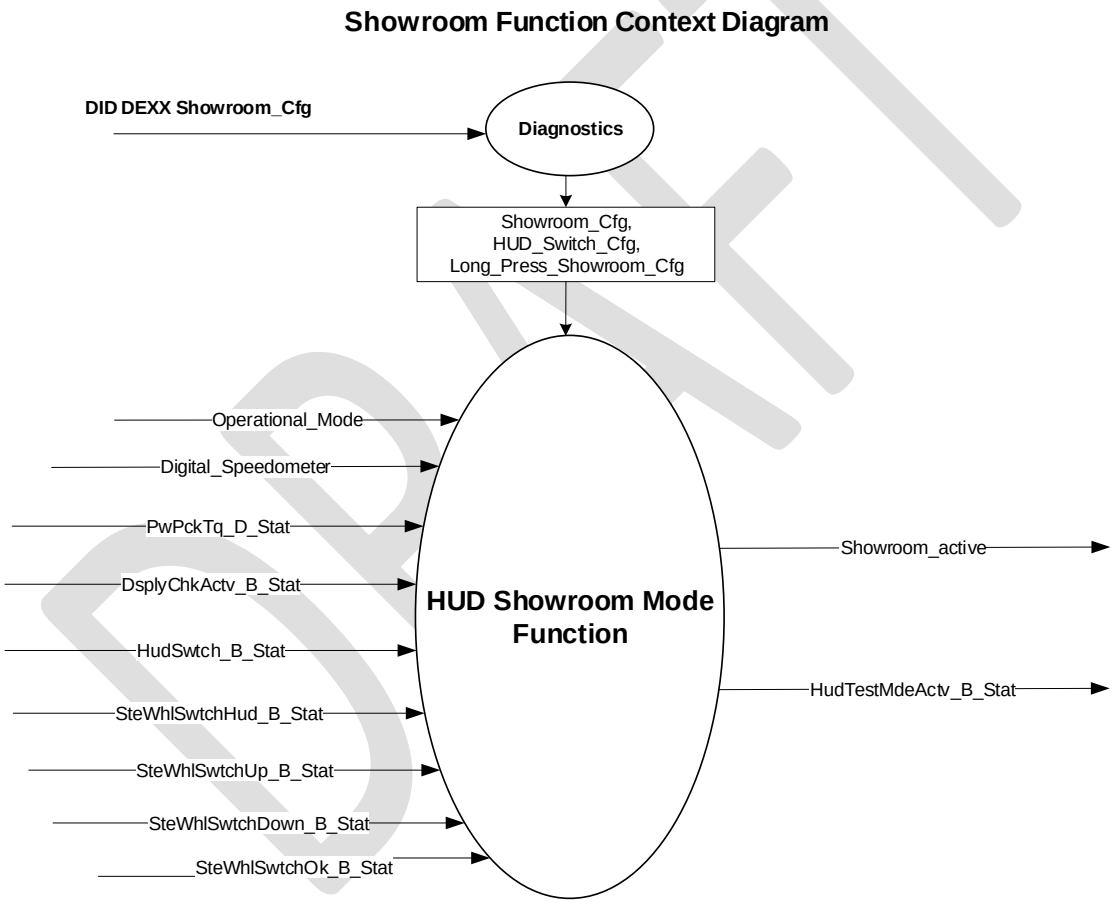
1 HUD Showroom Mode – CGEA1.3

1.1 Functional Description

The Showroom Mode enables dealers and customers to show the functions of the HUD to an interested audience which, without the Showroom Mode, could not see the functions because most of the HUD functions is only perceivable or best perceived while driving. Once entered via a long-press on the HUD button, the HUD will show a screen indicating the start of the demonstration followed by an animated sequence of exemplary values representing a virtual drive with locally correct units and street names. The showroom mode will be ceased upon another HUD button press or when the signal regarding the engine is indicating that the engine is running.

1.2 Interfaces

1.2.1 Interface Context Diagram (I/O Block Diagram)



1.2.2 Inputs

1.2.2.1 *IR-REQ-308802/A-INTERNAL:*

- Operational_Mode
- Digital_Speedometer
- Showroom_Cfg
- HudSwtch_B_Stat

1.2.2.2 MUX signals on the CAN Bus from GWM, IPC or SCCM

1.2.2.2.1 SIG-REQ-308796/A-PwPckTq_D_Stat Signal

Signal Name	Size (bits)	Detail	Units	Res.	Offset	State Encoded	Min	Max
PwPckTq_D_Stat	2	-	SED	1	0		0	0
		PwPckOff_TqNotAvailable				0x0		
		PwPckOn_TqNotAvailable				0x1		
		StartInPrgrss_TqNotAvail				0x2		
		PwPckOn_TqAvailable				0x3		

1.2.2.2.2 SIG-REQ-308797/A-DsplyChkActv_B_Stat Signal

Signal Name	Size (bits)	Detail	Units	Res.	Offset	State Encoded	Min	Max
DsplyChkActv_B_Stat	1	-	Number	1	0		0	1
		Inactive				0x0		
		Active				0x1		

1.2.2.2.3 SIG-REQ-308798/A-SteWhlSwtchHud_B_Stat Signal

Signal Name	Size (bits)	Detail	Units	Res.	Offset	State Encoded	Min	Max
SteWhlSwtchHud_B_Stat	1		SED	1	0		0	1
		Not_Pressed				0x0		
		Pressed				0x1		

1.2.2.2.4 SIG-REQ-308799/A-SteWhlSwtchUp_B_Stat Signal

Signal Name	Size (bits)	Detail	Units	Res.	Offset	State Encoded	Min	Max
SteWhlSwtchUp_B_Stat	1		SED	1	0		0	1
		Not_Pressed				0x0		
		Pressed				0x1		

1.2.2.2.5 SIG-REQ-308789/A-SteWhlSwtchDown_B_Stat Signal

Signal Name	Size (bits)	Detail	Units	Res.	Offset	State Encoded	Min	Max
SteWhlSwtchDown_B_Stat	1		SED	1	0		0	1
		Not_Pressed				0x0		
		Pressed				0x1		

1.2.2.2.6 SIG-REQ-308790/A-SteWhlSwtchOK_B_Stat Signal

Signal Name	Size (bits)	Detail	Units	Res.	Offset	State Encoded	Min	Max
SteWhlSwtchOk_B_Stat	1		SED	1	0		0	1
		Not_Pressed				0x0		
		Pressed				0x1		

1.2.3 Outputs

1.2.3.1 IR-REQ-308800/A-Internal

- Showroom_active indicates the status of the Showroom Mode

1.2.3.2 MUX signals on the CAN

1.2.3.2.1 SIG-REQ-308791/A-HudTestMdeActv_B_Stat Signal

Signal Name	Size (bits)	Detail	Units	Res.	Offset	State Encoded	Min	Max
HudTestMdeActv_B_Stat	1		SED	1	0		0	1
		Inactive				0x0		
		Active				0x1		

1.3 Function/Performance

1.3.1 F-REQ-308810/A-Operational Modes

Mode	Differentiating Vehicle Conditions
Sleep Mode	Showroom on cHUD Disabled
Limited Mode	Showroom on cHUD Disabled
Normal Mode	Showroom on cHUD Enabled / Disabled
Crank Mode	Showroom on cHUD Disabled

1.3.2 Voltage Levels

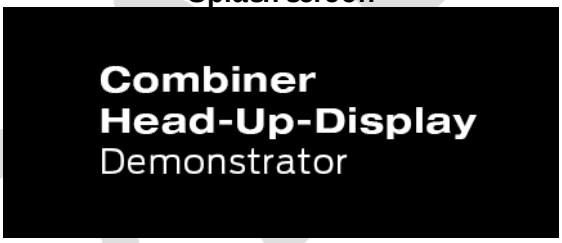
Refer to the Cluster Features table located in the Operational Modes and Voltage Range Strategies Section in this SPSS.

1.3.3 Human-Machine Interface

1.3.3.1 Visual

1.3.3.1.1 HMI-REQ-308792/A-Indicator Graphics / Display Format

Splash screen



1.3.3.1.2 Indicator Color Coordinates

Reference section COLOR & ILLUMINATION REQUIREMENTS (GRAPHICS)

1.3.3.2 Audio

No additional audio requirements in HUD Showroom Mode.

1.3.3.3 HMI-REQ-308801/A-Switch Control Logic

The steering wheel switches are shared with the IPC, similar to the Engineering Test Mode.

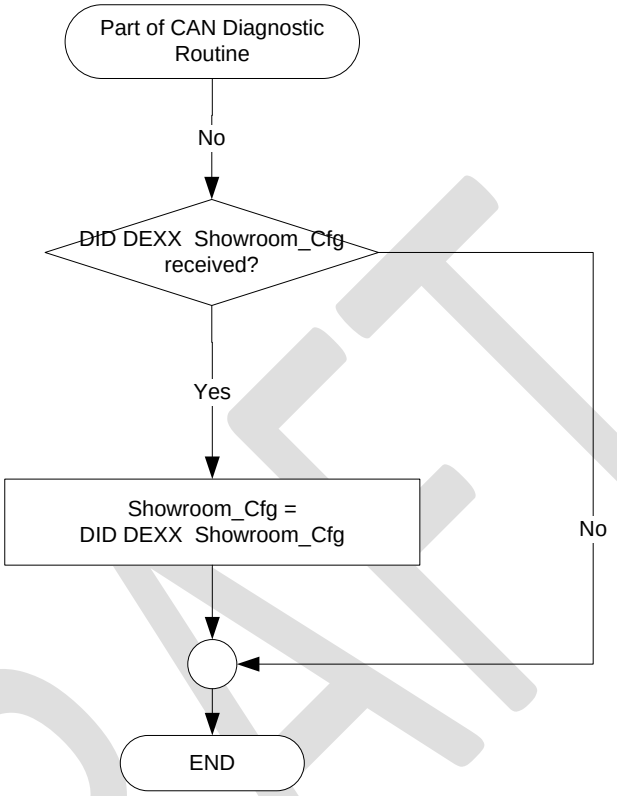
1.3.4 PFM-REQ-308809/A-System Accuracy

Within a 100msec of receiving a message that results in a change of state the HUD will update the display to the proper status.

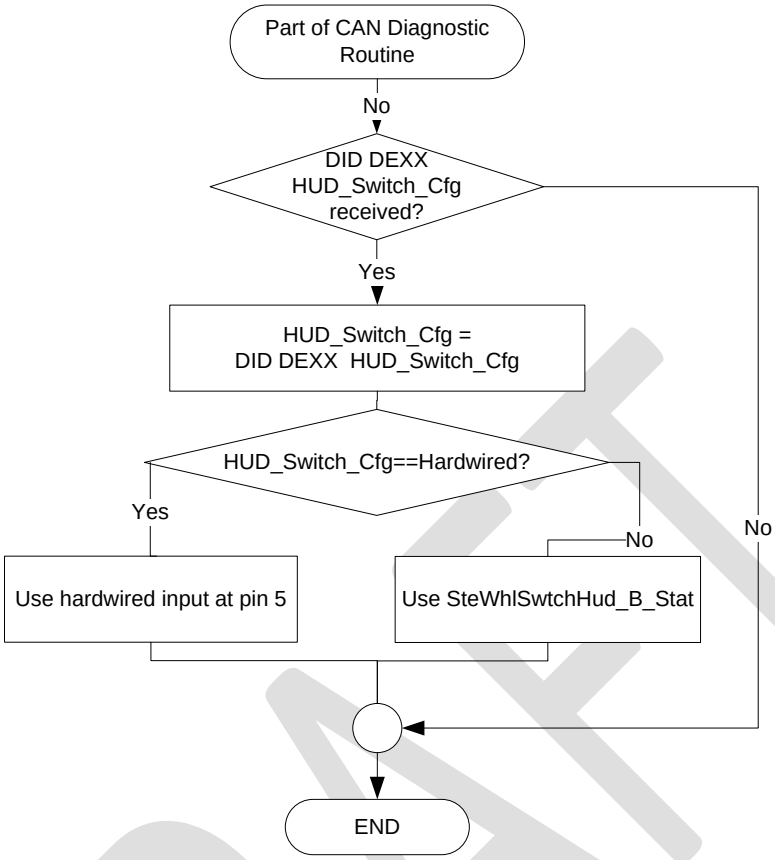
1.3.5 Operation: Performance and Functional

1.3.5.1 Subsystem Algorithm Flowchart / State Diagram

1.3.5.1.1 F-REQ-308793/A-Showroom Diagnostic Configuration Flowchart



1.3.5.1.2 F-REQ-308794/A-HUD Switch Diagnostic Configuration Flowchart



1.3.5.1.3 F-REQ-308795/A-Long Press Showroom Diagnostic Configuration Flowchart

1.3.5.2 Operation Description (supports algorithm flowchart /state diagram)

1.3.5.2.1 F-REQ-309418/A-Entry condition:

Upon reception of a 10 second long-press of the HUD button signal, which is Program dependent and determined via HUD_Switch_Cfg, while the following conditions apply:

- Operational Mode Normal and
- Engine is off (PwPckTq_D_Stat<2) and
- The car is not moving (Digital_Speedometer=0) and
- Showroom_Cfg==enabled

1.3.5.2.2 F-REQ-308786/A-Exit conditions:

- When the HUD button is pressed again or
- When the engine is starting or started (PwPckTq_D_Stat>=2) or
- When the car is moving (Digital_Speedometer>0) or
- When the Operational Mode is not Normal or
- 10 minutes timer expired

1.3.5.2.3 F-REQ-308787/A-User control

- Within the Showroom Mode, the user can use the steering wheel up and down buttons to move the image up and down. The brightness is dimmed according to the selected brightness setting

- Pressing the OK button triggers the Forward Collision Warning for 1.5 seconds (duration according to CADS spec)
- Button handling is similar to Engineering Test Mode. While the HUD is evaluating the steering wheel button signal values, the HUD is sending HudTestMdeActv_B_Stat as Active. The HUD pauses evaluating the steering wheel button signal values when the IPC is showing a resettable warning (DsplyChkActv_B_Stat==1), but the Sequence is not paused and there is no reference to ETM or another overlay shown on top of the Showroom Mode sequence.

1.3.5.2.4 F-REQ-308788/A-Visual Sequence in Showroom Mode, according to HMI Specification and cHUD_DemoMode.pdf

- Splash screen
- Welcome animation
- Speedometer, Lane keeping, navigation, speed assistance, distance indication, incoming call, Forward Collision Warning
- Goodbye animation
- Repeat

1.3.5.3 FS-REQ-308811/A;1-Function Safety Classification (EMC)

Class B

1.3.5.4 NVM-REQ-308804/A-Memory Storage

Parameter Name	Description	Value at Battery Connect	Value at Wake-up
Showroom_Cfg	State indicator for feature presence controlled via CAN at EOL at VO plant. Set to enabled at HUD Supplier Manufacturing Plant	Use Stored Value	Use Stored Value
HUD_Switch_Cfg	State indicator for determining presence of a hardwired switch instead of the can signal from the steering wheel control column	Use Stored Value	Use Stored Value
Long_Press_Cfg	4 different options for the duration how long the HUD button has to be pressed for entering the Showroom Mode	Use Stored Value	Use Stored Value
HudSwtch_B_Stat	Internal signal for the state of the hardwired HUD switch	0x0 Not_Pressed	0x0 Not_Pressed
Digital_Speedometer (for digital speedo)	Digital vehicle speed as displayed on the HUD be used as exit condition	Note 1	Note 1
Operational_Mode	4 state indicator for HUD operational mode	Limited	Limited, Normal or Crank

Note 1: Please refer to the HUD_Speedometer_Gauge_Digital_-_CGEA1.3 for information

1.3.5.5 F-REQ-308805/A-Reconfigurable Telltale

Yes

1.3.5.6 Prove Out

Not applicable

1.3.5.7 Message Center Msg

None

1.4 Error Handling

1.4.1 Missing Message Strategy

The signals will be declared missing as per the Diagnostics section of this SPSS.

DTCs states and history will be determined as per the Diagnostics section of this SPSS.

1.4.1.1 SR-REQ-308806/A-Missing Message Engine Status

When the message determining the Operational Mode (ID: 0x3B2) or the engine status (ID: 0x167) is missing as per the Diagnostics section of this SPSS, the HUD exits the Showroom Mode.

1.4.2 Invalid Message Strategy

None.

1.5 Diagnostics

1.5.1 Self Test

None

1.5.2 Engineering Test Mode

Reference section “Dealer / Engineering Test Mode (ETM)”

1.5.3 Part II Performance

1.5.3.1 DTC-REQ-308807/A-Supported Diagnostic Trouble Codes (DTCs)

DTC	Description
C15500	Lost Communication with IPC

1.5.3.2 DCR-REQ-308808/A-Supported Configurations ($DExx) DIDs

DID DExx

Block Num	Block Description	Size (bits)	Type	Byte(s)	Bits	State: Description	"0"	"1"	Default	Comments/ Information
PACKETED BLOCKS										

Block Num	Block Description	Size (bits)	Type	Byte(s)	Bits	State: Description	"0"	"1"	Default	Comments/ Information
$xx	Option Content (B&A)		1		1	HUD Switch	From_SCCM	Hardwired	0x00	
$xx	Option Content (B&A)	*	1	*	1	Showroom	Disabled	Enabled	0x00	
*Byte and bit location to be identified in Part II Specification for this cluster										

1.6 Reference Specification

CHUD_DemoMode.pdf
cHUD HMI Specification

1.7 Revision History

SPSS Module Revision History

Revision Level	Name	Change Description	Date
1.0	F. Mueller	cHUD Showroom – Initial Release. Changes compared to draft affecting DID DExx, marked in yellow. Values for 0 and 1 have been swapped. Also affecting Figure 4 Flowchart.	2/06/17
1.1	F. Mueller	Added clarification regarding dimming Added FCW trigger with OK button Added clarification about pausing in case of warnings in cluster	9/29/17
1.2	F. Mueller	Initial VSEM RM Release	5/17/2018