**Module Design Document**

**For**

**FltInj**

**04/29/2016**

**Prepared For:**

**Software Engineering**

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**Saginaw, MI, USA**

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|  |  |  |  |
| --- | --- | --- | --- |
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| Initial Version | Lucas Wendling | 1.0 | 08/26/15 |
| Updates are per FDD v2.1.0 | Krishna Anne | 2.0 | 04/29/16 |

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# Introduction

## Purpose

MDD for FltInj (DF001A).

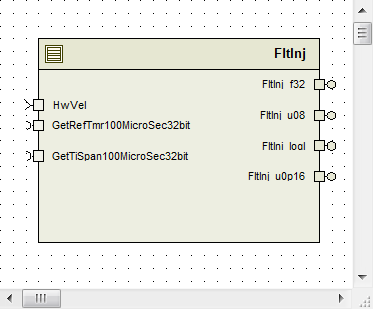
# FltInj High-Level Description

Refer FDD

# Design details of software module

## Graphical representation of FltInj

## Data Flow Diagram



### Component level DFD

### Function level DFD

# Constant Data Dictionary

## Program (fixed) Constants

### Embedded Constants

#### Local Constants

|  |  |  |  |
| --- | --- | --- | --- |
| Constant Name | Resolution | Units | Value |
| TICNVN\_MICROTOMILLI\_F32 | Single precision float | MicroToMilli | 0.001 |

* For other constants, refer DataDict.m

# Software Component Implementation

## Sub-Module Functions

## Init:

None

## Design Rationale

*N/A*

## Module Outputs

*N/A*

## Per: FltInjPer1

## Design Rationale

*Refer FDD*

## Store Module Inputs to Local copies

*Refer FDD*

## (Processing of function)………

*Refer FDD*

## Store Local copy of outputs into Module Outputs

*Refer FDD*

## Server Runables

## FltInj\_f32\_Oper

## Design Rationale

*Refer FDD*

## (Processing of function)………

*Refer FDD*

## FltInj\_logl\_Oper

## Design Rationale

*Refer FDD*

## (Processing of function)………

*Refer FDD*

## FltInj\_u08\_Oper

## Design Rationale

*Refer FDD*

## (Processing of function)………

*Refer FDD*

## FltInj\_u0p16\_Oper

## Design Rationale

*Refer FDD*

## (Processing of function)………

*Refer FDD*

## Interrupt Functions

*None*

## Interrupt Function Name

*N/A*

## Design Rationale

*N/A*

## (Processing of the ISR function)…..

*N/A*

## Module Internal (Local) Functions

NA



## GLOBAL Function/Macro Definitions

NA



# Known Limitations with Design

# UNIT TEST CONSIDERATION

1. Unit testing should be performed for when the build constant FLTINJENA is set to STD\_ON in order to enable core functionality of this module. This will have to be done by manually altering FltInj.h to change the value of this #define.
2. The SigPah\_Arg signal of the FltInj\_f32 server runnable has a special unit test consideration (MIL, SIL, PIL) that the range called out in the data dictionary should only be used for defining "input" vectors, and the range check that is normal done on the "output" is skipped in this special instance. (This second point is copied from the FDD).

Abbreviations and Acronyms

| **Abbreviation or Acronym** | **Description** |
| --- | --- |
|  |  |
|  |  |

Glossary

**Note**: Terms and definitions from the source “Nexteer Automotive” take precedence over all other definitions of the same term. Terms and definitions from the source “Nexteer Automotive” are formulated from multiple sources, including the following:

* ISO 9000
* ISO/IEC 12207
* ISO/IEC 15504
* Automotive SPICE® Process Reference Model (PRM)
* Automotive SPICE® Process Assessment Model (PAM)
* ISO/IEC 15288
* ISO 26262
* IEEE Standards
* SWEBOK
* PMBOK
* Existing Nexteer Automotive documentation

| **Term** | **Definition** | **Source** |
| --- | --- | --- |
| MDD | Module Design Document |  |
| DFD | Data Flow Diagram |  |

References

| **Ref. #** | **Title** | **Version** |
| --- | --- | --- |
| 1 | AUTOSAR Specification of Memory Mapping (Link:[AUTOSAR\_SWS\_MemoryMapping.pdf](http://www.autosar.org/download/R4.0/AUTOSAR_SWS_MemoryMapping.pdf)) | v1.3.0 R4.0 Rev 2 |
| 2 | MDD Guideline | EA4 01.00.00 |
| 3 | EA4 [Software Naming Conventions.doc](http://misagweb01.nexteer.com/eRoomReq/Files/erooms8/NextGeneration/0_fc55f/Software%20Naming%20Conventions%2003x(In%20Work).doc) | 01.00.00 |
| 4 | [Software Design and Coding Standards.doc](http://eroom1.nexteer.com/eRoomReq/Files/erooms8/NextGeneration/0_1a67a9/Software%20Design%20and%20Coding%20Standards.doc) | 2.1 |
| 4 | DF001A\_FltInj\_Design | See Synergy subproject version |