**Module Design Document**

**For**

**MotVelCtrl**

**May 4, 2016**

**Prepared For:**

**Software Engineering**

**Nexteer Automotive,**

**Saginaw, MI, USA**

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|  |  |  |  |
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| **Description** | **Author** | **Version** | **Date** |
| Initial Version | Sankardu Varadapureddi | 1 | 17-Feb-2016 |
| Input name change | Nick Saxton | 2 | 04-May-2016 |

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# Introduction

## Purpose

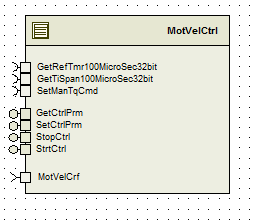
## Scope

# MotVelCtrl High-Level Description

Refer to FDD

# Design details of software module

## Graphical representation of MotVelCtrl

**

## Data Flow Diagram

Refer FDD

### Component level DFD

### Function level DFD

# Constant Data Dictionary

## Program (fixed) Constants

### Embedded Constants

|  |  |  |  |
| --- | --- | --- | --- |
| Constant Name | Resolution | Units | Value |
| ONEOVERTWOMPLR\_ULS\_F32 | 1 | Cnt | 0.5 |

For other constants, refer .m file.

#### Local Constants

# Software Component Implementation

## Sub-Module Functions

## Init: MotVelCtrlInit1

## Design Rationale

Refer FDD

## Module Outputs

Refer FDD

## Per: MotVelCtrlPer1

## 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

## GetCtrlPrm\_Oper

## Design Rationale

*Refer FDD*

## (Processing of function)………

*Refer FDD*

## SetCtrlPrm\_Oper

## Design Rationale

*Refer FDD*

## (Processing of function)………

*Refer FDD*

## StopCtrl\_Oper

## Design Rationale

*Refer FDD*

## (Processing of function)………

*Refer FDD*

## StrtCtrl\_Oper

## Design Rationale

*Refer FDD*

## (Processing of function)………

*Refer FDD*

## Interrupt Functions

*None*

## Module Internal (Local) Functions

## Local Function #1

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Function Name** | FPIDControl | Type | Min | | Max |
| **Arguments Passed** | MotVelTarSlewed\_MotRadPerSec\_T\_f32 | float32 | - 183500 | 183500 | |
|  | MotVelCrf\_MotRadPerSec\_T\_f32 | float32 | -1350 | 1350 | |
| **Return Value** | PIDCmdLimid\_MotNwtMtr\_T\_f32 | float32 | -8.8 | 8.8 | |

## Description

Blocks "F\_PID Control\_1" , "F\_PID Control\_2" and "F\_PID Control\_3" are of same functionality in the FDD. This sub function corresponds to those blocks implementation.

## GLOBAL Function/Macro Definitions

None

# Known Limitations with Design

None.

# UNIT TEST CONSIDERATION

None

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 01.00.01 |
| 3 | [Software Naming Conventions.doc](http://misagweb01.nexteer.com/eRoomReq/Files/erooms8/NextGeneration/0_fc55f/Software%20Naming%20Conventions%2003x(In%20Work).doc) | 2.0 |
| 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 |
| 5 | FDD : NM100A\_ MotVelCtrl\_Design | See Synergy sub project version |