**Module Design Document**

**For**

**HwTqCorrln**

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**Prepared For:**

**Software Engineering**

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**Change History**

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| **Description** | **Author** | **Version** | **Date** |
| Initial Version | ML | 1.0 | 08-March-2017 |

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# Introduction

## Purpose

## Scope

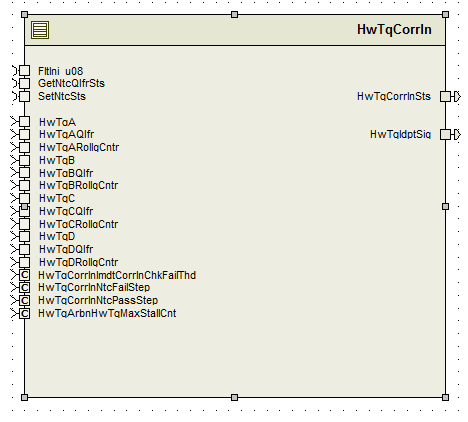
# HwTqCorrln & High-Level Description

*Refer FDD.*

# Design details of software module

*<The Data Flow Diagrams should be created in the absence of this representation with the 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 |
| BITSHIFTB\_CNT\_U08 | 1 | CNT | 1U |
| BITSHIFTC\_CNT\_U08 | 1 | CNT | 2U |
| BITSHIFTD\_CNT\_U08 | 1 | CNT | 3U |
| BITSHIFTAC\_CNT\_U08 | 1 | CNT | 1U |
| BITSHIFTAD\_CNT\_U08 | 1 | CNT | 2U |
| BITSHIFTBC\_CNT\_U08 | 1 | CNT | 3U |
| BITSHIFTBD\_CNT\_U08 | 1 | CNT | 4U |
| BITSHIFTCD\_CNT\_U08 | 1 | CNT | 5U |
| DHWTQCORRLNIMDTCORRLNSTSMINLMT\_CNT\_U08 | 1 | CNT | 0U |
| DHWTQCORRLNIMDTCORRLNSTSMAXLMT\_CNT\_U08 | 1 | CNT | 63U |

# Software Component Implementation

## Sub-Module Functions

## Init: HwTqCorrlnInit1

## Design Rationale

Init1 function is created so that it will allow a RTE model to be created in the AUTOSAR tools which allows Per-Instance Memory and calibration definition needs. The initialization function is doing nothing

## Module Outputs

*None*

## Per: HwTqCorrlnPer1

## Design Rationale

*None*

## (Processing of function)………

*Refer FDD*

## Server Runnable

None

## Interrupt Functions

*None*

## Module Internal (Local) Functions

## Local Function #1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Function Name** | HwTqSigAvl | Type | Min | Max |
| **Arguments Passed** | HwTqRollgCntr\_Cnt\_T\_u08 | uint8 | 0 | 255 |
|  | HwTqQlfr\_Cnt\_T\_enum | SigQlfr1 | SIGQLFR\_NORES | SIGQLFR\_FAILD |
|  | \*RollgCntrPrev\_Cnt\_T\_u08 | uint8 | 0 | 255 |
|  | \*StallCntr\_Cnt\_T\_u08 | uint8 | 0 | 255 |
| **Return Value** | SigAvl\_Cnt\_T\_logl | boolean | FALSE | TRUE |

## Design Rationale

None

## Processing

None

## Local Function #2

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Function Name** | HwTqCorrlnFunc | Type | Min | Max |
| **Arguments Passed** | Sig1HwNwtMtr\_T\_f32 | float32 | -10 | 10 |
|  | Sig2HwNwtMtr\_T\_f32 | float32 | -10 | 10 |
|  | \*SigCorrln\_Cnt\_T\_u08 | uint8 | 0 | 1 |
| **Return Value** | SigCorrln\_Cnt\_T\_logl | boolean | FALSE | TRUE |

## Design Rationale

None

## Processing

None

## Local Function #3

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Function Name** | LongTermCorrln | Type | Min | Max |
| **Arguments Passed** | HwTqCorrln\_Cnt\_T\_logl | boolean | FALSE | TRUE |
|  | NtcNr\_Cnt\_T\_enum | enum | NTCNR\_0X070 | NTCNR\_0X07A |
|  | NtcStInfo\_Cnt\_T\_u08 | uint8 | 0 | 63 |
| **Return Value** | HwTqNotFaild\_Cnt\_T\_logl | boolean | FALSE | TRUE |

## Design Rationale

None

## Processing

None

## Local Function #4

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Function Name** | ANDFunc | Type | Min | Max |
| **Arguments Passed** | Inp1\_Cnt\_T\_logl | boolean | FALSE | TRUE |
|  | Inp2\_Cnt\_T\_logl | boolean | FALSE | TRUE |
|  | Inp3\_Cnt\_T\_logl | boolean | FALSE | TRUE |
| **Return Value** | Outp1\_Cnt\_T\_logl | boolean | FALSE | TRUE |

## Design Rationale

This function was added to reduce path count.

## Processing

None

## Local Function #5

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Function Name** | ORFunc | Type | Min | Max |
| **Arguments Passed** | Inp1\_Cnt\_T\_logl | boolean | FALSE | TRUE |
|  | Inp2\_Cnt\_T\_logl | boolean | FALSE | TRUE |
|  | Inp3\_Cnt\_T\_logl | boolean | FALSE | TRUE |
| **Return Value** | Outp1\_Cnt\_T\_logl | boolean | FALSE | TRUE |

## Design Rationale

This function was added to reduce path count.

## Processing

None

## 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 01.00.00 |
| 3 | [Software Naming Conventions.doc](http://misagweb01.nexteer.com/eRoomReq/Files/erooms8/NextGeneration/0_fc55f/Software%20Naming%20Conventions%2003x(In%20Work).doc) | 1.0 |
| 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 – ES229C\_HwTqCorrln\_Design | See Synergy Subproject verison |