSS 108/LIGHTING SYSTEM, RETRO-REFLECTIVE DEVICES and HEADLAMP CONCEALMENT DEVICES	Adams-Campos,Kelley-KADAMSCA (kadamsca)
R: 3.2.3.1-3	CAN-004911/3	Canada/ Interior Lighting	CMVSS 101/SCHEDULE IV PART II 101 (CMVSS 101) Controls and Displays	Laesch,Renu-RLAESCH1 (rlaesch1)
R: 3.2.3.1-4	XCT-011075/1	Cross Country Topics/ Instrument Cluster	CROSS COUNTRY SPEEDOMETER MATRIX/CROSS COUNTRY MATRIX FOR SPEEDOMETER AND ODOMETER	Laesch,Renu-RLAESCH1 (rlaesch1)
R: 3.2.3.1-5	MEX-006101/1	Mexico/ Interior Lighting	MEX SECOFI-18/HAZARD WARNING SYSTEM	Arellano-Belloc,Hector-HARELLAN (harellan)
R: 3.2.3.1-6	MEX-006103/1	Mexico/ Exterior Lighting	MEX SECOFI-20/CLEARANCE LAMPS	Arellano-Belloc,Hector-HARELLAN (harellan)
R: 3.2.3.1-7	MEX-006134/1	Mexico/ Vehicle Display	MEX SECOFI-25/INSTRUMENT CLUSTER.	Arellano-Belloc,Hector-HARELLAN (harellan)
R: 3.2.3.1-8	USA-004809/20	US / Exterior Lighting	FMVSS 108/LAMPS, REFLECTIVE DEVICES AND ASSOCIATED EQUIPMENT	Adams-Campos,Kelley-KADAMSCA (kadamsca)

R: 3.2.3.1-9	USA-004890/4	US / Vehicle Display	Voluntary Agreements/Mandatory/Voluntary Agreement /Mandatory Commitment - Driver Focus-Telematics Guidelines	Overbeck,Thomas-TOVERBEC (toverbec)
R: 3.2.3.1-10	USA-004921/3	US / Exterior Lighting	FMVSS 111/FMVSS 111 - Rear Visibility	Vemulakonda,Gurunath-GVEMULAK (gvemulak)
R: 3.2.3.1-11	USA-006675/1	US / Vehicle Display	USA - STATE - SEVERAL/ODOMETER	Laesch,Renu-RLAESCH1 (rlaesch1)
R: 3.2.3.1-12	USA-006677/1	US / Exterior Lighting	USA - STATE - SEVERAL/FRONT FOG LAMPS	Adams-Campos,Kelley-KADAMSCA (kadamsca)
R: 3.2.3.1-13	USA-006734/1	US / Exterior Lighting	USA - STATE - SEVERAL/REAR FOG LAMPS	Adams-Campos,Kelley-KADAMSCA (kadamsca)
R: 3.2.3.1-14	USA-006735/1	US / Exterior Lighting	USA - STATE - SEVERAL/SIDE TURN SIGNAL LAMPS	Adams-Campos,Kelley-KADAMSCA (kadamsca)
R: 3.2.3.1-15	USA-006736/1	US / Exterior Lighting	USA - STATE - SEVERAL/AUXILIARY PASSING/LOW BEAM	Adams-Campos,Kelley-KADAMSCA (kadamsca)
R: 3.2.3.1-16	USA-006737/1	US / Exterior Lighting	USA - STATE - SEVERAL/FRONT CORNERING LAMPS	Adams-Campos,Kelley-KADAMSCA (kadamsca)
R: 3.2.3.1-17	USA-006738/1	US / Exterior Lighting	USA - STATE - SEVERAL/REAR CORNERING LAMPS	Adams-Campos,Kelley-KADAMSCA (kadamsca)
R: 3.2.3.1-18	USA-006739/1	US / Interior Lighting	USA - STATE - SEVERAL/CARGO LAMPS	Adams-Campos,Kelley-KADAMSCA (kadamsca)
R: 3.2.3.1-19	USA-006740/1	US / Exterior Lighting	USA - STATE - SEVERAL/SPOT LAMPS	Adams-Campos,Kelley-KADAMSCA (kadamsca)
R: 3.2.3.1-20	USA-006741/1	US / Exterior Lighting	USA - STATE - ALL/EXTERIOR LIGHTING - GENERAL	Adams-Campos,Kelley-KADAMSCA (kadamsca)
R: 3.2.3.1-21	USA-008712/1	US / Exterior Lighting	USA - STATE - SEVERAL/AUXILIARY DRIVING/HIGH BEAM	Adams-Campos,Kelley-KADAMSCA (kadamsca)
R: 3.2.3.1-22	USA-008716/3	US / Interior Lighting & Vehicle Displays	FMVSS 101/FMVSS 101 Controls and Displays	Laesch,Renu-RLAESCH1 (rlaesch1)
R: 3.2.3.1-23	USA-008732/1	US / Interior Lighting &	/NHTSA Visual-Manual Guidelines for In-Vehicle Electronic Devices	Leigh,Michael-MLEIGH (mleigh)

	RR ID/ Revision	Country/ Vehicle area	Regulation Number and Title	RR Author
		Vehicle Displays		
R: 3.2.3.1-24	USA-009169/2	US / Exterior Lighting	USA - STATE - SEVERAL/HEADLAMPS (LOW-BEAMS)	Adams-Campos,Kelley-KADAMSCA (kadamsca)
R: 3.2.3.1-25	USA-011127/2	US / Exterior Lighting, Interior Lighting & Vehicle Display	/2019MY U.S. NHTSA New Car Assessment Program (NCAP)	Buckman,Jennifer-JBARNARD (jbarnard)

3.2.3.2 **ECE Requirements to abide by (or not violate)**

	RR ID/ Revision	Country/ Vehicle area	Regulation Number and Title	RR Author
R: 3.2.3.2-1	ECE-009219/2	ECE / Exterior Lighting	ECE-20 amended to ECE-20.03/HALOGEN HEADLAMPS (LOW-BEAMS) (H4).	Sanchez,Greg-GSANCHE1 (gsanche1)
R: 3.2.3.2-2	ECE-007310/1	ECE / Exterior Lighting	ECE-01 amended to ECE-01.02/TUNGSTEN (R2, HS1) HEADLAMPS (LOW-BEAMS).	Sanchez,Greg-GSANCHE1 (gsanche1)
R: 3.2.3.2-3	ECE-008757/1	ECE / Vehicle Displays & Interior Lighting	RE3 ANNEX 16./ON-BOARD COMMUNICATION AND INFORMATION SYSTEMS.	Abraham,James-JABRAH11 (jabrah11)
R: 3.2.3.2-4	ECE-006905/1	ECE / Exterior Lighting	ECE-02 amended to ECE-02.03./TUNGSTEN HEADLAMP BULBS.	Sanchez,Greg-GSANCHE1 (gsanche1)
R: 3.2.3.2-5	ECE-009223/2	ECE / Exterior Lighting	ECE-31/HALOGEN SEALED BEAM HEADLAMPS (LOW-BEAMS) (HSB).	Sanchez,Greg-GSANCHE1 (gsanche1)
R: 3.2.3.2-6	ECE-005007/3	ECE / Exterior Lighting	ECE-65 amended to ECE-65.00 Supp.9/FLASHING WARNING BEACONS.	Sanchez,Greg-GSANCHE1 (gsanche1)
R: 3.2.3.2-7	ECE-004623/1	ECE / Exterior Lighting	ECE-123/ADAPTIVE FRONT-LIGHTING SYSTEMS (AFS)	Sanchez,Greg-GSANCHE1 (gsanche1)
R: 3.2.3.2-8	ECE-007313/1	ECE / Exterior Lighting	ECE-08 amended to ECE-08.05/HALOGEN HEADLAMPS (LOW-BEAMS) (EXCEPT H4 & HSB).	Sanchez,Greg-GSANCHE1 (gsanche1)
R: 3.2.3.2-9	ECE-007345/1	ECE / Exterior Lighting	ECE-5/TUNGSTEN SEALED BEAM HEADLAMPS (LOW-BEAMS).	Sanchez,Greg-GSANCHE1 (gsanche1)
R: 3.2.3.2-10	ECE-005026/6	ECE / Exterior Lighting	ECE-99/GAS DISCHARGE LIGHT SOURCES.	Sanchez,Greg-GSANCHE1 (gsanche1)

	RR ID/Revision	Country	Regulation Number and Title	RR Author
R: 3.2.3.2-11	ECE-005000/15	ECE / Exterior Lighting	ECE-37/FILAMENT LAMPS.	Sanchez,Greg-GSANCHE1 (gsanche1)
R: 3.2.3.2-12	ECE-008647/3	ECE / Exterior Lighting & Interior Lighting	ECE-128.00 Supp 2/LIGHT EMITTING DIODE (LED) LIGHT SOURCES	Sanchez,Greg-GSANCHE1 (gsanche1)
R: 3.2.3.2-13	ECE-004951/10	ECE / Vehicle Display	ECE-39/SPEEDOMETER	Sanchez,Greg-GSANCHE1 (gsanche1)
R: 3.2.3.2-14	ECE-004965/10	ECE / Exterior Lighting	ECE-4.00.Supp.17/REAR REGISTRATION PLATE LAMPS.	Sanchez,Greg-GSANCHE1 (gsanche1)
R: 3.2.3.2-15	ECE-005073/16	ECE / Interior Lighting & Vehicle Displays	ECE-121.01/Identification of Hand Controls, Tell-Tales and Indicators	Mueller,Joachim-JMUELLE6 (jmuelle6)
R: 3.2.3.2-16	ECE-005009/12	ECE / Exterior Lighting	ECE-26.02/Exterior Projections	Mueller,Joachim-JMUELLE6 (jmuelle6)

3.2.3.3 **China Requirements to abide by (or not violate)**

	RR ID/Revision	Country	Regulation Number and Title	RR Author
R: 3.2.3.3-1	CHN-005552/2	China / Exterior Lighting	GB 11554-2008/CHINA: REAR FOG LAMPS	Zhang,Yue-YZHAN256 (yzhan256)
R: 3.2.3.3-2	CHN-005656/2	China / Exterior Lighting	GB 21259-2007/CHINA: GAS-DISCHARGE HEADLAMPS (LOW-BEAMS)	Zhang,Yue-YZHAN256 (yzhan256)
R: 3.2.3.3-3	CHN-008890/3	China / Exterior Lighting	GB 18099/CHINA: SIDE-MARKER LAMPS	Zhang,Yue-YZHAN256 (yzhan256)
R: 3.2.3.3-4	CHN-004328/8	China / Exterior Lighting	GB 4785/CHINA: INSTALLATION OF EXTERNAL LIGHTING AND LIGHT SIGNALING DEVICES	Zhang,Yue-YZHAN256 (yzhan256)
R: 3.2.3.3-5	CHN-005445/2	China / Exterior Lighting	GB 5920-2008/CHINA: FRONT AND REAR POSITION, END-OUTLINE MARKER, AND STOP LAMPS	Zhang,Yue-YZHAN256 (yzhan256)
R: 3.2.3.3-6	CHN-008533/2	China / Exterior Lighting	GB 18408-2001, GB 18408-2015/CHINA: ILLUMINATION OF REAR REGISTRATION PLATES	Zhang,Yue-YZHAN256 (yzhan256)
R: 3.2.3.3-7	CHN-008566/2	China / Exterior Lighting	GB/T 30036-2013/CHINA: ADAPTIVE FRONT LIGHTING STSTEM (AFS)	Zhang,Yue-YZHAN256 (yzhan256)

R: 3.2.3.3-8	CHN-004539/19	China / Exterior Lighting, Interior Lighting & Vehicle Display	CNCA CCC rules-component/CHINA: CCC COMPONENT CERTIFICATION	Zhang,Yue-YZHAN256 (yzhan256)
R: 3.2.3.3-9	XCT-011075/1	Cross Country Topics / Vehicle Display	CROSS COUNTRY SPEEDOMETER MATRIX/CROSS COUNTRY MATRIX FOR SPEEDOMETER AND ODOMETER	Laesch,Renu-RLAESCH1 (rlaesch1)
R: 3.2.3.3-10	CHN-005684/2	China / Exterior Lighting	GB 23255/CHINA: DAYTIME RUNNING LAMP	Zhang,Yue-YZHAN256 (yzhan256)
R: 3.2.3.3-11	CHN-005443/1	China / Exterior Lighting	GB 4599-2007/CHINA: HEADLAMPS (LOW-BEAMS)	Zhang,Yue-YZHAN256 (yzhan256)
R: 3.2.3.3-12	CHN-004515/2	China / Exterior Lighting	GB 25991-2010/CHINA: LED HEADLAMPS (LOW-BEAMS)	Zhang,Yue-YZHAN256 (yzhan256)
R: 3.2.3.3-13	CHN-005444/1	China / Exterior Lighting & Interior Lighting	GB 17509-2008/CHINA: DIRECTION INDOCATORS	Zhang,Yue-YZHAN256 (yzhan256)
R: 3.2.3.3-14	CHN-010709/2	China / Vehicle Display	GB/T 19836/CHINA: INSTRUMENTATION FOR ELECTRIC VEHICLES	Peng,Quanping-QPENG4 (qpeng4)
R: 3.2.3.3-15	CHN-008524/1	China / Exterior Lighting	GB 11566-2009/CHINA: EXTERIOR PROJECTIONS	Zhang,Yue-YZHAN256 (yzhan256)
R: 3.2.3.3-16	CHN-005446/1	China / Exterior Lighting	GB 15235-2007/CHINA: REVERSING LAMPS	Zhang,Yue-YZHAN256 (yzhan256)
R: 3.2.3.3-17	CHN-008936/2	China / Exterior Lighting	GB/T 30511/CHINA: CORNERING LAMPS	Zhang,Yue-YZHAN256 (yzhan256)
R: 3.2.3.3-18	CHN-004436/16	China / Exterior Lighting, Interior Lighting & Vehicle Display	GB 7258/CHINA: CCC VEHICLE APPROVAL	Zhang,Yue-YZHAN256 (yzhan256)
R: 3.2.3.3-19	CHN-004481/6	China / Interior Lighting	GB 20182/CHINA: EXTERNAL RPOJECTIONS - COMMERCIAL VEHICLE CABIN	Zhang,Yue-YZHAN256 (yzhan256)
R: 3.2.3.3-20	CHN-005596/1	China / Exterior Lighting	GB 15766.1-2000/CHINA: LAMPS FOR ROAD VEHICLES (FILAMENT LAMPS & GAS-DISCHAGE LAMPS)	Zhang,Yue-YZHAN256 (yzhan256)

R: 3.2.3.3-21	CHN-005597/1	China / Exterior Lighting	GB 18409-2001/CHINA: PARKING LAMPS	Zhang,Yue-YZHAN256 (yzhan256)
R: 3.2.3.3-22	CHN-004329/5	China / Interior Lighting & Vehicle Displays	GB 4094/CHINA: SYMBOLS FOR CONTROLS, INDICATORS, AND TELL-TALES	Zhang,Yue-YZHAN256 (yzhan256)
R: 3.2.3.3-23	CHN-004330/5	China / Interior Lighting & Vehicle Display	GB 15082/CHINA: SPEEDOMETERS FOR MOTOR VEHICLE	Zhang,Yue-YZHAN256 (yzhan256)
R: 3.2.3.3-24	CHN-005551/2	China / Exterior Lighting	GB 4660-2007/CHINA: FRONT FOG LAMPS	Zhang,Yue-YZHAN256 (yzhan256)

***NOTE** – China market regulatory requirements are close to ECE market requirements with very few exceptions.
***NOTE** – Consult ASO team for any markets not specified.

3.2.4 Security Requirements

N/A – No unique security requirements are required by this feature.

4 FUNCTIONAL DECOMPOSITION

4.1 Functional Architecture
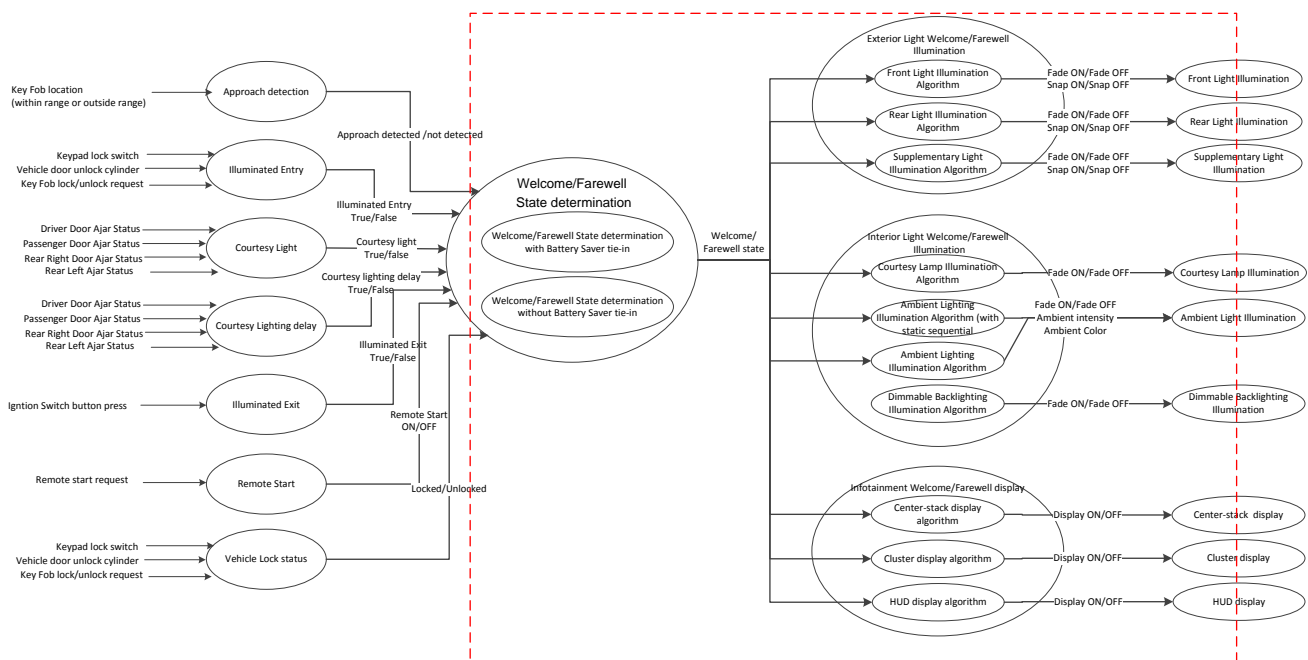
Figure 2: **Welcome Farewell Functional Architecture**

4.2 List of Functions

Section #	Function Name	Function Description
5.2.2	Welcome/Farewell State determination without Battery Saver tie-in	Algorithm within the controlling module which shall accept input signals to then determine the specific state of welcome farewell – not taking BCM specific "Battery Saver" function into account
5.2.3	Welcome/Farewell State determination with Battery Saver	Algorithm within the controlling module which shall accept input signals to then determine the specific state of welcome farewell - taking BCM specific "Battery Saver" function into account
5.3.1	Exterior "Front Illumination" Algorithm	Function used to transmit the appropriate control signals to lighting elements located at the front of the vehicle, based on Welcome/Farewell State
5.3.2	Exterior "Front Illumination" Lighting Response	Defines how the lighting elements identified as "Front Illumination" as per "RQT-002004-021878 DNA WELCOME-FAREWELL STRATEGY REV. 1" for Ford vehicles or "RQT-002004-022094 LINCOLN EMBRACE WELCOME AND FAREWELL BEHAVIOR REV. 1" for Lincoln vehicles shall respond to the control signals they're receiving from the Exterior "Front Illumination" Algorithm
5.3.3	Exterior "Rear Illumination" Algorithm	Function used to transmit the appropriate control signals to lighting elements located at the rear of the vehicle, based on Welcome/Farewell State
5.3.4	Exterior "Rear Illumination" Lighting Response	Defines how the lighting elements identified as "Rear Illumination" as per "RQT-002004-021878 DNA WELCOME-FAREWELL STRATEGY REV. 1" for Ford vehicles or "RQT-002004-022094 LINCOLN EMBRACE WELCOME AND FAREWELL BEHAVIOR REV. 1" for Lincoln vehicles shall respond to the control signals they're receiving from the Exterior "Rear Illumination" Algorithm
5.3.5	Exterior "Supplementary Illumination" Algorithm	Function used to transmit the appropriate control signals to supplemental lighting elements on the exterior of the vehicle, based on Welcome/Farewell State
5.3.6	Exterior "Supplementary Illumination" Lighting Response	Defines how the lighting elements identified as "Supplementary Illumination" as per "RQT-002004-021878 DNA WELCOME-FAREWELL STRATEGY REV. 1" for Ford vehicles or "RQT-002004-022094 LINCOLN EMBRACE WELCOME AND FAREWELL BEHAVIOR REV. 1" for Lincoln vehicles shall respond to the control signals they're receiving from the Exterior "Supplementary Illumination" Algorithm
5.4.1	Interior "Courtesy Lights" Algorithm	Function used to transmit the appropriate control signals to Interior Courtesy lighting elements, based on Welcome/Farewell State
5.4.2	Interior "Courtesy Lights" Lighting Response	Defines how the lighting elements identified as "Courtesy Lights" as per "RQT-002004-021878 DNA WELCOME-FAREWELL STRATEGY REV. 1" for Ford vehicles or "RQT-002004-022094 LINCOLN EMBRACE WELCOME AND FAREWELL BEHAVIOR REV. 1" for Lincoln vehicles shall respond to the control signals they're receiving from the Interior "Courtesy Lights" Algorithm.
5.4.3	Interior "Ambient Lighting without static sequential" Algorithm	Function used to transmit the appropriate control signals to Interior Ambient lighting elements without enabling static sequential, based on Welcome/Farewell State
5.4.4	Interior "Ambient Lighting without static sequential" Lighting Response	Defines how the lighting elements identified as "Ambient Lighting without Static Sequential" as per "RQT-002004-021878 DNA WELCOME-FAREWELL STRATEGY REV. 1" for Ford vehicles or "RQT-002004-022094 LINCOLN EMBRACE WELCOME AND FAREWELL BEHAVIOR REV. 1" for Lincoln vehicles shall respond to the control signals they're receiving from the Interior "Ambient Lighting without Static Sequential" Algorithm.

5.4.5	Interior "Ambient Lighting with static sequential" Algorithm	Function used to transmit the appropriate control signals to Interior Ambient lighting elements while supporting static sequential, based on Welcome/Farewell State
5.4.6	Interior "Ambient Lighting with static sequential" Lighting Response	Defines how the lighting elements identified as "Ambient Lighting with Static Sequential" as per "RQT-002004-021878 DNA WELCOME-FAREWELL STRATEGY REV. 1" for Ford vehicles or "RQT-002004-022094 LINCOLN EMBRACE WELCOME AND FAREWELL BEHAVIOR REV. 1" for Lincoln vehicles shall respond to the control signals they're receiving from the Interior "Ambient Lighting with Static Sequential" Algorithm.
5.4.7.1	Interior "Day-time Dimmable Backlighting" Algorithm	Function used to transmit the appropriate control signals to Interior Dimmable Backlighting elements, based on Welcome/Farewell State. Broken down into 3 sub functions: "Day-time Dimmable", "Night-time Dimmable", and "2-step Dimmable" backlighting algorithm.
5.4.7.2	Interior "Day-time Dimmable Backlighting" Lighting Response	Defines how the lighting elements identified as "Dimmable Backlighting" as per "RQT-002004-021878 DNA WELCOME-FAREWELL STRATEGY REV. 1" for Ford vehicles or "RQT-002004-022094 LINCOLN EMBRACE WELCOME AND FAREWELL BEHAVIOR REV. 1" for Lincoln vehicles shall respond to the control signals they're receiving from Interior "Dimmable Backlighting" Algorithm (more specifically either: "Day-time Dimmable", "Night-time Dimmable", and "2-step Dimmable" backlighting algorithm.)
5.4.7.3	Interior "Night-time Dimmable Backlighting" Algorithm	Function used to transmit the appropriate control signals to Interior Dimmable Backlighting elements, based on Welcome/Farewell State. Broken down into 3 sub functions: "Day-time Dimmable", "Night-time Dimmable", and "2-step Dimmable" backlighting algorithm.
5.4.7.4	Interior "Night-time Dimmable Backlighting" Lighting Response	Defines how the lighting elements identified as "Dimmable Backlighting" as per "RQT-002004-021878 DNA WELCOME-FAREWELL STRATEGY REV. 1" for Ford vehicles or "RQT-002004-022094 LINCOLN EMBRACE WELCOME AND FAREWELL BEHAVIOR REV. 1" for Lincoln vehicles shall respond to the control signals they're receiving from Interior "Dimmable Backlighting" Algorithm (more specifically either: "Day-time Dimmable", "Night-time Dimmable", and "2-step Dimmable" backlighting algorithm.)
5.4.7.5	Interior "2-Step Dimmable Backlighting" Algorithm	Function used to transmit the appropriate control signals to Interior Dimmable Backlighting elements, based on Welcome/Farewell State. Broken down into 3 sub functions: "Day-time Dimmable", "Night-time Dimmable", and "2-step Dimmable" backlighting algorithm.
5.4.7.6	Interior "2-Step Dimmable Backlighting" Lighting Response	Defines how the lighting elements identified as "Dimmable Backlighting" as per "RQT-002004-021878 DNA WELCOME-FAREWELL STRATEGY REV. 1" for Ford vehicles or "RQT-002004-022094 LINCOLN EMBRACE WELCOME AND FAREWELL BEHAVIOR REV. 1" for Lincoln vehicles shall respond to the control signals they're receiving from Interior "Dimmable Backlighting" Algorithm (more specifically either: "Day-time Dimmable", "Night-time Dimmable", and "2-step Dimmable" backlighting algorithm.)
5.5.1	Center-stack welcome/farewell Display	Function used to transmit the appropriate control signals to the Cluster display, based on Welcome/Farewell State
5.5.2	Cluster Welcome/Farewell Displays	Function used to transmit the appropriate control signals to the Cluster display, based on Welcome/Farewell State

5.5.3	HUD Welcome/Farewell Displays (aHUD)	Function used to transmit the appropriate control signals to the unspecified displays, based on Welcome/Farewell State

5 Function Requirement

5.1 Power Modes of each Function

Rqmt #	Function Name	Power Mode
R: 5.1-1	Welcome/Farewell State determination without Battery Saver tie-in	OFF, ACCESSORY, RUN, and START
R: 5.1-2	Welcome/Farewell State determination with Battery Saver	OFF, ACCESSORY, RUN, and START
R: 5.1-3	Exterior "Front Illumination" Algorithm	OFF, ACCESSORY, RUN, and START
R: 5.1-4	Exterior "Front Illumination" Lighting Response	OFF, ACCESSORY, RUN, and START
R: 5.1-5	Exterior "Rear Illumination" Algorithm	OFF, ACCESSORY, RUN, and START
R: 5.1-6	Exterior "Rear Illumination" Lighting Response	OFF, ACCESSORY, RUN, and START
R: 5.1-7	Exterior "Supplementary Illumination" Algorithm	OFF, ACCESSORY, RUN, and START
R: 5.1-8	Exterior "Supplementary Illumination" Lighting Response	OFF, ACCESSORY, RUN, and START
R: 5.1-9	Interior "Courtesy Lights" Algorithm	OFF, ACCESSORY, RUN, and START
R: 5.1-10	Interior "Courtesy Lights" Lighting Response	OFF, ACCESSORY, RUN, and START
R: 5.1-11	Interior "Ambient Lighting without static sequential" Algorithm	OFF, ACCESSORY, RUN, and START
R: 5.1-12	Interior "Ambient Lighting without static sequential" Lighting Response	OFF, ACCESSORY, RUN, and START
R: 5.1-13	Interior "Ambient Lighting with static sequential" Algorithm	OFF, ACCESSORY, RUN, and START
R: 5.1-14	Interior "Ambient Lighting with static sequential" Lighting Response	OFF, ACCESSORY, RUN, and START
R: 5.1-15	Interior "Day-time Dimmable Backlighting" Algorithm	OFF, ACCESSORY, RUN, and START
R: 5.1-16	Interior "Day-time Dimmable Backlighting" Lighting Response	OFF, ACCESSORY, RUN, and START
R: 5.1-17	Interior "Night-time Dimmable Backlighting" Algorithm	OFF, ACCESSORY, RUN, and START
R: 5.1-18	Interior "Night-time Dimmable Backlighting" Lighting Response	OFF, ACCESSORY, RUN, and START
R: 5.1-19	Interior "2-Step Dimmable Backlighting" Algorithm	OFF, ACCESSORY, RUN, and START
R: 5.1-20	Interior "2-Step Dimmable Backlighting" Lighting Response	OFF, ACCESSORY, RUN, and START
R: 5.1-21	Center-stack welcome/farewell Display	OFF, ACCESSORY, RUN, and START
R: 5.1-22	Cluster Welcome/Farewell Displays	OFF, ACCESSORY, RUN, and START
R: 5.1-23	HUD Welcome/Farewell Displays	OFF, ACCESSORY, RUN, and START

5.2 Welcome/Farewell State determination

5.2.1 Inputs used for Welcome/Farewell State determination

In order to transition between the Welcome/Farewell states listed within section 3.1.2, the vehicle shall need to monitor the following:

Rqmt #	Requirement	Values
R: 5.2.1-1	The Welcome/Farewell feature shall use the output associated with "Approach Detection Proximity Sensing", as defined in FS-HU5T-14B476-AAG, being active or in-active as an input for Welcome/Farewell State determination.	Approach Detected
		Approach not Detected
R: 5.2.1-2	The Welcome/Farewell feature shall accept Vehicle Driver Door Status (Driver, Passenger, Rear Left, and Rear Right: Ajar or Open) on change, as an input for Welcome/Farewell State determination	Driver Door Ajar
		Driver Door Closed
R: 5.2.1-3	The Welcome/Farewell feature shall accept Vehicle Passenger Door Status (Driver, Passenger, Rear Left, and Rear Right: Ajar or Open) on change, as an input for Welcome/Farewell State determination	Passenger Door Ajar
		Passenger Door Closed
R: 5.2.1-4	The Welcome/Farewell feature shall accept Vehicle Rear Left Door Status on change, as an input for Welcome/Farewell State determination	Rear Left Door Ajar
		Rear Left Door Closed
R: 5.2.1-5	The Welcome/Farewell feature shall accept Vehicle Rear Right Door Status on change, as an input for Welcome/Farewell State determination	Rear Right Door Ajar
		Rear Right Door Closed
R: 5.2.1-6	The Welcome/Farewell feature shall accept Vehicle Door Lock Status actuated via Keyfob / PK on change, as an input for Welcome/Farewell State determination.	Keyfob/PK lock
		Keyfob/PK unlock
R: 5.2.1-7	The Welcome/Farewell feature shall accept Vehicle Door Lock Status actuated via Keypad on change, as an input for Welcome/Farewell State determination.	Keypad lock
		Keypad unlock
R: 5.2.1-8	The Welcome/Farewell feature shall accept Vehicle Door Lock Status actuated via external lock cylinder on change, as an input for Welcome/Farewell State determination.	Cylinder lock
		Cylinder unlock
R: 5.2.1-9	The Welcome/Farewell feature shall accept Ignition Status (Off, Run and Start) on change, as an input for Welcome/Farewell State determination. NOTE: "Vehicle Ignition is OFF" refers to "Accessory" ignition state as well.	Vehicle Ignition is OFF
		Vehicle ignition is in Run/Start

5.2.2 Welcome/Farewell State determination without Battery Saver tie-in

The Control module containing the Welcome/Farewell State determination shall transition between its identified states slightly differently if the "Battery Saver" function, as defined in section 2.1.1 of FS-HU5T-14B476-AAG, is taken into consideration or not. The following section, diagram and list of requirements don't take it into account.

Figure 3 : **Welcome Farewell State Determination (without Battery Saver)**

State diagram text (transitions):

1. Ignition OFF / Vehicle Locked / Approach Enabled / PK within Range -> Outside of Range
2. Ignition OFF / Vehicle Locked / Approach Enabled / PK within Range / Approach Timer Expired (25 seconds)
3. Ignition OFF / Vehicle Locked / Approach Enabled / PK out of range -> PK within Range
5. Ignition OFF / Vehicle Locked -> Vehicle Unlocked
7. Ignition OFF / Vehicle Unlocked / All vehicle Doors closed -> Vehicle Door ajar
10. Ignition OFF / Vehicle Unlocked "Courtesy Light Timer" expired (25 seconds)
11. Ignition OFF / Vehicle Doors closed / Vehicle unLock requested
12. Ignition OFF / Vehicle Unlocked -> Vehicle Locked
13. Ignition OFF / Vehicle door(s) ajar "Courtesy Light Timer" Expired (25 seconds)
14. Ignition OFF / All vehicle Doors closed -> Vehicle Door ajar
15. Ignition OFF / Vehicle Door(s) Ajar -> All Doors Closed
16. Ignition OFF / Vehicle Doors Closed -> Vehicle Door Ajar
17. Ignition OFF / Vehicle Door(s) Ajar -> All Doors Closed "Courtesy Light Timer" Expired (25 seconds)
18. Ignition OFF / Vehicle Door(s) Ajar -> All Doors Closed
19. Vehicle Doors Closed / Ignition RUN -> OFF "Courtesy Light Timer" Expired (25 seconds)
20. Ignition OFF / Vehicle Doors Closed -> Vehicle Door(s) Ajar
21. Ignition OFF -> RUN/Start
22. Vehicle Doors Closed / Ignition RUN/Start -> OFF
23. Ignition OFF -> RUN/Start
24. Vehicle Door(s) Ajar / Ignition RUN/Start -> OFF
25. Ignition OFF / Vehicle Doors Closed / Vehicle Lock requested
26. Ignition OFF -> RUN/Start
27. Ignition OFF / Vehicle Locked / Vehicle Door(s) Ajar -> Vehicle Doors closed
28. Ignition OFF / Vehicle Doors Closed / Vehicle Lock requested
29. Vehicle Doors Closed / Vehicle Locked
30. Ignition OFF -> RUN/Start

States: I. Null / A. Approach Detection / B. Illuminated Entry / C. Courtesy Lighting / D. Courtesy Lighting Delay / E. Ignition RUN/Start / F. Illuminated Exit / G. Vehicle Locking

*NOTE – Even though the diagram above has two separate "Null" states called out, they are referring to the same "Null" state.

**NOTE – Additional details expressed in terms of transitions and inputs defined in section 5.2.1 listed in requirements/table below.

	A -> I.1: PK/Key Fob entered then went outside of Approach Detection range, currently set at 2.5 meters "Approach Detected" -> "Approach not Detected"
	A -> I.2: Approach Detection timer set at 25 seconds. State shall expire if no action is taken after initially detected and PK/Key fob remains within 2.5 meters' range. "Approach Detected" -> "Approach not Detected"
	I -> A.3: 25 seconds Approach Detection starts after PK/Key Fob enters Approach Detection range. "Null" -> "Approach Detected"
	A -> B.5: Unlock must occur using Key-fob, Keypad, or exterior door lock cylinder. 25 seconds "Courtesy Light Timer" starts at Unlock. "Approach Detected" -> "Approach not Detected" "Keyfob/Pk unlock" OR "Keypad unlock" OR "Cylinder unlock"
	B -> C.7: 25 second "Courtesy Light Timer" starts at first door open. Does not reset with each additional door open.

	"Driver Door Closed" AND "Passenger Door Closed" AND "Rear Left Door Closed" AND "Rear Right Door Closed" -> "Driver Door Ajar" OR "Passenger Door Ajar" OR "Rear Left Door Ajar" OR "Rear Right Door Ajar"
	B -> I.10: 25 second "Courtesy Light Timer" started at Unlock (via Key-fob, Keypad, or exterior door lock cylinder). Timer resets with each additional unlock request made. "Keyfob/Pk unlock" OR "Keypad unlock" OR "Cylinder unlock" AND Courtesy Light Timer expired -> "Null" state
	I -> B.11: Unlock must occur using Key-fob, Keypad, or exterior door lock cylinder. 25 seconds "Courtesy Light Timer" starts at Unlock "Null" -> "Keyfob/Pk unlock" OR "Keypad unlock" OR "Cylinder unlock"
	B ->G.12: Lock must occur using Key-fob, Keypad, or exterior door lock cylinder. "Keyfob/Pk lock" OR "Keypad lock" OR "Cylinder lock"
	C ->I.13: 25 seconds passed from first door ajar event. ("Driver Door Ajar" OR "Passenger Door Ajar" OR "Rear Left Door Ajar" OR "Rear Right Door Ajar") AND "Courtesy Light Timer" expired -> "Null"
	I -> C.14: 25 second "Courtesy Light Timer" starts at first door open. Does not reset with each additional door open. "Driver Door Closed" AND "Passenger Door Closed" AND "Rear Left Door Closed" AND "Rear Right Door Closed"-> "Driver Door Ajar" OR "Passenger Door Ajar" OR "Rear Left Door Ajar" OR "Rear Right Door Ajar"
	C -> D.15: All vehicle doors have to be closed within 25 seconds of first door ajar in order for transition to occur. Otherwise state shall transition to "Null". 25 second "Courtesy Light Timer" shall reset at all doors closed. "Driver Door Ajar" OR "Passenger Door Ajar" OR "Rear Left Door Ajar" OR "Rear Right Door Ajar" OR "Lift-Gate Ajar" OR "Lift-Gate Glass Ajar -> "Driver Door Closed" AND "Passenger Door Closed" AND "Rear Left Door Closed" AND "Rear Right Door Closed"
	D -> C.16: 25 second "Courtesy Light Timer" resets at first door open. Does not reset with each additional door open. "Driver Door Closed" AND "Passenger Door Closed" AND "Rear Left Door Closed" AND "Rear Right Door Closed" AND "Lift-Gate Closed" AND "Lift-Gate Glass Closed" -> "Driver Door Ajar" OR "Passenger Door Ajar" OR "Rear Left Door Ajar" OR "Rear Right Door Ajar"
	D -> I.17: 25 seconds passed from all ajar doors closed event. "Driver Door Ajar" OR "Passenger Door Ajar" OR "Rear Left Door Ajar" OR "Rear Right Door Ajar" OR "Lift-Gate Ajar" OR "Lift-Gate Glass Ajar -> ("Driver Door Closed" AND "Passenger Door Closed" AND "Rear Left Door Closed" AND "Rear Right Door Closed) AND "Courtesy Light Timer" expired.
	I -> D.18: 25 second "Courtesy Light Timer" shall start at all doors closed. "Driver Door Ajar" OR "Passenger Door Ajar" OR "Rear Left Door Ajar" OR "Rear Right Door Ajar" OR "Lift-Gate Ajar" OR "Lift-Gate Glass Ajar" -> "Driver Door Closed" AND "Passenger Door Closed" AND "Rear Left Door Closed" AND "Rear Right Door Closed"
	F -> I.19: 25 seconds passed from ignition transitioning from RUN/Start to OFF. "Vehicle Ignition is in Run/Start" -> "Vehicle Ignition is OFF" AND "Courtesy Light Timer" expired
	F -> C.20: 25 second "Courtesy Light Timer" starts at first door open. Does not reset with each additional door open. "Vehicle Ignition is in Run/Start" -> "Vehicle Ignition is OFF" "Driver Door Closed" AND "Passenger Door Closed" AND "Rear Left Door Closed" AND "Rear Right Door Closed" AND "Lift-Gate Closed" AND "Lift-Gate Glass Closed" ->

	"Driver Door Ajar" OR "Passenger Door Ajar" OR "Rear Left Door Ajar" OR "Rear Right Door Ajar"
	C -> E.21: Legislative/In drive vehicle behavior is enabled during Ignition Run/Start state "Driver Door Ajar" OR "Passenger Door Ajar" OR "Rear Left Door Ajar" OR "Rear Right Door Ajar" "Vehicle Ignition is OFF" -> "Vehicle Ignition is in Run/Start"
	E -> F.22: 25 second "Courtesy Light Timer" shall start at Ignition transitioning from RUN/Start to OFF. "Driver Door Closed" AND "Passenger Door Closed" AND "Rear Left Door Closed" AND "Rear Right Door Closed" "Vehicle Ignition is in Run/Start" -> "Vehicle Ignition is OFF"
	D -> E.23: Legislative/In drive vehicle behavior is enabled during Ignition Run/Start state "Driver Door Closed" AND "Passenger Door Closed" AND "Rear Left Door Closed" AND "Rear Right Door Closed" "Vehicle Ignition is OFF" -> "Vehicle Ignition is in Run/Start"
	E -> C.24: 25 second "Courtesy Light Timer" shall start at Ignition transitioning from RUN/Start to OFF. "Driver Door Ajar" OR "Passenger Door Ajar" OR "Rear Left Door Ajar" OR "Rear Right Door Ajar" "Vehicle Ignition is in Run/Start" -> "Vehicle Ignition is OFF"
	D -> G.25: Lock must occur using Key-fob, Keypad, or exterior door lock cylinder. "Driver Door Closed" AND "Passenger Door Closed" AND "Rear Left Door Closed" AND "Rear Right Door Closed" "Keyfob/Pk lock" OR "Keypad lock" OR "Cylinder lock"
	G -> E.26: Legislative/In drive vehicle behavior is enabled during Ignition Run/Start state "Driver Door Closed" AND "Passenger Door Closed" AND "Rear Left Door Closed" AND "Rear Right Door Closed" AND ("Keyfob/Pk lock" OR "Keypad lock" OR "Cylinder lock") AND ("Vehicle Ignition is OFF" -> "Vehicle Ignition is in Run/Start")
	C -> G.27: "Courtesy Lighting Timer" shall continue counting down if door(s) left ajar after vehicle lock request is made (via keyfob/keypad/door cylinder). Transition to state shall occur at all doors closed. "Keyfob/Pk lock" OR "Keypad lock" OR "Cylinder lock" "Driver Door Ajar" OR "Passenger Door Ajar" OR "Rear Left Door Ajar" OR "Rear Right Door Ajar" -> "Driver Door Closed" AND "Passenger Door Closed" AND "Rear Left Door Closed" AND "Rear Right Door Closed"
	I -> G.28: Lock must occur using Key-fob, Keypad, or exterior door lock cylinder. Same transition to state can occur if vehicle locked prior to all vehicle doors closed. "Vehicle Ignition is OFF" "Driver Door Closed" AND "Passenger Door Closed" AND "Rear Left Door Closed" AND "Rear Right Door Closed" "Keyfob/Pk lock" OR "Keypad lock" OR "Cylinder lock"
	G -> I.29: Transition to "Null" occurs after vehicle locking operation/state is complete/confirmed.
	I -> E.30: Legislative/In drive vehicle behavior is enabled during Ignition Run/Start state "Vehicle Ignition is OFF" -> "Vehicle Ignition is in Run/Start"

5.2.3 **Welcome/Farewell State determination with Battery Saver tie-in**

The Control module containing the Welcome/Farewell State determination shall transition between its identified states slightly differently if the "Battery Saver" function, as defined in section 2.1.1 of FS-HU5T-14B476-AAG, is taken into consideration or not. The following section, diagram and list of requirements take it into account.
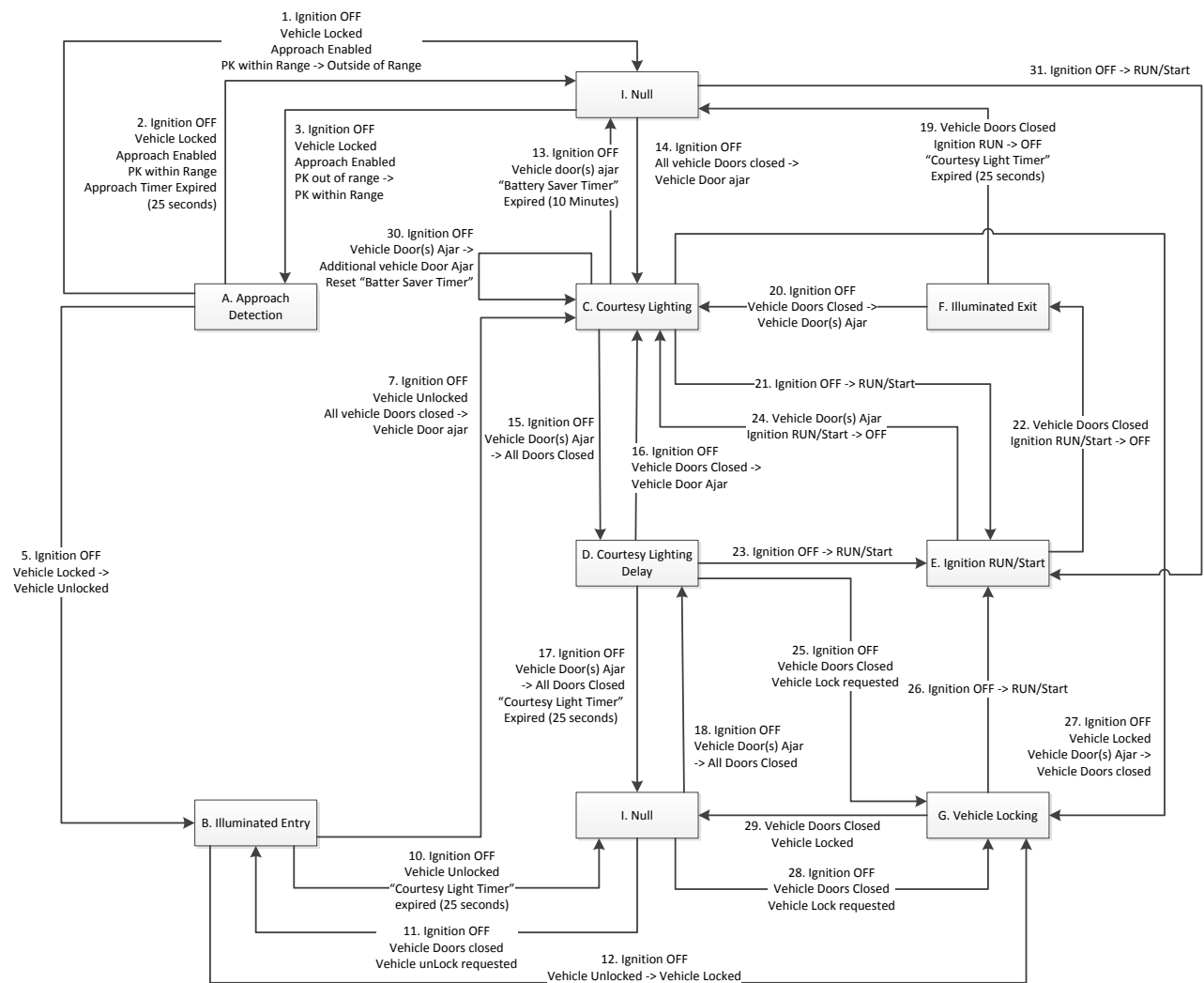
Figure 4:   Welcome Farewell State Determination (with Battery Saver)

***NOTE** – Even though the diagram above has two separate "Null" states called out, they are referring to the same "Null" state.

	A -> I.1: PK/Key Fob entered then went outside of Approach Detection range, currently set at 2.5 meters "Approach Detected" -> "Approach not Detected"
	A -> I.2: Approach Detection timer set at 25 seconds. State shall expire if no action is taken after initially detected and PK/Key fob remains within 2.5 meter range. "Approach Detected" -> "Approach not Detected"
	I -> A.3: 25 seconds Approach Detection starts after PK/Key Fob enters Approach Detection range. "Null" -> "Approach Detected"
	A -> B.5: Unlock must occur using Key-fob, Keypad, or exterior door lock cylinder. 25 seconds "Courtesy Light Timer" starts at Unlock "Approach Detected" -> "Approach not Detected" "Keyfob/Pk unlock" OR "Keypad unlock" OR "Cylinder unlock"

	B -> C.7: Battery saver timer (10 minutes by default) starts at first door open and resets with each new door ajar. ("Driver Door Closed" -> "Driver Door Ajar") OR ("Passenger Door Closed" -> "Passenger Door Ajar") OR ("Rear Left Door Closed" -> "Rear Left Door Ajar") OR ("Rear Right Door Closed" -> "Rear Right Door Ajar")
	B -> I.10: 25 second "Courtesy Light Timer" started at Unlock (via Key-fob, Keypad, or exterior door lock cylinder). Timer resets with each additional unlock request made. "Keyfob/Pk unlock" OR "Keypad unlock" OR "Cylinder unlock" AND Courtesy Light Timer expired -> "Null" state
	I -> B.11: Unlock must occur using Key-fob, Keypad, or exterior door lock cylinder. 25 seconds "Courtesy Light Timer" starts at Unlock "Null" -> "Keyfob/Pk unlock" OR "Keypad unlock" OR "Cylinder unlock"
	B ->G.12: Lock must occur using Key-fob, Keypad, or exterior door lock cylinder. "Keyfob/Pk lock" OR "Keypad lock" OR "Cylinder lock"
	C ->I.13: Timer expired 10 minutes (by default) after last door open. ("Driver Door Ajar" OR "Passenger Door Ajar" OR "Rear Left Door Ajar" OR "Rear Right Door Ajar") AND "Battery Saver Timer" expired -> "Null"
	I -> C.14: Battery saver timer (10 minutes by default) starts at first door open and resets with each new door ajar. ("Driver Door Closed" -> "Driver Door Ajar") OR ("Passenger Door Closed" -> "Passenger Door Ajar") OR ("Rear Left Door Closed" -> "Rear Left Door Ajar") OR ("Rear Right Door Closed" -> "Rear Right Door Ajar")
	C -> D.15: All vehicle doors have to be closed within 25 seconds of first door ajar in order for transition to occur. Otherwise state shall transition to "Null". 25 second "Courtesy Light Timer" shall reset at all doors closed. "Driver Door Ajar" OR "Passenger Door Ajar" OR "Rear Left Door Ajar" OR "Rear Right Door Ajar" -> "Driver Door Closed" AND "Passenger Door Closed" AND "Rear Left Door Closed" AND "Rear Right Door Closed"
	D -> C.16: Battery saver timer (10 minutes by default) starts at first door open and resets with each new door ajar. "Driver Door Closed" AND "Passenger Door Closed" AND "Rear Left Door Closed" AND "Rear Right Door Closed" -> "Driver Door Ajar" OR "Passenger Door Ajar" OR "Rear Left Door Ajar" OR "Rear Right Door Ajar"
	D -> I.17: 25 seconds passed from all ajar doors closed event. "Driver Door Ajar" OR "Passenger Door Ajar" OR "Rear Left Door Ajar" OR "Rear Right Door Ajar" -> ("Driver Door Closed" AND "Passenger Door Closed" AND "Rear Left Door Closed" AND "Rear Right Door Closed") AND "Courtesy Light Timer" expired.
	I -> D.18: 25 second "Courtesy Light Timer" shall start at all doors closed. "Driver Door Ajar" OR "Passenger Door Ajar" OR "Rear Left Door Ajar" OR "Rear Right Door Ajar" OR "Lift-Gate Ajar" OR "Lift-Gate Glass Ajar" -> "Driver Door Closed" AND "Passenger Door Closed" AND "Rear Left Door Closed" AND "Rear Right Door Closed"
	F -> I.19: 25 seconds passed from ignition transitioning from RUN/Start to OFF. "Vehicle Ignition is in Run/Start" -> "Vehicle Ignition is OFF" AND "Courtesy Light Timer" expired
	F -> C.20: Battery saver timer (10 minutes by default) starts at first door open and resets with each new door ajar "Vehicle Ignition is in Run/Start" -> "Vehicle Ignition is OFF"

	"Driver Door Closed" AND "Passenger Door Closed" AND "Rear Left Door Closed" AND "Rear Right Door Closed" -> "Driver Door Ajar" OR "Passenger Door Ajar" OR "Rear Left Door Ajar" OR "Rear Right Door Ajar"
	C -> E.21: Legislative/In drive vehicle behavior is enabled during Ignition Run/Start state "Driver Door Ajar" OR "Passenger Door Ajar" OR "Rear Left Door Ajar" OR "Rear Right Door Ajar" "Vehicle Ignition is OFF" -> "Vehicle Ignition is in Run/Start"
	E -> F.22: 25 second "Courtesy Light Timer" shall start at Ignition transitioning from RUN/Start to OFF. "Driver Door Closed" AND "Passenger Door Closed" AND "Rear Left Door Closed" AND "Rear Right Door Closed" "Vehicle Ignition is in Run/Start" -> "Vehicle Ignition is OFF"
	D -> E.23: Legislative/In drive vehicle behavior is enabled during Ignition Run/Start state "Driver Door Closed" AND "Passenger Door Closed" AND "Rear Left Door Closed" AND "Rear Right Door Closed" "Vehicle Ignition is OFF" -> "Vehicle Ignition is in Run/Start"
	E -> C.24:10 minute battery saver timer shall start at Ignition transitioning from RUN/Start to OFF. "Driver Door Ajar" OR "Passenger Door Ajar" OR "Rear Left Door Ajar" OR "Rear Right Door Ajar" OR "Lift-Gate Ajar" OR "Lift-Gate Glass Ajar" "Vehicle Ignition is in Run/Start" -> "Vehicle Ignition is OFF"
	D -> G.25: Lock must occur using Key-fob, Keypad, or exterior door lock cylinder. "Driver Door Closed" AND "Passenger Door Closed" AND "Rear Left Door Closed" AND "Rear Right Door Closed" "Keyfob/Pk lock" OR "Keypad lock" OR "Cylinder lock"
	G -> E.26: Legislative/In drive vehicle behavior is enabled during Ignition Run/Start state "Driver Door Closed" AND "Passenger Door Closed" AND "Rear Left Door Closed" AND "Rear Right Door Closed" "Keyfob/Pk lock" OR "Keypad lock" OR "Cylinder lock" "Vehicle Ignition is OFF" -> "Vehicle Ignition is in Run/Start"
	C -> G.27: "Courtesy Lighting Timer" shall continue counting down if door(s) left ajar after vehicle lock request is made (via keyfob/keypad/door cylinder). Transition to state shall occur at all doors closed. "Keyfob/Pk lock" OR "Keypad lock" OR "Cylinder lock" "Driver Door Ajar" OR "Passenger Door Ajar" OR "Rear Left Door Ajar" OR "Rear Right Door Ajar" -> "Driver Door Closed" AND "Passenger Door Closed" AND "Rear Left Door Closed" AND "Rear Right Door Closed"
	I -> G.28: Lock must occur using Key-fob, Keypad, or exterior door lock cylinder. Same transition to state can occur if vehicle locked prior to all vehicle doors closed. "Vehicle Ignition is OFF" "Driver Door Closed" AND "Passenger Door Closed" AND "Rear Left Door Closed" AND "Rear Right Door Closed" "Keyfob/Pk lock" OR "Keypad lock" OR "Cylinder lock"
	G -> I.29: Transition to "Null" occurs after vehicle locking operation/state is complete/confirmed.
	C -> C.30: Battery saver timer (10 minutes by default) starts at first door open and resets with each new door ajar. ("Driver Door Closed" -> "Driver Door Ajar") OR ("Passenger Door Closed" -> "Passenger Door Ajar") OR ("Rear Left Door Closed" -> "Rear Left Door Ajar") OR ("Rear Right Door Closed" -> "Rear Right Door Ajar")
	I -> E.31: Legislative/In drive vehicle behavior is enabled during Ignition Run/Start state

	"Vehicle Ignition is OFF" -> "Vehicle Ignition is in Run/Start"

5.3 Exterior Illumination response based on Welcome/Farewell state

5.3.1 Exterior Front Illumination Algorithm

Exterior lights that are at the front of the vehicle and have functional use beyond "Welcome" and "Farewell". These include but aren't limited to:
- Low Beams
- Signature/Decorative LED Lamps
- Fog Lamps
- Front Side Markers
- Front Park Lamps

5.3.1.1 Applicable Welcome Farewell State Transitions

	Illumination Algorithm Name	Headlamp switch position	State Determination Algorithm: as per section 5.2.2 or 5.2.3	Respond to Remote Start state	Respond to Delayed Accessory	Respond to Extended Play
R: 5.3.1.1-1	Exterior Front Illumination Algorithm	"Auto" or "OFF"	Both: 5.2.2 by default if not specifically mentioned	Yes (as per section 2.13.2 of FS HU5T-14B476)	No	No

5.3.1.2 Control Signal Definitions & Configurability

Exterior Front Illumination shall respond to changes in its driving Control Signal which is driven by transitions of Welcome/Farewell states

	Control Signal Response	Control Signal Curve	Default Duration	Minimum Duration	Max Duration	Config. Steps
R: 5.3.1.2-1	"Fade ON"/Ramp up	"Steven's Power Law"	3 seconds	120ms	10 seconds	40ms
R: 5.3.1.2-2	"Fade OFF"/Ramp down	"Steven's Power Law"	5 seconds	120ms	10 seconds	40ms
R: 5.3.1.2-3	"Snap ON"/Step up	"Step Function"	Less than 1 microsecond	N/A	N/A	N/A
R: 5.3.1.2-4	"Snap OFF"/Step down	"Step Function"	Less than 1 microsecond	N/A	N/A	N/A
R: 5.3.1.2-5	Delay before "Fade ON"	N/A	0ms	0ms	2 seconds	120ms
R: 5.3.1.2-6	Delay before "Fade OFF"	N/A	0ms	0ms	2 seconds	120ms

NOTE: 1. "Steven's Power Law" curve owned and managed by Exterior Lighting group, who can specify a different curve if it better serves the final goal of "perceived linear ramping"

2. "Fade ON" vs "Fade OFF" vs. "Snap ON" vs. "Snap OFF" behavior shall be called out under "Front Illumination" sections under "RQT-002004-021878 DNA Welcome-Farewell Strategy Rev. 1" for Ford vehicles and "RQT-002004-022094 Lincoln Embrace Welcome and Farewell Behavior Rev. 1" for Lincoln vehicles.
3. Definition of Control Signal (PWM) found within Appendix 1 "Exterior Lighting PWM Signal Specification"

5.3.1.3   Control Signal Value Targets

The Control Signals tied to Exterior "Front Illumination" shall ramp or snap along the aforementioned curves until they reach a target value that's defined as either "ON/Embrace" or "OFF" under "RQT-002004-021878 DNA Welcome-Farewell Strategy Rev. 1" for Ford vehicles and "RQT-002004-022094 Lincoln Embrace Welcome and Farewell Behavior Rev. 1" for Lincoln vehicles.

	ARL call-out	Target Control Signal value	Minimum value	Maximum value	Config. Steps
R: 5.3.1.3-1	"ON/Embrace"	80% PWM	20% PWM	100% PWM	1%
R: 5.3.1.3-2	"OFF"	<= 15% PWM	0% PWM	15% PWM	1%

5.3.1.4   Control Signal response based on Welcome/Farewell state transitions and "Vehicle Harmony" team specified behavior for "Front Illumination".

Figure 5:   Front Illumination Control Signal transitions based on ARL requests.

A -> A.1: No action, remain OFF
A -> D.2: Illuminate to "ON/Embrace Level", step function
A ->C.3: Start "Fade ON" sequence (3 seconds by default)
C ->A.4: De-illuminate to "OFF" level, step function
D ->B.5: Start "Fade OFF" sequence (5 seconds by default)
D ->D.6: Remain at "ON/Embrace" level, reset state time-out timer
C ->A.7: Interrupt "Fade ON" sequence, de-illuminate to "OFF" level, step function

	C ->B.8: Interrupt "Fade ON" sequence, begin "Fade OFF" sequence. Start "Fade OFF" from same point/level "Fade ON" reached at time of interruption. "Fade OFF" time = % Fade ON complete * Fade OFF total time.
	C ->C.9: Start "Fade ON" sequence after first request. Do not reset "Fade ON" sequence with each new request.
	C ->D.10: "Fade ON" complete. Start state time-out timer.
	C ->D.11: Interrupt "Fade ON" sequence, illuminate to "ON/ Embrace" level, step function
	B ->B.12: Start "Fade OFF" sequence after first request. Do not reset "Fade OFF" sequence with each new request.
	B ->A.13: "Fade OFF" complete. Remain OFF for duration of state.
	B ->A.14: Interrupt "Fade OFF" sequence, de-illuminate to "OFF" level, step function
	B ->D.15: Interrupt "Fade OFF" sequence, illuminate to "ON/ Embrace" level, step function
	B ->C.16: Interrupt "Fade OFF" sequence, begin "Fade ON" sequence. Start "Fade ON" from same point/level "Fade OFF" reached at time of interruption. "Fade ON" time = % Fade OFF complete * Fade ON total time.

NOTE: 1. Additional requirements called out under section 5.3.1.2 Control Signal Definitions and Configurability in satisfying behavior listed under "Control signal response"
2. Ford ARL: RQT-002004-021878 DNA Welcome-Farewell Strategy Rev. 1
3. Lincoln ARL: RQT-002004-022094 Lincoln Embrace Welcome and Farewell Behavior Rev. 1

5.3.1.5 **Additional requirements**

R: 5.3.1.5-1	Conflicting requests sent mid illumination ramping (Fade ON -> Fade OFF before Fade ON complete, or Fade OFF -> Fade ON before Fade OFF complete): New Fade request shall be honored starting at illumination level that was reached by previous request while maintaining specified ramp rate (shall complete in lesser time). No time delay required before acting on new Fade request.
R: 5.3.1.5-2	Ignition transitions from OFF to RUN/Start: Front Illumination shall follow legislative requirements on Illumination behavior (can forego "Fade ON" or "Fade OFF" behavior/delays if in conflict legislative requirements)

5.3.1.6 **Exterior Front Illumination Algorithm inhibits and overrides**

R: 5.3.1.6-1	Exterior Front Illumination Algorithm shall be given the least priority over competing algorithms that control Exterior Front Illumination
R: 5.3.1.6-2	Activating "Perimeter Alarm Mode" or "Panic Alarm" feature as per sections 2.5-4 or 2.5-7 of BCM FS-HU5T-14B476-AAG shall inhibit Exterior Front Illumination Algorithm while feature is active
R: 5.3.1.6-3	Activating "Silent Mode" feature as per section 3.2-1 of BCM FS-HU5T-14B476-AAG shall inhibit Exterior Front Illumination Algorithm while feature is active
R: 5.3.1.6-4	Activating "Key-Off-Load Mode" feature as per section 2.14.6-7 of BCM FS-HU5T-14B476-AAG shall inhibit Exterior Front Illumination Algorithm while feature is active
R: 5.3.1.6-5	Activating "Post-Crash Alert" feature as per section 2.5-78 of BCM FS-HU5T-14B476-AAG shall inhibit Exterior Front Illumination Algorithm while feature is active.

5.3.2 **Exterior Front Illumination Lighting Response**

R: 5.3.2-1	Exterior Front Illumination shall illuminate in response to control signal ramping up
R: 5.3.2-2	Exterior Front Illumination shall de-illuminate in response to control signal ramping down
R: 5.3.2-3	When the control signal reaches the duty cycle matched to the desired Front Exterior Illumination lighting element's intensity level, the lighting element shall consistently illuminate to the same level each time
R: 5.3.2-4	Specific "ON", "ON/Embrace", "Snap ON" illumination level for each individual lighting element shall be specified by Vehicle Harmony Group in conjunction with Exterior Lighting group.

R: 5.3.2-5	Exterior Front Illumination Lighting elements shall meet the requirements specified in section 3.2.2 "Performance Requirements" unless otherwise specified by SME or Vehicle Harmony Group
R: 5.3.2-6	Exterior Front Illumination Lighting elements shall meet (or not violate) requirements labelled "Exterior Lighting" in section 3.2.3. "Safety Requirements" – 3.2.3.1 "NAFTA Requirements" for NAFTA applications, 3.2.3.2 "ECE Requirements" for ECE applications, and 3.2.3.3 "China Requirements" for China applications.
R: 5.3.2-7	When the control signal reaches 0% duty cycle the desired Front Exterior Illumination lighting element's intensity level shall equal 0 (go to "OFF")
R: 5.3.2-8	During control signal "Fade ON" sequence, the Exterior Front Illumination lighting element shall Fade ON smoothly – no observable flickering.
R: 5.3.2-9	During control signal "Fade OFF" sequence, the Exterior Front Illumination lighting element shall Fade OFF smoothly – no observable flickering.
R: 5.3.2-10	During control signal "Snap ON" sequence, the Exterior Front Illumination lighting element shall Snap ON without flickering.
R: 5.3.2-11	During control signal "Snap OFF" sequence, the Exterior Front Illumination lighting element shall Snap OFF without flickering.
R: 5.3.2-12	Exterior Front Illumination Lighting response to ramping control signals shall not be inhibited if any of the individual exterior front lighting elements are malfunctioning/burnout.
R: 5.3.2-13	If the Control Signal, Power, or Ground to a specific Exterior Front Illumination lighting element is corrupted/disconnects, that specific lighting element shall default to "OFF" (de-illuminated)

5.3.3 **Exterior Rear Illumination Algorithm**

Exterior Lights that are at the rear of the vehicle and have functional use beyond "Welcome" and "Farewell". These include but aren't limited to:
- Rear Corner Lamps
- Rear Corner Lamps
- Rear Applique Light
- Rear Corner Lamps
- Rear Parklamps

5.3.3.1 **Applicable Welcome Farewell State Transitions**

	Illumination Algorithm Name	Headlamp switch position	State Determination Algorithm: as per section 5.2.2 or 5.2.3	Respond to Remote Start state	Respond to Delayed Accessory	Respond to Extended Play
R: 5.3.3.1-1	Exterior Rear Illumination Algorithm	"Auto" or "OFF"	Both: 5.2.2 by default if not specifically mentioned	Yes (as per section 2.13.2 of FS HU5T-14B476)	No	No

5.3.3.2 **Control Signal Definitions & Configurability**

Exterior Rear Illumination shall respond to changes in its driving Control Signal which is driven by transitions of Welcome/Farewell states

R: 5.3.3.2-1	**Control Signal Response**	**Control Signal Curve**	**Default Duration**	**Minimum Duration**	**Max Duration**	**Config. Steps**
R: 5.3.3.2-2	"Fade ON"/Ramp up	"Steven's Power Law"	3 seconds	120ms	10 seconds	40ms

R: 5.3.3.2-3	"Fade OFF"/Ramp down	"Steven's Power Law"	5 seconds	120ms	10 seconds	40ms
R: 5.3.3.2-4	"Snap ON"/Step up	"Step Function"	Less than 1 microsecond	N/A	N/A	N/A
R: 5.3.3.2-5	"Snap OFF"/Step down	"Step Function"	Less than 1 microsecond	N/A	N/A	N/A
R: 5.3.3.2-6	Delay before "Fade ON"	N/A	0ms	0ms	2 seconds	120ms
R: 5.3.3.2-7	Delay before "Fade OFF"	N/A	0ms	0ms	2 seconds	120ms

NOTE: 1. "Steven's Power Law" curve owned and managed by Exterior Lighting group, who can specify a different curve if it better serves the final goal of "perceived linear ramping"
2. "Fade ON" vs "Fade OFF" vs. "Snap ON" vs. "Snap OFF" behavior shall be called out under "Rear Illumination" sections under "RQT-002004-021878 DNA Welcome-Farewell Strategy Rev. 1" for Ford vehicles and "RQT-002004-022094 Lincoln Embrace Welcome and Farewell Behavior Rev. 1" for Lincoln vehicles.

5.3.3.3   Control Signal Value Targets

The Control Signals tied to Exterior "Rear Illumination" shall ramp or snap along the aforementioned curves until they reach a target value that's defined as either "ON/Embrace" or "OFF" under "RQT-002004-021878 DNA Welcome-Farewell Strategy Rev. 1" for Ford vehicles and "RQT-002004-022094 Lincoln Embrace Welcome and Farewell Behavior Rev. 1" for Lincoln vehicles.

	ARL call-out	Target Control Signal value	Minimum value	Maximum value	Config. Steps
R: 5.3.3.3-1	"ON/Embrace"	80% PWM	20% PWM	100% PWM	1%
R: 5.3.3.3-2	"OFF"	<= 15% PWM	0% PWM	15% PWM	1%

Note: Target Control Signal Value for "ON/Embrace" and "OFF" shall vary depending on specific lighting element and controlling module. Above specified values are intended as a reference for remaining requirements

5.3.3.4   Control Signal response based on Welcome/Farewell state transitions and "Vehicle Harmony" team specified behavior for "Rear Illumination".

Figure 6: Rear Illumination Control Signal transitions based on ARL requests.

	A -> A.1: No action, remain OFF
	A -> D.2: Illuminate to "ON/Embrace Level", step function
	A ->C.3: Start "Fade ON" sequence (3 seconds by default)
	C ->A.4: De-illuminate to "OFF" level, step function
	D ->B.5: Start "Fade OFF" sequence (5 seconds by default)
	D ->D.6: Remain at "ON/Embrace" level, reset state time-out timer
	C ->A.7: Interrupt "Fade ON" sequence, de-illuminate to "OFF" level, step function
	C ->B.8: Interrupt "Fade ON" sequence, begin "Fade OFF" sequence. Start "Fade OFF" from same point/level "Fade ON" reached at time of interruption. "Fade OFF" time = % Fade ON complete * Fade OFF total time.
	C ->C.9: Start "Fade ON" sequence after first request. Do not reset "Fade ON" sequence with each new request.
	C ->D.10: "Fade ON" complete. Start state time-out timer.
	C ->D.11: Interrupt "Fade ON" sequence, illuminate to "ON/ Embrace" level, step function
	B ->B.12: Start "Fade OFF" sequence after first request. Do not reset "Fade OFF" sequence with each new request.
	B ->A.13: "Fade OFF" complete. Remain OFF for duration of state.
	B ->A.14: Interrupt "Fade OFF" sequence, de-illuminate to "OFF" level, step function
	B ->D.15: Interrupt "Fade OFF" sequence, illuminate to "ON/ Embrace" level, step function
	B ->C.16: Interrupt "Fade OFF" sequence, begin "Fade ON" sequence. Start "Fade ON" from same point/level "Fade OFF" reached at time of interruption. "Fade ON" time = % Fade OFF complete * Fade ON total time.

NOTE: 1. Additional requirements called out under section 5.3.3.2 Control Signal Definitions and Configurability in satisfying behavior listed under "Control signal response"
2. Ford ARL: RQT-002004-021878 DNA Welcome-Farewell Strategy Rev. 1
3. Lincoln ARL: RQT-002004-022094 Lincoln Embrace Welcome and Farewell Behavior Rev. 1

5.3.3.1   **Additional requirements**

R: 5.3.3.1-1	Conflicting requests sent mid illumination ramping (Fade ON -> Fade OFF before Fade ON complete, or Fade OFF -> Fade ON before Fade OFF complete): New Fade request shall be honored starting at illumination level that was reached by previous request while maintaining specified ramp rate (shall complete in lesser time). No time delay required before acting on new Fade request.
R: 5.3.3.1-2	Ignition transitions from OFF to RUN/Start: Rear Illumination shall follow legislative requirements on Illumination behavior (can forego "Fade ON" or "Fade OFF" behavior/delays if in conflict legislative requirements)

5.3.3.2 Exterior Rear Illumination Algorithm inhibits and overrides

R: 5.3.3.2-1	Exterior Rear Illumination Algorithm shall be given the least priority over competing algorithms that control Exterior Rear Illumination
R: 5.3.3.2-2	Activating "Perimeter Alarm Mode" or "Panic Alarm" feature as per sections 2.5-4 or 2.5-7 of BCM FS-HU5T-14B476-AAG shall inhibit Exterior Rear Illumination Algorithm while feature is active
R: 5.3.3.2-3	Activating "Silent Mode" feature as per section 3.2-1 of BCM FS-HU5T-14B476-AAG shall inhibit Exterior Rear Illumination Algorithm while feature is active
R: 5.3.3.2-4	Activating "Key-Off-Load Mode" feature as per section 2.14.6-7 of BCM FS-HU5T-14B476-AAG shall inhibit Exterior Rear Illumination Algorithm while feature is active
R: 5.3.3.2-5	Activating "Post-Crash Alert" feature as per section 2.5-78 of BCM FS-HU5T-14B476-AAG shall inhibit Exterior Rear Illumination Algorithm while feature is active.

5.3.4 Exterior Rear Illumination Lighting Response

R: 5.3.4-1	Exterior Rear Illumination shall illuminate in response to control signal ramping up
R: 5.3.4-2	Exterior Rear Illumination shall de-illuminate in response to control signal ramping down
R: 5.3.4-3	When the control signal reaches the duty cycle matched to the desired Rear Exterior Illumination lighting element's intensity level, the lighting element shall consistently illuminate to the same level each time.
R: 5.3.4-4	Specific "ON", "ON/Embrace", "Snap ON" illumination level for each individual lighting element shall be specified by Vehicle Harmony Group in conjunction with Exterior Lighting group.
R: 5.3.4-5	Exterior Rear Illumination Lighting elements shall meet the requirements specified in section 3.2.2 "Performance Requirements", unless specified otherwise by SME or Vehicle Harmony Group
R: 5.3.4-6	Exterior Rear Illumination Lighting elements shall meet (or not violate) requirements labelled "Exterior Lighting" in section 3.2.3. "Safety Requirements" – 3.2.3.1 "NAFTA Requirements" for NAFTA applications, 3.2.3.2 "ECE Requirements" for ECE applications, and 3.2.3.3 "China Requirements" for China applications.
R: 5.3.4-7	When the control signal reaches 0% duty cycle the desired Exterior Rear Illumination lighting element's intensity level shall equal 0 (go to "OFF")
R: 5.3.4-8	During control signal "Fade ON" sequence, the Exterior Rear Illumination lighting element shall Fade ON smoothly – no observable flickering.
R: 5.3.4-9	During control signal "Fade OFF" sequence, the Exterior Rear Illumination lighting element shall Fade OFF smoothly – no observable flickering.
R: 5.3.4-10	During control signal "Snap ON" sequence, the Exterior Rear Illumination lighting element shall Snap ON without flickering.
R: 5.3.4-11	During control signal "Snap OFF" sequence, the Exterior Rear Illumination lighting element shall Snap OFF without flickering.
R: 5.3.4-12	Exterior Rear Illumination Lighting response to ramping control signals shall not be inhibited if any of the individual exterior front lighting elements are malfunctioning/burnout.
R: 5.3.4-13	If the Control Signal, Power, or Ground to a specific Exterior Rear Illumination lighting element is corrupted/disconnects, that specific lighting element shall default to "OFF" (de-illuminated)

5.3.5 Exterior Supplementary Illumination Algorithm:

Exterior lights that do not have any functional operation beyond "Welcome" and "Farewell", or require additional customer input to operate while vehicle is in Drive. These include but aren't limited to:
- Illuminated Door Handles
- Driver/Passenger Welcome Mats
- Puddle Lamps
- Running Board Illumination

5.3.5.1 Applicable Welcome Farewell State Transitions

	Illumination Algorithm Name	Headlamp switch position	State Determination Algorithm: as per section 5.2.2 or 5.2.3	Respond to Remote Start state	Respond to Delayed Accessory	Respond to Extended Play
R: 5.3.5.1-1	Exterior Supplementary Illumination Algorithm	"Auto" or "OFF"	Both: 5.2.2 by default if not specifically mentioned	No	No	No

5.3.5.2 Control Signal Definitions & Configurability

Exterior Supplementary Illumination shall respond to changes in its driving Control Signal which is driven by transitions of Welcome/Farewell states

	Control Signal Response	Control Signal Curve	Default Duration	Minimum Duration	Max Duration	Config. Steps
R: 5.3.5.2-1	"Fade ON"/Ramp up	"Steven's Power Law"	3 seconds	120ms	10 seconds	40ms
R: 5.3.5.2-2	"Fade OFF"/Ramp down	"Steven's Power Law"	5 seconds	120ms	10 seconds	40ms
R: 5.3.5.2-3	"Snap ON"/Step up	"Step Function"	Less than 1 microsecond	N/A	N/A	N/A
R: 5.3.5.2-4	"Snap OFF"/Step down	"Step Function"	Less than 1 microsecond	N/A	N/A	N/A
R: 5.3.5.2-5	Delay before "Fade ON"	N/A	0ms	0ms	2 seconds	120ms
R: 5.3.5.2-6	Delay before "Fade OFF"	N/A	0ms	0ms	2 seconds	120ms

NOTE: 1. "Steven's Power Law" curve owned and managed by Exterior Lighting group, who can specify a different curve if it better serves the final goal of "perceived linear ramping"
2. "Fade ON" vs "Fade OFF" vs. "Snap ON" vs. "Snap OFF" behavior shall be called out under "Supplementary Illumination" sections under "RQT-002004-021878 DNA Welcome-Farewell Strategy Rev. 1" for Ford vehicles and "RQT-002004-022094 Lincoln Embrace Welcome and Farewell Behavior Rev. 1" for Lincoln vehicles.

5.3.5.3 Control Signal Value Targets

The Control Signals tied to Exterior "Supplementary Illumination" shall ramp or snap along the aforementioned curves until they reach a target value that's defined as either "ON/Embrace" or "OFF" under "RQT-002004-

021878 DNA Welcome-Farewell Strategy Rev. 1" for Ford vehicles and "RQT-002004-022094 Lincoln Embrace Welcome and Farewell Behavior Rev. 1" for Lincoln vehicles.

	ARL call-out	Target Control Signal value	Minimum value	Maximum value	Config. Steps
R: 5.3.5.3-1	"ON/Embrace"	80% PWM	20% PWM	100% PWM	1%
R: 5.3.5.3-2	"OFF"	<= 15% PWM	0% PWM	15% PWM	1%

Note: Target Control Signal Value for "ON/Embrace" and "OFF" shall vary depending on specific lighting element and controlling module. Above specified values are intended as a reference for remaining requirements

5.3.5.4 Control Signal response based on Welcome/Farewell state transitions and "Vehicle Harmony" team specified behavior for "Supplementary Illumination".
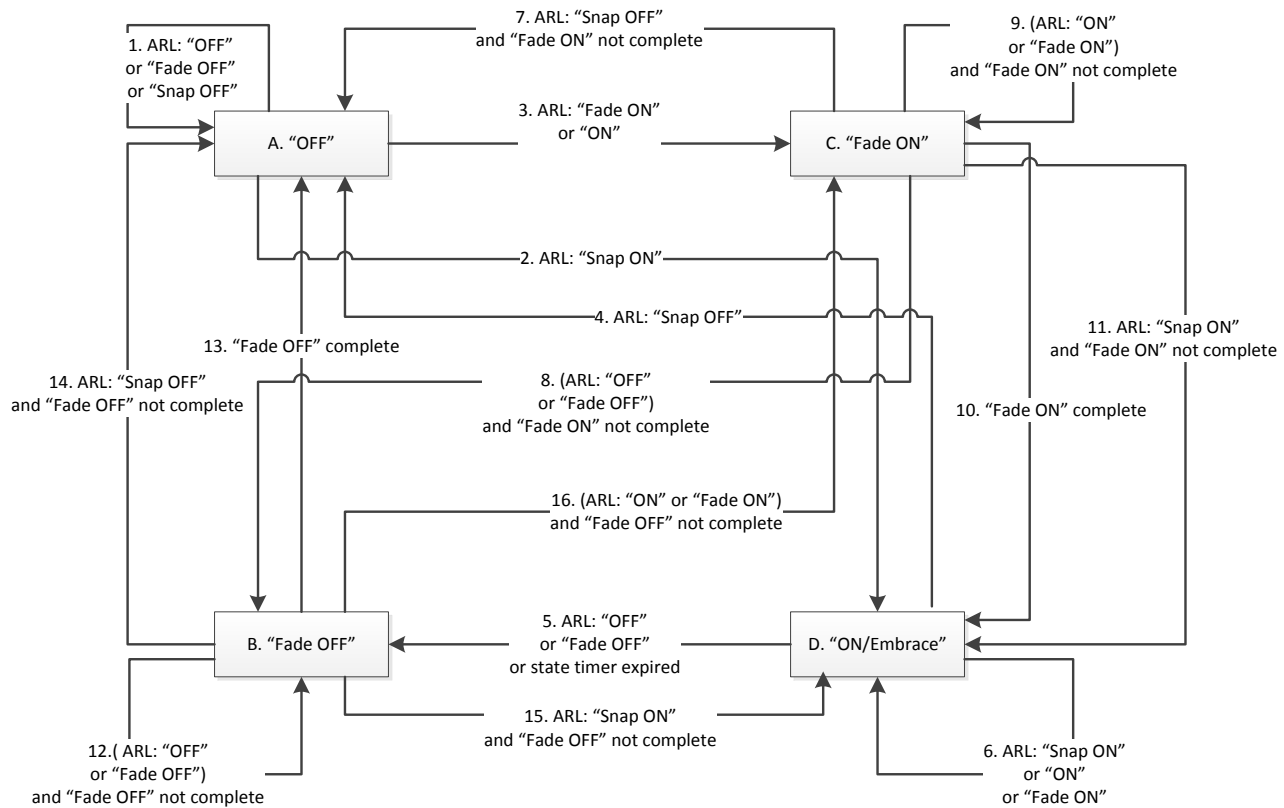

Figure 7: Supplementary Illumination Control Signal transitions based on ARL requests.

	A -> A.1: No action, remain OFF
	A -> D.2: Illuminate to "ON/Embrace Level", step function
	A ->C.3: Start "Fade ON" sequence (3 seconds by default)
	C ->A.4: De-illuminate to "OFF" level, step function
	D ->B.5: Start "Fade OFF" sequence (5 seconds by default)
	D ->D.6: Remain at "ON/Embrace" level, reset state time-out timer
	C ->A.7: Interrupt "Fade ON" sequence, de-illuminate to "OFF" level, step function
	C ->B.8: Interrupt "Fade ON" sequence, begin "Fade OFF" sequence. Start "Fade OFF" from same point/level "Fade ON" reached at time of interruption. "Fade OFF" time = % Fade ON complete * Fade OFF total time.
	C ->C.9: Start "Fade ON" sequence after first request. Do not reset "Fade ON" sequence with each new request.
	C ->D.10: "Fade ON" complete. Start state time-out timer.
	C ->D.11: Interrupt "Fade ON" sequence, illuminate to "ON/ Embrace" level, step function

	B ->B.12: Start "Fade OFF" sequence after first request. Do not reset "Fade OFF" sequence with each new request.
	B ->A.13: "Fade OFF" complete. Remain OFF for duration of state.
	B ->A.14: Interrupt "Fade OFF" sequence, de-illuminate to "OFF" level, step function
	B ->D.15: Interrupt "Fade OFF" sequence, illuminate to "ON/ Embrace" level, step function
	B ->C.16: Interrupt "Fade OFF" sequence, begin "Fade ON" sequence. Start "Fade ON" from same point/level "Fade OFF" reached at time of interruption. "Fade ON" time = % Fade OFF complete * Fade ON total time.

NOTE: 1. Additional requirements called out under section 5.3.5.2 Control Signal Definitions and Configurability in satisfying behavior listed under "Control signal response"
2. Ford ARL: RQT-002004-021878 DNA Welcome-Farewell Strategy Rev. 1
3. Lincoln ARL: RQT-002004-022094 Lincoln Embrace Welcome and Farewell Behavior Rev. 1

5.3.5.5 **Additional requirements**

R: 5.3.5.5-1	Conflicting requests sent mid illumination ramping (Fade ON -> Fade OFF before Fade ON complete, or Fade OFF -> Fade ON before Fade OFF complete): New Fade request shall be honored starting at illumination level that was reached by previous request while maintaining specified ramp rate (shall complete in lesser time). No time delay required before acting on new Fade request.
R: 5.3.5.5-2	Ignition transitions from OFF to RUN/Start: Supplementary Illumination shall follow legislative requirements on Illumination behavior (can forego "Fade ON" or "Fade OFF" behavior/delays if in conflict legislative requirements)

5.3.5.6 **Exterior Supplementary Illumination Algorithm inhibits and overrides**

R: 5.3.5.6-1	Exterior Supplementary Illumination Algorithm shall be given the least priority over competing algorithms that control Exterior Supplementary Illumination
R: 5.3.5.6-2	Activating "Perimeter Alarm Mode" or "Panic Alarm" feature as per sections 2.5-4 or 2.5-7 of BCM FS-HU5T-14B476-AAG shall inhibit Exterior Supplementary Illumination Algorithm while feature is active
R: 5.3.5.6-3	Activating "Silent Mode" feature as per section 3.2-1 of BCM FS-HU5T-14B476-AAG shall inhibit Exterior Supplementary Illumination Algorithm while feature is active
R: 5.3.5.6-4	Activating "Key-Off-Load Mode" feature as per section 2.14.6-7 of BCM FS-HU5T-14B476-AAG shall inhibit Exterior Supplementary Illumination Algorithm while feature is active
R: 5.3.5.6-5	Activating "Post-Crash Alert" feature as per section 2.5-78 of BCM FS-HU5T-14B476-AAG shall inhibit Exterior Supplementary Illumination Algorithm while feature is active.

5.3.6 **Exterior Supplementary Illumination Lighting Response**

R: 5.3.6-1	Exterior Supplementary Illumination shall illuminate in response to control signal ramping up
R: 5.3.6-2	Exterior Supplementary Illumination shall de-illuminate in response to control signal ramping down
R: 5.3.6-3	When the control signal reaches the duty cycle matched to the desired Front Exterior Illumination lighting element's intensity level, the lighting element shall consistently illuminate to the same level each time.
R: 5.3.6-4	Specific "ON", "ON/Embrace", "Snap ON" illumination level for each individual lighting element shall be specified by Vehicle Harmony Group in conjunction with Exterior Lighting group (if lighting element located on exterior of vehicle) or Interior Lighting group (if lighting element located in interior of vehicle.
R: 5.3.6-5	Exterior Supplementary Illumination Lighting elements shall meet the requirements specified in section 3.2.2 "Performance Requirements", unless specified otherwise by SME or Vehicle Harmony Group
R: 5.3.6-6	Exterior Supplementary Illumination Lighting elements shall meet (or not violate) requirements labelled "Exterior Lighting" in section 3.2.3. "Safety Requirements" – 3.2.3.1

	"NAFTA Requirements" for NAFTA applications, 3.2.3.2 "ECE Requirements" for ECE applications, and 3.2.3.3 "China Requirements" for China applications.
R: 5.3.6-7	When the control signal reaches 0% duty cycle the desired Exterior Supplementary Illumination lighting element's intensity level shall equal 0 (go to "OFF")
R: 5.3.6-8	During control signal "Fade ON" sequence, the Exterior Supplementary Illumination lighting element shall Fade ON smoothly – no observable flickering.
R: 5.3.6-9	During control signal "Fade OFF" sequence, the Exterior Supplementary Illumination lighting element shall Fade OFF smoothly – no observable flickering.
R: 5.3.6-10	During control signal "Snap ON" sequence, the Exterior Supplementary Illumination lighting element shall Snap ON without flickering.
R: 5.3.6-11	During control signal "Snap OFF" sequence, the Exterior Supplementary Illumination lighting element shall Snap OFF without flickering.
R: 5.3.6-12	Exterior Supplementary Illumination Lighting response to ramping control signals shall not be inhibited if any of the individual Exterior Supplementary lighting elements are malfunctioning/burnout.
R: 5.3.6-13	If the Control Signal, Power, or Ground to a specific Exterior Supplementary Illumination lighting element is corrupted/disconnects, that specific lighting element shall default to "OFF" (de-illuminated)
R: 5.3.6-14	Shall meet Generic, Exterior lighting specific, and all applicable Market specific Reliability, Performance, Safety and Security requirements specified under section 3.2 "Quality".

5.4 Interior Illumination response based on Welcome/Farewell state

5.4.1 Courtesy Lamps Illumination Algorithm:

Lights that are the primary source of illumination within the vehicle's interior (can function as Demand lamps if vehicle specific implementation allows). These include but aren't limited to:
o   Dome Lamp(s)
o   Map Lamp(s)
o   Foot-well Lighting (if not tied to Ambient Lighting)

5.4.1.1   Applicable Welcome Farewell State Transitions

	Illumination Algorithm Name	Headlamp switch position	State Determination Algorithm: as per section 5.2.2 or 5.2.3	Respond to Remote Start state	Respond to Delayed Accessory	Respond to Extended Play
R: 5.4.1.1-1	Courtesy Lamps Algorithm	"Auto" or "OFF"	5.2.3	No	No	No

5.4.1.2   Control Signal Definitions & Configurability

Courtesy Lamps shall respond to changes in its driving Control Signal which is driven by transitions of Welcome/Farewell states

	Control Signal Response	Control Signal Curve	Default Duration	Minimum Duration	Max Duration	Config. Steps
R: 5.4.1.2-1	"Fade ON"/Ramp up	"Theater Dimming"	3 seconds	100ms	10 seconds	100ms
R: 5.4.1.2-2	"Fade OFF"/Ramp down	"Theater Dimming"	5 seconds	100ms	10 seconds	100ms

R: 5.4.1.2-3	"Snap ON"/Step up	"Step Function"	Less than 1 microsecond	N/A	N/A	N/A
R: 5.4.1.2-4	"Snap OFF"/Step down	"Step Function"	Less than 1 microsecond	N/A	N/A	N/A
R: 5.4.1.2-5	Delay before "Fade ON"	N/A	0ms	0ms	2 seconds	100ms
R: 5.4.1.2-6	Delay before "Fade OFF"	N/A	0ms	0ms	2 seconds	100ms

NOTE: 1. "Theater Dimming" curve owned and managed by Interior Lighting group, who can specify a different curve if it better serves the final goal of "perceived linear ramping"

2. "Fade ON" vs "Fade OFF" vs. "Snap ON" vs. "Snap OFF" behavior shall be called out under "Courtesy Lamps" sections under "RQT-002004-021878 DNA Welcome-Farewell Strategy Rev. 1" for Ford vehicles and "RQT-002004-022094 Lincoln Embrace Welcome and Farewell Behavior Rev. 1" for Lincoln vehicles.

5.4.1.3   Control Signal Value Targets

The Control Signals tied to Interior "Courtesy Lamps" shall ramp or snap along the aforementioned curves until they reach a target value that's defined as either "ON/Embrace" or "OFF" under "RQT-002004-021878 DNA Welcome-Farewell Strategy Rev. 1" for Ford vehicles and "RQT-002004-022094 Lincoln Embrace Welcome and Farewell Behavior Rev. 1" for Lincoln vehicles.

	ARL call-out	Target Control Signal value	Minimum value	Maximum value	Config. Steps
R: 5.4.1.3-1	"ON/Embrace"	80% PWM	20% PWM	100% PWM	1%
R: 5.4.1.3-2	"OFF"	<= 15% PWM	0% PWM	15% PWM	1%

Note: Target Control Signal Value for "ON/Embrace" and "OFF" shall vary depending on specific lighting element and controlling module. Above specified values are intended as a reference for remaining requirements

5.4.1.4   Control Signal response based on Welcome/Farewell state transitions and "Vehicle Harmony" team specified behavior for "Courtesy Lamps".
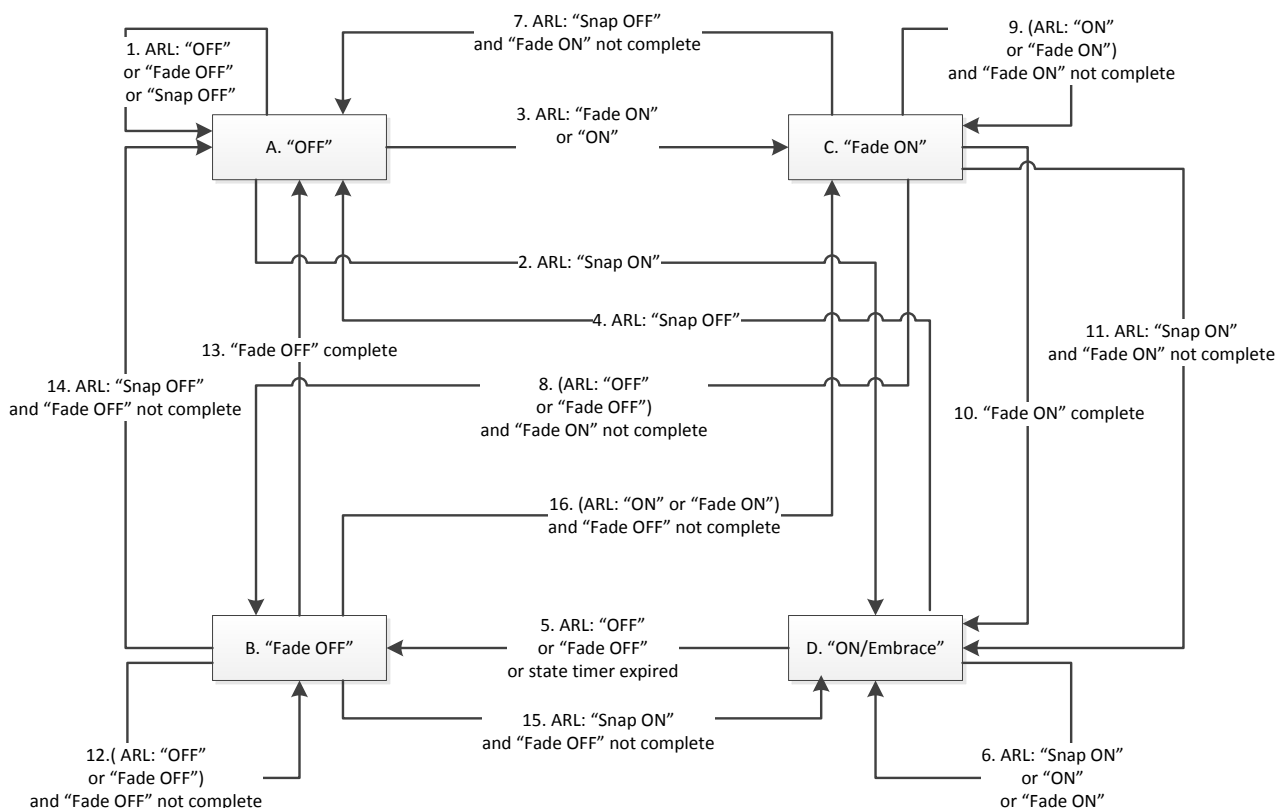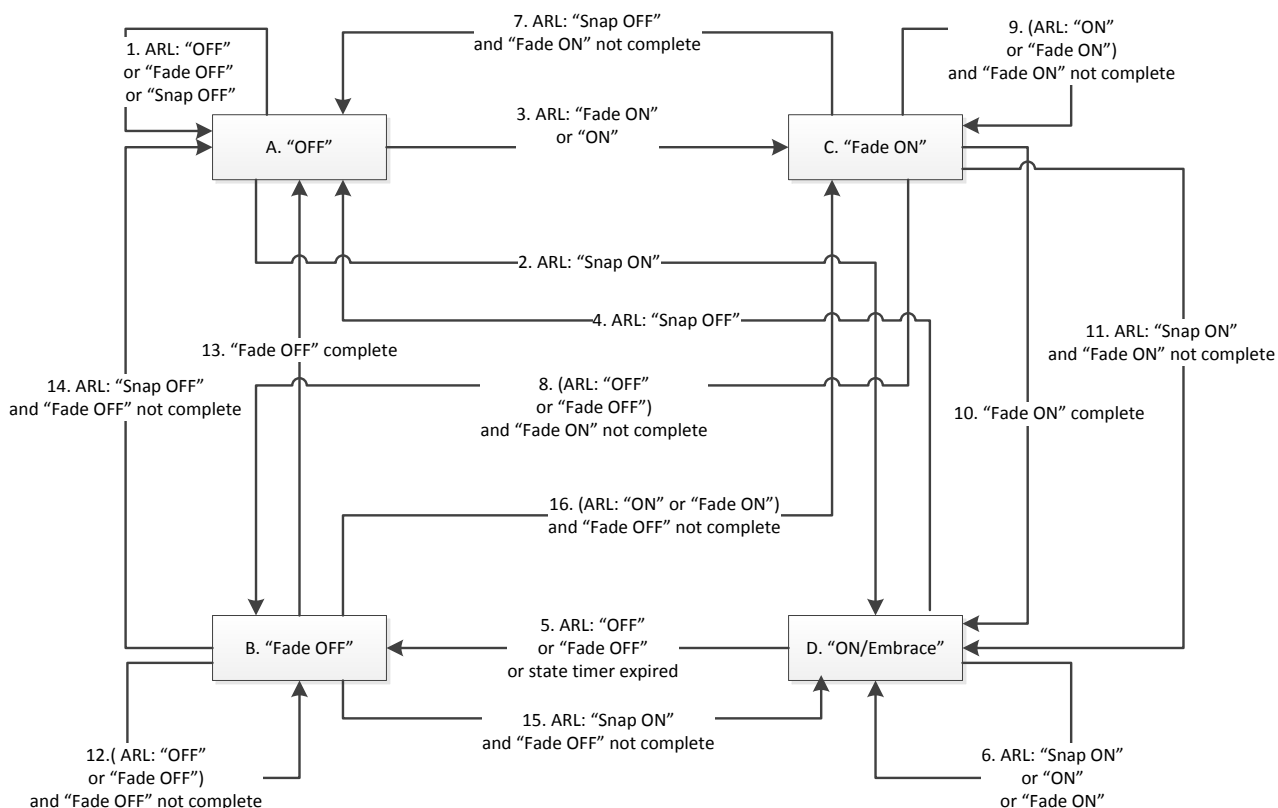
Figure 8: **"Courtesy Lamps" Illumination Control Signal transitions based on ARL requests.**

	A -> A.1: No action, remain OFF
	A -> D.2: Illuminate to "ON/Embrace Level", step function
	A ->C.3: Start "Fade ON" sequence (3 seconds by default)
	C ->A.4: De-illuminate to "OFF" level, step function
	D ->B.5: Start "Fade OFF" sequence (5 seconds by default)
	D ->D.6: Remain at "ON/Embrace" level, reset state time-out timer
	C ->A.7: Interrupt "Fade ON" sequence, de-illuminate to "OFF" level, step function
	C ->B.8: Interrupt "Fade ON" sequence, begin "Fade OFF" sequence. Start "Fade OFF" from same point/level "Fade ON" reached at time of interruption. "Fade OFF" time = % Fade ON complete * Fade OFF total time.
	C ->C.9: Start "Fade ON" sequence after first request. Do not reset "Fade ON" sequence with each new request.
	C ->D.10: "Fade ON" complete. Start state time-out timer.
	C ->D.11: Interrupt "Fade ON" sequence, illuminate to "ON/ Embrace" level, step function
	B ->B.12: Start "Fade OFF" sequence after first request. Do not reset "Fade OFF" sequence with each new request.
	B ->A.13: "Fade OFF" complete. Remain OFF for duration of state.
	B ->A.14: Interrupt "Fade OFF" sequence, de-illuminate to "OFF" level, step function
	B ->D.15: Interrupt "Fade OFF" sequence, illuminate to "ON/ Embrace" level, step function
	B ->C.16: Interrupt "Fade OFF" sequence, begin "Fade ON" sequence. Start "Fade ON" from same point/level "Fade OFF" reached at time of interruption. "Fade ON" time = % Fade OFF complete * Fade ON total time.

NOTE: 1. Additional requirements called out under section 5.4.1.2 Control Signal Definitions and Configurability in satisfying behavior listed under "Control signal response"
2. Ford ARL: RQT-002004-021878 DNA Welcome-Farewell Strategy Rev. 1
3. Lincoln ARL: RQT-002004-022094 Lincoln Embrace Welcome and Farewell Behavior Rev. 1

5.4.1.5   **Additional requirements**

R: 5.4.1.1-1	Conflicting requests sent mid illumination ramping (Fade ON -> Fade OFF before Fade ON complete, or Fade OFF -> Fade ON before Fade OFF complete): New Fade request shall be honored starting at illumination level that was reached by previous request while maintaining specified ramp rate (shall complete in lesser time). No time delay required before acting on new Fade request.
R: 5.4.1.1-2	Ignition transitions from OFF to RUN/Start: Courtesy Lamps Illumination shall follow legislative requirements on Illumination behavior (can forego "Fade ON" or "Fade OFF" behavior/delays if in conflict legislative requirements)

5.4.1.6   **Courtesy Lamps Illumination Algorithm inhibits and overrides**

R: 5.4.1.2-1	Courtesy Lamps Illumination Algorithm shall be given the least priority over competing algorithms that control Courtesy Lamps Illumination
R: 5.4.1.2-2	Activating "Perimeter Alarm Mode" or "Panic Alarm" feature as per sections 2.5-4 or 2.5-7 of BCM FS-HU5T-14B476-AAG shall inhibit Courtesy Lamps Illumination Algorithm while feature is active
R: 5.4.1.2-3	Activating "Silent Mode" feature as per section 3.2-1 of BCM FS-HU5T-14B476-AAG shall inhibit Courtesy Lamps Illumination Algorithm while feature is active
R: 5.4.1.2-4	Activating "Key-Off-Load Mode" feature as per section 2.14.6-7 of BCM FS-HU5T-14B476-AAG shall inhibit Courtesy Lamps Illumination Algorithm while feature is active
R: 5.4.1.2-5	Activating "Post-Crash Alert" feature as per section 2.5-78 of BCM FS-HU5T-14B476-AAG shall inhibit Courtesy Lamps Illumination Algorithm while feature is active.

5.4.2 **Courtesy Lamps Illumination Lighting Response**

R: 5.4.2-1	Courtesy Lamps Illumination shall illuminate in response to control signal ramping up
R: 5.4.2-2	Courtesy Lamps Illumination shall de-illuminate in response to control signal ramping down
R: 5.4.2-3	When the control signal reaches the duty cycle matched to the desired Courtesy Lamps Illumination lighting element's intensity level, the lighting element shall consistently illuminate to the same level each time
R: 5.4.2-4	Specific "ON", "ON/Embrace", "Snap ON" illumination level for each individual lighting element shall be specified by Vehicle Harmony Group in conjunction with Interior Lighting group.
R: 5.4.2-5	Courtesy Lamps Illumination shall meet the dimming and illumination requirements specified in RQT-001601-012984 "Illumination and Dimming". Any deviations shall be reviewed and bought off by Interior Harmony Group.
R: 5.4.2-6	Courtesy Lamps Illumination shall meet the general illumination color requirements specified in RQT-001601-012986 "General Illumination Color". Any deviations shall be reviewed and bought off by Interior Harmony Group.
R: 5.4.2-7	Courtesy Lamps Illumination Lighting elements shall meet (or not violate) requirements labelled "Interior Lighting" in section 3.2.3. "Safety Requirements" – 3.2.3.1 "NAFTA Requirements" for NAFTA applications, 3.2.3.2 "ECE Requirements" for ECE applications, and 3.2.3.3 "China Requirements" for China applications.
R: 5.4.2-8	When the control signal reaches 0% duty cycle the desired Courtesy Lamps Illumination lighting element's intensity level shall equal 0 (go to "OFF")
R: 5.4.2-9	During control signal "Fade ON" sequence, the Courtesy Lamps Illumination lighting element shall Fade ON smoothly – no observable flickering.
R: 5.4.2-10	During control signal "Fade OFF" sequence, the Courtesy Lamps Illumination lighting element shall Fade OFF smoothly – no observable flickering.
R: 5.4.2-11	Courtesy Lamps Illumination Lighting response to ramping control signals shall not be inhibited if any of the individual Courtesy Lamps lighting elements are malfunctioning/burnout.
R: 5.4.2-12	If the Control Signal, Power, or Ground to a specific Courtesy Lamps Illumination lighting element is corrupted/disconnects, that specific lighting element shall default to "OFF" (de-illuminated)

5.4.3 Ambient Lighting Illumination Algorithm (without static sequential):

As the name implies, these lights vary their intensity depending on the ambient light level. Depending on the vehicle line, the customer can also configure the color of these lights. These include but aren't limited to:
o   Cup Holders
o   Lower Pass through
o   Upper Pass through
o   Door Release Handle
o   Door map pocket

5.4.3.1   Applicable Welcome Farewell State Transitions

	Illumination Algorithm Name	Headlamp switch position	State Determination Algorithm: as per section 5.2.2 or 5.2.3	Respond to Remote Start state	Respond to Delayed Accessory	Respond to Extended Play
R: 5.4.3.1-1	Ambient Lighting Illumination Algorithm (without Static Sequential)	"Auto" or "OFF"	5.2.3	No	No	No

5.4.3.2   Control Signal Definitions & Configurability

Ambient Lighting Illumination (without static sequential) shall respond to changes in its driving Control Signal which is driven by transitions of Welcome/Farewell states

R: 5.4.3.2-1	Control Signal Response	Control Signal Curve	Default Duration	Minimum Duration	Max Duration	Config. Steps
R: 5.4.3.2-2	"Fade ON"/Ramp up	"Theater Dimming"	700ms	100ms	10 seconds	100ms
R: 5.4.3.2-3	"Fade OFF"/Ramp down	"Theater Dimming"	1700ms	100ms	10 seconds	100ms
R: 5.4.3.2-4	"Snap ON"/Step up	"Step Function"	Less than 1 microsecond	N/A	N/A	N/A
R: 5.4.3.2-5	"Snap OFF"/Step down	"Step Function"	Less than 1 microsecond	N/A	N/A	N/A
R: 5.4.3.2-6	Delay before "Fade ON"	N/A	0ms	0ms	2 seconds	100ms
R: 5.4.3.2-7	Delay before "Fade OFF"	N/A	0ms	0ms	2 seconds	100ms

NOTE: 1. "Theater Dimming" curve owned and managed by Interior Lighting group, who can specify a different curve if it better serves the final goal of "perceived linear ramping"
2. "Fade ON" vs "Fade OFF" vs. "Snap ON" vs. "Snap OFF" behavior shall be called out under "Ambient Lighting Illumination" sections under "RQT-002004-021878 DNA Welcome-Farewell Strategy Rev. 1" for Ford vehicles and "RQT-002004-022094 Lincoln Embrace Welcome and Farewell Behavior Rev. 1" for Lincoln vehicles.

5.4.3.3   **Control Signal Value Targets**

The Control Signals tied to Exterior "Ambient Lighting Illumination" shall ramp or snap along the aforementioned curves until they reach a target value that's defined as either "ON/Embrace" or "OFF" under "RQT-002004-021878 DNA Welcome-Farewell Strategy Rev. 1" for Ford vehicles and "RQT-002004-022094 Lincoln Embrace Welcome and Farewell Behavior Rev. 1" for Lincoln vehicles.

	ARL call-out	Target Control Signal value	Minimum value	Maximum value	Config. Steps
R: 5.4.3.3-1	"ON/Embrace"	80% PWM	20% PWM	100% PWM	1%
R: 5.4.3.3-2	"OFF"	<= 15% PWM	0% PWM	15% PWM	1%

Note: Target Control Signal Value for "ON/Embrace" and "OFF" shall vary depending on specific lighting element and controlling module. Above specified values are intended as a reference for remaining requirements

5.4.3.4   **Control Signal response based on Welcome/Farewell state transitions and "Vehicle Harmony" team specified behavior for "Ambient Lighting Illumination".**
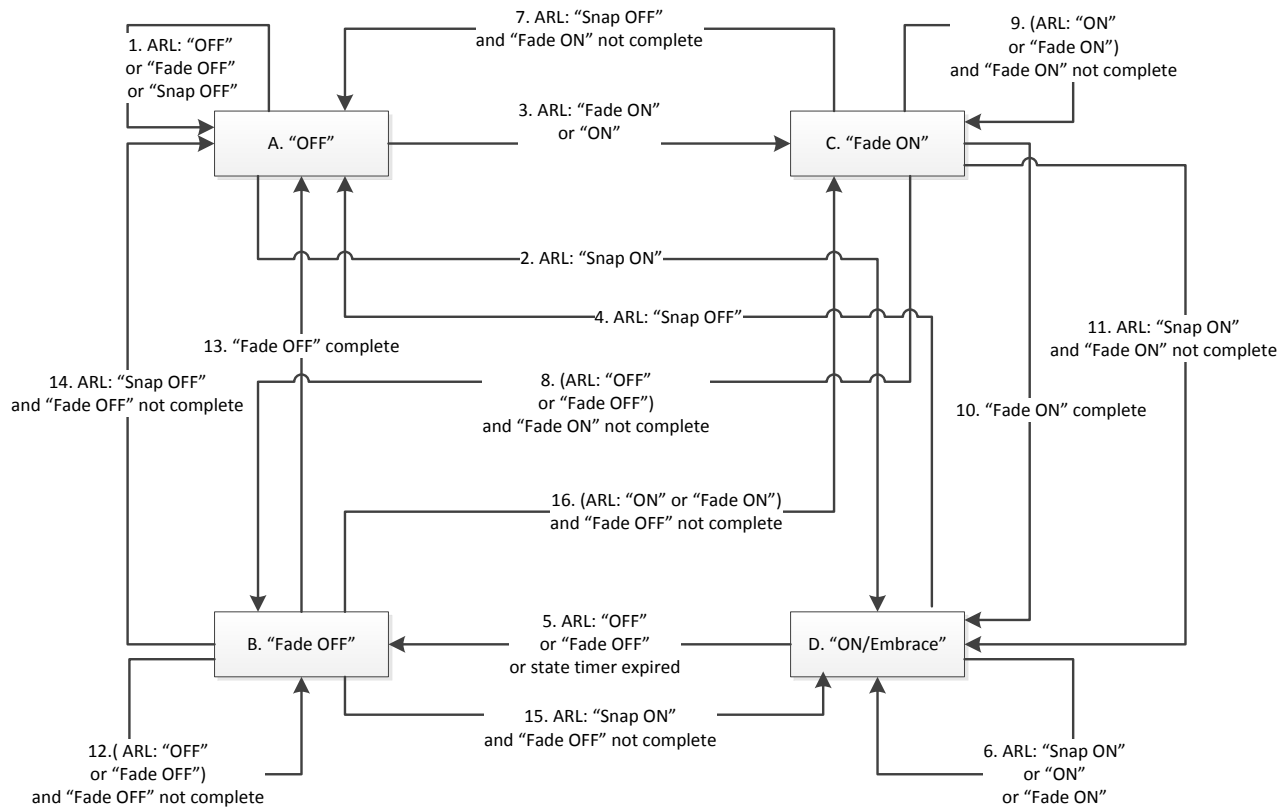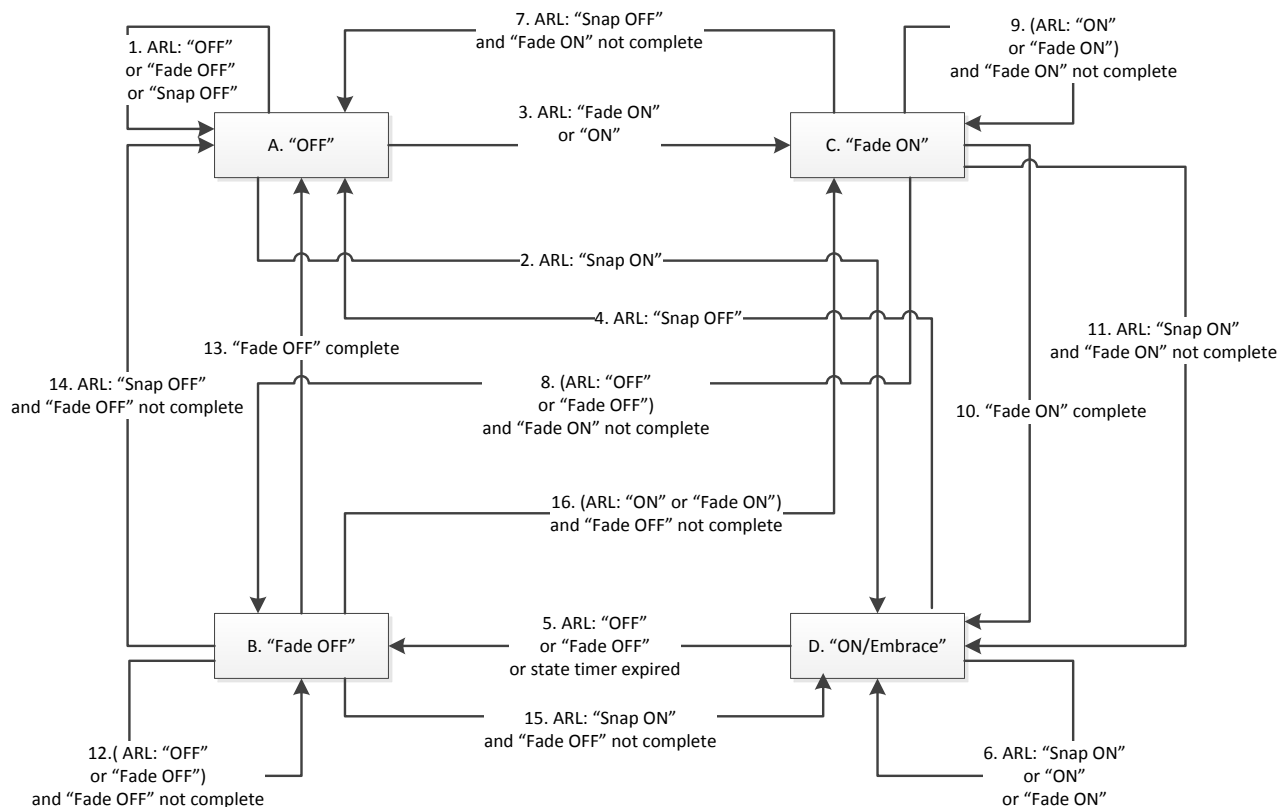

Figure 9:   **"Ambient Lighting" Illumination Control Signal transitions based on ARL requests.**

A -> A.1: No action, remain OFF
A -> D.2: Illuminate to "ON/Embrace Level", step function
A ->C.3: Start "Fade ON" sequence (3 seconds by default)
C ->A.4: De-illuminate to "OFF" level, step function
D ->B.5: Start "Fade OFF" sequence (5 seconds by default)
D ->D.6: Remain at "ON/Embrace" level, reset state time-out timer
C ->A.7: Interrupt "Fade ON" sequence, de-illuminate to "OFF" level, step function
C ->B.8: Interrupt "Fade ON" sequence, begin "Fade OFF" sequence. Start "Fade OFF" from same point/level "Fade ON" reached at time of interruption. "Fade OFF" time = % Fade ON complete * Fade OFF total time.

	C ->C.9: Start "Fade ON" sequence after first request. Do not reset "Fade ON" sequence with each new request.
	C ->D.10: "Fade ON" complete. Start state time-out timer.
	C ->D.11: Interrupt "Fade ON" sequence, illuminate to "ON/ Embrace" level, step function
	B ->B.12: Start "Fade OFF" sequence after first request. Do not reset "Fade OFF" sequence with each new request.
	B ->A.13: "Fade OFF" complete. Remain OFF for duration of state.
	B ->A.14: Interrupt "Fade OFF" sequence, de-illuminate to "OFF" level, step function
	B ->D.15: Interrupt "Fade OFF" sequence, illuminate to "ON/ Embrace" level, step function
	B ->C.16: Interrupt "Fade OFF" sequence, begin "Fade ON" sequence. Start "Fade ON" from same point/level "Fade OFF" reached at time of interruption. "Fade ON" time = % Fade OFF complete * Fade ON total time.

NOTE: 1. Additional requirements called out under section 5.4.3.2 Control Signal Definitions and Configurability in satisfying behavior listed under "Control signal response"
2. Ford ARL: RQT-002004-021878 DNA Welcome-Farewell Strategy Rev. 1
3. Lincoln ARL: RQT-002004-022094 Lincoln Embrace Welcome and Farewell Behavior Rev. 1

5.4.3.5   **Additional requirements**

R: 5.4.3.5-1	Conflicting requests sent mid illumination ramping (Fade ON -> Fade OFF before Fade ON complete, or Fade OFF -> Fade ON before Fade OFF complete): New Fade request shall be honored starting at illumination level that was reached by previous request while maintaining specified ramp rate (shall complete in lesser time). No time delay required before acting on new Fade request.
R: 5.4.3.5-2	For vehicles equipped with multi-colored LEDs, Ambient Lighting Illumination shall illuminate to customer selected color. Set to "signature color" by default (i.e. "Ice Blue" for Ford vehicles, "Lincoln White" for Lincoln vehicles) at each "Fade ON", "ON", or "Snap ON" event. Refer to RQT-Lincoln Chart (for Lincoln vehicles) or RQT-Ford Chart (for Ford vehicles) for Color and Intensity requirements.
R: 5.4.3.5-3	Ignition transitions from OFF to RUN/Start: Ambient Lighting Illumination shall follow legislative requirements on Illumination behavior (can forego "Fade ON" or "Fade OFF" behavior/delays if in conflict legislative requirements)

5.4.3.6   **Ambient Lighting Illumination Algorithm (without static sequential) inhibits and overrides**

R: 5.4.3.6-1	Ambient Lighting Illumination Algorithm shall be given the least priority over competing algorithms that control Ambient Lighting Illumination
R: 5.4.3.6-2	Activating "Perimeter Alarm Mode" or "Panic Alarm" feature as per sections 2.5-4 or 2.5-7 of BCM FS-HU5T-14B476-AAG shall inhibit Ambient Lighting Illumination Algorithm while feature is active
R: 5.4.3.6-3	Activating "Silent Mode" feature as per section 3.2-1 of BCM FS-HU5T-14B476-AAG shall inhibit Ambient Lighting Illumination Algorithm while feature is active
R: 5.4.3.6-4	Activating "Key-Off-Load Mode" feature as per section 2.14.6-7 of BCM FS-HU5T-14B476-AAG shall inhibit Ambient Lighting Illumination Algorithm while feature is active
R: 5.4.3.6-5	Activating "Post-Crash Alert" feature as per section 2.5-78 of BCM FS-HU5T-14B476-AAG shall inhibit Ambient Lighting Illumination Algorithm while feature is active.

5.4.4 **Ambient Lighting Illumination (without Static Sequential) Lighting Response**

R: 5.4.4-1	Ambient Lighting Illumination shall illuminate in response to control signal ramping up
R: 5.4.4-2	Ambient Lighting Illumination shall de-illuminate in response to control signal ramping down
R: 5.4.4-3	When the control signal reaches the duty cycle matched to the desired Ambient Lighting Illumination lighting element's intensity level, the lighting element shall consistently illuminate to the same level each time.

R: 5.4.4-4	Specific "ON", "ON/Embrace", "Snap ON" illumination level for each individual lighting element shall be specified by Vehicle Harmony Group in conjunction with Interior Lighting group.
R: 5.4.4-5	Ambient Lighting Illumination shall meet the dimming and illumination requirements specified in RQT-001601-012984 "Illumination and Dimming". Any deviations shall be reviewed and bought off by Interior Harmony Group.
R: 5.4.4-6	Ambient Lighting Illumination shall meet the general illumination color requirements specified in RQT-001601-012986 "General Illumination Color". Any deviations shall be reviewed and bought off by Interior Harmony Group.
R: 5.4.4-7	Ambient Lighting Illumination elements shall meet (or not violate) requirements labelled "Interior Lighting" in section 3.2.3. "Safety Requirements" – 3.2.3.1 "NAFTA Requirements" for NAFTA applications, 3.2.3.2 "ECE Requirements" for ECE applications, and 3.2.3.3 "China Requirements" for China applications.
R: 5.4.4-8	When the control signal reaches 0% duty cycle the desired Ambient Lighting Illumination element's intensity level shall equal 0 (go to "OFF")
R: 5.4.4-9	During control signal "Fade ON" sequence, the Ambient Lighting Illumination element shall Fade ON smoothly – no observable flickering.
R: 5.4.4-10	During control signal "Fade OFF" sequence, the Ambient Lighting Illumination element shall Fade OFF smoothly – no observable flickering.
R: 5.4.4-11	Ambient Lighting Illumination Lighting response to ramping control signals shall not be inhibited if any of the individual Ambient Lighting elements are malfunctioning/burnout.
R: 5.4.4-12	If the Control Signal, Power, or Ground to a specific Ambient Lighting Illumination element is corrupted/disconnects, that specific lighting element shall default to "OFF" (de-illuminated)

5.4.5 Ambient Lighting Illumination Algorithm (with static sequential):

A "delight the customer" feature which utilized individual ambient lights within the interior of the vehicle and illuminates them in sequence to "wrap" around the vehicle occupants. This feature is only active during Welcome/Farewell while the Ignition is OFF.
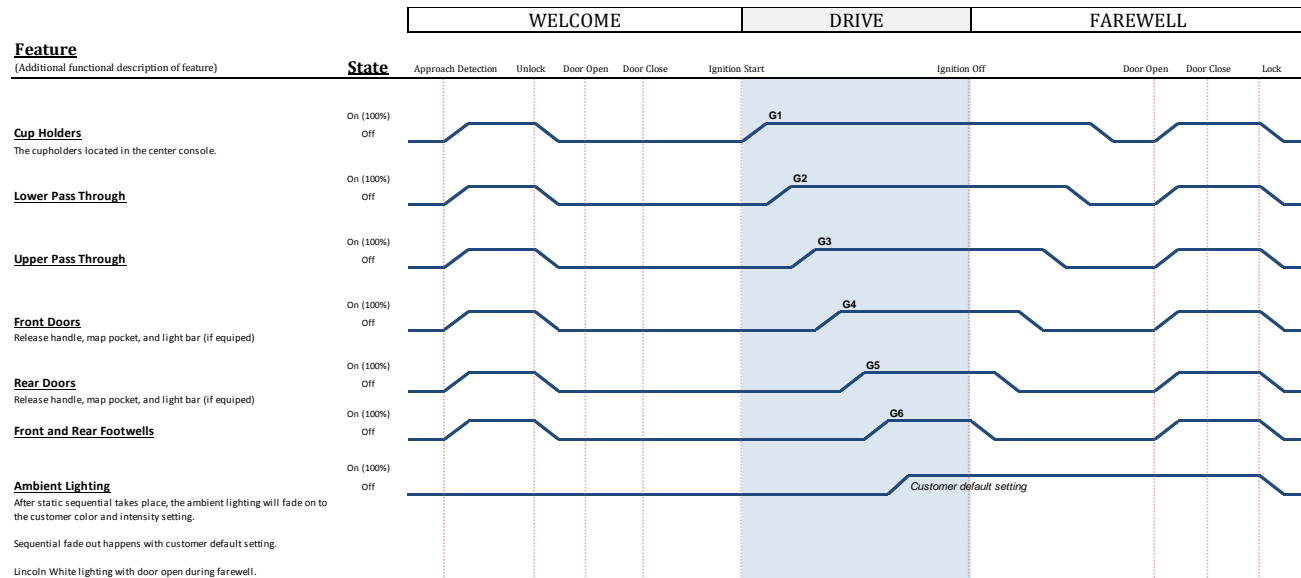
Figure 10: **NOTE: Static Sequential Ambient lighting response to Welcome/Farewell state**

5.4.5.1 Applicable Welcome Farewell State Transitions

	Illumination Algorithm Name	Headlamp switch position	State Determination Algorithm: as per section 5.2.2 or 5.2.3	Respond to Remote Start state	Respond to Delayed Accessory	Respond to Extended Play

R: 5.4.5.1-1	Ambient Lighting Illumination Algorithm (with Static Sequential)	"Auto" or "OFF"	5.2.3	No	No	No

5.4.5.2 Control Signal Definitions & Configurability

Ambient Lighting Illumination shall respond to changes in its driving Control Signal which is driven by transitions of Welcome/Farewell states

	Control Signal Response	Control Signal Curve	Default Duration	Minimum Duration	Max Duration	Config. Steps
R: 5.4.5.2-1	"Fade ON"/Ramp up	"Theater Dimming"	700ms	100ms	10 seconds	100ms
R: 5.4.5.2-2	"Fade OFF"/Ramp down	"Theater Dimming"	1700ms	100ms	10 seconds	100ms
R: 5.4.5.2-3	"Snap ON"/Step up	"Step Function"	Less than 1 microsecond	N/A	N/A	N/A
R: 5.4.5.2-4	"Snap OFF"/Step down	"Step Function"	Less than 1 microsecond	N/A	N/A	N/A
R: 5.4.5.2-5	Delay before "Fade ON"	N/A	0ms	0ms	2 seconds	100ms
R: 5.4.5.2-6	Delay before "Fade OFF"	N/A	0ms	0ms	2 seconds	100ms

NOTE: 1. "Theater Dimming" curve owned and managed by Interior Lighting group, who can specify a different curve if it better serves the final goal of "perceived linear ramping"
2. "Fade ON" vs "Fade OFF" vs. "Snap ON" vs. "Snap OFF" behavior shall be called out under "Ambient Lighting Illumination" sections under "RQT-002004-021878 DNA Welcome-Farewell Strategy Rev. 1" for Ford vehicles and "RQT-002004-022094 Lincoln Embrace Welcome and Farewell Behavior Rev. 1" for Lincoln vehicles.

5.4.5.3 Control Signal Value Targets

The Control Signals tied to Interior "Ambient Lighting Illumination" shall ramp or snap along the aforementioned curves until they reach a target value that's defined as either "ON/Embrace" or "OFF" under "RQT-002004-021878 DNA Welcome-Farewell Strategy Rev. 1" for Ford vehicles and "RQT-002004-022094 Lincoln Embrace Welcome and Farewell Behavior Rev. 1" for Lincoln vehicles.

	ARL call-out	Target Control Signal value	Minimum value	Maximum value	Config. Steps
R: 5.4.5.1-1	"ON/Embrace"	80% PWM	20% PWM	100% PWM	1%
R: 5.4.5.1-2	"OFF"	<= 15% PWM	0% PWM	15% PWM	1%

NOTE: Target Control Signal Value for "ON/Embrace" and "OFF" shall vary depending on specific lighting element and controlling module. Above specified values are intended as a reference for remaining requirements

### 5.4.5.4 Control Signal response based on Welcome/Farewell state transitions and "Vehicle Harmony" team specified behavior for "Ambient Lighting Illumination".
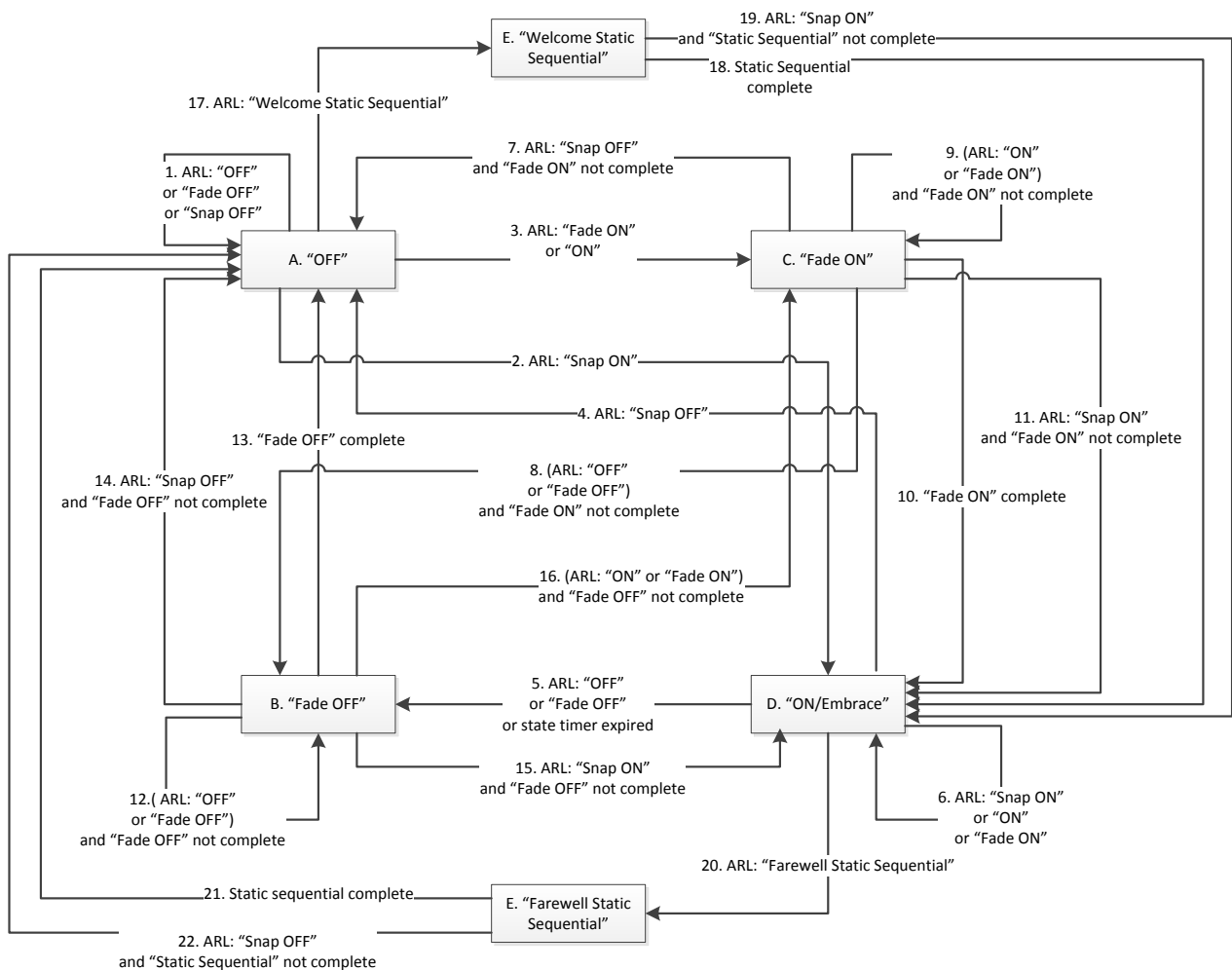
Figure 11: **"Ambient Lighting" Illumination Control Signal transitions based on ARL requests.**

	A -> A.1: No action, remain OFF
	A -> D.2: Illuminate to "ON/Embrace Level", step function
	A ->C.3: Start "Fade ON" sequence (3 seconds by default)
	C ->A.4: De-illuminate to "OFF" level, step function
	D ->B.5: Start "Fade OFF" sequence (5 seconds by default)
	D ->D.6: Remain at "ON/Embrace" level, reset state time-out timer
	C ->A.7: Interrupt "Fade ON" sequence, de-illuminate to "OFF" level, step function
	C ->B.8: Interrupt "Fade ON" sequence, begin "Fade OFF" sequence. Start "Fade OFF" from same point/level "Fade ON" reached at time of interruption. "Fade OFF" time = % Fade ON complete * Fade OFF total time.
	C ->C.9: Start "Fade ON" sequence after first request. Do not reset "Fade ON" sequence with each new request.
	C ->D.10: "Fade ON" complete. Start state time-out timer.
	C ->D.11: Interrupt "Fade ON" sequence, illuminate to "ON/ Embrace" level, step function
	B ->B.12: Start "Fade OFF" sequence after first request. Do not reset "Fade OFF" sequence with each new request.
	B ->A.13: "Fade OFF" complete. Remain OFF for duration of state.
	B ->A.14: Interrupt "Fade OFF" sequence, de-illuminate to "OFF" level, step function
	B ->D.15: Interrupt "Fade OFF" sequence, illuminate to "ON/ Embrace" level, step function
	B ->C.16: Interrupt "Fade OFF" sequence, begin "Fade ON" sequence. Start "Fade ON" from same point/level "Fade OFF" reached at time of interruption. "Fade ON" time = % Fade OFF complete * Fade ON total time.
	A ->E.17: Begin Welcome Static Sequential

	E ->D.18: Static Sequential complete. Transition ambient light color from signature color to last user selected color after complete.
	E ->D.19: Interrupt Static Sequential. Immediately transition ambient lighting to last user-selected color.
	D ->F.20: Begin Farewell Static Sequential
	F ->A.21: Static Sequential complete. All ambient lighting should be off.
	F ->A.22: Interrupt "Static Sequential" sequence. Immediately transition ambient lighting to "OFF".

NOTE: 1. Additional requirements called out under section 5.4.5.2 Control Signal Definitions and Configurability in satisfying behavior listed under "Control signal response"
2. Ford ARL: RQT-002004-021878 DNA Welcome-Farewell Strategy Rev. 1
3. Lincoln ARL: RQT-002004-022094 Lincoln Embrace Welcome and Farewell Behavior Rev. 1

5.4.5.5   **Additional requirements**

R: 5.4.5.3-1	If Ambient Lighting Illumination function can be enabled or disabled by the Driver (i.e. via Sync Screen), then the Algorithm shall only respond to Welcome/Farewell states if it is enabled (shall not respond/illuminate if disabled, and be forced OFF)
R: 5.4.5.3-2	Conflicting requests sent mid illumination ramping (Fade ON -> Fade OFF before Fade ON complete, or Fade OFF -> Fade ON before Fade OFF complete): New Fade request shall be honored starting at illumination level that was reached by previous request while maintaining specified ramp rate (shall complete in lesser time). No time delay required before acting on new Fade request.
R: 5.4.5.3-3	For vehicles equipped with multi-colored LEDs, Ambient Lighting Illumination shall illuminate to "signature color" during "Welcome" phase (i.e. "Ice Blue" for Ford vehicles, "Lincoln White" for Lincoln vehicles) at each "Fade ON", "ON", or "Snap ON" event. Refer to RQT-Lincoln Chart (for Lincoln vehicles) or RQT-Ford Chart (for Ford vehicles) for Color and Intensity requirements.
R: 5.4.5.3-4	For vehicles equipped with multi-colored LEDs, Ambient Lighting Illumination shall illuminate to (or remain in) customer selected color during Farewell phase. Set to "signature color" by default (i.e. "Ice Blue" for Ford vehicles, "Lincoln White" for Lincoln vehicles) at each "Fade ON", "ON", or "Snap ON" event. Refer to RQT-Lincoln Chart (for Lincoln vehicles) or RQT-Ford Chart (for Ford vehicles) for Color and Intensity requirements.

5.4.5.5.1   Static Sequential Triggers
"Static Sequential" is an additional feature which impacts vehicles equipped with multicolor LEDs (currently limited to Lincoln vehicle applications).

R: 5.4.5.3.1-1	Static Sequential shall be broken down into two broad phases: "Static Sequential Fade ON" and "Static Sequential Fade OFF".

	Trigger name	Trigger input
	"Static Sequential Fade ON"	IGN transition to RUN/Start
	"Static Sequential Fade OFF"	IGN transition to OFF/Accy

5.4.5.5.2   Static Sequential "Groups"
"Static Sequential" shall illuminate or de-illuminate specific locations/groups of ambient lights within the vehicle cockpit after "Static Sequential Fade ON" and "Static Sequential Fade OFF" triggers have occurred (respectively).

	Light group name	Light group location
	G1	Cup holders
	G2	Lower Pass Through
	G3	Upper Pass Through
	G4	Front Doors
	G5	Rear Doors

	G6	Front and Rear Foot wells

R: 5.4.5.3.2-	"Static Sequential Fade ON" trigger shall be used to begin illuminating Light groups one at a time (sequentially) in order from G1 to G6 (G1, G2, G3, G4, G5, then G6). Light group locations subject to change and shall require buyoff from Vehicle Harmony group as well as Interior Lighting group.
R: 5.4.5.3.2-	Multicolor Ambient lighting LEDs shall illuminate to vehicle signature color during "Static Sequential Fade ON" event. ("Ice Blue" for Ford vehicles, "Lincoln White" for Lincoln vehicles, exact color targets shall be provided by Vehicle Harmony team)
R: 5.4.5.3.2-	For vehicles equipped with Multicolor Ambient Lighting LEDs, they shall transition from signature color to last user selected color/intensity after "Static Sequential Fade ON" sequence is complete (last lighting group has illuminated).
R: 5.4.5.3.2-	"Static Sequential Fade OFF" trigger shall be used to begin de-illuminating Light groups one at a time (sequentially) in order from G6 to G1 (G6, G5, G4, G3, G2, then G1). Light group locations subject to change and shall require buyoff from Vehicle Harmony group as well as Interior Lighting group.

5.4.5.5.3   Static Sequential Definitions & Configurability

Besides being able to configure specific lighting groups and their order, the feature shall also allow for additional configurability of time delays between illuminating each group, duration a specific lighting group shall take to Fade ON/OFF, time to maintain "signature color" after last lighting group has illuminated before transitioning to customer selected color and intensity, and time to transition from "signature color" to customer selected color and intensity

	Time based config. parameter	Default Duration	Minimum Duration	Max Duration	Config. Steps
R: 5.4.5.3.3-1	"Time delay between consecutive group illumination"	300ms	100ms	2 seconds	100ms
R: 5.4.5.3.3-2	"Single Group Fade ON duration"	1200ms	100ms	2 seconds	100ms
R: 5.4.5.3.3-3	"Single Group Fade OFF duration"	1200ms	100ms	2 seconds	100ms
R: 5.4.5.3.3-4	"Time delay before transitioning from 'signature color' to 'last selected customer color and intensity'"	1800ms	100ms	2 seconds	100ms
R: 5.4.5.3.3-5	"'Signature color' to 'last selected customer color and intensity' fading transition time"	1500ms	100ms	2 seconds	100ms

5.4.5.6   **Ambient Lighting Illumination Algorithm (with static sequential) inhibits and overrides**

R: 5.4.5.4-1	Ambient Lighting Illumination Algorithm shall be given the least priority over competing algorithms that control Ambient Lighting Illumination
R: 5.4.5.4-2	Activating "Perimeter Alarm Mode" or "Panic Alarm" feature as per sections 2.5-4 or 2.5-7 of BCM FS-HU5T-14B476-AAG shall inhibit Ambient Lighting Illumination Algorithm while feature is active
R: 5.4.5.4-3	Activating "Silent Mode" feature as per section 3.2-1 of BCM FS-HU5T-14B476-AAG shall inhibit Ambient Lighting Illumination Algorithm while feature is active
R: 5.4.5.4-4	Activating "Key-Off-Load Mode" feature as per section 2.14.6-7 of BCM FS-HU5T-14B476-AAG shall inhibit Ambient Lighting Illumination Algorithm while feature is active
R: 5.4.5.4-5	Activating "Post-Crash Alert" feature as per section 2.5-78 of BCM FS-HU5T-14B476-AAG shall inhibit Ambient Lighting Illumination Algorithm while feature is active.

5.4.6 **Ambient Lighting Illumination (with Static Sequential) Lighting Response**

R: 5.4.6-1	Ambient Lighting shall illuminate to the vehicle's signature color ("Ice Blue" for Ford vehicles, "Lincoln White" for Lincoln vehicles) when the illumination algorithm requests the "ON/Embrace" illumination level – as identified in RQT-001601-012986 "General Illumination Color".)
R: 5.4.6-2	Ambient Lighting shall illuminate to the driver selected color and intensity when the illumination algorithm requests the "ON/Drive" illumination level.
R: 5.4.6-3	When the control signal reaches the duty cycle matched to the desired Ambient Lighting Illumination lighting element's intensity level, the lighting element shall consistently illuminate to the same level each time
R: 5.4.6-4	Specific "ON/Embrace" illumination level for each individual lighting element shall be specified by Vehicle Harmony Group in conjunction with Interior Lighting group.
R: 5.4.6-5	Ambient Lighting Illumination shall meet the dimming and illumination requirements specified in RQT-001601-012984 "Illumination and Dimming". Any deviations shall be reviewed and bought off by Interior Harmony Group.
R: 5.4.6-6	Ambient Lighting Illumination shall meet the general illumination color requirements specified in RQT-001601-012986 "General Illumination Color". Any deviations shall be reviewed and bought off by Interior Harmony Group.
R: 5.4.6-7	Ambient Lighting Illumination elements shall meet (or not violate) requirements labelled "Interior Lighting" in section 3.2.3. "Safety Requirements" – 3.2.3.1 "NAFTA Requirements" for NAFTA applications, 3.2.3.2 "ECE Requirements" for ECE applications, and 3.2.3.3 "China Requirements" for China applications.
R: 5.4.6-8	When the control signal reaches 0% duty cycle the desired Ambient Lighting Illumination element's intensity level shall equal 0 (go to "OFF")
R: 5.4.6-9	During control signal "Fade ON" sequence, the Ambient Lighting Illumination element shall Fade ON smoothly – no observable flickering.
R: 5.4.6-10	During control signal "Fade OFF" sequence, the Ambient Lighting Illumination element shall Fade OFF smoothly – no observable flickering.
R: 5.4.6-11	Ambient Lighting Illumination Lighting response to ramping control signals shall not be inhibited if any of the individual Ambient Lighting elements are malfunctioning/burnout.
R: 5.4.6-12	If the Control Signal, Power, or Ground to a specific Ambient Lighting Illumination element is corrupted/disconnects, that specific lighting element shall default to "OFF" (de-illuminated)

5.4.7 **Dimmable Backlighting Illumination Algorithm:**

Interior lighting that is not specifically used to illuminate the cabin but instead assist in either the find-ability or display of components OR switches within the interior of the vehicle. These lighting elements respond to inputs and changes in exterior ambient light level to transition between user-selectable "Day-time" and "Night-time" levels. The driver cannot configure the color of these lighting elements.

Dimmable Backlighting can exist in the following zones / vehicle-areas
- o Door trim switch illumination
- o Cluster switch illumination
- o Engine Start/Stop button backlighting
- o Instrument Cluster Backlighting/Indicators

5.4.7.1 **Applicable Welcome Farewell State Transitions**

	Illumination Algorithm Name	Headlamp switch position	State Determination Algorithm: as per section 5.2.2 or 5.2.3	Respond to Remote Start state	Respond to Delayed Accessory	Respond to Extended Play
R: 5.4.7.1.1-1	Dimmable Backlighting Illumination Algorithm	"Auto"	Both: 5.2.2	No	No	No

5.4.7.2 Control Signal Definitions & Configurability

Dimmable Backlighting Illumination shall respond to changes in its driving Control Signal which is driven by transitions of Welcome/Farewell states

	Control Signal Response	Control Signal Curve	Default Duration	Minimum Duration	Max Duration	Config. Steps
R: 5.4.7.1.2-1	"Fade ON"/Ramp up	"Smooth Dimming"	40ms	40ms	20.480 seconds	(40ms*2^x), where x is the number of shifts
R: 5.4.7.1.2-2	"Fade OFF"/Ramp down	"Smooth Dimming"	40ms	40ms	20.480 seconds	(40ms*2^x), where x is the number of shifts
R: 5.4.7.1.2-3	"Snap ON"/Step up	"Smooth Dimming"	40ms	40ms	20.480 seconds	(40ms*2^x), where x is the number of shifts
R: 5.4.7.1.2-4	"Snap OFF"/Step down	"Smooth Dimming"	40ms	40ms	20.480 seconds	(40ms*2^x), where x is the number of shifts
R: 5.4.7.1.2-5	Delay before "Fade ON"	N/A	0ms	0ms	2 seconds	100ms
R: 5.4.7.1.2-6	Delay before "Fade OFF"	N/A	0ms	0ms	2 seconds	100ms

Note: 1. "Smooth Dimming" curve owned and managed by Interior Lighting group, who can specify a different curve if it better serves the final goal of "perceived linear ramping". Refer to ES-H1BT-1A278-AA-VX for additional details

2. "Fade ON" vs "Fade OFF" vs. "Snap ON" vs. "Snap OFF" behavior shall be called out under "Day-time Dimmable Backlighting Illumination" sections under "RQT-002004-021878 DNA Welcome-Farewell Strategy Rev. 1" for Ford vehicles and "RQT-002004-022094 Lincoln Embrace Welcome and Farewell Behavior Rev. 1" for Lincoln vehicles.

5.4.7.3 Control Signal Value Targets

Dimmable Backlighting shall rely on an Ambient Light Sensor (ALS) in order to satisfy the requirements called out under "RQT-002004-021878 DNA Welcome-Farewell Strategy Rev. 1" for Ford vehicles and "RQT-002004-022094 Lincoln Embrace Welcome and Farewell Behavior Rev. 1" for Lincoln vehicles.

The Dimmable Backlighting shall illuminate to either a "Day-time" user selectable level or to a "Night-time" user selectable level for instances of "Fade ON", "ON, or "Snap ON" called out under "RQT-002004-021878 DNA Welcome-Farewell Strategy Rev. 1" for Ford vehicles and "RQT-002004-022094 Lincoln Embrace Welcome and Farewell Behavior Rev. 1" for Lincoln vehicles.

	ARL call-out	Exterior Ambient Light Level	Illumination Level target	Default Level (if no user selection/battery reset)	Selectable Steps
R: 5.4.7.1.3-1	"ON/Embrace"	"Day-time"	User selected "Day-time" illumination level	Maximum "Day-time" illumination level	6 (1 lowest, 6 being highest)

R: 5.4.7.1.3-2	"ON/Embrace"	"Night-time"	User selected "Night-time" illumination level	Maximum "Night-time" illumination level	12 (1 lowest, 12 being highest)
R: 5.4.7.1.3-3	"OFF"	N/A	OFF	Off	N/A

Note:

1. Refer to RQT-002004-021873 General Illumination Dimming Rev. XX for illumination intensity values for "Day-time" and "Night-time" selectable steps.
2. "Day-time" and "Night-time" determination function based off of Ambient Light Sensor is owned by BCM and called out under sections 2.3.10 "Autolamps", 2.3.19 "Headlamps Arbitrator" and 2.2.16 "Day-time Dimmable Backlighting" within BCM FS HU5T-14B476-AAG
3. Refer to latest version of ES-H1BT-1A278-AA-VX for information on how to drive PWM values based on target intensity values.

5.4.7.4 Illumination level response based on Welcome/Farewell state transitions and "Vehicle Harmony" team specified behavior for Dimmable Backlighting Illumination.
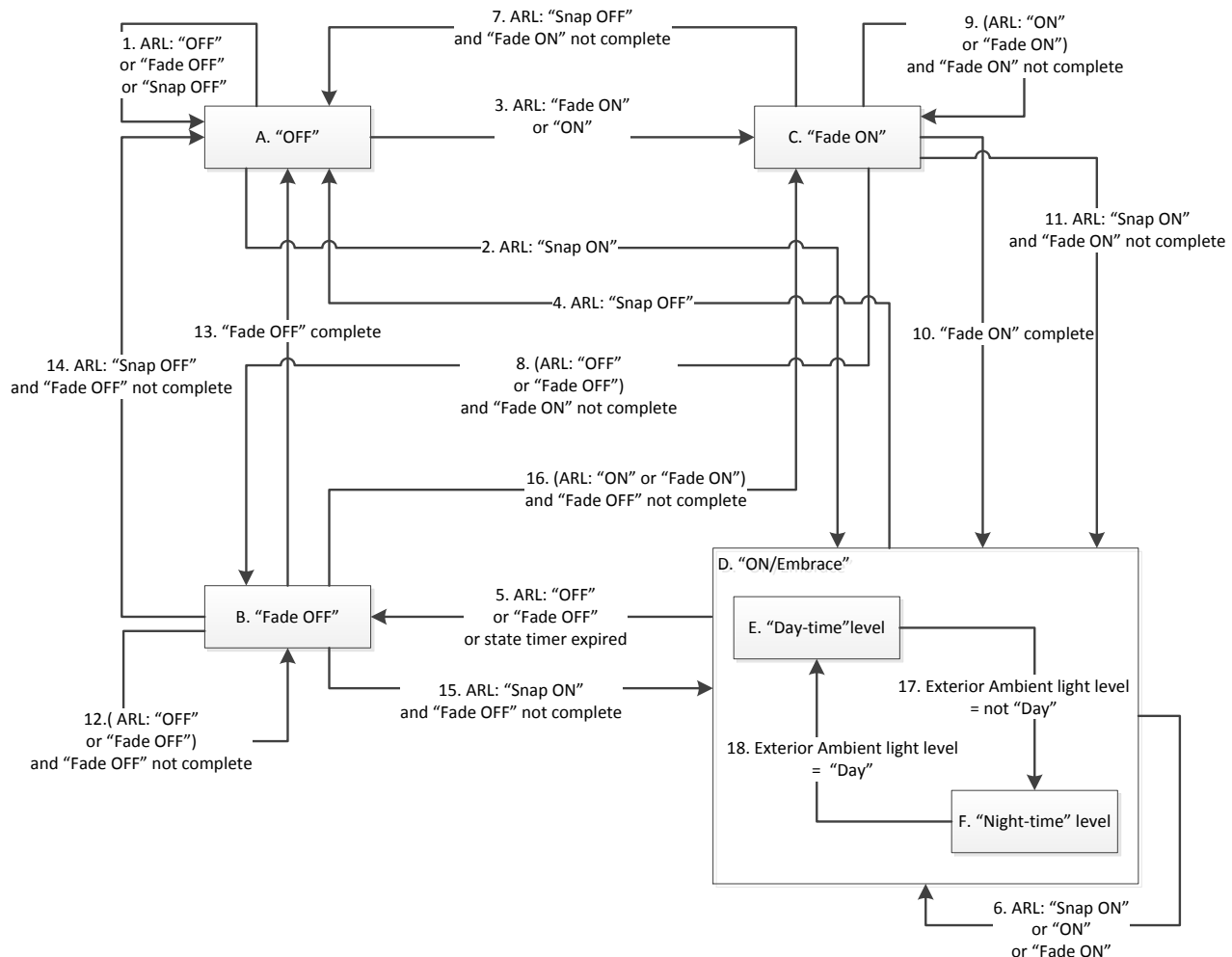
Figure 12: **Dimmable Backlighting Illumination Control Signal transitions based on ARL requests.**

	A -> A.1: No action, remain OFF
	A -> D.2: Illuminate to "ON/Embrace Level", step function. Go to "Day-time" or "Night-time" level based on exterior ambient light level
	A ->C.3: Start "Fade ON" sequence (3 seconds by default)

	C ->A.4: De-illuminate to "OFF" level, step function
	D ->B.5: Start "Fade OFF" sequence (5 seconds by default)
	D ->D.6: Remain at "ON/Embrace" level, reset state time-out timer
	C ->A.7: Interrupt "Fade ON" sequence, de-illuminate to "OFF" level, step function
	C ->B.8: Interrupt "Fade ON" sequence, begin "Fade OFF" sequence. Start "Fade OFF" from same point/level "Fade ON" reached at time of interruption. "Fade OFF" time = % Fade ON complete * Fade OFF total time.
	C ->C.9: Start "Fade ON" sequence after first request. Do not reset "Fade ON" sequence with each new request.
	C ->D.10: "Fade ON" complete. Start state time-out timer.
	C ->D.11: Interrupt "Fade ON" sequence, illuminate to "ON/ Embrace" level, step function
	B ->B.12: Start "Fade OFF" sequence after first request. Do not reset "Fade OFF" sequence with each new request.
	B ->A.13: "Fade OFF" complete. Remain OFF for duration of state.
	B ->A.14: Interrupt "Fade OFF" sequence, de-illuminate to "OFF" level, step function
	B ->D.15: Interrupt "Fade OFF" sequence, illuminate to "ON/ Embrace" level, step function
	B ->C.16: Interrupt "Fade OFF" sequence, begin "Fade ON" sequence. Start "Fade ON" from same point/level "Fade OFF" reached at time of interruption. "Fade ON" time = % Fade OFF complete * Fade ON total time.
	E ->F.17: Follow Smooth Dimming Day to Night transition (transtime_amb_down) as defined in ES-H1BT-1A278-AA-VX
	F ->E.18: Smooth Dimming Night to Day transition (transtime_amb_up) as defined in ES-H1BT-1A278-AA-VX

NOTE: 1. Additional requirements called out under section 5.4.7.2 Control Signal Definitions and Configurability in satisfying behavior listed under "Control signal response"
2. Ford ARL: RQT-002004-021878 DNA Welcome-Farewell Strategy Rev. 1
3. Lincoln ARL: RQT-002004-022094 Lincoln Embrace Welcome and Farewell Behavior Rev. 1

5.4.7.5 Responding to changes in "Exterior Light Level" during Welcome/Farewell State transitions

The Dimmable Backlighting Algorithm function is expected to react to changes in Exterior Ambient Lighting as they occur.

	Exterior Ambient Light level transition	Current Illumination Level Target	Next Illumination Level Target	Control Signal Response
R: 5.4.7.1.5-1	"Day-time" to "Night-time"	User selected "Day-time" illumination level	User selected "Night-time" illumination level	"Smooth Dimming Day to Night transition (transtime_amb_down) " as defined in ES-H1BT-1A278-AA-VX
R: 5.4.7.1.5-2	"Night-time" to "Day-time"	User selected "Night-time" illumination level	User selected "Day-time" illumination level	"Smooth Dimming Night to Day transition (transtime_amb_up)" as defined in ES-H1BT-1A278-AA-VX

Note: 1. "Day-time" to "Night-time" and vice versa transitions require that the Headlamp Switch be kept in the "AUTO" position and that the vehicle be equipped with an Ambient Light Sensor; otherwise illumination shall follow headlamp switch position ("ON"/"POS" = "Night-time" and "OFF" = "Day-time")

5.4.7.6 Additional requirements

R: 5.4.7.1.6-1	Ignition transitions from OFF to RUN/Start: Dimmable Backlighting shall follow legislative requirements on Illumination behavior (can forego "Fade ON" or "Fade OFF" behavior/delays if in conflict legislative requirements)

R: 5.4.7.1.6-2	If Driver is allowed to directly control Backlighting within the vehicle during Welcome/Farewell states (via headlamp switch, dimmer switch etc.), the requests shall be honored immediately: transitioning between "Day-time", "Night-time" and "OFF" levels; or between user selectable levels for "Day-time" and "Night-time".
R: 5.4.7.1.6-3	Conflicting requests sent mid illumination ramping (Fade ON -> Fade OFF before Fade ON complete, or Fade OFF -> Fade ON before Fade OFF complete): New Fade request shall be honored starting at illumination level that was reached by previous request while maintaining specified ramp rate (shall complete in lesser time). No time delay required before acting on new Fade request.
R: 5.4.7.1.6-4	Day-Time Dimmable Backlighting Illumination Algorithm will also support Smooth Dimming capability as detailed in the latest version of the following specification: "ES-H1BT-1A278-AA-VX"

5.4.7.7 **Dimmable Backlighting Illumination Algorithm inhibits and overrides**

R: 5.4.7.1.7-1	Day-Time Dimmable Backlighting Illumination Algorithm shall be given the least priority over competing algorithms that control Day-Time Dimmable Backlighting
R: 5.4.7.1.7-2	Activating "Perimeter Alarm Mode" or "Panic Alarm" feature as per sections 2.5-4 or 2.5-7 of BCM FS-HU5T-14B476-AAG shall inhibit Day-Time Dimmable Backlighting Illumination Algorithm while feature is active
R: 5.4.7.1.7-3	Activating "Silent Mode" feature as per section 3.2-1 of BCM FS-HU5T-14B476-AAG shall inhibit Day-Time Dimmable Backlighting Illumination Algorithm while feature is active
R: 5.4.7.1.7-4	Activating "Key-Off-Load Mode" feature as per section 2.14.6-7 of BCM FS-HU5T-14B476-AAG shall inhibit Day-Time Dimmable Backlighting Illumination Algorithm while feature is active
R: 5.4.7.1.7-5	Activating "Post-Crash Alert" feature as per section 2.5-78 of BCM FS-HU5T-14B476-AAG shall inhibit Day-Time Dimmable Backlighting Illumination Algorithm while feature is active.

5.4.8 **Dimmable Backlighting Illumination Response**

R: 5.4.7.2-1	Dimmable Backlighting Illumination shall illuminate in response to control signal ramping up
R: 5.4.7.2-2	Dimmable Backlighting Illumination shall de-illuminate in response to control signal ramping down
R: 5.4.7.2-3	When the control signal reaches the duty cycle matched to the desired Dimmable Backlighting Illumination lighting element's intensity level, the lighting element shall consistently illuminate to the same level each time.
R: 5.4.7.2-4	Specific "ON/Day-Embrace", "ON/Night-Embrace", "ON/Day-pulse", and "ON/Night-pulse" illumination level for each individual lighting element shall be specified by Vehicle Harmony Group in conjunction with Interior Lighting group.
R: 5.4.7.2-5	Dimmable Backlighting Illumination shall meet the dimming and illumination requirements specified in RQT-001601-012984 "Illumination and Dimming". Any deviations shall be reviewed and bought off by Interior Harmony Group.
R: 5.4.7.2-6	Dimmable Backlighting Illumination shall meet the general illumination color requirements specified in RQT-001601-012986 "General Illumination Color". Any deviations shall be reviewed and bought off by Interior Harmony Group.
R: 5.4.7.2-7	Dimmable Backlighting Illumination elements shall meet (or not violate) requirements labelled "Interior Lighting" in section 3.2.3. "Safety Requirements" – 3.2.3.1 "NAFTA Requirements" for NAFTA applications, 3.2.3.2 "ECE Requirements" for ECE applications, and 3.2.3.3 "China Requirements" for China applications.
R: 5.4.7.2-8	When the control signal reaches 0% duty cycle the desired Dimmable Backlighting Illumination lighting element's intensity level shall equal 0 (go to "OFF")
R: 5.4.7.2-9	During control signal "Fade ON" sequence, the Dimmable Backlighting Illumination lighting element shall Fade ON smoothly – no observable flickering.
R: 5.4.7.2-10	During control signal "Fade OFF" sequence, the Dimmable Backlighting Illumination lighting element shall Fade OFF smoothly – no observable flickering.
R: 5.4.7.2-11	During control signal "Pulsing", the Dimmable Backlighting element shall transition between its "ON/Day-Embrace" and "ON/Day-Pulse" (10% of ON/Day-Embrace by default) or

	"ON/Night-Embrace" and "ON/Night-Pulse" (10% of ON/Night-Embrace by default) at 1 HZ (by default) smoothly – no visible flickering
R: 5.4.7.2-12	Dimmable Backlighting Illumination Lighting response to ramping control signals shall not be inhibited if any of the individual Dimmable Backlighting lighting elements are malfunctioning/burnout.
R: 5.4.7.2-13	If the Control Signal, Power, or Ground to a specific Dimmable Backlighting Illumination lighting element is corrupted/disconnects, that specific lighting element shall default to "OFF" (de-illuminated)

5.5 Vehicle cockpit display(s) response based on Welcome/Farewell state

Vehicles equipped with customer facing displays or display devices i.e. heads-up-displays, shall be required to respond based off of welcome/farewell state. These displays or display devices include but aren't limited to:
•   Center-stack Welcome/Farewell Display (Sync Screen)
•   Cluster Welcome/Farewell Display (TFT/Digital portion)
•   Heads-up displays (aHUD)

5.5.1 Center-stack Welcome/Farewell Displays (Sync Screen):

R: 5.5.1-1	Center-stack Display shall follow the Welcome Farewell state transitions as they're listed in section 5.2.2 "Welcome/Farewell State determination without Battery saver tie-in" with the addition of "Extended Play" as described in section 3.1.2 under "Additional States"
R: 5.5.1-2	Ignition transitions from OFF to RUN/Start: Center-stack display shall transition from its previous display (can be OFF) to the last screen that was selected/enabled by the Driver while in RUN/Start. Transition animation (if any) shall be determined by HMI group
R: 5.5.1-3	Center-stack Display shall be capable of displaying a "Welcome" animation when given the correct inputs. Length and content of "Welcome" animation shall be determined by HMI group (3.3 seconds by default)
R: 5.5.1-4	Center-stack Display shall be capable of displaying a "Farewell" animation when given the correct inputs. Length and content of "Farewell" animation shall be determined by HMI group (3.3 seconds by default)
R: 5.5.1-5	IGN OFF, Center-stack Display OFF: Center-stack Display shall remain OFF when Welcome/Farewell state transitions to "Null", "Remote Start", "Approach Detection", "Illuminated Entry", or "Vehicle Locking" following state transitions as per section 5.2.2 "Welcome/Farewell state determination without Battery Saver tie-in"
R: 5.5.1-6	IGN OFF, Center-stack Display ON: Center-stack Display shall turn OFF when Welcome/Farewell state transitions to "Null", "Remote Start", "Approach Detection", "Illuminated Entry", or "Vehicle Locking" following state transitions as per section 5.2.2 "Welcome/Farewell state determination without Battery Saver tie-in"
R: 5.5.1-7	IGN OFF, Center-stack Display OFF: Center-stack Display shall turn ON, display "Welcome" animation and transition to "Welcome" display when Welcome/Farewell state transitions to "Courtesy Lighting". If no "Welcome" display present/loaded, then transition to last in-drive screen after "Welcome" animation complete. If no "Welcome" animation present/loaded, then transition directly to "Welcome" display and continue displaying for duration of w/f state. If neither present, then transition to last in-drive screen when Welcome/Farewell state transitions to "Courtesy Lighting"
R: 5.5.1-8	IGN OFF, Center-stack Display OFF: Center-stack Display shall turn ON display "Welcome" animation and transition to "Welcome" display when Welcome/Farewell state transitions to "Courtesy Lighting Delay". If no "Welcome" display present/loaded, then transition to last in-drive screen after "Welcome" animation complete. If no "Welcome" animation present/loaded, then transition directly to "Welcome" display and continue displaying for duration of w/f state. If neither present, then transition to last in-drive screen when Welcome/Farewell state transitions to "Courtesy Lighting Delay"
R: 5.5.1-9	IGN OFF, Center-stack Display OFF: Center-stack Display shall turn ON and display "Welcome" animation (if present/loaded) when Welcome/Farewell state transitions to "IGN RUN/Start" and then transition to In-drive display.

R: 5.5.1-10	IGN OFF, Center-stack Display ON: Center-stack Display shall remain ON (display "Welcome" display if present or last in-drive screen if "Welcome" display not present, and not re-display "Welcome" animation) when Welcome/Farewell state transitions to "Courtesy Lighting"
R: 5.5.1-11	IGN OFF, Center-stack Display ON: Center-stack Display shall remain ON (display "Welcome" display if present or last in-drive screen if "Welcome" display not present, and not re-display "Welcome" animation) when Welcome/Farewell state transitions to "Courtesy Lighting Delay"
R: 5.5.1-12	IGN OFF, Center-stack Display ON: Center-stack Display shall remain ON and display "Welcome" animation (if present/loaded) when Welcome/Farewell state transitions to "IGN RUN/Start" and then transition to In-drive display.
R: 5.5.1-13	Center-stack Display OFF and IGN transitions to OFF: Welcome/Farewell state shall transition to "Extended Play" state and remain OFF while in that state.
R: 5.5.1-14	Center-stack Display ON and IGN transitions to OFF: Welcome/Farewell state shall transition to "Extended Play" state and Center-stack Display shall continue displaying screen/info it was while in Drive.
R: 5.5.1-15	IGN OFF, Center-stack Display OFF and Driver manually toggles "Extended Play" mode via hard button: Welcome/Farewell state shall transition to "Extended Play" state, Center-stack Display shall turn ON and display last screen that was active while in-drive (not required to display "Welcome" animation)
R: 5.5.1-16	IGN OFF, Center-stack Display ON and Driver manually toggles "Extended Play" mode via hard button: Welcome/Farewell state shall transition to "Extended Play" state, Center-stack Display shall remain ON and display last screen that was active while in-drive (not required to display "Welcome" animation)
R: 5.5.1-17	All vehicle doors closed, IGN transitioned to OFF, Center-stack Display ON or OFF: Center-stack Display shall display "Farewell" graphic then transition to OFF Welcome/Farewell state transitions to "Courtesy Lighting"
R: 5.5.1-18	Vehicle door(s) Ajar, IGN transitioned to OFF, Center-stack Display ON or OFF: Center-stack Display shall display "Farewell" graphic then transition to OFF Welcome/Farewell state transitions to "Courtesy Lighting Delay"
R: 5.5.1-19	IGN transitioned to OFF, "Farewell" graphic already displayed, Center-stack Display OFF: Center-stack Display shall turn ON and display "Welcome" animation and remain ON when Welcome/Farewell state transitions to "Courtesy Lighting"
R: 5.5.1-20	"Welcome Animation", "Welcome Display", "Farewell Animation", and "Farewell Display" shall be specified by Vehicle Harmony Group, HMI group, and Studio graphics group
R: 5.5.1-21	Center-stack Display shall meet the illumination requirements specified in RQT-001601-012984 "Illumination and Dimming". Any deviations shall be reviewed and bought off by Interior Harmony Group.
R: 5.5.1-22	Center-stack Display shall meet the general illumination color requirements specified in RQT-001601-012986 "General Illumination Color". Any deviations shall be reviewed and bought off by Interior Harmony Group.
R: 5.5.1-23	Center-stack display shall meet (or not violate) requirements labelled "Vehicle Displays" in section 3.2.3. "Safety Requirements" – 3.2.3.1 "NAFTA Requirements" for NAFTA applications, 3.2.3.2 "ECE Requirements" for ECE applications, and 3.2.3.3 "China Requirements" for China applications.

5.5.2 Cluster during Welcome/Farewell:

The Cluster is required to respond to Welcome-Farewell state transitions:

5.5.2.1 Welcome/Farewell screen definitions:

R: 5.5.2.1-1	Cluster Display Area shall be capable of displaying a "Welcome Animation". HMI team in conjunction with Vehicle Harmony team to determine content and length of "Welcome animation".

R: 5.5.2.1-2	Cluster Display Area shall be capable of displaying a "Farewell Animation". HMI team in conjunction with Vehicle Harmony team to determine content and length of "Farewell animation".
R: 5.5.2.1-3	Cluster Display Area shall be capable of displaying a "Welcome Display" (looping graphic or static image). HMI team in conjunction with Vehicle Harmony team to determine content and length of "Welcome Display".
R: 5.5.2.1-4	Cluster Display Area shall be capable of displaying a "Farewell Display" (looping graphic or static image). HMI team in conjunction with Vehicle Harmony team to determine content and length of "Farewell Display"
R: 5.5.2.1-5	If both "Welcome Animation" and "Welcome Display" are configured ON. "Welcome Display" shall enable after "Welcome Animation" is complete. HMI team in conjunction with Vehicle Harmony team to determine transitions between animation and display.
R: 5.5.2.1-6	If both "Farewell Animation" and "Farewell Display" are configured ON. "Farewell Display" shall enable after "Farewell Animation" is complete. HMI team in conjunction with Vehicle Harmony team to determine transitions between animation and display.
R: 5.5.2.1-7	"Welcome Animation", "Welcome Display", "Farewell Animation", and "Farewell Display" shall be specified by Vehicle Harmony Group, HMI group, and Studio graphics group
R: 5.5.2.1-8	Cluster Display shall meet the illumination requirements specified in RQT-001601-012984 "Illumination and Dimming". Any deviations shall be reviewed and bought off by Interior Harmony Group.
R: 5.5.2.1-9	Cluster Display shall meet the general illumination color requirements specified in RQT-001601-012986 "General Illumination Color". Any deviations shall be reviewed and bought off by Interior Harmony Group.
R: 5.5.2.1-10	Cluster display shall meet (or not violate) requirements labelled "Vehicle Displays" in section 3.2.3. "Safety Requirements" – 3.2.3.1 "NAFTA Requirements" for NAFTA applications, 3.2.3.2 "ECE Requirements" for ECE applications, and 3.2.3.3 "China Requirements" for China applications.

5.5.2.2 **Welcome/Farewell States vs. Screens transitions**
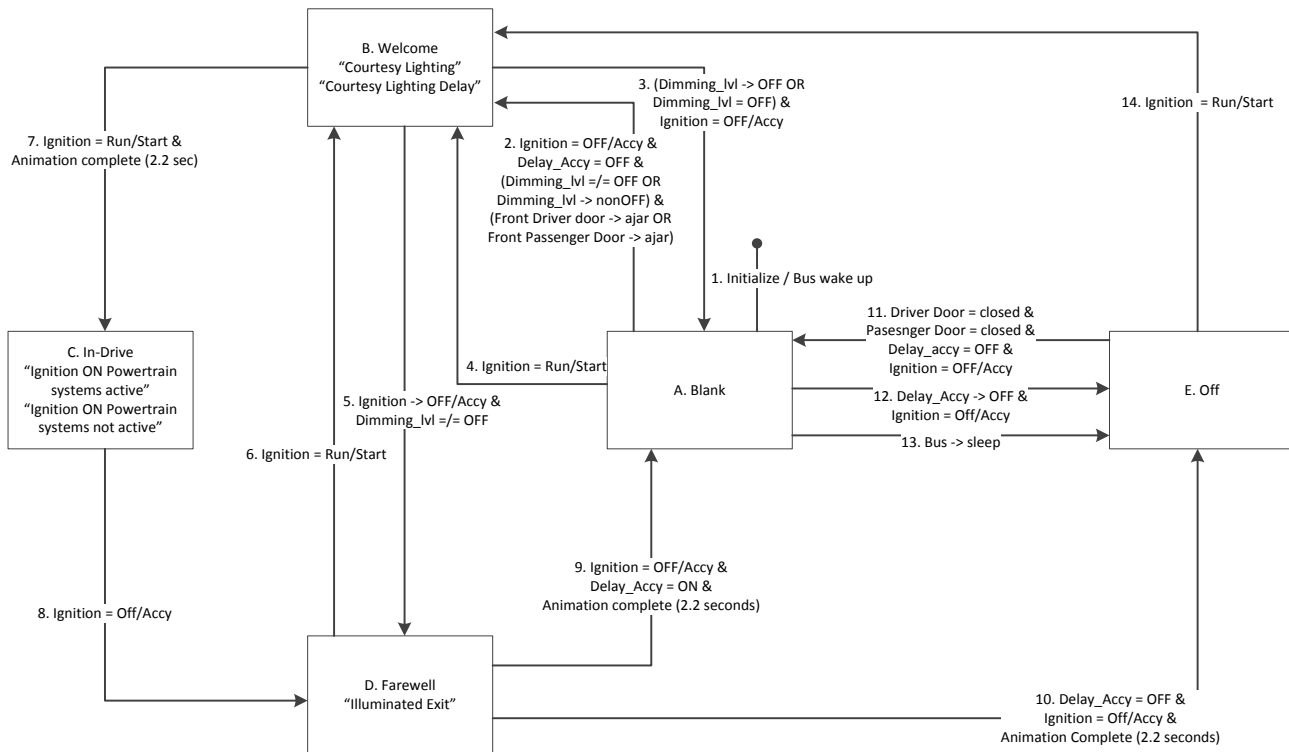
Figure 13: Welcome Farewell state transitions for Cluster Welcome/Farewell display.

Note: "=" requires that the signal value must be true for at least 200ms. Transitions denoted by "->" requires that the signal value changed to the specified value within 200ms

	• **-> A.1**: Initialize/Bus Wake up. Cluster is not required to remember last time it was in at time of local sleep upon wake up.
	A -> B.2: Transition should enable "Welcome Animation" and transition to "Welcome Display" after complete while in "Welcome State". If "Welcome Animation" or "Welcome Display" not configured or not present then screen can remain "Blank" while in "Welcome" state.
	B -> A.3
	A ->B.4:
	B ->D.5: Occurs if "Welcome Animation" interrupted by change in ignition.
	D ->B.6: Occurs if "Farewell Animation" interrupted by change in ignition
	B ->C.7: "Welcome Animation" required to complete before transition if configured ON. If "Welcome Animation" not configured ON or not present, then "& Animation Complete (2.2 sec)" does not apply.
	C ->D.8: Transition should only occur if no other conflicting (higher priority) feature is requiring to use same display area as Farewell Graphic (do not suppress warnings etc. that would be displayed in same area as farewell graphic)
	D ->A.9: "Farewell Animation" required to complete before transition if configured ON. If "Farewell Animation" not configured ON or not present, then "& Animation Complete (2.2 sec)" does not apply.
	D ->E.10: "Farewell Animation" required to complete before transition if configured ON. If "Farewell Animation" not configured ON or not present, then "& Animation Complete (2.2 sec)" does not apply.
	E ->A.11
	A ->E.12
	A ->E.13: Transition occurs at Local Sleep.

NOTE:
1. "=" requires that the signal value must be true for at least 200ms. Transitions denoted by "->" requires that the signal value changed to the specified value within 200ms
2. "Welcome" state mapped to "Courtesy lighting" and "Courtesy Lighting Delay", "In-Drive" mapped to "Ignition ON Powertrain systems active" and "Ignition ON Powertrain systems not active", and "Farewell" mapped to "Illuminated Exit" as defined in RQT-002004-021878 DNA Welcome-Farewell Strategy Rev. X for Ford vehicles and RQT-002004-022094 Lincoln Embrace Welcome and Farewell Behavior Rev. X for Lincoln vehicles. Any state called out in RQT documents not mapped in above transition diagram shall be treated as "Blank".

5.5.3 HUD Welcome/Farewell Displays (aHUD):

R: 5.5.3-1	HUD Welcome/Farewell Displays shall follow the Welcome Farewell state transitions as they're listed in section 5.2.2 "Welcome/Farewell State determination without Battery saver tie-in"
R: 5.5.3-2	Ignition OFF HUD not initialized: HUD shall initialize when Welcome/Farewell state transitions to "Approach Detection", "Illuminated Entry", "Courtesy Lighting", or "Courtesy Lighting Delay", as per section 5.2.2 "Welcome/Farewell state determination without Battery Saver tie-in".
R: 5.5.3-3	Ignition OFF HUD not initialized: HUD shall not initialize (de-initialize) when Welcome/Farewell state transitions to "Remote Start", "Null", "Vehicle Locking" as per section 5.2.2 "Welcome/Farewell state determination without Battery Saver tie-in".
R: 5.5.3-4	Ignition OFF HUD not initialized, HUD equipped with "Welcome" graphic/display: HUD shall initialize, display "Welcome" graphic/display (as determined by HMI group) then transition to in-drive display when Welcome/Farewell state transitions to "Ignition RUN/START".
R: 5.5.3-5	Ignition OFF HUD not initialized, HUD not equipped with "Welcome" graphic/display: HUD shall initialize, then transition to in-drive display when Welcome/Farewell state transitions to "Ignition RUN/START".
R: 5.5.3-6	Ignition OFF HUD initialized: HUD shall remain initialized when Welcome/Farewell state transitions to "Approach Detection", "Illuminated Entry", "Courtesy Lighting", or "Courtesy Lighting Delay", as per section 5.2.2 "Welcome/Farewell state determination without Battery Saver tie-in".
R: 5.5.3-7	Ignition OFF HUD initialized: HUD shall de-initialize/turn off when Welcome/Farewell state transitions to "Remote Start", "Null", or "Vehicle Locking" as per section 5.2.2 "Welcome/Farewell state determination without Battery Saver tie-in".
R: 5.5.3-8	Ignition RUN/Start, HUD turned OFF: HUD shall remain "OFF" for remainder of "Farewell" States ("Illuminated Exit", "Courtesy Lighting", "Courtesy Lighting Delay", and "Vehicle Locking"). Shall return to "Welcome" States after "Vehicle Locking" state has occurred.
R: 5.5.3-9	Ignition RUN/Start, HUD active with in-drive display, HUD not configured with "Farewell" graphic/display: HUD shall turn OFF when Welcome/Farewell state transitions to "Illuminated Exit". Shall remain "OFF" for remainder of "Farewell" States ("Courtesy Lighting", "Courtesy Lighting Delay", and "Vehicle Locking"). Shall return to "Welcome" States after "Vehicle Locking" state has occurred.
R: 5.5.3-10	Ignition RUN/Start, HUD active with in-drive display, HUD configured with "Farewell" graphic/display: HUD shall display "Farewell" graphic/display and turn OFF when Welcome/Farewell state transitions to "Illuminated Exit". Shall remain "OFF" for remainder of "Farewell" States ("Courtesy Lighting", "Courtesy Lighting Delay", and "Vehicle Locking"). Shall return to "Welcome" States after "Vehicle Locking" state has occurred.
R: 5.5.3-11	HUD shall meet the illumination requirements specified in RQT-001601-012984 "Illumination and Dimming". Any deviations shall be reviewed and bought off by Interior Harmony Group.
R: 5.5.3-12	HUD shall meet the general illumination color requirements specified in RQT-001601-012986 "General Illumination Color". Any deviations shall be reviewed and bought off by Interior Harmony Group.
R: 5.5.3-13	HUD shall meet (or not violate) requirements labelled "Vehicle Displays" in section 3.2.3. "Safety Requirements" – 3.2.3.1 "NAFTA Requirements" for NAFTA applications, 3.2.3.2 "ECE Requirements" for ECE applications, and 3.2.3.3 "China Requirements" for China applications.

5.6 "Other" vehicle lighting elements or part assemblies' response based on Welcome/Farewell state

This category is used to call out specific lighting elements or part assemblies' which don't necessarily fit within the aforementioned categories (or provide a "lighting" based output) but still respond to welcome/farewell state transitions. The exact behavior of these lighting elements or part assemblies' is owned by other feature owners/groups, with their own separate specifications. Examples include:
• Illuminated Seat Belt Buckle
• Engine Start Stop LED
• Night Lock Indication
• Illuminated Running Board Deployment
• Auto-fold mirrors

R: 5.6-1	Turn signal behavior dictated by Ford Body Security-Locking Group, and is dependent on local market requirements/features.
R: 5.6-2	Engine Start Stop LED behavior dictated by Ford Body Security-Locking Group, and is dependent on local market requirements/features (By default turns ON when brake pedal is depressed, turns OFF when brake pedal is released)
R: 5.6-3	Night Lock indication dictated by Ford Body Security-Locking Group, and is dependent on local market requirements/features.
R: 5.6-4	Autofold Mirrors dictated by Ford Body Security-Locking Group, and is dependent on local market requirements/features.
R: 5.6-5	Illuminated Running Board Deployment dictated by Ford Body Electronics Group
R: 5.6-6	Illuminated Seat belt behavior is dictated by Interior Lighting group
R: 5.6-7	cHUD behavior dictated by Ford Upperbody Electronics group

6 FEATURE VARIANT DESIGN ARCHITECTURE

6.1 Electrical Architecture – Lincoln Vehicles

Please note that the feature does not require specific modules (except the BCM) to be present on a vehicle, and is instead tailored to the content of the vehicle. The following section is a generic starting point to show how functions are allocated based off vehicle content and desired functionality.

6.1.1 Electrical Topology

Lincoln Embrace topology diagrams for the following architectures:
• CGEA 1.3

6.1.1.1 Combined Network/Block Diagram

The following combined network/block diagram is a generic starting point, and the actual topology should be consulted for each specific implementation
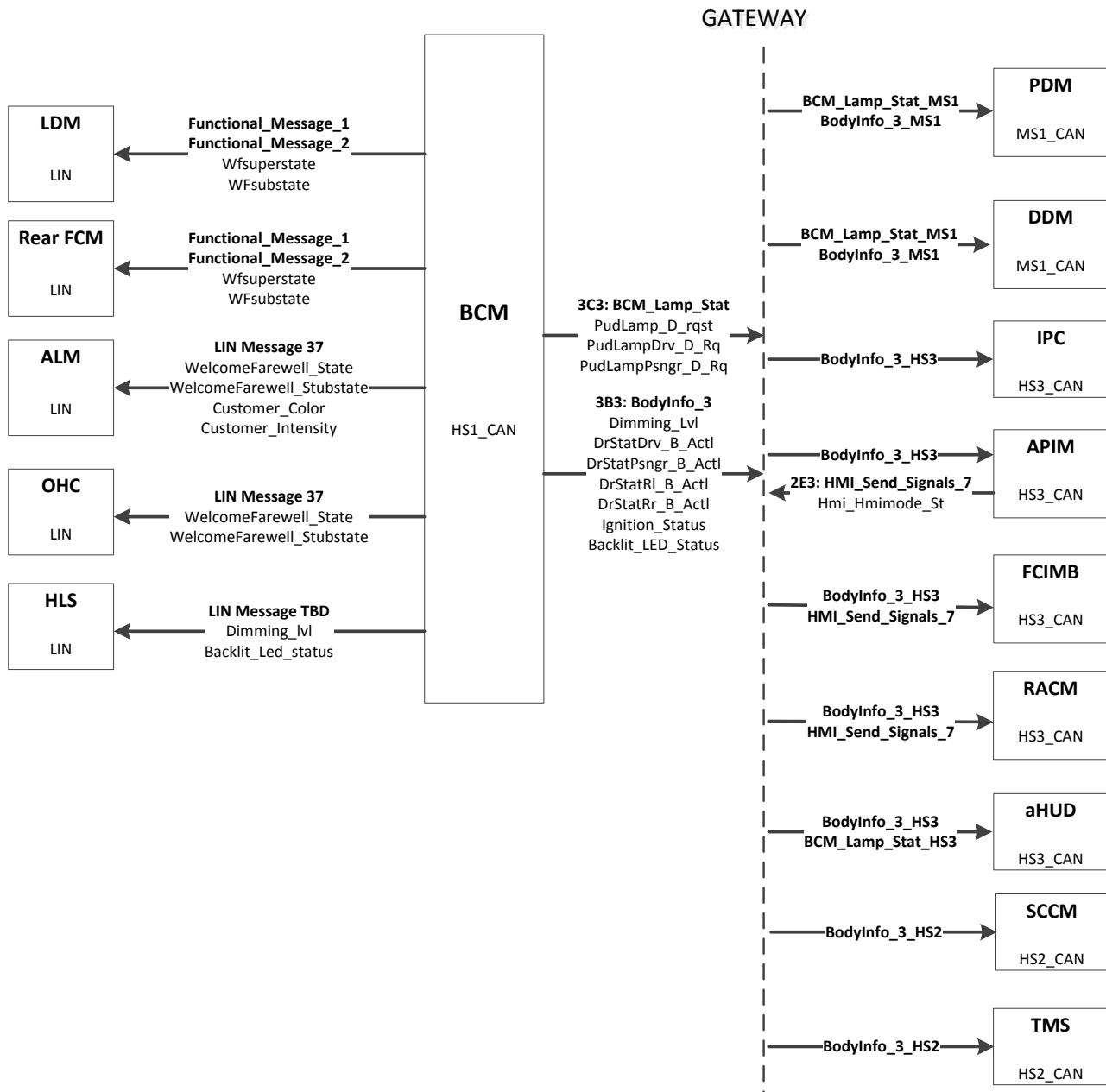
Figure 14:   Lincoln: Lincoln Embrace Combined Network/Block Diagram

6.1.2 **Common Requirements**

6.1.2.1   <u>Participating ECUs</u>

Generic list of participating ECUs provided in table below. Functionality along with Publisher and Subscriber requirements will change based on vehicle content.

Rqm't Num	ECU	Requirement
R: 6.1.2-1	BCM	CAN Publisher, LIN Publisher
R: 6.1.2-2	LDM	LIN Subscriber
R: 6.1.2-3	R-FCM	LIN Subscriber
R: 6.1.2-4	ALM	LIN Subscriber
R: 6.1.2-5	OHC	LIN Subscriber

R: 6.1.2-6	HLS	LIN Subscriber
R: 6.1.2-7	DDM	CAN Subscriber
R: 6.1.2-8	PDM	CAN Subscriber
R: 6.1.2-9	IPC	CAN Subscriber
R: 6.1.2-10	APIM	CAN Publisher, CAN Subscriber
R: 6.1.2-11	FCIMB	CAN Subscriber
R: 6.1.2-12	RACM	CAN Subscriber
R: 6.1.2-13	aHUD	CAN Subscriber
R: 6.1.2-14	SCCM	CAN Subscriber
R: 6.1.2-15	TMS	CAN Subscriber
R: 6.1.2-16	SDLC	CAN Publisher, CAN Subscriber

6.1.2.2 **Performance and Functional Voltage Ranges**

For this feature, Performance Voltage Range is the same as the Functional Range. It shall be noted that below 9v.

Rqm't Num	Type	Voltage Range
R: 6.1.2-17	Performance	9-16v
R: 6.1.2-18	Functional	6-16v

6.1.2.3 **Signal Requirements**

The following section lists all of the signals required to complete the desired behaviors required by the Feature. It links the logical data-flows used within this document to the actual CAN OR LIN signals which shall actually be used by the modules.

6.1.2.3.1 CAN Signal Requirements

Requirement	Signal Database Detail	Value
	Signal Name	Dimming_Lvl
	Functional Voltage Range (Min,Max)	6-16v
	Performance Voltage Range (Min,Max)	9-16v
	Source Network	HS1 CAN
	Signal refresh rate	500 ms
	Publishing Interval (ms)	<= 40ms
	Publisher Latency Requirements	If microprocessor is awake: <= 51ms
		If microprocessor is asleep: <=121ms
	Publishing Network Sleep Inhibitor	If signal is not equal to OFF, then allow for network sleep but not for local sleep
	Updates Signal while asleep	Updates on change
	Network Wake Up	Wake up network on signal change to non-OFF value
	Max latency before signal is valid on Network wakeup	<= 50ms
	Max latency before signal is valid on reset	<= 120ms
	CAN Node Type	HS1
	Signal Domain	Refer to data dictionary
	Signal Transmit Strategy	Event Periodic
	Signal Send Type	OnChange

Requirement	Signal Database Detail	Value
	Signal Transmit Cycle Time	500 ms
	End-to-End Latency Requirements	<=250 ms
	Publishing ECU	BCM
	Subscribing ECU	APIM, IPC, DDM, PDM, FCIMB, SCCM, RACM
	Subscribing Function	APIM: Interior Day-time Dimmable Backlighting Illumination Algorithm FCIMB: Interior Dimmable Backlighting Illumination Algorithm IPC: Interior Dimmable Backlighting Illumination Algorithm DDM: Interior Dimmable Backlighting Illumination Algorithm PDM: Interior Dimmable Backlighting Illumination Algorithm SCCM: Interior Dimmable Backlighting Illumination Algorithm RACM: Interior Dimmable Backlighting Illumination Algorithm

Requirement	Signal Database Detail	Value
	Signal Name	Litval
	Functional Voltage Range (Min,Max)	6-16v
	Performance Voltage Range (Min,Max)	9-16v
	Source Network	HS1 CAN
	Signal refresh rate	500 ms
	Publishing Interval (ms)	<= 40ms
	Publisher Latency Requirements	If microprocessor is awake: <= 51ms
		If microprocessor is asleep: <=121ms
	Publishing Network Sleep Inhibitor	If signal is not equal to OFF, then allow for network sleep but not for local sleep
	Updates Signal while asleep	Updates on change
	Network Wake Up	Wake up network on signal change to non-OFF value
	Max latency before signal is valid on Network wakeup	<= 50ms
	Max latency before signal is valid on reset	<= 120ms
	CAN Node Type	HS1
	Signal Domain	Refer to data dictionary
	Signal Transmit Strategy	Event Periodic
	Signal Send Type	OnChange
	Signal Transmit Cycle Time	500 ms
	End-to-End Latency Requirements	<=250 ms
	Publishing ECU	BCM
	Subscribing ECU	APIM, IPC, DDM, PDM, FCIMB, SCCM, RACM, TMS
	Subscribing Function	APIM: Interior Dimmable Backlighting Illumination Algorithm FCIMB: Interior Dimmable Backlighting Illumination Algorithm IPC: Interior Dimmable Backlighting Illumination Algorithm DDM: Interior Dimmable Backlighting Illumination Algorithm

		PDM: Interior Dimmable Backlighting Illumination Algorithm
		SCCM: Interior Dimmable Backlighting Illumination Algorithm
		RACM: Interior Dimmable Backlighting Illumination Algorithm
		TMS: Interior Dimmable Backlighting Illumination Algorithm

Requirement	Signal Database Detail	Value
	Signal Name	Delay_Accy
	Functional Voltage Range (Min,Max)	6-16v
	Performance Voltage Range (Min,Max)	9-16v
	Source Network	HS1 CAN
	Signal refresh rate	500 ms
	Publishing Interval (ms)	<= 40ms
	Publisher Latency Requirements	If microprocessor is awake: <= 51ms
		If microprocessor is asleep: <=121ms
	Publishing Network Sleep Inhibitor	If signal is not equal to OFF, then allow for network sleep but not for local sleep
	Updates Signal while asleep	Updates on change
	Network Wake Up	Wake up network on signal change to non-OFF value
	Max latency before signal is valid on Network wakeup	<= 50ms
	Max latency before signal is valid on reset	<= 120ms
	CAN Node Type	HS1
	Signal Domain	Refer to data dictionary
	Signal Transmit Strategy	Event Periodic
	Signal Send Type	OnChange
	Signal Transmit Cycle Time	500 ms
	End-to-End Latency Requirements	<=250 ms
	Publishing ECU	BCM
	Subscribing ECU	IPC
	Subscribing Function	IPC: Vehicle Display Cluster Welcome/Farewell

Requirement	Signal Database Detail	Value
	Signal Name	HMI_HMIMode_St
	Functional Voltage Range (Min,Max)	6-16v
	Performance Voltage Range (Min,Max)	9-16v
	Source Network	HS3 CAN
	Signal refresh rate	500 ms
	Publishing Interval (ms)	<= 40ms
	Publisher Latency Requirements	If microprocessor is awake: <= 51ms
		If microprocessor is asleep: <=121ms
	Publishing Network Sleep Inhibitor	If signal is not equal to OFF, then allow for network sleep but not for local sleep

Requirement	Signal Database Detail	Value
	Updates Signal while asleep	Updates on change
	Network Wake Up	Wake up network on signal change to non-OFF value
	Max latency before signal is valid on Network wakeup	<= 50ms
	Max latency before signal is valid on reset	<= 120ms
	CAN Node Type	HS3
	Signal Domain	Refer to data dictionary
	Signal Transmit Strategy	Event Periodic
	Signal Send Type	OnChange
	Signal Transmit Cycle Time	500 ms
	End-to-End Latency Requirements	<=250 ms
	Publishing ECU	APIM
	Subscribing ECU	FCIMB, RACM
	Subscribing Function	FCIMB: Interior Dimmable Backlighting Illumination Algorithm RACM: Interior Dimmable Backlighting Illumination Algorithm

Requirement	Signal Database Detail	Value
	Signal Name	Ignition_Status
	Functional Voltage Range (Min,Max)	6-16v
	Performance Voltage Range (Min,Max)	9-16v
	Source Network	HS1 CAN
	Signal refresh rate	1000ms
	Publishing Interval (ms)	<= 40ms
	Publisher Latency Requirements	If microprocessor is awake: <= 51ms
		If microprocessor is asleep: <=121ms
	Publishing Network Sleep Inhibitor	If signal is not equal to OFF, then allow for network sleep but not for local sleep
	Updates Signal while asleep	Updates on change
	Network Wake Up	Wake up network on signal change to non-OFF value
	Max latency before signal is valid on Network wakeup	<= 50ms
	Max latency before signal is valid on reset	<= 120ms
	CAN Node Type	HS1
	Signal Domain	Refer to data dictionary
	Signal Transmit Strategy	Event Periodic
	Signal Send Type	OnChange
	Signal Transmit Cycle Time	500 ms
	End-to-End Latency Requirements	<=250 ms
	Publishing ECU	BCM
	Subscribing ECU	APIM, IPC, AHUD, RACM
	Subscribing Function	APIM: Vehicle Display Center-stack Welcome/Farewell IPC: Vehicle Display Cluster Welcome/Farewell aHUD: Vehicle Display aHUD Welcome/Farewell RACM: Vehicle Display Center-stack Welcome/Farewell

Requirement	Signal Database Detail	Value
	Signal Name	DrStatDrv_B_Actl
	Functional Voltage Range (Min,Max)	6-16v
	Performance Voltage Range (Min,Max)	9-16v
	Source Network	HS1 CAN
	Signal refresh rate	1000ms
	Publishing Interval (ms)	<= 40ms
	Publisher Latency Requirements	If microprocessor is awake: <= 51ms
		If microprocessor is asleep: <=121ms
	Publishing Network Sleep Inhibitor	If signal is not equal to Closed, then allow for network sleep but not for local sleep
	Updates Signal while asleep	Updates on change
	Network Wake Up	Wake up network on signal change
	Max latency before signal is valid on Network wakeup	<= 50ms
	Max latency before signal is valid on reset	<= 120ms
	CAN Node Type	HS1
	Signal Domain	Refer to data dictionary
	Signal Transmit Strategy	Event Periodic
	Signal Send Type	OnChange
	Signal Transmit Cycle Time	500 ms
	End-to-End Latency Requirements	<=250 ms
	Publishing ECU	BCM
	Subscribing ECU	DDM, APIM, IPC, aHUD, RACM
	Subscribing Function	DDM: Exterior Supplementary Illumination Algorithm APIM: Vehicle Display Center-stack Welcome/Farewell IPC: Vehicle Display Cluster Welcome/Farewell aHUD: Vehicle Display aHUD Welcome/Farewell RACM: Vehicle Display Center-stack Welcome/Farewell

Requirement	Signal Database Detail	Value
	Signal Name	DrStatPsngr_B_Actl
	Functional Voltage Range (Min,Max)	6-16v
	Performance Voltage Range (Min,Max)	9-16v
	Source Network	HS1 CAN
	Signal refresh rate	1000ms
	Publishing Interval (ms)	<= 40ms
	Publisher Latency Requirements	If microprocessor is awake: <= 51ms
		If microprocessor is asleep: <=121ms
	Publishing Network Sleep Inhibitor	If signal is not equal to Closed, then allow for network sleep but not for local sleep
	Updates Signal while asleep	Updates on change
	Network Wake Up	Wake up network on signal change
	Max latency before signal is valid on Network wakeup	<= 50ms
	Max latency before signal is valid on reset	<= 120ms

Requirement	Signal Database Detail	Value
	CAN Node Type	HS1
	Signal Domain	Refer to data dictionary
	Signal Transmit Strategy	Event Periodic
	Signal Send Type	OnChange
	Signal Transmit Cycle Time	500 ms
	End-to-End Latency Requirements	<=250 ms
	Publishing ECU	BCM
	Subscribing ECU	PDM, APIM, IPC, AHUD, RACM
	Subscribing Function	PDM: Exterior Supplementary Illumination Algorithm APIM: Vehicle Display Center-stack Welcome/Farewell IPC: Vehicle Display Cluster Welcome/Farewell aHUD: Vehicle Display aHUD Welcome/Farewell RACM: Vehicle Display Center-stack Welcome/Farewell

Requirement	Signal Database Detail	Value
	Signal Name	DrStatRl_B_Actl
	Functional Voltage Range (Min,Max)	6-16v
	Performance Voltage Range (Min,Max)	9-16v
	Source Network	HS1 CAN
	Signal refresh rate	500 ms
	Publishing Interval (ms)	<= 40ms
	Publisher Latency Requirements	If microprocessor is awake: <= 51ms
		If microprocessor is asleep: <=121ms
	Publishing Network Sleep Inhibitor	If signal is not equal to Closed, then allow for network sleep but not for local sleep
	Updates Signal while asleep	Updates on change
	Network Wake Up	Wake up network on signal change
	Max latency before signal is valid on Network wakeup	<= 50ms
	Max latency before signal is valid on reset	<= 120ms
	CAN Node Type	HS1
	Signal Domain	Refer to data dictionary
	Signal Transmit Strategy	Event Periodic
	Signal Send Type	OnChange
	Signal Transmit Cycle Time	500 ms
	End-to-End Latency Requirements	<=250 ms
	Publishing ECU	BCM
	Subscribing ECU	IPC, AHUD
	Subscribing Function	IPC: Vehicle Display Cluster Welcome/Farewell aHUD: Vehicle Display aHUD Welcome/Farewell

Requirement	Signal Database Detail	Value
	Signal Name	DrStatRr_B_Actl
	Functional Voltage Range (Min,Max)	6-16v
	Performance Voltage Range (Min,Max)	9-16v
	Source Network	HS1 CAN

Requirement	Signal Database Detail	Value
	Signal refresh rate	500 ms
	Publishing Interval (ms)	<= 40ms
	Publisher Latency Requirements	If microprocessor is awake: <= 51ms
		If microprocessor is asleep: <=121ms
	Publishing Network Sleep Inhibitor	If signal is not equal to Closed, then allow for network sleep but not for local sleep
	Updates Signal while asleep	Updates on change
	Network Wake Up	Wake up network on signal change
	Max latency before signal is valid on Network wakeup	<= 50ms
	Max latency before signal is valid on reset	<= 120ms
	CAN Node Type	HS1
	Signal Domain	Refer to data dictionary
	Signal Transmit Strategy	Event Periodic
	Signal Send Type	OnChange
	Signal Transmit Cycle Time	500 ms
	End-to-End Latency Requirements	<=250 ms
	Publishing ECU	BCM
	Subscribing ECU	IPC, AHUD
	Subscribing Function	IPC: Vehicle Display Cluster Welcome/Farewell aHUD: Vehicle Display aHUD Welcome/Farewell

Requirement	Signal Database Detail	Value
	Signal Name	PudLamp_D_Rq
	Functional Voltage Range (Min,Max)	6-16v
	Performance Voltage Range (Min,Max)	9-16v
	Source Network	HS1 CAN
	Signal refresh rate	500 ms
	Publishing Interval (ms)	<= 40ms
	Publisher Latency Requirements	If microprocessor is awake: <= 51ms
		If microprocessor is asleep: <=121ms
	Publishing Network Sleep Inhibitor	If signal is not equal to OFF, then allow for network sleep but not for local sleep
	Updates Signal while asleep	Updates on change
	Network Wake Up	Wake up network on signal change to non-OFF value
	Max latency before signal is valid on Network wakeup	<= 50ms
	Max latency before signal is valid on reset	<= 120ms
	CAN Node Type	HS1
	Signal Domain	Refer to data dictionary
	Signal Transmit Strategy	Event Periodic
	Signal Send Type	OnChange
	Signal Transmit Cycle Time	500 ms
	End-to-End Latency Requirements	<=250 ms
	Publishing ECU	BCM
	Subscribing ECU	DDM, PDM, AHUD

Requirement	Signal Database Detail	Value
	Subscribing Function	DDM: Exterior Supplementary Illumination Algorithm PDM: Exterior Supplementary Illumination Algorithm aHUD: Vehicle Display aHUD Welcome/Farewell

Requirement	Signal Database Detail	Value
	Signal Name	PudLampDrv_D_Rq
	Functional Voltage Range (Min,Max)	6-16v
	Performance Voltage Range (Min,Max)	9-16v
	Source Network	HS1 CAN
	Signal refresh rate	500 ms
	Publishing Interval (ms)	<= 40ms
	Publisher Latency Requirements	If microprocessor is awake: <= 51ms
		If microprocessor is asleep: <=121ms
	Publishing Network Sleep Inhibitor	If signal is not equal to OFF, then allow for network sleep but not for local sleep
	Updates Signal while asleep	Updates on change
	Network Wake Up	Wake up network on signal change to non-OFF value
	Max latency before signal is valid on Network wakeup	<= 50ms
	Max latency before signal is valid on reset	<= 120ms
	CAN Node Type	HS1
	Signal Domain	Refer to data dictionary
	Signal Transmit Strategy	Event Periodic
	Signal Send Type	OnChange
	Signal Transmit Cycle Time	500 ms
	End-to-End Latency Requirements	<=250ms
	Publishing ECU	BCM
	Subscribing ECU	DDM
	Subscribing Function	DDM: Exterior Supplementary Illumination Algorithm

Requirement	Signal Database Detail	Value
	Signal Name	PudLampPsngr_D_Rq
	Functional Voltage Range (Min,Max)	6-16v
	Performance Voltage Range (Min,Max)	9-16v
	Source Network	HS1 CAN
	Signal refresh rate	500 ms
	Publishing Interval (ms)	<= 40ms
	Publisher Latency Requirements	If microprocessor is awake: <= 51ms
		If microprocessor is asleep: <=121ms
	Publishing Network Sleep Inhibitor	If signal is not equal to OFF, then allow for network sleep but not for local sleep
	Updates Signal while asleep	Updates on change
	Network Wake Up	Wake up network on signal change to non-OFF value

	Max latency before signal is valid on Network wakeup	<= 50ms
	Max latency before signal is valid on reset	<= 120ms
	CAN Node Type	HS1
	Signal Domain	Refer to data dictionary
	Signal Transmit Strategy	Event Periodic
	Signal Send Type	OnChange
	Signal Transmit Cycle Time	500 ms
	End-to-End Latency Requirements	<= 250 ms
	Publishing ECU	BCM
	Subscribing ECU	PDM
	Subscribing Function	PDM: Exterior Supplementary Illumination Algorithm

6.1.2.3.2   CAN Error Handling for Signal Gateway Messages

Requirements for signals that go missing either due to SNA or NC for a period of time, as per document name: "Diagnostic Fault Coverage and DTC Numbers Design Consideration", section 3.5 "Detection of faults caused by signal content and data values received from other ECUs"

R: 6.1.2-19	If a Signal gateway message containing the transmitted signal has an update bit which shows "not updated" for less than a period of time as per "Diagnostic Fault Coverage and DTC Numbers Design Consideration" (typically 5 seconds). Then the subscriber shall continue using last known value of the signal
R: 6.1.2-20	If a Signal gateway message containing the transmitted signal has an update bit which shows "not updated" for greater than a period of time as per "Diagnostic Fault Coverage and DTC Numbers Design Consideration" (typically 5 seconds). Then the subscriber shall use the signal's default value as listed in the data dictionary

6.1.2.3.3   CAN Error Handling for Frame Gateway Messages
Requirements for Frame Message that go missing due to SNA or NC for a period of time as per document name: "Diagnostic Fault Coverage and DTC Numbers Design Consideration", section 3.5 "Detection of faults caused by signal content and data values received from other ECUs"

R: 6.1.2-21	If a Frame gateway message goes missing for less than a period of time as per "Diagnostic Fault Coverage and DTC Numbers Design Consideration" (typically 5 seconds). Then the subscriber shall continue using last known value of the signal received in the last Frame message.
R: 6.1.2-22	If a Frame gateway message goes missing for greater than a period of time as per "Diagnostic Fault Coverage and DTC Numbers Design Consideration" (typically 5 seconds). Then the subscriber shall use the signal's default value as listed in the data dictionary

6.1.2.3.4   LIN Signal Requirements

It should be noted that the following section does not cover the level of details included under the previous "CAN Signal Requirements", since that level of details is owned and controlled by the LIN module owner, and contained within the LDFs.

The intention of this section is to list the required LIN signals to ensure that they are not discarded due to any future LDF updates.

Requirement	Signal Database Detail	Value

	Signal Database Detail	Value
	Signal Name	Dimming_lvl
	Source Network	LIN
	Signal refresh rate	<=40ms
	Signal Domain	Refer to Data Dictionary
	Signal Transmit Strategy	<=40ms Event Periodic
	Signal Send Type	OnChange
	Signal Transmit Cycle Time	<=40ms Event Periodic
	Publishing ECU	BCM
	Subscribing ECU	HLS
	Subscribing Function	HLS: Interior Day-time Dimmable Backlighting Illumination Algorithm

Requirement	Signal Database Detail	Value
	Signal Name	Litval
	Source Network	LIN
	Signal refresh rate	<=40ms
	Signal Domain	Refer to Data Dictionary
	Signal Transmit Strategy	<=40ms Event Periodic
	Signal Send Type	OnChange
	Signal Transmit Cycle Time	<=40ms Event Periodic
	Publishing ECU	BCM
	Subscribing ECU	HLS
	Subscribing Function	HLS: Interior Day-time Dimmable Backlighting Illumination Algorithm

Requirement	Signal Database Detail	Value
	Signal Name	Ignition_Status
	Source Network	LIN
	Signal refresh rate	<=40ms
	Signal Domain	Refer to Data Dictionary
	Signal Transmit Strategy	<=40ms Event Periodic
	Signal Send Type	OnChange
	Signal Transmit Cycle Time	<=40ms Event Periodic
	Publishing ECU	BCM
	Subscribing ECU	LDM, R-FCM, ALM, OHC
	Subscribing Function	LDM: Exterior Front Illumination Algorithm; R-FCM: Exterior Rear Illumination Algorithm; ALM: Interior Ambient Light Illumination (with Static Sequential) Algorithm ALM: Interior Ambient Light Illumination (without Static Sequential) Algorithm OHC: Interior Courtesy Lamps Illumination Algorithm

Requirement	Signal Database Detail	Value
	Signal Name	Wfsuperstate
	Source Network	LIN
	Signal refresh rate	<=40ms

Requirement	Signal Database Detail	Value
	Signal Domain	Refer to Data Dictionary
	Signal Transmit Strategy	<=40ms Event Periodic
	Signal Send Type	OnChange
	Signal Transmit Cycle Time	<=40ms Event Periodic
	Publishing ECU	BCM
	Subscribing ECU	LDM, R-FCM
	Subscribing Function	LDM: Exterior Front Illumination Algorithm; R-FCM: Exterior Rear Illumination Algorithm;

Requirement	Signal Database Detail	Value
	Signal Name	Wfsubstate
	Source Network	LIN
	Signal refresh rate	<=40ms
	Signal Domain	Refer to Data Dictionary
	Signal Transmit Strategy	<=40ms Event Periodic
	Signal Send Type	OnChange
	Signal Transmit Cycle Time	<=40ms Event Periodic
	Publishing ECU	BCM
	Subscribing ECU	LDM, R-FCM
	Subscribing Function	LDM: Exterior Front Illumination Algorithm; R-FCM: Exterior Rear Illumination Algorithm;

Requirement	Signal Database Detail	Value
	Signal Name	WelcomeFarewell_State
	Source Network	LIN
	Signal refresh rate	<=40ms
	Signal Domain	Refer to Data Dictionary
	Signal Transmit Strategy	<=40ms Event Periodic
	Signal Send Type	OnChange
	Signal Transmit Cycle Time	<=40ms Event Periodic
	Publishing ECU	BCM
	Subscribing ECU	ALM, OHC
	Subscribing Function	ALM: Interior Ambient Light Illumination (with Static Sequential) Algorithm ALM: Interior Ambient Light Illumination (without Static Sequential) Algorithm OHC: Interior Courtesy Lamps Illumination Algorithm

Requirement	Signal Database Detail	Value
	Signal Name	WelcomeFarewell_Substate
	Source Network	LIN
	Signal refresh rate	<=40ms
	Signal Domain	Refer to Data Dictionary
	Signal Transmit Strategy	<=40ms Event Periodic
	Signal Send Type	OnChange
	Signal Transmit Cycle Time	<=40ms Event Periodic
	Publishing ECU	BCM

Subscribing ECU	ALM, OHC
Subscribing Function	ALM: Interior Ambient Light Illumination (with Static Sequential) Algorithm ALM: Interior Ambient Light Illumination (without Static Sequential) Algorithm OHC: Interior Courtesy Lamps Illumination Algorithm

Requirement	Signal Database Detail	Value
	Signal Name	Customer_Color
	Source Network	LIN
	Signal refresh rate	<=40ms
	Signal Domain	Refer to Data Dictionary
	Signal Transmit Strategy	<=40ms Event Periodic
	Signal Send Type	OnChange
	Signal Transmit Cycle Time	<=40ms Event Periodic
	Publishing ECU	BCM
	Subscribing ECU	ALM
	Subscribing Function	ALM: Interior Ambient Light Illumination (with Static Sequential) Algorithm ALM: Interior Ambient Light Illumination (without Static Sequential) Algorithm

Requirement	Signal Database Detail	Value
	Signal Name	Customer_Intensity
	Source Network	LIN
	Signal refresh rate	<=40ms
	Signal Domain	Refer to Data Dictionary
	Signal Transmit Strategy	<=40ms Event Periodic
	Signal Send Type	OnChange
	Signal Transmit Cycle Time	<=40ms Event Periodic
	Publishing ECU	BCM
	Subscribing ECU	ALM
	Subscribing Function	ALM: Interior Ambient Light Illumination (with Static Sequential) Algorithm ALM: Interior Ambient Light Illumination (without Static Sequential) Algorithm

6.1.2.3.5 Linking Logical Data Flows to CAN/LIN Signals

Rqmt #	Logical Data Flow	Logical Data Flow Domain Name	Signal Name	Signal Domain Value
R: 6.1.2.3.4-	Ignition Status	Vehicle Ignition is OFF	Ignition_Status	OFF
		Vehicle Ignition is Accessory		Accessory
		Vehicle Ignition is Run		RUN
		Vehicle Ignition is Start		Start
		Not supported		Unknown

		Not supported		Invalid
R: 6.1.2.3.4-	Driver Door Status	Driver Door Ajar	DrStatDrv_B_Actl	Ajar
		Driver Door Closed		Closed
R: 6.1.2.3.4-	Passenger Door Status	Passenger Door Ajar	DrStatPsngr_B_Actl	Ajar
		Passenger Door Closed		Closed
R: 6.1.2.3.4-	Rear Left Door Status	Rear Left Door Ajar	DrStatRl_B_Actl	Ajar
		Rear Left Door Closed		Closed
R: 6.1.2.3.4-	Rear Right Door Status	Rear Right Door Ajar	DrStatRr_B_Actl	Ajar
		Rear Right Door Closed		Closed
R: 6.1.2.3.4-	Battery Saver Timer	Battery Saver Timer Active	Courtesy_Bsave_Stat	No_Effect
		Battery Saver Timer Expired		Off
		Not supported		Unknown
		Not supported		Invalid
R: 6.1.2.3.4-	Delayed Accessory	Delayed Accessory True	Delay_Accy	ON
		Delayed Accessory False		OFF
R: 6.1.2.3.4-	Extended Play	Extended Play True	HMI_HMIMode_St	On
		Extended Play False		OffMode
		Not supported		Phone
		Not supported		Climate
		Not supported		Load_Shed_Active
		Not supported		Invalid

6.1.3 **Lincoln Vehicle ECU specific requirements**

6.1.3.1 **Body Control Module (BCM)**

The Body Control Module (BCM) shall be responsible for doing the Welcome Farewell State determination (both with and without battery saver) and then either transmitting the state information (via CAN or LIN) or transmitting a control signal to a specific lighting element that is directly connected to it.

6.1.3.1.1 Over-arching requirements

R: 6.1.3.1.1-1	The BCM shall contain its Performance Latency within the End-to-End latency specified in section 3.2.2.1 "Performance Latency Requirements"
R: 6.1.3.1.1-2	The BCM shall take into account the requirements contained within section 3.2.3 "Safety Requirements" to ensure that no lighting element that it directly controls (via control signal) ends up violating any requirement (specific to the market the target vehicle shall be sold in) within the aforementioned section.
R: 6.1.3.1.1-3	The BCM shall take into account the requirements contained within section 3.2.4 "Security Requirements" to ensure that no lighting element that it directly controls (via control signal) ends up violating any requirement within the aforementioned section.
R: 6.1.3.1.1-1	The BCM shall meet the publisher requirements for all the signals it has been identified as a publisher to within section 6.1.2.3 "Signal Requirements"
R: 6.1.3.1.1-1	The BCM shall meet the subscriber requirements for all the signals it has been identified as a subscriber to within section 6.1.2.3 "Signal Requirements"

6.1.3.1.2 Support Welcome Farewell State Determination functions

R: 6.1.3.1.2-1	The BCM shall meet the "Welcome/Farewell State Determination" requirements under section 5.2 – shall be capable of supporting both "Welcome/Farewell State Determination without Battery Saver tie-in" and "Welcome/Farewell State Determination with Battery Saver tie-in" functions / state transitions

6.1.3.1.3 Support Exterior Front Illumination

6.1.3.1.3.1 Rely on BCM for Control Signal

R: 6.1.3.1.3-1	The BCM shall transmit a control signal to Exterior Front Illumination elements directly connected to it that meet the requirements under section 5.3.1 "Exterior Front Illumination Algorithm" (including the associated "State Determination Algorithm)
R: 6.1.3.1.3-1	The BCM shall transmit a control signal to Exterior Front Illumination elements directly connected to it that will support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-022094 LINCOLN EMBRACE WELCOME AND FAREWELL BEHAVIOR REV. 1" for Lincoln vehicles
R: 6.1.3.1.3-1	The BCM shall transmit a control signal to Exterior Front Illumination elements directly connected to it that will satisfy the control signal specific requirements listed under Appendix 1 "Exterior Lighting PWM Signal Specification"

6.1.3.1.3.2 Modules that subscribe to BCM via LIN

R: 6.1.3.1.3-1	The BCM shall use the outputs/state determination from section 5.2.2 "Welcome/Farewell State Determination without Battery Saver tie-in" function to then transmit WFsuperstate and WFsubstate as listed in the table below in order to support Exterior Front Illumination

Rqmt #	Logical Data Flow	Logical Data Flow Domain Name	Wfsuperstate	Wfsubstate
R: 6.1.2.3.5-	Approach Detection	Approach Detected	Welcome	Approach
		Approach Not Detected	Don't care	NULL**
R: 6.1.2.3.5-	Illuminated Entry	Illuminated Entry True	Welcome	IllumEntry
		Illuminated Entry False	Don't care	NULL**
R: 6.1.2.3.5-	Courtesy Lighting	Courtesy Lighting True	Don't care	DoorAjarCourtesyLight
		Courtesy Lighting False	Don't care	NULL**
R: 6.1.2.3.5-	Courtesy Lighting Delay	Courtesy Lighting Delay True	Don't care	CourtesyLightDelay
		Courtesy Lighting Delay False	Don't care	NULL**
R: 6.1.2.3.5-	Illuminated Exit	Illuminated Exit True	Farewell	IllExit
		Illuminated Exit False	Don't care	NULL**
R: 6.1.2.3.5-	Ignition State	Vehicle Ignition is OFF	NOT (RunStart)	Don't Care
		Vehicle Ignition is in Accessory	NOT (RunStart)	Don't Care
		Vehicle Ignition is in Run/Start	RunStart	NULL**
R: 6.1.2.3.5-	Vehicle Locking	Vehicle Locking True	OFF	NULL

		Vehicle Locking False	Don't care	NULL**

6.1.3.1.4 Support Exterior Rear Illumination

6.1.3.1.4.1 Rely on BCM for Control Signal

R: 6.1.3.1.3-2	The BCM shall transmit a control signal to Exterior Rear Illumination elements directly connected to it that meet the requirements under section 5.3.3 "Exterior Rear Illumination Algorithm" (including the associated "State Determination Algorithm)
R: 6.1.3.1.3-2	The BCM shall transmit a control signal to Exterior Rear Illumination elements directly connected to it that will support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-022094 LINCOLN EMBRACE WELCOME AND FAREWELL BEHAVIOR REV. 1" for Lincoln vehicles
R: 6.1.3.1.3-2	The BCM shall transmit a control signal to Exterior Rear Illumination elements directly connected to it that will satisfy the control signal specific requirements listed under Appendix 1 "Exterior Lighting PWM Signal Specification"

6.1.3.1.4.2 Modules that subscribe to BCM via LIN

R: 6.1.3.1.3-2	The BCM shall use the outputs/state determination from section 5.2.2 "Welcome/Farewell State Determination without Battery Saver tie-in" function to then transmit WFsuperstate and WFsubstate as listed in the table below in order to support Exterior Rear Illumination

Rqmt #	Logical Data Flow	Logical Data Flow Domain Name	Wfsuperstate	Wfsubstate
R: 6.1.2.3.5-	Approach Detection	Approach Detected	Welcome	Approach
		Approach Not Detected	Don't care	NULL**
R: 6.1.2.3.5-	Illuminated Entry	Illuminated Entry True	Welcome	IllumEntry
		Illuminated Entry False	Don't care	NULL**
R: 6.1.2.3.5-1	Courtesy Lighting	Courtesy Lighting True	Don't care	DoorAjarCourtesyLight
		Courtesy Lighting False	Don't care	NULL**
R: 6.1.2.3.5-1	Courtesy Lighting Delay	Courtesy Lighting Delay True	Don't care	CourtesyLightDelay
		Courtesy Lighting Delay False	Don't care	NULL**
R: 6.1.2.3.5-1	Illuminated Exit	Illuminated Exit True	Farewell	IllExit
		Illuminated Exit False	Don't care	NULL**
	Ignition State	Vehicle Ignition is OFF	NOT (RunStart)	Don't Care
		Vehicle Ignition is in Accessory	NOT (RunStart)	Don't Care
R: 6.1.2.3.5-1		Vehicle Ignition is in Run/Start	RunStart	NULL**
	Vehicle Locking	Vehicle Locking True	OFF	NULL
R: 6.1.2.3.5-1		Vehicle Locking False	Don't care	NULL**

6.1.3.1.5 Support Exterior Supplementary Illumination

6.1.3.1.5.1 Rely on BCM for Control Signal

R: 6.1.3.1.3-3	The BCM shall transmit a control signal to Exterior Supplementary Illumination elements directly connected to it that meet the requirements under section 5.3.5 "Exterior Supplementary Illumination Algorithm" (including the associated "State Determination Algorithm)
R: 6.1.3.1.3-3	The BCM shall transmit a control signal to Exterior Supplementary Illumination elements directly connected to it that will support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-022094 LINCOLN EMBRACE WELCOME AND FAREWELL BEHAVIOR REV. 1" for Lincoln vehicles
R: 6.1.3.1.3-3	The BCM shall transmit a control signal to Exterior Supplementary Illumination elements directly connected to it that will satisfy the control signal specific requirements listed under Appendix 1 "Exterior Lighting PWM Signal Specification"

6.1.3.1.5.1 Modules that subscribe to CAN signals originating from BCM (can be via Gateway)

R: 6.1.3.1.3-1	The BCM shall use the outputs/state determination from section 5.2.3 "Welcome/Farewell State Determination with Battery Saver tie-in" function to then transmit PudLamp_D_Rq, PudLampDrv_D_Rq and PudLampPsngr_D_Rq as listed in the table below in order to support Exterior Supplementary Illumination

Rqmt #	Approach Detected	Illuminated Entry	Courtesy Lighting	Courtesy Lighting Delay	PudLamp_D_Rq	PudLamp Drv_D_Rq	PudLamp Psngr_D_Rq
6.2.2.3.6-1	Approach Detected	(Don't Care)	(Don't Care)	(Don't Care)	Ramp_Up	Ramp_Up	Ramp_Up
6.2.2.3.6-2	Approach Not Detected	Illuminated Entry True (Keyfob/PK unlock)	(Don't Care)	(Don't Care)	Ramp_Up	Ramp_Up	Ramp_Up
6.2.2.3.6-3	Approach Not Detected	Illuminated Entry True (Keypad unlock)	(Don't Care)	(Don't Care)	Ramp_Up	OFF	OFF
6.2.2.3.6-4	Approach Not Detected	Illuminated Entry True (Cylinder unlock)	(Don't Care)	(Don't Care)	Ramp_Up	OFF	OFF
6.2.2.3.6-1	Approach Not Detected	Illuminated Entry False	Courtesy Lighting True AND (Both Driver AND Passenger Door Closed)	(Don't Care)	Ramp_Up	Ramp_Up	Ramp_Up
6.2.2.3.6-2	Approach Not Detected	Illuminated Entry False	Courtesy Lighting True AND Driver Door Closed	(Don't Care)	Ramp_Up	Ramp_Up	OFF
6.2.2.3.6-3	Approach Not Detected	Illuminated Entry False	Courtesy Lighting True AND Passenger Door Closed	(Don't Care)	Ramp_Up	OFF	Ramp_Up
6.2.2.3.6-4	Approach Not Detected	Illuminated Entry False	Courtesy Lighting False	Courtesy Lighting Delay True	Ramp_Up	OFF	OFF

6.2.2.3.6-5	Approach Not Detected	Illuminated Entry False	Courtesy Lighting False	Courtesy Lighting Delay False	Ramp_Down	OFF	OFF

Note: "Ramp_Up" outputs for "PudLampDrv_D_Rq" and "PudLampDrv_D_Rq " during "Courtesy Lighting True AND Driver Door Closed", and "Courtesy Lighting True AND Passenger Door Closed" conditions only apply when Courtesy Lighting State first occurs during "Welcome". Doors transitioning from Closed to Ajar to Closed should not re-enable "Ramp_Up" output, and stay at OFF while Courtesy Lighting remains active.

6.1.3.1.6   Support Interior Courtesy Lamps Illumination

6.1.3.1.6.1   Rely on BCM for Control Signal

R: 6.1.3.1.3-4	The BCM shall transmit a control signal to Interior Courtesy Lamps Illumination elements directly connected to it that meet the requirements under section 5.4.1 "Courtesy Lamps Illumination Algorithm" (including the associated "State Determination Algorithm)
R: 6.1.3.1.3-4	The BCM shall transmit a control signal to Courtesy Lamps Illumination elements directly connected to it that will support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-022094 LINCOLN EMBRACE WELCOME AND FAREWELL BEHAVIOR REV. 1" for Lincoln vehicles
R: 6.1.3.1.3-4	The BCM shall transmit a control signal to Courtesy Lamps Illumination elements directly connected to it that will satisfy the control signal specific requirements listed under Appendix 2 "Interior Lighting PWM Signal Specification"

6.1.3.1.6.2   Modules that subscribe to BCM via LIN

R: 6.1.3.1.3-3	The BCM shall use the outputs/state determination from section 5.2.3 "Welcome/Farewell State Determination with Battery Saver tie-in" function to then transmit WelcomeFarewell_State and WelcomeFarewell_Substate as listed in the table below in order to support Courtesy Lamps Illumination

Rqmt #	Logical Data Flow	Logical Data Flow Domain Name	WelcomeFarewell _State	WelcomeFarewell _Substate
	Approach Detection	Approach Detected	WELCOME	APPROACH
R: 6.1.2.3.5-1		Approach Not Detected	Don't care	NULL**
	Illuminated Entry	Illuminated Entry True	WELCOME	ENTRY
R: 6.1.2.3.5-1		Illuminated Entry False	Don't care	NULL**
	Courtesy Lighting	Courtesy Lighting True	Don't care	DOOR
R: 6.1.2.3.5-1		Courtesy Lighting False	Don't care	NULL**
	Courtesy Lighting Delay	Courtesy Lighting Delay True	Don't care	DELAY
R: 6.1.2.3.5-1		Courtesy Lighting Delay False	Don't care	NULL**
	Illuminated Exit	Illuminated Exit True	FAREWELL	EXIT
R: 6.1.2.3.5-1		Illuminated Exit False	Don't care	NULL**
	Ignition State	Vehicle Ignition is OFF	NOT (RUN_START)	Don't Care
R: 6.1.2.3.5-2		Vehicle Ignition is in Accessory	NOT (RUN_START)	Don't Care

Rqmt #	Logical Data Flow	Logical Data Flow Domain Name	WelcomeFarewell _State	WelcomeFarewell _Substate
		Vehicle Ignition is in Run/Start	RUN_START	NULL**
	Vehicle Locking	Vehicle Locking True	NULL	NULL
R: 6.1.2.3.5-2		Vehicle Locking False	Don't care	NULL**

6.1.3.1.7 Support Interior Ambient Lighting (with Static Sequential) Illumination

6.1.3.1.7.1 Modules that subscribe to BCM via LIN

R: 6.1.3.1.3-4	The BCM shall use the outputs/state determination from section 5.2.3 "Welcome/Farewell State Determination with Battery Saver tie-in" function to then transmit WelcomeFarewell_State and WelcomeFarewell_Substate as listed in the table below in order to support Interior Ambient Lighting (with Static Sequential) Illumination

Rqmt #	Logical Data Flow	Logical Data Flow Domain Name	WelcomeFarewell _State	WelcomeFarewell _Substate
	Approach Detection	Approach Detected	WELCOME	APPROACH
R: 6.1.2.3.5-2		Approach Not Detected	Don't care	NULL**
	Illuminated Entry	Illuminated Entry True	WELCOME	ENTRY
R: 6.1.2.3.5-2		Illuminated Entry False	Don't care	NULL**
	Courtesy Lighting	Courtesy Lighting True	Don't care	DOOR
R: 6.1.2.3.5-2		Courtesy Lighting False	Don't care	NULL**
	Courtesy Lighting Delay	Courtesy Lighting Delay True	Don't care	DELAY
R: 6.1.2.3.5-2		Courtesy Lighting Delay False	Don't care	NULL**
	Illuminated Exit	Illuminated Exit True	FAREWELL	EXIT
R: 6.1.2.3.5-2		Illuminated Exit False	Don't care	NULL**
	Ignition State	Vehicle Ignition is OFF	NOT (RUN_START)	Don't Care
		Vehicle Ignition is in Accessory	NOT (RUN_START)	Don't Care
R: 6.1.2.3.5-2		Vehicle Ignition is in Run/Start	RUN_START	NULL**
	Vehicle Locking	Vehicle Locking True	NULL	NULL
R: 6.1.2.3.5-2		Vehicle Locking False	Don't care	NULL**

R: 6.1.3.1.3-1	The BCM shall use the outputs/state determination from section 5.2.3 "Welcome/Farewell State Determination with Battery Saver tie-in" function to then transmit Customer_Color and Customer_Intensity to support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-022094 LINCOLN EMBRACE WELCOME AND FAREWELL BEHAVIOR REV. 1" for Lincoln vehicles

6.1.3.1.8 Support Interior Day-time Dimmable Backlighting Illumination

6.1.3.1.8.1 Rely on BCM for Control Signal

R: 6.1.3.1.3-5	The BCM shall transmit a control signal to Interior Day-time Dimmable Backlighting Illumination elements directly connected to it that meet the requirements under section 5.4.7.1 "Interior Day-time Dimmable Backlighting Illumination Algorithm" (including the associated "State Determination Algorithm)
R: 6.1.3.1.3-5	The BCM shall transmit a control signal to Interior Day-time Dimmable Backlighting elements directly connected to it that will support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-022094 LINCOLN EMBRACE WELCOME AND FAREWELL BEHAVIOR REV. 1" for Lincoln vehicles
R: 6.1.3.1.3-5	The BCM shall transmit a control signal to Interior Day-time Dimmable Backlighting elements directly connected to it that will satisfy the control signal specific requirements listed under Appendix 2 "Interior Lighting PWM Signal Specification"
R: 5.4.7.1.6-5	The BCM shall transmit a control signal to Interior Day-time Dimmable Backlighting elements directly connected to it that will support the desired Smooth Dimming behavior as detailed in the latest version of the following specification: "ES-H1BT-1A278-AA-VXX"

6.1.3.1.8.2 Modules that subscribe to CAN signals originating from BCM (can be via Gateway)

R: 6.1.3.1.3-2	The BCM shall use the outputs/state determination from section 5.2.2 "Welcome/Farewell State Determination without Battery Saver tie-in" function to then transmit Dimming_lvl and Litval as listed in the table below in order to support Interior Day-time Dimmable Backlighting

Rqmt #	Exterior Ambient Level	Ignition Status	Courtesy Lighting	Courtesy Lighting Delay	Illuminated Exit	Dimming_lvl
6.2.2.3.6-5	"Day"	Run/Start	(Don't Care)	(Don't Care)	(Don't Care)	User selected Day_1 to Day_6 level
6.2.2.3.6-1	"Night"	Run/Start	(Don't Care)	(Don't Care)	(Don't Care)	User selected Night_1 to Night_12 level
6.2.2.3.6-2	"Day"	OFF/Accy	Courtesy Lighting True	(Don't Care)	(Don't Care)	User selected Day_1 to Day_6 level
6.2.2.3.6-3	"Night"	OFF/Accy	Courtesy Lighting True	(Don't Care)	(Don't Care)	User selected Night_1 to Night_12 level
6.2.2.3.6-6	"Day"	OFF/Accy	Courtesy Lighting False	Courtesy Lighting Delay True	(Don't Care)	User selected Day_1 to Day_6 level
6.2.2.3.6-1	"Night"	OFF/Accy	Courtesy Lighting False	Courtesy Lighting Delay True	(Don't Care)	User selected Night_1 to Night_12 level
6.2.2.3.6-1	"Day"	OFF/Accy	Courtesy Lighting False	Courtesy Lighting Delay False	Illuminated Exit True	User selected Day_1 to Day_6 level
6.2.2.3.6-2	"Night"	OFF/Accy	Courtesy Lighting False	Courtesy Lighting Delay False	Illuminated Exit True	User selected Night_1 to Night_12 level
6.2.2.3.6-3	Don't Care	OFF/Accy	Courtesy Lighting False	Courtesy Lighting	Illuminated Exit False	OFF

				Delay False		

Note: Current Ambient Light Sensing strategy that relies on the ALS sensor listed under the following table and should be used as reference only. Ambient light sensing strategy subject to change depending on vehicle architecture and strategy owned by BCM team.

Logical Data Flow	Logical Data Flow Domain Name	Signal Name	Signal Domain Value
Exterior Ambient Level	"Day"	Litval	Day
	"Night"		Twilight_1
	"Night"		Twilight_2
	"Night"		Twilight_3
	"Night"		Twilight_4
	"Night"		Night
	not supported		Unknown
	not supported		Invalid

6.1.3.1.9   Support Interior Night-time Dimmable Backlighting Illumination

6.1.3.1.9.1   Rely on BCM for Control Signal

R: 6.1.3.1.3-6	The BCM shall transmit a control signal to Interior Night-time Dimmable Backlighting Illumination elements directly connected to it that meet the requirements under section 5.4.7.3 "Interior Night-time Dimmable Backlighting Illumination Algorithm" (including the associated "State Determination Algorithm)
R: 6.1.3.1.3-6	The BCM shall transmit a control signal to Interior Night-time Dimmable Backlighting elements directly connected to it that will support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-022094 LINCOLN EMBRACE WELCOME AND FAREWELL BEHAVIOR REV. 1" for Lincoln vehicles
R: 6.1.3.1.3-6	The BCM shall transmit a control signal to Interior Night-time Dimmable Backlighting elements directly connected to it that will satisfy the control signal specific requirements listed under Appendix 2 "Interior Lighting PWM Signal Specification"
R: 5.4.7.1.6-6	The BCM shall transmit a control signal to Interior Night-time Dimmable Backlighting elements directly connected to it that will support the desired Smooth Dimming behavior as detailed in the latest version of the following specification: "ES-H1BT-1A278-AA-VXX"

6.1.3.1.9.2   Modules that subscribe to CAN signals originating from BCM (can be via Gateway)

R: 6.1.3.1.3-3	The BCM shall use the outputs/state determination from section 5.2.2 "Welcome/Farewell State Determination without Battery Saver tie-in" function to then transmit Dimming_lvl and Litval as listed in the table below in order to support Interior Night-time Dimmable Backlighting

Rqmt #	Exterior Ambient Level	Ignition Status	Courtesy Lighting	Courtesy Lighting Delay	Illuminated Exit	Dimming_lvl
5.2.2.3.6-6	"Day"	Run/Start	(Don't Care)	(Don't Care)	(Don't Care)	User selected Day_1 to Day_6 level
5.2.2.3.6-4	"Night"	Run/Start	(Don't Care)	(Don't Care)	(Don't Care)	User selected Night_1 to Night_12 level

6.2.2.3.6-5	"Day"	OFF/Accy	Courtesy Lighting True	(Don't Care)	(Don't Care)	User selected Day_1 to Day_6 level
6.2.2.3.6-6	"Night"	OFF/Accy	Courtesy Lighting True	(Don't Care)	(Don't Care)	User selected Night_1 to Night_12 level
6.2.2.3.6-7	"Day"	OFF/Accy	Courtesy Lighting False	Courtesy Lighting Delay True	(Don't Care)	User selected Day_1 to Day_6 level
6.2.2.3.6-2	"Night"	OFF/Accy	Courtesy Lighting False	Courtesy Lighting Delay True	(Don't Care)	User selected Night_1 to Night_12 level
6.2.2.3.6-4	"Day"	OFF/Accy	Courtesy Lighting False	Courtesy Lighting Delay False	Illuminated Exit True	User selected Day_1 to Day_6 level
6.2.2.3.6-5	"Night"	OFF/Accy	Courtesy Lighting False	Courtesy Lighting Delay False	Illuminated Exit True	User selected Night_1 to Night_12 level
6.2.2.3.6-6	Don't Care	OFF/Accy	Courtesy Lighting False	Courtesy Lighting Delay False	Illuminated Exit False	OFF

Note: "User selected Day_1 to Day_6 level" are all set to the same intensity level for Night-time Dimmable Backlighting which is decided by Vehicle Harmony team.
Current Ambient Light Sensing strategy that relies on the ALS sensor listed under the following table and should be used as reference only. Ambient light sensing strategy subject to change depending on vehicle architecture and strategy owned by BCM team.

Logical Data Flow	Logical Data Flow Domain Name	Signal Name	Signal Domain Value
Exterior Ambient Level	"Day"	Litval	Day
	"Night"		Twilight_1
	"Night"		Twilight_2
	"Night"		Twilight_3
	"Night"		Twilight_4
	"Night"		Night
	not supported		Unknown
	not supported		Invalid

6.1.3.1.9.1 Support LIN Headlamp Switch Backlighting Illumination

R: 6.1.3.1.3-1	The BCM shall use the outputs/state determination from section 5.2.2 "Welcome/Farewell State Determination without Battery Saver tie-in" function to transmit Dimming_lvl as listed in previous section, to support LIN Headlamp Switch Backlighting Illumination.

6.1.3.1.10 Support Interior 2-Step Dimmable Backlighting Illumination

6.1.3.1.10.1 Rely on BCM for Control Signal

R: 6.1.3.1.3-7	The BCM shall transmit a control signal to Interior 2-Step Dimmable Backlighting Illumination elements directly connected to it that meet the requirements under section 5.4.7.5 "Interior Day-time Dimmable Backlighting Illumination Algorithm" (including the associated "State Determination Algorithm)

R: 6.1.3.1.3-7	The BCM shall transmit a control signal to Interior 2-Step Dimmable Backlighting elements directly connected to it that will support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-022094 LINCOLN EMBRACE WELCOME AND FAREWELL BEHAVIOR REV. 1" for Lincoln vehicles
R: 6.1.3.1.3-7	The BCM shall transmit a control signal to Interior 2-Step Dimmable Backlighting elements directly connected to it that will satisfy the control signal specific requirements listed under Appendix 2 "Interior Lighting PWM Signal Specification"
R: 5.4.7.1.6-7	The BCM shall transmit a control signal to Interior 2-Step Dimmable Backlighting elements directly connected to it that will support the desired Smooth Dimming behavior as detailed in the latest version of the following specification: "ES-H1BT-1A278-AA-VXX"

6.1.3.1.10.2   Modules that subscribe to CAN signals originating from BCM (can be via Gateway)

R: 6.1.3.1.3-2	The BCM shall use the outputs/state determination from section 5.2.2 "Welcome/Farewell State Determination without Battery Saver tie-in" function to then transmit Dimming_lvl and Litval as listed in the table below in order to support Interior 2-Step Dimmable Backlighting

Rqmt #	Exterior Ambient Level	Ignition Status	Courtesy Lighting	Courtesy Lighting Delay	Illuminated Exit	Dimming_lvl
6.2.2.3.6-7	"Day"	Run/Start	(Don't Care)	(Don't Care)	(Don't Care)	User selected Day_1 to Day_6 level
6.2.2.3.6-7	"Night"	Run/Start	(Don't Care)	(Don't Care)	(Don't Care)	User selected Night_1 to Night_12 level
6.2.2.3.6-8	"Day"	OFF/Accy	Courtesy Lighting True	(Don't Care)	(Don't Care)	User selected Day_1 to Day_6 level
6.2.2.3.6-9	"Night"	OFF/Accy	Courtesy Lighting True	(Don't Care)	(Don't Care)	User selected Night_1 to Night_12 level
6.2.2.3.6-8	"Day"	OFF/Accy	Courtesy Lighting False	Courtesy Lighting Delay True	(Don't Care)	User selected Day_1 to Day_6 level
6.2.2.3.6-3	"Night"	OFF/Accy	Courtesy Lighting False	Courtesy Lighting Delay True	(Don't Care)	User selected Night_1 to Night_12 level
6.2.2.3.6-7	"Day"	OFF/Accy	Courtesy Lighting False	Courtesy Lighting Delay False	Illuminated Exit True	User selected Day_1 to Day_6 level
6.2.2.3.6-8	"Night"	OFF/Accy	Courtesy Lighting False	Courtesy Lighting Delay False	Illuminated Exit True	User selected Night_1 to Night_12 level
6.2.2.3.6-9	Don't Care	OFF/Accy	Courtesy Lighting False	Courtesy Lighting Delay False	Illuminated Exit False	OFF

Note: Current Ambient Light Sensing strategy that relies on the ALS sensor listed under the following table and should be used as reference only. Ambient light sensing strategy subject to change depending on vehicle architecture and strategy owned by BCM team.

Logical Data Flow	Logical Data Flow Domain Name	Signal Name	Signal Domain Value

	"Day"		Day
	"Night"		Twilight_1
	"Night"		Twilight_2
Exterior Ambient Level	"Night"	Litval	Twilight_3
	"Night"		Twilight_4
	"Night"		Night
	not supported		Unknown
	not supported		Invalid

6.1.3.1.10.3 Support LIN Headlamp Switch Indicator Illumination

R: 6.1.3.1.3-3	The BCM shall use the outputs/state determination from section 5.2.2 "Welcome/Farewell State Determination without Battery Saver tie-in" function to transmit Dimming_lvl and Litval as listed in previous section, to support LIN Headlamp Switch Indicator Illumination.

6.1.3.1.11 Support Vehicle Display Center-stack Day-time Dimmable Illumination for Display Brightness

R: 6.1.3.1.3-4	The BCM shall use the outputs/state determination from section 5.2.2 "Welcome/Farewell State Determination without Battery Saver tie-in" function to then transmit Dimming_lvl and Litval as listed in the table below in order to support Center-stack Day-time Dimmable Illumination for Display Brightness

Rqmt #	Exterior Ambient Level	Ignition Status	Courtesy Lighting	Courtesy Lighting Delay	Illuminated Exit	Dimming_lvl
6.2.2.3.6-8	"Day"	Run/Start	(Don't Care)	(Don't Care)	(Don't Care)	User selected Day_1 to Day_6 level
2.2.3.6-10	"Night"	Run/Start	(Don't Care)	(Don't Care)	(Don't Care)	User selected Night_1 to Night_12 level
2.2.3.6-11	"Day"	OFF/Accy	Courtesy Lighting True	(Don't Care)	(Don't Care)	User selected Day_1 to Day_6 level
2.2.3.6-12	"Night"	OFF/Accy	Courtesy Lighting True	(Don't Care)	(Don't Care)	User selected Night_1 to Night_12 level
6.2.2.3.6-9	"Day"	OFF/Accy	Courtesy Lighting False	Courtesy Lighting Delay True	(Don't Care)	User selected Day_1 to Day_6 level
6.2.2.3.6-4	"Night"	OFF/Accy	Courtesy Lighting False	Courtesy Lighting Delay True	(Don't Care)	User selected Night_1 to Night_12 level
2.2.3.6-10	"Day"	OFF/Accy	Courtesy Lighting False	Courtesy Lighting Delay False	Illuminated Exit True	User selected Day_1 to Day_6 level
2.2.3.6-11	"Night"	OFF/Accy	Courtesy Lighting False	Courtesy Lighting Delay False	Illuminated Exit True	User selected Night_1 to Night_12 level
2.2.3.6-12	Don't Care	OFF/Accy	Courtesy Lighting False	Courtesy Lighting Delay False	Illuminated Exit False	OFF

Note: Current Ambient Light Sensing strategy that relies on the ALS sensor listed under the following table and should be used as reference only. Ambient light sensing strategy subject to change depending on vehicle architecture and strategy owned by BCM team.

Logical Data Flow	Logical Data Flow Domain Name	Signal Name	Signal Domain Value
Exterior Ambient Level	"Day"	Litval	Day
	"Night"		Twilight_1
	"Night"		Twilight_2
	"Night"		Twilight_3
	"Night"		Twilight_4
	"Night"		Night
	not supported		Unknown
	not supported		Invalid

6.1.3.1.12 Support Vehicle Display Cluster Day-time Dimmable Illumination for Display Brightness

R: 6.1.3.1.3-5	The BCM shall use the outputs/state determination from section 5.2.2 "Welcome/Farewell State Determination without Battery Saver tie-in" function to then transmit Dimming_lvl and litval as listed in the table below in order to support Cluster Day-time Dimmable Illumination for Display Brightness

Rqmt #	Exterior Ambient Level	Ignition Status	Courtesy Lighting	Courtesy Lighting Delay	Illuminated Exit	Dimming_lvl
6.2.2.3.6-9	"Day"	Run/Start	(Don't Care)	(Don't Care)	(Don't Care)	User selected Day_1 to Day_6 level
2.2.3.6-13	"Night"	Run/Start	(Don't Care)	(Don't Care)	(Don't Care)	User selected Night_1 to Night_12 level
2.2.3.6-14	"Day"	OFF/Accy	Courtesy Lighting True	(Don't Care)	(Don't Care)	User selected Day_1 to Day_6 level
2.2.3.6-15	"Night"	OFF/Accy	Courtesy Lighting True	(Don't Care)	(Don't Care)	User selected Night_1 to Night_12 level
2.2.3.6-10	"Day"	OFF/Accy	Courtesy Lighting False	Courtesy Lighting Delay True	(Don't Care)	User selected Day_1 to Day_6 level
6.2.2.3.6-5	"Night"	OFF/Accy	Courtesy Lighting False	Courtesy Lighting Delay True	(Don't Care)	User selected Night_1 to Night_12 level
2.2.3.6-13	"Day"	OFF/Accy	Courtesy Lighting False	Courtesy Lighting Delay False	Illuminated Exit True	User selected Day_1 to Day_6 level
2.2.3.6-14	"Night"	OFF/Accy	Courtesy Lighting False	Courtesy Lighting Delay False	Illuminated Exit True	User selected Night_1 to Night_12 level
2.2.3.6-15	Don't Care	OFF/Accy	Courtesy Lighting False	Courtesy Lighting Delay False	Illuminated Exit False	OFF

Note: Current Ambient Light Sensing strategy that relies on the ALS sensor listed under the following table and should be used as reference only. Ambient light sensing strategy subject to change depending on vehicle architecture and strategy owned by BCM team.

Logical Data Flow	Logical Data Flow Domain Name	Signal Name	Signal Domain Value
Exterior Ambient Level	"Day"	Litval	Day
	"Night"		Twilight_1
	"Night"		Twilight_2
	"Night"		Twilight_3
	"Night"		Twilight_4
	"Night"		Night
	not supported		Unknown
	not supported		Invalid

6.1.3.1.13 Support Vehicle Display aHUD Welcome/Farewell behavior

R: 6.1.3.1.3-6	The BCM shall use the outputs/state determination from section 5.2.2 "Welcome/Farewell State Determination without Battery Saver tie-in" function to then transmit PudLamp_D_Rq, as listed in the table below in order to support aHUD Welcome/Farewell behavior

Rqmt #	Approach Detected	Illuminated Entry	Courtesy Lighting	Courtesy Lighting Delay	PudLamp_D_Rq
2.2.3.6-10	Approach Detected	(Don't Care)	(Don't Care)	(Don't Care)	Ramp_Up
2.2.3.6-11	Approach Not Detected	Illuminated Entry True (Keyfob/PK unlock)	(Don't Care)	(Don't Care)	Ramp_Up
2.2.3.6-12	Approach Not Detected	Illuminated Entry True (Keypad unlock)	(Don't Care)	(Don't Care)	Ramp_Up
2.2.3.6-13	Approach Not Detected	Illuminated Entry True (Cylinder unlock)	(Don't Care)	(Don't Care)	Ramp_Up
2.2.3.6-11	Approach Not Detected	Illuminated Entry False	Courtesy Lighting True AND (Both Driver AND Passenger Door Closed)	(Don't Care)	Ramp_Up
2.2.3.6-12	Approach Not Detected	Illuminated Entry False	Courtesy Lighting True AND Driver Door Closed	(Don't Care)	Ramp_Up
2.2.3.6-13	Approach Not Detected	Illuminated Entry False	Courtesy Lighting True AND Passenger Door Closed	(Don't Care)	Ramp_Up

| 2.2.3.6-14 | Approach Not Detected | Illuminated Entry False | Courtesy Lighting False | Courtesy Lighting Delay True | Ramp_Up |
| 2.2.3.6-15 | Approach Not Detected | Illuminated Entry False | Courtesy Lighting False | Courtesy Lighting Delay False | Ramp_Down |

6.1.3.2 **LED Driver Module (LDM) requirements**

The LDM shall be a subscriber to the BCM (Welcome Farewell State determination function) and then use it to transmit a control signal to a specific lighting element it is directly connected to: Headlamps (low-beams), Front Side Markers, Signature/Decorative LED Lamps, Illuminated Lincoln Star, Front Fog Lamps.

NOTE: Lincoln Lit Star feature spec: LINCOLN LIT STAR SPEC. Contains additional feature specific information.

6.1.3.2.1 Over-arching requirements

R: 6.1.3.2-1	The LDM shall contain its Performance Latency within the End-to-End latency specified in section 3.2.2.1 "Performance Latency Requirements"
R: 6.1.3.2-2	The LDM shall take into account the requirements contained within section 3.2.3 "Safety Requirements" to ensure that no lighting element that it directly controls (via control signal) ends up violating any requirement (specific to the market the target vehicle shall be sold in) within the aforementioned section.
R: 6.1.3.2-3	The LDM shall take into account the requirements contained within section 3.2.4 "Security Requirements" to ensure that no lighting element that it directly controls (via control signal) ends up violating any requirement within the aforementioned section.
R: 6.1.3.2-4	The LDM shall be a publisher to signals it has been identified as a publisher for within section 6.1.2.3 "Signal requirements"

6.1.3.2.1 Provide Control Signal to support Front Exterior Illumination

R: 6.1.3.2-5	The LDM shall subscribe to the (LIN) signals required by the subscribing function "Exterior Front Illumination Algorithm" as identified in section 6.1.2.3 "Signal Requirements": Wfsuperstate and WFsubstate.
R: 6.1.3.2-6	The LDM shall use the signals it has been identified as a subscriber to in section 6.1.2.3 "Signal Requirements" to transmit a control signal to Exterior Front Lighting elements directly connected to it that meet the requirements under section 5.3.1 "Exterior Front Illumination Algorithm"
R: 6.1.3.2-7	The LDM shall transmit a control signal to Exterior Front Illumination elements directly connected to it that will support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-022094 LINCOLN EMBRACE WELCOME AND FAREWELL BEHAVIOR REV. 1" for Lincoln vehicles
R: 6.1.3.2-8	The LDM shall transmit a control signal to Front Exterior Illumination elements directly connected to it that will satisfy the control signal specific requirements listed under Appendix 1 "Exterior Lighting PWM Signal Specification"

Note: Table below provided as reference for LDM subscribed signals to ARL callouts mapping:

ARL call-out		Subscriber Signal Mapping	
Logical Data Flow	Logical Data Flow Domain Name	Wfsuperstate	Wfsubstate
Approach Detection	Approach Detected	Welcome	Approach
	Approach Not Detected	Don't care	NULL**
Illuminated Entry	Illuminated Entry True	Welcome	IllumEntry
	Illuminated Entry False	Don't care	NULL**

	Courtesy Lighting True	Don't care	DoorAjarCourtesyLight
Courtesy Lighting	Courtesy Lighting False	Don't care	NULL**
Courtesy Lighting Delay	Courtesy Lighting Delay True	Don't care	CourtesyLightDelay
	Courtesy Lighting Delay False	Don't care	NULL**
Illuminated Exit	Illuminated Exit True	Farewell	IllExit
	Illuminated Exit False	Don't care	NULL**
Ignition State	Vehicle Ignition is OFF	NOT (RunStart)	Don't Care
	Vehicle Ignition is in Accessory	NOT (RunStart)	Don't Care
	Vehicle Ignition is in Run/Start	RunStart	NULL**
Vehicle Locking	Vehicle Locking True	OFF	NULL
	Vehicle Locking False	Don't care	NULL**

6.1.3.3 **Rear Fade Control Module (R-FCM) requirements**

The R-FCM shall be a subscriber to the BCM (Welcome Farewell State determination function) and then use it to transmit a control signal to a specific lighting element it is directly connected to: Rear Parklamps and Rear Applique Park Lamp (RAPL).

6.1.3.3.1 Over-arching requirements

R: 6.1.3.2-9	The R-FCM shall contain its Performance Latency within the End-to-End latency specified in section 3.2.2.1 "Performance Latency Requirements"
R: 6.1.3.2-10	The R-FCM shall take into account the requirements contained within section 3.2.3 "Safety Requirements" to ensure that no lighting element that it directly controls (via control signal) ends up violating any requirement (specific to the market the target vehicle shall be sold in) within the aforementioned section.
R: 6.1.3.2-11	The R-FCM shall take into account the requirements contained within section 3.2.4 "Security Requirements" to ensure that no lighting element that it directly controls (via control signal) ends up violating any requirement within the aforementioned section.
R: 6.1.3.2-12	The R-FCM shall be a publisher to signals it has been identified as a publisher for within section 6.1.2.3 "Signal requirements"

6.1.3.3.2 Provide Control Signal to support Rear Exterior Illumination

R: 6.1.3.2-13	The R-FCM shall subscribe to the (LIN) signals required by the subscribing function "Exterior Rear Illumination Algorithm" as identified in section 6.1.2.3 "Signal Requirements": Wfsuperstate and WFsubstate.
R: 6.1.3.2-14	The R-FCM shall use the signals it has been identified as a subscriber to in section 6.1.2.3 "Signal Requirements" to transmit a control signal to Exterior Rear Lighting elements directly connected to it that meet the requirements under section 5.3.3 "Exterior Rear Illumination Algorithm"
R: 6.1.3.2-15	The R-FCM shall transmit a control signal to Exterior Rear Illumination elements directly connected to it that will support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-022094 LINCOLN EMBRACE WELCOME AND FAREWELL BEHAVIOR REV. 1" for Lincoln vehicles
R: 6.1.3.2-16	The R-FCM shall transmit a control signal to Exterior Rear Illumination elements directly connected to it that will satisfy the control signal specific requirements listed under Appendix 1 "Exterior Lighting PWM Signal Specification"

Note: Table below provided as reference for RCM subscribed signals to ARL callouts mapping:

ARL call-out		Subscriber Signal Mapping	
Logical Data Flow	Logical Data Flow Domain Name	Wfsuperstate	Wfsubstate
Approach Detection	Approach Detected	Welcome	Approach
	Approach Not Detected	Don't care	NULL**
Illuminated Entry	Illuminated Entry True	Welcome	IllumEntry
	Illuminated Entry False	Don't care	NULL**
Courtesy Lighting	Courtesy Lighting True	Don't care	DoorAjarCourtesyLight
	Courtesy Lighting False	Don't care	NULL**
Courtesy Lighting Delay	Courtesy Lighting Delay True	Don't care	CourtesyLightDelay
	Courtesy Lighting Delay False	Don't care	NULL**
Illuminated Exit	Illuminated Exit True	Farewell	IllExit
	Illuminated Exit False	Don't care	NULL**
Ignition State	Vehicle Ignition is OFF	NOT (RunStart)	Don't Care
	Vehicle Ignition is in Accessory	NOT (RunStart)	Don't Care
	Vehicle Ignition is in Run/Start	RunStart	NULL**
Vehicle Locking	Vehicle Locking True	OFF	NULL
	Vehicle Locking False	Don't care	NULL**

6.1.3.4 **Overhead Console (OHC) requirements**

The OHC shall be a subscriber to the BCM (Welcome Farewell State determination function) and then use it to transmit a control signal to a specific lighting element it is directly connected to: "Courtesy Lamps"

6.1.3.4.1 Over-arching requirements

R: 6.1.3.2-17	The OHC shall contain its Performance Latency within the End-to-End latency specified in section 3.2.2.1 "Performance Latency Requirements"
R: 6.1.3.2-18	The OHC shall take into account the requirements contained within section 3.2.3 "Safety Requirements" to ensure that no lighting element that it directly controls (via control signal) ends up violating any requirement (specific to the market the target vehicle shall be sold in) within the aforementioned section.
R: 6.1.3.2-19	The OHC shall take into account the requirements contained within section 3.2.4 "Security Requirements" to ensure that no lighting element that it directly controls (via control signal) ends up violating any requirement within the aforementioned section.
R: 6.1.3.2-20	The OHC shall be a publisher to signals it has been identified as a publisher for within section 6.1.2.3 "Signal requirements"

6.1.3.4.2 Provide Control Signal to support Courtesy Lamps Illumination

R: 6.1.3.2-21	The OHC shall subscribe to the (LIN) signals required by the subscribing function " Interior Courtesy Lamps Illumination Algorithm " as identified in section 6.1.2.3 "Signal Requirements": WelcomeFarewell_State and WelcomeFarewell_SubState

R: 6.1.3.2-22	The OHC shall use the signals it has been identified as a subscriber to in section 6.1.2.3 "Signal Requirements" to transmit a control signal to Interior Courtesy Lamps directly connected to it that meet the requirements under section 5.4.1 "Courtesy Lamps Illumination Algorithm"
R: 6.1.3.2-23	The OHC shall transmit a control signal to Interior Courtesy Lamps directly connected to it that will support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-022094 LINCOLN EMBRACE WELCOME AND FAREWELL BEHAVIOR REV. 1" for Lincoln vehicles
R: 6.1.3.2-24	The OHC shall transmit a control signal to Interior Courtesy Lamps directly connected to it that will satisfy the control signal specific requirements listed under Appendix 2 "Interior Lighting PWM Signal Specification"

Note: Table below provided as reference for OHC subscribed signals to ARL callouts mapping:

ARL call-out		Subscriber Signal Mapping	
Logical Data Flow	Logical Data Flow Domain Name	WelcomeFarewell_State	WelcomeFarewell_Substate
Approach Detection	Approach Detected	WELCOME	APPROACH
	Approach Not Detected	Don't care	NULL**
Illuminated Entry	Illuminated Entry True	WELCOME	ENTRY
	Illuminated Entry False	Don't care	NULL**
Courtesy Lighting	Courtesy Lighting True	Don't care	DOOR
	Courtesy Lighting False	Don't care	NULL**
Courtesy Lighting Delay	Courtesy Lighting Delay True	Don't care	DELAY
	Courtesy Lighting Delay False	Don't care	NULL**
Illuminated Exit	Illuminated Exit True	FAREWELL	EXIT
	Illuminated Exit False	Don't care	NULL**
Ignition State	Vehicle Ignition is OFF	NOT (RUN_START)	Don't Care
	Vehicle Ignition is in Accessory	NOT (RUN_START)	Don't Care
	Vehicle Ignition is in Run/Start	RUN_START	NULL**
Vehicle Locking	Vehicle Locking True	NULL	NULL
	Vehicle Locking False	Don't care	NULL**

6.1.3.5 **Ambient Light Module (ALM) requirements**

The ALM shall be a subscriber to the BCM (Welcome Farewell State determination function) and then use it to transmit a control signal to a specific lighting element it is directly connected to: "Ambient Lighting" and "Illuminated Seat Belt Buckle"

6.1.3.5.1 Over-arching requirements

R: 6.1.3.2-25	The ALM shall contain its Performance Latency within the End-to-End latency specified in section 3.2.2.1 "Performance Latency Requirements"
R: 6.1.3.2-26	The ALM shall take into account the requirements contained within section 3.2.3 "Safety Requirements" to ensure that no lighting element that it directly controls (via control

R: 6.1.3.2-27	signal) ends up violating any requirement (specific to the market the target vehicle shall be sold in) within the aforementioned section.
R: 6.1.3.2-27	The ALM shall take into account the requirements contained within section 3.2.4 "Security Requirements" to ensure that no lighting element that it directly controls (via control signal) ends up violating any requirement within the aforementioned section.
R: 6.1.3.2-28	The ALM shall be a publisher to signals it has been identified as a publisher for within section 6.1.2.3 "Signal requirements"

6.1.3.5.2 Provide Control Signal to support Ambient Lighting Illumination

R: 6.1.3.2-29	The ALM shall subscribe to the (LIN) signals required by the subscribing function " Interior Ambient Light Illumination (without Static Sequential) Algorithm " as identified in section 6.1.2.3 "Signal Requirements": WelcomeFarewell_State, WelcomeFarewell_SubState, Customer_Color, and Customer_Intensity
R: 6.1.3.2-30	The ALM shall use the signals it has been identified as a subscriber to in section 6.1.2.3 "Signal Requirements" to transmit a control signal to Interior Ambient Lighting Illumination directly connected to it that meet the requirements under section 5.4.3 "Interior Ambient Lighting (without Static Sequential) Illumination Algorithm"
R: 6.1.3.2-31	The ALM shall transmit a control signal to Interior Ambient Lights directly connected to it that will support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-022094 LINCOLN EMBRACE WELCOME AND FAREWELL BEHAVIOR REV. 1" for Lincoln vehicles
R: 6.1.3.2-32	The ALM shall transmit a control signal to Interior Ambient Lights directly connected to it that will satisfy the control signal specific requirements listed under Appendix 2 "Interior Lighting PWM Signal Specification"

Note: Table below provided as reference for ALM subscribed signals to ARL callouts mapping:

ARL call-out		Subscriber Signal Mapping	
Logical Data Flow	Logical Data Flow Domain Name	WelcomeFarewell _State	WelcomeFarewell _Substate
Approach Detection	Approach Detected	WELCOME	APPROACH
	Approach Not Detected	Don't care	NULL**
Illuminated Entry	Illuminated Entry True	WELCOME	ENTRY
	Illuminated Entry False	Don't care	NULL**
Courtesy Lighting	Courtesy Lighting True	Don't care	DOOR
	Courtesy Lighting False	Don't care	NULL**
Courtesy Lighting Delay	Courtesy Lighting Delay True	Don't care	DELAY
	Courtesy Lighting Delay False	Don't care	NULL**
Illuminated Exit	Illuminated Exit True	FAREWELL	EXIT
	Illuminated Exit False	Don't care	NULL**
Ignition State	Vehicle Ignition is OFF	NOT (RUN_START)	Don't Care
	Vehicle Ignition is in Accessory	NOT (RUN_START)	Don't Care
	Vehicle Ignition is in Run/Start	RUN_START	NULL**
Vehicle Locking	Vehicle Locking True	NULL	NULL

Vehicle Locking False	Don't care	NULL**	

6.1.3.6 **Driver Door Module (DDM) requirements**

The DDM shall be a subscriber to the BCM (Welcome Farewell State determination function) and then use it to transmit a control signal to specific lighting elements or part assemblies it is directly connected to: Welcome Mat (Driver's), "Door trim switch/button backlighting Illumination", "Autofold mirrors".

6.1.3.6.1 Over-arching requirements

R: 6.1.3.2-33	The DDM shall contain its Performance Latency within the End-to-End latency specified in section 3.2.2.1 "Performance Latency Requirements"
R: 6.1.3.2-34	The DDM shall take into account the requirements contained within section 3.2.3 "Safety Requirements" to ensure that no lighting element that it directly controls (via control signal) ends up violating any requirement (specific to the market the target vehicle shall be sold in) within the aforementioned section.
R: 6.1.3.2-35	The DDM shall take into account the requirements contained within section 3.2.4 "Security Requirements" to ensure that no lighting element that it directly controls (via control signal) ends up violating any requirement within the aforementioned section.
R: 6.1.3.2-36	The DDM shall be a publisher to signals it has been identified as a publisher for within section 6.1.2.3 "Signal requirements"

6.1.3.6.2 Provide Control Signal to support Exterior Supplementary Illumination

R: 6.1.3.2-37	The DDM shall subscribe to the (CAN) signals required by the subscribing function " Exterior Supplementary Illumination Algorithm " as identified in section 6.1.2.3 "Signal Requirements": Pudlamp_D_Rq, PudlampDrv_D_Rq (specific only for driver side "Welcome Mats")
R: 6.1.3.2-38	The DDM shall use the signals it has been identified as a subscriber to in section 6.1.2.3 "Signal Requirements" to transmit a control signal to Exterior Supplementary Lighting directly connected to it that meet the requirements under section 5.3.5 "Exterior Supplementary Illumination Algorithm"
R: 6.1.3.2-39	The DDM shall transmit a control signal to Exterior Supplementary Lights directly connected to it that will support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-022094 LINCOLN EMBRACE WELCOME AND FAREWELL BEHAVIOR REV. 1" for Lincoln vehicles
R: 6.1.3.2-40	The DDM shall transmit a control signal to Exterior Supplementary Lights directly connected to it that will satisfy the control signal specific requirements listed under Appendix 1 "Exterior Lighting PWM Signal Specification"

Table below provided as reference for DDM subscribed signals to Expected Initial Control Signal Response:

Subscriber Signal Mapping		Expected initial response as per section 5.3.5 "Exterior Supplementary Illumination Algorithm"
Pudlamp_D_Rq	PudLampDrv_D_Rq (only for Driver Welcome Mat)	Control Signal Response
RAMP_UP	RAMP_UP	"Fade ON"/Ramp up
RAMP_DOWN	N/A	"Fade OFF"/Ramp down
ON	N/A	"Snap ON"/Step up
OFF	OFF	"Snap OFF"/"Step down

6.1.3.6.3 Provide Control Signal to support Interior Day-time Dimmable Backlighting/Display Illumination

R: 6.1.3.2-41	The DDM shall subscribe to the (CAN) signals required by the subscribing function "Interior Day-time Dimmable Backlighting Illumination Algorithm" as identified in section 6.1.2.3 "Signal Requirements": Dimming_lvl and Litval. Note: Dimming_lvl ≠ OFF is a local sleep inhibitor. Modules on the network will allow the network(s) to sleep but illumination will remain ON indefinitely, no timeouts allowed. Local sleep is allowed then Dimming_lvl = OFF

R: 6.1.3.2-42	The DDM shall use the signals it has been identified as a subscriber to in section 6.1.2.3 "Signal Requirements" to transmit a control signal to Day-time Dimmable Backlighting/Display Illumination directly connected to it that meet the requirements under section 5.4.7.1 "Day-time Dimmable" Backlighting Illumination Algorithm
R: 6.1.3.2-43	The DDM shall transmit a control signal to Day-time Dimmable Backlighting/Display Illumination directly connected to it that will support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-022094 LINCOLN EMBRACE WELCOME AND FAREWELL BEHAVIOR REV. 1" for Lincoln vehicles
R: 6.1.3.2-44	The DDM shall transmit a control signal to Day-time Dimmable Backlighting/Display Illumination directly connected to it that will satisfy the control signal specific requirements listed under Appendix 2 "Interior Lighting PWM Signal Specification"
R: 5.4.7.1.6-8	The DDM shall transmit a control signal to Interior Day-time Dimmable Backlighting /Display elements directly connected to it that will support the desired Smooth Dimming behavior as detailed in the latest version of the following specification: "ES-H1BT-1A278-AA-VXX"

Table below provided as reference for DDM subscribed signals to Expected Initial Control Signal Response:

Subscriber Signal Mapping	Expected initial response as per section 5.4.7.1 "Day-time Dimmable" Backlighting Illumination Algorithm
Dimming_lvl	Control Signal Response
Day_1 – Day_6	"Fade ON"/Ramp up to "Day_1 – Day_6"
Night_1 – Night_12	"Fade ON"/Ramp up to "Night_1 – Night_12"
OFF	"Fade OFF"/Ramp down

6.1.3.6.4 Provide Control Signal to support Interior Night-Time Dimmable Backlighting Illumination

R: 6.1.3.2-45	The DDM shall subscribe to the (CAN) signals required by the subscribing function "Interior Night-time Dimmable Backlighting Illumination Algorithm" as identified in section 6.1.2.3 "Signal Requirements": Dimming_lvl and Litval. Note: Dimming_lvl ≠ OFF is a local sleep inhibitor. Modules on the network will allow the network(s) to sleep but illumination will remain ON indefinitely, no timeouts allowed. Local sleep is allowed then Dimming_lvl = OFF
R: 6.1.3.2-46	The DDM shall use the signals it has been identified as a subscriber to in section 6.1.2.3 "Signal Requirements" to transmit a control signal to Night-time Dimmable Backlighting Illumination directly connected to it that meet the requirements under section 5.4.7.3 "Night-time Dimmable" Backlighting Illumination Algorithm
R: 6.1.3.2-47	The DDM shall transmit a control signal to Night-time Dimmable Backlighting Illumination directly connected to it that will support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-022094 LINCOLN EMBRACE WELCOME AND FAREWELL BEHAVIOR REV. 1" for Lincoln vehicles
R: 6.1.3.2-48	The DDM shall transmit a control signal to Night-time Dimmable Backlighting Illumination directly connected to it that will satisfy the control signal specific requirements listed under Appendix 2 "Interior Lighting PWM Signal Specification"
R: 5.4.7.1.6-9	The DDM shall transmit a control signal to Interior Night-time Dimmable Backlighting elements directly connected to it that will support the desired Smooth Dimming behavior as detailed in the latest version of the following specification: "ES-H1BT-1A278-AA-VXX"

Table below provided as reference for DDM subscribed signals to Expected Initial Control Signal Response:

Subscriber Signal Mapping	Expected initial response as per section 5.4.7.3 "Night-time Dimmable" Backlighting Illumination Algorithm
Dimming_lvl	Control Signal Response
Day_1 – Day_6	"Fade ON"/Ramp up to "Non-selectable Daytime level"
Night_1 – Night_12	"Fade ON"/Ramp up to "Non-selectable Nighttime level"
OFF	"Fade OFF"/Ramp down

6.1.3.6.5 Provide Control Signal to support Interior 2-Step Dimmable Backlighting Illumination

R: 6.1.3.2-49	The DDM shall subscribe to the (CAN) signals required by the subscribing function "Interior Night-time Dimmable Backlighting Illumination Algorithm" as identified in section

	6.1.2.3 "Signal Requirements": Dimming_lvl and Litval. Note: Dimming_lvl ≠ OFF is a local sleep inhibitor. Modules on the network will allow the network(s) to sleep but illumination will remain ON indefinitely, no timeouts allowed. Local sleep is allowed then Dimming_lvl = OFF
R: 6.1.3.2-50	The DDM shall use the signals it has been identified as a subscriber to in section 6.1.2.3 "Signal Requirements" to transmit a control signal to 2-Step Dimmable Backlighting Illumination directly connected to it that meet the requirements under section 5.4.7.5 "2-Step Dimmable" Backlighting Illumination Algorithm
R: 6.1.3.2-51	The DDM shall transmit a control signal to 2-Step Dimmable Backlighting Illumination directly connected to it that will support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-022094 LINCOLN EMBRACE WELCOME AND FAREWELL BEHAVIOR REV. 1" for Lincoln vehicles
R: 6.1.3.2-52	The DDM shall transmit a control signal to 2-Step Dimmable Backlighting Illumination directly connected to it that will satisfy the control signal specific requirements listed under Appendix 2 "Interior Lighting PWM Signal Specification"
R: 5.4.7.1.6-10	The DDM shall transmit a control signal to 2-Step Dimmable Dimmable Backlighting elements directly connected to it that will support the desired Smooth Dimming behavior as detailed in the latest version of the following specification: "ES-H1BT-1A278-AA-VXX"

Table below provided as reference for DDM subscribed signals to Expected Initial Control Signal Response:

Subscriber Signal Mapping	Expected initial response as per section 5.4.7.5 "2-Step Dimmable" Backlighting Illumination Algorithm
Dimming_lvl	Control Signal Response
Day_1 – Day_6	"Fade ON"/Ramp up to "Non-selectable Daytime level"
Night_1 – Night_12	"Fade ON"/Ramp up to "Non-selectable Nighttime level"
OFF	"Fade OFF"/Ramp down

6.1.3.7 **Passenger Door Module (PDM) requirements**

The PDM shall be a subscriber to the BCM (Welcome Farewell State determination function) and then use it to transmit a control signal to specific lighting elements or part assemblies it is directly connected to: Welcome Mat (Passenger's), "Door trim switch/button backlighting Illumination", "Autofold mirrors"

6.1.3.7.1 Over-arching requirements

R: 6.1.3.2-53	The PDM shall contain its Performance Latency within the End-to-End latency specified in section 3.2.2.1 "Performance Latency Requirements"
R: 6.1.3.2-54	The PDM shall take into account the requirements contained within section 3.2.3 "Safety Requirements" to ensure that no lighting element that it directly controls (via control signal) ends up violating any requirement (specific to the market the target vehicle shall be sold in) within the aforementioned section.
R: 6.1.3.2-55	The PDM shall take into account the requirements contained within section 3.2.4 "Security Requirements" to ensure that no lighting element that it directly controls (via control signal) ends up violating any requirement within the aforementioned section.
R: 6.1.3.2-56	The PDM shall be a publisher to signals it has been identified as a publisher for within section 6.1.2.3 "Signal requirements"

6.1.3.7.2 Provide Control Signal to support Exterior Supplementary Illumination

R: 6.1.3.2-57	The PDM shall subscribe to the (CAN) signals required by the subscribing function " Exterior Supplementary Illumination Algorithm " as identified in section 6.1.2.3 "Signal Requirements": Pudlamp_D_Rq, PudlampPsngr_D_Rq (specific only for driver side "Welcome Mats")
R: 6.1.3.2-58	The PDM shall use the signals it has been identified as a subscriber to in section 6.1.2.3 "Signal Requirements" to transmit a control signal to Exterior Supplementary Lighting directly connected to it that meet the requirements under section 5.3.5 "Exterior Supplementary Illumination Algorithm"

R: 6.1.3.2-59	The PDM shall transmit a control signal to Exterior Supplementary Lights directly connected to it that will support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-022094 LINCOLN EMBRACE WELCOME AND FAREWELL BEHAVIOR REV. 1" for Lincoln vehicles
R: 6.1.3.2-60	The PDM shall transmit a control signal to Exterior Supplementary Lights directly connected to it that will satisfy the control signal specific requirements listed under Appendix 1 "Exterior Lighting PWM Signal Specification"

Table below provided as reference for PDM subscribed signals to Expected Initial Control Signal Response:

Subscriber Signal Mapping		Expected initial response as per section 5.3.5 "Exterior Supplementary Illumination Algorithm"
Pudlamp_D_Rq	PudlampPsngr_D_Rq (only for Passenger Welcome Mat)	Control Signal Response
RAMP_UP	RAMP_UP	"Fade ON"/Ramp up
RAMP_DOWN	N/A	"Fade OFF"/Ramp down
ON	N/A	"Snap ON"/Step up
OFF	OFF	"Snap OFF"/"Step down

6.1.3.7.3   Provide Control Signal to support Interior Day-time Dimmable Backlighting/Display Illumination

R: 6.1.3.2-61	The PDM shall subscribe to the (CAN) signals required by the subscribing function "Interior Day-time Dimmable Backlighting Illumination Algorithm" as identified in section 6.1.2.3 "Signal Requirements": Dimming_lvl and Litval. Note: Dimming_lvl ≠ OFF is a local sleep inhibitor. Modules on the network will allow the network(s) to sleep but illumination will remain ON indefinitely, no timeouts allowed. Local sleep is allowed then Dimming_lvl = OFF
R: 6.1.3.2-62	The PDM shall use the signals it has been identified as a subscriber to in section 6.1.2.3 "Signal Requirements" to transmit a control signal to Day-time Dimmable Backlighting/Display Illumination directly connected to it that meet the requirements under section 5.4.7.1 "Day-time Dimmable" Backlighting Illumination Algorithm
R: 6.1.3.2-63	The PDM shall transmit a control signal to Day-time Dimmable Backlighting/Display Illumination directly connected to it that will support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-022094 LINCOLN EMBRACE WELCOME AND FAREWELL BEHAVIOR REV. 1" for Lincoln vehicles
R: 6.1.3.2-64	The PDM shall transmit a control signal to Day-time Dimmable Backlighting/Display Illumination directly connected to it that will satisfy the control signal specific requirements listed under Appendix 2 "Interior Lighting PWM Signal Specification"
R: 5.4.7.1.6-11	The PDM shall transmit a control signal to Interior Day-time Dimmable Backlighting /Display elements directly connected to it that will support the desired Smooth Dimming behavior as detailed in the latest version of the following specification: "ES-H1BT-1A278-AA-VXX"

Table below provided as reference for PDM subscribed signals to Expected Initial Control Signal Response:

Subscriber Signal Mapping	Expected initial response as per section 5.4.7.1 "Day-time Dimmable" Backlighting Illumination Algorithm
Dimming_lvl	Control Signal Response
Day_1 – Day_6	"Fade ON"/Ramp up to "Day_1 – Day_6"
Night_1 – Night_12	"Fade ON"/Ramp up to "Night_1 – Night_12"
OFF	"Fade OFF"/Ramp down

6.1.3.7.4   Provide Control Signal to support Interior Night-Time Dimmable Backlighting Illumination

R: 6.1.3.2-65	The PDM shall subscribe to the (CAN) signals required by the subscribing function "Interior Night-time Dimmable Backlighting Illumination Algorithm" as identified in section 6.1.2.3 "Signal Requirements": Dimming_lvl and Litval. Note: Dimming_lvl ≠ OFF is a local sleep inhibitor. Modules on the network will allow the network(s) to sleep but illumination will remain ON indefinitely, no timeouts allowed. Local sleep is allowed then Dimming_lvl = OFF

R: 6.1.3.2-66	The PDM shall use the signals it has been identified as a subscriber to in section 6.1.2.3 "Signal Requirements" to transmit a control signal to Night-time Dimmable Backlighting Illumination directly connected to it that meet the requirements under section 5.4.7.3 "Night-time Dimmable" Backlighting Illumination Algorithm
R: 6.1.3.2-67	The PDM shall transmit a control signal to Night-time Dimmable Backlighting Illumination directly connected to it that will support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-022094 LINCOLN EMBRACE WELCOME AND FAREWELL BEHAVIOR REV. 1" for Lincoln vehicles
R: 6.1.3.2-68	The PDM shall transmit a control signal to Night-time Dimmable Backlighting Illumination directly connected to it that will satisfy the control signal specific requirements listed under Appendix 2 "Interior Lighting PWM Signal Specification"
R: 5.4.7.1.6-12	The PDM shall transmit a control signal to Interior Night-time Dimmable Backlighting elements directly connected to it that will support the desired Smooth Dimming behavior as detailed in the latest version of the following specification: "ES-H1BT-1A278-AA-VXX"

Table below provided as reference for PDM subscribed signals to Expected Initial Control Signal Response:

Subscriber Signal Mapping	Expected initial response as per section 5.4.7.3 "Night-time Dimmable" Backlighting Illumination Algorithm
Dimming_lvl	Control Signal Response
Day_1 – Day_6	"Fade ON"/Ramp up to "Day_1 – Day_6"
Night_1 – Night_12	"Fade ON"/Ramp up to "Night_1 – Night_12"
OFF	"Fade OFF"/Ramp down

6.1.3.7.5   <u>Provide Control Signal to support Interior 2-Step Dimmable Backlighting Illumination</u>

R: 6.1.3.2-69	The PDM shall subscribe to the (CAN) signals required by the subscribing function "Interior 2-Step Dimmable Backlighting Illumination Algorithm" as identified in section 6.1.2.3 "Signal Requirements": Dimming_lvl and Litval. Note: Dimming_lvl ≠ OFF is a local sleep inhibitor. Modules on the network will allow the network(s) to sleep but illumination will remain ON indefinitely, no timeouts allowed. Local sleep is allowed then Dimming_lvl = OFF
R: 6.1.3.2-70	The PDM shall use the signals it has been identified as a subscriber to in section 6.1.2.3 "Signal Requirements" to transmit a control signal to 2-Step Dimmable Backlighting Illumination directly connected to it that meet the requirements under section 5.4.7.5 "2-Step Dimmable" Backlighting Illumination Algorithm
R: 6.1.3.2-71	The PDM shall transmit a control signal to 2-Step Dimmable Backlighting Illumination directly connected to it that will support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-022094 LINCOLN EMBRACE WELCOME AND FAREWELL BEHAVIOR REV. 1" for Lincoln vehicles
R: 6.1.3.2-72	The PDM shall transmit a control signal to 2-Step Dimmable Backlighting Illumination directly connected to it that will satisfy the control signal specific requirements listed under Appendix 2 "Interior Lighting PWM Signal Specification"
R: 5.4.7.1.6-13	The PDM shall transmit a control signal to 2-Step Dimmable Backlighting elements directly connected to it that will support the desired Smooth Dimming behavior as detailed in the latest version of the following specification: "ES-H1BT-1A278-AA-VXX"

Table below provided as reference for PDM subscribed signals to Expected Initial Control Signal Response:

Subscriber Signal Mapping	Expected initial response as per section 5.4.7.5 "2-Step Dimmable" Backlighting Illumination Algorithm
Dimming_lvl	Control Signal Response
Day_1 – Day_6	"Fade ON"/Ramp up to "Non-selectable Daytime level"
Night_1 – Night_12	"Fade ON"/Ramp up to "Non-selectable Nighttime level"
OFF	"Fade OFF"/Ramp down

6.1.3.8   **Steering Column Control Module (SCCM) requirements**

The SCCM shall be a subscriber to the BCM (Welcome Farewell State determination function) and then use it to transmit a control signal to specific lighting elements or part assemblies it is directly connected to.

6.1.3.8.1 Over-arching requirements

R: 6.1.3.2-73	The SCCM shall contain its Performance Latency within the End-to-End latency specified in section 3.2.2.1 "Performance Latency Requirements"
R: 6.1.3.2-74	The SCCM shall take into account the requirements contained within section 3.2.3 "Safety Requirements" to ensure that no lighting element that it directly controls (via control signal) ends up violating any requirement (specific to the market the target vehicle shall be sold in) within the aforementioned section.
R: 6.1.3.2-75	The SCCM shall take into account the requirements contained within section 3.2.4 "Security Requirements" to ensure that no lighting element that it directly controls (via control signal) ends up violating any requirement within the aforementioned section.
R: 6.1.3.2-76	The SCCM shall be a publisher to signals it has been identified as a publisher for within section 6.1.2.3 "Signal requirements"

6.1.3.8.2 Provide Control Signal to support Interior Day-time Dimmable Backlighting Illumination

R: 6.1.3.2-77	The SCCM shall subscribe to the (CAN) signals required by the subscribing function "Interior Day-time Dimmable Backlighting Illumination Algorithm" as identified in section 6.1.2.3 "Signal Requirements": Dimming_lvl and Litval. Note: Dimming_lvl ≠ OFF is a local sleep inhibitor. Modules on the network will allow the network(s) to sleep but illumination will remain ON indefinitely, no timeouts allowed. Local sleep is allowed then Dimming_lvl = OFF
R: 6.1.3.2-78	The SCCM shall use the signals it has been identified as a subscriber to in section 6.1.2.3 "Signal Requirements" to transmit a control signal to Day-time Dimmable Backlighting Illumination directly connected to it that meet the requirements under section 5.4.7.1 "Day-time Dimmable" Backlighting Illumination Algorithm
R: 6.1.3.2-79	The SCCM shall transmit a control signal to Day-time Dimmable Backlighting Illumination directly connected to it that will support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-022094 LINCOLN EMBRACE WELCOME AND FAREWELL BEHAVIOR REV. 1" for Lincoln vehicles
R: 6.1.3.2-80	The SCCM shall transmit a control signal to Day-time Dimmable Backlighting Illumination directly connected to it that will satisfy the control signal specific requirements listed under Appendix 2 "Interior Lighting PWM Signal Specification"
R: 5.4.7.1.6-14	The SCCM shall transmit a control signal to Interior Day-time Dimmable Backlighting elements directly connected to it that will support the desired Smooth Dimming behavior as detailed in the latest version of the following specification: "ES-H1BT-1A278-AA-VXX"

Table below provided as reference for SCCM subscribed signals to Expected Initial Control Signal Response:

Subscriber Signal Mapping	Expected initial response as per section 5.4.7.1 "Day-time Dimmable" Backlighting Illumination Algorithm
Dimming_lvl	**Control Signal Response**
Day_1 – Day_6	"Fade ON"/Ramp up to "Day_1 – Day_6"
Night_1 – Night_12	"Fade ON"/Ramp up to "Night_1 – Night_12"
OFF	"Fade OFF"/Ramp down

6.1.3.8.3 Provide Control Signal to support Interior Night-Time Dimmable Backlighting Illumination

R: 6.1.3.2-81	The SCCM shall subscribe to the (CAN) signals required by the subscribing function "Interior Night-time Dimmable Backlighting Illumination Algorithm" as identified in section 6.1.2.3 "Signal Requirements": Dimming_lvl and Litval. Note: Dimming_lvl ≠ OFF is a local sleep inhibitor. Modules on the network will allow the network(s) to sleep but illumination will remain ON indefinitely, no timeouts allowed. Local sleep is allowed then Dimming_lvl = OFF
R: 6.1.3.2-82	The SCCM shall use the signals it has been identified as a subscriber to in section 6.1.2.3 "Signal Requirements" to transmit a control signal to Night-time Dimmable Backlighting Illumination directly connected to it that meet the requirements under section 5.4.7.3 "Night-time Dimmable" Backlighting Illumination Algorithm
R: 6.1.3.2-83	The SCCM shall transmit a control signal to Night-time Dimmable Backlighting Illumination directly connected to it that will support the desired Welcome/Farewell state specific

	behavior called out in "RQT-002004-022094 LINCOLN EMBRACE WELCOME AND FAREWELL BEHAVIOR REV. 1" for Lincoln vehicles
R: 6.1.3.2-84	The SCCM shall transmit a control signal to Night-time Dimmable Backlighting Illumination directly connected to it that will satisfy the control signal specific requirements listed under Appendix 2 "Interior Lighting PWM Signal Specification"
R: 5.4.7.1.6-15	The SCCM shall transmit a control signal to Interior Night-time Dimmable Backlighting elements directly connected to it that will support the desired Smooth Dimming behavior as detailed in the latest version of the following specification: "ES-H1BT-1A278-AA-VXX"

Table below provided as reference for PDM subscribed signals to Expected Initial Control Signal Response:

Subscriber Signal Mapping	Expected initial response as per section 5.4.7.3 "Night-time Dimmable" Backlighting Illumination Algorithm
Dimming_lvl	Control Signal Response
Day_1 – Day_6	"Fade ON"/Ramp up to "Day_1 – Day_6"
Night_1 – Night_12	"Fade ON"/Ramp up to "Night_1 – Night_12"
OFF	"Fade OFF"/Ramp down

6.1.3.9 **Terrain Management Switch (TMS) requirements**

The TMS shall be a subscriber to the BCM (Welcome Farewell State determination function) and then use it to transmit a control signal to specific lighting elements or part assemblies it is directly connected to.

6.1.3.9.1 Over-arching requirements

R: 6.1.3.2-85	The TMS shall contain its Performance Latency within the End-to-End latency specified in section 3.2.2.1 "Performance Latency Requirements"
R: 6.1.3.2-86	The TMS shall take into account the requirements contained within section 3.2.3 "Safety Requirements" to ensure that no lighting element that it directly controls (via control signal) ends up violating any requirement (specific to the market the target vehicle shall be sold in) within the aforementioned section.
R: 6.1.3.2-87	The TMS shall take into account the requirements contained within section 3.2.4 "Security Requirements" to ensure that no lighting element that it directly controls (via control signal) ends up violating any requirement within the aforementioned section.
R: 6.1.3.2-88	The TMS shall be a publisher to signals it has been identified as a publisher for within section 6.1.2.3 "Signal requirements"

6.1.3.9.2 Provide Control Signal to support Interior Day-time Dimmable Backlighting Illumination

R: 6.1.3.2-89	The TMS shall subscribe to the (CAN) signals required by the subscribing function "Interior Day-time Dimmable Backlighting Illumination Algorithm" as identified in section 6.1.2.3 "Signal Requirements": Dimming_lvl and Litval. Note: Dimming_lvl ≠ OFF is a local sleep inhibitor. Modules on the network will allow the network(s) to sleep but illumination will remain ON indefinitely, no timeouts allowed. Local sleep is allowed then Dimming_lvl = OFF
R: 6.1.3.2-90	The TMS shall use the signals it has been identified as a subscriber to in section 6.1.2.3 "Signal Requirements" to transmit a control signal to Day-time Dimmable Backlighting Illumination directly connected to it that meet the requirements under section 5.4.7.1 "Day-time Dimmable" Backlighting Illumination Algorithm
R: 6.1.3.2-91	The TMS shall transmit a control signal to Day-time Dimmable Backlighting Illumination directly connected to it that will support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-022094 LINCOLN EMBRACE WELCOME AND FAREWELL BEHAVIOR REV. 1" for Lincoln vehicles
R: 6.1.3.2-92	The TMS shall transmit a control signal to Day-time Dimmable Backlighting Illumination directly connected to it that will satisfy the control signal specific requirements listed under Appendix 2 "Interior Lighting PWM Signal Specification"
R: 5.4.7.1.6-16	The TMS shall transmit a control signal to Interior Day-time Dimmable Backlighting elements directly connected to it that will support the desired Smooth Dimming behavior as detailed in the latest version of the following specification: "ES-H1BT-1A278-AA-VXX"

Table below provided as reference for SCCM subscribed signals to Expected Initial Control Signal Response:

Subscriber Signal Mapping	Expected initial response as per section 5.4.7.1 "Day-time Dimmable" Backlighting Illumination Algorithm
Dimming_lvl	Control Signal Response
Day_1 – Day_6	"Fade ON"/Ramp up to "Day_1 – Day_6"
Night_1 – Night_12	"Fade ON"/Ramp up to "Night_1 – Night_12"
OFF	"Fade OFF"/Ramp down

6.1.3.9.3   Provide Control Signal to support Interior Night-Time Dimmable Backlighting Illumination

R: 6.1.3.2-93	The TMS shall subscribe to the (CAN) signals required by the subscribing function "Interior Night-time Dimmable Backlighting Illumination Algorithm" as identified in section 6.1.2.3 "Signal Requirements": Dimming_lvl and Litval. Note: Dimming_lvl ≠ OFF is a local sleep inhibitor. Modules on the network will allow the network(s) to sleep but illumination will remain ON indefinitely, no timeouts allowed. Local sleep is allowed then Dimming_lvl = OFF
R: 6.1.3.2-94	The TMS shall use the signals it has been identified as a subscriber to in section 6.1.2.3 "Signal Requirements" to transmit a control signal to Night-time Dimmable Backlighting Illumination directly connected to it that meet the requirements under section 5.4.7.3 "Night-time Dimmable" Backlighting Illumination Algorithm
R: 6.1.3.2-95	The TMS shall transmit a control signal to Night-time Dimmable Backlighting Illumination directly connected to it that will support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-022094 LINCOLN EMBRACE WELCOME AND FAREWELL BEHAVIOR REV. 1" for Lincoln vehicles
R: 6.1.3.2-96	The TMS shall transmit a control signal to Night-time Dimmable Backlighting Illumination directly connected to it that will satisfy the control signal specific requirements listed under Appendix 2 "Interior Lighting PWM Signal Specification"
R: 5.4.7.1.6-17	The TMS shall transmit a control signal to Interior Night-time Dimmable Backlighting elements directly connected to it that will support the desired Smooth Dimming behavior as detailed in the latest version of the following specification: "ES-H1BT-1A278-AA-VXX"

Table below provided as reference for TMS subscribed signals to Expected Initial Control Signal Response:

Subscriber Signal Mapping	Expected initial response as per section 5.4.7.3 "Night-time Dimmable" Backlighting Illumination Algorithm
Dimming_lvl	Control Signal Response
Day_1 – Day_6	"Fade ON"/Ramp up to "Day_1 – Day_6"
Night_1 – Night_12	"Fade ON"/Ramp up to "Night_1 – Night_12"
OFF	"Fade OFF"/Ramp down

6.1.3.10   **Front Control Interface Module (FCIM, FCIMB, HVAC) requirements**

The FCIM shall be a subscriber to the BCM (Welcome Farewell State determination function) and APIM (Radio Power Button toggle) then use it to transmit a control signal to specific lighting elements it is directly connected to: "Sync/Radio Control button backlighting illumination"

6.1.3.10.1   Provide Control Signal to support Interior Day-Time Dimmable Backlighting Illumination

R: 6.1.3.2-97	The FCIM shall subscribe to the (CAN) signals required by the subscribing function "Interior Day-time Dimmable Backlighting Illumination Algorithm" as identified in section 6.1.2.3 "Signal Requirements": Dimming_lvl, Litval and HMI_HMIMode_St. Note: Dimming_lvl ≠ OFF is a local sleep inhibitor. Modules on the network will allow the network(s) to sleep but illumination will remain ON indefinitely, no timeouts allowed. Local sleep is allowed then Dimming_lvl = OFF
R: 6.1.3.2-98	The FCIM shall use the signals it has been identified as a subscriber to in section 6.1.2.3 "Signal Requirements" to transmit a control signal to Day-time Dimmable Backlighting Illumination directly connected to it that meet the requirements under section 5.4.7.1 "Day-time Dimmable" Backlighting Illumination Algorithm

R: 6.1.3.2-99	The FCIM shall transmit a control signal to Day-time Dimmable Backlighting Illumination directly connected to it that will support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-022094 LINCOLN EMBRACE WELCOME AND FAREWELL BEHAVIOR REV. 1" for Lincoln vehicles
R: 6.1.3.2-100	The FCIM shall transmit a control signal to Day-time Dimmable Backlighting Illumination directly connected to it that will satisfy the control signal specific requirements listed under Appendix 2 "Interior Lighting PWM Signal Specification"
R: 5.4.7.1.6-18	The FCIM shall transmit a control signal to Interior Day-time Dimmable Backlighting elements directly connected to it that will support the desired Smooth Dimming behavior as detailed in the latest version of the following specification: "ES-H1BT-1A278-AA-VXX"

Table below provided as reference for FCIM subscribed signals to Expected Initial Control Signal Response:

Subscriber Signal Mapping		Expected initial response as per section 5.4.7.1 "Day-time Dimmable" Backlighting Illumination Algorithm
Dimming_lvl	HMI_HMIMode_St	Control Signal Response
Day_1 to Day_6 or Night_1 – Night_12	Don't Care	"Fade ON"/Ramp up
OFF	≠ OFFmode	"Fade ON"/Ramp up**
OFF	OFFmode	"Fade OFF"/Ramp down

**Note: Only for Radio Controls, remaining controls (i.e. HVAC): "Fade OFF"/Ramp down

Table below provided as reference for FCIM subscribed signals to Expected Illumination Level

Dimming_lvl	HMI_HMIMode_St	Desired Illumination Level
Day_1 to Day_6 or Night_1 – Night_12	Don't Care	Day_1 to Day_6 or Night_1 – Night_12
Transition to OFF	≠ OFFmode	Night_12**
OFF	OFFmode	OFF

**Note: Only for Radio Controls, remaining controls (i.e. HVAC): OFF

6.1.3.10.2 Provide Control Signal to support Interior Night-Time Dimmable Backlighting Illumination

R: 6.1.3.2-101	The FCIM shall subscribe to the (CAN) signals required by the subscribing function "Interior Night-time Dimmable Backlighting Illumination Algorithm" as identified in section 6.1.2.3 "Signal Requirements": Dimming_lvl, Litval and HMI_HMIMode_St. Note: Dimming_lvl ≠ OFF is a local sleep inhibitor. Modules on the network will allow the network(s) to sleep but illumination will remain ON indefinitely, no timeouts allowed. Local sleep is allowed then Dimming_lvl = OFF
R: 6.1.3.2-102	The FCIM shall use the signals it has been identified as a subscriber to in section 6.1.2.3 "Signal Requirements" to transmit a control signal to Night-time Dimmable Backlighting Illumination directly connected to it that meet the requirements under section 5.4.7.3 "Night-time Dimmable" Backlighting Illumination Algorithm
R: 6.1.3.2-103	The FCIM shall transmit a control signal to Night-time Dimmable Backlighting Illumination directly connected to it that will support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-022094 LINCOLN EMBRACE WELCOME AND FAREWELL BEHAVIOR REV. 1" for Lincoln vehicles
R: 6.1.3.2-104	The FCIM shall transmit a control signal to Night-time Dimmable Backlighting Illumination directly connected to it that will satisfy the control signal specific requirements listed under Appendix 2 "Interior Lighting PWM Signal Specification"
R: 5.4.7.1.6-19	The FCIM shall transmit a control signal to Interior Night-time Dimmable Backlighting elements directly connected to it that will support the desired Smooth Dimming behavior as detailed in the latest version of the following specification: "ES-H1BT-1A278-AA-VXX"

Table below provided as reference for FCIM subscribed signals to Expected Initial Control Signal Response:

Subscriber Signal Mapping		Expected initial response as per section 5.4.7.3 "Night-time Dimmable" Backlighting Illumination Algorithm
Dimming_lvl	HMI_HMIMode_St	Control Signal Response

Day_1 to Day_6 or Night_1 – Night_12	Don't Care	"Fade ON"/Ramp up
OFF	≠ OFFmode	"Fade ON"/Ramp up**
OFF	OFFmode	"Fade OFF"/Ramp down

**Note: Only for Radio Controls, remaining controls (i.e. HVAC): "Fade OFF"/Ramp down

Table below provided as reference for FCIM subscribed signals to Expected Illumination Level

Dimming_lvl	HMI_HMIMode_St	Desired Illumination Level
Day_1 to Day_6 or Night_1 – Night_12	Don't Care	Day_1 to Day_6 or Night_1 – Night_12
Transition to OFF	≠ OFFmode	Night_12**
OFF	OFFmode	OFF

**Note: Only for Radio Controls, remaining controls (i.e. HVAC): OFF

6.1.3.10.3 Provide Control Signal to support Interior 2-Step Dimmable Backlighting Illumination

R: 6.1.3.2-105	The FCIM shall subscribe to the (CAN) signals required by the subscribing function "Interior 2-Step Dimmable Backlighting Illumination Algorithm" as identified in section 6.1.2.3 "Signal Requirements": Dimming_lvl and Litval. Note: Dimming_lvl ≠ OFF is a local sleep inhibitor. Modules on the network will allow the network(s) to sleep but illumination will remain ON indefinitely, no timeouts allowed. Local sleep is allowed then Dimming_lvl = OFF
R: 6.1.3.2-106	The FCIM shall use the signals it has been identified as a subscriber to in section 6.1.2.3 "Signal Requirements" to transmit a control signal to 2-Step Dimmable Backlighting Illumination directly connected to it that meet the requirements under section 5.4.7.5 "2-Step Dimmable" Backlighting Illumination Algorithm
R: 6.1.3.2-107	The FCIM shall transmit a control signal to 2-Step Dimmable Backlighting Illumination directly connected to it that will support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-022094 LINCOLN EMBRACE WELCOME AND FAREWELL BEHAVIOR REV. 1" for Lincoln vehicles
R: 6.1.3.2-108	The FCIM shall transmit a control signal to 2-Step Dimmable Backlighting Illumination directly connected to it that will satisfy the control signal specific requirements listed under Appendix 2 "Interior Lighting PWM Signal Specification"
R: 5.4.7.1.6-20	The FCIM shall transmit a control signal to Interior Day-time Dimmable Backlighting elements directly connected to it that will support the desired Smooth Dimming behavior as detailed in the latest version of the following specification: "ES-H1BT-1A278-AA-VXX"

Table below provided as reference for FCIM subscribed signals to Expected Initial Control Signal Response:

Subscriber Signal Mapping	Expected initial response as per section 5.4.7.5 "2-Step Dimmable" Backlighting Illumination Algorithm
Dimming_lvl	Control Signal Response
Day_1 – Day_6	"Fade ON"/Ramp up to "Non-selectable Daytime level"
Night_1 – Night_12	"Fade ON"/Ramp up to "Non-selectable Nighttime level"
OFF	"Fade OFF"/Ramp down

6.1.3.11 **Accessory Protocol Interface Module (APIM/SYNC) requirements**

The APIM/SYNC shall be a subscriber to the BCM (Welcome Farewell State determination function) then use it to determine which screen/graphics to display.

6.1.3.11.1 Over-arching requirements

R: 6.1.3.10-1	The APIM/SYNC shall contain its Performance Latency within the End-to-End latency specified in section 3.2.2.1 "Performance Latency Requirements"
R: 6.1.3.10-2	The APIM/SYNC shall take into account the requirements contained within section 3.2.3 "Safety Requirements" to ensure that no screen/display that it directly controls ends up violating any requirement (specific to the market the target vehicle shall be sold in) within the aforementioned section.

R: 6.1.3.10-3	The APIM/SYNC shall take into account the requirements contained within section 3.2.4 "Security Requirements" to ensure that no screen/display that it directly controls (via control signal) ends up violating any requirement within the aforementioned section.
R: 6.1.3.10-4	The APIM shall be a publisher to signals it has been identified as a publisher for within section 6.1.2.3 "Signal requirements"

6.1.3.11.2 <u>Support Interior Day-Time Dimmable Backlighting Illumination for Display Brightness</u>

R: 6.1.3.2-109	The APIM shall subscribe to the (CAN) signals required by the subscribing function "Interior Day-time Dimmable Backlighting Illumination Algorithm" as identified in section 6.1.2.3 "Signal Requirements": Dimming_lvl, Litval and HMI_HMIMode_St. Note: Dimming_lvl ≠ OFF is a local sleep inhibitor. Modules on the network will allow the network(s) to sleep but illumination will remain ON indefinitely, no timeouts allowed. Local sleep is allowed then Dimming_lvl = OFF
R: 6.1.3.2-110	The APIM shall use the signals it has been identified as a subscriber to in section 6.1.2.3 "Signal Requirements" to transmit a control signal to Day-time Dimmable Backlighting Illumination directly connected to it that meet the requirements under section 5.4.7.1 "Day-time Dimmable" Backlighting Illumination Algorithm
R: 6.1.3.2-111	The APIM shall transmit a control signal to Day-time Dimmable Backlighting Illumination directly connected to it that will support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-022094 LINCOLN EMBRACE WELCOME AND FAREWELL BEHAVIOR REV. 1" for Lincoln vehicles

Table below provided as reference for APIM subscribed signals to Expected Initial Control Signal Response:

Subscriber Signal Mapping		Expected initial response as per section 5.4.7.1 "Day-time Dimmable" Backlighting Illumination Algorithm
Dimming_lvl	**HMI_HMIMode_St**	**Display Illumination Response**
Day_1 to Day_6 or Night_1 – Night_12	Don't Care	"Snap ON"/ Turn On
OFF	≠ OFFmode	"Snap ON"/ Turn On
OFF	OFFmode	"Snap OFF"/ Turn Off

Table below provided as reference for APIM subscribed signals to Expected Illumination Level

Dimming_lvl	**HMI_HMIMode_St**	**Desired Illumination Level**
Day_1 to Day_6 or Night_1 – Night_12	Don't Care	Day_1 to Day_6 or Night_1 – Night_12
Transition to OFF	≠ OFFmode	Night_12
OFF	OFFmode	OFF

6.1.3.11.3 <u>Support Welcome/Farewell Animations and Displays during Welcome Farewell sequence</u>

R: 6.1.3.1.3-8	The APIM shall meet the requirements listed under section 5.5.1 "Center-stack Welcome/Farewell Displays (Sync Screen)" (including the associated "State Determination Algorithm)
R: 6.1.3.1.3-8	The APIM will support the desired Welcome/Farewell state specific behavior specific to "Welcome" and "Farewell" graphics called out in "RQT-002004-022094 LINCOLN EMBRACE WELCOME AND FAREWELL BEHAVIOR REV. 1" for Lincoln vehicles
R: 6.1.3.1.3-1	The APIM shall use the signals it has been identified as a subscriber to in section 6.1.2.3 "Signal Requirements" to follow the state transitions as they're listed section 5.2.2 "Welcome/Farewell State determination without Battery saver tie-in" with the addition of "Extended Play" as described in section 3.1.2 under "Additional States": Ignition_Status, DrStatDrv_B_Actl, DrStatPsngr_B_Actl, Dimming_lvl, HMI_hmimode_st.

Welcome Farewell state	Required Signals	Behavior
Welcome Courtesy Lighting True	Ignition_Status	(Ignition_Status = OFF/ACCY) & Dimming_lvl ≠ OFF &

	DrStatDrv_B_Actl, DrStatPsngr_B_Actl Dimming_lvl	(DrStatDrv_B_Actl OR DrStatPsngr_B_Actl = Ajar)
Welcome Courtesy Lighting Delay True	Ignition_Status DrStatDrv_B_Actl, DrStatPsngr_B_Actl Dimming_lvl	(Ignition_Status = OFF/ACCY) & Dimming_lvl ≠ OFF & (DrStatDrv_B_Actl & DrStatPsngr_B_Actl = Closed)
Ignition RUN/Start	Ignition_Status	Ignition_Status = RUN/Start
Illuminated Exit True	Ignition_Status	Ignition_Status = RUN/Start transition to OFF & Dimming_lvl ≠ OFF
Extended Play	Ignition_Status HMI_hmimode_st	Ignition_Status = RUN/Start transition to OFF & (HMI_hmimode_st ≠ OFFmode)
Farewell Courtesy Lighting True	Ignition_Status DrStatDrv_B_Actl, DrStatPsngr_B_Actl Dimming_lvl	(Ignition_Status transition to OFF) & Dimming_lvl ≠ OFF &(DrStatDrv_B_Actl OR DrStatPsngr_B_Actl = Ajar)
Farewell Courtesy Lighting Delay True	Ignition_Status DrStatDrv_B_Actl, DrStatPsngr_B_Actl Dimming_lvl	(Ignition_Status transition to OFF) & Dimming_lvl ≠ OFF & (DrStatDrv_B_Actl & DrStatPsngr_B_Actl = Closed)

Note: Please refer to section 5.2.2 "Welcome/Farewell State Determination without Battery saver tie-in" for additional transition criteria, timeouts etc. "Approach Detection", "Illuminated Entry", and "Vehicle Locking" state should be treated the same as "Null". Dimming_lvl = nonOFF value

6.1.3.12 **Rear Audio Control Module (RACM) requirements**

The RACM shall be a subscriber to the BCM (Welcome Farewell State determination function) then use it to determine which screen/graphics to display.

6.1.3.12.1 Over-arching requirements

R: 6.1.3.10-5	The RACM shall contain its Performance Latency within the End-to-End latency specified in section 3.2.2.1 "Performance Latency Requirements"
R: 6.1.3.10-6	The RACM shall take into account the requirements contained within section 3.2.3 "Safety Requirements" to ensure that no screen/display that it directly controls ends up violating any requirement (specific to the market the target vehicle shall be sold in) within the aforementioned section.
R: 6.1.3.10-7	The RACM shall take into account the requirements contained within section 3.2.4 "Security Requirements" to ensure that no screen/display that it directly controls (via control signal) ends up violating any requirement within the aforementioned section.
R: 6.1.3.10-8	The RACM shall be a publisher to signals it has been identified as a publisher for within section 6.1.2.3 "Signal requirements"

6.1.3.12.2 Provide Control Signal to support Interior Day-Time Dimmable Illumination (Display Brightness and Switch Backlighting)

R: 6.1.3.2-112	The RACM shall subscribe to the (CAN) signals required by the subscribing function "Interior Day-time Dimmable Backlighting Illumination Algorithm" as identified in section 6.1.2.3 "Signal Requirements": Dimming_lvl, Litval and HMI_HMIMode_St. Note: Dimming_lvl ≠ OFF is a local sleep inhibitor. Modules on the network will allow the network(s) to sleep but illumination will remain ON indefinitely, no timeouts allowed. Local sleep is allowed then Dimming_lvl = OFF
R: 6.1.3.2-113	The RACM shall use the signals it has been identified as a subscriber to in section 6.1.2.3 "Signal Requirements" to transmit a control signal to Day-time Dimmable Backlighting Illumination directly connected to it that meet the requirements under section 5.4.7.1 "Day-time Dimmable" Backlighting Illumination Algorithm

R: 6.1.3.2-114	The RACM shall transmit a control signal to Day-time Dimmable Backlighting Illumination directly connected to it that will support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-022094 LINCOLN EMBRACE WELCOME AND FAREWELL BEHAVIOR REV. 1" for Lincoln vehicles
R: 6.1.3.2-115	The RACM shall transmit a control signal to Day-time Dimmable Backlighting Illumination directly connected to it that will satisfy the control signal specific requirements listed under Appendix 2 "Interior Lighting PWM Signal Specification"
R: 5.4.7.1.6-21	The RACM shall transmit a control signal to Interior Day-time Dimmable Backlighting elements directly connected to it that will support the desired Smooth Dimming behavior as detailed in the latest version of the following specification: "ES-H1BT-1A278-AA-VXX"

Table below provided as reference for RACM subscribed signals to Expected Initial Control Signal Response:

Subscriber Signal Mapping		Expected initial response as per section 5.4.7.1 "Day-time Dimmable" Backlighting Illumination Algorithm	
Dimming_lvl	HMI_HMIMode_St	Display Illumination Response	Backlighting Control Signal Response
Day_1 to Day_6 or Night_1 – Night_12	Don't Care	"Snap ON"/ Turn On	"Fade ON"/Ramp up
OFF	≠ OFFmode	"Snap ON"/ Turn On	"Fade ON"/Ramp up**
OFF	OFFmode	"Snap OFF"/ Turn Off	"Fade OFF"/Ramp down

**Note: Only for Radio Controls, remaining controls (i.e. HVAC): "Fade OFF"/Ramp down

Table below provided as reference for RACM subscribed signals to Expected Illumination Level

Dimming_lvl	HMI_HMIMode_St	Desired Illumination Level
Day_1 to Day_6 or Night_1 – Night_12	Don't Care	Day_1 - Day_6 or Night_1 – Night_12
Transition to OFF	≠ OFFmode	Night_12**
OFF	OFFmode	OFF

**Note: Only for Radio Controls, remaining controls (i.e. HVAC): OFF

6.1.3.12.3 <u>Provide Control Signal to support Interior Night-Time Dimmable Backlighting Illumination</u>

R: 6.1.3.2-116	The RACM shall subscribe to the (CAN) signals required by the subscribing function "Interior Night-time Dimmable Backlighting Illumination Algorithm" as identified in section 6.1.2.3 "Signal Requirements": Dimming_lvl, Litval and HMI_HMIMode_St. Note: Dimming_lvl ≠ OFF is a local sleep inhibitor. Modules on the network will allow the network(s) to sleep but illumination will remain ON indefinitely, no timeouts allowed. Local sleep is allowed then Dimming_lvl = OFF
R: 6.1.3.2-117	The RACM shall use the signals it has been identified as a subscriber to in section 6.1.2.3 "Signal Requirements" to transmit a control signal to Night-time Dimmable Backlighting Illumination directly connected to it that meet the requirements under section 5.4.7.3 "Night-time Dimmable" Backlighting Illumination Algorithm
R: 6.1.3.2-118	The RACM shall transmit a control signal to Night-time Dimmable Backlighting Illumination directly connected to it that will support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-022094 LINCOLN EMBRACE WELCOME AND FAREWELL BEHAVIOR REV. 1" for Lincoln vehicles
R: 6.1.3.2-119	The RACM shall transmit a control signal to Night-time Dimmable Backlighting Illumination directly connected to it that will satisfy the control signal specific requirements listed under Appendix 2 "Interior Lighting PWM Signal Specification"
R: 5.4.7.1.6-22	The RACM shall transmit a control signal to Interior Night-time Dimmable Backlighting elements directly connected to it that will support the desired Smooth Dimming behavior as detailed in the latest version of the following specification: "ES-H1BT-1A278-AA-VXX"

Table below provided as reference for RACM subscribed signals to Expected Initial Control Signal Response:

Subscriber Signal Mapping		Expected initial response as per section 5.4.7.5 "Night-time Dimmable" Backlighting Illumination Algorithm	
Dimming_lvl	HMI_HMIMode_St	Display Illumination Response	Backlighting Control Signal Response
Day_1 to Day_6 or Night_1 – Night_12	Don't Care	"Snap ON"/ Turn On	"Fade ON"/Ramp up
OFF	≠ OFFmode	"Snap ON"/ Turn On	"Fade ON"/Ramp up**
OFF	OFFmode	"Snap OFF"/ Turn Off	"Fade OFF"/Ramp down

**Note: Only for Radio Controls, remaining controls (i.e. HVAC): "Fade OFF"/Ramp down

Table below provided as reference for RACM subscribed signals to Expected Illumination Level

Dimming_lvl	HMI_HMIMode_St	Desired Illumination Level
Day_1 to Day_6 or Night_1 – Night_12	Don't Care	Day_1 - Day_6 or Night_1 – Night_12
Transition to OFF	≠ OFFmode	Night_12**
OFF	OFFmode	OFF

**Note: Only for Radio Controls, remaining controls (i.e. HVAC): OFF

6.1.3.12.4 <u>Support Welcome/Farewell Animations and Displays during Welcome Farewell sequence</u>

R: 6.1.3.1.3-9	The RACM shall meet the requirements listed under section 5.5.1 "Center-stack Welcome/Farewell Displays (Sync Screen)" (including the associated "State Determination Algorithm)
R: 6.1.3.1.3-9	The RACM will support the desired Welcome/Farewell state specific behavior specific to "Welcome" and "Farewell" graphics called out in "RQT-002004-022094 LINCOLN EMBRACE WELCOME AND FAREWELL BEHAVIOR REV. 1" for Lincoln vehicles
R: 6.1.3.1.3-2	The RACM shall use the signals it has been identified as a subscriber to in section 6.1.2.3 "Signal Requirements" to follow the state transitions as they're listed section 5.2.2 "Welcome/Farewell State determination without Battery saver tie-in" with the addition of "Extended Play" as described in section 3.1.2 under "Additional States": Ignition_Status, DrStatDrv_B_Actl, DrStatPsngr_B_Actl, HMI_hmimode_st.

Welcome Farewell state	Required Signals	Behavior
Ignition RUN/Start	Ignition_Status	Ignition_Status = RUN/Start
Illuminated Exit True	Ignition_Status	Ignition_Status = RUN/Start transition to OFF
Extended Play	Ignition_Status HMI_hmimode_st	Ignition_Status = RUN/Start transition to OFF & (HMI_hmimode_st ≠ OFFmode)
Farewell Courtesy Lighting True	Ignition_Status DrStatDrv_B_Actl, DrStatPsngr_B_Actl	(Ignition_Status transition to OFF) &(DrStatDrv_B_Actl OR DrStatPsngr_B_Actl = Ajar)
Farewell Courtesy Lighting Delay True	Ignition_Status DrStatDrv_B_Actl, DrStatPsngr_B_Actl	(Ignition_Status transition to OFF) &(DrStatDrv_B_Actl & DrStatPsngr_B_Actl = Closed)

Note: Please refer to section 5.2.2 "Welcome/Farewell State Determination without Battery saver tie-in" for additional transition criteria, timeouts etc. "Approach Detection", "Illuminated Entry", "Welcome Courtesy

Lighting", "Welcome Courtesy Lighting Delay" and "Vehicle Locking" state should be treated the same as "Null".

6.1.3.13   Instrument Panel Cluster (IPC) requirements

The IPC shall be a subscriber to the BCM (Welcome Farewell State determination function) then use it to determine which screen/graphics to display.

6.1.3.13.1 Over-arching requirements

R: 6.1.3.11-1	The IPC shall contain its Performance Latency within the End-to-End latency specified in section 3.2.2.1 "Performance Latency Requirements"
R: 6.1.3.11-2	The IPC shall take into account the requirements contained within section 3.2.3 "Safety Requirements" to ensure that no screen/display that it directly controls ends up violating any requirement (specific to the market the target vehicle shall be sold in) within the aforementioned section.
R: 6.1.3.11-3	The IPC shall take into account the requirements contained within section 3.2.4 "Security Requirements" to ensure that no screen/display that it directly controls (via control signal) ends up violating any requirement within the aforementioned section.

6.1.3.13.2 Provide Control Signal to support Interior Day-time Dimmable Backlighting/Display Illumination

R: 6.1.3.2-120	The IPC shall subscribe to the (CAN) signals required by the subscribing function "Interior Day-time Dimmable Backlighting Illumination Algorithm" as identified in section 6.1.2.3 "Signal Requirements": Dimming_lvl and Litval. Note: Dimming_lvl ≠ OFF is a local sleep inhibitor. Modules on the network will allow the network(s) to sleep but illumination will remain ON indefinitely, no timeouts allowed. Local sleep is allowed then Dimming_lvl = OFF
R: 6.1.3.2-121	The IPC shall use the signals it has been identified as a subscriber to in section 6.1.2.3 "Signal Requirements" to transmit a control signal to Day-time Dimmable Backlighting/Display Illumination directly connected to it that meet the requirements under section 5.4.7.1 "Day-time Dimmable" Backlighting Illumination Algorithm
R: 6.1.3.2-122	The IPC shall transmit a control signal to Day-time Dimmable Backlighting/Display Illumination directly connected to it that will support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-022094 LINCOLN EMBRACE WELCOME AND FAREWELL BEHAVIOR REV. 1" for Lincoln vehicles
R: 6.1.3.2-123	The IPC shall transmit a control signal to Day-time Dimmable Backlighting/Display Illumination directly connected to it that will satisfy the control signal specific requirements listed under Appendix 2 "Interior Lighting PWM Signal Specification"
R: 5.4.7.1.6-23	The IPC shall transmit a control signal to Interior Day-time Dimmable Backlighting /Display elements directly connected to it that will support the desired Smooth Dimming behavior as detailed in the latest version of the following specification: "ES-H1BT-1A278-AA-VXX"

Table below provided as reference for IPC subscribed signals to Expected Illumination Control Signal Response:

Subscriber Signal Mapping	Expected initial response as per section 5.4.7.1 "Day-time Dimmable" Backlighting Illumination Algorithm
Dimming_lvl	Control Signal Response
Day_1 – Day_6	"Fade ON"/Ramp up to "Day_1 – Day_6"
Night_1 – Night_12	"Fade ON"/Ramp up to "Night_1 – Night_12"
OFF	"Fade OFF"/Ramp down

6.1.3.13.3 Provide Control Signal to support Interior Night-Time Dimmable Backlighting Illumination

R: 6.1.3.2-124	The IPC shall subscribe to the (CAN) signals required by the subscribing function "Interior Night-time Dimmable Backlighting Illumination Algorithm" as identified in section 6.1.2.3 "Signal Requirements": Backlit_LED_Status and Litval. Note: Backlit_LED_Status ≠ OFF is a local sleep inhibitor. Modules on the network will allow the network(s) to sleep but

	illumination will remain ON indefinitely, no timeouts allowed. Local sleep is allowed then Backlit_LED_Status = OFF
R: 6.1.3.2-125	The IPC shall use the signals it has been identified as a subscriber to in section 6.1.2.3 "Signal Requirements" to transmit a control signal to Night-time Dimmable Backlighting Illumination directly connected to it that meet the requirements under section 5.4.7.3 "Night-time Dimmable" Backlighting Illumination Algorithm
R: 6.1.3.2-126	The IPC shall transmit a control signal to Night-time Dimmable Backlighting Illumination directly connected to it that will support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-022094 LINCOLN EMBRACE WELCOME AND FAREWELL BEHAVIOR REV. 1" for Lincoln vehicles
R: 6.1.3.2-127	The IPC shall transmit a control signal to Night-time Dimmable Backlighting Illumination directly connected to it that will satisfy the control signal specific requirements listed under Appendix 2 "Interior Lighting PWM Signal Specification"

Table below provided as reference for IPC subscribed signals to Expected Initial Control Signal Response:

Subscriber Signal Mapping	Expected initial response as per section 5.4.7.3 "Night-time Dimmable" Backlighting Illumination Algorithm
Backlit_LED_status	Control Signal Response
Night_1 – Night_12	"Fade ON"/Ramp up
OFF	"Fade OFF"/Ramp down

6.1.3.13.4 <u>Provide Control Signal to support Interior 2-Step Dimmable Backlighting Illumination</u>

R: 6.1.3.2-128	The IPC shall subscribe to the (CAN) signals required by the subscribing function "Interior 2-Step Dimmable Backlighting Illumination Algorithm" as identified in section 6.1.2.3 "Signal Requirements": Dimming_lvl and Litval. Note: Dimming_lvl ≠ OFF is a local sleep inhibitor. Modules on the network will allow the network(s) to sleep but illumination will remain ON indefinitely, no timeouts allowed. Local sleep is allowed then Dimming_lvl = OFF
R: 6.1.3.2-129	The IPC shall use the signals it has been identified as a subscriber to in section 6.1.2.3 "Signal Requirements" to transmit a control signal to 2-Step Dimmable Backlighting Illumination directly connected to it that meet the requirements under section 5.4.7.5 "2-Step Dimmable" Backlighting Illumination Algorithm
R: 6.1.3.2-130	The IPC shall transmit a control signal to 2-Step Dimmable Backlighting Illumination directly connected to it that will support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-022094 LINCOLN EMBRACE WELCOME AND FAREWELL BEHAVIOR REV. 1" for Lincoln vehicles
R: 6.1.3.2-131	The IPC shall transmit a control signal to 2-Step Dimmable Backlighting Illumination directly connected to it that will satisfy the control signal specific requirements listed under Appendix 2 "Interior Lighting PWM Signal Specification"
R: 5.4.7.1.6-24	The IPC shall transmit a control signal to 2-Step Dimmable Backlighting elements directly connected to it that will support the desired Smooth Dimming behavior as detailed in the latest version of the following specification: "ES-H1BT-1A278-AA-VXX"

Table below provided as reference for IPC subscribed signals to Expected Initial Control Signal Response:

Subscriber Signal Mapping	Expected initial response as per section 5.4.7.5 "2-Step Dimmable" Backlighting Illumination Algorithm
Dimming_lvl	Control Signal Response
Day_1 – Day_6	"Fade ON"/Ramp up to "Non-selectable Daytime level"
Night_1 – Night_12	"Fade ON"/Ramp up to "Non-selectable Nighttime level"
OFF	"Fade OFF"/Ramp down

6.1.3.13.5 <u>Support Welcome/Farewell Animations and Displays, Gauges/Acrylic Rings, Cluster Pointers and Odometer illumination during Welcome Farewell sequence</u>

The requirements under this section are only applicable to vehicles with push button ignitions. For any bladed key or alternative implementations please refer to "Welcome-Goodbye Strategy - CGEA1.3_v6.0" document.

R: 6.1.3.1.3-1	The IPC shall meet the welcome farewell state transition requirements listed under section 5.5.2 "Cluster Display, Pointers, and Odometer during Welcome/Farewell" – already takes inputs associated with each applicable state and their timeouts into account.
R: 6.1.3.1.3-10	The IPC will support the desired Welcome/Farewell state specific behavior (Illumination Levels) for "Welcome/Farewell Displays", "Instrument Cluster Backlighting / Gauges and/or Acrylic Rings", "Instrument Cluster Pointers" and "Odometer" called out in "RQT-002004-022094 LINCOLN EMBRACE WELCOME AND FAREWELL BEHAVIOR REV. X" for Lincoln vehicles.
R: 6.1.3.1.3-3	The IPC shall subscribe to the (CAN) signals required by the subscribing function " Vehicle Display Cluster Welcome/Farewell" as identified in section 6.1.2.3 "Signal Requirements" (included within state transition diagrams within section 5.2.2)

6.1.3.14 **Austere Heads-Up Display (aHUD) requirements**

The aHUD shall be a subscriber to the BCM (Welcome Farewell State determination function) then use it to determine which screen/graphics to display.

6.1.3.14.1 Over-arching requirements

R: 6.1.3.12-1	The AHUD shall contain its Performance Latency within the End-to-End latency specified in section 3.2.2.1 "Performance Latency Requirements"
R: 6.1.3.12-2	The AHUD shall take into account the requirements contained within section 3.2.3 "Safety Requirements" to ensure that no screen/display that it directly controls ends up violating any requirement (specific to the market the target vehicle shall be sold in) within the aforementioned section.
R: 6.1.3.12-3	The AHUD shall take into account the requirements contained within section 3.2.4 "Security Requirements" to ensure that no screen/display that it directly controls (via control signal) ends up violating any requirement within the aforementioned section.
R: 6.1.3.12-4	The aHUD shall be a publisher to signals it has been identified as a publisher for within section 6.1.2.3 "Signal requirements"

6.1.3.14.2 Support Welcome/Farewell Animations and Displays during Welcome Farewell sequence

R: 6.1.3.1.3-10	The aHUD shall meet the requirements listed under section 5.5.3 HUD Welcome/Farewell Displays (aHUD)" (including the associated "State Determination Algorithm)
R: 6.1.3.1.3-11	The aHUD will support the desired Welcome/Farewell state specific behavior specific to "Welcome" and "Farewell" graphics called out in "RQT-002004-022094 LINCOLN EMBRACE WELCOME AND FAREWELL BEHAVIOR REV. 1" for Lincoln vehicles
R: 6.1.3.1.3-1	The aHUD shall use the signals it has been identified as a subscriber to in section 6.1.2.3 "Signal Requirements" to follow the state transitions as they're listed section 5.2.2 "Welcome/Farewell State determination without Battery saver tie-in": Ignition_Status, DrStatDrv_B_Actl, DrStatPsngr_B_Actl,, DrStatRl_B_ Actl, DrStatRr_B_ Actl, and PudLamp_D_Rq

Welcome Farewell state	Required Signals	Behavior
Welcome Courtesy Lighting True	Ignition_Status DrStatDrv_B_Actl, DrStatPsngr_B_Actl	(Ignition_Status = OFF/ACCY) &(DrStatDrv_B_Actl OR DrStatPsngr_B_Actl = Ajar)
Welcome Courtesy Lighting Delay True	Ignition_Status DrStatDrv_B_Actl, DrStatPsngr_B_Actl	(Ignition_Status = OFF/ACCY) &(DrStatDrv_B_Actl & DrStatPsngr_B_Actl = Closed)
Ignition RUN/Start	Ignition_Status	Ignition_Status = RUN/Start
Illuminated Exit True	Ignition_Status	Ignition_Status = RUN/Start transition to OFF
Farewell Courtesy Lighting True	Ignition_Status DrStatDrv_B_Actl, DrStatPsngr_B_Actl	(Ignition_Status transition to OFF) &(DrStatDrv_B_Actl OR DrStatPsngr_B_Actl = Ajar)

	Ignition_Status	(Ignition_Status transition to OFF)
Farewell Courtesy Lighting Delay True	DrStatDrv_B_Actl, DrStatPsngr_B_Actl	&(DrStatDrv_B_Actl & DrStatPsngr_B_Actl = Closed)

Note: Please refer to section 5.2.2 "Welcome/Farewell State Determination without Battery saver tie-in" for additional transition criteria, timeouts etc. "Approach Detection", "Illuminated Entry", and "Vehicle Locking" state should be treated the same as "Null".

Due to aHUD initialization delays, aHUD will initialize at whichever occurs first: Pudlamp_D_Rq = Fade/ON or ON, Vehicle Door transitioning to ajar, or ignition transitioning to RUN/Start..

6.1.4 Lincoln Vehicle Lighting Element/Assembly Response Performance requirements

Requirement	Performance requirements (section reference)	Control Signal Source (for Illumination)	Component
R: 6.1.4-1	Section 5.3.2 "Exterior Front Illumination Lighting Response"	LDM	Headlamps (Low-beams) Front Side Markers Signature/Decorative LED Lamps Illuminated Lincoln Star Front Fog Lamps
R: 6.1.4-2	Section 5.3.4 "Exterior Rear Illumination Lighting Response"	R-FCM	Rear Parklamps Rear Applique Park Lamp (RAPL)
R: 6.1.4-3		BCM	Rear Corner Lamps
R: 6.1.4-4	Section 5.3.6 "Exterior Supplementary Illumination Lighting Response"	DDM	Driver's Welcome Mat
R: 6.1.4-5		PDM	Passenger's Welcome Mat
R: 6.1.4-6		RBM	Illuminated Power Running Boards
R: 6.1.4-7		BCM	Illuminated Door Handle Pockets
R: 6.1.4-8	Section 5.4.2 "Courtesy Lamps Lighting Response"	BCM	Courtesy Lamps Scuff Plates
R: 6.1.4-9	Section 5.4.4 "Ambient Lighting Illumination (without Static Sequential) Lighting Response"	ALM	Ambient Lighting
R: 6.1.4-10	Section 5.4.7.2 "Day-Time Dimmable Backlighting Illumination Response"	BCM	Pulsing PTS
R: 6.1.4-11		IPC	Cluster Backlighting/Indicators
R: 6.1.4-12		APIM	Center-stack display dimming
R: 6.1.4-13	Section 5.4.7.4 "Night-Time Dimmable Backlighting Illumination Response"	DDM/PDM/BCM	Door trim switch/button backlighting
R: 6.1.4-14		BCM	Headlamp switch IP & Overhead-Control Switch/Button
R: 6.1.4-15		IPC	Cluster Backlighting/Indicators
R: 6.1.4-16		FCIM	Sync/Radio Control button Backlighting
R: 6.1.4-17	Section 5.4.7.6 "2-step Dimmable Backlighting Illumination Response"	DDM/PDM/BCM	Door trim switch/button backlighting
R: 6.1.4-18		BCM	Headlamp switch IP & Overhead-Control Switch/Button
R: 6.1.4-19		FCIM	Sync/Radio Control button Backlighting
R: 6.1.4-20		IPC	Cluster Backlighting/Indicators
R: 6.1.4-21	Section 5.5.1 "Center-stack Welcome/Farewell Displays (Sync Screen)"	APIM	Center-stack Welcome/Farewell Displays
R: 6.1.4-22	Section 5.5.2 "Cluster Welcome/Farewell Displays (Sync Screen)"	IPC	Cluster Welcome/Farewell Displays Odometer
R: 6.1.4-23	Section 5.5.3 "HUD Welcome/Farewell Displays"	aHUD	aHUD Welcome/Farewell Displays

6.1.4.1 "Other" Performance requirements

This section is for lighting elements or vehicle part assemblies that have been identified on **"RQT-002004-022094 LINCOLN EMBRACE WELCOME AND FAREWELL BEHAVIOR REV. 1"** that respond to inputs that are outside the scope of "Welcome/Farewell" but have been included due to their impact on the feature as a whole (additionally these "features" have their own separate owners)

Requirement	Component	Control Signal Source (for Illumination)	Performance requirements owner
R: 6.1.4.1-1	Turn Signal Indicator	BCM	Body Security Group
R: 6.1.4.1-2	Illuminated Seat Belt Buckles	ALM	Interior Lighting Group Additional requirements contained within "Illuminated Belt Buckle Spec" owned by MMAJKOWS
R: 6.1.4.1-3	Night Lock Indication	BCM	Body Security Group
R: 6.1.4.1-4	Illuminated Deployable Running Board Performance	RBM	Body Electronics Group
R: 6.1.4.1-5	Autofold Mirrors	DDM/PDM	Body Electronics Group
R: 6.1.4.1-6	SECURICODE Keypad	BCM	Body Security Group
R: 6.1.4.1-7	Engine/Start stop LED	BCM	Body Electronics Group

6.2 Electrical Architecture – Ford Vehicles

Please note that the feature does not require specific modules (except the BCM) to be present on a vehicle, and is instead tailored to the content of the vehicle. The following section is a generic starting point to show how functions are allocated based off vehicle content and desired functionality.

6.2.1 Electrical Topology

Ford Welcome-Farewell topology diagrams for the following architectures:
* CGEA 1.3

6.2.1.1 Combined Network/Block Diagram

The following combined network/block diagram is a generic starting point, and the actual topology should be consulted for each specific implementation.
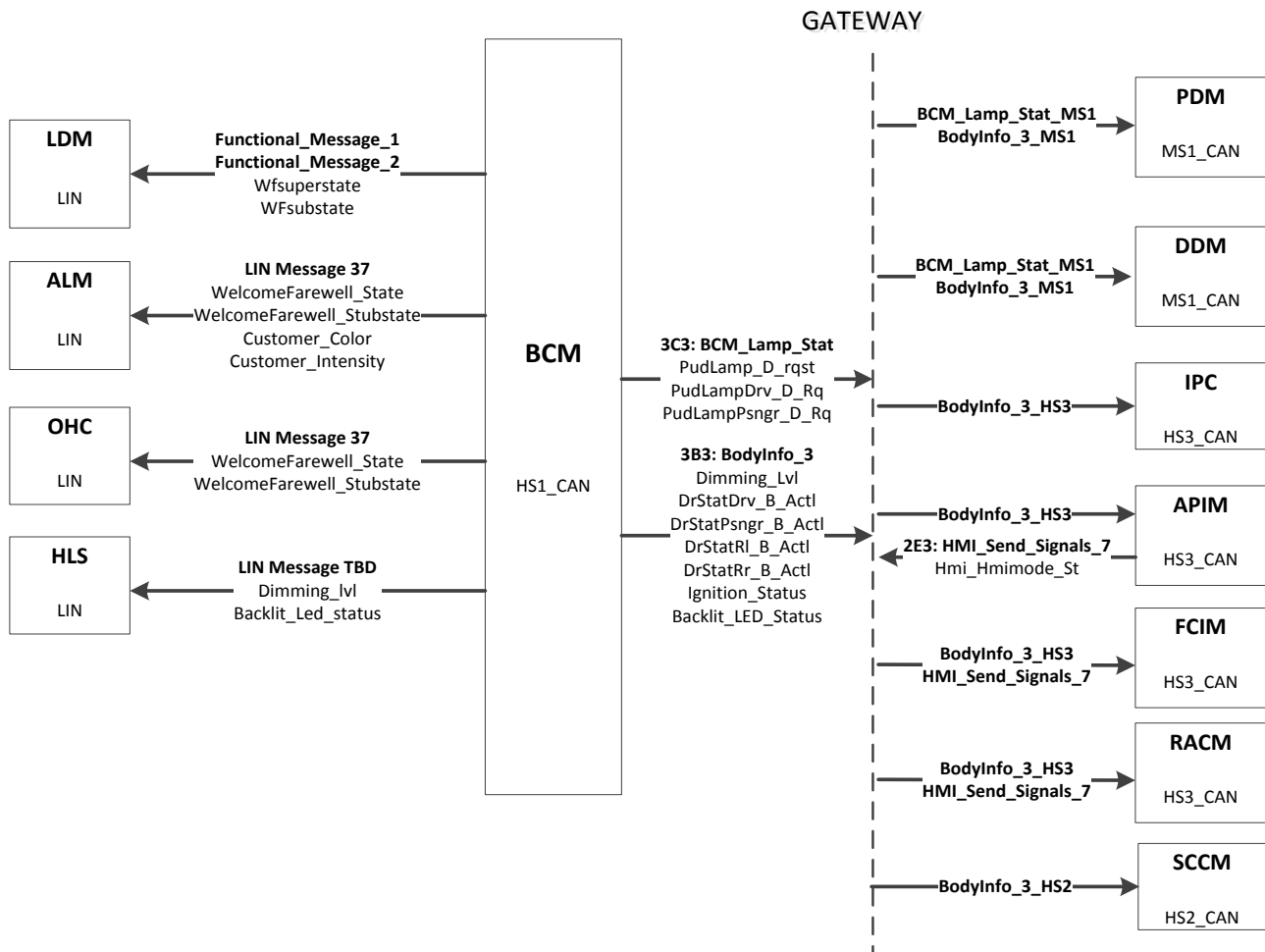
Figure 15: **Ford: Welcome Farewell Combined Network/Block Diagram**

6.2.2 **Common Requirements**

6.2.2.1 **Participating ECUs**

Rqm't Num	ECU	Requirement
R: 6.2.2-1	BCM	CAN Publisher, LIN Publisher
R: 6.2.2-2	LDM	LIN Subscriber
R: 6.2.2-3	ALM	LIN Subscriber
R: 6.2.2-4	OHC	LIN Subscriber
R: 6.2.2-5	HLS	LIN Subscriber
R: 6.2.2-6	DDM	CAN Subscriber
R: 6.2.2-7	PDM	CAN Subscriber
R: 6.2.2-8	IPC	CAN Subscriber
R: 6.2.2-9	APIM	CAN Publisher, CAN Subscriber
R: 6.2.2-10	RACM	CAN Subscriber
R: 6.2.2-11	FCIM	CAN Subscriber
R: 6.2.2-12	SCCM	CAN Subscriber
R: 6.2.2-13	SDLC	CAN Publisher, CAN Subscriber

6.2.2.2 **Performance and Functional Voltage Ranges**

For this feature, Performance Voltage Range is the same as the Functional Range. It shall be noted that below 9v.

Rqm't Num	Type	Voltage Range
R: 6.2.2.2-1	Performance	9-16v
R: 6.2.2.2-2	Functional	6-16v

6.2.2.3 **Signal Requirements**

The following section lists all of the signals required to complete the desired behaviors required by the Feature. It links the logical data-flows used within this document to the actual CAN OR LIN signals that are used by the modules.

6.2.2.3.1 CAN Signal Requirements

Requirement	Signal Database Detail	Value
	Signal Name	Dimming_Lvl
	Functional Voltage Range (Min,Max)	6-16v
	Performance Voltage Range (Min,Max)	9-16v
	Source Network	HS1 CAN
	Signal refresh rate	500 ms
	Publishing Interval (ms)	<= 40ms
	Publisher Latency Requirements	If microprocessor is awake: <= 51ms
		If microprocessor is asleep: <=121ms
	Publishing Network Sleep Inhibitor	If signal is not equal to OFF, then allow for network sleep but not for local sleep
	Updates Signal while asleep	Updates on change
	Network Wake Up	Wake up network on signal change to non-OFF value
	Max latency before signal is valid on Network wakeup	<= 50ms
	Max latency before signal is valid on reset	<= 120ms
	CAN Node Type	HS1
	Signal Domain	Refer to data dictionary
	Signal Transmit Strategy	Event Periodic
	Signal Send Type	OnChange
	Signal Transmit Cycle Time	500 ms
	End-to-End Latency Requirements	<=250 ms
	Publishing ECU	BCM
	Subscribing ECU	APIM, FCIM, IPC, DDM, PDM, SCCM, RACM
	Subscribing Function	APIM: Interior Dimmable Backlighting Illumination Algorithm FCIM: Interior Dimmable Backlighting Illumination Algorithm IPC: Interior Dimmable Backlighting Illumination Algorithm DDM: Interior Dimmable Backlighting Illumination Algorithm PDM: Interior Dimmable Backlighting Illumination Algorithm SCCM: Interior Dimmable Backlighting Illumination Algorithm RACM: Interior Dimmable Backlighting Illumination Algorithm

Requirement	Signal Database Detail	Value
	Signal Name	Litval
	Functional Voltage Range (Min,Max)	6-16v
	Performance Voltage Range (Min,Max)	9-16v
	Source Network	HS1 CAN
	Signal refresh rate	500 ms
	Publishing Interval (ms)	<= 40ms
	Publisher Latency Requirements	If microprocessor is awake: <= 51ms
		If microprocessor is asleep: <=121ms
	Publishing Network Sleep Inhibitor	If signal is not equal to OFF, then allow for network sleep but not for local sleep
	Updates Signal while asleep	Updates on change
	Network Wake Up	Wake up network on signal change to non-OFF value
	Max latency before signal is valid on Network wakeup	<= 50ms
	Max latency before signal is valid on reset	<= 120ms
	CAN Node Type	HS1
	Signal Domain	Refer to data dictionary
	Signal Transmit Strategy	Event Periodic
	Signal Send Type	OnChange
	Signal Transmit Cycle Time	500 ms
	End-to-End Latency Requirements	<=250 ms
	Publishing ECU	BCM
	Subscribing ECU	APIM, IPC, DDM, PDM, FCIM, SCCM, RACM
	Subscribing Function	APIM: Interior Dimmable Backlighting Illumination Algorithm FCIM: Interior Dimmable Backlighting Illumination Algorithm IPC: Interior Dimmable Backlighting Illumination Algorithm DDM: Interior Dimmable Backlighting Illumination Algorithm PDM: Interior Dimmable Backlighting Illumination Algorithm SCCM: Interior Dimmable Backlighting Illumination Algorithm RACM: Interior Dimmable Backlighting Illumination Algorithm

Requirement	Signal Database Detail	Value
	Signal Name	Delay_Accy
	Functional Voltage Range (Min,Max)	6-16v
	Performance Voltage Range (Min,Max)	9-16v
	Source Network	HS1 CAN
	Signal refresh rate	500 ms
	Publishing Interval (ms)	<= 40ms
	Publisher Latency Requirements	If microprocessor is awake: <= 51ms
		If microprocessor is asleep: <=121ms

Requirement	Signal Database Detail	Value
	Publishing Network Sleep Inhibitor	If signal is not equal to OFF, then allow for network sleep but not for local sleep
	Updates Signal while asleep	Updates on change
	Network Wake Up	Wake up network on signal change to non-OFF value
	Max latency before signal is valid on Network wakeup	<= 50ms
	Max latency before signal is valid on reset	<= 120ms
	CAN Node Type	HS1
	Signal Domain	Refer to data dictionary
	Signal Transmit Strategy	Event Periodic
	Signal Send Type	OnChange
	Signal Transmit Cycle Time	500 ms
	End-to-End Latency Requirements	<=250 ms
	Publishing ECU	BCM
	Subscribing ECU	IPC
	Subscribing Function	IPC: Vehicle Display Cluster Welcome/Farewell

Requirement	Signal Database Detail	Value
	Signal Name	Backlit_LED_Status
	Functional Voltage Range (Min,Max)	6-16v
	Performance Voltage Range (Min,Max)	9-16v
	Source Network	HS1 CAN
	Signal refresh rate	500 ms
	Publishing Interval (ms)	<= 40ms
	Publisher Latency Requirements	If microprocessor is awake: <= 51ms If microprocessor is asleep: <=121ms
	Publishing Network Sleep Inhibitor	If signal is not equal to OFF, then allow for network sleep but not for local sleep
	Updates Signal while asleep	Updates on change
	Network Wake Up	Wake up network on signal change to non-OFF value
	Max latency before signal is valid on Network wakeup	<= 50ms
	Max latency before signal is valid on reset	<= 120ms
	CAN Node Type	HS1
	Signal Domain	Refer to data dictionary
	Signal Transmit Strategy	Event Periodic
	Signal Send Type	OnChange
	Signal Transmit Cycle Time	500 ms
	End-to-End Latency Requirements	<=250 ms
	Publishing ECU	BCM
	Subscribing ECU	DDM, PDM, SCCM, IPC, FCIM, RACM
	Subscribing Function	DDM: Interior Night-time Dimmable Backlighting Illumination Algorithm PDM: Interior Night-time Dimmable Backlighting Illumination Algorithm SCCM: Interior Night-time Dimmable Backlighting Illumination Algorithm IPC: Interior Night-time Dimmable Backlighting Illumination Algorithm FCIM: Interior Night-time Dimmable Backlighting Illumination Algorithm

Requirement	Signal Database Detail	Value
		RACM: Interior Night-time Dimmable Backlighting Illumination Algorithm

Requirement	Signal Database Detail	Value
	Signal Name	HMI_HMIMode_St
	Functional Voltage Range (Min,Max)	6-16v
	Performance Voltage Range (Min,Max)	9-16v
	Source Network	HS3 CAN
	Signal refresh rate	500 ms
	Publishing Interval (ms)	<= 40ms
	Publisher Latency Requirements	If microprocessor is awake: <= 51ms
		If microprocessor is asleep: <=121ms
	Publishing Network Sleep Inhibitor	If signal is not equal to OFF, then allow for network sleep but not for local sleep
	Updates Signal while asleep	Updates on change
	Network Wake Up	Wake up network on signal change to non-OFF value
	Max latency before signal is valid on Network wakeup	<= 50ms
	Max latency before signal is valid on reset	<= 120ms
	CAN Node Type	HS3
	Signal Domain	Refer to data dictionary
	Signal Transmit Strategy	Event Periodic
	Signal Send Type	OnChange
	Signal Transmit Cycle Time	500 ms
	End-to-End Latency Requirements	<=250 ms
	Publishing ECU	APIM
	Subscribing ECU	FCIM, RACM
	Subscribing Function	FCIM: Interior Day-time Dimmable Backlighting Illumination Algorithm FCIM: Interior Night-time Dimmable Backlighting Illumination Algorithm FCIM: Interior 2 step Dimmable Backlighting Illumination Algorithm RACM: Interior Day-time Dimmable Backlighting Illumination Algorithm RACM: Interior Night-time Dimmable Backlighting Illumination Algorithm

Requirement	Signal Database Detail	Value
	Signal Name	Ignition_Status
	Functional Voltage Range (Min,Max)	6-16v

Requirement	Signal Database Detail	Value
	Performance Voltage Range (Min,Max)	9-16v
	Source Network	HS1 CAN
	Signal refresh rate	1000ms
	Publishing Interval (ms)	<= 40ms
	Publisher Latency Requirements	If microprocessor is awake: <= 51ms
		If microprocessor is asleep: <=121ms
	Publishing Network Sleep Inhibitor	If signal is not equal to OFF, then allow for network sleep but not for local sleep
	Updates Signal while asleep	Updates on change
	Network Wake Up	Wake up network on signal change to non-OFF value
	Max latency before signal is valid on Network wakeup	<= 50ms
	Max latency before signal is valid on reset	<= 120ms
	CAN Node Type	HS1
	Signal Domain	Refer to data dictionary
	Signal Transmit Strategy	Event Periodic
	Signal Send Type	OnChange
	Signal Transmit Cycle Time	500 ms
	End-to-End Latency Requirements	<=250 ms
	Publishing ECU	BCM
	Subscribing ECU	APIM, IPC, AHUD, RACM
	Subscribing Function	APIM: Vehicle Display Center-stack Welcome/Farewell IPC: Vehicle Display Cluster Welcome/Farewell aHUD: Vehicle Display aHUD Welcome/Farewell RACM: Vehicle Display Center-stack Welcome/Farewell

Requirement	Signal Database Detail	Value
	Signal Name	DrStatDrv_B_Actl
	Functional Voltage Range (Min,Max)	6-16v
	Performance Voltage Range (Min,Max)	9-16v
	Source Network	HS1 CAN
	Signal refresh rate	500 ms
	Publishing Interval (ms)	<= 40ms
	Publisher Latency Requirements	If microprocessor is awake: <= 51ms
		If microprocessor is asleep: <=121ms
	Publishing Network Sleep Inhibitor	If signal is not equal to Closed, then allow for network sleep but not for local sleep
	Updates Signal while asleep	Updates on change

	Network Wake Up	Wake up network on signal change
	Max latency before signal is valid on Network wakeup	<= 50ms
	Max latency before signal is valid on reset	<= 120ms
	CAN Node Type	HS1
	Signal Domain	Refer to data dictionary
	Signal Transmit Strategy	Event Periodic
	Signal Send Type	OnChange
	Signal Transmit Cycle Time	500 ms
	End-to-End Latency Requirements	<=250 ms
	Publishing ECU	BCM
	Subscribing ECU	DDM, APIM, IPC, aHUD, RACM
	Subscribing Function	DDM: Exterior Supplementary Illumination Algorithm APIM: Vehicle Display Center-stack Welcome/Farewell IPC: Vehicle Display Cluster Welcome/Farewell aHUD: Vehicle Display aHUD Welcome/Farewell RACM: Vehicle Display Center-stack Welcome/Farewell

Requirement	Signal Database Detail	Value
	Signal Name	DrStatPsngr_B_Actl
	Functional Voltage Range (Min,Max)	6-16v
	Performance Voltage Range (Min,Max)	9-16v
	Source Network	HS1 CAN
	Signal refresh rate	500 ms
	Publishing Interval (ms)	<= 40ms
	Publisher Latency Requirements	If microprocessor is awake: <= 51ms
		If microprocessor is asleep: <=121ms
	Publishing Network Sleep Inhibitor	If signal is not equal to Closed, then allow for network sleep but not for local sleep
	Updates Signal while asleep	Updates on change
	Network Wake Up	Wake up network on signal change
	Max latency before signal is valid on Network wakeup	<= 50ms
	Max latency before signal is valid on reset	<= 120ms
	CAN Node Type	HS1
	Signal Domain	Refer to data dictionary
	Signal Transmit Strategy	Event Periodic
	Signal Send Type	OnChange
	Signal Transmit Cycle Time	500 ms
	End-to-End Latency Requirements	<=250 ms
	Publishing ECU	BCM

	Subscribing ECU	PDM, APIM, IPC, AHUD, RACM
	Subscribing Function	PDM: Exterior Supplementary Illumination Algorithm APIM: Vehicle Display Center-stack Welcome/Farewell IPC: Vehicle Display Cluster Welcome/Farewell aHUD: Vehicle Display aHUD Welcome/Farewell RACM: Vehicle Display Center-stack Welcome/Farewell

Requirement	Signal Database Detail	Value
	Signal Name	DrStatRl_B_Actl
	Functional Voltage Range (Min,Max)	6-16v
	Performance Voltage Range (Min,Max)	9-16v
	Source Network	HS1 CAN
	Signal refresh rate	500 ms
	Publishing Interval (ms)	<= 40ms
	Publisher Latency Requirements	If microprocessor is awake: <= 51ms
		If microprocessor is asleep: <=121ms
	Publishing Network Sleep Inhibitor	If signal is not equal to Closed, then allow for network sleep but not for local sleep
	Updates Signal while asleep	Updates on change
	Network Wake Up	Wake up network on signal change
	Max latency before signal is valid on Network wakeup	<= 50ms
	Max latency before signal is valid on reset	<= 120ms
	CAN Node Type	HS1
	Signal Domain	Refer to data dictionary
	Signal Transmit Strategy	Event Periodic
	Signal Send Type	OnChange
	Signal Transmit Cycle Time	500 ms
	End-to-End Latency Requirements	<=250 ms
	Publishing ECU	BCM
	Subscribing ECU	IPC, aHUD
	Subscribing Function	IPC: Vehicle Display Cluster Welcome/Farewell aHUD: Vehicle Display aHUD Welcome/Farewell

Requirement	Signal Database Detail	Value
	Signal Name	DrStatRr_B_Actl
	Functional Voltage Range (Min,Max)	6-16v
	Performance Voltage Range (Min,Max)	9-16v
	Source Network	HS1 CAN
	Signal refresh rate	500 ms
	Publishing Interval (ms)	<= 40ms

Requirement	Signal Database Detail	Value
	Publisher Latency Requirements	If microprocessor is awake: <= 51ms
		If microprocessor is asleep: <=121ms
	Publishing Network Sleep Inhibitor	If signal is not equal to Closed, then allow for network sleep but not for local sleep
	Updates Signal while asleep	Updates on change
	Network Wake Up	Wake up network on signal change
	Max latency before signal is valid on Network wakeup	<= 50ms
	Max latency before signal is valid on reset	<= 120ms
	CAN Node Type	HS1
	Signal Domain	Refer to data dictionary
	Signal Transmit Strategy	Event Periodic
	Signal Send Type	OnChange
	Signal Transmit Cycle Time	500 ms
	End-to-End Latency Requirements	<=250 ms
	Publishing ECU	BCM
	Subscribing ECU	IPC, HUD (adv)
	Subscribing Function	IPC: Vehicle Display Cluster Welcome/Farewell aHUD: Vehicle Display aHUD Welcome/Farewell

Requirement	Signal Database Detail	Value
	Signal Name	PudLamp_D_Rq
	Functional Voltage Range (Min,Max)	6-16v
	Performance Voltage Range (Min,Max)	9-16v
	Source Network	HS1 CAN
	Signal refresh rate	500 ms
	Publishing Interval (ms)	<= 40ms
	Publisher Latency Requirements	If microprocessor is awake: <= 51ms
		If microprocessor is asleep: <=121ms
	Publishing Network Sleep Inhibitor	If signal is not equal to OFF, then allow for network sleep but not for local sleep
	Updates Signal while asleep	Updates on change
	Network Wake Up	Wake up network on signal change to non-OFF value
	Max latency before signal is valid on Network wakeup	<= 50ms
	Max latency before signal is valid on reset	<= 120ms
	CAN Node Type	HS1
	Signal Domain	Refer to data dictionary

	Signal Transmit Strategy	Event Periodic
	Signal Send Type	OnChange
	Signal Transmit Cycle Time	500 ms
	End-to-End Latency Requirements	<=250 ms
	Publishing ECU	BCM
	Subscribing ECU	DDM, PDM, AHUD
	Subscribing Function	DDM: Exterior Supplementary Illumination Algorithm PDM: Exterior Supplementary Illumination Algorithm aHUD: Vehicle Display aHUD Welcome/Farewell

6.2.2.3.2   CAN Error Handling for Signal Gateway Messages

Requirements for signals that go missing either due to SNA or NC for a period of time, as per document name: "Diagnostic Fault Coverage and DTC Numbers Design Consideration", section 3.5 "Detection of faults caused by signal content and data values received from other ECUs"

R: 6.2.2.3.1-1	If a Signal gateway message containing the transmitted signal has an update bit which shows "not updated" for less than a period of time as per "Diagnostic Fault Coverage and DTC Numbers Design Consideration" (typically 5 seconds). Then the subscriber shall continue using last known value of the signal
R: 6.2.2.3.1-2	If a Signal gateway message containing the transmitted signal has an update bit which shows "not updated" for greater than a period of time as per "Diagnostic Fault Coverage and DTC Numbers Design Consideration" (typically 5 seconds). Then the subscriber shall use the signal's default value as listed in the data dictionary

6.2.2.3.3   CAN Error Handling for Frame Gateway Messages

Requirements for Frame Message that go missing due to SNA or NC for a period of time as per document name: "Diagnostic Fault Coverage and DTC Numbers Design Consideration", section 3.5 "Detection of faults caused by signal content and data values received from other ECUs"

R: 6.2.2.3.2-1	If a Frame gateway message goes missing for less than a period of time as per "Diagnostic Fault Coverage and DTC Numbers Design Consideration" (typically 5 seconds). Then the subscriber shall continue using last known value of the signal received in the last Frame message.
R: 6.2.2.3.2-2	If a Frame gateway message goes missing for greater than a period of time as per "Diagnostic Fault Coverage and DTC Numbers Design Consideration" (typically 5 seconds). Then the subscriber shall use the signal's default value as listed in the data dictionary

6.2.2.3.4   LIN Signal Requirements

It should be noted that the following section does not cover the level of details included under the previous "CAN Signal Requirements", since that level of details is owned and controlled by the LIN module owner, and contained within the LDFs.

The intention of this section is to list the required LIN signals to ensure that they are not discarded due to any future LDF updates.

Requirement	Signal Database Detail	Value
	Signal Name	Dimming_lvl
	Source Network	LIN
	Signal refresh rate	<=40ms
	Signal Domain	Refer to Data Dictionary

Requirement	Signal Database Detail	Value
	Signal Transmit Strategy	<=40ms Event Periodic
	Signal Send Type	OnChange
	Signal Transmit Cycle Time	<=40ms Event Periodic
	Publishing ECU	BCM
	Subscribing ECU	HLS
	Subscribing Function	HLS: Interior Day-time Dimmable Backlighting Illumination Algorithm

Requirement	Signal Database Detail	Value
	Signal Name	Litval
	Source Network	LIN
	Signal refresh rate	<=40ms
	Signal Domain	Refer to Data Dictionary
	Signal Transmit Strategy	<=40ms Event Periodic
	Signal Send Type	OnChange
	Signal Transmit Cycle Time	<=40ms Event Periodic
	Publishing ECU	BCM
	Subscribing ECU	HLS
	Subscribing Function	HLS: Interior Day-time Dimmable Backlighting Illumination Algorithm

Requirement	Signal Database Detail	Value
	Signal Name	Ignition_Status
	Source Network	LIN
	Signal refresh rate	<=40ms
	Signal Domain	Refer to data dictionary
	Signal Transmit Strategy	Event Periodic
	Signal Send Type	OnChange
	Signal Transmit Cycle Time	<=40ms
	Publishing ECU	BCM
	Subscribing ECU	LDM, ALM, OHC
	Subscribing Function	LDM: Exterior Front Illumination Algorithm; ALM: Interior Ambient Light Illumination (with Static Sequential) Algorithm ALM: Interior Ambient Light Illumination (without Static Sequential) Algorithm OHC: Interior Courtesy Lamps Illumination Algorithm

Requirement	Signal Database Detail	Value
	Signal Name	Wfsuperstate
	Source Network	LIN
	Signal refresh rate	<=40ms
	Signal Domain	Refer to Data Dictionary
	Signal Transmit Strategy	<=40ms Event Periodic
	Signal Send Type	OnChange

Requirement	Signal Database Detail	Value
	Signal Transmit Cycle Time	<=40ms Event Periodic
	Publishing ECU	BCM
	Subscribing ECU	LDM, R-FCM
	Subscribing Function	LDM: Exterior Front Illumination Algorithm; R-FCM: Exterior Rear Illumination Algorithm;

Requirement	Signal Database Detail	Value
	Signal Name	Wfsubstate
	Source Network	LIN
	Signal refresh rate	<=40ms
	Signal Domain	Refer to Data Dictionary
	Signal Transmit Strategy	<=40ms Event Periodic
	Signal Send Type	OnChange
	Signal Transmit Cycle Time	<=40ms Event Periodic
	Publishing ECU	BCM
	Subscribing ECU	LDM, R-FCM
	Subscribing Function	LDM: Exterior Front Illumination Algorithm; R-FCM: Exterior Rear Illumination Algorithm;

Requirement	Signal Database Detail	Value
	Signal Name	WelcomeFarewell_State
	Source Network	LIN
	Signal refresh rate	<=40ms
	Signal Domain	Refer to Data Dictionary
	Signal Transmit Strategy	<=40ms Event Periodic
	Signal Send Type	OnChange
	Signal Transmit Cycle Time	<=40ms Event Periodic
	Publishing ECU	BCM
	Subscribing ECU	ALM, OHC
	Subscribing Function	ALM: Interior Ambient Light Illumination (with Static Sequential) Algorithm ALM: Interior Ambient Light Illumination (without Static Sequential) Algorithm OHC: Interior Courtesy Lamps Illumination Algorithm

Requirement	Signal Database Detail	Value
	Signal Name	WelcomeFarewell_Substate
	Source Network	LIN
	Signal refresh rate	<=40ms
	Signal Domain	Refer to Data Dictionary
	Signal Transmit Strategy	<=40ms Event Periodic
	Signal Send Type	OnChange

Requirement	Signal Database Detail	Value
	Signal Transmit Cycle Time	<=40ms Event Periodic
	Publishing ECU	BCM
	Subscribing ECU	ALM, OHC
	Subscribing Function	ALM: Interior Ambient Light Illumination (with Static Sequential) Algorithm ALM: Interior Ambient Light Illumination (without Static Sequential) Algorithm OHC: Interior Courtesy Lamps Illumination Algorithm

Requirement	Signal Database Detail	Value
	Signal Name	Customer_Color
	Source Network	LIN
	Signal refresh rate	<=40ms
	Signal Domain	Refer to data dictionary
	Signal Transmit Strategy	Event Periodic
	Signal Send Type	OnChange
	Signal Transmit Cycle Time	<=40ms
	Publishing ECU	BCM
	Subscribing ECU	ALM
	Subscribing Function	ALM: Interior Ambient Light Illumination (with Static Sequential) Algorithm ALM: Interior Ambient Light Illumination (without Static Sequential) Algorithm

Requirement	Signal Database Detail	Value
	Signal Name	Customer_Intensity
	Source Network	LIN
	Signal refresh rate	<=40ms
	Signal Domain	Refer to data dictionary
	Signal Transmit Strategy	Event Periodic
	Signal Send Type	OnChange
	Signal Transmit Cycle Time	<=40ms
	Publishing ECU	BCM
	Subscribing ECU	ALM
	Subscribing Function	ALM: Interior Ambient Light Illumination (with Static Sequential) Algorithm ALM: Interior Ambient Light Illumination (without Static Sequential) Algorithm

6.2.2.3.5 Linking Logical Data Flows to CAN/LIN Signals

Rqmt #	Logical Data Flow	Logical Data Flow Domain Name	Signal Name	Signal Domain Value
R: 6.1.2.3.4-	Ignition Status	Vehicle Ignition is OFF	Ignition_Status	OFF
		Vehicle Ignition is Accessory		Accessory

		Vehicle Ignition is Run		RUN
		Vehicle Ignition is Start		Start
		Not supported		Unknown
		Not supported		Invalid
R: 6.1.2.3.4-	Driver Door Status	Driver Door Ajar	DrStatDrv_B_Actl	Ajar
		Driver Door Closed		Closed
R: 6.1.2.3.4-	Passenger Door Status	Passenger Door Ajar	DrStatPsngr_B_Actl	Ajar
		Passenger Door Closed		Closed
R: 6.1.2.3.4-	Rear Left Door Status	Rear Left Door Ajar	DrStatRl_B_Actl	Ajar
		Rear Left Door Closed		Closed
R: 6.1.2.3.4-	Rear Right Door Status	Rear Right Door Ajar	DrStatRr_B_Actl	Ajar
		Rear Right Door Closed		Closed
R: 6.1.2.3.4-	Battery Saver Timer	Battery Saver Timer Active	Courtesy_Bsave_Stat	No_Effect
		Battery Saver Timer Expired		Off
		Not supported		Unknown
		Not supported		Invalid
R: 6.1.2.3.4-	Delayed Accessory	Delayed Accessory True	Delay_Accy	ON
		Delayed Accessory False		OFF
R: 6.1.2.3.4-	Extended Play	Extended Play True	HMI_HMIMode_St	On
		Extended Play False		OffMode
		Not supported		Phone
		Not supported		Climate
		Not supported		Load_Shed_Active
		Not supported		Invalid

6.2.3 Ford Vehicle ECU specific requirements

6.2.3.1 Body Control Module (BCM)

The Body Control Module (BCM) shall be responsible for doing the Welcome Farewell State determination (both with and without battery saver) and then either transmitting the state information (via CAN or LIN) or transmitting a control signal to a specific lighting element that is directly connected to it.

6.2.3.1.1 Over-arching requirements

R: 6.2.3.1.1-1	The BCM shall contain its Performance Latency within the End-to-End latency specified in section 3.2.2.1 "Performance Latency Requirements"
R: 6.2.3.1.1-2	The BCM shall take into account the requirements contained within section 3.2.3 "Safety Requirements" to ensure that no lighting element that it directly controls (via control signal) ends up violating any requirement (specific to the market the target vehicle shall be sold in) within the aforementioned section.
R: 6.2.3.1.1-3	The BCM shall take into account the requirements contained within section 3.2.4 "Security Requirements" to ensure that no lighting element that it directly controls (via control signal) ends up violating any requirement within the aforementioned section.

R: 6.1.3.1.1-2	The BCM shall meet the publisher requirements for all the signals it has been identified as a publisher to within section 6.2.2.3 "Signal Requirements"
R: 6.1.3.1.1-2	The BCM shall meet the subscriber requirements for all the signals it has been identified as a subscriber to within section 6.2.2.3 "Signal Requirements"

6.2.3.1.2   Support Welcome Farewell State Determination functions

R: 6.2.3.1.2-1	The BCM shall meet the "Welcome/Farewell State Determination" requirements under section 5.2 – shall be capable of supporting both "Welcome/Farewell State Determination without Battery Saver tie-in" and "Welcome/Farewell State Determination with Battery Saver tie-in" functions / state transitions

6.2.3.1.3   Support Exterior Front Illumination

6.2.3.1.3.1   Rely on BCM for Control Signal

R: 6.1.3.1.3-11	The BCM shall transmit a control signal to Exterior Front Illumination elements directly connected to it that meet the requirements under section 5.3.1 "Exterior Front Illumination Algorithm" (including the associated "State Determination Algorithm)
R: 6.1.3.1.3-12	The BCM shall transmit a control signal to Exterior Front Illumination elements directly connected to it that will support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-021878 DNA WELCOME-FAREWELL STRATEGY REV. 1" for Ford vehicles
R: 6.1.3.1.3-8	The BCM shall transmit a control signal to Exterior Front Illumination elements directly connected to it that will satisfy the control signal specific requirements listed under Appendix 1 "Exterior Lighting PWM Signal Specification"

6.2.3.1.3.2   Modules that subscribe to BCM via LIN

R: 6.1.3.1.3-5	The BCM shall use the outputs/state determination from section 5.2.2 "Welcome/Farewell State Determination without Battery Saver tie-in" function to then transmit WFsuperstate and WFsubstate as listed in the table below in order to support Exterior Front Illumination

Rqmt #	Logical Data Flow	Logical Data Flow Domain Name	Wfsuperstate	Wfsubstate
R: 6.1.2.3.5-2	Approach Detection	Approach Detected	Welcome	Approach
		Approach Not Detected	Don't care	NULL**
R: 6.1.2.3.5-3	Illuminated Entry	Illuminated Entry True	Welcome	IllumEntry
		Illuminated Entry False	Don't care	NULL**
R: 6.1.2.3.5-3	Courtesy Lighting	Courtesy Lighting True	Don't care	DoorAjarCourtesyLight
		Courtesy Lighting False	Don't care	NULL**
R: 6.1.2.3.5-3	Courtesy Lighting Delay	Courtesy Lighting Delay True	Don't care	CourtesyLightDelay
		Courtesy Lighting Delay False	Don't care	NULL**
R: 6.1.2.3.5-3	Illuminated Exit	Illuminated Exit True	Farewell	IllExit
		Illuminated Exit False	Don't care	NULL**
R: 6.1.2.3.5-3	Ignition State	Vehicle Ignition is OFF	NOT (RunStart)	Don't Care

		Vehicle Ignition is in Accessory	NOT (RunStart)	Don't Care
		Vehicle Ignition is in Run/Start	RunStart	NULL**
	Vehicle Locking	Vehicle Locking True	OFF	NULL
R: 6.1.2.3.5-3		Vehicle Locking False	Don't care	NULL**

6.2.3.1.4 Support Exterior Rear Illumination

6.2.3.1.4.1 Rely on BCM for Control Signal

R: 6.1.3.1.3-12	The BCM shall transmit a control signal to Exterior Rear Illumination elements directly connected to it that meet the requirements under section 5.3.3 "Exterior Rear Illumination Algorithm" (including the associated "State Determination Algorithm)
R: 6.1.3.1.3-13	The BCM shall transmit a control signal to Exterior Rear Illumination elements directly connected to it that will support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-021878 DNA WELCOME-FAREWELL STRATEGY REV. 1" for Ford vehicles
R: 6.1.3.1.3-9	The BCM shall transmit a control signal to Exterior Rear Illumination elements directly connected to it that will satisfy the control signal specific requirements listed under Appendix 1 "Exterior Lighting PWM Signal Specification"

6.2.3.1.4.2 Modules that subscribe to BCM via LIN

R: 6.1.3.1.3-6	The BCM shall use the outputs/state determination from section 5.2.2 "Welcome/Farewell State Determination without Battery Saver tie-in" function to then transmit WFsuperstate and WFsubstate as listed in the table below in order to support Exterior Rear Illumination

Rqmt #	Logical Data Flow	Logical Data Flow Domain Name	Wfsuperstate	Wfsubstate
	Approach Detection	Approach Detected	Welcome	Approach
R: 6.1.2.3.5-3		Approach Not Detected	Don't care	NULL**
	Illuminated Entry	Illuminated Entry True	Welcome	IllumEntry
R: 6.1.2.3.5-3		Illuminated Entry False	Don't care	NULL**
	Courtesy Lighting	Courtesy Lighting True	Don't care	DoorAjarCourtesyLight
R: 6.1.2.3.5-3		Courtesy Lighting False	Don't care	NULL**
	Courtesy Lighting Delay	Courtesy Lighting Delay True	Don't care	CourtesyLightDelay
R: 6.1.2.3.5-3		Courtesy Lighting Delay False	Don't care	NULL**
	Illuminated Exit	Illuminated Exit True	Farewell	IllExit
R: 6.1.2.3.5-4		Illuminated Exit False	Don't care	NULL**
	Ignition State	Vehicle Ignition is OFF	NOT (RunStart)	Don't Care
		Vehicle Ignition is in Accessory	NOT (RunStart)	Don't Care
R: 6.1.2.3.5-4		Vehicle Ignition is in Run/Start	RunStart	NULL**

| | Vehicle Locking | Vehicle Locking True | OFF | NULL |
| R: 6.1.2.3.5-4 | | Vehicle Locking False | Don't care | NULL** |

6.2.3.1.5 Support Exterior Supplementary Illumination

6.2.3.1.5.1 Rely on BCM for Control Signal

R: 6.1.3.1.3-13	The BCM shall transmit a control signal to Exterior Supplementary Illumination elements directly connected to it that meet the requirements under section 5.3.5 "Exterior Supplementary Illumination Algorithm" (including the associated "State Determination Algorithm)
R: 6.1.3.1.3-14	The BCM shall transmit a control signal to Exterior Supplementary Illumination elements directly connected to it that will support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-021878 DNA WELCOME-FAREWELL STRATEGY REV. 1" for Ford vehicles
R: 6.1.3.1.3-10	The BCM shall transmit a control signal to Exterior Supplementary Illumination elements directly connected to it that will satisfy the control signal specific requirements listed under Appendix 1 "Exterior Lighting PWM Signal Specification"

6.2.3.1.5.2 Modules that subscribe to CAN signals originating from BCM (can be via Gateway)

| R: 6.1.3.1.3-4 | The BCM shall use the outputs/state determination from section 5.2.3 "Welcome/Farewell State Determination with Battery Saver tie-in" function to then transmit PudLamp_D_Rq, as listed in the table below in order to support Exterior Supplementary Illumination |

Rqmt #	Approach Detected	Illuminated Entry	Courtesy Lighting	Courtesy Lighting Delay	PudLamp_D_Rq
2.2.3.6-14	Approach Detected	(Don't Care)	(Don't Care)	(Don't Care)	Ramp_Up
2.2.3.6-15	Approach Not Detected	Illuminated Entry True (Keyfob/PK unlock)	(Don't Care)	(Don't Care)	Ramp_Up
2.2.3.6-16	Approach Not Detected	Illuminated Entry True (Keypad unlock)	(Don't Care)	(Don't Care)	Ramp_Up
2.2.3.6-17	Approach Not Detected	Illuminated Entry True (Cylinder unlock)	(Don't Care)	(Don't Care)	Ramp_Up
2.2.3.6-16	Approach Not Detected	Illuminated Entry False	Courtesy Lighting True	(Don't Care)	Ramp_Up
2.2.3.6-17	Approach Not Detected	Illuminated Entry False	Courtesy Lighting False	Courtesy Lighting Delay True	Ramp_Up
2.2.3.6-18	Approach Not Detected	Illuminated Entry False	Courtesy Lighting False	Courtesy Lighting Delay False	Ramp_Down

6.2.3.1.6 Support Interior Courtesy Lamps Illumination

6.2.3.1.6.1 Rely on BCM for Control Signal

| R: 6.1.3.1.3-14 | The BCM shall transmit a control signal to Interior Courtesy Lamps Illumination elements directly connected to it that meet the requirements under section 5.4.1 "Courtesy Lamps Illumination Algorithm" (including the associated "State Determination Algorithm) |

R: 6.1.3.1.3-15	The BCM shall transmit a control signal to Courtesy Lamps Illumination elements directly connected to it that will support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-021878 DNA WELCOME-FAREWELL STRATEGY REV. 1" for Ford vehicles
R: 6.1.3.1.3-11	The BCM shall transmit a control signal to Courtesy Lamps Illumination elements directly connected to it that will satisfy the control signal specific requirements listed under Appendix 2 "Interior Lighting PWM Signal Specification"

6.2.3.1.6.2 Modules that subscribe to BCM via LIN

R: 6.1.3.1.3-7	The BCM shall use the outputs/state determination from section 5.2.3 "Welcome/Farewell State Determination with Battery Saver tie-in" function to then transmit WelcomeFarewell_State and WelcomeFarewell_Substate as listed in the table below in order to support Courtesy Lamps Illumination

Rqmt #	Logical Data Flow	Logical Data Flow Domain Name	WelcomeFarewell _State	WelcomeFarewell _Substate
R: 6.1.2.3.5-4	Approach Detection	Approach Detected	WELCOME	APPROACH
		Approach Not Detected	Don't care	NULL**
R: 6.1.2.3.5-4	Illuminated Entry	Illuminated Entry True	WELCOME	ENTRY
		Illuminated Entry False	Don't care	NULL**
R: 6.1.2.3.5-4	Courtesy Lighting	Courtesy Lighting True	Don't care	DOOR
		Courtesy Lighting False	Don't care	NULL**
R: 6.1.2.3.5-4	Courtesy Lighting Delay	Courtesy Lighting Delay True	Don't care	DELAY
		Courtesy Lighting Delay False	Don't care	NULL**
R: 6.1.2.3.5-4	Illuminated Exit	Illuminated Exit True	FAREWELL	EXIT
		Illuminated Exit False	Don't care	NULL**
R: 6.1.2.3.5-4	Ignition State	Vehicle Ignition is OFF	NOT (RUN_START)	Don't Care
		Vehicle Ignition is in Accessory	NOT (RUN_START)	Don't Care
		Vehicle Ignition is in Run/Start	RUN_START	NULL**
R: 6.1.2.3.5-4	Vehicle Locking	Vehicle Locking True	NULL	NULL
		Vehicle Locking False	Don't care	NULL**

6.2.3.1.7 Support Interior Ambient Lighting (without Static Sequential) Illumination

6.2.3.1.7.1 Modules that subscribe to BCM via LIN

R: 6.1.3.1.3-8	The BCM shall use the outputs/state determination from section 5.2.3 "Welcome/Farewell State Determination with Battery Saver tie-in" function to then transmit WelcomeFarewell_State and WelcomeFarewell_Substate as listed in the

Rqmt #	Logical Data Flow	Logical Data Flow Domain Name	WelcomeFarewell _State	WelcomeFarewell _Substate
		table below in order to support Interior Ambient Lighting (without Static Sequential) Illumination		

Rqmt #	Logical Data Flow	Logical Data Flow Domain Name	WelcomeFarewell _State	WelcomeFarewell _Substate
R: 6.1.2.3.5-5	Approach Detection	Approach Detected	WELCOME	APPROACH
		Approach Not Detected	Don't care	NULL**
R: 6.1.2.3.5-5	Illuminated Entry	Illuminated Entry True	WELCOME	ENTRY
		Illuminated Entry False	Don't care	NULL**
R: 6.1.2.3.5-5	Courtesy Lighting	Courtesy Lighting True	Don't care	DOOR
		Courtesy Lighting False	Don't care	NULL**
R: 6.1.2.3.5-5	Courtesy Lighting Delay	Courtesy Lighting Delay True	Don't care	DELAY
		Courtesy Lighting Delay False	Don't care	NULL**
R: 6.1.2.3.5-5	Illuminated Exit	Illuminated Exit True	FAREWELL	EXIT
		Illuminated Exit False	Don't care	NULL**
R: 6.1.2.3.5-5	Ignition State	Vehicle Ignition is OFF	NOT (RUN_START)	Don't Care
		Vehicle Ignition is in Accessory	NOT (RUN_START)	Don't Care
		Vehicle Ignition is in Run/Start	RUN_START	NULL**
R: 6.1.2.3.5-5	Vehicle Locking	Vehicle Locking True	NULL	NULL
		Vehicle Locking False	Don't care	NULL**

R: 6.1.3.1.3-2	The BCM shall use the outputs/state determination from section 5.2.3 "Welcome/Farewell State Determination with Battery Saver tie-in" function to then transmit Customer_Color and Customer_Intensity to support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-021878 DNA WELCOME-FAREWELL STRATEGY REV. 1" for Ford vehicles

6.2.3.1.8   Support Interior Day-time Dimmable Backlighting Illumination

6.2.3.1.8.1   Rely on BCM for Control Signal

R: 6.1.3.1.3-15	The BCM shall transmit a control signal to Interior Day-time Dimmable Backlighting Illumination elements directly connected to it that meet the requirements under section 5.4.7.1 "Interior Day-time Dimmable Backlighting Illumination Algorithm" (including the associated "State Determination Algorithm)
R: 6.1.3.1.3-16	The BCM shall transmit a control signal to Interior Day-time Dimmable Backlighting elements directly connected to it that will support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-021878 DNA WELCOME-FAREWELL STRATEGY REV. 1" for Ford vehicles
R: 6.1.3.1.3-12	The BCM shall transmit a control signal to Interior Day-time Dimmable Backlighting elements directly connected to it that will satisfy the control signal specific requirements listed under Appendix 2 "Interior Lighting PWM Signal Specification"

R: 5.4.7.1.6-25	The BCM shall transmit a control signal to Day-time Dimmable Backlighting elements directly connected to it that will support the desired Smooth Dimming behavior as detailed in the latest version of the following specification: "ES-H1BT-1A278-AA-VXX"

6.2.3.1.8.2   Modules that subscribe to CAN signals originating from BCM (can be via Gateway)

R: 6.1.3.1.3-5	The BCM shall use the outputs/state determination from section 5.2.2 "Welcome/Farewell State Determination without Battery Saver tie-in" function to then transmit Dimming_lvl and Litval as listed in the table below in order to support Interior Day-time Dimmable Backlighting

Rqmt #	Exterior Ambient Level	Ignition Status	Courtesy Lighting	Courtesy Lighting Delay	Illuminated Exit	Dimming_lvl
2.2.3.6-18	"Day"	Run/Start	(Don't Care)	(Don't Care)	(Don't Care)	User selected Day_1 to Day_6 level
2.2.3.6-16	"Night"	Run/Start	(Don't Care)	(Don't Care)	(Don't Care)	User selected Night_1 to Night_12 level
2.2.3.6-17	"Day"	OFF/Accy	Courtesy Lighting True	(Don't Care)	(Don't Care)	User selected Day_1 to Day_6 level
2.2.3.6-18	"Night"	OFF/Accy	Courtesy Lighting True	(Don't Care)	(Don't Care)	User selected Night_1 to Night_12 level
2.2.3.6-19	"Day"	OFF/Accy	Courtesy Lighting False	Courtesy Lighting Delay True	(Don't Care)	User selected Day_1 to Day_6 level
6.2.2.3.6-6	"Night"	OFF/Accy	Courtesy Lighting False	Courtesy Lighting Delay True	(Don't Care)	User selected Night_1 to Night_12 level
2.2.3.6-16	"Day"	OFF/Accy	Courtesy Lighting False	Courtesy Lighting Delay False	Illuminated Exit True	User selected Day_1 to Day_6 level
2.2.3.6-17	"Night"	OFF/Accy	Courtesy Lighting False	Courtesy Lighting Delay False	Illuminated Exit True	User selected Night_1 to Night_12 level
2.2.3.6-18	Don't Care	OFF/Accy	Courtesy Lighting False	Courtesy Lighting Delay False	Illuminated Exit False	OFF

Note: Current Ambient Light Sensing strategy that relies on the ALS sensor listed under the following table and should be used as reference only. Ambient light sensing strategy subject to change depending on vehicle architecture and strategy owned by BCM team.

Logical Data Flow	Logical Data Flow Domain Name	Signal Name	Signal Domain Value
Exterior Ambient Level	"Day"	Litval	Day
	"Night"		Twilight_1
	"Night"		Twilight_2
	"Night"		Twilight_3
	"Night"		Twilight_4
	"Night"		Night

	not supported		Unknown
	not supported		Invalid

6.2.3.1.9 Support Interior Night-time Dimmable Backlighting Illumination

6.2.3.1.9.1 Rely on BCM for Control Signal

R: 6.1.3.1.3-16	The BCM shall transmit a control signal to Interior Night-time Dimmable Backlighting Illumination elements directly connected to it that meet the requirements under section 5.4.7.3 "Interior Night-time Dimmable Backlighting Illumination Algorithm" (including the associated "State Determination Algorithm)
R: 6.1.3.1.3-17	The BCM shall transmit a control signal to Interior Night-time Dimmable Backlighting elements directly connected to it that will support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-021878 DNA WELCOME-FAREWELL STRATEGY REV. 1" for Ford vehicles
R: 6.1.3.1.3-13	The BCM shall transmit a control signal to Interior Night-time Dimmable Backlighting elements directly connected to it that will satisfy the control signal specific requirements listed under Appendix 2 "Interior Lighting PWM Signal Specification"
R: 5.4.7.1.6-26	The BCM shall transmit a control signal to Night-time Dimmable Backlighting elements directly connected to it that will support the desired Smooth Dimming behavior as detailed in the latest version of the following specification: "ES-H1BT-1A278-AA-VXX"

6.2.3.1.9.2 Modules that subscribe to CAN signals originating from BCM (can be via Gateway)

R: 6.1.3.1.3-6	The BCM shall use the outputs/state determination from section 5.2.2 "Welcome/Farewell State Determination without Battery Saver tie-in" function to then transmit Backlit_Led_status and Litval as listed in the table below in order to support Interior Night-time Dimmable Backlighting

Rqmt #	Exterior Ambient Level	Ignition Status	Courtesy Lighting	Courtesy Lighting Delay	Illuminated Exit	Backlit_ Led_ Status
2.2.3.6-19	"Day"	Run/Start	(Don't Care)	(Don't Care)	(Don't Care)	Non-selectable Night_1 to Night_12 value
2.2.3.6-19	"Night"	Run/Start	(Don't Care)	(Don't Care)	(Don't Care)	User selected Night_1 to Night_12 level
2.2.3.6-20	"Day"	OFF/Accy	Courtesy Lighting True	(Don't Care)	(Don't Care)	Non-selectable Night_1 to Night_12 value
2.2.3.6-21	"Night"	OFF/Accy	Courtesy Lighting True	(Don't Care)	(Don't Care)	User selected Night_1 to Night_12 level
2.2.3.6-20	"Day"	OFF/Accy	Courtesy Lighting False	Courtesy Lighting Delay True	(Don't Care)	Non-selectable Night_1 to Night_12 value
6.2.2.3.6-7	"Night"	OFF/Accy	Courtesy Lighting False	Courtesy Lighting Delay True	(Don't Care)	User selected Night_1 to Night_12 level
2.2.3.6-19	"Day"	OFF/Accy	Courtesy Lighting False	Courtesy Lighting Delay False	Illuminated Exit True	Non-selectable Night_1 to Night_12 value
2.2.3.6-20	"Night"	OFF/Accy	Courtesy Lighting False	Courtesy Lighting	Illuminated Exit True	User selected Night_1 to Night_12 level

| 2.2.3.6-21 | Don't Care | OFF/Accy | Courtesy Lighting False | Delay False | | |
| | | | | Courtesy Lighting Delay False | Illuminated Exit False | OFF |

Note: "Non-selectable Night_1 to Night_12 value" is configurable within the BCM, and must be approved by Vehicle Harmony team.

Current Ambient Light Sensing strategy that relies on the ALS sensor listed under the following table and should be used as reference only. Ambient light sensing strategy subject to change depending on vehicle architecture and strategy owned by BCM team.

Logical Data Flow	Logical Data Flow Domain Name	Signal Name	Signal Domain Value
Exterior Ambient Level	"Day"	Litval	Day
	"Night"		Twilight_1
	"Night"		Twilight_2
	"Night"		Twilight_3
	"Night"		Twilight_4
	"Night"		Night
	not supported		Unknown
	not supported		Invalid

6.2.3.1.9.3 Support LIN Headlamp Switch Backlighting Illumination

R: 6.1.3.1.3-7	The BCM shall use the outputs/state determination from section 5.2.2 "Welcome/Farewell State Determination without Battery Saver tie-in" function to transmit Backlit_Led_status as listed in previous section, to support LIN Headlamp Switch Backlighting Illumination.

6.2.3.1.10 Support Interior 2-Step Dimmable Backlighting Illumination

6.2.3.1.10.1 Rely on BCM for Control Signal

R: 6.1.3.1.3-17	The BCM shall transmit a control signal to Interior 2-Step Dimmable Backlighting Illumination elements directly connected to it that meet the requirements under section 5.4.7.5 "Interior Day-time Dimmable Backlighting Illumination Algorithm" (including the associated "State Determination Algorithm)
R: 6.1.3.1.3-18	The BCM shall transmit a control signal to Interior 2-Step Dimmable Backlighting elements directly connected to it that will support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-021878 DNA WELCOME-FAREWELL STRATEGY REV. 1" for Ford vehicles
R: 6.1.3.1.3-14	The BCM shall transmit a control signal to Interior 2-Step Dimmable Backlighting elements directly connected to it that will satisfy the control signal specific requirements listed under Appendix 2 "Interior Lighting PWM Signal Specification"
R: 5.4.7.1.6-27	The BCM shall transmit a control signal to 2-Step Dimmable Backlighting elements directly connected to it that will support the desired Smooth Dimming behavior as detailed in the latest version of the following specification: "ES-H1BT-1A278-AA-VXX"

6.2.3.1.10.2 Modules that subscribe to CAN signals originating from BCM (can be via Gateway)

R: 6.1.3.1.3-8	The BCM shall use the outputs/state determination from section 5.2.2 "Welcome/Farewell State Determination without Battery Saver tie-in" function to then transmit Dimming_lvl and Litval as listed in the table below in order to support Interior 2-Step Dimmable Backlighting

Rqmt #	Exterior Ambient Level	Ignition Status	Courtesy Lighting	Courtesy Lighting Delay	Illuminated Exit	Dimming_lvl
2.2.3.6-20	"Day"	Run/Start	(Don't Care)	(Don't Care)	(Don't Care)	User selected Day_1 to Day_6 level
2.2.3.6-22	"Night"	Run/Start	(Don't Care)	(Don't Care)	(Don't Care)	User selected Night_1 to Night_12 level
2.2.3.6-23	"Day"	OFF/Accy	Courtesy Lighting True	(Don't Care)	(Don't Care)	User selected Day_1 to Day_6 level
2.2.3.6-24	"Night"	OFF/Accy	Courtesy Lighting True	(Don't Care)	(Don't Care)	User selected Night_1 to Night_12 level
2.2.3.6-21	"Day"	OFF/Accy	Courtesy Lighting False	Courtesy Lighting Delay True	(Don't Care)	User selected Day_1 to Day_6 level
6.2.2.3.6-8	"Night"	OFF/Accy	Courtesy Lighting False	Courtesy Lighting Delay True	(Don't Care)	User selected Night_1 to Night_12 level
2.2.3.6-22	"Day"	OFF/Accy	Courtesy Lighting False	Courtesy Lighting Delay False	Illuminated Exit True	User selected Day_1 to Day_6 level
2.2.3.6-23	"Night"	OFF/Accy	Courtesy Lighting False	Courtesy Lighting Delay False	Illuminated Exit True	User selected Night_1 to Night_12 level
2.2.3.6-24	Don't Care	OFF/Accy	Courtesy Lighting False	Courtesy Lighting Delay False	Illuminated Exit False	OFF

Note: Current Ambient Light Sensing strategy that relies on the ALS sensor listed under the following table and should be used as reference only. Ambient light sensing strategy subject to change depending on vehicle architecture and strategy owned by BCM team.

Logical Data Flow	Logical Data Flow Domain Name	Signal Name	Signal Domain Value
Exterior Ambient Level	"Day"	Litval	Day
	"Night"		Twilight_1
	"Night"		Twilight_2
	"Night"		Twilight_3
	"Night"		Twilight_4
	"Night"		Night
	not supported		Unknown
	not supported		Invalid

6.2.3.1.10.3 Support LIN Headlamp Switch Indicator Illumination

R: 6.1.3.1.3-9	The BCM shall use the outputs/state determination from section 5.2.2 "Welcome/Farewell State Determination without Battery Saver tie-in" function to transmit Dimming_lvl, and Litval as listed in previous section, to support LIN Headlamp Switch Indicator Illumination.

6.2.3.1.11 Support Vehicle Display Center-stack Day-time Dimmable Illumination for Display Brightness

R: 6.1.3.1.3-10	The BCM shall use the outputs/state determination from section 5.2.2 "Welcome/Farewell State Determination without Battery Saver tie-in" function to then transmit Dimming_lvl and Litval as listed in the table below in order to support Center-stack Day-time Dimmable Illumination for Display Brightness

Rqmt #	Exterior Ambient Level	Ignition Status	Courtesy Lighting	Courtesy Lighting Delay	Illuminated Exit	Dimming_lvl
2.2.3.6-21	"Day"	Run/Start	(Don't Care)	(Don't Care)	(Don't Care)	User selected Day_1 to Day_6 level
2.2.3.6-25	"Night"	Run/Start	(Don't Care)	(Don't Care)	(Don't Care)	User selected Night_1 to Night_12 level
2.2.3.6-26	"Day"	OFF/Accy	Courtesy Lighting True	(Don't Care)	(Don't Care)	User selected Day_1 to Day_6 level
2.2.3.6-27	"Night"	OFF/Accy	Courtesy Lighting True	(Don't Care)	(Don't Care)	User selected Night_1 to Night_12 level
2.2.3.6-22	"Day"	OFF/Accy	Courtesy Lighting False	Courtesy Lighting Delay True	(Don't Care)	User selected Day_1 to Day_6 level
6.2.2.3.6-9	"Night"	OFF/Accy	Courtesy Lighting False	Courtesy Lighting Delay True	(Don't Care)	User selected Night_1 to Night_12 level
2.2.3.6-25	"Day"	OFF/Accy	Courtesy Lighting False	Courtesy Lighting Delay False	Illuminated Exit True	User selected Day_1 to Day_6 level
2.2.3.6-26	"Night"	OFF/Accy	Courtesy Lighting False	Courtesy Lighting Delay False	Illuminated Exit True	User selected Night_1 to Night_12 level
2.2.3.6-27	Don't Care	OFF/Accy	Courtesy Lighting False	Courtesy Lighting Delay False	Illuminated Exit False	OFF

Note: Current Ambient Light Sensing strategy that relies on the ALS sensor listed under the following table and should be used as reference only. Ambient light sensing strategy subject to change depending on vehicle architecture and strategy owned by BCM team.

Logical Data Flow	Logical Data Flow Domain Name	Signal Name	Signal Domain Value
Exterior Ambient Level	"Day"	Litval	Day
	"Night"		Twilight_1
	"Night"		Twilight_2
	"Night"		Twilight_3
	"Night"		Twilight_4
	"Night"		Night
	not supported		Unknown
	not supported		Invalid

6.2.3.1.12 Support Vehicle Display Cluster Day-time Dimmable Illumination for Display Brightness

Rqmt #	R: 6.1.3.1.3-11	The BCM shall use the outputs/state determination from section 5.2.2 "Welcome/Farewell State Determination without Battery Saver tie-in" function to then transmit Dimming_lvl and Litval as listed in the table below in order to support Cluster Day-time Dimmable Illumination for Display Brightness

Rqmt #	Exterior Ambient Level	Ignition Status	Courtesy Lighting	Courtesy Lighting Delay	Illuminated Exit	Dimming_lvl
2.2.3.6-22	"Day"	Run/Start	(Don't Care)	(Don't Care)	(Don't Care)	User selected Day_1 to Day_6 level
2.2.3.6-28	"Night"	Run/Start	(Don't Care)	(Don't Care)	(Don't Care)	User selected Night_1 to Night_12 level
2.2.3.6-29	"Day"	OFF/Accy	Courtesy Lighting True	(Don't Care)	(Don't Care)	User selected Day_1 to Day_6 level
2.2.3.6-30	"Night"	OFF/Accy	Courtesy Lighting True	(Don't Care)	(Don't Care)	User selected Night_1 to Night_12 level
2.2.3.6-23	"Day"	OFF/Accy	Courtesy Lighting False	Courtesy Lighting Delay True	(Don't Care)	User selected Day_1 to Day_6 level
2.2.3.6-10	"Night"	OFF/Accy	Courtesy Lighting False	Courtesy Lighting Delay True	(Don't Care)	User selected Night_1 to Night_12 level
2.2.3.6-28	"Day"	OFF/Accy	Courtesy Lighting False	Courtesy Lighting Delay False	Illuminated Exit True	User selected Day_1 to Day_6 level
2.2.3.6-29	"Night"	OFF/Accy	Courtesy Lighting False	Courtesy Lighting Delay False	Illuminated Exit True	User selected Night_1 to Night_12 level
2.2.3.6-30	Don't Care	OFF/Accy	Courtesy Lighting False	Courtesy Lighting Delay False	Illuminated Exit False	OFF

Note: Current Ambient Light Sensing strategy that relies on the ALS sensor listed under the following table and should be used as reference only. Ambient light sensing strategy subject to change depending on vehicle architecture and strategy owned by BCM team.

Logical Data Flow	Logical Data Flow Domain Name	Signal Name	Signal Domain Value
Exterior Ambient Level	"Day"	Litval	Day
	"Night"		Twilight_1
	"Night"		Twilight_2
	"Night"		Twilight_3
	"Night"		Twilight_4
	"Night"		Night
	not supported		Unknown
	not supported		Invalid

6.2.3.1.13 Support Vehicle Display aHUD Welcome/Farewell behavior

R: 6.1.3.1.3-12	The BCM shall use the outputs/state determination from section 5.2.2 "Welcome/Farewell State Determination without Battery Saver tie-in" function to then transmit PudLamp_D_Rq, as listed in the table below in order to support aHUD Welcome/Farewell behavior

Rqmt #	Approach Detected	Illuminated Entry	Courtesy Lighting	Courtesy Lighting Delay	PudLamp_D_Rq
2.2.3.6-23	Approach Detected	(Don't Care)	(Don't Care)	(Don't Care)	Ramp_Up
2.2.3.6-24	Approach Not Detected	Illuminated Entry True (Keyfob/PK unlock)	(Don't Care)	(Don't Care)	Ramp_Up
2.2.3.6-25	Approach Not Detected	Illuminated Entry True (Keypad unlock)	(Don't Care)	(Don't Care)	Ramp_Up
2.2.3.6-26	Approach Not Detected	Illuminated Entry True (Cylinder unlock)	(Don't Care)	(Don't Care)	Ramp_Up
2.2.3.6-24	Approach Not Detected	Illuminated Entry False	Courtesy Lighting True AND (Both Driver AND Passenger Door Closed)	(Don't Care)	Ramp_Up
2.2.3.6-25	Approach Not Detected	Illuminated Entry False	Courtesy Lighting True AND Driver Door Closed	(Don't Care)	Ramp_Up
2.2.3.6-26	Approach Not Detected	Illuminated Entry False	Courtesy Lighting True AND Passenger Door Closed	(Don't Care)	Ramp_Up
2.2.3.6-27	Approach Not Detected	Illuminated Entry False	Courtesy Lighting False	Courtesy Lighting Delay True	Ramp_Up
2.2.3.6-28	Approach Not Detected	Illuminated Entry False	Courtesy Lighting False	Courtesy Lighting Delay False	Ramp_Down

6.2.3.1.14 Support "Other" Welcome/Farewell Behavior

R: 6.2.3.1.14-1	To support the "Turn Signal Indicators" illumination as per "RQT-002004-021878 DNA WELCOME-FAREWELL STRATEGY REV. 1" the BCM shall use the outputs/state determination from section 5.2.2 "Welcome/Farewell State Determination without Battery Saver tie-in". Turn signal response to welcome farewell states is owned by Body Security Group.
R: 6.2.3.1.14-2	To support the "Illuminated Scuff Plates" behavior as per "RQT-002004-021878 DNA WELCOME-FAREWELL STRATEGY REV. 1" the BCM shall use the outputs/state determination from section 5.2.3 "Welcome/Farewell State Determination with Battery

	Saver tie-in" to meet the requirements listed within section 5.4.1 "Interior Courtesy Lamps Illumination Algorithm"
R: 6.2.3.1.14-3	To support the "Night Lock Indication" behavior as per "RQT-002004-021878 DNA WELCOME-FAREWELL STRATEGY REV. 1" the BCM shall use the outputs/state determination from section 5.2.3 "Welcome/Farewell State Determination with Battery Saver tie-in" to meet the requirements listed within 5.4.1 "Interior Courtesy Lamps Illumination Algorithm" and BCM FS 2.2.18 Night Lock Indication (NLI)
R: 6.2.3.1.14-4	To support the "Illuminated SECURICODE Keypad" behavior as per "RQT-002004-021878 DNA WELCOME-FAREWELL STRATEGY REV. 1" the BCM shall use the outputs/state determination from section 5.2.3 "Welcome/Farewell State Determination with Battery Saver tie-in" to meet the requirements listed within section 5.3.5 "Exterior Supplementary Illumination Algorithm" with the following exceptions: The "Fade ON" and "Fade OFF" ramping curves shall follow "Theatre dimming" vs, "Steven's Power Law"; and the associated control signal shall ramp up over 0.7 seconds (vs 3 seconds), and ramp down over 1.7 seconds (vs 5 seconds) by default. Additional conditions for when to illuminate during Welcome/Farewell called out in BCM FS 2.4.11 "Keypad Control" and 2.4.17 "keypad switch illumination output"

6.2.3.2   **LED Driver Module (LDM) requirements**

The LDM shall be a subscriber to the BCM (Welcome Farewell State determination function) and then use it to transmit a control signal to a specific lighting element it is directly connected to: Headlamps (low-beams), Signature/Decorative LED Lamps

6.2.3.2.1   Over-arching requirements

R: 6.1.3.2-132	The LDM shall contain its Performance Latency within the End-to-End latency specified in section 3.2.2.1 "Performance Latency Requirements"
R: 6.1.3.2-133	The LDM shall take into account the requirements contained within section 3.2.3 "Safety Requirements" to ensure that no lighting element that it directly controls (via control signal) ends up violating any requirement (specific to the market the target vehicle shall be sold in) within the aforementioned section.
R: 6.1.3.2-134	The LDM shall take into account the requirements contained within section 3.2.4 "Security Requirements" to ensure that no lighting element that it directly controls (via control signal) ends up violating any requirement within the aforementioned section.
R: 6.1.3.2-135	The LDM shall be a publisher to signals it has been identified as a publisher for within section 6.2.2.3 "Signal requirements"

6.2.3.2.2   Provide Control Signal to support Front Exterior Illumination

R: 6.1.3.2-136	The LDM shall subscribe to the (LIN) signals required by the subscribing function "Exterior Front Illumination Algorithm" as identified in section 6.2.2.3 "Signal Requirements": Wfsuperstate and WFsubstate.
R: 6.1.3.2-137	The LDM shall use the signals it has been identified as a subscriber to in section 6.1.2.3 "Signal Requirements" to transmit a control signal to Exterior Front Lighting elements directly connected to it that meet the requirements under section 5.3.1 "Exterior Front Illumination Algorithm"
R: 6.1.3.2-138	The LDM shall transmit a control signal to Exterior Front Illumination elements directly connected to it that will support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-021878 DNA WELCOME-FAREWELL STRATEGY REV. 1" for Ford vehicles
R: 6.1.3.2-139	The LDM shall transmit a control signal to Front Exterior Illumination elements directly connected to it that will satisfy the control signal specific requirements listed under Appendix 1 "Exterior Lighting PWM Signal Specification"

Note: Table below provided as reference for LDM subscribed signals to ARL callouts mapping:

ARL call-out		Subscriber Signal Mapping	
Logical Data Flow	**Logical Data Flow Domain Name**	**Wfsuperstate**	**Wfsubstate**

Approach Detection	Approach Detected	Welcome	Approach
	Approach Not Detected	Don't care	NULL**
Illuminated Entry	Illuminated Entry True	Welcome	IllumEntry
	Illuminated Entry False	Don't care	NULL**
Courtesy Lighting	Courtesy Lighting True	Don't care	DoorAjarCourtesyLight
	Courtesy Lighting False	Don't care	NULL**
Courtesy Lighting Delay	Courtesy Lighting Delay True	Don't care	CourtesyLightDelay
	Courtesy Lighting Delay False	Don't care	NULL**
Illuminated Exit	Illuminated Exit True	Farewell	IllExit
	Illuminated Exit False	Don't care	NULL**
Ignition State	Vehicle Ignition is OFF	NOT (RunStart)	Don't Care
	Vehicle Ignition is in Accessory	NOT (RunStart)	Don't Care
	Vehicle Ignition is in Run/Start	RunStart	NULL**
Vehicle Locking	Vehicle Locking True	OFF	NULL
	Vehicle Locking False	Don't care	NULL**

6.2.3.3 **Overhead Console (OHC) requirements**

The OHC shall be a subscriber to the BCM (Welcome Farewell State determination function) and then use it to transmit a control signal to a specific lighting element it is directly connected to: "Courtesy Lamps"

6.2.3.3.1 Over-arching requirements

R: 6.1.3.2-140	The OHC shall contain its Performance Latency within the End-to-End latency specified in section 3.2.2.1 "Performance Latency Requirements"
R: 6.1.3.2-141	The OHC shall take into account the requirements contained within section 3.2.3 "Safety Requirements" to ensure that no lighting element that it directly controls (via control signal) ends up violating any requirement (specific to the market the target vehicle shall be sold in) within the aforementioned section.
R: 6.1.3.2-142	The OHC shall take into account the requirements contained within section 3.2.4 "Security Requirements" to ensure that no lighting element that it directly controls (via control signal) ends up violating any requirement within the aforementioned section.
R: 6.1.3.2-143	The OHC shall be a publisher to signals it has been identified as a publisher for within section 6.2.2.3 "Signal requirements"

6.2.3.3.2 Provide Control Signal to support Courtesy Lamps Illumination

R: 6.1.3.2-144	The OHC shall subscribe to the (LIN) signals required by the subscribing function " Interior Courtesy Lamps Illumination Algorithm " as identified in section 6.2.2.3 "Signal Requirements": WelcomeFarewell_State and WelcomeFarewell_SubState
R: 6.1.3.2-145	The OHC shall use the signals it has been identified as a subscriber to in section 6.2.2.3 "Signal Requirements" to transmit a control signal to Interior Courtesy Lamps directly connected to it that meet the requirements under section 5.4.1 "Courtesy Lamps Illumination Algorithm"

R: 6.1.3.2-146	The OHC shall transmit a control signal to Interior Courtesy Lamps directly connected to it that will support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-021878 DNA WELCOME-FAREWELL STRATEGY REV. 1" for Ford vehicles
R: 6.1.3.2-147	The OHC shall transmit a control signal to Interior Courtesy Lamps directly connected to it that will satisfy the control signal specific requirements listed under Appendix 2 "Interior Lighting PWM Signal Specification"

Note: Table below provided as reference for OHC subscribed signals to ARL callouts mapping:

ARL call-out		Subscriber Signal Mapping	
Logical Data Flow	Logical Data Flow Domain Name	WelcomeFarewell _State	WelcomeFarewell _Substate
Approach Detection	Approach Detected	WELCOME	APPROACH
	Approach Not Detected	Don't care	NULL**
Illuminated Entry	Illuminated Entry True	WELCOME	ENTRY
	Illuminated Entry False	Don't care	NULL**
Courtesy Lighting	Courtesy Lighting True	Don't care	DOOR
	Courtesy Lighting False	Don't care	NULL**
Courtesy Lighting Delay	Courtesy Lighting Delay True	Don't care	DELAY
	Courtesy Lighting Delay False	Don't care	NULL**
Illuminated Exit	Illuminated Exit True	FAREWELL	EXIT
	Illuminated Exit False	Don't care	NULL**
Ignition State	Vehicle Ignition is OFF	NOT (RUN_START)	Don't Care
	Vehicle Ignition is in Accessory	NOT (RUN_START)	Don't Care
	Vehicle Ignition is in Run/Start	RUN_START	NULL**
Vehicle Locking	Vehicle Locking True	NULL	NULL
	Vehicle Locking False	Don't care	NULL**

6.2.3.4 **Ambient Light Module (ALM) requirements**
The ALM shall be a subscriber to the BCM (Welcome Farewell State determination function) and then use it to transmit a control signal to a specific lighting element it is directly connected to: "Ambient Lighting

6.2.3.4.1 Over-arching requirements

R: 6.1.3.2-148	The ALM shall contain its Performance Latency within the End-to-End latency specified in section 3.2.2.1 "Performance Latency Requirements"
R: 6.1.3.2-149	The ALM shall take into account the requirements contained within section 3.2.3 "Safety Requirements" to ensure that no lighting element that it directly controls (via control signal) ends up violating any requirement (specific to the market the target vehicle shall be sold in) within the aforementioned section.
R: 6.1.3.2-150	The ALM shall take into account the requirements contained within section 3.2.4 "Security Requirements" to ensure that no lighting element that it directly controls (via control signal) ends up violating any requirement within the aforementioned section.
R: 6.1.3.2-151	The ALM shall be a publisher to signals it has been identified as a publisher for within section 6.2.2.3 "Signal requirements"

6.2.3.4.2 Provide Control Signal to support Ambient Lighting Illumination

R: 6.1.3.2-152	The ALM shall subscribe to the (LIN) signals required by the subscribing function " Interior Ambient Light Illumination (without Static Sequential) Algorithm " as identified in section 6.2.2.3 "Signal Requirements": WelcomeFarewell_State, WelcomeFarewell_SubState, Customer_Color, and Customer_Intensity
R: 6.1.3.2-153	The ALM shall use the signals it has been identified as a subscriber to in section 6.2.2.3 "Signal Requirements" to transmit a control signal to Interior Ambient Lighting Illumination directly connected to it that meet the requirements under section 5.4.5 "Interior Ambient Lighting (without Static Sequential) Illumination Algorithm"
R: 6.1.3.2-154	The ALM shall transmit a control signal to Interior Ambient Lights directly connected to it that will support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-021878 DNA WELCOME-FAREWELL STRATEGY REV. 1" for Ford vehicles
R: 6.1.3.2-155	The ALM shall transmit a control signal to Interior Ambient Lights directly connected to it that will satisfy the control signal specific requirements listed under Appendix 2 "Interior Lighting PWM Signal Specification"

Note: Table below provided as reference for ALM subscribed signals to ARL callouts mapping:

ARL call-out		Subscriber Signal Mapping	
Logical Data Flow	Logical Data Flow Domain Name	WelcomeFarewell _State	WelcomeFarewell _Substate
Approach Detection	Approach Detected	WELCOME	APPROACH
	Approach Not Detected	Don't care	NULL**
Illuminated Entry	Illuminated Entry True	WELCOME	ENTRY
	Illuminated Entry False	Don't care	NULL**
Courtesy Lighting	Courtesy Lighting True	Don't care	DOOR
	Courtesy Lighting False	Don't care	NULL**
Courtesy Lighting Delay	Courtesy Lighting Delay True	Don't care	DELAY
	Courtesy Lighting Delay False	Don't care	NULL**
Illuminated Exit	Illuminated Exit True	FAREWELL	EXIT
	Illuminated Exit False	Don't care	NULL**
Ignition State	Vehicle Ignition is OFF	NOT (RUN_START)	Don't Care
	Vehicle Ignition is in Accessory	NOT (RUN_START)	Don't Care
	Vehicle Ignition is in Run/Start	RUN_START	NULL**
Vehicle Locking	Vehicle Locking True	NULL	NULL
	Vehicle Locking False	Don't care	NULL**

6.2.3.5 **Driver Door Module (DDM) requirements**

The DDM shall be a subscriber to the BCM (Welcome Farewell State determination function) and then use it to transmit a control signal to specific lighting elements or part assemblies it is directly connected to: "Door trim switch/button backlighting Illumination", "Autofold mirrors"

6.2.3.5.1 Over-arching requirements

R: 6.1.3.2-156	The DDM shall contain its Performance Latency within the End-to-End latency specified in section 3.2.2.1 "Performance Latency Requirements"
R: 6.1.3.2-157	The DDM shall take into account the requirements contained within section 3.2.3 "Safety Requirements" to ensure that no lighting element that it directly controls (via control signal) ends up violating any requirement (specific to the market the target vehicle shall be sold in) within the aforementioned section.
R: 6.1.3.2-158	The DDM shall take into account the requirements contained within section 3.2.4 "Security Requirements" to ensure that no lighting element that it directly controls (via control signal) ends up violating any requirement within the aforementioned section.
R: 6.1.3.2-159	The DDM shall be a publisher to signals it has been identified as a publisher for within section 6.2.2.3 "Signal requirements"

6.2.3.5.2 Provide Control Signal to support Exterior Supplementary Illumination

R: 6.1.3.2-160	The DDM shall subscribe to the (CAN) signals required by the subscribing function " Exterior Supplementary Illumination Algorithm " as identified in section 6.2.2.3 "Signal Requirements": Pudlamp_D_Rq,
R: 6.1.3.2-161	The DDM shall use the signals it has been identified as a subscriber to in section 6.2.2.3 "Signal Requirements" to transmit a control signal to Exterior Supplementary Lighting directly connected to it that meet the requirements under section 5.3.5 "Exterior Supplementary Illumination Algorithm"
R: 6.1.3.2-162	The DDM shall transmit a control signal to Exterior Supplementary Lights directly connected to it that will support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-021878 DNA WELCOME-FAREWELL STRATEGY REV. 1" for Ford vehicles
R: 6.1.3.2-163	The DDM shall transmit a control signal to Exterior Supplementary Lights directly connected to it that will satisfy the control signal specific requirements listed under Appendix 1 "Exterior Lighting PWM Signal Specification"

Table below provided as reference for DDM subscribed signals to Expected Initial Control Signal Response:

Subscriber Signal Mapping	Expected initial response as per section 5.3.5 "Exterior Supplementary Illumination Algorithm"
Pudlamp_D_Rq	Control Signal Response
RAMP_UP	"Fade ON"/Ramp up
RAMP_DOWN	"Fade OFF"/Ramp down
ON	"Snap ON"/Step up
OFF	"Snap OFF"/"Step down

6.2.3.5.3 Provide Control Signal to support Interior Day-time Dimmable Backlighting/Display Illumination

R: 6.1.3.2-164	The DDM shall subscribe to the (CAN) signals required by the subscribing function "Interior Day-time Dimmable Backlighting Illumination Algorithm" as identified in section 6.2.2.3 "Signal Requirements": Dimming_lvl and Litval. Note: Dimming_lvl ≠ OFF is a local sleep inhibitor. Modules on the network will allow the network(s) to sleep but illumination will remain ON indefinitely, no timeouts allowed. Local sleep is allowed then Dimming_lvl = OFF
R: 6.1.3.2-165	The DDM shall use the signals it has been identified as a subscriber to in section 6.2.2.3 "Signal Requirements" to transmit a control signal to Day-time Dimmable Backlighting/Display Illumination directly connected to it that meet the requirements under section 5.4.7.1 "Day-time Dimmable" Backlighting Illumination Algorithm
R: 6.1.3.2-166	The DDM shall transmit a control signal to Day-time Dimmable Backlighting/Display Illumination directly connected to it that will support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-021878 DNA WELCOME-FAREWELL STRATEGY REV. 1" for Ford vehicles
R: 6.1.3.2-167	The DDM shall transmit a control signal to Day-time Dimmable Backlighting/Display Illumination directly connected to it that will satisfy the control signal specific requirements listed under Appendix 2 "Interior Lighting PWM Signal Specification"

R: 5.4.7.1.6-28	The DDM shall transmit a control signal to Interior Day-time Dimmable Backlighting /Display elements directly connected to it that will support the desired Smooth Dimming behavior as detailed in the latest version of the following specification: "ES-H1BT-1A278-AA-VXX"

Table below provided as reference for DDM subscribed signals to Expected Initial Control Signal Response:

Subscriber Signal Mapping	Expected initial response as per section 5.4.7.1 "Day-time Dimmable" Backlighting Illumination Algorithm
Dimming_lvl	Control Signal Response
Day_1 – Day_6	"Fade ON"/Ramp up to "Day_1 – Day_6"
Night_1 – Night_12	"Fade ON"/Ramp up to "Night_1 – Night_12"
OFF	"Fade OFF"/Ramp down

6.2.3.5.4 Provide Control Signal to support Interior Night-Time Dimmable Backlighting Illumination

R: 6.1.3.2-168	The DDM shall subscribe to the (CAN) signals required by the subscribing function "Interior Night-time Dimmable Backlighting Illumination Algorithm" as identified in section 6.2.2.3 "Signal Requirements": Backlit_LED_Status and Litval. Note: Backlit_LED_Status ≠ OFF is a local sleep inhibitor. Modules on the network will allow the network(s) to sleep but illumination will remain ON indefinitely, no timeouts allowed. Local sleep is allowed then Backlit_LED_Status = OFF
R: 6.1.3.2-169	The DDM shall use the signals it has been identified as a subscriber to in section 6.2.2.3 "Signal Requirements" to transmit a control signal to Night-time Dimmable Backlighting Illumination directly connected to it that meet the requirements under section 5.4.7.3 "Night-time Dimmable" Backlighting Illumination Algorithm
R: 6.1.3.2-170	The DDM shall transmit a control signal to Night-time Dimmable Backlighting Illumination directly connected to it that will support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-021878 DNA WELCOME-FAREWELL STRATEGY REV. 1" for Ford vehicles
R: 6.1.3.2-171	The DDM shall transmit a control signal to Night-time Dimmable Backlighting Illumination directly connected to it that will satisfy the control signal specific requirements listed under Appendix 2 "Interior Lighting PWM Signal Specification"
R: 5.4.7.1.6-29	The DDM shall transmit a control signal to Night-time Dimmable Backlighting elements directly connected to it that will support the desired Smooth Dimming behavior as detailed in the latest version of the following specification: "ES-H1BT-1A278-AA-VXX"

Table below provided as reference for DDM subscribed signals to Expected Initial Control Signal Response:

Subscriber Signal Mapping	Expected initial response as per section 5.4.7.3 "Night-time Dimmable" Backlighting Illumination Algorithm
Backlit_LED_status	Control Signal Response
Night_1 – Night_12	"Fade ON"/Ramp up
OFF	"Fade OFF"/Ramp down

6.2.3.5.5 Provide Control Signal to support Interior 2-Step Dimmable Backlighting Illumination

R: 6.1.3.2-172	The DDM shall subscribe to the (CAN) signals required by the subscribing function "Interior Night-time Dimmable Backlighting Illumination Algorithm" as identified in section 6.2.2.3 "Signal Requirements": Dimming_lvl and Litval. Note: Dimming_lvl ≠ OFF is a local sleep inhibitor. Modules on the network will allow the network(s) to sleep but illumination will remain ON indefinitely, no timeouts allowed. Local sleep is allowed then Dimming_lvl = OFF
R: 6.1.3.2-173	The DDM shall use the signals it has been identified as a subscriber to in section 6.2.2.3 "Signal Requirements" to transmit a control signal to 2-Step Dimmable Backlighting Illumination directly connected to it that meet the requirements under section 5.4.7.5 "2-Step Dimmable" Backlighting Illumination Algorithm
R: 6.1.3.2-174	The DDM shall transmit a control signal to 2-Step Dimmable Backlighting Illumination directly connected to it that will support the desired Welcome/Farewell state specific

	behavior called out in "RQT-002004-021878 DNA WELCOME-FAREWELL STRATEGY REV. 1" for Ford vehicles
R: 6.1.3.2-175	The DDM shall transmit a control signal to 2-Step Dimmable Backlighting Illumination directly connected to it that will satisfy the control signal specific requirements listed under Appendix 2 "Interior Lighting PWM Signal Specification"
R: 5.4.7.1.6-30	The DDM shall transmit a control signal to 2-Step Dimmable Backlighting elements directly connected to it that will support the desired Smooth Dimming behavior as detailed in the latest version of the following specification: "ES-H1BT-1A278-AA-VXX"

Table below provided as reference for DDM subscribed signals to Expected Initial Control Signal Response:

Subscriber Signal Mapping	Expected initial response as per section 5.4.7.5 "2-Step Dimmable" Backlighting Illumination Algorithm
Dimming_lvl	Control Signal Response
Day_1 – Day_6	"Fade ON"/Ramp up to "Non-selectable Daytime level"
Night_1 – Night_12	"Fade ON"/Ramp up to "Non-selectable Nighttime level"
OFF	"Fade OFF"/Ramp down

6.2.3.6 **Passenger Door Module (PDM) requirements**

The PDM shall be a subscriber to the BCM (Welcome Farewell State determination function) and then use it to transmit a control signal to specific lighting elements or part assemblies it is directly connected to: "Door trim switch/button backlighting Illumination", "Autofold mirrors"

6.2.3.6.1 Over-arching requirements

R: 6.1.3.2-176	The PDM shall contain its Performance Latency within the End-to-End latency specified in section 3.2.2.1 "Performance Latency Requirements"
R: 6.1.3.2-177	The PDM shall take into account the requirements contained within section 3.2.3 "Safety Requirements" to ensure that no lighting element that it directly controls (via control signal) ends up violating any requirement (specific to the market the target vehicle shall be sold in) within the aforementioned section.
R: 6.1.3.2-178	The PDM shall take into account the requirements contained within section 3.2.4 "Security Requirements" to ensure that no lighting element that it directly controls (via control signal) ends up violating any requirement within the aforementioned section.
R: 6.1.3.2-179	The PDM shall be a publisher to signals it has been identified as a publisher for within section 6.2.2.3 "Signal requirements"

6.2.3.6.2 Provide Control Signal to support Exterior Supplementary Illumination

R: 6.1.3.2-180	The PDM shall subscribe to the (CAN) signals required by the subscribing function " Exterior Supplementary Illumination Algorithm " as identified in section 6.2.2.3 "Signal Requirements": Pudlamp_D_Rq.
R: 6.1.3.2-181	The PDM shall use the signals it has been identified as a subscriber to in section 6.2.2.3 "Signal Requirements" to transmit a control signal to Exterior Supplementary Lighting directly connected to it that meet the requirements under section 5.3.5 "Exterior Supplementary Illumination Algorithm"
R: 6.1.3.2-182	The PDM shall transmit a control signal to Exterior Supplementary Lights directly connected to it that will support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-022094 LINCOLN EMBRACE WELCOME AND FAREWELL BEHAVIOR REV. 1" for Lincoln vehicles
R: 6.1.3.2-183	The PDM shall transmit a control signal to Exterior Supplementary Lights directly connected to it that will satisfy the control signal specific requirements listed under Appendix 1 "Exterior Lighting PWM Signal Specification"

Table below provided as reference for PDM subscribed signals to Expected Initial Control Signal Response:

Subscriber Signal Mapping	Expected initial response as per section 5.3.5 "Exterior Supplementary Illumination Algorithm"
Pudlamp_D_Rq	Control Signal Response
RAMP_UP	"Fade ON"/Ramp up

RAMP_DOWN	"Fade OFF"/Ramp down
ON	"Snap ON"/Step up
OFF	"Snap OFF"/"Step down"

6.2.3.6.3 Provide Control Signal to support Interior Day-time Dimmable Backlighting/Display Illumination

R: 6.1.3.2-184	The PDM shall subscribe to the (CAN) signals required by the subscribing function "Interior Day-time Dimmable Backlighting Illumination Algorithm" as identified in section 6.2.2.3 "Signal Requirements": Dimming_lvl and Litval. Note: Dimming_lvl ≠ OFF is a local sleep inhibitor. Modules on the network will allow the network(s) to sleep but illumination will remain ON indefinitely, no timeouts allowed. Local sleep is allowed then Dimming_lvl = OFF
R: 6.1.3.2-185	The PDM shall use the signals it has been identified as a subscriber to in section 6.2.2.3 "Signal Requirements" to transmit a control signal to Day-time Dimmable Backlighting/Display Illumination directly connected to it that meet the requirements under section 5.4.7.1 "Day-time Dimmable" Backlighting Illumination Algorithm
R: 6.1.3.2-186	The PDM shall transmit a control signal to Day-time Dimmable Backlighting/Display Illumination directly connected to it that will support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-021878 DNA WELCOME-FAREWELL STRATEGY REV. 1" for Ford vehicles
R: 6.1.3.2-187	The PDM shall transmit a control signal to Day-time Dimmable Backlighting/Display Illumination directly connected to it that will satisfy the control signal specific requirements listed under Appendix 2 "Interior Lighting PWM Signal Specification"
R: 5.4.7.1.6-31	The PDM shall transmit a control signal to Interior Day-time Dimmable Backlighting /Display elements directly connected to it that will support the desired Smooth Dimming behavior as detailed in the latest version of the following specification: "ES-H1BT-1A278-AA-VXX"

Table below provided as reference for PDM subscribed signals to Expected Initial Control Signal Response:

Subscriber Signal Mapping	Expected initial response as per section 5.4.7.1 "Day-time Dimmable" Backlighting Illumination Algorithm
Dimming_lvl	Control Signal Response
Day_1 – Day_6	"Fade ON"/Ramp up to "Day_1 – Day_6"
Night_1 – Night_12	"Fade ON"/Ramp up to "Night_1 – Night_12"
OFF	"Fade OFF"/Ramp down

6.2.3.6.4 Provide Control Signal to support Interior Night-Time Dimmable Backlighting Illumination

R: 6.1.3.2-188	The PDM shall subscribe to the (CAN) signals required by the subscribing function "Interior Night-time Dimmable Backlighting Illumination Algorithm" as identified in section 6.2.2.3 "Signal Requirements": Backlit_LED_Status and Litval. Note: Backlit_LED_Status ≠ OFF is a local sleep inhibitor. Modules on the network will allow the network(s) to sleep but illumination will remain ON indefinitely, no timeouts allowed. Local sleep is allowed then Backlit_LED_Status = OFF
R: 6.1.3.2-189	The PDM shall use the signals it has been identified as a subscriber to in section 6.2.2.3 "Signal Requirements" to transmit a control signal to Night-time Dimmable Backlighting Illumination directly connected to it that meet the requirements under section 5.4.7.3 "Night-time Dimmable" Backlighting Illumination Algorithm
R: 6.1.3.2-190	The PDM shall transmit a control signal to Night-time Dimmable Backlighting Illumination directly connected to it that will support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-021878 DNA WELCOME-FAREWELL STRATEGY REV. 1" for Ford vehicles
R: 6.1.3.2-191	The PDM shall transmit a control signal to Night-time Dimmable Backlighting Illumination directly connected to it that will satisfy the control signal specific requirements listed under Appendix 2 "Interior Lighting PWM Signal Specification"
R: 5.4.7.1.6-32	The PDM shall transmit a control signal to Night-time Dimmable Backlighting elements directly connected to it that will support the desired Smooth Dimming behavior as detailed in the latest version of the following specification: "ES-H1BT-1A278-AA-VXX"

Table below provided as reference for PDM subscribed signals to Expected Initial Control Signal Response:

Subscriber Signal Mapping	Expected initial response as per section 5.4.7.3 "Night-time Dimmable" Backlighting Illumination Algorithm
Backlit_LED_status	Control Signal Response
Night_1 – Night_12	"Fade ON"/Ramp up
OFF	"Fade OFF"/Ramp down

6.2.3.6.5   Provide Control Signal to support Interior 2-Step Dimmable Backlighting Illumination

R: 6.1.3.2-192	The PDM shall subscribe to the (CAN) signals required by the subscribing function "Interior 2-Step Dimmable Backlighting Illumination Algorithm" as identified in section 6.2.2.3 "Signal Requirements": Dimming_lvl and Litval. Note: Dimming_lvl ≠ OFF is a local sleep inhibitor. Modules on the network will allow the network(s) to sleep but illumination will remain ON indefinitely, no timeouts allowed. Local sleep is allowed then Dimming_lvl = OFF
R: 6.1.3.2-193	The PDM shall use the signals it has been identified as a subscriber to in section 6.2.2.3 "Signal Requirements" to transmit a control signal to 2-Step Dimmable Backlighting Illumination directly connected to it that meet the requirements under section 5.4.7.5 "2-Step Dimmable" Backlighting Illumination Algorithm
R: 6.1.3.2-194	The PDM shall transmit a control signal to 2-Step Dimmable Backlighting Illumination directly connected to it that will support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-022094 LINCOLN EMBRACE WELCOME AND FAREWELL BEHAVIOR REV. 1" for Lincoln vehicles
R: 6.1.3.2-195	The PDM shall transmit a control signal to 2-Step Dimmable Backlighting Illumination directly connected to it that will satisfy the control signal specific requirements listed under Appendix 2 "Interior Lighting PWM Signal Specification"
R: 5.4.7.1.6-33	The PDM shall transmit a control signal to Night-time Dimmable Backlighting elements directly connected to it that will support the2-Step desired Smooth Dimming behavior as detailed in the latest version of the following specification: "ES-H1BT-1A278-AA-VXX"

Table below provided as reference for PDM subscribed signals to Expected Initial Control Signal Response:

Subscriber Signal Mapping	Expected initial response as per section 5.4.7.5 "2-Step Dimmable" Backlighting Illumination Algorithm
Dimming_lvl	Control Signal Response
Day_1 – Day_6	"Fade ON"/Ramp up to "Non-selectable Daytime level"
Night_1 – Night_12	"Fade ON"/Ramp up to "Non-selectable Nighttime level"
OFF	"Fade OFF"/Ramp down

6.2.3.7   **Steering Column Control Module (SCCM) requirements**

The SCCM shall be a subscriber to the BCM (Welcome Farewell State determination function) and then use it to transmit a control signal to specific lighting elements or part assemblies it is directly connected to.

6.2.3.7.1   Over-arching requirements

R: 6.1.3.2-196	The SCCM shall contain its Performance Latency within the End-to-End latency specified in section 3.2.2.1 "Performance Latency Requirements"
R: 6.1.3.2-197	The SCCM shall take into account the requirements contained within section 3.2.3 "Safety Requirements" to ensure that no lighting element that it directly controls (via control signal) ends up violating any requirement (specific to the market the target vehicle shall be sold in) within the aforementioned section.
R: 6.1.3.2-198	The SCCM shall take into account the requirements contained within section 3.2.4 "Security Requirements" to ensure that no lighting element that it directly controls (via control signal) ends up violating any requirement within the aforementioned section.
R: 6.1.3.2-199	The SCCM shall be a publisher to signals it has been identified as a publisher for within section 6.1.2.3 "Signal requirements"

6.2.3.7.2   Provide Control Signal to support Interior Day-time Dimmable Backlighting Illumination

R: 6.1.3.2-200	The SCCM shall subscribe to the (CAN) signals required by the subscribing function "Interior Day-time Dimmable Backlighting Illumination Algorithm" as identified in section 6.2.2.3 "Signal Requirements": Dimming_lvl and Litval. Note: Dimming_lvl ≠ OFF is a local sleep inhibitor. Modules on the network will allow the network(s) to sleep but illumination will remain ON indefinitely, no timeouts allowed. Local sleep is allowed then Dimming_lvl = OFF
R: 6.1.3.2-201	The SCCM shall use the signals it has been identified as a subscriber to in section 6.2.2.3 "Signal Requirements" to transmit a control signal to Day-time Dimmable Backlighting Illumination directly connected to it that meet the requirements under section 5.4.7.1 "Day-time Dimmable" Backlighting Illumination Algorithm
R: 6.1.3.2-202	The SCCM shall transmit a control signal to Day-time Dimmable Backlighting Illumination directly connected to it that will support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-021878 DNA WELCOME-FAREWELL STRATEGY REV. 1" for Ford vehicles
R: 6.1.3.2-203	The SCCM shall transmit a control signal to Day-time Dimmable Backlighting Illumination directly connected to it that will satisfy the control signal specific requirements listed under Appendix 2 "Interior Lighting PWM Signal Specification"
R: 5.4.7.1.6-34	The SCCM shall transmit a control signal to Day-time Dimmable Backlighting elements directly connected to it that will support the desired Smooth Dimming behavior as detailed in the latest version of the following specification: "ES-H1BT-1A278-AA-VXX"

Table below provided as reference for SCCM subscribed signals to Expected Initial Control Signal Response:

Subscriber Signal Mapping	Expected initial response as per section 5.4.7.1 "Day-time Dimmable" Backlighting Illumination Algorithm
Dimming_lvl	Control Signal Response
Day_1 – Day_6	"Fade ON"/Ramp up to "Day_1 – Day_6"
Night_1 – Night_12	"Fade ON"/Ramp up to "Night_1 – Night_12"
OFF	"Fade OFF"/Ramp down

6.2.3.7.3   Provide Control Signal to support Interior Night-Time Dimmable Backlighting Illumination

R: 6.1.3.2-204	The SCCM shall subscribe to the (CAN) signals required by the subscribing function "Interior Night-time Dimmable Backlighting Illumination Algorithm" as identified in section 6.2.2.3 "Signal Requirements": Backlit_LED_Status and Litval. Note: Backlit_LED_Status ≠ OFF is a local sleep inhibitor. Modules on the network will allow the network(s) to sleep but illumination will remain ON indefinitely, no timeouts allowed. Local sleep is allowed then Backlit_LED_Status = OFF
R: 6.1.3.2-205	The SCCM shall use the signals it has been identified as a subscriber to in section 6.2.2.3 "Signal Requirements" to transmit a control signal to Night-time Dimmable Backlighting Illumination directly connected to it that meet the requirements under section 5.4.7.3 "Night-time Dimmable" Backlighting Illumination Algorithm
R: 6.1.3.2-206	The SCCM shall transmit a control signal to Night-time Dimmable Backlighting Illumination directly connected to it that will support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-021878 DNA WELCOME-FAREWELL STRATEGY REV. 1" for Ford vehicles
R: 6.1.3.2-207	The SCCM shall transmit a control signal to Night-time Dimmable Backlighting Illumination directly connected to it that will satisfy the control signal specific requirements listed under Appendix 2 "Interior Lighting PWM Signal Specification"
R: 5.4.7.1.6-35	The SCCM shall transmit a control signal to Night-time Dimmable Backlighting elements directly connected to it that will support the desired Smooth Dimming behavior as detailed in the latest version of the following specification: "ES-H1BT-1A278-AA-VXX"

Table below provided as reference for SCCM subscribed signals to Expected Initial Control Signal Response:

Subscriber Signal Mapping	Expected initial response as per section 5.4.7.3 "Night-time Dimmable" Backlighting Illumination Algorithm
Backlit_LED_status	Control Signal Response
Night_1 – Night_12	"Fade ON"/Ramp up
OFF	"Fade OFF"/Ramp down

6.2.3.8 **Front Control Interface Module (FCIM, FCIMB, HVAC) requirements**

The FCIM shall be a subscriber to the BCM (Welcome Farewell State determination function) and APIM (Radio Power Button toggle) then use it to transmit a control signal to specific lighting elements it is directly connected to: "Sync/Radio Control button backlighting illumination"

6.2.3.8.1 Provide Control Signal to support Interior Day-Time Dimmable Backlighting Illumination

R: 6.1.3.2-208	The FCIM shall subscribe to the (CAN) signals required by the subscribing function "Interior Night-time Dimmable Backlighting Illumination Algorithm" as identified in section 6.2.2.3 "Signal Requirements": Dimming_lvl, Litval and HMI_HMIMode_St. Note: Dimming_lvl ≠ OFF is a local sleep inhibitor. Modules on the network will allow the network(s) to sleep but illumination will remain ON indefinitely, no timeouts allowed. Local sleep is allowed then Dimming_lvl = OFF
R: 6.1.3.2-209	The FCIM shall use the signals it has been identified as a subscriber to in section 6.2.2.3 "Signal Requirements" to transmit a control signal to Day-time Dimmable Backlighting Illumination directly connected to it that meet the requirements under section 5.4.7.1 "Day-time Dimmable" Backlighting Illumination Algorithm
R: 6.1.3.2-210	The FCIM shall transmit a control signal to Day-time Dimmable Backlighting Illumination directly connected to it that will support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-021878 DNA WELCOME-FAREWELL STRATEGY REV. 1" for Ford vehicles
R: 6.1.3.2-211	The FCIM shall transmit a control signal to Day-time Dimmable Backlighting Illumination directly connected to it that will satisfy the control signal specific requirements listed under Appendix 2 "Interior Lighting PWM Signal Specification"
R: 5.4.7.1.6-36	The FCIM shall transmit a control signal to Night-time Dimmable Backlighting elements directly connected to it that will support the desired Smooth Dimming behavior as detailed in the latest version of the following specification: "ES-H1BT-1A278-AA-VXX"

Table below provided as reference for FCIM subscribed signals to Expected Initial Control Signal Response:

Subscriber Signal Mapping		Expected initial response as per section 5.4.7.1 "Day-time Dimmable" Backlighting Illumination Algorithm
Dimming_lvl	HMI_HMIMode_St	Control Signal Response
Day_1 to Day_6 or Night_1 – Night_12	Don't Care	"Fade ON"/Ramp up
OFF	≠ OFFmode	"Fade ON"/Ramp up**
OFF	OFFmode	"Fade OFF"/Ramp down

**Note: Only for Radio Controls, remaining controls (i.e. HVAC): "Fade OFF"/Ramp down

Table below provided as reference for FCIM subscribed signals to Expected Illumination Level

Dimming_lvl	HMI_HMIMode_St	Desired Illumination Level
Day_1 to Day_6 or Night_1 – Night_12	Don't Care	Day_1 to Day_6 or Night_1 – Night_12
Transition to OFF	≠ OFFmode	Night_12**
OFF	OFFmode	OFF

**Note: Only for Radio Controls, remaining controls (i.e. HVAC): "Fade OFF"/Ramp down

6.2.3.8.2 Provide Control Signal to support Interior Night-Time Dimmable Backlighting Illumination

R: 6.1.3.2-212	The FCIM shall subscribe to the (CAN) signals required by the subscribing function "Interior Night-time Dimmable Backlighting Illumination Algorithm" as identified in section 6.2.2.3 "Signal Requirements": Backlit_LED_Status, Litval, and HMI_HMIMode_St. Note: Backlit_LED_Status ≠ OFF is a local sleep inhibitor. Modules on the network will allow the network(s) to sleep but illumination will remain ON indefinitely, no timeouts allowed. Local sleep is allowed then Backlit_LED_Status = OFF
R: 6.1.3.2-213	The FCIM shall use the signals it has been identified as a subscriber to in section 6.2.2.3 "Signal Requirements" to transmit a control signal to Night-time Dimmable Backlighting

	Illumination directly connected to it that meet the requirements under section 5.4.7.3 "Night-time Dimmable" Backlighting Illumination Algorithm
R: 6.1.3.2-214	The FCIM shall transmit a control signal to Night-time Dimmable Backlighting Illumination directly connected to it that will support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-021878 DNA WELCOME-FAREWELL STRATEGY REV. 1" for Ford vehicles
R: 6.1.3.2-215	The FCIM shall transmit a control signal to Night-time Dimmable Backlighting Illumination directly connected to it that will satisfy the control signal specific requirements listed under Appendix 2 "Interior Lighting PWM Signal Specification"
R: 5.4.7.1.6-37	The FCIM shall transmit a control signal to Night-time Dimmable Backlighting elements directly connected to it that will support the desired Smooth Dimming behavior as detailed in the latest version of the following specification: "ES-H1BT-1A278-AA-VXX"

Table below provided as reference for FCIM subscribed signals to Expected Initial Control Signal Response:

Subscriber Signal Mapping		Expected initial response as per section 5.4.7.3 "Night-time Dimmable" Backlighting Illumination Algorithm
Backlit_LED_status	HMI_HMIMode_St	Control Signal Response
Night_1 – Night_12	Don't Care	"Fade ON"/Ramp up
OFF	≠ OFFmode	"Fade ON"/Ramp up
OFF	OFFmode	"Fade OFF"/Ramp down

Table below provided as reference for FCIM subscribed signals to Expected Illumination Level

Backlit_LED_status	HMI_HMIMode_St	Desired Illumination Level
Night_1 – Night_12	Don't Care	Night_1 – Night_12
Transition to OFF	≠ OFFmode	Night_12
OFF	OFFmode	OFF

6.2.3.8.3   Provide Control Signal to support Interior 2-Step Dimmable Backlighting Illumination

R: 6.1.3.2-216	The FCIM shall subscribe to the (CAN) signals required by the subscribing function "Interior 2-Step Dimmable Backlighting Illumination Algorithm" as identified in section 6.2.2.3 "Signal Requirements": Dimming_lvl and Litval. Note: Dimming_lvl ≠ OFF is a local sleep inhibitor. Modules on the network will allow the network(s) to sleep but illumination will remain ON indefinitely, no timeouts allowed. Local sleep is allowed then Dimming_lvl = OFF
R: 6.1.3.2-217	The FCIM shall use the signals it has been identified as a subscriber to in section 6.2.2.3 "Signal Requirements" to transmit a control signal to 2-Step Dimmable Backlighting Illumination directly connected to it that meet the requirements under section 5.4.7.5 "2-Step Dimmable" Backlighting Illumination Algorithm
R: 6.1.3.2-218	The FCIM shall transmit a control signal to 2-Step Dimmable Backlighting Illumination directly connected to it that will support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-021878 DNA WELCOME-FAREWELL STRATEGY REV. 1" for Ford vehicles
R: 6.1.3.2-219	The FCIM shall transmit a control signal to 2-Step Dimmable Backlighting Illumination directly connected to it that will satisfy the control signal specific requirements listed under Appendix 2 "Interior Lighting PWM Signal Specification"
R: 5.4.7.1.6-38	The FCIM shall transmit a control signal to 2-Step Dimmable Backlighting elements directly connected to it that will support the desired Smooth Dimming behavior as detailed in the latest version of the following specification: "ES-H1BT-1A278-AA-VXX"

Table below provided as reference for FCIM subscribed signals to Expected Initial Control Signal Response:

Subscriber Signal Mapping	Expected initial response as per section 5.4.7.5 "2-Step Dimmable" Backlighting Illumination Algorithm
Dimming_lvl	Control Signal Response
Day_1 – Day_6	"Fade ON"/Ramp up to "Non-selectable Daytime level"
Night_1 – Night_12	"Fade ON"/Ramp up to "Non-selectable Nighttime level"
OFF	"Fade OFF"/Ramp down

6.2.3.9   **Accessory Protocol Interface Module (APIM/SYNC) requirements**

The APIM/SYNC shall be a subscriber to the BCM (Welcome Farewell State determination function) then use it to determine which screen/graphics to display.

6.2.3.9.1   Over-arching requirements

R: 6.1.3.10-9	The APIM/SYNC shall contain its Performance Latency within the End-to-End latency specified in section 3.2.2.1 "Performance Latency Requirements"
R: 6.1.3.10-10	The APIM/SYNC shall take into account the requirements contained within section 3.2.3 "Safety Requirements" to ensure that no screen/display that it directly controls ends up violating any requirement (specific to the market the target vehicle shall be sold in) within the aforementioned section.
R: 6.1.3.10-11	The APIM/SYNC shall take into account the requirements contained within section 3.2.4 "Security Requirements" to ensure that no screen/display that it directly controls (via control signal) ends up violating any requirement within the aforementioned section.
R: 6.1.3.10-12	The APIM shall be a publisher to signals it has been identified as a publisher for within section 6.2.2.3 "Signal requirements"

6.2.3.9.2   Support Interior Day-Time Dimmable Backlighting Illumination for Display Brightness

R: 6.1.3.2-220	The APIM shall subscribe to the (CAN) signals required by the subscribing function "Interior Night-time Dimmable Backlighting Illumination Algorithm" as identified in section 6.2.2.3 "Signal Requirements": Dimming_lvl, Litval and HMI_HMIMode_St. Note: Dimming_lvl ≠ OFF is a local sleep inhibitor. Modules on the network will allow the network(s) to sleep but illumination will remain ON indefinitely, no timeouts allowed. Local sleep is allowed then Dimming_lvl = OFF
R: 6.1.3.2-221	The APIM shall use the signals it has been identified as a subscriber to in section 6.2.2.3 "Signal Requirements" to transmit a control signal to Day-time Dimmable Backlighting Illumination directly connected to it that meet the requirements under section 5.4.7.1 "Day-time Dimmable" Backlighting Illumination Algorithm
R: 6.1.3.2-222	The APIM shall transmit a control signal to Day-time Dimmable Backlighting Illumination directly connected to it that will support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-021878 DNA WELCOME-FAREWELL STRATEGY REV. 1" for Ford vehicles
R: 5.4.7.1.6-39	The APIM shall transmit a control signal to Day-time Dimmable Backlighting elements directly connected to it that will support the desired Smooth Dimming behavior as detailed in the latest version of the following specification: "ES-H1BT-1A278-AA-VXX"

Table below provided as reference for FCIM subscribed signals to Expected Initial Control Signal Response:

Subscriber Signal Mapping		Expected initial response as per section 5.4.7.1 "Day-time Dimmable" Backlighting Illumination Algorithm
Dimming_lvl	HMI_HMIMode_St	Display Illumination Response
Day_1 to Day_6 or Night_1 – Night_12	Don't Care	"Snap ON"/ Turn On
OFF	≠ OFFmode	"Snap ON"/ Turn On
OFF	OFFmode	"Snap OFF"/ Turn Off

Table below provided as reference for FCIM subscribed signals to Expected Illumination Level

Dimming_lvl	HMI_HMIMode_St	Desired Illumination Level
Day_1 to Day_6 or Night_1 – Night_12	Don't Care	Day_1 to Day_6 or Night_1 – Night_12
Transition to OFF	≠ OFFmode	Night_12
OFF	OFFmode	OFF

6.2.3.9.3   Support Welcome/Farewell Animations and Displays during Welcome Farewell sequence

R: 6.1.3.1.3-18	The APIM shall meet the requirements listed under section 5.5.1 "Center-stack Welcome/Farewell Displays (Sync Screen)" (including the associated "State Determination Algorithm)
R: 6.1.3.1.3-19	The APIM will support the desired Welcome/Farewell state specific behavior specific to "Welcome" and "Farewell" graphics called out in "RQT-002004-021878 DNA WELCOME-FAREWELL STRATEGY REV. 1" for Ford vehicles
R: 6.1.3.1.3-4	The APIM shall use the signals it has been identified as a subscriber to in section 6.2.2.3 "Signal Requirements" to follow the state transitions as they're listed section 5.2.2 "Welcome/Farewell State determination without Battery saver tie-in" with the addition of "Extended Play" as described in section 3.1.2 under "Additional States": Ignition_Status, DrStatDrv_B_Actl, DrStatPsngr_B_Actl, HMI_hmimode_st.

Welcome Farewell state	Required Signals	Behavior
Welcome Courtesy Lighting True	Ignition_Status DrStatDrv_B_Actl, DrStatPsngr_B_Actl	(Ignition_Status = OFF/ACCY) &(DrStatDrv_B_Actl OR DrStatPsngr_B_Actl = Ajar)
Welcome Courtesy Lighting Delay True	Ignition_Status DrStatDrv_B_Actl, DrStatPsngr_B_Actl	(Ignition_Status = OFF/ACCY) &(DrStatDrv_B_Actl & DrStatPsngr_B_Actl = Closed)
Ignition RUN/Start	Ignition_Status	Ignition_Status = RUN/Start
Illuminated Exit True	Ignition_Status	Ignition_Status = RUN/Start transition to OFF
Extended Play	Ignition_Status HMI_hmimode_st	Ignition_Status = RUN/Start transition to OFF & (HMI_hmimode_st ≠ OFFmode)
Farewell Courtesy Lighting True	Ignition_Status DrStatDrv_B_Actl, DrStatPsngr_B_Actl	(Ignition_Status transition to OFF) &(DrStatDrv_B_Actl OR DrStatPsngr_B_Actl = Ajar)
Farewell Courtesy Lighting Delay True	Ignition_Status DrStatDrv_B_Actl, DrStatPsngr_B_Actl	(Ignition_Status transition to OFF) &(DrStatDrv_B_Actl & DrStatPsngr_B_Actl = Closed)

Note:
1. Please refer to section 5.2.2 "Welcome/Farewell State Determination without Battery saver tie-in" for additional transition criteria, timeouts etc. "Approach Detection", "Illuminated Entry", and "Vehicle Locking" state should be treated the same as "Null". Dimming_lvl = OFF should be used for "Courtesy Light Timer = Expired"

6.2.3.10   **Rear Audio Control Module (RACM) requirements**

The RACM shall be a subscriber to the BCM (Welcome Farewell State determination function) then use it to determine which screen/graphics to display.

6.2.3.10.1 Over-arching requirements

R: 6.1.3.10-13	The RACM shall contain its Performance Latency within the End-to-End latency specified in section 3.2.2.1 "Performance Latency Requirements"
R: 6.1.3.10-14	The RACM shall take into account the requirements contained within section 3.2.3 "Safety Requirements" to ensure that no screen/display that it directly controls ends up violating any requirement (specific to the market the target vehicle shall be sold in) within the aforementioned section.
R: 6.1.3.10-15	The RACM shall take into account the requirements contained within section 3.2.4 "Security Requirements" to ensure that no screen/display that it directly controls (via control signal) ends up violating any requirement within the aforementioned section.
R: 6.1.3.10-16	The RACM shall be a publisher to signals it has been identified as a publisher for within section 6.2.2.3 "Signal requirements"

6.2.3.10.2 Provide Control Signal to support Interior Day-Time Dimmable Illumination (Display Brightness and Switch Backlighting)

R: 6.1.3.2-223	The RACM shall subscribe to the (CAN) signals required by the subscribing function "Interior Day-time Dimmable Backlighting Illumination Algorithm" as identified in section 6.2.2.3 "Signal Requirements": Dimming_lvl, Litval and HMI_HMIMode_St. Note: Dimming_lvl ≠ OFF is a local sleep inhibitor. Modules on the network will allow the network(s) to sleep but illumination will remain ON indefinitely, no timeouts allowed. Local sleep is allowed then Dimming_lvl = OFF
R: 6.1.3.2-224	The RACM shall use the signals it has been identified as a subscriber to in section 6.2.2.3 "Signal Requirements" to transmit a control signal to Day-time Dimmable Backlighting Illumination directly connected to it that meet the requirements under section 5.4.7.1 "Day-time Dimmable" Backlighting Illumination Algorithm
R: 6.1.3.2-225	The RACM shall transmit a control signal to Day-time Dimmable Backlighting Illumination directly connected to it that will support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-021878 DNA WELCOME-FAREWELL STRATEGY REV. 1" for Ford vehicles
R: 6.1.3.2-226	The RACM shall transmit a control signal to Day-time Dimmable Backlighting Illumination directly connected to it that will satisfy the control signal specific requirements listed under Appendix 2 "Interior Lighting PWM Signal Specification"
R: 5.4.7.1.6-40	The RACM shall transmit a control signal to Interior Day-time Dimmable Backlighting elements directly connected to it that will support the desired Smooth Dimming behavior as detailed in the latest version of the following specification: "ES-H1BT-1A278-AA-VXX"

Table below provided as reference for RACM subscribed signals to Expected Initial Control Signal Response:

Subscriber Signal Mapping		Expected initial response as per section 5.4.7.1 "Day-time Dimmable" Backlighting Illumination Algorithm	
Dimming_lvl	HMI_HMIMode_St	Display Illumination Response	Backlighting Control Signal Response
Day_1 to Day_6 or Night_1 – Night_12	Don't Care	"Snap ON"/ Turn On	"Fade ON"/Ramp up
OFF	≠ OFFmode	"Snap ON"/ Turn On	"Fade ON"/Ramp up**
OFF	OFFmode	"Snap OFF"/ Turn Off	"Fade OFF"/Ramp down

**Note: Only for Radio Controls, remaining controls (i.e. HVAC): "Fade OFF"/Ramp down

Table below provided as reference for RACM subscribed signals to Expected Illumination Level

Dimming_lvl	HMI_HMIMode_St	Desired Illumination Level
Day_1 to Day_6 or Night_1 – Night_12	Don't Care	Day_1 - Day_6 or Night_1 – Night_12
Transition to OFF	≠ OFFmode	Night_12**
OFF	OFFmode	OFF

**Note: Only for Radio Controls, remaining controls (i.e. HVAC): OFF

6.2.3.10.3 Provide Control Signal to support Interior Night-Time Dimmable Backlighting Illumination

R: 6.1.3.2-227	The RACM shall subscribe to the (CAN) signals required by the subscribing function "Interior Night-time Dimmable Backlighting Illumination Algorithm" as identified in section 6.2.2.3 "Signal Requirements": Backlit_LED_Status, Litval and HMI_HMIMode_St. Note: Backlit_LED_Status ≠ OFF is a local sleep inhibitor. Modules on the network will allow the network(s) to sleep but illumination will remain ON indefinitely, no timeouts allowed. Local sleep is allowed then Backlit_LED_Status = OFF
R: 6.1.3.2-228	The RACM shall use the signals it has been identified as a subscriber to in section 6.2.2.3 "Signal Requirements" to transmit a control signal to Night-time Dimmable Backlighting Illumination directly connected to it that meet the requirements under section 5.4.7.3 "Night-time Dimmable" Backlighting Illumination Algorithm
R: 6.1.3.2-229	The RACM shall transmit a control signal to Night-time Dimmable Backlighting Illumination directly connected to it that will support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-021878 DNA WELCOME-FAREWELL STRATEGY REV. 1" for Ford vehicles

R: 6.1.3.2-230	The RACM shall transmit a control signal to Night-time Dimmable Backlighting Illumination directly connected to it that will satisfy the control signal specific requirements listed under Appendix 2 "Interior Lighting PWM Signal Specification"
R: 5.4.7.1.6-41	The RACM shall transmit a control signal to Interior Night-time Dimmable Backlighting elements directly connected to it that will support the desired Smooth Dimming behavior as detailed in the latest version of the following specification: "ES-H1BT-1A278-AA-VXX"

6.2.3.10.4 Support Welcome/Farewell Animations and Displays during Welcome Farewell sequence

R: 6.1.3.1.3-5	The RACM shall meet the requirements listed under section 5.5.1 "Center-stack Welcome/Farewell Displays (Sync Screen)" (including the associated "State Determination Algorithm)
R: 6.1.3.1.3-20	The RACM will support the desired Welcome/Farewell state specific behavior specific to "Welcome" and "Farewell" graphics called out in "RQT-002004-021878 DNA WELCOME-FAREWELL STRATEGY REV. 1" for Ford vehicles
R: 6.1.3.1.3-6	The RACM shall use the signals it has been identified as a subscriber to in section 6.2.2.3 "Signal Requirements" to follow the state transitions as they're listed section 5.2.2 "Welcome/Farewell State determination without Battery saver tie-in" with the addition of "Extended Play" as described in section 3.1.2 under "Additional States": Ignition_Status, DrStatDrv_B_Actl, DrStatPsngr_B_Actl, HMI_hmimode_st and Dimming_lvl

Welcome Farewell state	Required Signals	Behavior
Ignition RUN/Start	Ignition_Status	Ignition_Status = RUN/Start
Illuminated Exit True	Ignition_Status Dimming_lvl	Ignition_Status = RUN/Start transition to OFF & Dimming_lvl ≠ OFF
Extended Play	Ignition_Status HMI_hmimode_st	Ignition_Status = RUN/Start transition to OFF & (HMI_hmimode_st ≠ OFFmode)
Farewell Courtesy Lighting True	Ignition_Status DrStatDrv_B_Actl, DrStatPsngr_B_Actl Dimming_lvl	(Ignition_Status transition to OFF) & Dimming_lvl ≠ OFF &(DrStatDrv_B_Actl OR DrStatPsngr_B_Actl = Ajar)
Farewell Courtesy Lighting Delay True	Ignition_Status DrStatDrv_B_Actl, DrStatPsngr_B_Actl Dimming_lvl	(Ignition_Status transition to OFF) & Dimming_lvl ≠ OFF &(DrStatDrv_B_Actl & DrStatPsngr_B_Actl = Closed)

Note: Please refer to section 5.2.2 "Welcome/Farewell State Determination without Battery saver tie-in" for additional transition criteria, timeouts etc. "Approach Detection", "Illuminated Entry", "Welcome Courtesy Lighting", "Welcome Courtesy Lighting Delay" and "Vehicle Locking" state should be treated the same as "Null". Dimming_lvl = OFF should be used for "Courtesy Light Timer = Expired"

6.2.3.11 **Instrument Panel Cluster (IPC) requirements**

The IPC shall be a subscriber to the BCM (Welcome Farewell State determination function) then use it to determine which screen/graphics to display.

6.2.3.11.1 Over-arching requirements

R: 6.1.3.11-4	The IPC shall contain its Performance Latency within the End-to-End latency specified in section 3.2.2.1 "Performance Latency Requirements"
R: 6.1.3.11-5	The IPC shall take into account the requirements contained within section 3.2.3 "Safety Requirements" to ensure that no screen/display that it directly controls ends up violating any requirement (specific to the market the target vehicle shall be sold in) within the aforementioned section.
R: 6.1.3.11-6	The IPC shall take into account the requirements contained within section 3.2.4 "Security Requirements" to ensure that no screen/display that it directly controls (via control signal) ends up violating any requirement within the aforementioned section.

6.2.3.11.2 Provide Control Signal to support Interior Day-time Dimmable Backlighting/Display Illumination

R: 6.1.3.2-231	The IPC shall subscribe to the (CAN) signals required by the subscribing function "Interior Day-time Dimmable Backlighting Illumination Algorithm" as identified in section 6.2.2.3 "Signal Requirements": Dimming_lvl and Litval. Note: Dimming_lvl ≠ OFF is a local sleep inhibitor. Modules on the network will allow the network(s) to sleep but illumination will remain ON indefinitely, no timeouts allowed. Local sleep is allowed then Dimming_lvl = OFF
R: 6.1.3.2-232	The IPC shall use the signals it has been identified as a subscriber to in section 6.2.2.3 "Signal Requirements" to transmit a control signal to Day-time Dimmable Backlighting/Display Illumination directly connected to it that meet the requirements under section 5.4.7.1 "Day-time Dimmable" Backlighting Illumination Algorithm
R: 6.1.3.2-233	The IPC shall transmit a control signal to Day-time Dimmable Backlighting/Display Illumination directly connected to it that will support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-021878 DNA WELCOME-FAREWELL STRATEGY REV. 1" for Ford vehicles
R: 6.1.3.2-234	The IPC shall transmit a control signal to Day-time Dimmable Backlighting Illumination directly connected to it that will satisfy the control signal specific requirements listed under Appendix 2 "Interior Lighting PWM Signal Specification"
R: 5.4.7.1.6-42	The IPC shall transmit a control signal to Day-time Dimmable Backlighting/Display elements directly connected to it that will support the desired Smooth Dimming behavior as detailed in the latest version of the following specification: "ES-H1BT-1A278-AA-VXX"

Table below provided as reference for IPC subscribed signals to Expected Initial Control Signal Response:

Subscriber Signal Mapping	Expected initial response as per section 5.4.7.1 "Day-time Dimmable" Backlighting Illumination Algorithm
Dimming_lvl	Control Signal Response
Day_1 – Day_6	"Fade ON"/Ramp up to "Day_1 – Day_6"
Night_1 – Night_12	"Fade ON"/Ramp up to "Night_1 – Night_12"
OFF	"Fade OFF"/Ramp down

6.2.3.11.3 Provide Control Signal to support Interior Night-Time Dimmable Backlighting Illumination

R: 6.1.3.2-235	The IPC shall subscribe to the (CAN) signals required by the subscribing function "Interior Night-time Dimmable Backlighting Illumination Algorithm" as identified in section 6.2.2.3 "Signal Requirements": Backlit_LED_Status and Litval. Note: Backlit_LED_Status ≠ OFF is a local sleep inhibitor. Modules on the network will allow the network(s) to sleep but illumination will remain ON indefinitely, no timeouts allowed. Local sleep is allowed then Backlit_LED_Status = OFF
R: 6.1.3.2-236	The IPC shall use the signals it has been identified as a subscriber to in section 6.2.2.3 "Signal Requirements" to transmit a control signal to Night-time Dimmable Backlighting Illumination directly connected to it that meet the requirements under section 5.4.7.3 "Night-time Dimmable" Backlighting Illumination Algorithm
R: 6.1.3.2-237	The IPC shall transmit a control signal to Night-time Dimmable Backlighting Illumination directly connected to it that will support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-021878 DNA WELCOME-FAREWELL STRATEGY REV. 1" for Ford vehicles
R: 6.1.3.2-238	The IPC shall transmit a control signal to Night-time Dimmable Backlighting Illumination directly connected to it that will satisfy the control signal specific requirements listed under Appendix 2 "Interior Lighting PWM Signal Specification"
R: 5.4.7.1.6-43	The IPC shall transmit a control signal to Night-time Dimmable Backlighting elements directly connected to it that will support the desired Smooth Dimming behavior as detailed in the latest version of the following specification: "ES-H1BT-1A278-AA-VXX"

Table below provided as reference for IPC subscribed signals to Expected Initial Control Signal Response:

Subscriber Signal Mapping	Expected initial response as per section 5.4.7.3 "Night-time Dimmable" Backlighting Illumination Algorithm

Backlit_LED_status	Control Signal Response
Night_1 – Night_12	"Fade ON"/Ramp up
OFF	"Fade OFF"/Ramp down

6.2.3.11.4 Provide Control Signal to support Interior 2-Step Dimmable Backlighting Illumination

R: 6.1.3.2-239	The IPC shall subscribe to the (CAN) signals required by the subscribing function "Interior 2-Step Dimmable Backlighting Illumination Algorithm" as identified in section 6.2.2.3 "Signal Requirements": Dimming_lvl and Litval. Note: Dimming_lvl ≠ OFF is a local sleep inhibitor. Modules on the network will allow the network(s) to sleep but illumination will remain ON indefinitely, no timeouts allowed. Local sleep is allowed then Dimming_lvl = OFF
R: 6.1.3.2-240	The IPC shall use the signals it has been identified as a subscriber to in section 6.2.2.3 "Signal Requirements" to transmit a control signal to 2-Step Dimmable Backlighting Illumination directly connected to it that meet the requirements under section 5.4.7.5 "2-Step Dimmable" Backlighting Illumination Algorithm
R: 6.1.3.2-241	The IPC shall transmit a control signal to 2-Step Dimmable Backlighting Illumination directly connected to it that will support the desired Welcome/Farewell state specific behavior called out in "RQT-002004-021878 DNA WELCOME-FAREWELL STRATEGY REV. 1" for Ford vehicles
R: 6.1.3.2-242	The IPC shall transmit a control signal to 2-Step Dimmable Backlighting Illumination directly connected to it that will satisfy the control signal specific requirements listed under Appendix 2 "Interior Lighting PWM Signal Specification"
R: 5.4.7.1.6-44	The IPC shall transmit a control signal to 2-Step Dimmable Backlighting elements directly connected to it that will support the desired Smooth Dimming behavior as detailed in the latest version of the following specification: "ES-H1BT-1A278-AA-VXX"

Table below provided as reference for IPC subscribed signals to Expected Initial Control Signal Response:

Subscriber Signal Mapping	Expected initial response as per section 5.4.7.5 "2-Step Dimmable" Backlighting Illumination Algorithm
Dimming_lvl	Control Signal Response
Day_1 – Day_6	"Fade ON"/Ramp up to "Non-selectable Daytime level"
Night_1 – Night_12	"Fade ON"/Ramp up to "Non-selectable Nighttime level"
OFF	"Fade OFF"/Ramp down

6.2.3.11.5 Support Odometer, Welcome/Farewell Animations and Displays, and Pointer illumination during Welcome Farewell sequence

The requirements under this section are only applicable to vehicles with push button ignitions. For any bladed key or alternative implementations please refer to "Welcome-Goodbye Strategy - CGEA1.3_v6.0" document.

R: 6.1.3.1.3-2	The IPC shall meet the welcome farewell state transition requirements listed under section 5.5.2 "Cluster Display, Pointers, and Odometer during Welcome/Farewell" – already taken inputs associated with each applicable state and their timeouts into account.
R: 6.1.3.1.3-21	The IPC will support the desired Welcome/Farewell state specific behavior (Illumination Level) for "Welcome/Farewell Displays", "Pointers", and "Odometer" called out in "RQT-002004-021878 DNA WELCOME-FAREWELL STRATEGY REV. X" for Ford vehicles
R: 6.1.3.1.3-7	The IPC shall subscribe to the (CAN) signals required by the subscribing function " Vehicle Display Cluster Welcome/Farewell" as identified in section 6.2.2.3 "Signal Requirements" (included within state transition diagrams within section 5.2.2)

6.2.3.12 **Austere Heads-Up Display (aHUD) requirements**
The aHUD shall be a subscriber to the BCM (Welcome Farewell State determination function) then use it to determine which screen/graphics to display.

6.2.3.12.1 Over-arching requirements

R: 6.1.3.12-5	The AHUD shall contain its Performance Latency within the End-to-End latency specified in section 3.2.2.1 "Performance Latency Requirements"
R: 6.1.3.12-6	The AHUD shall take into account the requirements contained within section 3.2.3 "Safety Requirements" to ensure that no screen/display that it directly controls ends up violating any requirement (specific to the market the target vehicle shall be sold in) within the aforementioned section.
R: 6.1.3.12-7	The AHUD shall take into account the requirements contained within section 3.2.4 "Security Requirements" to ensure that no screen/display that it directly controls (via control signal) ends up violating any requirement within the aforementioned section.
R: 6.1.3.12-8	The aHUD shall be a publisher to signals it has been identified as a publisher for within section 6.1.2.3 "Signal requirements"

6.2.3.12.2 Support Welcome/Farewell Animations and Displays during Welcome Farewell sequence

R: 6.1.3.1.3-8	The aHUD shall meet the requirements listed under section 5.5.3 HUD Welcome/Farewell Displays (aHUD)" (including the associated "State Determination Algorithm)
R: 6.1.3.1.3-22	The aHUD will support the desired Welcome/Farewell state specific behavior specific to "Welcome" and "Farewell" graphics called out in "RQT-002004-021878 DNA WELCOME-FAREWELL STRATEGY REV. 1" for Ford vehicles
R: 6.1.3.1.3-2	The aHUD shall use the signals it has been identified as a subscriber to in section 6.2.2.3 "Signal Requirements" to follow the state transitions as they're listed section 5.2.2 "Welcome/Farewell State determination without Battery saver tie-in": Ignition_Status, DrStatDrv_B_Actl, DrStatPsngr_B_Actl,, DrStatRl_B_ Actl, DrStatRr_B_ Actl, and PudLamp_D_Rq

Welcome Farewell state	Required Signals	Behavior
Welcome Courtesy Lighting True	Ignition_Status DrStatDrv_B_Actl**,** DrStatPsngr_B_Actl	(Ignition_Status = OFF/ACCY) &(DrStatDrv_B_Actl OR DrStatPsngr_B_Actl = Ajar)
Welcome Courtesy Lighting Delay True	Ignition_Status DrStatDrv_B_Actl**,** DrStatPsngr_B_Actl	(Ignition_Status = OFF/ACCY) &(DrStatDrv_B_Actl & DrStatPsngr_B_Actl = Closed)
Ignition RUN/Start	Ignition_Status	Ignition_Status = RUN/Start
Illuminated Exit True	Ignition_Status	Ignition_Status = RUN/Start transition to OFF
Farewell Courtesy Lighting True	Ignition_Status DrStatDrv_B_Actl**,** DrStatPsngr_B_Actl	(Ignition_Status transition to OFF) &(DrStatDrv_B_Actl OR DrStatPsngr_B_Actl = Ajar)
Farewell Courtesy Lighting Delay True	Ignition_Status DrStatDrv_B_Actl**,** DrStatPsngr_B_Actl	(Ignition_Status transition to OFF) &(DrStatDrv_B_Actl & DrStatPsngr_B_Actl = Closed)

Note: Please refer to section 5.2.2 "Welcome/Farewell State Determination without Battery saver tie-in" for additional transition criteria, timeouts etc. "Approach Detection", "Illuminated Entry", and "Vehicle Locking" state should be treated the same as "Null".

Due to aHUD initialization delays, aHUD will initialize at whichever occurs first: Pudlamp_D_Rq = Fade/ON or ON, Vehicle Door transitioning to ajar, or ignition transitioning to RUN/Start..

6.2.4 Ford Vehicle Lighting Element/Assembly Response Performance requirements

Requirement	Performance requirements (section reference)	Control Signal Source (for Illumination)	Component

R: 6.2.4-1	Section 5.3.2 "Exterior Front Illumination Lighting Response"	LDM	Headlamps (Low-beams) Signature/Decorative LED Lamps
R: 6.2.4-2		BCM	Front Parklamps
R: 6.2.4-3	Section 5.3.4 "Exterior Rear Illumination Lighting Response"	BCM	Rear Park Lamp License Plate Lamps
R: 6.2.4-4	Section 5.3.6 "Exterior Supplementary Illumination Lighting Response"	BCM	Illuminated Door Handle Pockets Puddle Area Side Pickup truck cargo light
R: 6.2.4-5	Section 5.4.2 "Courtesy Lamps Lighting Response"	BCM	Courtesy Lamps Scuff Plates
R: 6.2.4-6	Section 5.4.4 "Ambient Lighting Illumination (without Static Sequential) Lighting Response"	ALM	Ambient Lighting
R: 6.2.4-7	Section 5.4.7.2 "Day-Time Dimmable Backlighting Illumination Response"	IPC	Cluster Backlighting/Indicators
R: 6.2.4-8		APIM	Center-stack display dimming
R: 6.2.4-9	Section 5.4.7.4 "Night-Time Dimmable Backlighting Illumination Response"	DDM/PDM/BCM	Door trim switch/button backlighting
R: 6.2.4-10		BCM	Headlamp switch IP & Overhead-Control Switch/Button Engine Start/Stop button graphic/halo
R: 6.2.4-11		IPC	Cluster Backlighting/Indicators
R: 6.2.4-12		FCIM	Sync/Radio Control button Backlighting
R: 6.2.4-13	Section 5.4.7.6 "2-step Dimmable Backlighting Illumination Response"	DDM/PDM/BCM	Door trim switch/button backlighting
R: 6.2.4-14		BCM	Headlamp switch IP & Overhead-Control Switch/Button
R: 6.2.4-15		FCIM	Sync/Radio Control button Backlighting
R: 6.2.4-16		IPC	Cluster Backlighting/Indicators
R: 6.2.4-17	Section 5.5.1 "Center-stack Welcome/Farewell Displays (Sync Screen)"	APIM	Center-stack Welcome/Farewell Displays
R: 6.2.4-18	Section 5.5.2 "Cluster Welcome/Farewell Displays (Sync Screen)"	IPC	Cluster Welcome/Farewell Displays Odometer
R: 6.2.4-19	Section 5.5.3 "HUD Welcome/Farewell Displays (Sync Screen)"	aHUD	aHUD Welcome/Farewell Displays

6.2.4.1 "Other" Performance requirements

This section is for lighting elements or vehicle part assemblies that have been identified on "RQT-002004-021878 DNA WELCOME-FAREWELL STRATEGY REV. 1" that respond to inputs that are outside the scope of "Welcome/Farewell" but have been included due to their impact on the feature as a whole (additionally these "features" have their own separate owners)

Requirement	Component	Control Signal Source (for Illumination)	Performance requirements owner
R: 6.2.4.1-1	Turn Signal Indicator	BCM	Body Security Group
R: 6.2.4.1-2	Pick-up truck bedlamp	BCM	Body Electronics Group Additional requirements contained within "Illuminated Belt Buckle Spec" owned by MMAJKOWS
R: 6.2.4.1-3	Night Lock Indication	BCM	Body Security Group
R: 6.2.4.1-4	Autofold Mirrors	DDM/PDM	Body Electronics Group
R: 6.2.4.1-5	SECURICODE Keypad	BCM	Body Security Group
R: 6.2.4.1-6	cHUD	cHUD	Driver Information HUD Group

			Additional requirements contained within "cHUD Welcome – Goodbye Strategy – CGEA1.3" spec owned by AMATHAI

7 DATA DICTIONARY

7.1 Dictionary

Name: **Backlit_LED_Status**
Description: Status of Backlighting LED output. Used in-place of dimming_lvl for night-time dimmable backlighting elements
Type: Discrete
Category: CAN and LIN
Initial Value: NIGHT_12
Storage Class: Volatile
Structure of Data: Scalar

Domain	Domain Element Description
NIGHT_1	nighttime step 1, minimum nighttime mode brightness
NIGHT_10	nighttime step 10
NIGHT_11	nighttime step 11
NIGHT_12	nighttime step 12, maximum nighttime mode brightness
NIGHT_2	nighttime step 2
NIGHT_3	nighttime step 3
NIGHT_4	nighttime step 4
NIGHT_5	nighttime step 5
NIGHT_6	nighttime step 6
NIGHT_7	nighttime step 7
NIGHT_8	nighttime step 8
NIGHT_9	nighttime step 9
OFF	standard backlighting is off

Name: **Customer_Color**
Description: Color X, where X is a value in the range of 0 → 15 and corresponds to the customer's selected color
Type: Discrete
Category: LIN
Initial Value: 0
Storage Class: Non-Volatile – Customer Set
Structure of Data: Scalar
Units: N/A
Resolution: 1
Min Value: 0
Max Value: 15

Name: **Customer_Intensity**
Description: A value in the range of 0 → 0xF and corresponds to the customer's selected intensity.
Type: Discrete
Category: LIN
Initial Value: 1
Storage Class: Non-Volatile – Customer Set
Structure of Data: Scalar
Units: N/A
Resolution: 1
Min Value: 0
Max Value: 15

Name: **Delay_Accy**
Description: Indicated if Delayed Accessory power is active
Type: Discrete
Category: CAN
Initial Value: NO_EFFECT
Storage Class: Volatile
Structure of Data: Scalar

Domain	Domain Element Description
OFF	
ON	

Name: **Dimming_Lvl**
Description: Intensity level of dimmable backlighting.
Type: Discrete
Category: CAN and LIN
Initial Value: NIGHT_12
Storage Class: Volatile
Structure of Data: Scalar

Domain	Domain Element Description
DAY_1	daytime step 1, minimum daytime mode brightness
DAY_2	daytime step 2
DAY_3	daytime step 3
DAY_4	daytime step 4
DAY_5	daytime step 5
DAY_6	daytime step 6, maximum daytime mode brightness
INVALID	means that the BCM is not configured for Day-time Dimmable Backlighting
NIGHT_1	nighttime step 1, minimum nighttime mode brightness
NIGHT_10	nighttime step 10
NIGHT_11	nighttime step 11
NIGHT_12	nighttime step 12, maximum nighttime mode brightness
NIGHT_2	nighttime step 2
NIGHT_3	nighttime step 3
NIGHT_4	nighttime step 4
NIGHT_5	nighttime step 5
NIGHT_6	nighttime step 6
NIGHT_7	nighttime step 7
NIGHT_8	nighttime step 8
NIGHT_9	nighttime step 9
OFF	backlighting is off
UNKNOWN	is not used. BCM never sets this to UNKNOWN.

Name: **Litval**
Description: An indication of ambient light level for use by modules implementing non-standard dimmable backlighting.
Type: Discrete
Category: CAN & LIN
Initial Value: NIGHT
Storage Class: Volatile
Structure of Data: Scalar

Domain	Domain Element Description
DAY	ambient light is at day level
NIGHT	ambient light is at night level
TWILIGHT_1	ambient light is at twilight 1 level
TWILIGHT_2	ambient light is at twilight 2 level

| TWILIGHT_3 | ambient light is at twilight 3 level |
| TWILIGHT_4 | ambient light is at twilight 4 level |

Name: **DrStatDrv_B_Actl**
Description: Indicates if the driver's front door is ajar.
Type: Discrete
Category: CAN
Initial Value: CLOSED
Storage Class: Volatile
Structure of Data: Scalar

Domain	Domain Element Description
AJAR	The driver's front door is ajar.
CLOSED	The driver's front door is not ajar.

Name: **DrStatPsngr_B_Actl**
Description: Indicates if the passenger's front door is ajar.
Type: Discrete
Category: CAN
Initial Value: CLOSED
Storage Class: Volatile
Structure of Data: Scalar

Domain	Domain Element Description
AJAR	the passenger's front door is ajar
CLOSED	the passenger's front door is not ajar

Name: **DrStatRl_B_Actl**
Description: Rear left door ajar status. Applies to the rear left door regardless of vehicle configuration.
Type: Discrete
Category: CAN
Initial Value: CLOSED
Storage Class: Volatile
Structure of Data: Scalar

Domain	Domain Element Description
AJAR	door is ajar
CLOSED	door is closed

Name: **DrStatRr_B_Actl**
Description: Rear right door ajar status. Applies to the rear right door regardless of vehicle configuration.
Type: Discrete
Category: CAN
Initial Value: CLOSED
Storage Class: Volatile
Structure of Data: Scalar

Domain	Domain Element Description
AJAR	door is ajar
CLOSED	door is closed

Name: **HMI_HMIMode_St**
Description: Multimedia system state
Type: Discrete
Category: CAN
Initial Value: OFF
Storage Class: Volatile
Structure of Data: Scalar

Domain	Domain Element Description
Invalid	Invalid state (error)
OffMode	Sync screen is OFF
On	Sync screen is ON

Phone   Sync screen is held at Phone screen/display
Climate   Sync screen is held at Climate screen/display
Load_Shed_Active   Sync is in low power/function mode

Name: **Ignition_Status**
Description: The processed value for current Ignition state.
Type: Discrete
Category: CAN
Initial Value: OFF
Storage Class: Volatile
Structure of Data: Scalar

Domain	Domain Element Description
ACC	- ignition is in the ACC position
OFF	- ignition is in the OFF position
RUN	- ignition is in the RUN position
START	- ignition is in the START position

Name: **PudLamp_D_Rq**
Description: CAN signal to mimic the puddle lamp circuit.
Type: Discrete
Category: CAN
Initial Value: OFF
Storage Class: Volatile
Structure of Data: Scalar

Domain	Domain Element Description
OFF	Puddle lamp is on
ON	Puddle lamp is off
RAMP_DOWN	Puddle lamp is ramping down
RAMP_UP	Puddle lamp is ramping up

Name: **PudLampDrv_D_Rq**
Description: CAN signal to mimic the puddle lamp circuit.
Type: Discrete
Category: CAN
Initial Value: OFF
Storage Class: Volatile
Structure of Data: Scalar

Domain	Domain Element Description
OFF	Puddle lamp is on
ON	Puddle lamp is off
RAMP_DOWN	Puddle lamp is ramping down
RAMP_UP	Puddle lamp is ramping up

Name: **PudLampPsngr_D_Rq**
Description: CAN signal to mimic the puddle lamp circuit.
Type: Discrete
Category: CAN
Initial Value: OFF
Storage Class: Volatile
Structure of Data: Scalar

Domain	Domain Element Description
OFF	Puddle lamp is on
ON	Puddle lamp is off
RAMP_DOWN	Puddle lamp is ramping down
RAMP_UP	Puddle lamp is ramping up

Name: **Remote_Start_Status**
Description: Request from FCSD remote start receiver to activate remote start.
Type: Discrete
Category: LIN

Initial Value: NULL
Storage Class: Volatile
Structure of Data: Scalar

Domain	Domain Element Description
CANCEL	Request to cancel remote start event
NULL	No request for action made
START	Request for remote start event to occur

Name: **Wfsuperstate**
Description: Indicates the different phases of Courtesy illumination. i.e Welcome/Farewell/Iginition Run.
               Used by Exterior Lighting specific modules connected to BCM via LIN
Type: Discrete
Category: LIN
Initial Value: NULL
Storage Class: Volatile
Structure of Data: Scalar

Domain	Domain Element Description
OFF	Vehicle is not in any part of Welcome/Farewell
WELCOME	Vehicle is in Welcome State
RUNSTART	Vehicle is in Ignition Run/Start State
FAREWELL	Vehicle is in Farewell State

Name: **Wfsubstate**
Description: Tell the status of BCM current welcome farewell Substate(i.e. Entry, Door, Delay, Exit,
               Approach) on LIN. Used by Exterior Lighting specific modules connected to BCM via LIN
Type: Discrete
Category: LIN
Initial Value: NULL
Storage Class: Volatile
Structure of Data: Scalar

Domain	Domain Element Description
NULL	Vehicle is either locked or timed out of states
IllumEntry	Vehicle was unlocked from outside of vehicle
IllEXIT	Vehicle ignition has transitioned to OFF
DoorAjarCourtesyLight	Vehicle door(s) transitioned to Ajar
CourtesyLightDelay	Vehicle door(s) transitioned from Ajar to all Closed
APPROACH	Vehicle Approach was detected

Name: **WelcomeFarewell_State**
Description: Indicates the different phases of Courtesy illumination. i.e Welcome/Farewell/Iginition Run.
               Used by Interior Lighting specific modules connected to BCM via LIN
Type: Discrete
Category: LIN
Initial Value: NULL
Storage Class: Volatile
Structure of Data: Scalar

Domain	Domain Element Description
NULL	Vehicle is not in any part of Welcome/Farewell
WELCOME	Vehicle is in Welcome State
RUN_START	Vehicle is in Ignition Run/Start State
FAREWELL	Vehicle is in Farewell State

Name: **WelcomeFarewell_Substate**
Description: Tell the status of BCM current welcome farewell Substate(i.e. Entry, Door, Delay, Exit,
               Approach) on LIN. Used by Interior Lighting specific modules connected to BCM via LIN
Type: Discrete
Category: LIN
Initial Value: NULL

| Storage Class: | Volatile | |
| Structure of Data: | Scalar | |

Domain	Domain Element Description
NULL	Vehicle is either locked or timed out of states
APPROACH	Vehicle Approach was detected
DELAY	Vehicle door(s) transitioned from Ajar to all Closed
DOOR	Vehicle door(s) transitioned to Ajar
ENTRY	Vehicle was unlocked from outside of vehicle
EXIT	Vehicle ignition has transitioned to OFF

8 REVISION HISTORY

Revision Level	Name	Change Description	Date
V1.0	FEHSAN2	Initial Release	4/21/2016
V1.1	FEHSAN2	Section 3.2.2: Functional Voltage Range updated from 9 – 16V to 6 – 16V Section 6.1.2.3.1: Updated Functional Voltage Range for all CAN messages from 9 – 16v to 6 – 16V Section 6.2.2.3.1: Updated Functional Voltage Range for all CAN messages from 9 – 16v to 6 – 16V Section 5.2.1: Included "Accessory" as part of "Ignition OFF" state. Section 5.2.2: Changed "AND/OR" to "OR" Section 5.2.3: Changed "AND/OR" to "OR" Section 5.4.7.1.2: Changed Theater Dimming curve to Smooth Dimming curves and updated Default durations Section 5.4.7.3.2: Changed Theater Dimming curve to Smooth Dimming curves and updated Default durations Section 5.4.7.5.2: Changed Theater Dimming curve to Smooth Dimming curves and updated Default durations	6/8/2016
V1.2	FEHSAN2	Section 5.5.2: Updated to include state flow diagram Section 6.1.3.13.5: Updated based on section 5.5.2 update Section 6.2.3.11.5: Updated based on section 5.5.2 update	

9 APPENDIX

9.1 APPENDIX 1: Exterior Lighting PWM Signal Specification

Operating Conditions: [1,2]		System Voltage: 9.5 < Vsys < 16.0 volts Ambient Temperature: -40oC < Tamb < 85oC					
No	Characteristic	Comment	Min	Typ	Max	Unit
1	PWM output frequency 1/P for Incandescent Bulbs	Configurable in the ECU	100	110	300	Hz
2	PWM output frequency 1/P for LED Bulbs	Configurable in the ECU	100	220	300	Hz
3	Frequency jitter	Measured via 1 second sliding window			0.1	Δ %
4	PWM rise t(r) / fall time t(f)		8		50	µs
5	PWM output duty cycle Pw/P[7]		0		100	%
6	PWM output duty cycle jitter	Measured via 1 second sliding window			0.1	Δ %
7	PWM output duty cycle tolerance total				0.2	Δ %
8	PWM resolution	8 bit or better			1/255	
9	PWM response time message [4]				21	ms
10	PWM response time voltage [5]				18	ms
11	Shortage to GND detection	Duty cycle while error detection active	10		100	%
12	Shortage to Ubat or open line detection	Duty cycle while error detection active	0		90	%
13	PWM output voltage (Vpk)	Short circuit & reverse battery protected	Vsys-1.5			V
14	Ground Offset	See ELCOMP requirement RQT-191001-009976 & 009989				V

Note 1: Specified values are valid for complete range of system voltage and ambient temperature.
Note 2: Output values are measured at the ECU with the PWM output and related to ECU GND.
Note 4: Time when message is complete at bus to PWM response is measured at ECU PWM output.
Note 5: Time when voltage jump is applied to PWM response is measured at ECU PWM output.
Note 6: Any received PWM duty cycle shall be mapped to the closed available (taking into account resolution) duty cycle in the receiving ECU.

9.2 APPENDIX 2: Interior Lighting PWM Signal Specification

	Operating Conditions: [1,2]	System Voltage: 9.5 < Vsys < 16.0 volts Ambient Temperature: -40oC < Tamb < 85oC					
No	Characteristic	Comment	Min	Typ	Max	Unit
1	PWM output frequency 1/P for Incandescent Bulbs	Configurable in the ECU	100	110	300	Hz
2	PWM output frequency 1/P for LED Bulbs	Configurable in the ECU	100	220	300	Hz
3	Frequency jitter	Measured via 1 second sliding window			0.1	Δ %
4	PWM rise t(r) / fall time t(f)		8		50	μs
5	PWM output duty cycle Pw/P[7]		0		100	%
6	PWM output duty cycle jitter	Measured via 1 second sliding window			0.1	Δ %
7	PWM output duty cycle tolerance total				0.2	Δ %
8	PWM resolution	8 bit or better			1/255	
9	PWM response time message [4]				21	ms
10	PWM response time voltage [5]				18	ms
11	Shortage to GND detection	Duty cycle while error detection active	10		100	%
12	Shortage to Ubat or open line detection	Duty cycle while error detection active	0		90	%
13	PWM output voltage (Vpk)	Short circuit & reverse battery protected	Vsys-1.5			V
14	Ground Offset	See ELCOMP requirement RQT-191001-009976 & 009989				V

Note 1: Specified values are valid for complete range of system voltage and ambient temperature.
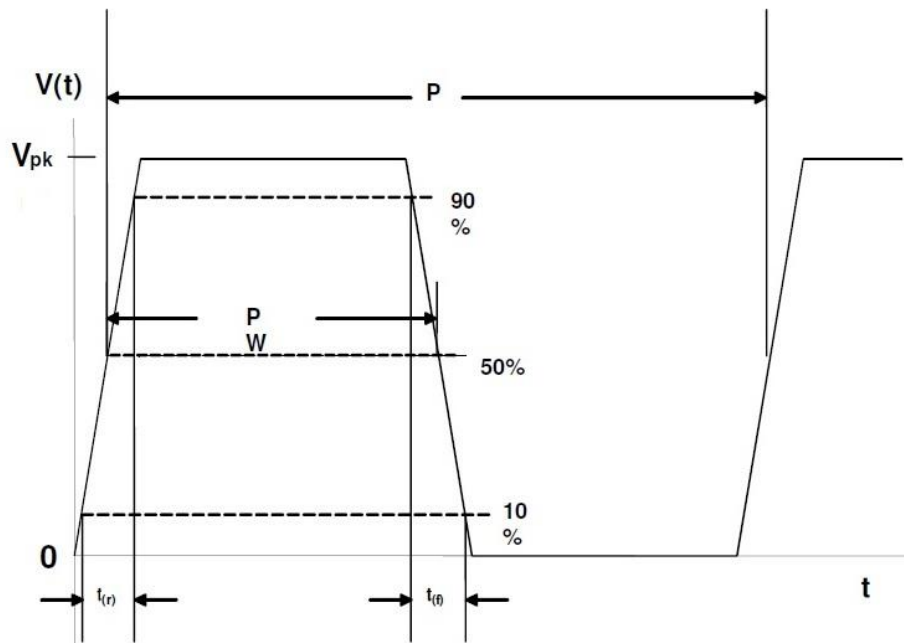Note 2: Output values are measured at the ECU with the PWM output and related to ECU GND.
Note 4: Time when message is complete at bus to PWM response is measured at ECU PWM output.
Note 5: Time when voltage jump is applied to PWM response is measured at ECU PWM output.
Note 6: Any received PWM duty cycle shall be mapped to the closed available (taking into account resolution) duty cycle in the receiving ECU.

9.3 APPENDIX 3: FEATURE LEVEL USE CASES

01.0 APPROACH

Use Case ID	
Use Case Title	**Keyfob holder approaches towards the vehicle with valid PK**
Actors	Keyfob holder
Pre-conditions	Vehicle is Locked, Approach detection is enabled, Ignition is OFF, Headlamp switch "AUTO" or "OFF"
Scenario Description	Keyfob holder approaches vehicle with functioning PK Valid PK detected within approach detection range

Post-conditions	Exterior Illumination: Fades ON over 3 seconds Interior Illumination: Stays OFF Vehicle Displays: Stay OFF
List of Exception Use Cases	
Interfaces	
Links to Referenced Use Cases	

02.0 UNLOCK

Use Case ID	
Use Case Title	**Keyfob holder unlocks vehicle**
Actors	Keyfob holder
Pre-conditions	Approach was detected. Ignition is OFF, Headlamp switch "AUTO" or "OFF"
Scenario Description	Keyfob holder walks towards the vehicle Approach detected Keyfob holder unlocks vehicle using keyfob or keypad
Post-conditions	Exterior Illumination: Remains ON Interior Illumination: Stays OFF Vehicle Displays: Stay OFF
List of Exception Use Cases	
Interfaces	
Links to Referenced Use Cases	

03.0 OPEN DOOR

Use Case ID	
Use Case Title	**Keyfob holder opens vehicle door**
Actors	Keyfob holder
Pre-conditions	Vehicle Unlocked, Ignition is OFF, Headlamp switch "AUTO" or "OFF"
Scenario Description	Keyfob holder opens any exterior door
Post-conditions	Exterior Illumination: Remains ON Interior Illumination: Fade ON over 3 seconds Vehicle Displays: Begin/Display Welcome Animation
List of Exception Use Cases	
Interfaces	
Links to Referenced Use Cases	

04.0 CLOSE ALL DOORS

Use Case ID	
Use Case Title	**Keyfob holder closed all vehicle door**
Actors	Keyfob holder
Pre-conditions	Ignition is OFF, vehicle door(s) ajar, Headlamp switch "AUTO" or "OFF"

Scenario Description	Keyfob holder closes all vehicle doors
Post-conditions	Exterior Illumination: Remains ON Interior Illumination: Remains ON Vehicle Displays: Continue displaying Welcome Animation until complete, then enable welcome display (static)
List of Exception Use Cases	
Interfaces	
Links to Referenced Use Cases	

Use Case ID	
Use Case Title	**Keyfob holder cycles ignition to RUN/START**
Actors	Keyfob holder
Pre-conditions	Ignition is OFF, vehicle door closed, Headlamp switch "AUTO" or "OFF"
Scenario Description	Keyfob holder cycles ignition to RUN/START
Post-conditions	Exterior Illumination: Revert to legislatively required in-drive setting Interior Illumination: Revert to legislatively required in-drive setting Vehicle Displays: Revert to legislatively required in-drive setting
List of Exception Use Cases	
Interfaces	
Links to Referenced Use Cases	

Use Case ID	
Use Case Title	**Ignition transitions from RUN to OFF**
Actors	Keyfob holder
Pre-conditions	Ignition is RUN, Headlamp switch "AUTO" or "OFF", Illumination and Displays are ON
Scenario Description	Ignition transitions to OFF
Post-conditions	Exterior Illumination: Remains ON Interior Illumination: Remains ON Vehicle Displays: Remain ON (remain at previous selected screen)
List of Exception Use Cases	
Interfaces	
Links to Referenced Use Cases	

Use Case ID	

Use Case Title	**Ignition transitions from RUN to OFF**
Actors	Keyfob holder
Pre-conditions	Ignition is RUN, Headlamp switch "AUTO" or "OFF"
Scenario Description	Ignition transitions to OFF
Post-conditions	Exterior Illumination: Not impacted Interior Illumination: Not impacted Vehicle Displays: Remain ON (remain at previous selected screen)
List of Exception Use Cases	
Interfaces	
Links to Referenced Use Cases	

<mark>08.0 OPEN DOOR</mark>

Use Case ID	
Use Case Title	**Keyfob holder opens vehicle door after Ignition transitions to OFF**
Actors	Keyfob holder
Pre-conditions	Ignition transitioned to OFF, vehicle doors closed, Headlamp switch "AUTO" or "OFF"
Scenario Description	Keyfob holder opens any vehicle door
Post-conditions	Exterior Illumination: Remains ON Interior Illumination: Remains ON Vehicle Displays: Begin/Display Farewell Animation. Turn OFF after Animation complete
List of Exception Use Cases	
Interfaces	
Links to Referenced Use Cases	

<mark>09.0 CLOSE ALL DOORS</mark>

Use Case ID	
Use Case Title	**Keyfob holder closes all open vehicle doors after Ignition transitions to OFF**
Actors	Keyfob holder
Pre-conditions	Ignition transitioned to OFF, vehicle door(s) open, Headlamp switch "AUTO" or "OFF"
Scenario Description	Keyfob holder closes all open vehicle doors
Post-conditions	Exterior Illumination: Remains ON Interior Illumination: Remains ON Vehicle Displays: Remains OFF
List of Exception Use Cases	
Interfaces	

Links to Referenced Use Cases	

Use Case ID	
Use Case Title	**Keyfob holder locks vehicle after Ignition transitions to OFF**
Actors	Keyfob holder
Pre-conditions	Ignition is OFF, vehicle doors closed, Headlamp switch "AUTO" or "OFF"
Scenario Description	Keyfob holder locks vehicle using keyfob/keypad
Post-conditions	Exterior Illumination: Fades OFF over 5 seconds Interior Illumination: Fades OFF over 5 seconds Vehicle Displays: Remains OFF
List of Exception Use Cases	
Interfaces	
Links to Referenced Use Cases	