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|  |  | | |  |
|  | RSCL Function (Group) | | |  |
|  | (F003110) | | |  |
|  |  | | |  |
|  |  | | |  |
| Document Type | **Function Specification** | | |  |
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| GIS2 Classification: | **Confidential** | |
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| Document Approval | | | | |
| Name | Role | | Email Confirmation | Date |
|  |  | |  |  |
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**Important Note**

You need to use the RE specification macros provided by the “RE\_SpecificationMacroTemplate.dotm” (refer to “Utilities” on [*page “Specification Templates” in the RE Wiki*](http://wiki.ford.com/display/RequirementsEngineering/Specification+templates)) to allow seamless VSEM import of the specification content. **Use only these RE specification macros to create requirements** in this specification. Refer to “[How to use the Specification Templates](http://wiki.ford.com/display/RequirementsEngineering/How+to+use+the+Specification+Templates?src=contextnavpagetreemode)” on how to enable and use the macros and the requirements templates in this specification.

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# Introduction

## Document Purpose

The Function (Group) Specification (FS) specifies an individual function / a group of functions.

To get more information about the concept of feature, function and component level abstraction refer to the [Ford RE Wiki](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Engineering+for+SW+Enabled+Features).

## Document Scope

The following set of functions from the [Global Feature & Function List](https://www.vsemweb.ford.com:443/tc/launchapp?-attach=true&-s=226TCSession&-o=ZmZNi0JHx3NrTDAAAAAAAAAAAAA) is described in this specification.

|  |  |  |  |
| --- | --- | --- | --- |
| **Function ID** | **Function Name** | **Owner** | **Reference** |
| 1 | RSCL HMI control | Hanan Ahmed | VSEM link |
| 2 | RSCL control | Hanan Ahmed |  |
| 3 | PCL control | Denney Vellaramkalayil |  |
| 4 | Rear Inner Handle Control | Denney Vellaramkalayil |  |
| 5 | URCL control | FO: Gregory Reed |  |
|  |  |  |  |
|  |  |  |  |

**Table 1: Functions described in this specification**

## Document Audience

The FS is authored by the owners of the individual functions. All Stakeholders, i.e., all people who have a valid interest in the functions and their behavior should read and, if possible, review the FS. It needs to be guaranteed, that all stakeholders have access to the currently valid version of the FS.

***#Hint:*** *The FS template has the IP Classification “Proprietary” by default. IP Classification “Confidential” might be required in some cases, e.g. by Ford Functional Safety.*

***#Macro****:* [*Add Ins -> Edit Document Properties macro*](http://wiki.ford.com/display/RequirementsEngineering/How+to+use+the+Specification+Templates#HowtousetheSpecificationTemplates-EditDocProperties) *(select “Proprietary” for “Document Classification”).*

### Stakeholder List

For the latest list of the feature stakeholder and their roles & responsibilities refer to <Put VSEM Link here>.

***#Hint:*** *Refer to* [*Ford RE Wiki – Stakeholder List*](http://wiki.ford.com/display/RequirementsEngineering/Stakeholder+Analysis) *on how to create a stakeholder list.* *The stakeholder list should be stored in VSEM in the pseudo folder “General Data Artifacts” of the corresponding function.*

## Document Organization

### Document Context

Refer to the [Specification Structure page](http://wiki.ford.com/display/RequirementsEngineering/Specification+templates) in the [Ford RE Wiki](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Engineering+for+SW+Enabled+Features) to understand how the FS relates to other Ford Requirements Documents and Specifications.

### Document Structure

The structure of this document is explained below:

**Section 1** – Introduction how to use this document including responsibilities and requisite documents. Explains the terminology. Gives a clarification of the definitions, concepts and abbreviations used in the document.

**Section 2** – Function Group Description. Gives an overview and the purpose of the function group.

**Section 3** – Functional Architecture: Specifies the overall functional architecture of the function group

**Section 4** – Function Specifications: Specifies the logical functions of the function group in detail

**Section 5** – List of Open Concerns

**Section 6** Revision history including a list of new or modified requirements. The requirements in this document are tagged, and this section contains different types of tables listing all, new, or changed requirements by their title and page no.

**Section 7** – Appendix: Presenting additional data mainly in a tabular form, e.g., a data dictionary

**#Hint:** All sections are mandatory, unless explicitly marked by the tag “#Classification” as “optional” or as applicable e.g. to certain domains like “Functional Safety”.

## Document Conventions

### Requirements Templates

Refer to “[How to use the Specification Templates](http://wiki.ford.com/display/RequirementsEngineering/How+to+use+the+Specification+Templates?src=contextnavpagetreemode)” on how to use the specification templates and the VBA macros to create/edit the requirements in the specifications.

The VBA macro enable the import of the specification to VSEM (refer to ["How to import specifications into VSEM as separate requirements"](http://wiki.ford.com/pages/viewpage.action?pageId=104991616&src=contextnavpagetreemode)).

#### Identification of Requirements

The unique requirement ID given in the headline of any requirement follows the requirement throughout the development process. The requirement ID format follows a well-defined syntax.

All identifiers in a FS shall be composed of 4 parts:

* A leading prefix, which indicates the type of requirement (R=Requirement, UC=Use Case, SC=Scenario, …)
* A prefix, which indicates the abstraction level (F=Feature, FNC=Function, CMP = component).
* Followed by a name, indicating the scope, which the requirement belongs to (e.g. feature or function name )
* Ending with the actual requirement number

*Example:*

*R\_FNC\_LockArbitrator\_00004* This is the fourth requirement on function level for the function Lock Arbitrator.

#### Requirements Attributes

The templates provided by *Specification\_Macros.dotm* define a list of attributes for each requirement. This helps to classify the requirement. The attributes are explained at [RE Wiki - Requirements Attributes](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes?src=contextnavpagetreemode).

## References

### Ford Documents

List here all Ford internal documents, which are directly related to the feature.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Reference** | **Title** | **Doc. ID** | **Revision** | **Document Location** |
| [aaa] | FD F003110 Rear Seat Controls Lockout (RSCL)- draft.xls |  | draft | VSEM |
|  | ConOps\_Rear Seat Controls Lockout |  | 0.07 |  |
| REQ-389554 | RR BTN status 1st |  |  | VSEM |
| REQ-389555 | RR Lock BTN stt HVAK to SYNC |  |  | VSEM |
| In progress | HVAK to RHVAK |  |  | VSEM |
|  | Rear Audio Control RACM SPSS |  | 1.6 | VSEM |
|  |  |  |  |  |
|  |  |  |  |  |

Table 2: Ford Documents

### External Documents and Publications

The list of external documents could include books, reports and online sources.

**#Hint:** You may refer to [IEEE Citation Reference](http://www.ieee.org/documents/ieeecitationref.pdf) on how to format a reference.

|  |  |
| --- | --- |
| **Reference** | **Document / Publication** |
| [bbb] |  |
|  |  |

Table 3: External Documents and Publications

## Glossary

**#Hint**: Terms, concepts and abbreviations used in the document shall be defined and illustrated here. Note that changes to terms and/or concepts described in this section tend to cause major updates to this document.

The tables below have feature specific definitions and abbreviations. For additional, non-feature specific terms please refer to the [RE Glossary](http://wiki.ford.com/display/RequirementsEngineering/Glossary?src=contextnavpagetreemode)

### Definitions

**#Hint:** The table below has definitions and abbreviations relevant for the functions in this document. For additional terms please refer to the [RE Glossary](http://wiki.ford.com/display/RequirementsEngineering/Glossary?src=contextnavpagetreemode)

|  |  |
| --- | --- |
| Definition | Description |
|  |  |
|  |  |

Table 4: Definitions relevant for Function Group “RSCL”

### Abbreviations

|  |  |  |
| --- | --- | --- |
| Abbr. | Meaning | Description |
| FS | Function Requirements Specification /  Function Group Specification | The document describing, collecting and developing the requirements of a function or a group of functions. |
|  |  |  |

Table 5: Abbreviations relevant for Function Group “RSCL”

# Function Group Description

**#Classification:** Function Group only (remove section, if only a single Function is specified in this document)

**#Hint**: Provide an overview / a description of the Function Group

RSCL feature combines the following **existing** functions and provides control using a new HMI:

* Power Child Lock (PCL) which allows the user to enable/disable the rear inner door handles
* Window Child Lockout (WCL) which allows the user to enable/disable the rear window switches
* Rear Audio Lockout (RAL) which allows the user to enable/disable the rear audio controls
* Rear Climate Lockout (RCL) which allows the user to enable/disable the rear climate controls

Additionally the following **new** function is controled by the RSCL feature:

* Ultimate Remote Control Lockout (URCL Control) which allows the user to enable/disable the rear connected mobile devices globally and individually.

The RSCL feature uses the following **new** functions:

* RSCL HMI Control
* RSCL Control

This Document specifies only the **new** functions to support this feature.

PCL, WCL, RAL and RCL functions will be reused as existing.

# Functional Decompostion and Architecture

**#Classification:** Function Group only (remove section, if only a single Function is specified in this document)

**#Hint:** The Functional Architecture shall reflect the result of the functional decomposition for a given feature or parts of it.

Refer to the [*RE Wiki – Functional Decomposition*](http://wiki.ford.com/display/RequirementsEngineering/Functional+Analysis+and+Architecture) for some guidance on how to decompose a feature into functions, i.e., how to find the right functional partitioning for the function level. The functions shown here are those, which are specified in section 4 “Function Specifications”.

## Description

**#Hint:** Provide some informal description of the characteristics of the chosen architecture. Also give some graphical representation of the Functional Architecture. Either SysML Internal Block diagrams or [Data Flow Diagrams](http://wiki.ford.com/display/RequirementsEngineering/Data+Flow+Diagram?src=contextnavpagetreemode) could be used to depict such a Functional Architecture.

**#Link:** [*SysML – Internal Block Diagrams*](https://pd3.spt.ford.com/sites/SystemsEngineering/SEC/sysml-teamsite/SysML%20Wiki/Internal%20Block%20Diagram%20Basics.aspx) or [*RE Wiki - Data Flow Diagrams*](http://wiki.ford.com/display/RequirementsEngineering/Data+Flow+Diagram?src=contextnavpagetreemodehttp://wiki.ford.com/display/RequirementsEngineering/Data+Flow+Diagram?src=contextnavpagetreemode)

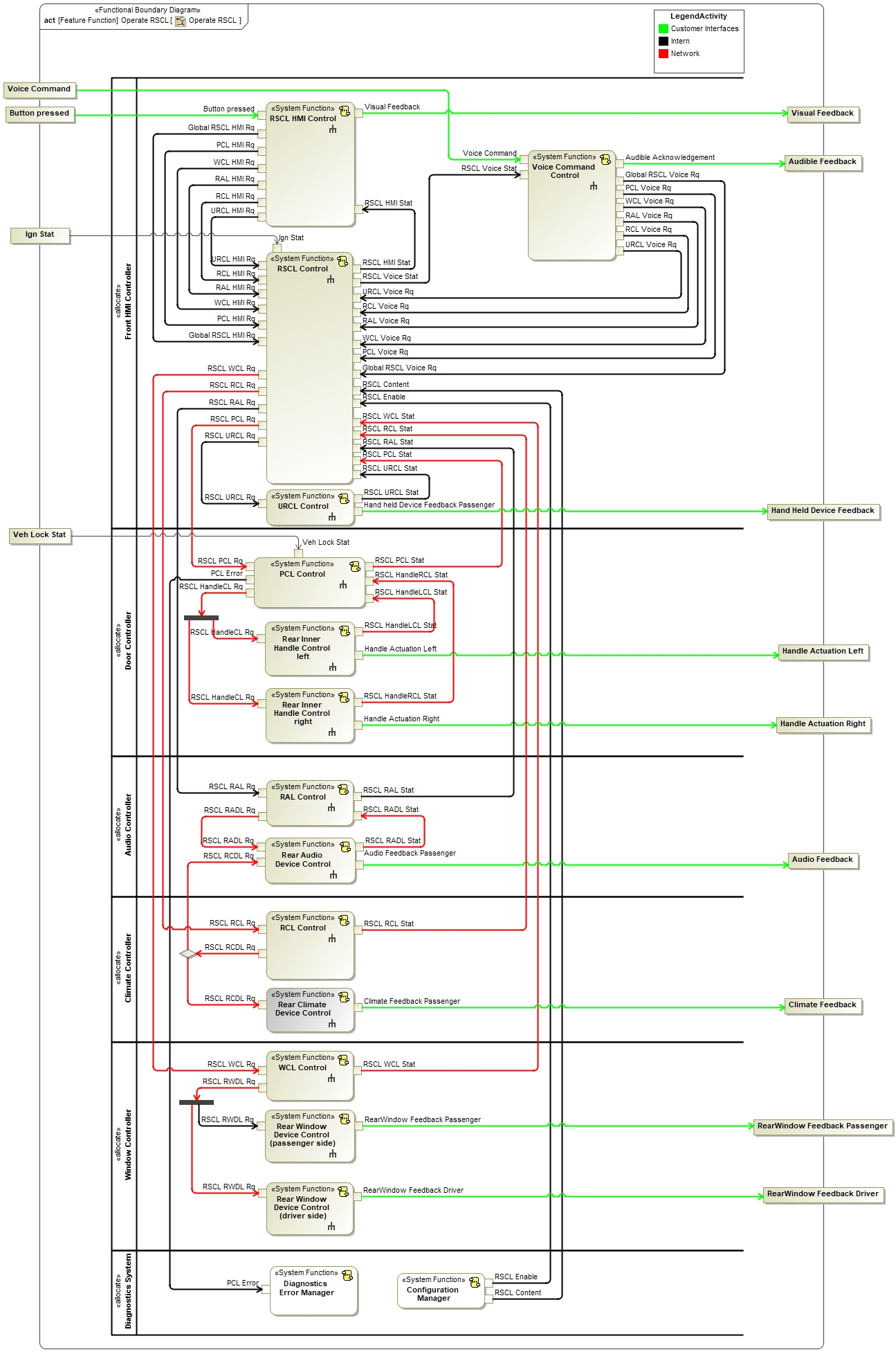


Figure 1: Functional Architecture of Function Group “RSCL”

## Function List

| **Function Name** | Description | Comments |
| --- | --- | --- |
| *(activity)* URCL Control | *(activity)* Controls URCL on rear connected mobile devices  RSCL URC status feedback |  |
| *(activity)* Diagnostics Error Manager | *(activity)* Handles error information relevant for diagnostics. |  |
| *(activity)* WCL Control | *(activity)* Controls WCL on rear window switches  RSCL WCL status feedback | This function already exists in vehicle and will not be described in this document as it is not affected by RSCL. |
| *(activity)* PCL Control | *(activity)* Controls PCL on rear inner door handles  RSCL PCL status feedback | This function already exists in vehicle and is not affected by RSCL. |
| *(activity)* Rear Inner Handle Control | *(activity)* Controls useability of rear inner door handles.  Actual rear inner door handle status feedback. | This function already exists in vehicle and is not affected by RSCL. |
| *(activity)* RCL Control | *(activity)* Controls RCL on rear climate controls  RSCL RCL status feedback | This function already exists in vehicle and will not be described in this document as it is not affected by RSCL. |
| *(activity)* Voice Command Control | *(activity)* Provides voice controls for RSCL options and converts voice commands into logical signals for further processing by RSCL control.  Provides audible feedback to the user about feature status |  |
| *(activity)* Configuration Manager | *(activity)* Provides vehicle configuration settings to configure feature logic or functions. |  |
| *(activity)* RSCL Control | *(activity)* Central state management of RSCL feature.  Reads RSCL HMI control input and provides commands / requests for PCL, WCL, RAL, RCL and URCL control. |  |
| *(activity)* Rear Climate Device Control | *(activity)* Read lock/unlock signal and enable / disable rear climate interfaces for rear passenger. Provide status feedback | This function already exists in vehicle and will not be described in this document as it is not affected by RSCL. |
| *(activity)* Rear Window Device Control | *(activity)* Enable / Disable rear window position control interface for rear passenger.  Instantiated two times, rear passenger and rear driver side. | This function already exists in vehicle and will not be described in this document as it is not affected by RSCL. |
| *(activity)* RSCL HMI Control | *(activity)* Provides HMI controls for RSCL options and converts user input (e.g. physical button press) into logical signals for further processing by RSCL control.  Provides feedback to the user about feature status. |  |
| *(activity)* Rear Audio Device Control | *(activity)* Read lock/unlock signal and enable / disable rear audio interfaces for rear passenger. Provide status feedback. | This function already exists in vehicle and will not be described in this document as it is not affected by RSCL. |
| *(activity)* RAL Control | *(activity)* Controls RAL on rear audio controls  RSCL RAL status feedback | This function already exists in vehicle and will not be described in this document as it is not affected by RSCL. |

Table 6: List of Logical Functions

## Signal List

Refer to the [Data Dictionary](#_Data_Dictionary) - [Logical Signals](#_Logical_Signals).

# Function Specifications

## Logical Function “RSCL Control”

### Function Overview

#### Function Description

**#Hint:** Some descriptive text to explain the purpose and functionality of the function.

Central state management of RSCL feature.

Reads RSCL HMI control input and provides commands / requests for PCL, WCL, RAL, RCL and URCL control.

#### Function Variants (no Variants)

**#Classification**: Mandatory (State “Not applicable”, if not used)

**#Hint:** If different variants of the same function are specified in this section, list those variants in the table below.

Variants on Function level could be driven by e.g. technology or feature content. Example: There could be a “Low Content” and a “High Content” variant of some exterior lighting function. The “Low Content” variant is used for Conventional Headlight technology, the “High Content” variant is used for LED and Xenon technology. In this case we call the different technologies the Variant Options, which the Variant depends on. The optional column “Variant condition” allows to express the dependency of a Variant based on Variant Options. Variant Options should be centrally managed in VSEM.

If requirements/signals are not applicable for all variants/variant options, those requirements should state explicitly, which function variant/variant option they apply to.

**#Link:** [RE Wiki – Variant Management](http://wiki.ford.com/display/RequirementsEngineering/Variant+Management).

|  |  |  |
| --- | --- | --- |
| Variant Name | Variant Description | Variant Condition (optional) |
|  | n/a |  |

#### Input Requirements/Documents

**#Hint:** *The table below helps the function owner to collect relevant input* (requirements, documents, mails, models, …) *while writing the spec. When finalizing the spec, the function owner should check, if all inputs have been properly considered by derived/outgoing requirements* in chapter “Function Requirements”.

Note: It is not required to list each input requirement individually in this table, referencing the input document is enough (if relevant document section is indicated).

|  |  |  |  |
| --- | --- | --- | --- |
| **Reference**  (Reference as listed in ch. ”References”) | **Section/Requirement** | **Description** | **Derived Requirement**  (optional – reference to requirement in ch. “Function Requirements”) |
| **Feature Requirements** | | | |
| Feature document | <Example:  id + title of relevant Feature Docs> | <Example: “Requirements of Feature …”> | <Note: If you reference a requirement in this column, that requirement should have a trace link in its [“Source”/”Source Req.” attribute](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) field pointing back to the input requirement (or to a requirement inside the input document) given in this table row> |
|  |  |  |  |
| **Ford Engineering Standards** | | | |
|  | <Example: some SDS (requirement)> |  |  |
|  |  |  |  |
| **Legal Regulations** | | | |
|  | <Example: some excerpt from ECE or FMVSS> |  |  |
|  |  |  |  |
| **Industry Standards** | | | |
|  | <Example: some ISO/IEEE/SAE or other standard> |  |  |
|  |  |  |  |
| **Other Sources** | | | |
|  | <Example: some stakeholder document> |  |  |
|  |  |  |  |

Table 7: Input Requirements/Documents

#### Assumptions

**#Classification**: Mandatory (State “Not applicable”, if not used)

**#Hint:** A list of known assumptions concerning the effects of the function’s behavior on other functions or elements (i.e., dependencies) as well as assumptions on the behavior expected by the function (e.g. known limitations). During the course of the development most of those assumptions are typically either converted into actual requirements or discarded at some point – such that this chapter remains mostly empty.

### Function Scope

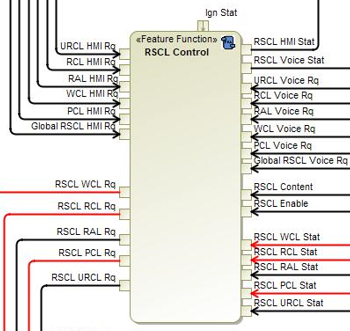


Figure 2: Context Diagram of Function “RSCL Control”

### Function Interfaces

**#Hint:**

* First create a Logical Signal in the ”Logical Signals” section of the “Data Dictionary”. Use [Add Ins -> Add Requirement macro](http://wiki.ford.com/display/RequirementsEngineering/Adding+a+Logical+Signal+or+Parameter) (select “Logical Signal” as type).
* Insert just a Word reference to the Signal ID, Name and Description (which are bookmarks in the signal/parameter definition in the section in the Data Dictionary).

**#Link:** [RE Wiki – Adding a Logical Signal or Parameter](http://wiki.ford.com/display/RequirementsEngineering/Adding+a+Logical+Signal+or+Parameter)

#### Logical Inputs

|  |  |
| --- | --- |
| **Signal Name** | **Description** |
| Global\_RSCL\_HMI\_rq | Signal between RSCL HMI Control and RSCL Control describing the user request for feature status.   |  |  |  | | --- | --- | --- | | **ASIL** | | Choose an item. | | **Encoding Type Name** | | n/a | | **Value**  (Discrete  Encoding) | Lock all | Lock all RSCL functions   * WCL * PCL * RAL * RCL * URCL | | Unlock all | Unlock all RSCL functions   * WCL * PCL * RAL * RCL * URCL | | **Unit** | | n/a | |
| PCL\_HMI\_rq | Signal between RSCL HMI Control and RSCL Control describing the user request for PCL status   |  |  |  | | --- | --- | --- | | **ASIL** | | A | | **Encoding Type Name** | | n/a | | **Value**  (Discrete  Encoding) | Lock | Request to enable PCL. Disable rear inner door handles. | | Unlock | Request to disable PCL. Enable rear inner door handles. | | **Unit** | | n/a | |
| WCL\_HMI\_rq | Signal between RSCL HMI Control and RSCL Control describing the user request for WCL status   |  |  |  | | --- | --- | --- | | **ASIL** | | QM | | **Encoding Type Name** | | n/a | | **Value**  (Discrete  Encoding) | Lock | Request to disable rear window switches | | Unlock | Request to enable rear window switches | | **Unit** | | n/a | |
| RAL\_HMI\_rq | Signal between RSCL HMI Control and RSCL Control describing the user request for RAL status   |  |  |  | | --- | --- | --- | | **ASIL** | | QM | | **Encoding Type Name** | | n/a | | **Value**  (Discrete  Encoding) | Lock | Request to disable rear audio devices | | Unlock | Request to enable rear audio devices | | **Unit** | | n/a | |
| RCL\_HMI\_rq | Signal between RSCL HMI Control and RSCL Control describing the user request for RCL status   |  |  |  | | --- | --- | --- | | **ASIL** | | QM | | **Encoding Type Name** | | n/a | | **Value**  (Discrete  Encoding) | Lock | Request to disable rear climate devices | | Unlock | Request to enable rear climate devices | | **Unit** | | n/a | |
| URCL\_HMI\_rq | Signal between RSCL HMI Control and RSCL Control describing the user request for URCL status   |  |  |  | | --- | --- | --- | | **ASIL** | | QM | | **Encoding Type Name** | | n/a | | **Value**  (Discrete  Encoding) | Lock | Request to disable all URC HHD | | Unlock | Request to enable all URC HHD | | **Unit** | | n/a | |
| Global\_RSCL\_Voice\_rq | Signal between Voice Command Control and RSCL Control describing the user request for feature status.   |  |  |  | | --- | --- | --- | | **ASIL** | | Choose an item. | | **Encoding Type Name** | | n/a | | **Value**  (Discrete  Encoding) | Lock all | Lock all RSCL functions   * WCL * PCL * RAL * RCL * URCL | | Unlock all | Unlock all RSCL functions   * WCL * PCL * RAL * RCL * URCL | | **Unit** | | n/a | |
| PCL\_Voice\_rq | Signal between Voice Command Control and RSCL Control describing the user request for PCL status   |  |  |  | | --- | --- | --- | | **ASIL** | | A | | **Encoding Type Name** | | n/a | | **Value**  (Discrete  Encoding) | Lock | Request to enable PCL. Disable rear inner door handles. | | Unlock | Request to disable PCL. Enable rear inner door handles. | | **Unit** | | n/a | |
| WCL\_Voice\_rq | Signal between Voice Command Control and RSCL Control describing the user request for WCL status   |  |  |  | | --- | --- | --- | | **ASIL** | | QM | | **Encoding Type Name** | | n/a | | **Value**  (Discrete  Encoding) | Lock | Request to disable rear window switches | | Unlock | Request to enable rear window switches | | **Unit** | | n/a | |
| RAL\_Voice\_rq | Signal between Voice Command Control and RSCL Control describing the user request for RAL status   |  |  |  | | --- | --- | --- | | **ASIL** | | QM | | **Encoding Type Name** | | n/a | | **Value**  (Discrete  Encoding) | Lock | Request to disable rear audio devices | | Unlock | Request to enable rear audio devices | | **Unit** | | n/a | |
| RCL\_Voice\_rq | Signal between Voice Command Control and RSCL Control describing the user request for RCL status   |  |  |  | | --- | --- | --- | | **ASIL** | | QM | | **Encoding Type Name** | | n/a | | **Value**  (Discrete  Encoding) | Lock | Request to disable rear climate devices | | Unlock | Request to enable rear climate devices | | **Unit** | | n/a | |
| URCL\_Voice\_rq | Signal between Voice Command Control and RSCL Control describing the user request for URCL status   |  |  |  | | --- | --- | --- | | **ASIL** | | QM | | **Encoding Type Name** | | n/a | | **Value**  (Discrete  Encoding) | Lock | Request to disable all URC HHD | | Unlock | Request to enable all URC HHD | | **Unit** | | n/a | |
| RSCL\_URCL\_stat | Signal from URCL Control providing the actual URCL status   |  |  |  | | --- | --- | --- | | **ASIL** | | QM | | **Encoding Type Name** | | n/a | | **Value**  (Discrete  Encoding) | all locked | All URC HHD locked | | all unlocked | All URC HHD unlocked | | Audio locked | Audio locked | | Climate locked | Climate locked | | Audio unlocked | Audio unlocked | | Climate unlocked | Climate unlocked | | **Unit** | | n/a | |
| RSCL\_PCL\_Stat | Signal generated by PCL control showing status of rear inner door handles incl. error detection and comparison with RSCL PCL Rq.   |  |  |  | | --- | --- | --- | | **ASIL** | | A | | **Encoding Type Name** | | n/a | | **Value**  (Discrete  Encoding) | activated | Both rear inner handles disabled | | deactivated | Both rear inner handles enabled | | Error | User request does not match rear inner door handle status | | **Unit** | | n/a | |
| RSCL\_RAL\_stat | Signal generated by RAL Control providing RAL status based on RSCL RADL stat   |  |  |  | | --- | --- | --- | | **ASIL** | | QM | | **Encoding Type Name** | | n/a | | **Value**  (Discrete  Encoding) | locked | Rear Audio devices disabled | | unlocked | Rear Audio devices enabled | | **Unit** | | n/a | |
| RSCL\_RCL\_stat | Signal generated by RCL Control showing the RCL status>   |  |  |  | | --- | --- | --- | | **ASIL** | | QM | | **Encoding Type Name** | | n/a | | **Value**  (Discrete  Encoding) | Locked | Rear Climate Devices disabled | | Unlocked | Rear Climate Devices enabled | | **Unit** | | n/a | |
| RSCL\_WCL\_stat | Signal generated by WCL Control based on RSCL RWDL stat from Rear Window Device Control   |  |  |  | | --- | --- | --- | | **ASIL** | | QM | | **Encoding Type Name** | | n/a | | **Value**  (Discrete  Encoding) | Locked | Rear Window switches disabled | | Unlocked | Rear Window switches enabled | | Error | Left switch different to right switch condition | | **Unit** | | n/a | |
| Ign\_stat | Signal describing the ignition status of the vehicle   |  |  |  | | --- | --- | --- | | **ASIL** | | QM | | **Encoding Type Name** | | n/a | | **Value**  (Discrete  Encoding) | Off |  | | Acc |  | | Run |  | | Start |  | | **Unit** | | n/a | |

#### Logical Outputs

|  |  |
| --- | --- |
| **Signal Name** | **Description** |
| RSCL\_HMI\_stat | Signal between RSCL HMI Control and RSCL control describing the feature status incl. error detection.   |  |  |  | | --- | --- | --- | | **ASIL** | | A | | **Encoding Type Name** | | n/a | | **Value**  (Discrete  Encoding) | All different conditions | TBD | |  | … | | Error | … | | Error PCL | No feedback signal from PCL system | | Error WCL | No feedback signal from WCL system | | Error RAL | No feedback signal from RAL system | | Error RCL | No feedback signal from RCL system | | Error URCL | No feedback signal from URCL system | | **Unit** | | n/a | |
| RSCL\_Voice\_stat | Signal between RSCL Voice Control and RSCL control describing the feature status incl. error detection.   |  |  |  | | --- | --- | --- | | **ASIL** | | A | | **Value**  (Discrete  Encoding) | All different conditions | TBD | | Value 2 | … | | … | … | |  |  | | Error |  | | **Unit** | | n/a | |
| RSCL\_URCL\_rq | Signal generated by RSCL Control to request locking/unlocking of URC functionalities individually or globally   |  |  |  | | --- | --- | --- | | **ASIL** | | QM | | **Encoding Type Name** | | n/a | | **Value**  (Discrete  Encoding) | Lock all | Lock all URC HHD | | Unlock all | Unlock all URC HHD | | Lock Audio | Lock Audio | | Lock Climate | Lock Climate | | Unlock Audio | Unlock Audio | | Unlock Climate | Unlock Climate | | **Unit** | | n/a | |
| RSCL\_PCL\_Rq | Signal generated by RSCL Control based on user request.   |  |  |  | | --- | --- | --- | | **ASIL** | | A | | **Encoding Type Name** | | n/a | | **Value**  (Discrete  Encoding) | activate | PCL activate requested | | deactivate | PCL deactivate requested | | **Unit** | | n/a | |
| RSCL\_RAL\_rq | Signal received from RSCL Control requesting to lock/unlock rear audio devices   |  |  |  | | --- | --- | --- | | **ASIL** | | Choose an item. | | **Encoding Type Name** | | n/a | | **Value**  (Discrete  Encoding) | Lock | Request to disable rear audio devices | | Unlock | Request to enable rear audio devices | | **Unit** | | n/a | |
| RSCL\_RCL\_rq | Signal generated by RSCL Control requesting to disable/enable rear climate user interfaces   |  |  |  | | --- | --- | --- | | **ASIL** | | QM | | **Encoding Type Name** | | n/a | | **Value**  (Discrete  Encoding) | Lock | Request to disable rear climate devices | | Unlock | Requet to enable rear climate devices | | **Unit** | | n/a | |
| RSCL\_WCL\_rq | Signal sent from RSCL Control requesting to enable/disable WCL on rear door window switches   |  |  |  | | --- | --- | --- | | **ASIL** | | QM | | **Encoding Type Name** | | n/a | | **Value**  (Discrete  Encoding) | lock | Request to disable rear window switches | | unlock | Request to enable rear window switches | | **Unit** | | n/a | |

#### Logical Parameters

**#Hint**: Put requirements for parameters here, which are implemented as configuration parameters using Method 2 or 3 or as parameters for calibration.

|  |  |
| --- | --- |
| **Parameter Name** | **Description** |
| RSCL\_enable | Configuration Parameter to enable / disable RSCL feature   |  |  |  | | --- | --- | --- | | **Value**  (Discrete  Encoding) | Enable | Feature available for user | | Disable | Feature not available for user | | **Unit** | |  | |
| RSCL\_content | Configuration Parameter to specify RSCL capabilities and ensure the proper HMI gets activated in Domain Controller.   |  |  |  | | --- | --- | --- | | **Value**  (Discrete  Encoding) | PCL on/off |  | | WCL on/off |  | | RAL on/off |  | | RCL on/off |  | | URCL on/off |  | | **Unit** | |  | |

### Function Modeling

**#Classification:** Mandatory

**#Hint:** Typical modeling artifacts in this section are State Machines, Activity Diagrams / Flow Charts, Decision Tables, and possibly Sequence Diagrams, which can all be used as techniques to analyze the function requirements.

It is highly recommended to use at least one of the following modeling techniques for modeling and analyzing the Function behavior and derived requirements (refer to sample diagrams below): State Machines, Activity Diagrams / Flow Charts, or Decision Tables

**#Links:** Analyze / Model Requirements: [RE Wiki – Analyze / Model Requirements](http://wiki.ford.com/pages/viewpage.action?pageId=110594919&src=contextnavpagetreemode)

#### Use Cases

**#Classification:** Infotainment Only (remove section, if not used)

**#Hint:** Some Domains (e.g. Infotainment) use not only Customer Use Cases (in the Feature Doc), but refine Use Case descriptions down to function level. In general, the RE approach encourages the use of Use Cases on Feature Level but not on Function Level. Activity Diagrams are a more suitable way to express the same on Function Level.

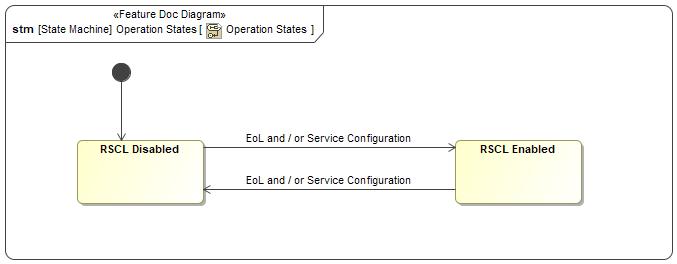
**#Links:** Infotainment – “Harmony Systems Engineering” Approach

#### State Charts

**#Classification:** Optional (remove section, if not used)

**#Hint:** State Charts are widely used to describe reactive, event-driven behavior.

**#Links:** State Charts [RE Wiki – State Charts](http://wiki.ford.com/display/RequirementsEngineering/State+Charts?src=contextnavpagetreemode)



RSCL\_enable = on

RSCL\_enable = off

Figure 3: State Machine of RSCL Control

#### Activity Diagrams

**#Classification:** Optional (remove section, if not used)

**#Hint:** Activity diagrams are well suited to describe a flow of actions (e.g. to refine the an use case).

**#Links:** Activity Diagrams: [RE Wiki – Activity Diagram](http://wiki.ford.com/display/RequirementsEngineering/Activity+Diagram?src=contextnavpagetreemode), [SysML User Group – Activity Diagram Basics](https://pd3.spt.ford.com/sites/SystemsEngineering/SEC/sysml-teamsite/SysML%20Wiki/Activity%20Diagram%20Basics.aspx)

Figure 4: Activity Diagram of Function A

#### Sequence Diagrams

**#Classification:** Optional (remove section, if not used)

**#Hint:** Sequence diagrams may help to analyze the interaction between Functions in specific scenarios.

**#Links:** Sequence Diagrams: [RE Wiki – Sequence Chart](http://wiki.ford.com/display/RequirementsEngineering/Sequence+Chart?src=contextnavpagetreemode), [SysML User Group – Sequence Diagram Basics](https://pd3.spt.ford.com/sites/SystemsEngineering/SEC/sysml-teamsite/SysML%20Wiki/Sequence%20Diagram%20Basics.aspx)

Figure 5: Sequence Diagram of Function A

#### Decision Tables

**#Classification:** Optional (remove section, if not used)

**#Hint:** Decision Tables are well suited to describe combinatorial logic

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SubReq ID | RSCL Control Input Requests | | | | | | RSCL Control Output Requests | | | | |
| Global RSCL HMI Rq | PCL HMI Rq | WCL HMI Rq | RAL HMI rq | RCL HMI Rq | URCL HMI Rq | RSCL PCL rq | RSCL WCL rq | RSCL RAL rq | RSCL RCL rq | RSCL URCL rq |
|  | activate | don't care | don't care | don't care | don't care | don't care | activate | activate | activate | activate | activate |
|  | deactivate | don't care | don't care | don't care | don't care | don't care | deactivate | deactivate | deactivate | deactivate | deactivate |
|  |  | activate |  |  |  |  | activate | Don’t change | Don’t change | Don’t change | Don’t change |
|  |  | deactivate |  |  |  |  | deactivate | Don’t change | Don’t change | Don’t change | Don’t change |
|  |  |  | activate |  |  |  | Don’t change | activate | Don’t change | Don’t change | Don’t change |
|  |  |  | deactivate |  |  |  | Don’t change | deactivate | Don’t change | Don’t change | Don’t change |
|  |  |  |  | activate |  |  | Don’t change | Don’t change | activate | Don’t change | Don’t change |
|  |  |  |  | deactivate |  |  | Don’t change | Don’t change | deactivate | Don’t change | Don’t change |
|  |  |  |  |  | activate |  | Don’t change | Don’t change | Don’t change | activate | Don’t change |
|  |  |  |  |  | deactivate |  | Don’t change | Don’t change | Don’t change | deactivate | Don’t change |
|  |  |  |  |  |  | activate | Don’t change | Don’t change | Don’t change | Don’t change | activate |
|  |  |  |  |  |  | deactivate | Don’t change | Don’t change | Don’t change | Don’t change | deactivate |

Table 8 Decision Table RSCL Control

### Function Requirements

#Macro: [Add Ins -> Add Requirement macro](http://wiki.ford.com/display/RequirementsEngineering/How+to+use+the+Specification+Templates#AddNewRequirement) (select “FNC” as ID Prefix, the function name as ID Infix (Short Name) and “Requirement” as type)

#Link: [*RE Wiki – How to write good requirements*](http://wiki.ford.com/display/RequirementsEngineering/How+to+write+better+requirements?src=contextnavpagetreemode)

#### Functional Requirements

***#Hint:*** *Please also consider specific situations like Initialization (Startup) and Deinitialization (Shutdown) apart from Normal Operation and Error Handling. E.g. a* state chart or activity diagram in section “Function Modeling” might help for better understanding.

##### Normal Operation

###R\_FNC\_RSCL\_00001### RSCL disable

If RSCL Control reads configuration parameter RSCL\_enable=off it shall go to state RSCL disable (see 4.1.4.2). All outgoing request signals shall be set to deactivated.

Signal RSCL HMI stat shall be set to disabled.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: ###R\_FNC\_RSCL\_00001### | | | | | | | |
| **Rationale** |  | | | | | | | |
| **Acceptance Criteria** |  | | | | | | | |
| **Notes** |  | | | | | | | |
| **Source** | FD-RSCL | | | | | **Owner** |  | |
| **Source Req.** | R\_F\_RSCL\_17 | | | | | **V&V Method** |  | |
| **Type** | Functional | | | **Priority** | High (Mandatory) | **Status** | Choose an item. | |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.1a | End of Requirement | | | | |

###R\_FNC\_RSCL\_00002### RSCL enable

If RSCL Control reads configuration parameter RSCL\_enable=on it shall go to state RSCL enable (see 4.1.4.2). All outgoing request signals shall be set to deactivated.

Signal RSCL HMI stat and RSCL Voice stat shall be set to show feature status.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: ###R\_FNC\_RSCL\_00002### | | | | | | | |
| **Rationale** |  | | | | | | | |
| **Acceptance Criteria** |  | | | | | | | |
| **Notes** |  | | | | | | | |
| **Source** | FD-RSCL | | | | | **Owner** |  | |
| **Source Req.** | R\_F\_RSCL\_17 | | | | | **V&V Method** |  | |
| **Type** | Functional | | | **Priority** | High (Mandatory) | **Status** | Choose an item. | |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.1a | End of Requirement | | | | |

###R\_FNC\_RSCL\_00050### Vehicle configuration

If RSCL\_enable = on RSCL Control shall read RSCL\_content to request the proper HMI interface.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: ###R\_FNC\_RSCL\_00050### | | | | | | | |
| **Rationale** | Feature content epends on hardware capabilities. Feature must be configurable to reflect hardware capabilities. | | | | | | | |
| **Acceptance Criteria** |  | | | | | | | |
| **Notes** |  | | | | | | | |
| **Source** |  | | | | | **Owner** |  | |
| **Source Req.** |  | | | | | **V&V Method** |  | |
| **Type** | Choose an item. | | | **Priority** | Choose an item. | **Status** | Choose an item. | |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.1a | End of Requirement | | | | |

###R\_FNC\_RSCL\_00039### Reset

After reset RSCL Control shall start with last memorized state of output signals. If no memorized state is available RSCL Control shall start with all Signals set to deactivate.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: ###R\_FNC\_RSCL\_00039### | | | | | | | |
| **Rationale** | Ease use of feature for customer. | | | | | | | |
| **Acceptance Criteria** |  | | | | | | | |
| **Notes** |  | | | | | | | |
| **Source** | Alignment with Hanan Ahmed | | | | | **Owner** |  | |
| **Source Req.** |  | | | | | **V&V Method** |  | |
| **Type** | Choose an item. | | | **Priority** | Choose an item. | **Status** | Choose an item. | |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.1a | End of Requirement | | | | |

###R\_FNC\_RSCL\_00049### Engine restart

At each ignition on, RSCL Control shall start with the last memorized state of output signals. RSCL Control will memorize the last state of the feature settings.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: ###R\_FNC\_RSCL\_00049### | | | | | | | |
| **Rationale** | Ease use of feature for customer | | | | | | | |
| **Acceptance Criteria** |  | | | | | | | |
| **Notes** |  | | | | | | | |
| **Source** |  | | | | | **Owner** |  | |
| **Source Req.** |  | | | | | **V&V Method** |  | |
| **Type** | Choose an item. | | | **Priority** | Choose an item. | **Status** | Choose an item. | |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.1a | End of Requirement | | | | |

###R\_FNC\_RSCL\_00045### Delayed accessory timer

RSCL Control shall allow to change settings until Delayed Accessory timer times out or driver opens the driver door

Settings for locking of rear climate control will not be available as soon as ignition is off.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: ###R\_FNC\_RSCL\_00045### | | | | | | | |
| **Rationale** | RSCL feature shall allow to change settings after vehicle is shut down and driver stays in vehicle | | | | | | | |
| **Acceptance Criteria** |  | | | | | | | |
| **Notes** |  | | | | | | | |
| **Source** | FD-RSCL | | | | | **Owner** |  | |
| **Source Req.** | UCs | | | | | **V&V Method** |  | |
| **Type** | Choose an item. | | | **Priority** | Choose an item. | **Status** | Choose an item. | |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.1a | End of Requirement | | | | |

###R\_FNC\_RSCL\_00028### RSCL Feature Status feedback

RSCL Control shall read all ingoing status signals and generate and send consolidated feature status to RSCL HMI Control.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: ###R\_FNC\_RSCL\_00028### | | | | | | | |
| **Rationale** |  | | | | | | | |
| **Acceptance Criteria** |  | | | | | | | |
| **Notes** |  | | | | | | | |
| **Source** | FD-RSCL | | | | | **Owner** |  | |
| **Source Req.** | R\_F\_RSCL\_12, R\_F\_RSCL\_14 | | | | | **V&V Method** |  | |
| **Type** | Choose an item. | | | **Priority** | Choose an item. | **Status** | Choose an item. | |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.1a | End of Requirement | | | | |

###R\_FNC\_RSCL\_00046###Global RSCL HMI rq activation

If RSCL Control receives Global RSCL HMI rq = lock all, it shall send

RSCL URCL rq= lock

AND

RSCL PCL rq = activate

AND

RSCL RAL rq = lock

AND

RSCL RCL rq= lock

AND

RSCL WCL rq = lock

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: ###R\_FNC\_RSCL\_00046### | | | | | | | |
| **Rationale** |  | | | | | | | |
| **Acceptance Criteria** |  | | | | | | | |
| **Notes** |  | | | | | | | |
| **Source** | FD-RSCL | | | | | **Owner** |  | |
| **Source Req.** | R\_F\_RSCL\_11 | | | | | **V&V Method** |  | |
| **Type** | Choose an item. | | | **Priority** | Choose an item. | **Status** | Choose an item. | |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.1a | End of Requirement | | | | |

###R\_FNC\_RSCL\_00047### Global RSCL HMI rq deactivation

If RSCL Control receives Global RSCL HMI rq = unlock it shall send

RSCL URCL rq=unlock

AND

RSCL PCL rq = deactivate

AND

RSCL RAL rq =unlock

AND

RSCL RCL rq=unlock

AND

RSCL WCL rq =unlock

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: ###R\_FNC\_RSCL\_00047### | | | | | | | |
| **Rationale** |  | | | | | | | |
| **Acceptance Criteria** |  | | | | | | | |
| **Notes** |  | | | | | | | |
| **Source** | FD-RSCL | | | | | **Owner** |  | |
| **Source Req.** | R\_F\_RSCL\_11 | | | | | **V&V Method** |  | |
| **Type** | Choose an item. | | | **Priority** | Choose an item. | **Status** | Choose an item. | |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.1a | End of Requirement | | | | |

###R\_FNC\_RSCL\_00040### RSCL WCL rq activation / deactivation

If RSCL WCL stat is unlocked (deactivated) and RSCL Control receives WCL HMI rq = lock or Global RSCL HMI rq = lock all, then RSCL Control shall set RSCL WCL rq = lock.

If RSCL WCL stat is locked (activated) and RSCL Control receives WCL HMI rq = unlock or Global RSCL HMI rq = unlock all then RSCL Control shall set RSCL WCL rq = unlock

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: ###R\_FNC\_RSCL\_00040### | | | | | | | |
| **Rationale** |  | | | | | | | |
| **Acceptance Criteria** |  | | | | | | | |
| **Notes** |  | | | | | | | |
| **Source** | FD-RSCL | | | | | **Owner** |  | |
| **Source Req.** | R\_F\_RSCL\_24 | | | | | **V&V Method** |  | |
| **Type** | Choose an item. | | | **Priority** | Choose an item. | **Status** | Choose an item. | |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.1a | End of Requirement | | | | |

###R\_FNC\_RSCL\_00041### RSCL PCL rq activation / deactivation

If RSCL PCL stat is deactivated and RSCL Control receives PCL HMI rq = activate or Global RSCL HMI rq = lock all, then RSCL Control shall set RSCL PCL rq = activate

If RSCL PCL stat is activated and RSCL Control receives PCL HMI rq = deactivate or Global RSCL HMI rq = unlock all, then RSCL Control shall set RSCL PCL rq = deactivate

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: ###R\_FNC\_RSCL\_00041### | | | | | | | |
| **Rationale** |  | | | | | | | |
| **Acceptance Criteria** |  | | | | | | | |
| **Notes** |  | | | | | | | |
| **Source** | FD-RSCL | | | | | **Owner** |  | |
| **Source Req.** | R\_F\_RSCL\_23 PCL | | | | | **V&V Method** |  | |
| **Type** | Choose an item. | | | **Priority** | Choose an item. | **Status** | Choose an item. | |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.1a | End of Requirement | | | | |

###R\_FNC\_RSCL\_00043### RSCL RAL rq activation / deactivation

If RSCL RAL stat is unlocked (deactivated) and RSCL Control receives RAL HMI rq = lock or Global RSCL HMI rq = lock all, it shall send RSCL RAL rq = lock AND RSCL URCL rq = lock audio

If RSCL RAL stat is locked (activated) and RSCL Control receives RAL HMI rq = unlock or Global RSCL HMI rq = unlock all, it shall send RSCL RAL rq = unlock AND RSCL URCL rq = unlock audio

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: ###R\_FNC\_RSCL\_00043### | | | | | | | |
| **Rationale** |  | | | | | | | |
| **Acceptance Criteria** |  | | | | | | | |
| **Notes** |  | | | | | | | |
| **Source** | FD-RSCL | | | | | **Owner** |  | |
| **Source Req.** | R\_F\_RSCL\_25 RAL | | | | | **V&V Method** |  | |
| **Type** | Choose an item. | | | **Priority** | Choose an item. | **Status** | Choose an item. | |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.1a | End of Requirement | | | | |

###R\_FNC\_RSCL\_00044### RSCL RCL rq activation / deactivation

If RSCL RCL stat is unlocked (deactivated) and RSCL Control receives RCL HMI rq = lock or Global RSCL HMI rq = lock all, it shall send RSCL RCL rq = lock AND RSCL URCL rq=lock climate

If RSCL RCL stat is locked (activated) and RSCL Control receives RCL HMI rq = unlock or Global RSCL HMI rq = unlock all, it shall send RSCL RCL rq = unlock AND RSCL URCL rq = unlock climate

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: ###R\_FNC\_RSCL\_00044### | | | | | | | |
| **Rationale** |  | | | | | | | |
| **Acceptance Criteria** |  | | | | | | | |
| **Notes** |  | | | | | | | |
| **Source** | FD-RSCL | | | | | **Owner** |  | |
| **Source Req.** | R\_F\_RSCL\_26 | | | | | **V&V Method** |  | |
| **Type** | Choose an item. | | | **Priority** | Choose an item. | **Status** | Choose an item. | |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.1a | End of Requirement | | | | |

###R\_FNC\_RSCL\_00042### RSCL URCL rq HHD lock/unlock

If RSCL URCL stat is unlocked (deactivated) and RSCL Control receives URCL HMI rq = lock or Global RSCL HMI rq = lock all, it shall send RSCL URCL rq=lock all

If RSCL URCL stat is locked (activated) and RSCL Control receives URCL HMI rq = unlock or Global RSCL HMI rq = unlock all, it shall send RSCL URCL rq=unlock all

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: ###R\_FNC\_RSCL\_00042### | | | | | | | |
| **Rationale** | Ensures that the user input to the HMI for URCLgets dispatched to the URCLfunction logic | | | | | | | |
| **Acceptance Criteria** |  | | | | | | | |
| **Notes** |  | | | | | | | |
| **Source** | FD-RSCL | | | | | **Owner** |  | |
| **Source Req.** | R\_F\_RSCL\_27 URCL | | | | | **V&V Method** |  | |
| **Type** | Choose an item. | | | **Priority** | Choose an item. | **Status** | Choose an item. | |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.1a | End of Requirement | | | | |

##### Error Handling

***#Hint:*** *FMEA counter measures could be considered as requirements in this chapter*

###R\_FNC\_RSCL\_00048### PCL Error

If RSCL Control reads RSCL PCL stat = error it shall send RSCL HMI stat = Error

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: ###R\_FNC\_RSCL\_00048### | | | | | | | |
| **Rationale** | RSCL HMI Control shall be triggered to show message to user | | | | | | | |
| **Acceptance Criteria** |  | | | | | | | |
| **Notes** |  | | | | | | | |
| **Source** |  | | | | | **Owner** |  | |
| **Source Req.** |  | | | | | **V&V Method** |  | |
| **Type** | Choose an item. | | | **Priority** | Choose an item. | **Status** | Choose an item. | |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.1a | End of Requirement | | | | |

###R\_FNC\_RSCL\_00053### No feedback signal

In case RSCL Control does not receive below status signals within 1sec

- RSCL\_PCL\_Stat (if enabled)

- RSCL\_WCL\_Stat (if enabled)

- RSCL\_ RAL\_Stat (if enabled)

- RSCL\_RCL\_Stat (if enabled)

- RSCL\_URCL\_Stat (if enabled)

it shall send RSCL HMI stat = Error for respective system.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: ###R\_FNC\_RSCL\_00053### | | | | | | | |
| **Rationale** | Robustness | | | | | | | |
| **Acceptance Criteria** |  | | | | | | | |
| **Notes** |  | | | | | | | |
| **Source** | Alignment with Hanan Ahmed | | | | | **Owner** |  | |
| **Source Req.** |  | | | | | **V&V Method** |  | |
| **Type** | Choose an item. | | | **Priority** | Choose an item. | **Status** | Choose an item. | |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.1a | End of Requirement | | | | |

#### Non-Functional Requirements

***#Hint:*** *Non-functional requirements specify some performance criteria in addition to the functional behavior given defined by the functional requirements. Timing (if not already included in the functional requirements), security details (e.g. how secure does an algorithm have to be) or reliability (e.g. mean time between failure) could be specified in this section.*

#### Functional Safety Requirements

**#Classification**: Functional Safety only – If not used, remove content and state “Not Applicable”

***#Hint:*** *The table references the Functional Safety Requirements (FSR) satisfied by the Logical Function. The FSRs themselves are listed in the Feature Docs.*

**#Link:**[RE Wiki – RE Alignment with Functional Safety (ISO26262)](http://wiki.ford.com/pages/viewpage.action?pageId=176397025)

[Functional Safety Sharepoint](https://pd3.spt.ford.com/sites/GlobalFunctionalSafety/Pages/default.aspx) – Functional Safety Concept

|  |  |
| --- | --- |
| **FSR ID**  (from Feature Doc) | **Requirement Title** |
| FSR1.1 | Evaluate PCL activation input from driver |
| FSR1.4 | Inform customer about PCL status |

Table 9: FSRs satisfied by Logical Function

#### Other Requirements

##### Design Requirements

***#Hint:*** *Requirements of a Logical Function should be typically agnostic of their SW/HW implementation*. If for specific reasons the function owner needs to define explicitly design constraints, it can be done in this chapter.

## Logical Function “PCL Control”

### Function Overview

#### Function Description

**#Hint:** Some descriptive text to explain the purpose and functionality of the function.

PCL Control controls PCL on rear inner door handles based on input signals and sends feedback of PCL status.

#### Function Variants (no Variants)

**#Classification**: Mandatory (State “Not applicable”, if not used)

**#Hint:** If different variants of the same function are specified in this section, list those variants in the table below.

Variants on Function level could be driven by e.g. technology or feature content. Example: There could be a “Low Content” and a “High Content” variant of some exterior lighting function. The “Low Content” variant is used for Conventional Headlight technology, the “High Content” variant is used for LED and Xenon technology. In this case we call the different technologies the Variant Options, which the Variant depends on. The optional column “Variant condition” allows to express the dependency of a Variant based on Variant Options. Variant Options should be centrally managed in VSEM.

If requirements/signals are not applicable for all variants/variant options, those requirements should state explicitly, which function variant/variant option they apply to.

**#Link:** [RE Wiki – Variant Management](http://wiki.ford.com/display/RequirementsEngineering/Variant+Management).

|  |  |  |
| --- | --- | --- |
| Variant Name | Variant Description | Variant Condition (optional) |
|  | n/a |  |

#### Input Requirements/Documents

**#Hint:** *The table below helps the function owner to collect relevant input* (requirements, documents, mails, models, …) *while writing the spec. When finalizing the spec, the function owner should check, if all inputs have been properly considered by derived/outgoing requirements* in chapter “Function Requirements”.

Note: It is not required to list each input requirement individually in this table, referencing the input document is enough (if relevant document section is indicated).

|  |  |  |  |
| --- | --- | --- | --- |
| **Reference**  (Reference as listed in ch. ”References”) | **Section/Requirement** | **Description** | **Derived Requirement**  (optional – reference to requirement in ch. “Function Requirements”) |
| **Feature Requirements** | | | |
| Feature document | <Example:  id + title of relevant Feature Docs> | <Example: “Requirements of Feature …”> | <Note: If you reference a requirement in this column, that requirement should have a trace link in its [“Source”/”Source Req.” attribute](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) field pointing back to the input requirement (or to a requirement inside the input document) given in this table row> |
|  |  |  |  |
| **Ford Engineering Standards** | | | |
|  | <Example: some SDS (requirement)> |  |  |
|  |  |  |  |
| **Legal Regulations** | | | |
|  | <Example: some excerpt from ECE or FMVSS> |  |  |
|  |  |  |  |
| **Industry Standards** | | | |
|  | <Example: some ISO/IEEE/SAE or other standard> |  |  |
|  |  |  |  |
| **Other Sources** | | | |
|  | <Example: some stakeholder document> |  |  |
|  |  |  |  |

Table 10: Input Requirements/Documents

#### Assumptions

**#Classification**: Mandatory (State “Not applicable”, if not used)

**#Hint:** A list of known assumptions concerning the effects of the function’s behavior on other functions or elements (i.e., dependencies) as well as assumptions on the behavior expected by the function (e.g. known limitations). During the course of the development most of those assumptions are typically either converted into actual requirements or discarded at some point – such that this chapter remains mostly empty.

### Function Scope

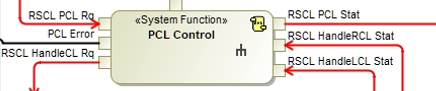


Figure 6: Context Diagram of Function “PCL Control”

### Function Interfaces

**#Hint:**

* First create a Logical Signal in the ”Logical Signals” section of the “Data Dictionary”. Use [Add Ins -> Add Requirement macro](http://wiki.ford.com/display/RequirementsEngineering/Adding+a+Logical+Signal+or+Parameter) (select “Logical Signal” as type).
* Insert just a Word reference to the Signal ID, Name and Description (which are bookmarks in the signal/parameter definition in the section in the Data Dictionary).

**#Link:** [RE Wiki – Adding a Logical Signal or Parameter](http://wiki.ford.com/display/RequirementsEngineering/Adding+a+Logical+Signal+or+Parameter)

#### Logical Inputs

|  |  |
| --- | --- |
| **Signal Name** | **Description** |
| RSCL\_PCL\_Rq | Signal generated by RSCL Control based on user request.   |  |  |  | | --- | --- | --- | | **ASIL** | | A | | **Encoding Type Name** | | n/a | | **Value**  (Discrete  Encoding) | activate | PCL activate requested | | deactivate | PCL deactivate requested | | **Unit** | | n/a | |
| RSCL\_HandleLCL\_stat | Signal generated by rear left inner handle control showing the actual left rear inner door handle status   |  |  |  | | --- | --- | --- | | **ASIL** | | A | | **Encoding Type Name** | | n/a | | **Value**  (Discrete  Encoding) | Deactivated | rear inner door handle enabled | | Activated | Rear inner door handle disabled | | **Unit** | | n/a | |
| RSCL\_HandleRCL\_stat | Signal generated by rear right inner handle control showing the actual right rear inner door handle status   |  |  |  | | --- | --- | --- | | **ASIL** | | A | | **Encoding Type Name** | | n/a | | **Value**  (Discrete  Encoding) | Deactivated | rear inner door handle enabled | | Activated | Rear inner door handle disabled | | **Unit** | | n/a | |
| Vehicle\_Lock\_stat | Signal describing the outer handle lock status and double lock status   |  |  |  | | --- | --- | --- | | **ASIL** | | QM | | **Encoding Type Name** | | n/a | | **Value**  (Discrete  Encoding) | Unlock all | All doors unlocked | | Unlock driver | Driver door unlocked | | Lock all | All doors locked | | Lock double | All doors double locked | | **Unit** | | n/a | |

#### Logical Outputs

|  |  |
| --- | --- |
| **Signal Name** | **Description** |
| RSCL\_HandleCL\_Rq | Signal requesting to enable/disable rear inner door handles based on user request.   |  |  |  | | --- | --- | --- | | **ASIL** | | A | | **Encoding Type Name** | | n/a | | **Value**  (Discrete  Encoding) | deactivate | Unlock request for rear inner door handles | | activate | Lock request for rear inner door handles | | **Unit** | | n/a | |
| RSCL\_PCL\_Stat | Signal generated by PCL control showing status of rear inner door handles incl. error detection and comparison with RSCL PCL Rq.   |  |  |  | | --- | --- | --- | | **ASIL** | | A | | **Encoding Type Name** | | n/a | | **Value**  (Discrete  Encoding) | activated | Both rear inner handles disabled | | deactivated | Both rear inner handles enabled | | Error | User request does not match rear inner door handle status | | **Unit** | | n/a | |
| PCL\_Error | Error signal to diagnostics   |  |  |  | | --- | --- | --- | | **ASIL** | | Choose an item. | | **Value**  (Discrete  Encoding) | Error present |  | | Error not present |  | | **Unit** | | n/a | |

#### Logical Parameters

**#Hint**: Put requirements for parameters here, which are implemented as configuration parameters using Method 2 or 3 or as parameters for calibration.

|  |  |
| --- | --- |
| **Parameter Name** | **Description** |
| PCL enable | Configuration Parameter to enable / disable PCL functionality |
|  |  |

### Function Modeling

**#Classification:** Mandatory

**#Hint:** Typical modeling artifacts in this section are State Machines, Activity Diagrams / Flow Charts, Decision Tables, and possibly Sequence Diagrams, which can all be used as techniques to analyze the function requirements.

It is highly recommended to use at least one of the following modeling techniques for modeling and analyzing the Function behavior and derived requirements (refer to sample diagrams below): State Machines, Activity Diagrams / Flow Charts, or Decision Tables

**#Links:** Analyze / Model Requirements: [RE Wiki – Analyze / Model Requirements](http://wiki.ford.com/pages/viewpage.action?pageId=110594919&src=contextnavpagetreemode)

#### Decision Tables

**#Classification:** Optional (remove section, if not used)

**#Hint:** Decision Tables are well suited to describe combinatorial logic

|  |  |  |  |
| --- | --- | --- | --- |
| SubReq ID | **PCL Control Input** | | **PCL Control Output** |
| Veh Lock stat | RSCL PCL rq | RSCL HandleCL rq |
|  | <> Lock double | activate | lock |
|  | <> Lock double | deactivate | unlock |
|  | Lock double | activate | unchanged |
|  | Lock double | deactivate | unchanged |

Table 11: Decision table RSCL HandleCL rq

|  |  |  |  |
| --- | --- | --- | --- |
| SubReq ID | **PCL Control Input** | | **PCL Control Output** |
| RSCL PCL rq | RSCL HandleCL stat | RSCL PCL stat |
|  | activate | locked | locked |
|  | deactivate | unlocked | unlocked |
|  | activate | unlocked | Error |
|  | deactivate | locked | Error |

Table 12 Decision table RSCL PCL stat

### Function Requirements

#Macro: [Add Ins -> Add Requirement macro](http://wiki.ford.com/display/RequirementsEngineering/How+to+use+the+Specification+Templates#AddNewRequirement) (select “FNC” as ID Prefix, the function name as ID Infix (Short Name) and “Requirement” as type)

#Link: [*RE Wiki – How to write good requirements*](http://wiki.ford.com/display/RequirementsEngineering/How+to+write+better+requirements?src=contextnavpagetreemode)

#### Functional Requirements

***#Hint:*** *Please also consider specific situations like Initialization (Startup) and Deinitialization (Shutdown) apart from Normal Operation and Error Handling. E.g. a* state chart or activity diagram in section “Function Modeling” might help for better understanding.

##### Normal Operation

###R\_FNC\_RSCL\_00010### PCL Behavior in Crash

If a crash occurs / is detected, PCL Control shall not change the state of PCL.

That means:

• if PCL is activated, it shall prevent the appropriate PCL doors from being opened via interior door handle

• if PCL is deactivated, it shall not prevent the appropriate PCL doors from being opened via interior door handle.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: ###R\_FNC\_RSCL\_00010### | | | | | | | |
| **Rationale** |  | | | | | | | |
| **Acceptance Criteria** |  | | | | | | | |
| **Notes** |  | | | | | | | |
| **Source** | **FD RSCL** | | | | | **Owner** |  | |
| **Source Req.** | **R\_F\_RSCL\_2** | | | | | **V&V Method** |  | |
| **Type** | Functional | | | **Priority** | High (Mandatory) | **Status** | Choose an item. | |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.1a | End of Requirement | | | | |

###R\_FNC\_RSCL\_00011### Interdependency with Double Lock

If RSCL HandleCL stat = enabled, PCL Control shall ignore Double Lock stat deactivation so that vehicle stays in child locked condition.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: ###R\_FNC\_RSCL\_00011### | | | | | | | |
| **Rationale** |  | | | | | | | |
| **Acceptance Criteria** |  | | | | | | | |
| **Notes** |  | | | | | | | |
| **Source** | FD-RSCL | | | | | **Owner** |  | |
| **Source Req.** | R\_F\_RSCL\_3 | | | | | **V&V Method** |  | |
| **Type** | Choose an item. | | | **Priority** | High (Mandatory) | **Status** | Choose an item. | |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.1a | End of Requirement | | | | |

###R\_FNC\_RSCL\_00012### Inhibit PCL Activation/Deactivation in Double Lock

If Vehicle Lock stat = lock double, PCL Control shall ignore RSCL PCL rq

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: ###R\_FNC\_RSCL\_00012### | | | | | | | |
| **Rationale** |  | | | | | | | |
| **Acceptance Criteria** |  | | | | | | | |
| **Notes** |  | | | | | | | |
| **Source** | FD-RSCL | | | | | **Owner** |  | |
| **Source Req.** | R\_F\_RSCL\_4 | | | | | **V&V Method** |  | |
| **Type** | Functional | | | **Priority** | High (Mandatory) | **Status** | Choose an item. | |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.1a | End of Requirement | | | | |

###R\_FNC\_RSCL\_00013### Exterior Door Handle in Vehicle Locked State

PCL Control shall ensure that if

• PCL is activated

AND

• the vehicle is locked, but not double-locked

AND

•the interior door handle of a PCL enabled door is pulled,

the corresponding exterior door handle allows somebody from outside the vehicle to open that door.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: ###R\_FNC\_RSCL\_00013### | | | | | | | |
| **Rationale** |  | | | | | | | |
| **Acceptance Criteria** |  | | | | | | | |
| **Notes** | In double-lock state an activated PCL shall have no influence on the exterior handle | | | | | | | |
| **Source** | FD-RSCL | | | | | **Owner** |  | |
| **Source Req.** | R\_F\_RSCL\_5 | | | | | **V&V Method** |  | |
| **Type** | Functional | | | **Priority** | Medium (Highly Recommended) | **Status** | Choose an item. | |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.1a | End of Requirement | | | | |

##### Error Handling

***#Hint:*** *FMEA counter measures could be considered as requirements in this chapter*

###R\_FNC\_RSCL\_00015### PCL State Mismatch

PCL control shall detect a PCL error, if a mismatch between the user requested activation state and the actual activation state of the doors persists for longer than TPCLError.TPCLError shall be tunable in the range of 0..30 sec. Default is 3 sec.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: ###R\_FNC\_RSCL\_00015### | | | | | | | |
| **Rationale** |  | | | | | | | |
| **Acceptance Criteria** |  | | | | | | | |
| **Notes** |  | | | | | | | |
| **Source** | FD-RSCL | | | | | **Owner** |  | |
| **Source Req.** | R\_F\_RSCL\_8 | | | | | **V&V Method** |  | |
| **Type** | Functional | | | **Priority** | High (Mandatory) | **Status** | Choose an item. | |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.1a | End of Requirement | | | | |

###R\_FNC\_RSCL\_00018### PCL Error Detection

If PCL is enabled PCL control shall detect PCL related errors.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: ###R\_FNC\_RSCL\_00018### | | | | | | | |
| **Rationale** |  | | | | | | | |
| **Acceptance Criteria** |  | | | | | | | |
| **Notes** |  | | | | | | | |
| **Source** | FD-RSCL | | | | | **Owner** |  | |
| **Source Req.** | R\_F\_RSCL\_10 | | | | | **V&V Method** |  | |
| **Type** | Choose an item. | | | **Priority** | Choose an item. | **Status** | Choose an item. | |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.1a | End of Requirement | | | | |

###R\_FNC\_RSCL\_00022### PCL State Mismatch DTC

If PCL is enabled PCL Control shall set a diagnostic DTC for service when PCL control detects a state mismatch error.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: ###R\_FNC\_RSCL\_00022### | | | | | | | |
| **Rationale** |  | | | | | | | |
| **Acceptance Criteria** |  | | | | | | | |
| **Notes** |  | | | | | | | |
| **Source** | FD-RSCL | | | | | **Owner** |  | |
| **Source Req.** | R\_F\_RSCL\_18 | | | | | **V&V Method** |  | |
| **Type** | Choose an item. | | | **Priority** | Choose an item. | **Status** | Choose an item. | |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.1a | End of Requirement | | | | |

#### Non-Functional Requirements

***#Hint:*** *Non-functional requirements specify some performance criteria in addition to the functional behavior given defined by the functional requirements. Timing (if not already included in the functional requirements), security details (e.g. how secure does an algorithm have to be) or reliability (e.g. mean time between failure) could be specified in this section.*

#### Functional Safety Requirements

**#Classification**: Functional Safety only – If not used, remove content and state “Not Applicable”

***#Hint:*** *The table references the Functional Safety Requirements (FSR) satisfied by the Logical Function. The FSRs themselves are listed in the Feature Docs.*

**#Link:**[RE Wiki – RE Alignment with Functional Safety (ISO26262)](http://wiki.ford.com/pages/viewpage.action?pageId=176397025)

[Functional Safety Sharepoint](https://pd3.spt.ford.com/sites/GlobalFunctionalSafety/Pages/default.aspx) – Functional Safety Concept

|  |  |
| --- | --- |
| **FSR ID**  (from Feature Doc) | **Requirement Title** |
| FSR1.2 | Power Child Lock cannot be overridden by other feature |
| FSR1.3 | Command Power Child Lock output control |
| FSR1.4 | Inform customer about PCL status |

Table 13: FSRs satisfied by Logical Function

#### Other Requirements

##### Design Requirements

***#Hint:*** *Requirements of a Logical Function should be typically agnostic of their SW/HW implementation*. If for specific reasons the function owner needs to define explicitly design constraints, it can be done in this chapter.

## Logical Function “Rear Inner Handle Control left”

### Function Overview

#### Function Description

**#Hint:** Some descriptive text to explain the purpose and functionality of the function.

Controls useability of rear inner door handles. Provides actual rear inner door handle status feedback.

#### Function Variants

**#Classification**: Mandatory (State “Not applicable”, if not used)

**#Hint:** If different variants of the same function are specified in this section, list those variants in the table below.

Variants on Function level could be driven by e.g. technology or feature content. Example: There could be a “Low Content” and a “High Content” variant of some exterior lighting function. The “Low Content” variant is used for Conventional Headlight technology, the “High Content” variant is used for LED and Xenon technology. In this case we call the different technologies the Variant Options, which the Variant depends on. The optional column “Variant condition” allows to express the dependency of a Variant based on Variant Options. Variant Options should be centrally managed in VSEM.

If requirements/signals are not applicable for all variants/variant options, those requirements should state explicitly, which function variant/variant option they apply to.

**#Link:** [RE Wiki – Variant Management](http://wiki.ford.com/display/RequirementsEngineering/Variant+Management).

|  |  |  |
| --- | --- | --- |
| Variant Name | Variant Description | Variant Condition (optional) |
|  |  |  |

#### Input Requirements/Documents

**#Hint:** *The table below helps the function owner to collect relevant input* (requirements, documents, mails, models, …) *while writing the spec. When finalizing the spec, the function owner should check, if all inputs have been properly considered by derived/outgoing requirements* in chapter “Function Requirements”.

Note: It is not required to list each input requirement individually in this table, referencing the input document is enough (if relevant document section is indicated).

|  |  |  |  |
| --- | --- | --- | --- |
| **Reference**  (Reference as listed in ch. ”References”) | **Section/Requirement** | **Description** | **Derived Requirement**  (optional – reference to requirement in ch. “Function Requirements”) |
| **Feature Requirements** | | | |
| Feature Document | <Example:  id + title of relevant Feature Docs> | <Example: “Requirements of Feature …”> | <Note: If you reference a requirement in this column, that requirement should have a trace link in its [“Source”/”Source Req.” attribute](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) field pointing back to the input requirement (or to a requirement inside the input document) given in this table row> |
|  |  |  |  |
| **Ford Engineering Standards** | | | |
|  | <Example: some SDS (requirement)> |  |  |
|  |  |  |  |
| **Legal Regulations** | | | |
|  | <Example: some excerpt from ECE or FMVSS> |  |  |
|  |  |  |  |
| **Industry Standards** | | | |
|  | <Example: some ISO/IEEE/SAE or other standard> |  |  |
|  |  |  |  |
| **Other Sources** | | | |
|  | <Example: some stakeholder document> |  |  |
|  |  |  |  |

Table 14: Input Requirements/Documents

#### Assumptions

**#Classification**: Mandatory (State “Not applicable”, if not used)

**#Hint:** A list of known assumptions concerning the effects of the function’s behavior on other functions or elements (i.e., dependencies) as well as assumptions on the behavior expected by the function (e.g. known limitations). During the course of the development most of those assumptions are typically either converted into actual requirements or discarded at some point – such that this chapter remains mostly empty.

### Function Scope

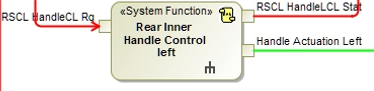


Figure 7: Context Diagram of Function “Rear Inner Handle Control”

### Function Interfaces

**#Hint:**

* First create a Logical Signal in the ”Logical Signals” section of the “Data Dictionary”. Use [Add Ins -> Add Requirement macro](http://wiki.ford.com/display/RequirementsEngineering/Adding+a+Logical+Signal+or+Parameter) (select “Logical Signal” as type).
* Insert just a Word reference to the Signal ID, Name and Description (which are bookmarks in the signal/parameter definition in the section in the Data Dictionary).

**#Link:** [RE Wiki – Adding a Logical Signal or Parameter](http://wiki.ford.com/display/RequirementsEngineering/Adding+a+Logical+Signal+or+Parameter)

#### Logical Inputs

|  |  |
| --- | --- |
| **Signal Name** | **Description** |
| RSCL\_HandleCL\_Rq | Signal requesting to enable/disable rear inner door handles based on user request.   |  |  |  | | --- | --- | --- | | **ASIL** | | A | | **Encoding Type Name** | | n/a | | **Value**  (Discrete  Encoding) | deactivate | Unlock request for rear inner door handles | | activate | Lock request for rear inner door handles | | **Unit** | | n/a | |

#### Logical Outputs

|  |  |
| --- | --- |
| **Signal Name** | **Description** |
| RSCL\_HandleLCL\_stat | Signal generated by rear left inner handle control showing the actual left rear inner door handle status   |  |  |  | | --- | --- | --- | | **ASIL** | | A | | **Encoding Type Name** | | n/a | | **Value**  (Discrete  Encoding) | Deactivated | rear inner door handle enabled | | Activated | Rear inner door handle disabled | | **Unit** | | n/a | |

#### Logical Parameters

**#Hint**: Put requirements for parameters here, which are implemented as configuration parameters using Method 2 or 3 or as parameters for calibration.

|  |  |
| --- | --- |
| **Parameter Name** | **Description** |
|  |  |

### Function Modeling

**#Classification:** Mandatory

**#Hint:** Typical modeling artifacts in this section are State Machines, Activity Diagrams / Flow Charts, Decision Tables, and possibly Sequence Diagrams, which can all be used as techniques to analyze the function requirements.

It is highly recommended to use at least one of the following modeling techniques for modeling and analyzing the Function behavior and derived requirements (refer to sample diagrams below): State Machines, Activity Diagrams / Flow Charts, or Decision Tables

**#Links:** Analyze / Model Requirements: [RE Wiki – Analyze / Model Requirements](http://wiki.ford.com/pages/viewpage.action?pageId=110594919&src=contextnavpagetreemode)

#### State Charts

**#Classification:** Optional (remove section, if not used)

**#Hint:** State Charts are widely used to describe reactive, event-driven behavior.

**#Links:** State Charts [RE Wiki – State Charts](http://wiki.ford.com/display/RequirementsEngineering/State+Charts?src=contextnavpagetreemode)



Figure 8: State Machine of Function A

#### Decision Tables

**#Classification:** Optional (remove section, if not used)

**#Hint:** Decision Tables are well suited to describe combinatorial logic

### Function Requirements

#Macro: [Add Ins -> Add Requirement macro](http://wiki.ford.com/display/RequirementsEngineering/How+to+use+the+Specification+Templates#AddNewRequirement) (select “FNC” as ID Prefix, the function name as ID Infix (Short Name) and “Requirement” as type)

#Link: [*RE Wiki – How to write good requirements*](http://wiki.ford.com/display/RequirementsEngineering/How+to+write+better+requirements?src=contextnavpagetreemode)

#### Functional Requirements

***#Hint:*** *Please also consider specific situations like Initialization (Startup) and Deinitialization (Shutdown) apart from Normal Operation and Error Handling. E.g. a* state chart or activity diagram in section “Function Modeling” might help for better understanding.

##### Normal Operation

###R\_FNC\_RSCL\_00023### Provide actual handle PCL status

Rear Inner Handle Control shall generate and transmit the actual rear inner handle child lock satus. If rear inner door handles are disabled, RSCL\_HandleXCL\_Stat = activated. If rear inner door handles are enabled, RSCL\_HandleXCL\_stat = deactivated.

X=R(right)

X=L(left)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: ###R\_FNC\_RSCL\_00023### | | | | | | | |
| **Rationale** |  | | | | | | | |
| **Acceptance Criteria** |  | | | | | | | |
| **Notes** |  | | | | | | | |
| **Source** | FD-RSCL | | | | | **Owner** |  | |
| **Source Req.** | R\_F\_RSCL\_14 | | | | | **V&V Method** |  | |
| **Type** | Choose an item. | | | **Priority** | Choose an item. | **Status** | Choose an item. | |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.1a | End of Requirement | | | | |

###R\_FNC\_RSCL\_00024### Enable/disable rear inner door handles

Rear Inner Handle Control shall disable the use of the rear inner door handles when it reads RSCL HandleCL rq = activate.

Rear Inner Handle Control shall enable the use of the rear inner door handles when it reads RSCL HandleCL rq = deactivate.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: ###R\_FNC\_RSCL\_00024### | | | | | | | |
| **Rationale** |  | | | | | | | |
| **Acceptance Criteria** |  | | | | | | | |
| **Notes** | When it reads RSCL HandleCL rq = activate,the rear passenger shall be able to use the rear inner door handles to open the rear doors when the use of the rear inner door handles is enabled  When it reads RSCL HandleCL rq = deactivate,.the rear passenger shall not be able to use the rear inner door handles to open the rear doors when the use of the rear inner door handles is disabled | | | | | | | |
| **Source** | FD-RSCL | | | | | **Owner** |  | |
| **Source Req.** | R\_F\_RSCL\_23 | | | | | **V&V Method** |  | |
| **Type** | Functional | | | **Priority** | High (Mandatory) | **Status** | Choose an item. | |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.1a | End of Requirement | | | | |

##### Error Handling

***#Hint:*** *FMEA counter measures could be considered as requirements in this chapter*

#### Non-Functional Requirements

***#Hint:*** *Non-functional requirements specify some performance criteria in addition to the functional behavior given defined by the functional requirements. Timing (if not already included in the functional requirements), security details (e.g. how secure does an algorithm have to be) or reliability (e.g. mean time between failure) could be specified in this section.*

#### Functional Safety Requirements

**#Classification**: Functional Safety only – If not used, remove content and state “Not Applicable”

***#Hint:*** *The table references the Functional Safety Requirements (FSR) satisfied by the Logical Function. The FSRs themselves are listed in the Feature Docs.*

**#Link:**[RE Wiki – RE Alignment with Functional Safety (ISO26262)](http://wiki.ford.com/pages/viewpage.action?pageId=176397025)

[Functional Safety Sharepoint](https://pd3.spt.ford.com/sites/GlobalFunctionalSafety/Pages/default.aspx) – Functional Safety Concept

|  |  |
| --- | --- |
| **FSR ID**  (from Feature Doc) | **Requirement Title** |
| FSR1.5 | Mechanical considerations |
|  |  |
| … |  |

Table 15: FSRs satisfied by Logical Function

#### Other Requirements

##### Design Requirements

***#Hint:*** *Requirements of a Logical Function should be typically agnostic of their SW/HW implementation*. If for specific reasons the function owner needs to define explicitly design constraints, it can be done in this chapter.

## Logical Function “Rear Inner Handle Control right”

### Function Overview

#### Function Description

**#Hint:** Some descriptive text to explain the purpose and functionality of the function.

Controls useability of rear inner door handles. Provides actual rear inner door handle status feedback.

#### Function Variants

**#Classification**: Mandatory (State “Not applicable”, if not used)

**#Hint:** If different variants of the same function are specified in this section, list those variants in the table below.

Variants on Function level could be driven by e.g. technology or feature content. Example: There could be a “Low Content” and a “High Content” variant of some exterior lighting function. The “Low Content” variant is used for Conventional Headlight technology, the “High Content” variant is used for LED and Xenon technology. In this case we call the different technologies the Variant Options, which the Variant depends on. The optional column “Variant condition” allows to express the dependency of a Variant based on Variant Options. Variant Options should be centrally managed in VSEM.

If requirements/signals are not applicable for all variants/variant options, those requirements should state explicitly, which function variant/variant option they apply to.

**#Link:** [RE Wiki – Variant Management](http://wiki.ford.com/display/RequirementsEngineering/Variant+Management).

|  |  |  |
| --- | --- | --- |
| Variant Name | Variant Description | Variant Condition (optional) |
|  |  |  |

#### Input Requirements/Documents

**#Hint:** *The table below helps the function owner to collect relevant input* (requirements, documents, mails, models, …) *while writing the spec. When finalizing the spec, the function owner should check, if all inputs have been properly considered by derived/outgoing requirements* in chapter “Function Requirements”.

Note: It is not required to list each input requirement individually in this table, referencing the input document is enough (if relevant document section is indicated).

|  |  |  |  |
| --- | --- | --- | --- |
| **Reference**  (Reference as listed in ch. ”References”) | **Section/Requirement** | **Description** | **Derived Requirement**  (optional – reference to requirement in ch. “Function Requirements”) |
| **Feature Requirements** | | | |
| Feature Document | <Example:  id + title of relevant Feature Docs> | <Example: “Requirements of Feature …”> | <Note: If you reference a requirement in this column, that requirement should have a trace link in its [“Source”/”Source Req.” attribute](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) field pointing back to the input requirement (or to a requirement inside the input document) given in this table row> |
|  |  |  |  |
| **Ford Engineering Standards** | | | |
|  | <Example: some SDS (requirement)> |  |  |
|  |  |  |  |
| **Legal Regulations** | | | |
|  | <Example: some excerpt from ECE or FMVSS> |  |  |
|  |  |  |  |
| **Industry Standards** | | | |
|  | <Example: some ISO/IEEE/SAE or other standard> |  |  |
|  |  |  |  |
| **Other Sources** | | | |
|  | <Example: some stakeholder document> |  |  |
|  |  |  |  |

Table 14: Input Requirements/Documents

#### Assumptions

**#Classification**: Mandatory (State “Not applicable”, if not used)

**#Hint:** A list of known assumptions concerning the effects of the function’s behavior on other functions or elements (i.e., dependencies) as well as assumptions on the behavior expected by the function (e.g. known limitations). During the course of the development most of those assumptions are typically either converted into actual requirements or discarded at some point – such that this chapter remains mostly empty.

### Function Scope

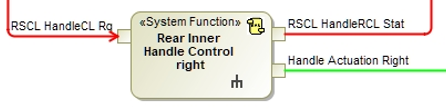


Figure 7: Context Diagram of Function “Rear Inner Handle Control”

### Function Interfaces

**#Hint:**

* First create a Logical Signal in the ”Logical Signals” section of the “Data Dictionary”. Use [Add Ins -> Add Requirement macro](http://wiki.ford.com/display/RequirementsEngineering/Adding+a+Logical+Signal+or+Parameter) (select “Logical Signal” as type).
* Insert just a Word reference to the Signal ID, Name and Description (which are bookmarks in the signal/parameter definition in the section in the Data Dictionary).

**#Link:** [RE Wiki – Adding a Logical Signal or Parameter](http://wiki.ford.com/display/RequirementsEngineering/Adding+a+Logical+Signal+or+Parameter)

#### Logical Inputs

|  |  |
| --- | --- |
| **Signal Name** | **Description** |
| RSCL\_HandleCL\_Rq | Signal requesting to enable/disable rear inner door handles based on user request.   |  |  |  | | --- | --- | --- | | **ASIL** | | A | | **Encoding Type Name** | | n/a | | **Value**  (Discrete  Encoding) | deactivate | Unlock request for rear inner door handles | | activate | Lock request for rear inner door handles | | **Unit** | | n/a | |

#### Logical Outputs

|  |  |
| --- | --- |
| **Signal Name** | **Description** |
| RSCL\_HandleRCL\_stat | Signal generated by rear right inner handle control showing the actual right rear inner door handle status   |  |  |  | | --- | --- | --- | | **ASIL** | | A | | **Encoding Type Name** | | n/a | | **Value**  (Discrete  Encoding) | Deactivated | rear inner door handle enabled | | Activated | Rear inner door handle disabled | | **Unit** | | n/a | |

#### Logical Parameters

**#Hint**: Put requirements for parameters here, which are implemented as configuration parameters using Method 2 or 3 or as parameters for calibration.

|  |  |
| --- | --- |
| **Parameter Name** | **Description** |
|  |  |

### Function Modeling

**#Classification:** Mandatory

**#Hint:** Typical modeling artifacts in this section are State Machines, Activity Diagrams / Flow Charts, Decision Tables, and possibly Sequence Diagrams, which can all be used as techniques to analyze the function requirements.

It is highly recommended to use at least one of the following modeling techniques for modeling and analyzing the Function behavior and derived requirements (refer to sample diagrams below): State Machines, Activity Diagrams / Flow Charts, or Decision Tables

**#Links:** Analyze / Model Requirements: [RE Wiki – Analyze / Model Requirements](http://wiki.ford.com/pages/viewpage.action?pageId=110594919&src=contextnavpagetreemode)

#### State Charts

**#Classification:** Optional (remove section, if not used)

**#Hint:** State Charts are widely used to describe reactive, event-driven behavior.

**#Links:** State Charts [RE Wiki – State Charts](http://wiki.ford.com/display/RequirementsEngineering/State+Charts?src=contextnavpagetreemode)



Figure 8: State Machine of Function A

#### Decision Tables

**#Classification:** Optional (remove section, if not used)

**#Hint:** Decision Tables are well suited to describe combinatorial logic

### Function Requirements

#Macro: [Add Ins -> Add Requirement macro](http://wiki.ford.com/display/RequirementsEngineering/How+to+use+the+Specification+Templates#AddNewRequirement) (select “FNC” as ID Prefix, the function name as ID Infix (Short Name) and “Requirement” as type)

#Link: [*RE Wiki – How to write good requirements*](http://wiki.ford.com/display/RequirementsEngineering/How+to+write+better+requirements?src=contextnavpagetreemode)

#### Functional Requirements

***#Hint:*** *Please also consider specific situations like Initialization (Startup) and Deinitialization (Shutdown) apart from Normal Operation and Error Handling. E.g. a* state chart or activity diagram in section “Function Modeling” might help for better understanding.

##### Normal Operation

Refer to requirements of function “Rear Inner Handle Control left”

##### Error Handling

***#Hint:*** *FMEA counter measures could be considered as requirements in this chapter*

#### Non-Functional Requirements

***#Hint:*** *Non-functional requirements specify some performance criteria in addition to the functional behavior given defined by the functional requirements. Timing (if not already included in the functional requirements), security details (e.g. how secure does an algorithm have to be) or reliability (e.g. mean time between failure) could be specified in this section.*

#### Functional Safety Requirements

**#Classification**: Functional Safety only – If not used, remove content and state “Not Applicable”

***#Hint:*** *The table references the Functional Safety Requirements (FSR) satisfied by the Logical Function. The FSRs themselves are listed in the Feature Docs.*

**#Link:**[RE Wiki – RE Alignment with Functional Safety (ISO26262)](http://wiki.ford.com/pages/viewpage.action?pageId=176397025)

[Functional Safety Sharepoint](https://pd3.spt.ford.com/sites/GlobalFunctionalSafety/Pages/default.aspx) – Functional Safety Concept

|  |  |
| --- | --- |
| **FSR ID**  (from Feature Doc) | **Requirement Title** |
| FSR1.5 | Mechanical considerations |
|  |  |
| … |  |

Table 15: FSRs satisfied by Logical Function

#### Other Requirements

##### Design Requirements

***#Hint:*** *Requirements of a Logical Function should be typically agnostic of their SW/HW implementation*. If for specific reasons the function owner needs to define explicitly design constraints, it can be done in this chapter.

## Logical Function “WCL Control”

### Function Overview

#### Function Description

**#Hint:** Some descriptive text to explain the purpose and functionality of the function.

WCL Control controls WCL on rear window switches and gives WCL status feedback. Function already exists in vehicle and will not be affected by RSCL.

## Logical Function “Rear Window Device Control”

### Function Overview

#### Function Description

**#Hint:** Some descriptive text to explain the purpose and functionality of the function.

Enable / Disable rear window position control interface for rear passenger. Function already exists in vehicle and will not be affected by RSCL.

## Logical Function “RAL Control”

### Function Overview

#### Function Description

**#Hint:** Some descriptive text to explain the purpose and functionality of the function.

RAL Control controls RAL on rear audio controls and gives RAL status feedback. Function already exists in vehicle and will not be affected by RSCL.

## Logical Function “Rear Audio Device Control”

### Function Overview

#### Function Description

**#Hint:** Some descriptive text to explain the purpose and functionality of the function.

Read lock/unlock signal and enable / disable rear audio interfaces for rear passenger. Provide status feedback. Function already exists in vehicle and will not be affected by RSCL.

## Logical Function “RCL Control”

### Function Overview

#### Function Description

**#Hint:** Some descriptive text to explain the purpose and functionality of the function.

Controls RCL on rear climate controls. RSCL RCL status feedback. Function already exists in vehicle and will not be affected by RSCL.

## Logical Function “Rear Climate Device Control”

### Function Overview

#### Function Description

**#Hint:** Some descriptive text to explain the purpose and functionality of the function.

Read lock/unlock signal and enable / disable rear climate interfaces for rear passenger. Provide status feedback. Function already exists in vehicle and will not be affected by RSCL.

## Logical Function “URCL Control”

### Function Overview

#### Function Description

**#Hint:** Some descriptive text to explain the purpose and functionality of the function.

Controls URCL on rear connected mobile devices RSCL URC status feedback

#### Function Variants (no Variants)

**#Classification**: Mandatory (State “Not applicable”, if not used)

**#Hint:** If different variants of the same function are specified in this section, list those variants in the table below.

Variants on Function level could be driven by e.g. technology or feature content. Example: There could be a “Low Content” and a “High Content” variant of some exterior lighting function. The “Low Content” variant is used for Conventional Headlight technology, the “High Content” variant is used for LED and Xenon technology. In this case we call the different technologies the Variant Options, which the Variant depends on. The optional column “Variant condition” allows to express the dependency of a Variant based on Variant Options. Variant Options should be centrally managed in VSEM.

If requirements/signals are not applicable for all variants/variant options, those requirements should state explicitly, which function variant/variant option they apply to.

**#Link:** [RE Wiki – Variant Management](http://wiki.ford.com/display/RequirementsEngineering/Variant+Management).

|  |  |  |
| --- | --- | --- |
| Variant Name | Variant Description | Variant Condition (optional) |
|  | n/a |  |

#### Input Requirements/Documents

**#Hint:** *The table below helps the function owner to collect relevant input* (requirements, documents, mails, models, …) *while writing the spec. When finalizing the spec, the function owner should check, if all inputs have been properly considered by derived/outgoing requirements* in chapter “Function Requirements”.

Note: It is not required to list each input requirement individually in this table, referencing the input document is enough (if relevant document section is indicated).

|  |  |  |  |
| --- | --- | --- | --- |
| **Reference**  (Reference as listed in ch. ”References”) | **Section/Requirement** | **Description** | **Derived Requirement**  (optional – reference to requirement in ch. “Function Requirements”) |
| **Feature Requirements** | | | |
| Feature document | <Example:  id + title of relevant Feature Docs> | <Example: “Requirements of Feature …”> | <Note: If you reference a requirement in this column, that requirement should have a trace link in its [“Source”/”Source Req.” attribute](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) field pointing back to the input requirement (or to a requirement inside the input document) given in this table row> |
|  |  |  |  |
| **Ford Engineering Standards** | | | |
|  | <Example: some SDS (requirement)> |  |  |
|  |  |  |  |
| **Legal Regulations** | | | |
|  | <Example: some excerpt from ECE or FMVSS> |  |  |
|  |  |  |  |
| **Industry Standards** | | | |
|  | <Example: some ISO/IEEE/SAE or other standard> |  |  |
|  |  |  |  |
| **Other Sources** | | | |
|  | <Example: some stakeholder document> |  |  |
|  |  |  |  |

Table 16: Input Requirements/Documents

#### Assumptions

**#Classification**: Mandatory (State “Not applicable”, if not used)

**#Hint:** A list of known assumptions concerning the effects of the function’s behavior on other functions or elements (i.e., dependencies) as well as assumptions on the behavior expected by the function (e.g. known limitations). During the course of the development most of those assumptions are typically either converted into actual requirements or discarded at some point – such that this chapter remains mostly empty.

### Function Scope



Figure 9: Context Diagram of Function “URCL Control”

### Function Interfaces

**#Hint:**

* First create a Logical Signal in the ”Logical Signals” section of the “Data Dictionary”. Use [Add Ins -> Add Requirement macro](http://wiki.ford.com/display/RequirementsEngineering/Adding+a+Logical+Signal+or+Parameter) (select “Logical Signal” as type).
* Insert just a Word reference to the Signal ID, Name and Description (which are bookmarks in the signal/parameter definition in the section in the Data Dictionary).

**#Link:** [RE Wiki – Adding a Logical Signal or Parameter](http://wiki.ford.com/display/RequirementsEngineering/Adding+a+Logical+Signal+or+Parameter)

#### Logical Inputs

|  |  |
| --- | --- |
| **Signal Name** | **Description** |
| RSCL\_URCL\_rq | Signal generated by RSCL Control to request locking/unlocking of URC functionalities individually or globally   |  |  |  | | --- | --- | --- | | **ASIL** | | QM | | **Encoding Type Name** | | n/a | | **Value**  (Discrete  Encoding) | Lock all | Lock all URC HHD | | Unlock all | Unlock all URC HHD | | Lock Audio | Lock Audio | | Lock Climate | Lock Climate | | Unlock Audio | Unlock Audio | | Unlock Climate | Unlock Climate | | **Unit** | | n/a | |

#### Logical Outputs

|  |  |
| --- | --- |
| **Signal Name** | **Description** |
| RSCL\_URCL\_stat | Signal from URCL Control providing the actual URCL status   |  |  |  | | --- | --- | --- | | **ASIL** | | QM | | **Encoding Type Name** | | n/a | | **Value**  (Discrete  Encoding) | all locked | All URC HHD locked | | all unlocked | All URC HHD unlocked | | Audio locked | Audio locked | | Climate locked | Climate locked | | Audio unlocked | Audio unlocked | | Climate unlocked | Climate unlocked | | **Unit** | | n/a | |

#### Logical Parameters

**#Hint**: Put requirements for parameters here, which are implemented as configuration parameters using Method 2 or 3 or as parameters for calibration.

|  |  |
| --- | --- |
| **Parameter Name** | **Description** |
|  |  |

### Function Modeling

**#Classification:** Mandatory

**#Hint:** Typical modeling artifacts in this section are State Machines, Activity Diagrams / Flow Charts, Decision Tables, and possibly Sequence Diagrams, which can all be used as techniques to analyze the function requirements.

It is highly recommended to use at least one of the following modeling techniques for modeling and analyzing the Function behavior and derived requirements (refer to sample diagrams below): State Machines, Activity Diagrams / Flow Charts, or Decision Tables

**#Links:** Analyze / Model Requirements: [RE Wiki – Analyze / Model Requirements](http://wiki.ford.com/pages/viewpage.action?pageId=110594919&src=contextnavpagetreemode)

#### Use Cases

**#Classification:** Infotainment Only (remove section, if not used)

**#Hint:** Some Domains (e.g. Infotainment) use not only Customer Use Cases (in the Feature Doc), but refine Use Case descriptions down to function level. In general, the RE approach encourages the use of Use Cases on Feature Level but not on Function Level. Activity Diagrams are a more suitable way to express the same on Function Level.

**#Links:** Infotainment – “Harmony Systems Engineering” Approach

#### State Charts

**#Classification:** Optional (remove section, if not used)

**#Hint:** State Charts are widely used to describe reactive, event-driven behavior.

**#Links:** State Charts [RE Wiki – State Charts](http://wiki.ford.com/display/RequirementsEngineering/State+Charts?src=contextnavpagetreemode)



Figure 10: State Machine of Function A

#### Activity Diagrams

**#Classification:** Optional (remove section, if not used)

**#Hint:** Activity diagrams are well suited to describe a flow of actions (e.g. to refine the an use case).

**#Links:** Activity Diagrams: [RE Wiki – Activity Diagram](http://wiki.ford.com/display/RequirementsEngineering/Activity+Diagram?src=contextnavpagetreemode), [SysML User Group – Activity Diagram Basics](https://pd3.spt.ford.com/sites/SystemsEngineering/SEC/sysml-teamsite/SysML%20Wiki/Activity%20Diagram%20Basics.aspx)



Figure 11: Activity Diagram of Function A

#### Sequence Diagrams

**#Classification:** Optional (remove section, if not used)

**#Hint:** Sequence diagrams may help to analyze the interaction between Functions in specific scenarios.

**#Links:** Sequence Diagrams: [RE Wiki – Sequence Chart](http://wiki.ford.com/display/RequirementsEngineering/Sequence+Chart?src=contextnavpagetreemode), [SysML User Group – Sequence Diagram Basics](https://pd3.spt.ford.com/sites/SystemsEngineering/SEC/sysml-teamsite/SysML%20Wiki/Sequence%20Diagram%20Basics.aspx)

#### Decision Tables

**#Classification:** Optional (remove section, if not used)

**#Hint:** Decision Tables are well suited to describe combinatorial logic

### Function Requirements

#Macro: [Add Ins -> Add Requirement macro](http://wiki.ford.com/display/RequirementsEngineering/How+to+use+the+Specification+Templates#AddNewRequirement) (select “FNC” as ID Prefix, the function name as ID Infix (Short Name) and “Requirement” as type)

#Link: [*RE Wiki – How to write good requirements*](http://wiki.ford.com/display/RequirementsEngineering/How+to+write+better+requirements?src=contextnavpagetreemode)

#### Functional Requirements

***#Hint:*** *Please also consider specific situations like Initialization (Startup) and Deinitialization (Shutdown) apart from Normal Operation and Error Handling. E.g. a* state chart or activity diagram in section “Function Modeling” might help for better understanding.

##### Normal Operation

###R\_FNC\_RSCL\_00025### Lock URC Functionalities

If RSCL URCL rq is set to lock all, URCL Control shall disable URC functionalities for rear linked hand held devices.

If RSCL URCL rq is set to unlock all, URCL Control shall enable URC functionalities for rear linked hand held devices.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: ###R\_FNC\_RSCL\_00025### | | | | | | | |
| **Rationale** |  | | | | | | | |
| **Acceptance Criteria** |  | | | | | | | |
| **Notes** |  | | | | | | | |
| **Source** | FD-RSCL | | | | | **Owner** |  | |
| **Source Req.** | R\_F\_RSCL\_11 & R\_F\_RSCL\_27 | | | | | **V&V Method** |  | |
| **Type** | Choose an item. | | | **Priority** | Choose an item. | **Status** | Choose an item. | |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.1a | End of Requirement | | | | |

###R\_FNC\_RSCL\_00051### URC Rear Audio lock/unlock

If URCL Control receives URCL\_HMI\_rq = lock audio it shall disable the rear audio settings on the linked hand held devices and send RSCL\_URCL\_stat = locked Audio.

If URCL Control receives URCL\_HMI\_rq = unlock audio it shall enable the rear audio settings on the linked hand held devices and send RSCL\_URCL\_stat = unlocked Audio

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: ###R\_FNC\_RSCL\_00051### | | | | | | | |
| **Rationale** |  | | | | | | | |
| **Acceptance Criteria** |  | | | | | | | |
| **Notes** |  | | | | | | | |
| **Source** | FD-RSCL | | | | | **Owner** |  | |
| **Source Req.** | R\_F\_RSCL\_25 | | | | | **V&V Method** |  | |
| **Type** | Choose an item. | | | **Priority** | Choose an item. | **Status** | Choose an item. | |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.1a | End of Requirement | | | | |

###R\_FNC\_RSCL\_00052### URC Rear Climate lock/unlock

If URCL Control receives URCL\_HMI\_rq = lock climate it shall disable the rear climate settings on the linked hand held devices and send RSCL\_URCL\_stat = locked Climate.

If URCL Control receives URCL\_HMI\_rq = unlock climate it shall enable the rear audio settings on the linked hand held devices and send RSCL\_URCL\_stat = unlocked Climate

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: ###R\_FNC\_RSCL\_00052### | | | | | | | |
| **Rationale** |  | | | | | | | |
| **Acceptance Criteria** |  | | | | | | | |
| **Notes** |  | | | | | | | |
| **Source** | FD-RSCL | | | | | **Owner** |  | |
| **Source Req.** | R\_F\_RSCL\_26 RCL | | | | | **V&V Method** |  | |
| **Type** | Choose an item. | | | **Priority** | Choose an item. | **Status** | Choose an item. | |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.1a | End of Requirement | | | | |

###R\_FNC\_RSCL\_00026### Provide URC feature feedback

URCL Control shall provide URCL status feedback via RSCL URCL stat

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: ###R\_FNC\_RSCL\_00026### | | | | | | | |
| **Rationale** |  | | | | | | | |
| **Acceptance Criteria** |  | | | | | | | |
| **Notes** |  | | | | | | | |
| **Source** | FD-RSCL | | | | | **Owner** |  | |
| **Source Req.** | R\_F\_RSCL\_14 | | | | | **V&V Method** |  | |
| **Type** | Choose an item. | | | **Priority** | Choose an item. | **Status** | Choose an item. | |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.1a | End of Requirement | | | | |

##### Error Handling

***#Hint:*** *FMEA counter measures could be considered as requirements in this chapter*

#### Non-Functional Requirements

***#Hint:*** *Non-functional requirements specify some performance criteria in addition to the functional behavior given defined by the functional requirements. Timing (if not already included in the functional requirements), security details (e.g. how secure does an algorithm have to be) or reliability (e.g. mean time between failure) could be specified in this section.*

#### Functional Safety Requirements

**#Classification**: Functional Safety only – If not used, remove content and state “Not Applicable”

***#Hint:*** *The table references the Functional Safety Requirements (FSR) satisfied by the Logical Function. The FSRs themselves are listed in the Feature Docs.*

**#Link:**[RE Wiki – RE Alignment with Functional Safety (ISO26262)](http://wiki.ford.com/pages/viewpage.action?pageId=176397025)

[Functional Safety Sharepoint](https://pd3.spt.ford.com/sites/GlobalFunctionalSafety/Pages/default.aspx) – Functional Safety Concept

|  |  |
| --- | --- |
| **FSR ID**  (from Feature Doc) | **Requirement Title** |
|  |  |
| … |  |

Table 17: FSRs satisfied by Logical Function

#### Other Requirements

##### Design Requirements

***#Hint:*** *Requirements of a Logical Function should be typically agnostic of their SW/HW implementation*. If for specific reasons the function owner needs to define explicitly design constraints, it can be done in this chapter.

## HMI Function “RSCL HMI Control”

**#Classification**: Optional (Remove section, if not used)

***#Hint:*** *HMI functions shall be defined in close cooperation between Function Owner and HMI team. There are currently 2 approaches in the HMI team for the specification of GUIs:*

*1. Visio Wallpapers with textual behavior descriptions*

*2. An executable model according to the Model-View-Control approach.*

*Both approaches can be used with this specification. The QPIP approach separates the feature logic from the HMI logic. The HMI logic (either the Controller / View part of the MVC approach or the Visio Wallpaper centered logic) is encapsulated in a separate HMI Function. The internal structure of the HMI Function section slightly differs from the section for normal Logical Functions. The use of HMI functions is explained at* [*RE Wiki – HMI Funcitons*](http://wiki.ford.com/display/RequirementsEngineering/HMI+Functions)*.*

### Function Overview

#### Function Description

**#Hint:** Some descriptive text to explain the purpose and functionality of the function.

Provides HMI controls for RSCL options and converts user input (e.g. physical button press) into logical signals for further processing by RSCL control. Provides feedback to the user about feature status.

#### Function Variants

**#Classification**: Mandatory (State “Not applicable”, if not used)

**#Hint:** If different variants of the same function are specified in this specification, list those variants in the table below.

Variants on Function level could be driven by e.g. technology or feature content. The optional column “Variant condition” allows to express the dependency of a Variant based on Variant Options. Variant Options should be centrally managed in VSEM.

If requirements/signals are not applicable for all variants/variant options, those requirements should state explicitly, which function variant/variant option they apply to.

**#Link:** [RE Wiki – Variant Management](http://wiki.ford.com/display/RequirementsEngineering/Variant+Management)

|  |  |  |
| --- | --- | --- |
| Variant Name | Variant Description | Variant Condition (optional) |
|  | n/a |  |

#### Input Requirements/Documents

**#Hint:** *The table below helps the function owner to collect relevant input* (requirements, documents, mails, models, …) *while writing the spec. When finalizing the spec, the function owner* should check, if all inputs have been properly considered by derived/outgoing requirements in chapter “Function Requirements”.

Note: It is not required to list each input requirement individually in this table, referencing the input document is enough (if relevant document section is indicated).

|  |  |  |  |
| --- | --- | --- | --- |
| **Reference**  (Reference as listed in ch. “References”) | **Section/Requirement** | **Description** | **Derived Requirement**  (optional – reference to requirement in ch. “Function Requirements”) |
| **Feature Requirements** | | | |
| Feature document | <Example:  id + title of relevant Feature Docs> | <Example: “Requirements of Feature …”> | <If you reference a requirement in this column, that requirement should have a trace link in its [“Source”/”Source Req.” attribute](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) field pointing back to the input requirement (or to a requirement inside the input document) given in this table row> |
|  |  |  |  |
| **Ford Engineering Standards** | | | |
|  | <Example: some SDS (requirement)> |  |  |
|  |  |  |  |
| **Legal Regulations** | | | |
|  | <Example: some excerpt from ECE or FMVSS> |  |  |
|  |  |  |  |
| **Industry Standards** | | | |
|  | <Example: some ISO/IEEE/SAE or other standard> |  |  |
|  |  |  |  |
| **Other Sources** | | | |
|  | <Example: some stakeholder document> |  |  |
|  |  |  |  |

Table 18: Input Requirements/Documents

#### Assumptions

**#Classification**: Mandatory (State “Not applicable”, if not used)

**#Hint:** A list of known assumptions concerning the effects of the function’s behavior on other functions or elements (i.e., dependencies) as well as assumptions on the behavior expected by the function (e.g. known limitations). During the course of the development most of those assumptions are typically either converted into actual requirements or discarded at some point – such that this chapter remains mostly empty.

### Function Scope

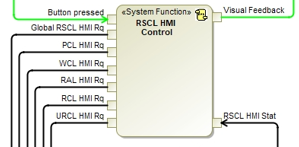


Figure 12: Context Diagram of RSCL HMI Control

### Function Interfaces

**#Hint:**

* First create a Logical Signal in the “Logical Signals” section of the “Data Dictionary”. Use [Add Ins -> Add Requirement macro](http://wiki.ford.com/display/RequirementsEngineering/Adding+a+Logical+Signal+or+Parameter) (select “Logical Signal” as type).
* Insert just a Word reference to the Signal ID, Name and Description (which are bookmarks in the signal/parameter definition in the section in the Data Dictionary).

**#Link:** [RE Wiki – Adding a Logical Signal or Parameter](http://wiki.ford.com/display/RequirementsEngineering/Adding+a+Logical+Signal+or+Parameter)

#### Logical Inputs

|  |  |
| --- | --- |
| **Signal Name** | **Description** |
| Button\_pressed | Physical user input requesting feature status by pressing softbutton on HMI   |  |  |  | | --- | --- | --- | | **ASIL** | | Choose an item. | | **Encoding Type Name** | | n/a | | **Value**  (Discrete  Encoding) | Global Lock | Lock all RSCL functions   * WCL * PCL * RAL * RCL * URCL | | Global Unlock | Unlock all RSCL functions   * WCL * PCL * RAL * RCL * URCL | | PCL Lock | Request to enable PCL. Disable rear inner door handles. | | PCL Unlock | Request to disable PCL. Enable rear inner door handles. | | WCL Lock | Request to disable rear window switches | |  | WCL Unlock | Request to enable rear window switches | |  | RAL Lock | Request to disable rear audio devices | |  | RAL Unlock | Request to enable rear audio devices | |  | RCL Lock | Request to disable rear climate devices | |  | RCL Unlock | Requet to enable rear climate devices | |  | URCL Lock | Lock all URC HHD | |  | URCL Unlock | Unlock all URC HHD | | **Unit** | | n/a | |
| RSCL\_HMI\_stat | Signal between RSCL HMI Control and RSCL control describing the feature status incl. error detection.   |  |  |  | | --- | --- | --- | | **ASIL** | | A | | **Encoding Type Name** | | n/a | | **Value**  (Discrete  Encoding) | All different conditions | TBD | |  | … | | Error | … | | Error PCL | No feedback signal from PCL system | | Error WCL | No feedback signal from WCL system | | Error RAL | No feedback signal from RAL system | | Error RCL | No feedback signal from RCL system | | Error URCL | No feedback signal from URCL system | | **Unit** | | n/a | |

#### Logical Outputs

|  |  |
| --- | --- |
| **Signal Name** | **Description** |
| Global\_RSCL\_HMI\_rq | Signal between RSCL HMI Control and RSCL Control describing the user request for feature status.   |  |  |  | | --- | --- | --- | | **ASIL** | | Choose an item. | | **Encoding Type Name** | | n/a | | **Value**  (Discrete  Encoding) | Lock all | Lock all RSCL functions   * WCL * PCL * RAL * RCL * URCL | | Unlock all | Unlock all RSCL functions   * WCL * PCL * RAL * RCL * URCL | | **Unit** | | n/a | |
| PCL\_HMI\_rq | Signal between RSCL HMI Control and RSCL Control describing the user request for PCL status   |  |  |  | | --- | --- | --- | | **ASIL** | | A | | **Encoding Type Name** | | n/a | | **Value**  (Discrete  Encoding) | Lock | Request to enable PCL. Disable rear inner door handles. | | Unlock | Request to disable PCL. Enable rear inner door handles. | | **Unit** | | n/a | |
| WCL\_HMI\_rq | Signal between RSCL HMI Control and RSCL Control describing the user request for WCL status   |  |  |  | | --- | --- | --- | | **ASIL** | | QM | | **Encoding Type Name** | | n/a | | **Value**  (Discrete  Encoding) | Lock | Request to disable rear window switches | | Unlock | Request to enable rear window switches | | **Unit** | | n/a | |
| RAL\_HMI\_rq | Signal between RSCL HMI Control and RSCL Control describing the user request for RAL status   |  |  |  | | --- | --- | --- | | **ASIL** | | QM | | **Encoding Type Name** | | n/a | | **Value**  (Discrete  Encoding) | Lock | Request to disable rear audio devices | | Unlock | Request to enable rear audio devices | | **Unit** | | n/a | |
| RCL\_HMI\_rq | Signal between RSCL HMI Control and RSCL Control describing the user request for RCL status   |  |  |  | | --- | --- | --- | | **ASIL** | | QM | | **Encoding Type Name** | | n/a | | **Value**  (Discrete  Encoding) | Lock | Request to disable rear climate devices | | Unlock | Request to enable rear climate devices | | **Unit** | | n/a | |
| URCL\_HMI\_rq | Signal between RSCL HMI Control and RSCL Control describing the user request for URCL status   |  |  |  | | --- | --- | --- | | **ASIL** | | QM | | **Encoding Type Name** | | n/a | | **Value**  (Discrete  Encoding) | Lock | Request to disable all URC HHD | | Unlock | Request to enable all URC HHD | | **Unit** | | n/a | |
| Visual\_Feedback | Visual feedback to user on feature status incl. tell tale for PCL activation   |  |  |  | | --- | --- | --- | | **ASIL** | | QM | | **Encoding Type Name** | | n/a | | **Value**  (Discrete  Encoding) | All conditions | TBD | |  |  | |  |  | |  |  | |  |  | | **Unit** | | n/a | |

#### Logical Parameters

**#Hint**: Put requirements for parameters here, which are implemented as configuration parameters using Method 2 or 3 or as parameters for calibration.

|  |  |
| --- | --- |
| **Parameter Name** | **Description** |
|  |  |
|  |  |

### Function Modeling

**#Classification:** Mandatory

**#Hint:** Typical modeling artifacts in this section are State Machines, Activity Diagrams / Flow Charts, Decision Tables, and possibly Sequence Diagrams, which can all be used as techniques to analyze the function requirements.

It is highly recommended to use at least one of the following modeling techniques for modeling and analyzing the Function behavior and derived requirements (refer to sample diagrams below): State Machines, Activity Diagrams / Flow Charts, or Decision Tables

**#Links:** Analyze / Model Requirements: [RE Wiki – Analyze / Model Requirements](http://wiki.ford.com/pages/viewpage.action?pageId=110594919&src=contextnavpagetreemode)

#### Wire-Frames/Wallpapers

**#Classification:** Infotainment Only (remove section, if not used)

**#Hint:** Some Domains (e.g. Infotainment) use not only Customer Use Cases (in the Feature Doc), but refine Use Case descriptions down to function level. In general, the RE approach encourages the use of Use Cases on Feature Level but not on Function Level. Activity Diagrams are a more suitable way to express the same on Function Level.

**#Links:** Infotainment – “Harmony Systems Engineering” Approach

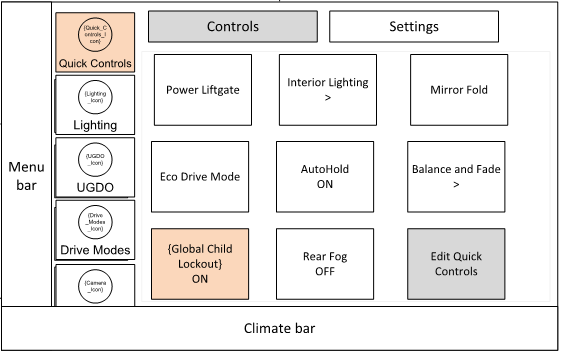


Figure 13: HMI Global Setting

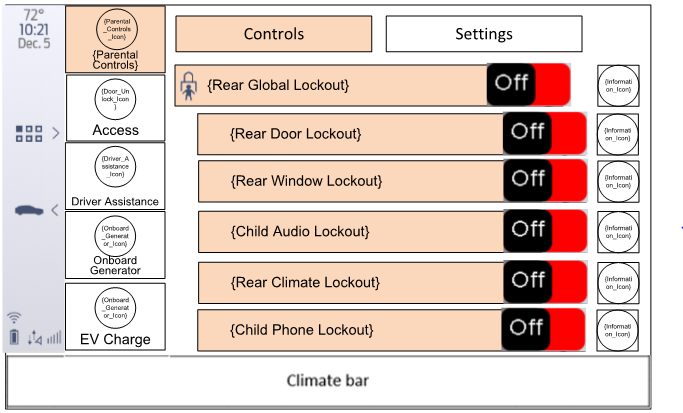


Figure 14: HMI Individual settings

### Function Requirements

**#Macro:** [Add Ins -> Add Requirement macro](http://wiki.ford.com/display/RequirementsEngineering/How+to+use+the+Specification+Templates#AddNewRequirement) (select “FNC” as ID Prefix, the function name as ID Infix (Short Name) and “Requirement” as type)

#Link: [*RE Wiki – How to write good requirements*](http://wiki.ford.com/display/RequirementsEngineering/How+to+write+better+requirements?src=contextnavpagetreemode)

#### Functional Requirements

**#Hint:** Place requirements on the HMI behavior here. Those requirements should leave sufficient room for the HMI team to come up with a suitable solution. A state chart might be already to be too restrictive, because, the HMI might behave differently on different displays. On the other hand a state chart or activity diagram in section “Function Modeling” might help for better understanding*.*

##### User Requests

###R\_FNC\_RSCL\_00056### RSCL menu availability

RSCL HMI Control shall be available to change settings until Delayed Accessory timer times out or driver opens the driver door

Settings for locking of rear climate control will not be available as soon as ignition is off.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: ###R\_FNC\_RSCL\_00056### | | | | | | | |
| **Rationale** |  | | | | | | | |
| **Acceptance Criteria** |  | | | | | | | |
| **Notes** |  | | | | | | | |
| **Source** |  | | | | | **Owner** |  | |
| **Source Req.** |  | | | | | **V&V Method** |  | |
| **Type** | Choose an item. | | | **Priority** | Choose an item. | **Status** | Choose an item. | |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0b | End of Requirement | | | | |

###R\_FNC\_RSCL\_00004### HMI individual settings screen

RSCL HMI Control shall provide menu options to activate / deactivate:

* PCL (if supported) individually
* WCL (if supported) individually
* RAL (if supported) individually
* RCL (if supported) individually
* URCL (if supported) individually
* All above functions (as supported) globally

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: ###R\_FNC\_RSCL\_00004### | | | | | | | |
| **Rationale** |  | | | | | | | |
| **Acceptance Criteria** |  | | | | | | | |
| **Notes** | Figure 14: HMI Individual settings shows a sample GUI | | | | | | | |
| **Source** | FD RSCL | | | | | **Owner** |  | |
| **Source Req.** | R\_F\_RSCL\_11 | | | | | **V&V Method** |  | |
| **Type** | Interface | | | **Priority** | High (Mandatory) | **Status** | Choose an item. | |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.1a | End of Requirement | | | | |

##### User Feedback

###R\_FNC\_RSCL\_00006### PCL activation/deactivation feedback

If PCL is supported RSCL HMI Control shall support a visual PCL confirmation within tbd msec when user activates / deactivates PCL with RSCL HMI stat.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: ###R\_FNC\_RSCL\_00006### | | | | | | | |
| **Rationale** |  | | | | | | | |
| **Acceptance Criteria** |  | | | | | | | |
| **Notes** | Asil A | | | | | | | |
| **Source** | FD RSCL | | | | | **Owner** |  | |
| **Source Req.** | R\_F\_RSCL\_12 | | | | | **V&V Method** |  | |
| **Type** | Interface | | | **Priority** | High (Mandatory) | **Status** | Choose an item. | |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.1a | End of Requirement | | | | |

###R\_FNC\_RSCL\_00008### User Notification for manual PCL

If “Manual PCL” is supported only, RSCL content = PCLoff, RSCL HMI Control shall provide a visual information to the user that PCL needs to be enabled/disabled manually.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: ###R\_FNC\_RSCL\_00008### | | | | | | | |
| **Rationale** |  | | | | | | | |
| **Acceptance Criteria** |  | | | | | | | |
| **Notes** | PCL functionality depends on capabilities of door latches. Manual PCL implies the has to enable / disable child lock by inserting the mechanical device into the door shut face | | | | | | | |
| **Source** | FD RSCL | | | | | **Owner** |  | |
| **Source Req.** | R\_F\_RSCL\_16 | | | | | **V&V Method** |  | |
| **Type** | Interface | | | **Priority** | Low (Optional) | **Status** | Choose an item. | |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.1a | End of Requirement | | | | |

###R\_FNC\_RSCL\_00017### HMI Error Indication

If an error is detected (refer to signal:RSCL PCL stat), RSCL HMI Control shall indicate an error to the user with a service notification.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: ###R\_FNC\_RSCL\_00017### | | | | | | | |
| **Rationale** |  | | | | | | | |
| **Acceptance Criteria** |  | | | | | | | |
| **Notes** |  | | | | | | | |
| **Source** | FD-RSCL | | | | | **Owner** |  | |
| **Source Req.** | R\_F\_RSCL\_9 | | | | | **V&V Method** |  | |
| **Type** | Interface | | | **Priority** | High (Mandatory) | **Status** | Choose an item. | |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.1a | End of Requirement | | | | |

#### Non-Functional Requirements

***#Hint:*** *Non-functional requirements specify some performance criteria in addition to the functional behavior given defined by the functional requirements. Timing (if not already included in the functional requirements), security details (e.g. how secure does an algorithm have to be) or reliability (e.g. mean time between failure) could be specified in this section.*

###R\_FNC\_RSCL\_00055### Use of Symbols

RSCL HMI Control shall use the following symbols for WCL and PCL:

WCL 

PCL 

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: ###R\_FNC\_RSCL\_00055### | | | | | | | |
| **Rationale** | To comply with ASO requirments and have common look and feel | | | | | | | |
| **Acceptance Criteria** |  | | | | | | | |
| **Notes** |  | | | | | | | |
| **Source** | FD-RSCL | | | | | **Owner** |  | |
| **Source Req.** | TBD | | | | | **V&V Method** |  | |
| **Type** | Choose an item. | | | **Priority** | Choose an item. | **Status** | Choose an item. | |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0b | End of Requirement | | | | |

###R\_FNC\_RSCL\_00003### HMI global settings screen

RSCL HMI Control shall allow to access the RSCL feature menu in at most 2 steps (i.e., 2 actions) – starting from any HMI state

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: ###R\_FNC\_RSCL\_00003### | | | | | | | |
| **Rationale** | Quick access to relevant HMI controls to reduce driver distraction | | | | | | | |
| **Acceptance Criteria** |  | | | | | | | |
| **Notes** | As example refer to Figure Global settings | | | | | | | |
| **Source** | FD RSCL | | | | | **Owner** |  | |
| **Source Req.** | R\_F\_RSCL\_11 | | | | | **V&V Method** |  | |
| **Type** | Interface | | | **Priority** | High (Mandatory) | **Status** | Choose an item. | |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.1a | End of Requirement | | | | |

###R\_FNC\_RSCL\_00007### RSCL Status Indicators

RSCL HMI Control shall provide visual status indicators to the user to indicate activation state of

* PCL (if supported)
* WCL (if supported)
* RAL (if supported)
* RCL (if supported)
* URCL (if supported)
* RSCL globally

based on RSCL HMI stat

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: ###R\_FNC\_RSCL\_00007### | | | | | | | |
| **Rationale** |  | | | | | | | |
| **Acceptance Criteria** |  | | | | | | | |
| **Notes** |  | | | | | | | |
| **Source** | FD RSCL | | | | | **Owner** |  | |
| **Source Req.** | R\_F\_RSCL\_14 | | | | | **V&V Method** |  | |
| **Type** | Interface | | | **Priority** | High (Mandatory) | **Status** | Choose an item. | |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.1a | End of Requirement | | | | |

#### Functional Safety Requirements

**#Classification**: Functional Safety only – If not used, remove content and state “Not Applicable”

***#Hint:*** *The table references the Functional Safety Requirements (FSR) satisfied by the Logical Function. The FSRs themselves are listed in the Feature Docs.*

**#Link:**[RE Wiki – RE Alignment with Functional Safety (ISO26262)](http://wiki.ford.com/pages/viewpage.action?pageId=176397025)

[Functional Safety Sharepoint](https://pd3.spt.ford.com/sites/GlobalFunctionalSafety/Pages/default.aspx) – Functional Safety Concept

|  |  |
| --- | --- |
| **FSR ID**  (from Feature Doc) | **Requirement Title** |
| FSR1.4 | Inform customer about PCL status |
|  |  |
| … |  |

Table 19: FSRs satisfied by Logical Function

## HMI Function “RSCL Voice Command Control”

### Function Overview

#### Function Description

Convert user voice command in logical signals for further processing by RSCL control.

#### Function Variants

Not Applicable

#### Input Requirements/Documents

**#Hint:** *The table below helps the function owner to collect relevant input* (requirements, documents, mails, models, …) *while writing the spec. When finalizing the spec, the function owner* should check, if all inputs have been properly considered by derived/outgoing requirements in chapter “Function Requirements”.

Note: It is not required to list each input requirement individually in this table, referencing the input document is enough (if relevant document section is indicated).

|  |  |  |  |
| --- | --- | --- | --- |
| **Reference**  (Reference as listed in ch. “References”) | **Section/Requirement** | **Description** | **Derived Requirement**  (optional – reference to requirement in ch. “Function Requirements”) |
| **Feature Requirements** | | | |
| Feature document | <Example:  id + title of relevant Feature Docs> | <Example: “Requirements of Feature …”> | <If you reference a requirement in this column, that requirement should have a trace link in its [“Source”/”Source Req.” attribute](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) field pointing back to the input requirement (or to a requirement inside the input document) given in this table row> |
|  |  |  |  |
| **Ford Engineering Standards** | | | |
|  | <Example: some SDS (requirement)> |  |  |
|  |  |  |  |
| **Legal Regulations** | | | |
|  | <Example: some excerpt from ECE or FMVSS> |  |  |
|  |  |  |  |
| **Industry Standards** | | | |
|  | <Example: some ISO/IEEE/SAE or other standard> |  |  |
|  |  |  |  |
| **Other Sources** | | | |
|  | <Example: some stakeholder document> |  |  |
|  |  |  |  |

Table 20: Input Requirements/Documents

#### Assumptions

Not Applicable

### Function Scope

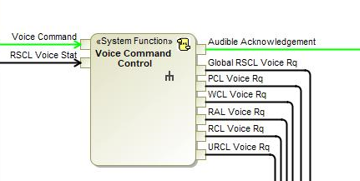


Figure 15: Context Diagram of RSCL Voice Command Control

### Function Interfaces

#### Logical Inputs

|  |  |
| --- | --- |
| **Signal Name** | **Description** |
| Voice\_Command | Acoustical user input requesting feature status by speaking out voice command   |  |  |  | | --- | --- | --- | | **ASIL** | | Choose an item. | | **Encoding Type Name** | | n/a | | **Value**  (Discrete  Encoding) | Global Lock | Lock all RSCL functions   * WCL * PCL * RAL * RCL * URCL | | Global Unlock | Unlock all RSCL functions   * WCL * PCL * RAL * RCL * URCL | | **PCL Lock** | Request to enable PCL. Disable rear inner door handles. | | **PCL Unlock** | Request to disable PCL. Enable rear inner door handles. | | **WCL Lock** | Request to disable rear window switches | | **WCL Unlock** | Request to enable rear window switches | | **RAL Lock** | Request to disable rear audio devices | | **RAL Unlock** | Request to enable rear audio devices | | **RCL Lock** | Request to disable rear climate devices | | **RCL Unlock** | Requet to enable rear climate devices | | **URCL Lock** | Lock all URC HHD | | **URCL Unlock** | Unlock all URC HHD | | **Unit** | | n/a | |
| RSCL\_Voice\_stat | Signal between RSCL Voice Control and RSCL control describing the feature status incl. error detection.   |  |  |  | | --- | --- | --- | | **ASIL** | | A | | **Value**  (Discrete  Encoding) | All different conditions | TBD | | Value 2 | … | | … | … | |  |  | | Error |  | | **Unit** | | n/a | |

#### Logical Outputs

|  |  |
| --- | --- |
| **Signal Name** | **Description** |
| Global\_RSCL\_Voice\_rq | Signal between Voice Command Control and RSCL Control describing the user request for feature status.   |  |  |  | | --- | --- | --- | | **ASIL** | | Choose an item. | | **Encoding Type Name** | | n/a | | **Value**  (Discrete  Encoding) | Lock all | Lock all RSCL functions   * WCL * PCL * RAL * RCL * URCL | | Unlock all | Unlock all RSCL functions   * WCL * PCL * RAL * RCL * URCL | | **Unit** | | n/a | |
| PCL\_Voice\_rq | Signal between Voice Command Control and RSCL Control describing the user request for PCL status   |  |  |  | | --- | --- | --- | | **ASIL** | | A | | **Encoding Type Name** | | n/a | | **Value**  (Discrete  Encoding) | Lock | Request to enable PCL. Disable rear inner door handles. | | Unlock | Request to disable PCL. Enable rear inner door handles. | | **Unit** | | n/a | |
| WCL\_Voice\_rq | Signal between Voice Command Control and RSCL Control describing the user request for WCL status   |  |  |  | | --- | --- | --- | | **ASIL** | | QM | | **Encoding Type Name** | | n/a | | **Value**  (Discrete  Encoding) | Lock | Request to disable rear window switches | | Unlock | Request to enable rear window switches | | **Unit** | | n/a | |
| RAL\_Voice\_rq | Signal between Voice Command Control and RSCL Control describing the user request for RAL status   |  |  |  | | --- | --- | --- | | **ASIL** | | QM | | **Encoding Type Name** | | n/a | | **Value**  (Discrete  Encoding) | Lock | Request to disable rear audio devices | | Unlock | Request to enable rear audio devices | | **Unit** | | n/a | |
| RCL\_Voice\_rq | Signal between Voice Command Control and RSCL Control describing the user request for RCL status   |  |  |  | | --- | --- | --- | | **ASIL** | | QM | | **Encoding Type Name** | | n/a | | **Value**  (Discrete  Encoding) | Lock | Request to disable rear climate devices | | Unlock | Request to enable rear climate devices | | **Unit** | | n/a | |
| URCL\_Voice\_rq | Signal between Voice Command Control and RSCL Control describing the user request for URCL status   |  |  |  | | --- | --- | --- | | **ASIL** | | QM | | **Encoding Type Name** | | n/a | | **Value**  (Discrete  Encoding) | Lock | Request to disable all URC HHD | | Unlock | Request to enable all URC HHD | | **Unit** | | n/a | |
| Audible\_Feedback | Audible feedback to user on feature status incl. tell tale for PCL activation   |  |  |  | | --- | --- | --- | | **ASIL** | | Choose an item. | | **Encoding Type Name** | | n/a | | **Value**  (Discrete  Encoding) | All conditions | TBD | | Value 2 | … | | … | … | |  |  | |  |  | | **Unit** | | n/a | |

#### Logical Parameters

**#Hint**: Put requirements for parameters here, which are implemented as configuration parameters using Method 2 or 3 or as parameters for calibration.

|  |  |
| --- | --- |
| **Parameter Name** | **Description** |
|  |  |
|  |  |

### Function Modeling

#### Wire-Frames/Wallpapers

### Function Requirements

#### Functional Requirements

##### User Requests

###R\_FNC\_RSCL\_00057### RSCL Voice Control availability

Voice Command Control shall be available to change settings until Delayed Accessory timer times out or driver opens the driver door

Settings for locking of rear climate control will not be available as soon as ignition is off.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: ###R\_FNC\_RSCL\_00057### | | | | | | | |
| **Rationale** |  | | | | | | | |
| **Acceptance Criteria** |  | | | | | | | |
| **Notes** |  | | | | | | | |
| **Source** |  | | | | | **Owner** |  | |
| **Source Req.** |  | | | | | **V&V Method** |  | |
| **Type** | Choose an item. | | | **Priority** | Choose an item. | **Status** | Choose an item. | |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.0b | End of Requirement | | | | |

###R\_FNC\_RSCL\_00005### Voice Control Commands

RSCL Voice Control shall provide voice commands to activate / deactivate

* WCL (if supported) individually
* RAL (if supported) individually
* RCL (if supported) individually
* URCL (if supported) individually
* All above functions (as supported) globally

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Requirement ID: ###R\_FNC\_RSCL\_00005### | | | | | | | |
| **Rationale** |  | | | | | | | |
| **Acceptance Criteria** |  | | | | | | | |
| **Notes** |  | | | | | | | |
| **Source** | FD RSCL | | | | | **Owner** |  | |
| **Source Req.** | R\_F\_RSCL\_11 | | | | | **V&V Method** |  | |
| **Type** | Interface | | | **Priority** | Medium (Highly Recommended) | **Status** | Choose an item. | |
| [Req. Template](http://wiki.ford.com/display/RequirementsEngineering/Requirements+Attributes) Version | | 6.1a | End of Requirement | | | | |

##### User Feedback

It has not been decided yet, if an audible feedback is required.

#### Non-Functional Requirements

#### Functional Safety Requirements

**#Classification**: Functional Safety only – If not used, remove content and state “Not Applicable”

***#Hint:*** *The table references the Functional Safety Requirements (FSR) satisfied by the Logical Function. The FSRs themselves are listed in the Feature Docs.*

**#Link:**[RE Wiki – RE Alignment with Functional Safety (ISO26262)](http://wiki.ford.com/pages/viewpage.action?pageId=176397025)

[Functional Safety Sharepoint](https://pd3.spt.ford.com/sites/GlobalFunctionalSafety/Pages/default.aspx) – Functional Safety Concept

|  |  |
| --- | --- |
| **FSR ID**  (from Feature Doc) | **Requirement Title** |
|  |  |
|  |  |
| … |  |

Table 21: FSRs satisfied by Logical Function

# Open Concerns

**#Hint:** The following list presents open concerns, which have to be discussed or clarified over the course of the on-going requirements engineering.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| ID | Concern Description | e-Tracker / Reference | Responsible | Status | Solution |
| 1 | WCL CDX746:  No “one touch up” on rear doors.  Need solution to disable rear window switch by signals. | Discussion just started 18.9.2020 | tbd | Open | tbd |

Table 22: Open Concerns

Next steps:

* Align requiremt text with signal values
* Update function break down
* Follow up with stake holders

# Revision History

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Revision | Date | Description | Approved by | Responsible |
| A | 09/23/2020 | Initial version for PSC Milestone |  | mhirschm |
| Draft |  | Updated requirements and Signals  All Functions affected |  |  |
|  |  | Added function “RSCL Voice Command Control” |  |  |
|  |  | Added FSRs for PCL |  |  |

## Template Revisions

*#Important: Do not change this section*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Version | Rev. | Date | Description | Responsible |
| 1 | 0 | 2016-02-26 | Initial version, derived form FDS | Jbaden1 |
| 1 | 1 | 2016-02-26 | Word properties corrected | Jbaden1 |
| 1 | 2 | 2016-03-10 | Clean up of ocument meta data (Word properties) | Jbaden1 |
| 1 | 3 | 2016-03-22 | * Footer formating corrected (Issue 19) * “Constraints” chapter renamed to “Input Requirements” (Issue 20) | Jbaden1 |
| 1 | 4 | 2016-04-20 | * Broken Wiki links repaired | Jbaden1 |
| 2 | 0 | 2016-06-10 | * Document metadata adapted. Prepared for new macros * DTC table removed * HMI function added as a chapter (details still to be refined) * Signal / Parameter IDs column deleted interface tables | Jbaden1 |
| 2 | 1 | 2016-07-14 | * Converted to SysML diagrams * HMI section further elaborated * Template version added to footer * Dedicated Startup / Shutdown sections removed (only hints added) * Data Dictionary reworked and Signal / Parameter IDs column re-introduced | Jbaden1 |
| 2 | 2 | 2016-12-07 | * Minor formatting changes | Jbaden1 |
| 3 |  |  | Skipped to synchronize with Specification\_Macros.dotm |  |
| 4 |  |
| 5 | 0 | 2017-01-13 | * Meta data updated for specification macros, version 3.1 * SW Unit chapter removed for the time being * Green boxes added for user hints | Jbaden1 |
| 5 | 1 | 2017-01-18 | * Some additional hints. * Hyperlinks highlighted in hints | Jbaden1 |
| 6 | 0 | 2017-04-28 | * Editorial change. Hints added to chapter 4.1.4 * Chapter “Traceability Matrix” removed | Jbaden1 |
| 6 | 0 | 2018-04-28 | * CR69/63: New chapters added for Functional Safety (FTTI and Technical Safety Requirements) * CR53: New coversheet + additional meta-data * CR76: merge sections for configuration and for calibration parameters into one on Function Level | Jbaden1 |
| 6 | 0 | 2018-08-06 | * CR66: Fix version numbering in footer of Function Spec | Jbaden1 |
| 6 | 0 | 2018-09-28 | * Broken links to RE Wiki repaired | Jbaden1 |
| 6 | 0 | 2018-10-31 | * Minor corrections on cover sheet and in footer to be more GIS compliant and VSEM aligned * “Overview” and “Description” exchanged in headings (following common sense) | Jbaden1 |
| 6 | 0 | 2018-11-12 | * Explanatory text in Variants” section revised * Functional Safety modifications as agreed with FuSa core team (Baseline: November 2018 Dearborn On-Site) | Jbaden1 |
| 6 | 0b | 2020-02-10 | Bugfix release:   * Chapter “Decomposed FSRs” renamed to Functional Safety Requirements”. ASIL decomposition table removed, no longer supported on Function Level. Got also be corrupted, when imported to VSEM * Refinement of FSRs no longer supported by Function Specification (as requested by Functional Safety team). FSR chapter just forwards FSRs from the Feature Docs 1:1 to the Implemented Function(s). | Jbaden1 |
| 6 | 1a | 2019-01-02 | * Editorial changes (in “Variants” section) | Jbaden1 |
| 6 | 1a | 2019-01-21 | * Template Id set to 2 | Jbaden1 |
| 6 | 1a | 2019-03-22 | * Chapter “Decomposed FSRs” renamed to Functional Safety Requirements” A new chapter “ASIL Decomposition of of Functional Safety Requirements” added as a subsection to that chapter. | Jbaden1 |
| 6 | 1a | 2019-04-05 | * Some wording in ASIL decomposition table modified. Description of fields in that table improved. | Jbaden1 |
| 6 | 1a | 2019-04-05 | * ASIL decomposition table removed (ASIL decomposition only allowed on Feature Level or on Component Level in the FIS or ECU Functional Spec) | Jbaden1 |
| 6 | 1a | 2019-07-02 | * "Important" box added on cover sheet which points to the macros * Chapters “References” and “Glossary” moved back up to section “Introduction * Chapter “Inputs Requirements” reworked | Jbaden1 |
| 6 | 1a | 2019-09-10 | * Chapter 4.1.4 has now one section per modeling technique again. This is to allow more intuitive tailoring of the section (driven by AV team request). | Jbaden1 |
| 6 | 1a | 2019-09-10 | * Copyright notice shortened and moved to cover sheet and added to footer (to be compliant [with Ford copyright guidelines](http://www.fgti.ford.com/client/NewFGTI/CopyrightNotice.html)) * Term “Disclaimer” no longer used for what is actually only a copyright notice | Jbaden1 |
| 6 | 1a | 2019-05-11 | * Per FuSa core team request: Subsection “Functional Safety Requirements” removed completely from Function Spec. FSRs are only captured in the Feature Doc * Chapter “Input Requirements” renamed to “Input Requirements/Documents” | Jbaden1 |
| 6 | 1a | 2019-12-05 | * Upstream Documents section added to “Input Requirements/Documents” table * Custom style table formatting removed * Per FuSa core team request: Subsection “Functional Safety Requirements” to remain in (but no ASIL Decomposition in Function Spec) | Jbaden1 |
| 6 | 1a | 2019-12-09 | * Term “Upstream Documents” replaced by “Feature Requirements” in “Input Requirements/Documents” table * ASIL Decomposition table replaced by a version, which get not corrupted during VSEM import. | Jbaden1 |
| 6 | 1a | 2019-12-10 | * Refinement of FSRs no longer supported by Function Specification (as requested by Functional Safety team). FSR chapter just forwards FSRs from the Feature Docs 1:1 to the Implemented Function(s). | Jbaden1 |
| 6 | 1a | 2019-12-10 | Minor changes made to enable use of the function group spec for specification of system services (system service spec is to be removed):   * Chapter “Functional Architecture” renamed to “Functional Decomposition and Architecture” * Functional Decomposition diagram added to renamed chapter. | Jbaden1 |
| 6 | 1a | 2020-02-12 | Minor rewording of hint for FSR table after review by FuSa team. | Jbaden1 |
| 6 | 1a | 2020-03-09 | * Missing doc property “LatestSigMappingID” and “LatestAisInterfaceID” added * doc property “CopyrightDate” re-formatted to text and copyright date field in footer corrected * Version numbering re-initialized as 0.1 * Init value of version/revision date set to “yyyy/mm/dd” instead of “yyyy-mm-dd” to be in line with the “Edit Document Property” dialog * Copyright date field on cover sheet corrected | Jbaden1 |

# Appendix

## Data Dictionary

### Logical Signals

**#Macro:** [Add Ins -> Add Requirement macro](http://wiki.ford.com/display/RequirementsEngineering/Adding+a+Logical+Signal+or+Parameter) (select “Logical Signal” as type)

#### Request Signals

###LSG\_RSCL\_00004### Global\_RSCL\_HMI\_rq

Signal between RSCL HMI Control and RSCL Control describing the user request for feature status.

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Encoding Type Name** | | n/a |
| **Value**  (Discrete  Encoding) | Lock all | Lock all RSCL functions   * WCL * PCL * RAL * RCL * URCL |
| Unlock all | Unlock all RSCL functions   * WCL * PCL * RAL * RCL * URCL |
| **Unit** | | n/a |

###LSG\_RSCL\_00005### PCL\_HMI\_rq

Signal between RSCL HMI Control and RSCL Control describing the user request for PCL status

|  |  |  |
| --- | --- | --- |
| **ASIL** | | A |
| **Encoding Type Name** | | n/a |
| **Value**  (Discrete  Encoding) | Lock | Request to enable PCL. Disable rear inner door handles. |
| Unlock | Request to disable PCL. Enable rear inner door handles. |
| **Unit** | | n/a |

###LSG\_RSCL\_00030### WCL\_HMI\_rq

Signal between RSCL HMI Control and RSCL Control describing the user request for WCL status

|  |  |  |
| --- | --- | --- |
| **ASIL** | | QM |
| **Encoding Type Name** | | n/a |
| **Value**  (Discrete  Encoding) | Lock | Request to disable rear window switches |
| Unlock | Request to enable rear window switches |
| **Unit** | | n/a |

###LSG\_RSCL\_00031### RAL\_HMI\_rq

Signal between RSCL HMI Control and RSCL Control describing the user request for RAL status

|  |  |  |
| --- | --- | --- |
| **ASIL** | | QM |
| **Encoding Type Name** | | n/a |
| **Value**  (Discrete  Encoding) | Lock | Request to disable rear audio devices |
| Unlock | Request to enable rear audio devices |
| **Unit** | | n/a |

###LSG\_RSCL\_00032### RCL\_HMI\_rq

Signal between RSCL HMI Control and RSCL Control describing the user request for RCL status

|  |  |  |
| --- | --- | --- |
| **ASIL** | | QM |
| **Encoding Type Name** | | n/a |
| **Value**  (Discrete  Encoding) | Lock | Request to disable rear climate devices |
| Unlock | Request to enable rear climate devices |
| **Unit** | | n/a |

###LSG\_RSCL\_00033### URCL\_HMI\_rq

Signal between RSCL HMI Control and RSCL Control describing the user request for URCL status

|  |  |  |
| --- | --- | --- |
| **ASIL** | | QM |
| **Encoding Type Name** | | n/a |
| **Value**  (Discrete  Encoding) | Lock | Request to disable all URC HHD |
| Unlock | Request to enable all URC HHD |
| **Unit** | | n/a |

###LSG\_RSCL\_00037### Global\_RSCL\_Voice\_rq

Signal between Voice Command Control and RSCL Control describing the user request for feature status.

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Encoding Type Name** | | n/a |
| **Value**  (Discrete  Encoding) | Lock all | Lock all RSCL functions   * WCL * PCL * RAL * RCL * URCL |
| Unlock all | Unlock all RSCL functions   * WCL * PCL * RAL * RCL * URCL |
| **Unit** | | n/a |

###LSG\_RSCL\_00038### PCL\_Voice\_rq

Signal between Voice Command Control and RSCL Control describing the user request for PCL status

|  |  |  |
| --- | --- | --- |
| **ASIL** | | A |
| **Encoding Type Name** | | n/a |
| **Value**  (Discrete  Encoding) | Lock | Request to enable PCL. Disable rear inner door handles. |
| Unlock | Request to disable PCL. Enable rear inner door handles. |
| **Unit** | | n/a |

###LSG\_RSCL\_00039### WCL\_Voice\_rq

Signal between Voice Command Control and RSCL Control describing the user request for WCL status

|  |  |  |
| --- | --- | --- |
| **ASIL** | | QM |
| **Encoding Type Name** | | n/a |
| **Value**  (Discrete  Encoding) | Lock | Request to disable rear window switches |
| Unlock | Request to enable rear window switches |
| **Unit** | | n/a |

###LSG\_RSCL\_00040### RAL\_Voice\_rq

Signal between Voice Command Control and RSCL Control describing the user request for RAL status

|  |  |  |
| --- | --- | --- |
| **ASIL** | | QM |
| **Encoding Type Name** | | n/a |
| **Value**  (Discrete  Encoding) | Lock | Request to disable rear audio devices |
| Unlock | Request to enable rear audio devices |
| **Unit** | | n/a |

###LSG\_RSCL\_00041### RCL\_Voice\_rq

Signal between Voice Command Control and RSCL Control describing the user request for RCL status

|  |  |  |
| --- | --- | --- |
| **ASIL** | | QM |
| **Encoding Type Name** | | n/a |
| **Value**  (Discrete  Encoding) | Lock | Request to disable rear climate devices |
| Unlock | Request to enable rear climate devices |
| **Unit** | | n/a |

###LSG\_RSCL\_00042### URCL\_Voice\_rq

Signal between Voice Command Control and RSCL Control describing the user request for URCL status

|  |  |  |
| --- | --- | --- |
| **ASIL** | | QM |
| **Encoding Type Name** | | n/a |
| **Value**  (Discrete  Encoding) | Lock | Request to disable all URC HHD |
| Unlock | Request to enable all URC HHD |
| **Unit** | | n/a |

###LSG\_RSCL\_00007### RSCL\_PCL\_Rq

Signal generated by RSCL Control based on user request.

|  |  |  |
| --- | --- | --- |
| **ASIL** | | A |
| **Encoding Type Name** | | n/a |
| **Value**  (Discrete  Encoding) | No action |  |
| activate | PCL activate requested |
| deactivate | PCL deactivate requested |
| **Unit** | | n/a |

###LSG\_RSCL\_00015### RSCL\_WCL\_rq

Signal sent from RSCL Control requesting to enable/disable WCL on rear door window switches

|  |  |  |
| --- | --- | --- |
| **ASIL** | | QM |
| **Encoding Type Name** | | n/a |
| **Value**  (Discrete  Encoding) | lock | Request to disable rear window switches |
| unlock | Request to enable rear window switches |
| **Unit** | | n/a |

###LSG\_RSCL\_00019### RSCL\_RAL\_rq

Signal received from RSCL Control requesting to lock/unlock rear audio devices

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Encoding Type Name** | | n/a |
| **Value**  (Discrete  Encoding) | Lock | Request to disable rear audio devices |
| Unlock | Request to enable rear audio devices |
| **Unit** | | n/a |

###LSG\_RSCL\_00023### RSCL\_RCL\_rq

Signal generated by RSCL Control requesting to disable/enable rear climate user interfaces

|  |  |  |
| --- | --- | --- |
| **ASIL** | | QM |
| **Encoding Type Name** | | n/a |
| **Value**  (Discrete  Encoding) | Lock | Request to disable rear climate devices |
| Unlock | Requet to enable rear climate devices |
| **Unit** | | n/a |

###LSG\_RSCL\_00013### RSCL\_URCL\_rq

Signal generated by RSCL Control to request locking/unlocking of URC functionalities individually or globally

|  |  |  |
| --- | --- | --- |
| **ASIL** | | QM |
| **Encoding Type Name** | | n/a |
| **Value**  (Discrete  Encoding) | Lock all | Lock all URC HHD |
| Unlock all | Unlock all URC HHD |
| Lock Audio | Lock Audio |
| Lock Climate | Lock Climate |
| Unlock Audio | Unlock Audio |
| Unlock Climate | Unlock Climate |
| **Unit** | | n/a |

###LSG\_RSCL\_00001### RSCL\_HandleCL\_Rq

Signal requesting to enable/disable rear inner door handles based on user request.

|  |  |  |
| --- | --- | --- |
| **ASIL** | | A |
| **Encoding Type Name** | | n/a |
| **Value**  (Discrete  Encoding) | deactivate | Unlock request for rear inner door handles |
| activate | Lock request for rear inner door handles |
| **Unit** | | n/a |

###LSG\_RSCL\_00017### RSCL\_RWDL\_rq

Signal generated by WCL Control based on RSCL WCL rq to enable/disable rear window switches.

|  |  |  |
| --- | --- | --- |
| **ASIL** | | QM |
| **Encoding Type Name** | | n/a |
| **Value**  (Discrete  Encoding) | Lock | Disable rear window switches |
| Unlock | Enable rear window switches |
| **Unit** | | n/a |

###LSG\_RSCL\_00021### RSCL\_RADL\_rq

Signal generated by RAL Control based on RSCL RAL rq requesting to lock/unlock rear audio devices.

|  |  |  |
| --- | --- | --- |
| **ASIL** | | QM |
| **Encoding Type Name** | | n/a |
| **Value**  (Discrete  Encoding) | Null | Null |
| Lock | Lock Rear Audio Devices |
| Unlock | Unlock Rear Audio Devices |
| **Unit** | | n/a |

###LSG\_RSCL\_00025### RSCL\_RCDL\_rq

Signal generated by RCL Control requesting activation/deactivation of rear climate control interfaces to user

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Encoding Type Name** | | n/a |
| **Value**  (Discrete  Encoding) | Lock | Disable rear climate devices |
| Unlock | Enable rear climate devices |
| **Unit** | | n/a |

###LSG\_RSCL\_00010### Button\_pressed

Physical user input requesting feature status by pressing softbutton on HMI

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Encoding Type Name** | | n/a |
| **Value**  (Discrete  Encoding) | Global Lock | Lock all RSCL functions   * WCL * PCL * RAL * RCL * URCL |
| Global Unlock | Unlock all RSCL functions   * WCL * PCL * RAL * RCL * URCL |
| PCL Lock | Request to enable PCL. Disable rear inner door handles. |
| PCL Unlock | Request to disable PCL. Enable rear inner door handles. |
| WCL Lock | Request to disable rear window switches |
|  | WCL Unlock | Request to enable rear window switches |
|  | RAL Lock | Request to disable rear audio devices |
|  | RAL Unlock | Request to enable rear audio devices |
|  | RCL Lock | Request to disable rear climate devices |
|  | RCL Unlock | Requet to enable rear climate devices |
|  | URCL Lock | Lock all URC HHD |
|  | URCL Unlock | Unlock all URC HHD |
| **Unit** | | n/a |

###LSG\_RSCL\_00011### Voice\_Command

Acoustical user input requesting feature status by speaking out voice command

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Encoding Type Name** | | n/a |
| **Value**  (Discrete  Encoding) | Global Lock | Lock all RSCL functions   * WCL * PCL * RAL * RCL * URCL |
| Global Unlock | Unlock all RSCL functions   * WCL * PCL * RAL * RCL * URCL |
| PCL Lock | Request to enable PCL. Disable rear inner door handles. |
| PCL Unlock | Request to disable PCL. Enable rear inner door handles. |
| WCL Lock | Request to disable rear window switches |
| WCL Unlock | Request to enable rear window switches |
| RAL Lock | Request to disable rear audio devices |
| RAL Unlock | Request to enable rear audio devices |
| RCL Lock | Request to disable rear climate devices |
| RCL Unlock | Requet to enable rear climate devices |
| URCL Lock | Lock all URC HHD |
| URCL Unlock | Unlock all URC HHD |
| **Unit** | | n/a |

#### Status Signals

###LSG\_RSCL\_00028### Ign\_stat

Signal describing the ignition status of the vehicle

|  |  |  |
| --- | --- | --- |
| **ASIL** | | QM |
| **Encoding Type Name** | | n/a |
| **Value**  (Discrete  Encoding) | Off |  |
| Acc |  |
| Run |  |
| Start |  |
| **Unit** | | n/a |

###LSG\_RSCL\_00029### Vehicle\_Lock\_stat

Signal describing the outer handle lock status and double lock status

|  |  |  |
| --- | --- | --- |
| **ASIL** | | QM |
| **Encoding Type Name** | | n/a |
| **Value**  (Discrete  Encoding) | Unlock all | All doors unlocked |
| Unlock driver | Driver door unlocked |
| Lock all | All doors locked |
| Lock double | All doors double locked |
| **Unit** | | n/a |

###LSG\_RSCL\_00006### RSCL\_HMI\_stat

Signal between RSCL HMI Control and RSCL control describing the feature status incl. error detection.

|  |  |  |
| --- | --- | --- |
| **ASIL** | | A |
| **Encoding Type Name** | | n/a |
| **Value**  (Discrete  Encoding) | All different conditions | TBD |
|  | … |
|  | … |
| Error PCL | No feedback signal from PCL system or RSCL PCL stat = Error |
| Error WCL | No feedback signal from WCL system |
| Error RAL | No feedback signal from RAL system |
| Error RCL | No feedback signal from RCL system |
| Error URCL | No feedback signal from URCL system |
| **Unit** | | n/a |

###LSG\_RSCL\_00043### RSCL\_Voice\_stat

Signal between RSCL Voice Control and RSCL control describing the feature status incl. error detection.

|  |  |  |
| --- | --- | --- |
| **ASIL** | | A |
| **Value**  (Discrete  Encoding) | All different conditions | TBD |
| Value 2 | … |
| … | … |
|  |  |
| Error |  |
| **Unit** | | n/a |

###LSG\_RSCL\_00008### RSCL\_PCL\_Stat

Signal generated by PCL control showing status of rear inner door handles incl. error detection and comparison with RSCL PCL Rq.

|  |  |  |
| --- | --- | --- |
| **ASIL** | | A |
| **Encoding Type Name** | | n/a |
| **Value**  (Discrete  Encoding) | activated | Both rear inner handles disabled |
| deactivated | Both rear inner handles enabled |
| Error | User request does not match rear inner door handle status |
| **Unit** | | n/a |

###LSG\_RSCL\_00016### RSCL\_WCL\_stat

Signal generated by WCL Control based on RSCL RWDL stat from Rear Window Device Control

|  |  |  |
| --- | --- | --- |
| **ASIL** | | QM |
| **Encoding Type Name** | | n/a |
| **Value**  (Discrete  Encoding) | Locked | Rear Window switches disabled |
| Unlocked | Rear Window switches enabled |
| Error | Left switch different to right switch condition |
| **Unit** | | n/a |

###LSG\_RSCL\_00020### RSCL\_RAL\_stat

Signal generated by RAL Control providing RAL status based on RSCL RADL stat

|  |  |  |
| --- | --- | --- |
| **ASIL** | | QM |
| **Encoding Type Name** | | n/a |
| **Value**  (Discrete  Encoding) | locked | Rear Audio devices disabled |
| unlocked | Rear Audio devices enabled |
| **Unit** | | n/a |

###LSG\_RSCL\_00024### RSCL\_RCL\_stat

Signal generated by RCL Control showing the RCL status>

|  |  |  |
| --- | --- | --- |
| **ASIL** | | QM |
| **Encoding Type Name** | | n/a |
| **Value**  (Discrete  Encoding) | Locked | Rear Climate Devices disabled |
| Unlocked | Rear Climate Devices enabled |
| **Unit** | | n/a |

###LSG\_RSCL\_00014### RSCL\_URCL\_stat

Signal from URCL Control providing the actual URCL status

|  |  |  |
| --- | --- | --- |
| **ASIL** | | QM |
| **Encoding Type Name** | | n/a |
| **Value**  (Discrete  Encoding) | all locked | All URC HHD locked |
| all unlocked | All URC HHD unlocked |
| Audio locked | Audio locked |
| Climate locked | Climate locked |
| Audio unlocked | Audio unlocked |
| Climate unlocked | Climate unlocked |
| **Unit** | | n/a |

###LSG\_RSCL\_00022### RSCL\_RADL\_stat

Feedback signal from Rear Audio Devices on locking status of rear audio devices

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Encoding Type Name** | | n/a |
| **Value**  (Discrete  Encoding) | Null | Null |
| Locked | Rear Audio Panel disabled |
| Unlocked | Rear Audio Panel enabled |
| **Unit** | | n/a |

###LSG\_RSCL\_00035### RSCL\_HandleLCL\_stat

Signal generated by rear left inner handle control showing the actual left rear inner door handle status

|  |  |  |
| --- | --- | --- |
| **ASIL** | | A |
| **Encoding Type Name** | | n/a |
| **Value**  (Discrete  Encoding) | Deactivated | rear inner door handle enabled |
| Activated | Rear inner door handle disabled |
| **Unit** | | n/a |

###LSG\_RSCL\_00046### RSCL\_HandleRCL\_stat

Signal generated by rear right inner handle control showing the actual right rear inner door handle status

|  |  |  |
| --- | --- | --- |
| **ASIL** | | A |
| **Encoding Type Name** | | n/a |
| **Value**  (Discrete  Encoding) | Deactivated | rear inner door handle enabled |
| Activated | Rear inner door handle disabled |
| **Unit** | | n/a |

###LSG\_RSCL\_00012### Visual\_Feedback

Visual feedback to user on feature status incl. tell tale for PCL activation

|  |  |  |
| --- | --- | --- |
| **ASIL** | | QM |
| **Encoding Type Name** | | n/a |
| **Value**  (Discrete  Encoding) | All conditions | TBD |
|  |  |
|  |  |
|  |  |
|  |  |
| **Unit** | | n/a |

###LSG\_RSCL\_00044### Audible\_Feedback

Audible feedback to user on feature status incl. tell tale for PCL activation

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Encoding Type Name** | | n/a |
| **Value**  (Discrete  Encoding) | All conditions | TBD |
| Value 2 | … |
| … | … |
|  |  |
|  |  |
| **Unit** | | n/a |

###LSG\_RSCL\_00036### PCL\_Error

Error signal to diagnostics

|  |  |  |
| --- | --- | --- |
| **ASIL** | | Choose an item. |
| **Value**  (Discrete  Encoding) | Error present |  |
| Error not present |  |
| **Unit** | | n/a |

### Logical Parameters

**#Macro:** [Add Ins -> Add Requirement macro](http://wiki.ford.com/display/RequirementsEngineering/Adding+a+Logical+Signal+or+Parameter) (select “Logical Parameter” as type)

###LPR\_RSCL\_00001### RSCL\_enable

Configuration Parameter to enable / disable RSCL feature

|  |  |  |
| --- | --- | --- |
| **Value**  (Discrete  Encoding) | Enable | Feature available for user |
| Disable | Feature not available for user |
| **Unit** | |  |

###LPR\_RSCL\_00002### RSCL\_content

Configuration Parameter to specify RSCL capabilities and ensure the proper HMI gets activated in Domain Controller.

|  |  |  |
| --- | --- | --- |
| **Value**  (Discrete  Encoding) | PCL on/off |  |
| WCL on/off |  |
| RAL on/off |  |
| RCL on/off |  |
| URCL on/off |  |
| **Unit** | |  |

### Encoding Types

**#Macro:** [Add Ins -> Add Requirement macro](http://wiki.ford.com/display/RequirementsEngineering/Adding+an+Encoding+Type) (select “Encoding Type” as type)

Document ends here.