Research & Vehicle Technology
"Infotainment Systems Product Development"

Feature – Power Running Boards Softswitch Interface Client

Infotainment Subsystem Part Specific Specification (SPSS)

Version 1.3

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Version Date: August 31, 2021

FORD CONFIDENTIAL

Revision History

Date	Ver	Notes	
Oct. 5, 2018	**1.0**	**Initial Release**	
November 5, 2020	**1.1**		
	STR-578799/B-Architectural Design	MBORREL4: Added REQ-401528	
	PRBSS-CLD-REQ-401528/A-Power Running Boards Softswitch Server2	MBORREL4: New CLD	
	DOC-578800/B-Physical Mapping of Classes	MBORREL4: Updated table	
	PRBSS-IIR-REQ-325395/B-PRBSSInterfaceClient_Tx	MBORREL4: Added REQ-401601	
	MD-REQ-401601/A-PRBDeployment2_Rq	MBORREL4: New req.	
	MD-REQ-199807/B-VehicleSpeed_St	asimukhi: revised to update the Logical-Physical Mapping Attachement I	
	STR-578802/B-General Requirements	MBORREL4: Added REQ-401609	
	PRBSS-REQ-401609/A-PRB Feature Configuration v2	MBORREL4: New req.	
	PRBSS-REQ-331160/B-Missing Message DTC	MBORREL4: Added note for clarity	
	STR-578804/B-Requirements	MBORREL4: Added REQ-401610, REQ-401611	
	PRBSS-REQ-401610/A-PRB Settings Request	MBORREL4: New req.	
	PRBSS-REQ-401611/A-PRB Settings - Interface Client Request v2	MBORREL4: New req.	
	PRBSS-REQ-325961/B-PRB Settings - Server Response	MBORREL4: Added "or PRBSSServer2"	
	PRBSS-REQ-326417/B-PRB Settings - Startup/Shutdown	MBORREL4: Added "or PRBSSServer2" and updated for using last known value at startup	
	PRBSS-REQ-325963/B-PRB Settings - User Input	MBORREL4: Added HMI ID# for reference	
	PRBSS-UC-REQ-325952/B-User sets Power Runing Boards to Auto	MBORREL4: Added "or PRBSSServer2"	
	PRBSS-UC-REQ-325953/B-User sets Power Runing Boards to Off	MBORREL4: Added "or PRBSSServer2"	
	PRBSS-UC-REQ-325954/B-User sets Power Runing Boards to Out	MBORREL4: Added "or PRBSSServer2"	
	PRBSS-UC-REQ-325957/B-Power Running Board settings while vehicle in motion	MBORREL4: Added "or PRBSSServer2"	
	STR-591679/B-Activity Diagrams	MBORREL4: Added REQ-401612	
	PRBSS-ACT-REQ-401612/A-User Sets PRB Feature Setting v2	MBORREL4: New diagram for v2 configuration using new signal	
	STR-591682/B-Sequence Diagrams	MBORREL4: Added REQ-401613	
	PRBSS-SD-REQ-401613/A-User Sets PRB Feature Setting v2	MBORREL4: New diagram for v2 configuration using new signal	
	PRBSS-REQ-330079/B-PRB Timer Setting - User Input	MBORREL4: Added HMI ID# for reference	
	PRBSS-REQ-326164/B-PRB Kickswitch Setting - User Input	MBORREL4: Added HMI ID# for reference	
	STR-578807/B-Appendix: Reference Documents	MBORREL4: Added reference to HMI Settings ID doc.	

March 15, 2021	**1.2**	
	PRBSS-REQ-326417/C-PRB Settings - Startup/Shutdown	MBORREL4: Updated to reflect v1/v2 implementation
August 31, 2021	**1.3**	
	MD-REQ-401601/B-PRBDeployment2_Rq	MBORREL4: Corrected typo. No req. change
	STR-578804/C-Requirements	MBORREL4: Added REQ-438484
	PRBSS-REQ-401610/B-PRB Settings Request	MBORREL4: Added reference to REQ-438484
	PRBSS-REQ-438484/A-PRB Settings - v2 Request / Response Synchronization	MBORREL4: New req.
	PRBSS-UC-REQ-325957/C-Power Running Board settings while vehicle in motion	MBORREL4: Updated Post-Condition and Notes

Table of Contents

1 Architectural Design

1.1 PRBSS-CLD-REQ-325393/A-Power Running Boards Softswitch Interface Client

The Power Running Boards Softswitch Interface Client (PRBSSInterfaceClient) is responsible for the tasks listed below:

- Providing a user interface to allow the altering of PRB feature settings
- Transmitting user input to PRBSSServer
- Receiving feature status from PRBSSServer
- Displaying active feature state on user interface

Please review the implementation guide/block diagram to locate the PRBSSInterfaceClient class.

1.2 PRBSS-CLD-REQ-325394/A-Power Running Boards Softswitch Server

The Power Running Boards Softswitch Server (PRBSSServer) is responsible for the tasks listed below:

- Receiving user request from PRBSSInterfaceClient
- Managing PRB feature status
- Transmitting feature status to PRBSSInterfaceClient

Please review the implementation guide/block diagram to locate the PRBSSServer class.

1.3 PRBSS-CLD-REQ-401528/A-Power Running Boards Softswitch Server2

The Power Running Boards Softswitch Server2 (PRBSSServer2) is responsible for the tasks listed below:

- Receiving user request from PRBSSInterfaceClient
- Managing PRB feature status
- Transmitting feature status to PRBSSInterfaceClient

Please review the implementation guide/block diagram to locate the PRBSSServer2 class.

1.4 Physical Mapping of Classes

The table below shows an example of how the logical classes that make up the Power Running Boards Softswitch feature can be mapped into physical modules. This mapping is an example only and does not necessarily carryover to other carlines or vehicle architectures.

Logical Class	Physical Module (ECU)
PRBSSInterfaceClient	SYNC
PRBSSServer	DSM
PRBSSServer2	PRBM / RBM

1.5 PRBSSInterfaceClient Interface

1.5.1 PRBSS-IIR-REQ-325395/B-PRBSSInterfaceClient_Tx

1.5.1.1 MD-REQ-325504/A-PRBDeployment_Rq

Message Type: Request

The signal is used by the PRBSSInterfaceClient to change the Power Running Board deployment as indicated in the request.

Name	Literals	Value	Description
Type	-	-	Indicates the PRB deployment being requested.

	Inactive	0x0	
	Off	0x1	
	Out	0x2	
	Auto	0x3	

1.5.1.2 MD-REQ-401601/B-PRBDeployment2_Rq

Message Type: Request

The signal is used by the PRBSSInterfaceClient to change the Power Running Board deployment as indicated in the request. This second variant of the signal is only applicable for programs with a PRBSSServer2 (ex. U554).

Name	Literals	Value	Description
Type	-	-	Indicates the PRB deployment being requested.
	All_Disabled	0x0	
	All_Enabled	0x1	
	Manually_Deployed	0x2	
	Not Used	0x3	

1.5.1.3 MD-REQ-325478/A-PRBKickSwitch_Rq

Message Type: Request

The signal is used by the PRBSSInterfaceClient to change the Kickswitfch mode as indicated in the request.

Name	Literals	Value	Description
Type	-	-	Indicates the Kickswitch mode requested.
	Inactive	0x0	
	Always Active	0x1	
	Deploy Unlocked	0x2	

1.5.1.4 MD-REQ-330072/A-PRBTimer_Rq

Message Type: Request

The signal is used by the PRBSSInterfaceClient to change the Timer as indicated in the request.

Name	Literals	Value	Description
Type	-	-	Indicates the Timer requested.
	Inactive	0x0	
	Timer 1	0x1	
	Timer 2	0x2	

1.5.2 PRBSS-IIR-REQ-325396/A-PRBSSInterfaceClient_Rx

1.5.2.1 MD-REQ-325505/A-PRBDeployment_St

Message Type: Status

The signal is used to inform the PRBSSInterfaceClient of the current PRB deployment status.

Name	Literals	Value	Description
Status	-	-	Indicates the current PRB deployment status.
	All Disabled	0x0	
	All Enabled	0x1	
	Manually Deployed	0x2	
	Unused	0x3	

1.5.2.2 MD-REQ-325479/A-PRBKickSwitch_St

Message Type: Status

The signal is used to inform the PRBSSInterfaceClient of the current Kickswitch status.

Name	Literals	Value	Description
Status	-	-	Indicates the current Kickswitch status
	Inactive	0x0	
	Always Active	0x1	
	Deploy Unlocked	0x2	

1.5.2.3 MD-REQ-330073/A-PRBTimer_St

Message Type: Status

The signal is used to inform the PRBSSInterfaceClient of the current Timer status.

Name	Literals	Value	Description
Status	-	-	Indicates the current Timer status
	Inactive	0x0	
	Timer 1	0x1	
	Timer 2	0x2	

1.5.2.4 MD-REQ-199809/A-IgnitionStatus_St

Message Type: Status

Signal used to indicate ignition state.

Name	Literals	Value	Description
Type	-	-	Indicates ignition state
	Unknown	0x0	
	Off	0x1	
	Accessory	0x2	
	Run	0x4	
	Start	0x8	
	Invalid	0xF	

1.5.2.5 MD-REQ-199807/B-VehicleSpeed_St

Message Type: Status

Status used to indicate vehicle speed.

Name	Literals	Value	Description
Type	-	-	Indicates vehicle speed. Unit: kph Resolution:0.01 Offset:0
	kph	0x0 to 0xFFFF	

1.5.2.6 MD-REQ-086348/A-CarMode_St

Message Type: Status

Name	Literals	Value	Description
Type	-	-	Defines what car mode state is active.
	Normal	0x0	
	Factory	0x1	
	NotUsed	0x2	
	Transportation	0x3	

2 General Requirements

2.1 PRBSS-REQ-325962/A-Powermode Conditions

The PRBSSInterfaceClient shall only allow the functionality defined by this feature/SPSS when the IgnitionStatus_St = Run, and the touch screen display is On.

2.2 PRBSS-REQ-326148/A-PRB Feature Configuration

The PRBSSInterfaceClient shall have a configurable parameter to determine whether the vehicle supports Power Running Boards.

- If the parameter indicates that the vehicle supports Power Running Boards, then the functionality and signals defined in this SPSS shall be supported.
  - Please see REQ-331146 to determine Kickswitch functionality
- If the parameter indicates that the vehicle does not support Power Running Boards, then none of the functionality defined in this SPSS shall be supported.

2.3 PRBSS-REQ-401609/A-PRB Feature Configuration v2

The PRBSSInterfaceClient shall have a second configurable parameter to determine whether the vehicle supports Power Running Boards v2.

- If the parameter indicates that the vehicle supports Power Running Boards v2, then only the functionality and signals defined in FUN-REQ-325397 shall be supported (Kickswitch and Timer shall not be supported).
  - REQ-331146 shall not determine Kickswitch functionality for this configuration
- If the parameter indicates that the vehicle does not support Power Running Boards v2, then none of the functionality defined in this SPSS shall be supported.

The Power Running Boards and Power Running Boards v2 configurations shall be mutually exclusive. If both are set to "Enabled" by error, the PRBSSInterfaceClient shall prioritize Power Running Boards over Power Running Boards v2.

2.4 PRBSS-REQ-331146/A-PRB Kickswitch Configuration

The PRBSSInterfaceClient shall have a configurable parameter to determine whether the vehicle supports the Power Running Boards Kickswitch.

- If the parameter indicates that the vehicle supports the Kickswitch, then the functionality and signals defined in REQ-325399 shall be supported.
- If the parameter indicates that the vehicle does not support the Kickswitch, then the functionality and signals defined in REQ-325399 shall not be supported.

As a precondition to this requirement, the Power Running Boards feature configuration defined in REQ-326148 must indicate that the Power Running Boards feature is supported.

2.5 PRBSS-REQ-325966/A-Speed Restriction Configuration

The PRBSSInterfaceClient shall have a configurable parameter to set the vehicle speed threshold by which the Power Running Boards menu and Power Running Boards Kickswitch menu shall be made available/unavailable.

2.6 PRBSS-REQ-325965/A-Return to Inactive/Null state

The request signals used for the Power Running Boards feature shall revert to their respective "Inactive" or "Null" encodings 1 second after being sent (refer to all sequence diagrams).

Note: The receiving server or client shall act upon the event signal and shall not wait for the "Inactive" or "Null" to act upon the signal request.

2.7 PRBSS-REQ-331160/B-Missing Message DTC

The PRBSSInterfaceClient shall set a "lost communication" DTC for any expected PRBSS periodic messages that are not received for more than 5 seconds.

Note: the "expected" messages differ between the different feature configurations.

3 Functional Definition

3.1 PRBSS-FUN-REQ-325397/A-Power Running Board Feature Setting

3.1.1 Requirements

3.1.1.1 PRBSS-REQ-401610/B-PRB Settings Request

The PRBSSInterfaceClient shall send either PRB request as per the below:

- If the PRBSSInterfaceClient is configured for Power Running Boards = Enabled, PRBDeployment_Rq shall be sent as per REQ-325960
- If the PRBSSInterfaceClient is configured for Power Running Boards v2 = Enabled, PRBDeployment2_Rq shall be sent as per REQ-401611, followed by REQ-438484

3.1.1.2 PRBSS-REQ-325960/A-PRB Settings - Interface Client Request

The PRBSSInterfaceClient shall send PRBDeployment_Rq to the PRBSSServer with the following values:

- PRBDeployment_Rq = "(0x1) Off" when OFF is selected by the user
- PRBDeployment_Rq = "(0x2) Out" when OUT is selected by the user
- PRBDeployment_Rq = "(0x3) Auto" when AUTO is selected by the user

3.1.1.3 PRBSS-REQ-401611/A-PRB Settings - Interface Client Request v2

The PRBSSInterfaceClient shall set and continuously send PRBDeployment2_Rq to the PRBSSServer2 with the following values:

- PRBDeployment2_Rq = "(0x0) All_Disabled" when OFF is selected by the user
- PRBDeployment2_Rq = "(0x1) All_Enabled" when AUTO is selected by the user
- PRBDeployment2_Rq = "(0x2) Manually Deployed" when OUT is selected by the user

Note: There is no "Inactive" state for PRBDeployment2_Rq. This signal must remain set to the requested state.

3.1.1.4 PRBSS-REQ-438484/A-PRB Settings - v2 Request / Response Synchronization

Anytime after setting PRBDeployment2_Rq (user request, startup, etc.), the PRBSSInterfaceClient shall:

- Monitor PRBDeployment_St for a change in status
- Once a change is detected, the PRBSSInterfaceClient shall start a 5s timer
- If the value of PRBDeployment_St remains the same for the duration of the timer, the PRBSSInterfaceClient shall set PRBDeployment2_Rq = PRBDeployment_St
    - Note: In most cases, these values will already match
- If at any point during the timer a user request is made, the timer shall abort/cancel and this process shall begin again for the new request

This shall not delay or impact the update to the HMI per REQ-325961 (the HMI shall still update immediately based on PRBDeployment_St).

Note: Since the PRBSSServer2 may change the feature state based on its own set of preconditions, this requirement allows the PRBSSInterfaceClient to synchronize its periodic request with the active status, after a short delay/learning period.

3.1.1.5 PRBSS-REQ-325961/B-PRB Settings - Server Response

The PRBSSInterfaceClient shall monitor PRBDeployment_St from the PRBSSServer or PRBSSServer2 for the active Power Running Boards feature status.

- When PRBDeployment_St = "(0x0) All Disabled" is received, the PRBSSInterfaceClient shall reflect that OFF is selected to the user
- When PRBDeployment_St = "(0x1) All Enabled" is received, the PRBSSInterfaceClient shall reflect that AUTO is selected to the user
- When PRBDeployment_St = "(0x2) Manually Deployed" is received, the PRBSSInterfaceClient shall reflect that OUT is selected to the user

3.1.1.6 PRBSS-REQ-326417/C-PRB Settings - Startup/Shutdown

If the PRBSSInterfaceClient is configured for Power Running Boards = Enabled,

- Upon system shutdown, the PRBSSInterfaceClient shall store the last active state of the PRBDeployment_St from the PRBSSServer. This value shall be stored through battery disconnects, loss of power, etc.
- Upon system startup, the PRBSSInterfaceClient shall display the stored value until PRBDeployment_St is received from the PRBSSServer.

If the PRBSSInterfaceClient is configured for Power Running Boards v2 = Enabled,

- Upon system shutdown, the PRBSSInterfaceClient shall store the last active state of PRBDeployment_St, and the last transmitted value of PRBDeployment2_Rq. These values shall be stored through battery disconnects, loss of power, etc.
- Upon system startup,
  - the PRBSSInterfaceClient shall transmit the stored value via PRBDeployment2_Rq to the PRBSSServer2
  - the PRBSSInterfaceClient shall display the stored value until PRBDeployment_St is received from the PRBSSServer2

3.1.1.7 PRBSS-REQ-325963/B-PRB Settings - User Input

The PRBSSInterfaceClient shall provide a user interface (button/graphic) to allow selection of the Power Runing Boards feature settings.

SYNC Gen4 Screen / ID HMI Number	HMI Setting ID
173	1008

3.1.1.8 PRBSS-REQ-325964/A-PRB Settings - User Input Enable/Disable

The PRBSSInterfaceClient shall enable/disable (show/hide, grey-out, etc.) the Power Running Boards feature settings user interface (button/graphic) based on the following:

- If IgnitionStatus_St != (0x4) Run, the above shall be disabled (greyed-out, hidden, etc.)
- If VehicleSpeed_St is greater than the threshold config. defined by REQ-325966, the above shall be disabled (greyed-out, hidden, etc.)
- If IgnitionStatus_St = (0x4) Run, AND VehicleSpeed_St is lower than the threshold config. defined by REQ-325966, the above shall be enabled
- If the DTC defined by REQ-331160 is active, the above shall be disabled (greyed-out, hidden, etc.)

3.1.2 Use Cases

3.1.2.1 PRBSS-UC-REQ-325952/B-User sets Power Runing Boards to Auto

Actors	Vehicle Occupant
Pre-conditions	Powermode Conditions are met PRBSSInterfaceClient is ON Vehicle Speed < Threshold config. Power Running Boards feature is set to “Out” or “Off”
Scenario Description	The user accesses the Power Running Board feature menu on the PRBSSInterfaceClient and selects “Auto”
Post-conditions	• The PRBSSServer or PRBSSServer2 updates the Power Running Board feature to “Auto” • The PRBSSInterfaceClient updates its HMI to reflect “Auto” is active
List of Exception Use Cases	REQ-325957-Power Running Board settings while vehicle in motion
Interfaces	PRBSSInterfaceClient

3.1.2.2 PRBSS-UC-REQ-325953/B-User sets Power Runing Boards to Off

Actors	Vehicle Occupant
Pre-conditions	Powermode Conditions are met PRBSSInterfaceClient is ON Vehicle Speed < Threshold config. Power Running Boards feature is set to “Out” or “Auto”
Scenario Description	The user accesses the Power Running Board feature menu on the PRBSSInterfaceClient and selects “Off”
Post-conditions	• The PRBSSServer or PRBSSServer2 updates the Power Running Board feature to “Off” • The PRBSSInterfaceClient updates its HMI to reflect “Off” is active
List of Exception Use Cases	REQ-325957-Power Running Board settings while vehicle in motion
Interfaces	PRBSSInterfaceClient

3.1.2.3 PRBSS-UC-REQ-325954/B-User sets Power Runing Boards to Out

Actors	Vehicle Occupant
Pre-conditions	Powermode Conditions are met PRBSSInterfaceClient is ON Vehicle Speed < Threshold config. Power Running Boards feature is set to “Off” or “Auto”
Scenario Description	The user accesses the Power Running Board feature menu on the PRBSSInterfaceClient and selects “Out”
Post-conditions	• The PRBSSServer or PRBSSServer2 updates the Power Running Board feature to “Out” • The PRBSSInterfaceClient updates its HMI to reflect “Out” is active
List of Exception Use Cases	REQ-325957-Power Running Board settings while vehicle in motion
Interfaces	PRBSSInterfaceClient

3.1.2.4 PRBSS-UC-REQ-325957/C-Power Running Board settings while vehicle in motion

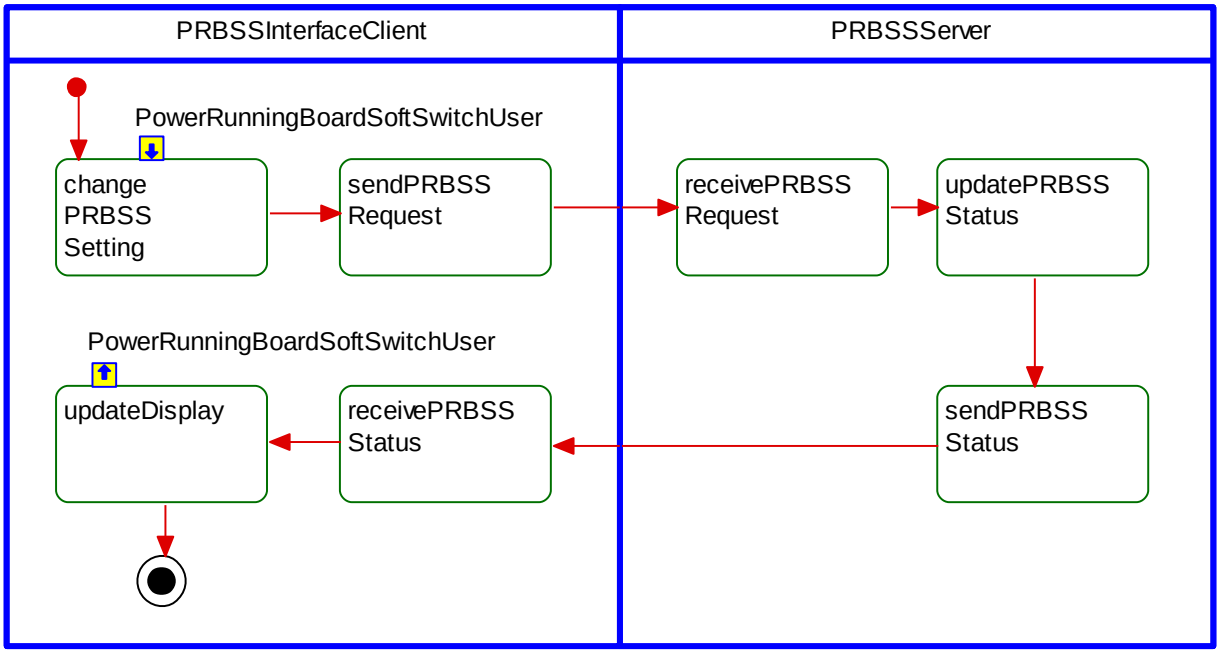
Actors	Vehicle Occupant
Pre-conditions	Powermode Conditions are met PRBSSInterfaceClient is ON Vehicle Speed > Threshold config.
Scenario Description	The user accesses the Power Running Board feature menu on the PRBSSInterfaceClient and attempts to change the Power Running Board setting
Post-conditions	• The user cannot access the menu • The Power Running Board setting is not changed per the users request (see note below)

List of Exception Use Cases	
Interfaces	PRBSSInterfaceClient
Notes	• When vehicle speed exceeds the Threshold config., the PRBSSServer or PRBSSServer2 changes the Power Running Boards setting to “Auto” which is reflected on the PRBSSInterfaceClient (although still greyed-out/inactive) • When vehicle speed returns to a value below the Threshold config., the PRBSSServer or PRBSSServer2 maintains the Power Running Boards setting as “Auto” and the interface becomes not greyed-out/active

3.1.3 White Box View

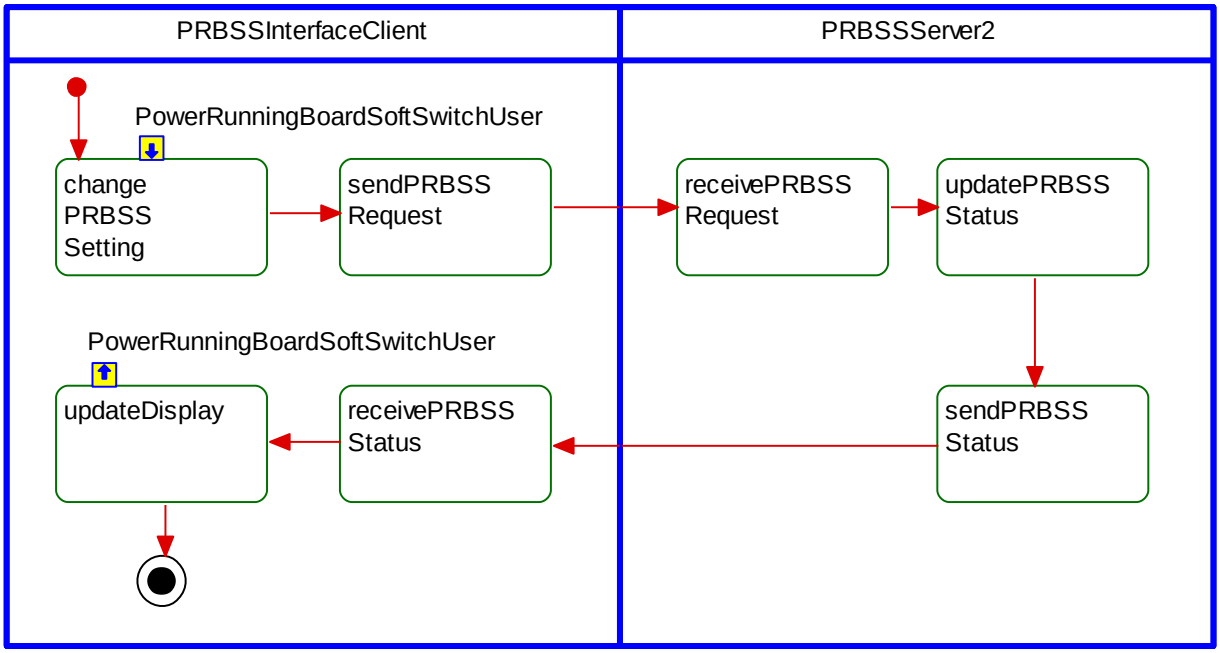
3.1.3.1 Activity Diagrams

3.1.3.1.1 PRBSS-ACT-REQ-330691/A-User Sets PRB Feature Setting Activity Diagram



3.1.3.1.2 PRBSS-ACT-REQ-401612/A-User Sets PRB Feature Setting v2

Activity Diagram



3.1.3.2 Sequence Diagrams

3.1.3.2.1 PRBSS-SD-REQ-330761/A-User Sets PRB Feature Setting

Constraints

Pre-Condition

Powermode Conditions are met
PRBSSInterfaceClient is ON
Vehicle Speed < Threshold config.

Scenarios

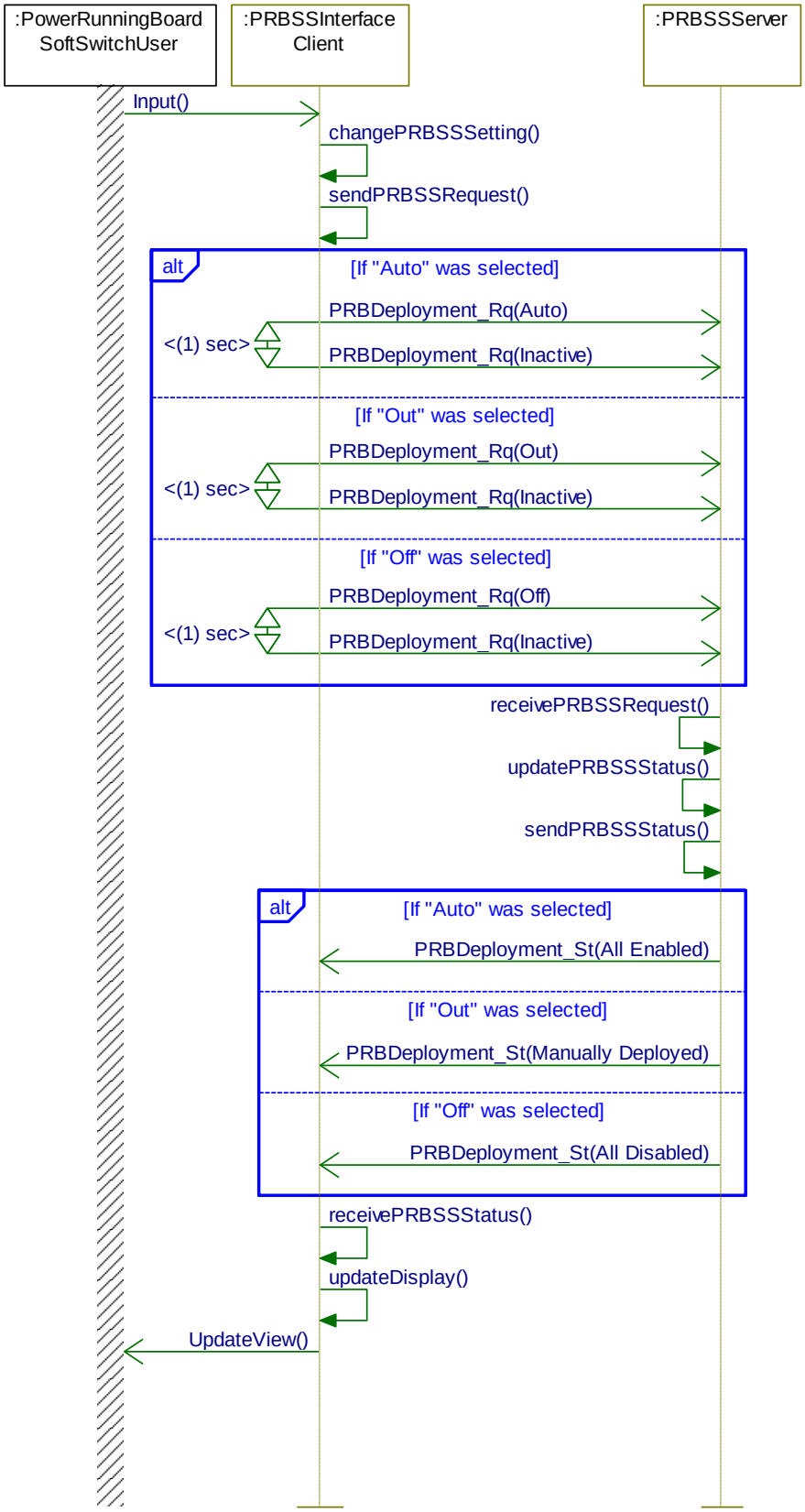
Normal Usage

The user accesses the Power Running Board feature menu on the PRBSSInterfaceClient and selects “Auto”, “Out”, or “Off”

Post-Condition

The PRBSSServer updates the Power Running Board feature setting accordingly
The PRBSSInterfaceClient updates its HMI to reflect active state

Sequence Diagram



3.1.3.2.2 PRBSS-SD-REQ-401613/A-User Sets PRB Feature Setting v2

Constraints

Pre-Condition

Powermode Conditions are met
PRBSSInterfaceClient is ON
Vehicle Speed < Threshold config.

Scenarios

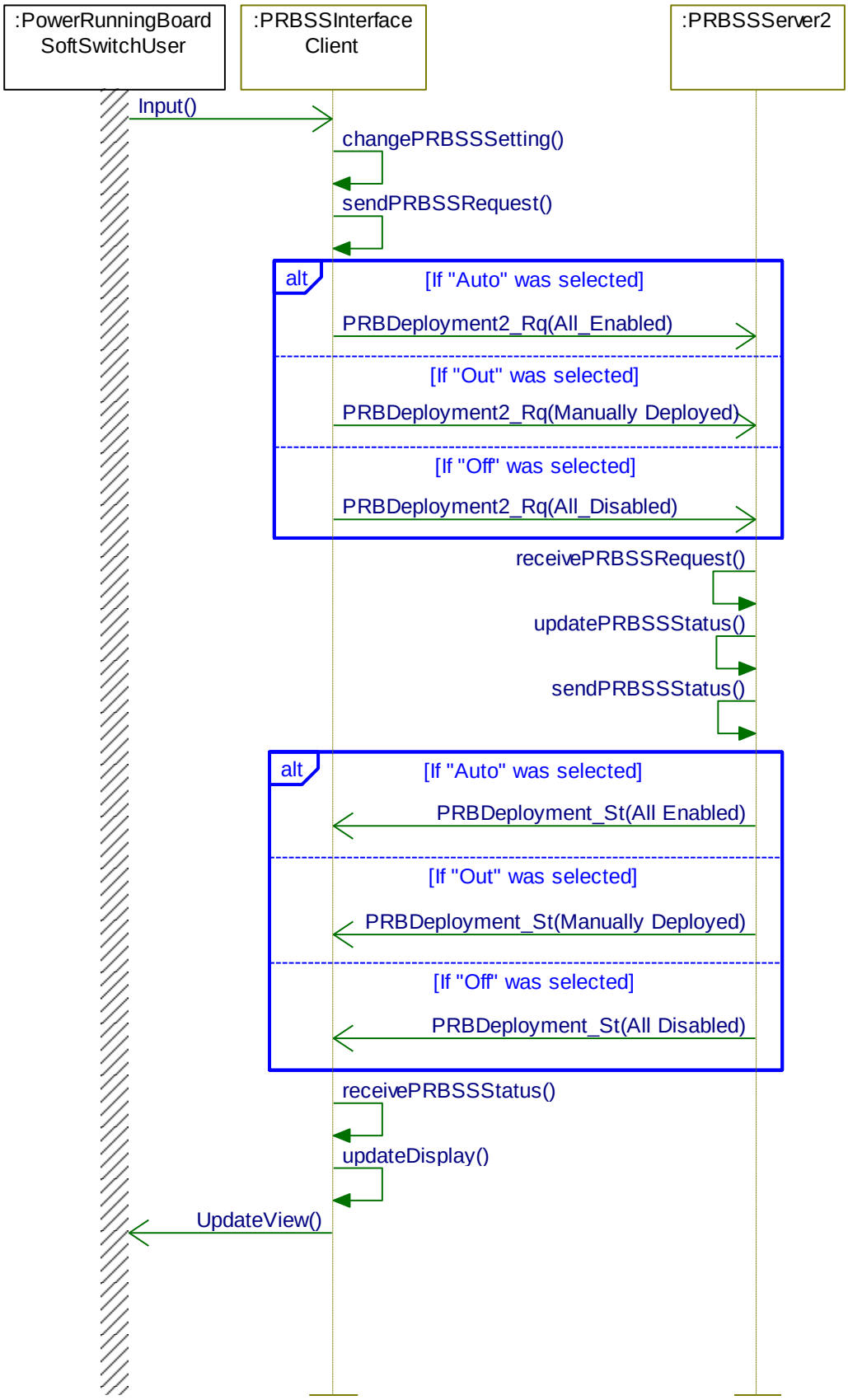
Normal Usage

The user accesses the Power Running Board feature menu on the PRBSSInterfaceClient and selects “Auto”, “Out”, or “Off”

Post-Condition

The PRBSSServer2 updates the Power Running Board feature setting accordingly
The PRBSSInterfaceClient updates its HMI to reflect active state

Sequence Diagram



3.2 PRBSS-FUN-REQ-330074/A-Power Running Board Timer Setting

3.2.1 Requirements

3.2.1.1 PRBSS-REQ-330076/A-PRB Timer Setting - Interface Client Request

The PRBSSInterfaceClient shall send PRBTimer_Rq to the PRBSSServer with the following values:

- PRBTimer_Rq = “(0x1) Timer 1” when the first timer is selected by the user
- PRBTimer_Rq = “(0x2) Timer 2” when the second timer is selected by the user

3.2.1.2 PRBSS-REQ-330077/A-PRB Timer Setting - Server Response

The PRBSSInterfaceClient shall monitor PRBTimer_St from the PRBSSServer for the active Power Running Boards Timer status.

- When PRBTimer_St = “(0x0) Timer 1” is received, the PRBSSInterfaceClient shall reflect that the first timer is selected to the user
- When PRBTimer_St = “(0x1) Timer 2” is received, the PRBSSInterfaceClient shall reflect that the second timer is selected to the user

3.2.1.3 PRBSS-REQ-330078/A-PRB Timer Setting - Startup/Shutdown

Upon system shutdown, the PRBSSInterfaceClient shall store the last active state of the PRBTimer_St from the PRBSSServer.

Upon system startup, the PRBSSInterfaceClient shall display the stored PRBTimer_St value until PRBTimer_St is received from the PRBSSServer with any value other than “(0x0) Inactive.”

3.2.1.4 PRBSS-REQ-330079/B-PRB Timer Setting - User Input

The PRBSSInterfaceClient shall provide a user interface (button/graphic) to allow selection of the Power Runing Boards Timer setting.

SYNC Gen4 Screen / ID HMI Number	HMI Setting ID
173	1009

3.2.1.5 PRBSS-REQ-330080/A-PRB Timer Setting - User Input Enable/Disable

The PRBSSInterfaceClient shall enable/disable (show/hide, grey-out, etc.) the Power Running Boards Timer setting user interface (button/graphic) based on the following:

- If IgnitionStatus_St != (0x4) Run, the above shall be disabled (greyed-out, hidden, etc.)
- If VehicleSpeed_St is greater than the threshold config. defined by REQ-325966, the above shall be disabled (greyed-out, hidden, etc.)
- If IgnitionStatus_St = (0x4) Run, AND VehicleSpeed_St is lower than the threshold config. defined by REQ-325966, the above shall be enabled
- If the DTC defined by REQ-331160 is active, the above shall be disabled (greyed-out, hidden, etc.)

3.2.2 Use Cases

3.2.2.1 PRBSS-UC-REQ-330190/A-User sets Timer to Timer 1

Actors	Vehicle Occupant
Pre-conditions	Powermode Conditions are met PRBSSInterfaceClient is ON Vehicle Speed < Threshold config.

	Power Running Boards feature is set to “Auto”
Scenario Description	The user accesses the Power Running Board Timer menu on the PRBSSInterfaceClient and selects the first timer
Post-conditions	• The PRBSSServer updates the Power Running Board Timer to Timer 1 • The PRBSSInterfaceClient updates its HMI to reflect Timer 1 is active
List of Exception Use Cases	PRBSS-UC-REQ-330192-Timer setting while vehicle in motion
Interfaces	PRBSSInterfaceClient

3.2.2.2 PRBSS-UC-REQ-330191/A-User sets Timer to Timer 2

Actors	Vehicle Occupant
Pre-conditions	Powermode Conditions are met PRBSSInterfaceClient is ON Vehicle Speed < Threshold config. Power Running Boards feature is set to “Auto”
Scenario Description	The user accesses the Power Running Board Timer menu on the PRBSSInterfaceClient and selects the second timer
Post-conditions	• The PRBSSServer updates the Power Running Board Timer to Timer 2 • The PRBSSInterfaceClient updates its HMI to reflect Timer 2 is active
List of Exception Use Cases	PRBSS-UC-REQ-330192-Timer setting while vehicle in motion
Interfaces	PRBSSInterfaceClient

3.2.2.3 PRBSS-UC-REQ-330192/A-Timer setting while vehicle in motion

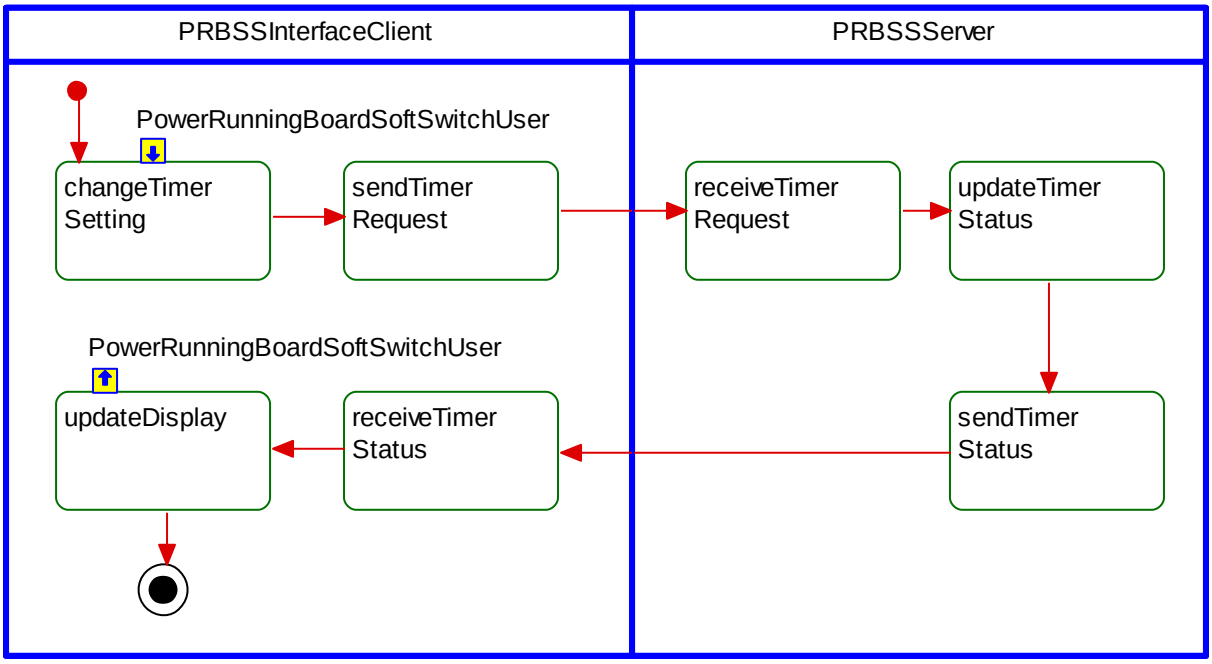
Actors	Vehicle Occupant
Pre-conditions	Powermode Conditions are met PRBSSInterfaceClient is ON Vehicle Speed < Threshold config. Power Running Boards feature is set to “Auto”
Scenario Description	The user accesses the Power Running Board Timer menu on the PRBSSInterfaceClient and attempts to change the Timer setting
Post-conditions	• The user cannot access the menu • The Timer setting is not changed
List of Exception Use Cases	
Interfaces	PRBSSInterfaceClient

3.2.3 White Box View

3.2.3.1 Activity Diagrams

3.2.3.1.1 PRBSS-ACT-REQ-330692/A-User Sets Timer Setting

Activity Diagram



3.2.3.2 Sequence Diagrams

3.2.3.2.1 PRBSS-SD-REQ-330762/A-User Sets Timer Setting

Constraints

Pre-Condition

Powermode Conditions are met
PRBSSInterfaceClient is ON
Vehicle Speed < Threshold config.

Scenarios

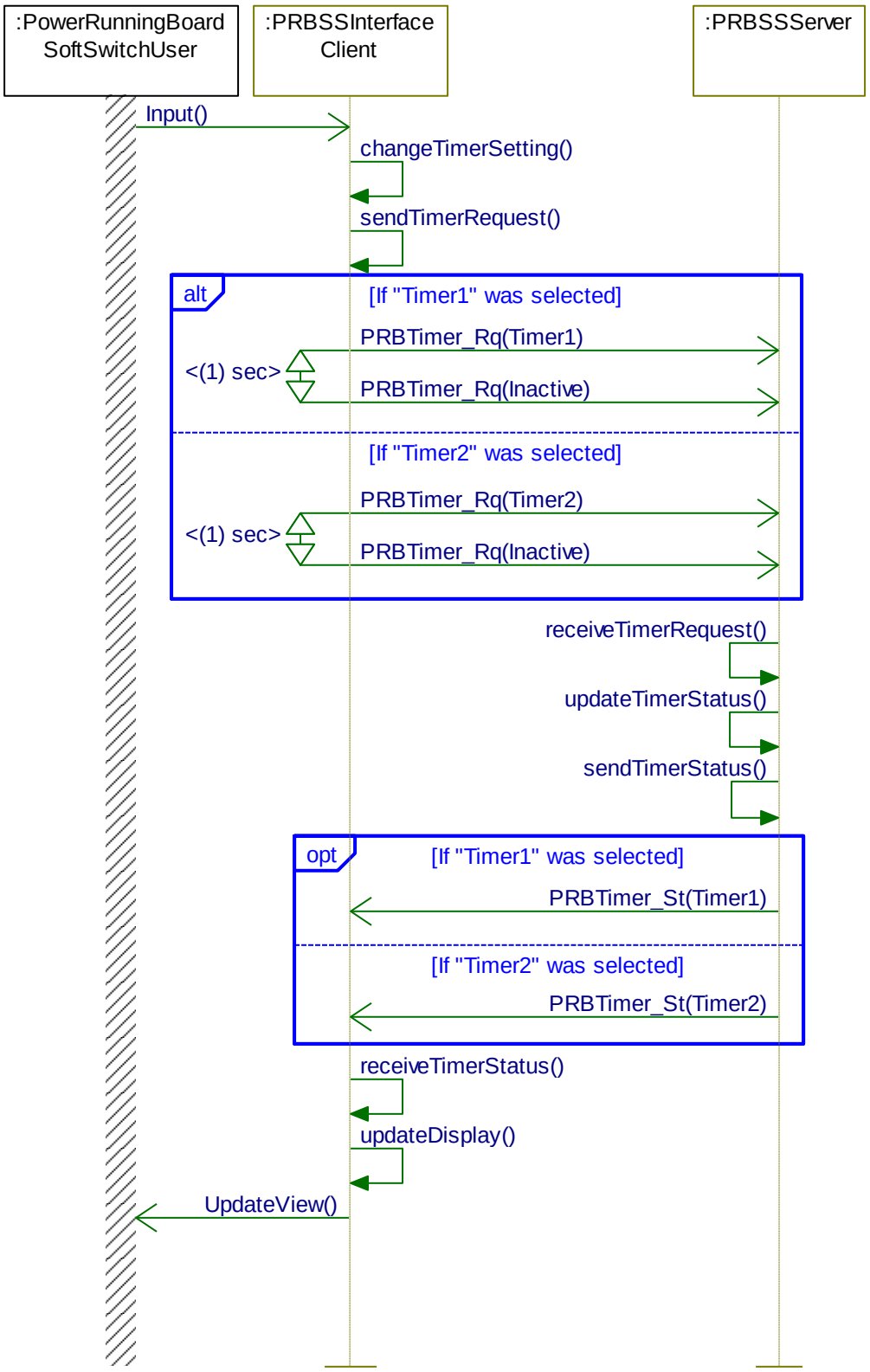
Normal Usage

The user accesses the Power Running Board Timer menu on the PRBSSInterfaceClient and selects the first or second timer

Post-Condition

The PRBSSServer updates the Power Running Board Timer setting accordingly
The PRBSSInterfaceClient updates its HMI to reflect active state

Sequence Diagram



3.3 PRBSS-FUN-REQ-325399/A-Power Running Board Kickswitch Setting

3.3.1 Requirements

3.3.1.1 PRBSS-REQ-326162/A-PRB Kickswitch Setting - Interface Client Request

The PRBSSInterfaceClient shall send PRBKickSwitch_Rq to the PRBSSServer with the following values:

- PRBKickSwitch_Rq = "(0x1) Always Active" when "Always Active" is selected by the user
- PRBKickSwitch_Rq = "(0x2) Deploy Unlocked" when "Deploy only when Unlocked" is selected by the user

3.3.1.2 PRBSS-REQ-326163/A-PRB Kickswitch Setting - Server Response

The PRBSSInterfaceClient shall monitor PRBKickSwitch_St from the PRBSSServer for the active Power Running Boards Kickswitch status.

- When PRBKickSwitch_St = "(0x1) Always Active" is received, the PRBSSInterfaceClient shall reflect that "Always Active" is selected to the user
- When PRBKickSwitch_St = "(0x2) Deploy Unlocked" is received, the PRBSSInterfaceClient shall reflect that "Deploy only when Unlocked" is selected to the user

3.3.1.3 PRBSS-REQ-326418/A-PRB Kickswitch Setting - Startup/Shutdown

Upon system shutdown, the PRBSSInterfaceClient shall store the last active state of the PRBKickSwitch_St from the PRBSSServer.

Upon system startup, the PRBSSInterfaceClient shall display the stored PRBKickSwitch_St value until PRBKickSwitch_St is received from the PRBSSServer with any value other than "(0x0) Inactive."

3.3.1.4 PRBSS-REQ-326164/B-PRB Kickswitch Setting - User Input

The PRBSSInterfaceClient shall provide a user interface (button/graphic) to allow selection of the Power Runing Boards Kickswitch setting.

SYNC Gen4 Screen / ID HMI Number	HMI Setting ID
172	1010

3.3.1.5 PRBSS-REQ-326165/A-PRB Kickswitch Setting - User Input Enable/Disable

The PRBSSInterfaceClient shall enable/disable (show/hide, grey-out, etc.) the Power Running Boards Kickswitch setting user interface (button/graphic) based on the following:

- If IgnitionStatus_St != (0x4) Run, the above shall be disabled (greyed-out, hidden, etc.)
- If VehicleSpeed_St is greater than the threshold config. defined by REQ-325966, the above shall be disabled (greyed-out, hidden, etc.)
- If IgnitionStatus_St = (0x4) Run, AND VehicleSpeed_St is lower than the threshold config. defined by REQ-325966, the above shall be enabled
- If the DTC defined by REQ-331160 is active, the above shall be disabled (greyed-out, hidden, etc.)
- If CarMode_St = (0x1) Factory, the above shall be disabled (greyed-out, hidden, etc.)

3.3.2 Use Cases

3.3.2.1 PRBSS-UC-REQ-325955/A-User sets Kickswitch to Always Active

Actors	Vehicle Occupant
Pre-conditions	Powermode Conditions are met PRBSSInterfaceClient is ON

	Vehicle Speed < Threshold config. Kickswitch feature is set to “Deploy Unlocked”
Scenario Description	The user accesses the Power Running Board Kickswitch menu on the PRBSSInterfaceClient and selects “Always Active”
Post-conditions	• The PRBSSServer updates the Power Running Board Kickswitch to “Always Active” • The PRBSSInterfaceClient updates its HMI to reflect “Always Active” is active
List of Exception Use Cases	REQ-325958-Kickswitch setting while vehicle in motion
Interfaces	PRBSSInterfaceClient

3.3.2.2 PRBSS-UC-REQ-325956/A-User sets Kickswitch to Deploy Unlocked

Actors	Vehicle Occupant
Pre-conditions	Powermode Conditions are met PRBSSInterfaceClient is ON Vehicle Speed < Threshold config. Kickswitch feature is set to “Always Active”
Scenario Description	The user accesses the Power Running Board Kickswitch menu on the PRBSSInterfaceClient and selects “DeployUnlocked”
Post-conditions	• The PRBSSServer updates the Power Running Board Kickswitch to “DeployUnlocked” • The PRBSSInterfaceClient updates its HMI to reflect “DeployUnlocked” is active
List of Exception Use Cases	REQ-325958-Kickswitch setting while vehicle in motion
Interfaces	PRBSSInterfaceClient

3.3.2.3 PRBSS-UC-REQ-325958/A-Kickswitch setting while vehicle in motion

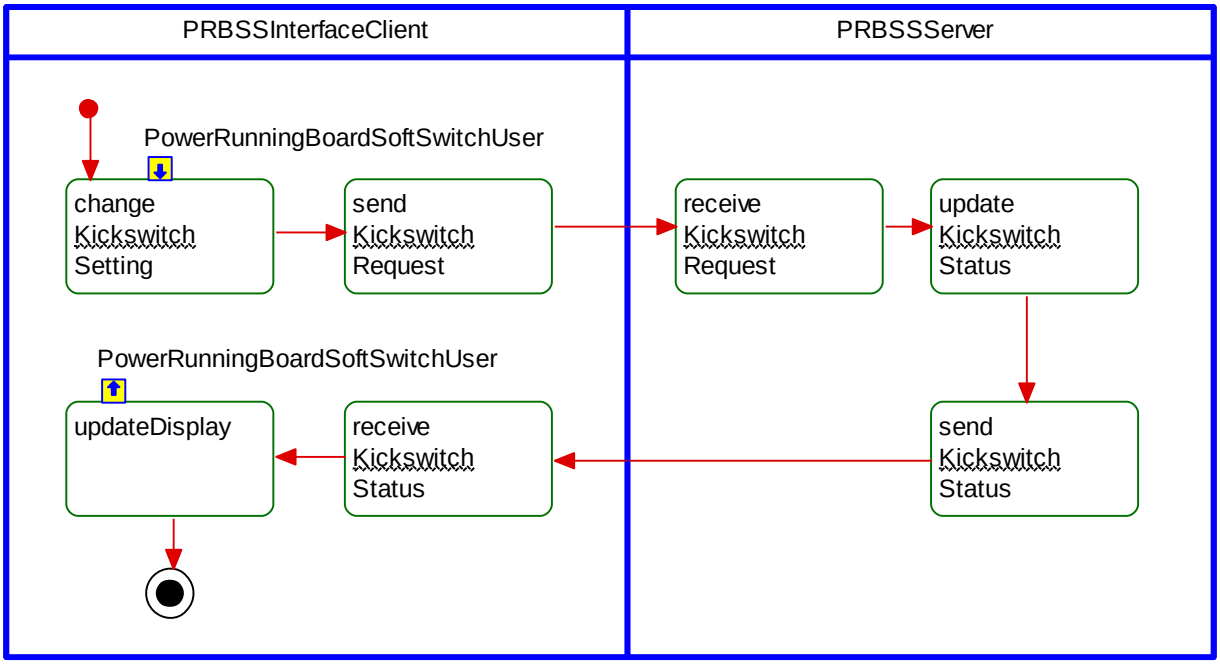
Actors	Vehicle Occupant
Pre-conditions	Powermode Conditions are met PRBSSInterfaceClient is ON Vehicle Speed > Threshold config.
Scenario Description	The user accesses the Power Running Board Kickswitch menu on the PRBSSInterfaceClient and attempts to change the Kickswitch setting
Post-conditions	• The user cannot access the menu • The Kickswitch setting is not changed
List of Exception Use Cases	
Interfaces	PRBSSInterfaceClient

3.3.3 White Box View

3.3.3.1 Activity Diagrams

3.3.3.1.1 PRBSS-ACT-REQ-330690/A-User Sets KickSwitch Setting

Activity Diagram



3.3.3.2 Sequence Diagrams

3.3.3.2.1 PRBSS-SD-REQ-330760/A-User Sets KickSwitch Setting

Constraints

Pre-Condition

Powermode Conditions are met
PRBSSInterfaceClient is ON
Vehicle Speed < Threshold config.

Scenarios

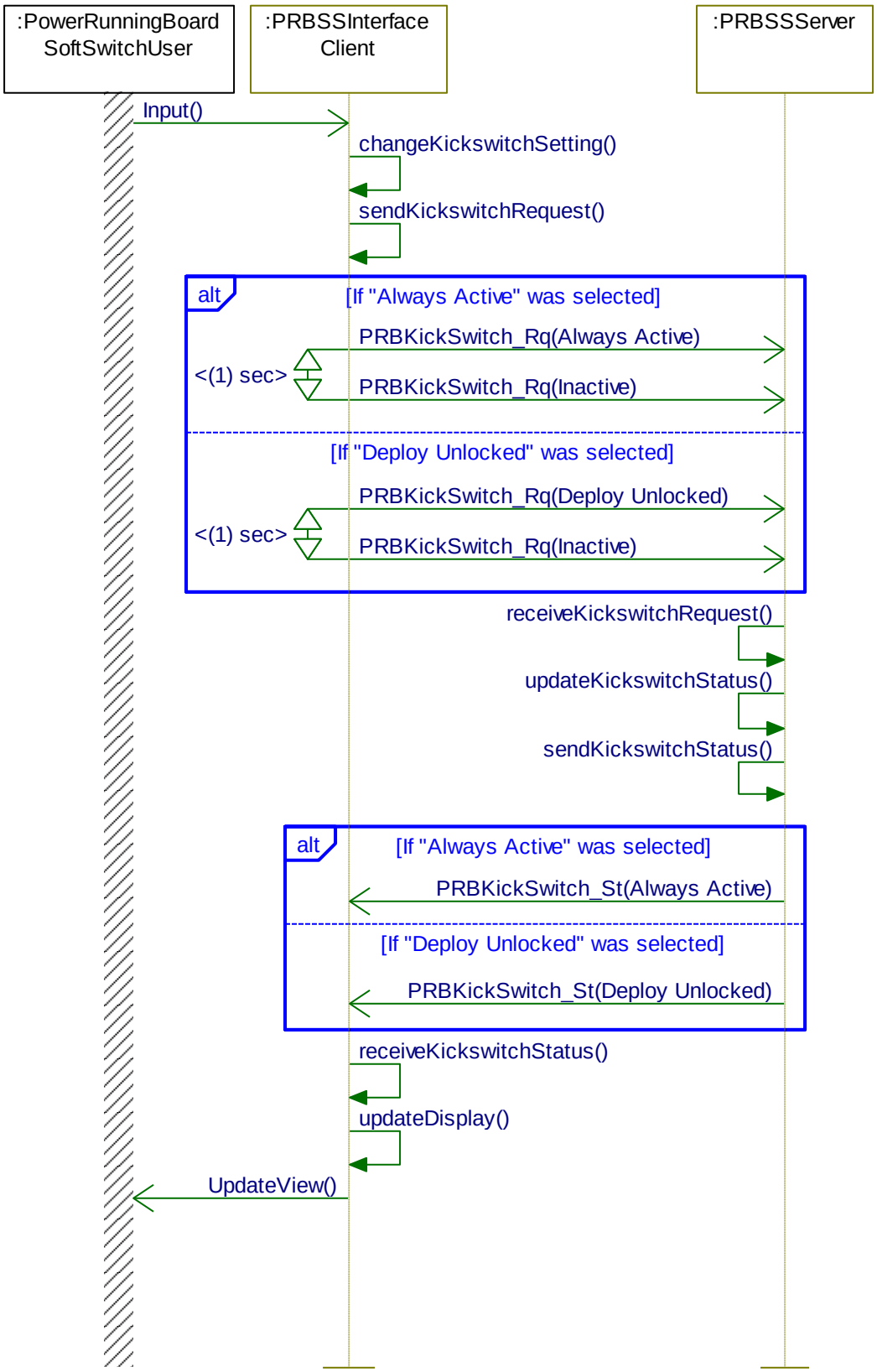
Normal Usage

The user accesses the Power Running Board Kickswitch menu on the PRBSSInterfaceClient and selects “Always Active” or “Deployed Unlocked.”

Post-Condition

The PRBSSServer updates the Power Running Board Kickswitch setting accordingly
The PRBSSInterfaceClient updates its HMI to reflect active state

Sequence Diagram



4 Appendix: Reference Documents

Reference #	Document Title
1	Logical to Physical Signal Mapping (available on FISI Sharepoint)
2	HMI Settings ID's - not generated by Cluster
3	
4	
5	
6	
7	
8	
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