Research & Vehicle Technology
"Infotainment Systems Product Development"

Feature – Vehicle Settings for Rear Lighting

APIM Infotainment Subsystem Part Specific Specification (SPSS)

Version 1.0

UNCONTROLLED COPY IF PRINTED

Version Date: Sept 15th, 2021

FORD CONFIDENTIAL

Table of Contents

1 Functional Definition

1.1 VS-FUN-REQ-339729/A-Rear Lighting Animation Setting

1.1.1 VS-CLD-REQ-340540/A- Rear Lighting Animation Client

The rear lighting animation client interfaces with the user via HMI and is responsible for sending the rear lighting animation setting request to the rear lighting animation server and receive the feedback from rear lighting.

1.1.2 VS-CLD-REQ-340542/A- Rear Lighting Animation Server

The rear lighting animation server is responsible for the rear lighting animation function and interfaces with the rear lighting animation client.

1.1.3 Use Cases

1.1.3.1 VS-UC-REQ-340548/A-User changes animation of rear lighting

Actors	Vehicle front seat occupant(s)
Pre-conditions	Ignition is ON Center stack display is ON and stay at “Rear Lighting Animation” menu
Scenario Description	User selects an animation among three selections via rear lighting animation HMI
Post-conditions	The selected rear lighting animation is the new one and is saved in APIM The selected animation signal transfers from APIM to HCM module via public CAN , then HCM transfers via private CAN to rear lighting modules. Rear lighting animation settings in HMI shows the animation is selected
Notes	when user select one type among these 3 types of rear lighting animation on HMI, the corresponding animation preview animation shall be showed in HMI. The specific HMI design is owned by studio or HMI team.

1.1.4 Interface Requirements

1.1.4.1 MD-REQ-339730/A- ExtLghtAnmtn_D_Rq

Message Type: Request

Note: Request signal from rear lighting animation client to rear lighting animation server to select which animation should be selected and showed for rear lighting.

Logical Signal Name	Literals	Value	Description
ExtLghtAnmtn_D_Rq	Null	0x0	Default value.
	Type1	0x1	The first animation of mid variant.
	Type2	0x2	The second animation of mid variant.
	Type3	0x3	The third animation of mid variant.
	Type4	0x4	The first animation of high variant.
	Type5	0x5	The second animation of high variant.
	Type6	0x6	The third animation of high variant.

APIM would send “ExtLghtAnmtn_D_Rq” for synchronization with taillamp when ignition is on every time. Apart from that, when customer click center screen for choosing a type of rear lighting animation, “ExtLghtAnmtn_D_Rq” will be sent also.

1.1.4.2 MD-REQ-339730/A- TailLghtAnmtn_D_Stat

Logical Signal Name	Literals	Value	Description
TailLghtAnmtn_D_Stat	Null	0x0	Default value.
	Type1	0x1	The first type of taillight animation is played.
	Type2	0x2	The second type of taillight animation is played.
	Type3	0x3	The third type of taillight animation is played.
	Type4	0x4	The fourth type of taillight animation is played.
	Type5	0x5	The fifth type of taillight animation is played.
	Type6	0x6	The sixth type of taillight animation is played.

Taillamps would also send the private CAN signal of “TailLghtAnmtn_D_Stat” which tells HCM the real animation type that taillamps play. HCM would transmit the signal via public CAN to APIM_CIM(SYNC+) and check if it matches with the selected animation.

1.1.4.3

1.1.5 Requirements

1.1.5.1 Rear lighting animation functional requirement

The rear lighting animation server shall transfer the animation signal via pulic CAN from APIM to HCM, then the animation signal would transfer as private CAN signal from HCM to tail lamp modules. Tail lamp modules include left and right bodyside lamps plus left and right decklid lamps.
Enhanced memory is not supported by the rear lighting animation server as user index signal would not change during approach detection stage.
If the user selects an animation, the APIM shall change to the selected one in after receiving the signal of “TailLghtAnmtn_D_Stat.”

1.1.5.2 APIM Configuration bit for rear lighting animation

In order to distinguish different variants of taillamps, APIM should define a configuration bit of DE06 which is called “Rear Lamp Animation”. APIM could identify taillamp variant according to the configuration bit of rear lighting animation.

DE block	Name	Byte	Start Bit	Length	Definition	中文描述	0x0	0x1	0x2	0x3
DE06	Config Block DE06	6	3	4	Stop Mode	power mode电源模式	Disabled	Stop Mode follows Sync Strategy	Stop Mode follows BCM Strategy	
		7	7	4	Clear Exit Assist	下车提示后方是否有危险	Disabled	Enabled – Egress Warning	Enabled – Egress Prevention	Enabled – Menu Setting Disabled
		7	3	4	Sunroof control	天窗控制	No Sunroof	1 piece Sunroof	2 pieces Sunroof	fixed glass
		8	7	4	Rear Lamp Animation	尾灯动画	Not Selectable	Animation sets 1	Animation sets 2	

If taillamp is low or mid variant, three animations are available, APIM should send “ExtLghtAnmtn_D_Rq” with low and middle variant values, which are 0x1, ox2, 0x3. If it is high variant, APIM should send “ExtLghtAnmtn_D_Rq” with high variant values, which are 0x4, ox5, 0x6. The default value is 0x0 as initial value all variants.

The value of 0x1(Animation sets 1) is correspond to “ExtLghtAnmtn_D_Rq” with low and middle variant values of 0x1, ox2, 0x3. The value of 0x2(Animation sets 2) is correspond to “ExtLghtAnmtn_D_Rq” with high variant values of 0x4, ox5, 0x6.

Here is the UI of rear animation selection interface in center screen.
Elegance – 优雅
Sport – **动感 (出厂默认选项)**
Dynamic – 激情

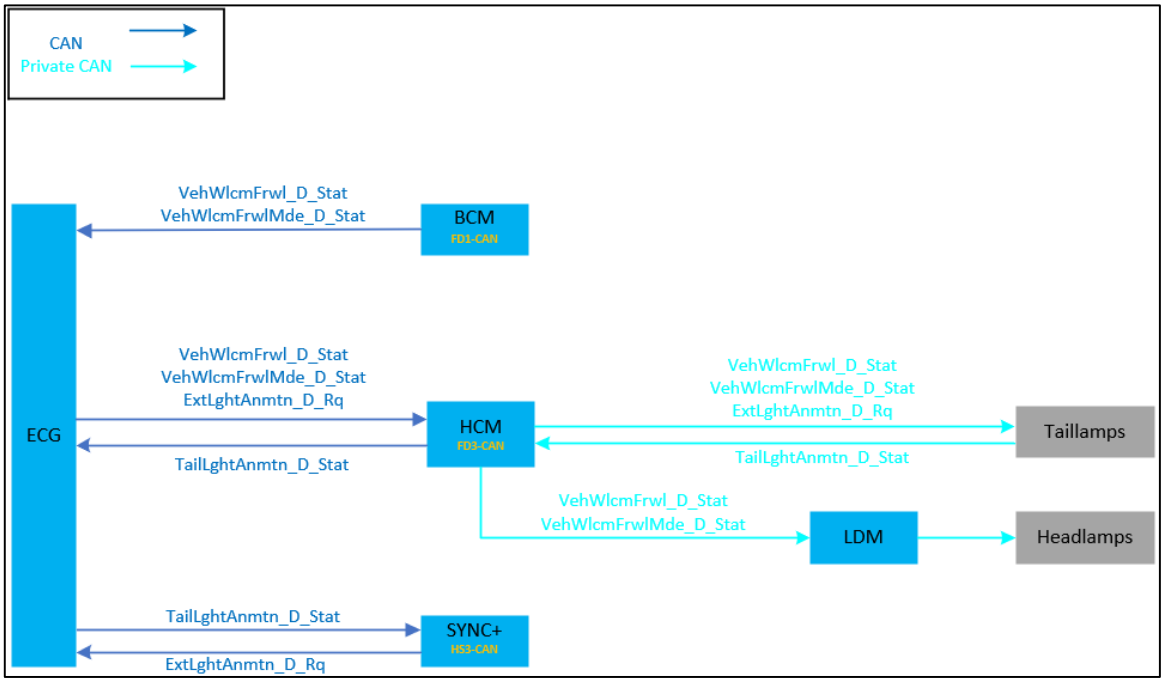
1–1 入口：快捷控制

Logical Signal Name	Literals	Value	Description	UI Name
ExtLghtAnmtn_D_Rq	Null	0x0	Default value.	
	Type1	0x1	The first animation of mid variant.	优雅
	Type2	0x2	The second animation of mid variant.	动感
	Type3	0x3	The third animation of mid variant.	激情
	Type4	0x4	The first animation of high variant.	优雅
	Type5	0x5	The second animation of high variant.	动感
	Type6	0x6	The third animation of high variant.	激情

When the configuration of “Rear Lamp Animation” is 0x1(Animation sets 1), the default value of “ExtLghtAnmtn_D_Rq” would be 0x2 Type2（动感）.
When the configuration of “Rear Lamp Animation” is 0x2(Animation sets 2), the default value of “ExtLghtAnmtn_D_Rq” would be 0x5 Type5（动感）.

1.1.6 Block Diagram

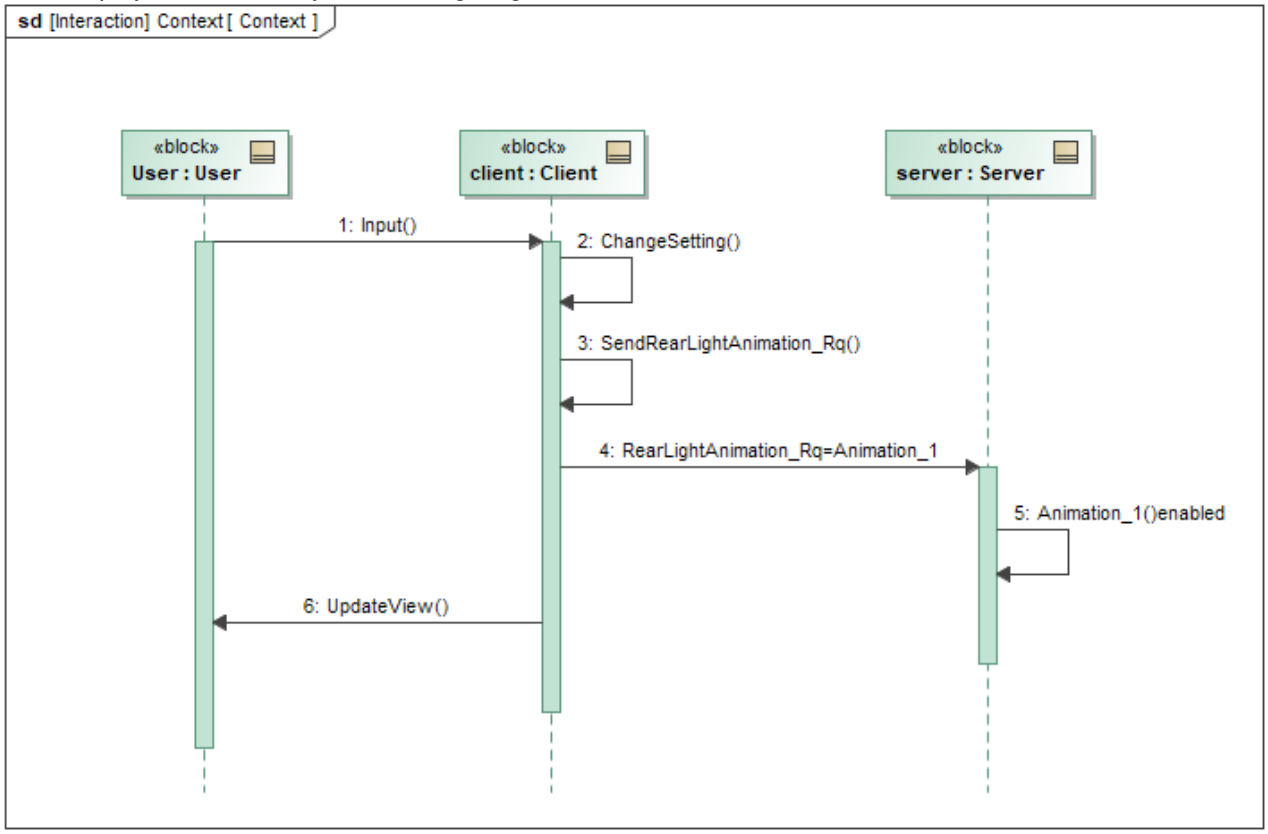
User could make a selection of personal preferred rear light animation type. Then the Public CAN signal “ExtLghtAnmtn_D_Rq” will be transferred to HCM. HCM would also transmit the signal to “RearAnimation_Type” as private CAN signal and transfer to rear lamp modules.
The block diagram could be referred to as below.



1.1.7 Sequence Diagram

1.1.7.1 VS-SD-REQ-341028/A-Rear Lighting Animation Selection via HMI

Pre-Condition:
Ignition is on
Center stack display is ON and stay at “Rear Lighting Animation” menu



2 Change log

	Content	Date
1.	Modified 1.1.5.2APIM Configuration bit for rear lighting animation. Three options for all tail lamp variants.	
2.	Add default animation in center screen and in APIM software.	