**Module Design Document**

**For**

**MotDrvDiagc**

**Apr 18, 2016**

**Prepared For:**

**Software Engineering**

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| --- | --- | --- | --- |
| **Description** | **Author** | **Version** | **Date** |
| Initial Version | Sankardu Varadapureddi | 1 | 19-Aug-2015 |
| ‘MotDrvDiagcInit1’ design rational updated | Sankardu Varadapureddi | 2 | 21-Aug-2015 |
| Updating MDD to incorporate the changes in FDD 1.4.0 | Basavaraja Ganeshappa | 3 | 18-Apr-2016 |

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# Introduction

## Purpose

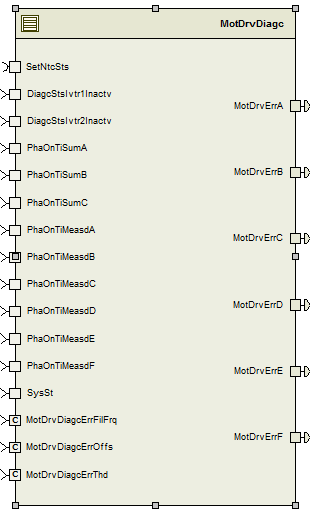
## Scope

# MotDrvDiagc High-Level Description

Refer to FDD

# Design details of software module

## Graphical representation of MotDrvDiagc

**

## Data Flow Diagram

Refer FDD

### Component level DFD

### Function level DFD

# Constant Data Dictionary

## Program (fixed) Constants

### Embedded Constants

#### Local Constants

|  |  |  |  |
| --- | --- | --- | --- |
| Constant Name | Resolution | Units | Value |
| BITMASK0\_CNT\_U08 | 1 | Cnt | 0x01 |
| BITMASK2\_CNT\_U08 | 1 | Cnt | 0x04 |
| BITMASK4\_CNT\_U08 | 1 | Cnt | 0x10 |
| MOTDRVERRMIN\_NANOSEC\_F32 | 1 | NoanoSec | 0.0F |
| MOTDRVERRMAX\_NANOSEC\_F32 | 1 | NoanoSec | 40000000.0F |

# Software Component Implementation

## Sub-Module Functions

## Init: MotDrvDiagcInit1

## Design Rationale

*Refer FDD for the functionality.*

## Module Outputs

*Refer FDD*

## Per: MotDrvDiagcPer1

## Design Rationale

1. In blocks ‘MeasdPhaFltChkABC’ and ‘MeasdPhaFltChkDEF’, inputs to filters are in integer datatypes. They are converted to float type in order to be compatible with filter SW library functions*.*
2. As per discussion with FDD owner, ‘BitsetStsA’ block sets bit 0 of ‘NtcStInfoA’. ‘BitsetStsA1’ sets bit 1 of ‘NtcStInfoA’. ‘DetermineBitsetA1’ block resets both bit0 and bit1. Same is applicable for phase B (bits 2 and 3) and phase C (bits 4 and 5).

In SW implementation, since NTC state info (NtcStInfoABC\_Uls\_T\_u08) is initialized to ‘0’, clearing of state bits logic (DetermineBitsetA1) is not implemented. It is redundant.

Same logic repeated in case of phase D, E and F signals.

## 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

*None*

## Interrupt Functions

*None*

## Module Internal (Local) Functions

## Local Function #1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Function Name** | SetNtcStInfo | Type | Min | Max |
| **Arguments Passed** | PhaOnTiMeasd\_NanoSec\_T\_u32 | uint32 | 0 | 4294967295 |
|  | PhaOnTiSumExp\_NanoSec\_T\_u32 | uint32 | 0 | 4294967295 |
|  | Err\_NanoSec\_T\_f32 | float32 | -3.4E+38 | +3.4E+38 |
|  | BitMask\_Cnt\_u08 | uint8 | 0x01 | 0x10 |
|  | \*NtcStInfo\_Uls\_T\_u08 | uint8 | 0x00 | 0x1F |
| **Return Value** | Flt\_Uls\_T\_lgc | boolean | FALSE | TRUE |

## Design Rationale

‘BitMask\_Cnt\_u08’ takes only 0x01, 0x04 and 0x10.

## Processing

Determines ‘NTC State Info’ for Phase on time signals. Corresponds to implementation of 'MeasdPhaFltChkABC' and ‘MeasdPhaFltChkDEF’ functional blocks.

## 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)) | Process 4.02.01 |
| 2 | MDD Guideline | Process 4.02.01 |
| 3 | [Software Naming Conventions.doc](http://misagweb01.nexteer.com/eRoomReq/Files/erooms8/NextGeneration/0_fc55f/Software%20Naming%20Conventions%2003x(In%20Work).doc) | Process 4.02.01 |
| 4 | [Software Design and Coding Standards.doc](http://eroom1.nexteer.com/eRoomReq/Files/erooms8/NextGeneration/0_1a67a9/Software%20Design%20and%20Coding%20Standards.doc) | Process 4.02.01 |