**Module Design Document**

**For**

**HwTqCorrln**

**April 14, 2016**

**Prepared For:**

**Software Engineering**

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|  |  |  |  |
| --- | --- | --- | --- |
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| Initial Version | SB | 1.0 | 04-Aug-2015 |
| Updated to FDD v2.1.0 | NS | 2.0 | 07-Oct-2015 |
| Anomaly EA4#1980 fixed | NS | 3.0 | 20-Oct-2015 |
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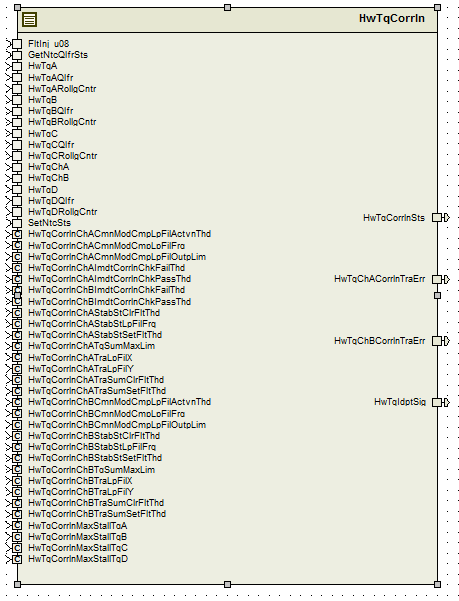
# HwTqCorrln & High-Level Description

*Refer FDD*

# Design details of software module

*Refer FDD*

## Graphical representation of HwTqCorrln



## Data Flow Diagram

Refer FDD

### Component level DFD

Refer FDD

### Function level DFD

Refer FDD

# Constant Data Dictionary

## Program (fixed) Constants

### Embedded Constants

#### Local Constants

|  |  |  |  |
| --- | --- | --- | --- |
| Constant Name | Resolution | Units | Value |
| Refer .m file |  |  |  |
| HWTQCORRLNSTSSIGA\_CNT\_U08 | 1 | Cnt | 0x01 |
| HWTQCORRLNSTSSIGB\_CNT\_U08 | 1 | Cnt | 0x02 |
| HWTQCORRLNSTSSIGC\_CNT\_U08 | 1 | Cnt | 0x04 |
| HWTQCORRLNSTSSIGD\_CNT\_U08 | 1 | Cnt | 0x08 |
| MAXSTALL\_CNT\_U08 | 1 | Cnt | 255 |
| HWTQIDPTSIGALL\_CNT\_U08 | 1 | Cnt | 4 |
| HWTQIDPTSIGHALF\_CNT\_U08 | 1 | Cnt | 2 |
| HWTQIDPTSIGNZERO\_CNT\_U08 | 1 | Cnt | 0 |
| HWTQCHCORRLNTRAERRMAXLMT\_ HWNWTMTR\_F32 | 1 | HWNWTMTR | 10.0 |
| HWTQCHCORRLNTRAERRMINLMT\_ HWNWTMTR\_F32 | 1 | HWNWTMTR | -10.0 |

# Software Component Implementation

Refer FDD

## Sub-Module Functions

## Init: HwTqCorrlnInit1

Refer FDD

## Per: HwTqCorrlnPer1

*Refer FDD*

## Per: HwTqCorrlnPer2

*Refer FDD*

## Per: HwTqCorrlnPer3

*Refer FDD*

## Server Runables

None

## Interrupt Functions

None

## Module Internal (Local) Functions

## Local Function #1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Function Name** | CorrlnSigAvlChk | Type | Min | Max |
| **Arguments Passed** | SigRollgCnt\_Cnt\_T\_u08 | uint8 | 0 | 255 |
|  | SigQlfr\_Cnt\_T\_enum | SigQlfr1 | SIGQLFR\_NORES | SIGQLFR\_FAILD |
|  | MaxStallCnt\_Cnt\_T\_u08 | Uint8 | 0 | 255 |
|  | \* LstRollgCnt\_Cnt\_T\_u08 | uint8 | 0 | 255 |
|  | \* StallCnt\_Cnt\_T\_u08 | uint8 | 0 | 255 |
| **Return Value** | SigAvl\_Cnt\_T\_lgc | boolean | FALSE | TRUE |

## Design Rationale

None

## Processing

Refer FDD CorrSigAvlChkRev1 State flow Chart

## Local Function #2

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Function Name** | ImdtCorrlnChk | Type | Min | Max |
| **Arguments Passed** | Sig1Avl\_Cnt\_T\_lgc | Booelan | FALSE | TRUE |
|  | Sig2Avl\_Cnt\_T\_lgc | Boolean | FALSE | TRUE |
|  | HwTq1\_HwNwtMtr\_T\_f32 | Float32 | -10.0 | 10.0 |
|  | HwTq2\_HwNwtMtr\_T\_f32 | Float32 | -10.0 | 10.0 |
|  | ImdtCorrlnChkFailThd\_HwNwtMtr\_T\_f32 | Float32 | 0.0 | 20.0 |
|  | ImdtCorrlnChkPassThd\_HwNwtMtr\_T\_f32 | Float32 | 0.0 | 20.0 |
|  | NtcNr\_T\_enum | Enum | 1 | 511 |
|  | \*CorrlnSigAPass\_Cnt\_T\_lgc | Boolean | FALSE | TRUE |
|  | \*CorrlnSigBPass\_Cnt\_T\_lgc | Boolean | FALSE | TRUE |
|  | \*ImdtCorrlnChk\_Cnt\_T\_lgc | Boolean | FALSE | TRUE |
| **Return Value** | ChAImdtCorrlnChk\_Cnt\_T\_lgc | boolean | FALSE | TRUE |

## Design Rationale

None

## Processing

Refer FDD ImdtCorrlnChk block

## 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 | Process 04.02.00 |
| 3 | [Software Naming Conventions.doc](http://misagweb01.nexteer.com/eRoomReq/Files/erooms8/NextGeneration/0_fc55f/Software%20Naming%20Conventions%2003x(In%20Work).doc) | Process 04.02.00 |
| 4 | [Software Design and Coding Standards.doc](http://eroom1.nexteer.com/eRoomReq/Files/erooms8/NextGeneration/0_1a67a9/Software%20Design%20and%20Coding%20Standards.doc) | Process 04.02.00 |
| 5 | FDD – ES229A\_HwTqCorrln\_Design | See Synergy SubProject version |