Research & Vehicle Technology
"Infotainment Systems Product Development"

Feature – Auto Start Stop

Infotainment Subsystem Part Specific Specification (SPSS)

Version 1.1

UNCONTROLLED COPY IF PRINTED

Version Date: October 25, 2018

FORD CONFIDENTIAL

Revision History

Date	Version	Notes	
May 26, 2017	**1.0**	**Initial Release**	
Octobre 25, 2018	**1.1**	**Updated Release**	
	AUTOSS-454817/B-Architectural Design		AUTOSS-454817/B-Architectural Design
	AUTOSS-CLD-REQ-258533/B-Auto Start Stop Client		AUTOSS-CLD-REQ-258533/B-Auto Start Stop Client
	AUTOSS-CLD-REQ-258534/B-Auto Start Stop Server		AUTOSS-CLD-REQ-258534/B-Auto Start Stop Server
	AUTOSS-IIR-REQ-258538/B-AutoStartStopServer_Tx		AUTOSS-IIR-REQ-258538/B-AutoStartStopServer_Tx
	AUTOSS-MD-REQ-258543/B-AutoStartStopSt		AUTOSS-MD-REQ-258543/B-AutoStartStopSt
	AUTOSS-IIR-REQ-258539/B-AutoStartStopServer_Rx		AUTOSS-IIR-REQ-258539/B-AutoStartStopServer_Rx
	AUTOSS-MD-REQ-258542/B-AutoStartStopSwitch		AUTOSS-MD-REQ-258542/B-AutoStartStopSwitch
	AUTOSS-MD-REQ-318694/A-Fault Message FBMP		AUTOSS-MD-REQ-318694/A-Fault Message FBMP
	AUTOSS-IIR-REQ-258540/B-AutoStartStopClient_Tx		AUTOSS-IIR-REQ-258540/B-AutoStartStopClient_Tx
	AUTOSS-IIR-REQ-258541/B-AutoStartStopClient_Rx		AUTOSS-IIR-REQ-258541/B-AutoStartStopClient_Rx
	AUTOSS-454819/B-General Requirements		AUTOSS-454819/B-General Requirements
	AUTOSS-REQ-258557/B-System Fault Detection		AUTOSS-REQ-258557/B-System Fault Detection
	AUTOSS-REQ-258562/B-Button Press		AUTOSS-REQ-258562/B-Button Press
	AUTOSS-REQ-318695/A-Client Fault Scenario		AUTOSS-REQ-318695/A-Client Fault Scenario
	AUTOSS-REQ-258446/B-Auto Start Stop AD		AUTOSS-REQ-258446/B-Auto Start Stop AD
	AUTOSS-REQ-258564/B-Auto Start Stop SD		AUTOSS-REQ-258564/B-Auto Start Stop SD
	AUTOSS-454816/B-Appendix: Reference Documents		AUTOSS-454816/B-Appendix: Reference Documents

Table of Contents

1 Architectural Design

1.1 AUTOSS-REQ-258447/A-Overview

Auto StartStop feature turns off the engine and then back on in relevant situations, more predominantly to decrease fuel consumption while the vehicle is in traffic jam or sitting idle without driving. This SPSS describes the feature to turn ON or OFF Auto StartStop as driver wishes. At the moment some vehicles have a physical button to do this. This SPSS describes the Soft button operation.

1.2 AUTOSS-CLD-REQ-258533/B-Auto Start Stop Client

Responsibility: Auto Start Stop Client among its other duties is also responsible for sending Auto Start Stop button press information (On or Off) and for displaying the Auto Start Stop feature state.

1.3 AUTOSS-CLD-REQ-258534/B-Auto Start Stop Server

Auto Start Stop Server is responsible for the main feature functionality. Basically it will reply to user requests to turn the feature On or Off or may notify the user if the feature is unavailable due to any restrictions or errors.

1.4 AUTOSS-FUR-REQ-258537/A-Auto Start Stop Logical Signal Map

The CAN signals mentioned throughout this document shall refer to the CAN signal's logical name. The logical names shall be mapped to their actual CAN signal names. Please use the table below to perform the mapping. The InfoCAN database file is the master file for the actual CAN signal names. Note: There may be cases where the actual CAN signal name is used in this documentation.

Logical Name	CAN Signal Name
AutoStartStopSwitch	**StopStrtDrvMde_B_RqBtn3**
AutoStartStopSt	**StopStrtDrvMde_D_Indic**

Table: Logical name/CAN signal mapping

1.5 AUTOSS-IIR-REQ-258538/B-AutoStartStopServer_Tx

1.5.1 AUTOSS-MD-REQ-258543/B-AutoStartStopSt

AutoStartStopSt tells to the client the state of the feature, if it is ON, Off or there is a system fault.

Name	Literals	Value	Description
AutoStartStopSt			
	StopStart_Selected	0x0	Feature should be shown as On.
	StopStart_Deselected	0x1	Feature should be shown as Off.
	StopStart_IndirectDeselect	0x2	System fault.
	Not Used	0x3	Not used at the moment.

1.6 AUTOSS-IIR-REQ-258539/B-AutoStartStopServer_Rx

1.6.1 AUTOSS-MD-REQ-258542/B-AutoStartStopSwitch

AutoStartStopSwitch is used by the Client to send user request to the server to turn the Auto Start Stop feature ON or Off.

Auto Start Stop is generated by Client at a periodic interval. For timing information and details please refer to CAN DBC file. The signal is generated as Pressed when user touches the button and as not pressed otherwise.

Name	Literals	Value	Description
Auto Start Stop Switch			
	Not Pressed	0x0	Auto Start Stop switch is not being pressed by the user.
	Button Pressed	0x1	Auto Start Stop switch is being pressed by the user.

1.6.2 AUTOSS-MD-REQ-318694/A-Fault Message FBMP

Feature Name	ID	Config	Config Values
Fault Scenario	0x0030	0x0	Not Used
		0x1	No Display Fault
		0x2	Display Faulted

1.7 AUTOSS-IIR-REQ-258540/B-AutoStartStopClient_Tx

1.7.1 AUTOSS-MD-REQ-258542/B-AutoStartStopSwitch

AutoStartStopSwitch is used by the Client to send user request to the server to turn the Auto Start Stop feature ON or Off.

Auto Start Stop is generated by Client at a periodic interval. For timing information and details please refer to CAN DBC file. The signal is generated as Pressed when user touches the button and as not pressed otherwise.

Name	Literals	Value	Description
Auto Start Stop Switch			
	Not Pressed	0x0	Auto Start Stop switch is not being pressed by the user.
	Button Pressed	0x1	Auto Start Stop switch is being pressed by the user.

1.7.2 AUTOSS-MD-REQ-318694/A-Fault Message FBMP

Feature Name	ID	Config	Config Values
Fault Scenario	0x0030	0x0	Not Used
		0x1	No Display Fault
		0x2	Display Faulted

1.8 AUTOSS-IIR-REQ-258541/B-AutoStartStopClient_Rx

1.8.1 AUTOSS-MD-REQ-258543/B-AutoStartStopSt

AutoStartStopSt tells to the client the state of the feature, if it is ON, Off or there is a system fault.

Name	Literals	Value	Description
AutoStartStopSt			
	StopStart_Selected	0x0	Feature should be shown as On.
	StopStart_Deselected	0x1	Feature should be shown as Off.
	StopStart_IndirectDeselect	0x2	System fault.
	Not Used	0x3	Not used at the moment.

2 General Requirements

2.1 AUTOSS-REQ-258557/B-System Fault Detection

If client receives can signal AutoStartStopSt with the value StartStop_IndirectDeselect (system faulty 0x2), it shall display the feature is being OFF.

2.2 AUTOSS-REQ-258561/A-Missing Signal

In case the signal AutoStartStopSt hasn't been received by the client for an equivalent time of 10 signal periods, the client shall display the feature as being in ON state.

2.3 AUTOSS-REQ-258562/B-Button Press

The client shall generate a button press value only when the user presses the soft button. The button press signal will be generated for as long as the user keeps the soft button pressed.

Upon release of soft button, the client shall generate a button not pressed signal value.

2.4 AUTOSS-REQ-318695/A-Client Fault Scenario

Due to regulations, Client is required to tell a server if there is any fault with the user input (HMI) thus not allowing the user to enter their input of choice.
To transmit the fault conditions, Client and server make use of a variant of Feature Based Messaging Protocol. Read the FBMP SPSS for details and understanding on the transmit message.

However, FBMP includes retry strategies and acknowledgements. The implementation of the FBMP variant for this feature does not make use of retries or acknowledgments. Necessary details have been provided in this requirement.

Client shall send the below message every 5sec (period of 5000ms) for 100ms with the values as mentioned below.
Feature_St(Operation = Set, Feature_ID= 0030 [Fault Scenario], Configuration = 0x1 [No Display Fault]; PersonalityIndex = Vehicle)

If for some reason there is any error detected by the client, the client should send the message below every 5 sec:
Feature_St(Operation = Set, Feature_ID= 0030 [Fault Scenario], Configuration = 0x2 [Display Faulted]; PersonalityIndex = Vehicle)

If for any reason, the client is unable to send this signal for 5 consecutive times, the Server will miss receiving the no Display Fault value, thus a fault will be generated from the server.

3 Functional Definition

3.1 Use cases

3.1.1 AUTOSS-UC-REQ-258566/A-Auto Start Stop turned On

Actors	Vehicle occupant
Pre-conditions	The infotainment system is powered on. The ignition status is Run/Start. Auto Start Stop switch is in OFF position.
Scenario Description	The driver clicks on the Auto Start Stop soft switch to turn the feature ON. All Auto Start Stop enabling conditions are fulfilled.
Post-conditions	The vehicle display shows Auto Start Stop soft switch in switched ON position.
List of Exception Use Cases	
Interfaces	

3.1.2 AUTOSS-UC-REQ-258567/A-Auto Start Stop turned Off

Actors	Vehicle occupant
Pre-conditions	The infotainment system is powered on. The ignition status is Run/Start. Auto Start Stop switch is in ON position.
Scenario Description	The driver clicks on the Auto Start Stop soft switch to turn the feature OFF. All Auto Start Stop enabling conditions are fulfilled.
Post-conditions	The vehicle display shows Auto Start Stop soft switch in switched OFF position.
List of Exception Use Cases	
Interfaces	

3.1.3 AUTOSS-UC-REQ-258568/A-Auto Start Stop detects system fault

Actors	Auto Start Stop system
Pre-conditions	The infotainment system is powered on. The ignition status is Run/Start. Auto Start Stop switch is in ON position.
Scenario Description	Auto Start Stop feature detects a system fault.
Post-conditions	The vehicle display shows Auto Start Stop soft switch in switched OFF position.
List of Exception Use Cases	
Interfaces	

3.1.4 AUTOSS-UC-REQ-258569/A-Auto Start Stop missing signal

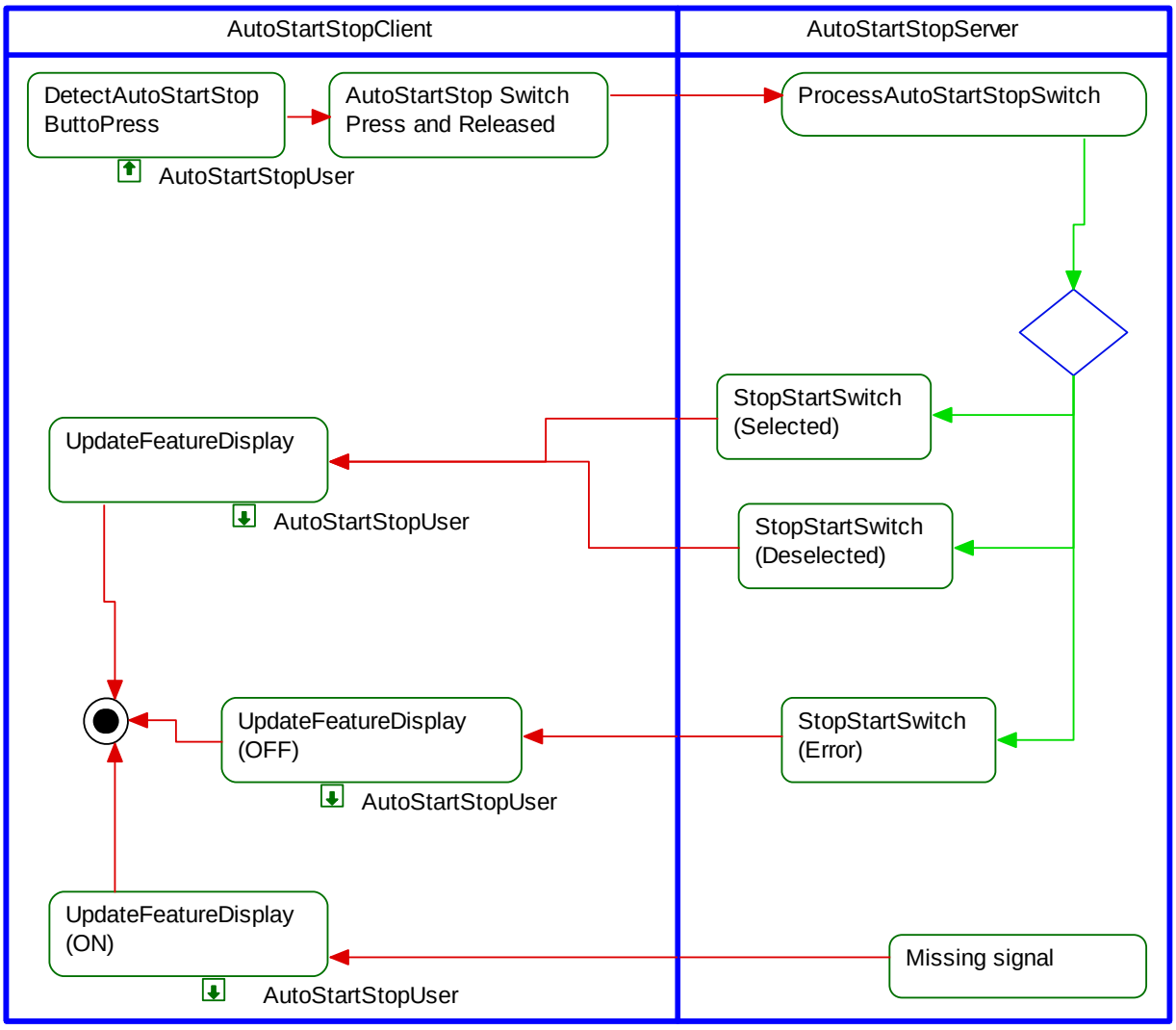
Actors	Vehicle occupant
Pre-conditions	The infotainment system is powered on. The ignition status is Run/Start.

	Auto Start Stop switch is in Off position.
Scenario Description	The signal AutoStartStopSt is missing in the bus.
Post-conditions	The vehicle display shows Auto Start Stop soft switch in switched ON position.
List of Exception Use Cases	
Interfaces	

3.2 White Box Views

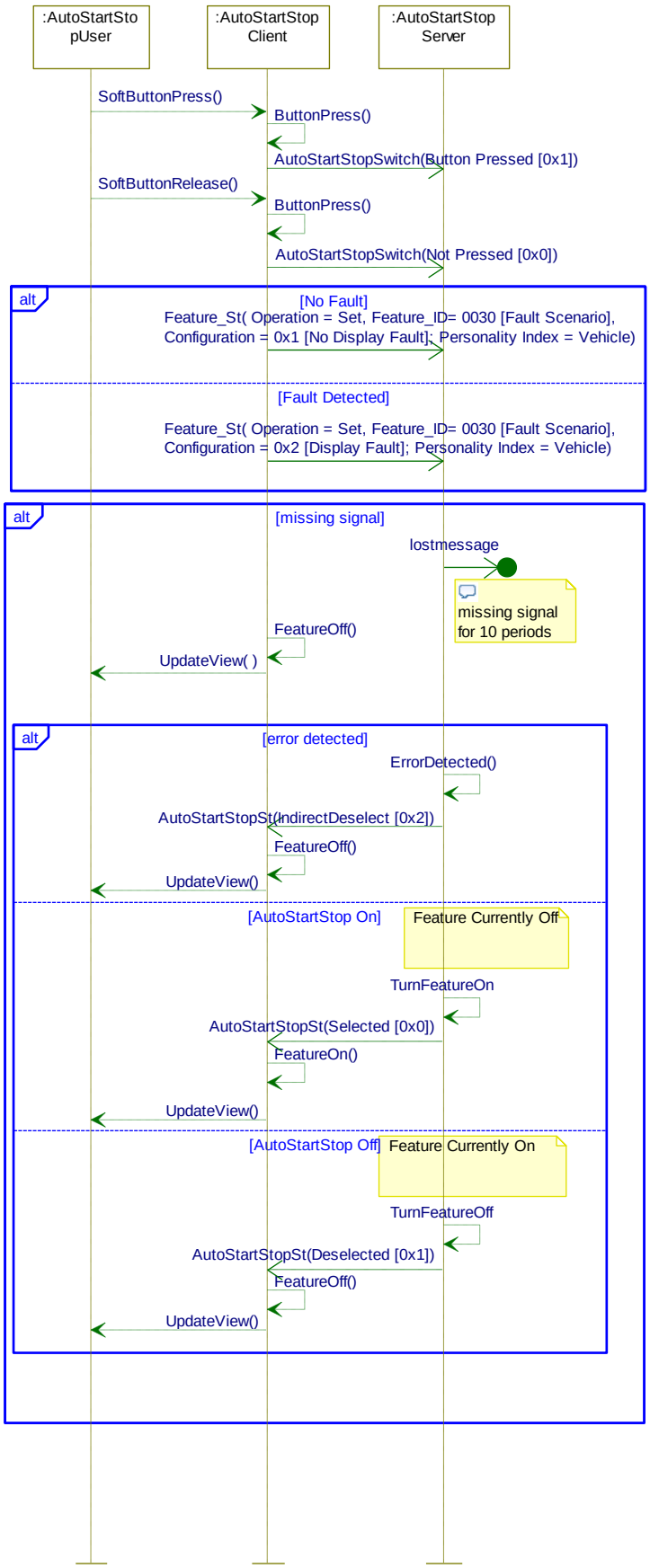
3.2.1 Activity Diagram

3.2.1.1 AUTOSS-REQ-258446/B-Auto Start Stop AD



3.2.2 Sequence Diagram

3.2.2.1 AUTOSS-REQ-258564/B-Auto Start Stop SD


:AutoStartStopUser
:AutoStartStopClient
:AutoStartStopServer
SoftButtonPress()
ButtonPress()
AutoStartStopSwitch(Button Pressed [0x1])
SoftButtonRelease()
ButtonPress()
AutoStartStopSwitch(Not Pressed [0x0])
alt
[No Fault]
Feature_St(Operation = Set, Feature_ID= 0030 [Fault Scenario], Configuration = 0x1 [No Display Fault]; Personality Index = Vehicle)
[Fault Detected]
Feature_St(Operation = Set, Feature_ID= 0030 [Fault Scenario], Configuration = 0x2 [Display Fault]; Personality Index = Vehicle)
alt
[missing signal]
lostmessage
missing signal for 10 periods
FeatureOff()
UpdateView( )
alt
[error detected]
ErrorDetected()
AutoStartStopSt(IndirectDeselect [0x2])
FeatureOff()
UpdateView()
[AutoStartStop On]
Feature Currently Off
TurnFeatureOn
AutoStartStopSt(Selected [0x0])
FeatureOn()
UpdateView()
[AutoStartStop Off]
Feature Currently On
TurnFeatureOff
AutoStartStopSt(Deselected [0x1])
FeatureOff()
UpdateView()

4 Appendix: Reference Documents

Feature Based Messaging Protocol SPSS.