**Module Design Document**

**For**

**‘MotAgCorrln’**

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**Prepared For:**

**Software Engineering**

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# Introduction

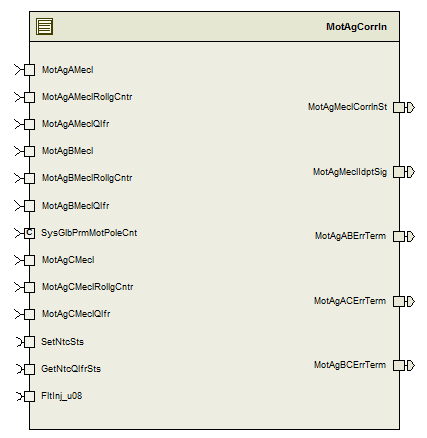
MDD for MotAgCorrln .

# MotAgCorrln & High-Level Description

*None*

# Design details of software module

## Graphical representation of MotAgCorrln



## 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 |
| MOTAGMECLCORRLNSTMIN\_CNT\_U08 | None | NA | 0 |
| MOTAGMECLCORRLNSTMAX\_CNT\_U08 | None | NA | 7 |
| MOTAGMECLIDPTSIGMIN\_CNT\_U08 | None | Cnt | 0 |
| MOTAGMECLIDPTSIGMAX\_CNT\_U08 | None | Cnt | 3 |

# Software Component Implementation

## Sub-Module Functions

## Init: MotAgCorrlnInit1

*Refer FDD*

## Design Rationale

*Design follows implementation in FDD.*

## Module Outputs

*Refer FDD*

## Per: MotAgCorrlnPer1

*Refer FDD*

## Design Rationale

*Refer FDD*

## Store Module Inputs to Local copies

*Refer FDD*

## (Processing of function)………

*Refer to FDD (Block ‘MotAgCorrlnPer1’)*

## Store Local copy of outputs into Module Outputs

*Refer FDD*

## Server Runables

## *None*Interrupt Functions

*None*

## Interrupt Function Name

*None*

## Design Rationale

*None*

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

*None*

## Module Internal (Local) Functions

## Local Function #1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Function Name** | MtrAgSigAvlCheck | Type | Min | Max |
| **Arguments Passed** | SigRollg\_Cnt\_T\_u08 | uint8 | 0 | 255 |
|  | SigQlfr\_Cnt\_T\_enum | Enum (SigQlfr1) | SIGQLFR\_NORES | SIGQLFR\_FAILD |
|  | LstRollg\_Cnt\_T\_u08 | uint8 | 0 | 255 |
|  | LstStall\_Cnt\_T\_u08 | uint8 | 0 | 255 |
|  | \*StallCntOutp\_Cnt\_T\_u08 | uint8 | 0 | 255 |
| **Return Value** | SigAvl\_Cnt\_T\_lgc | boolean | FALSE | TRUE |

## Design Rationale

Checks Signal Availability of Motor. Implementation of 'MtrAgA SigAvlCheck', 'MtrAgB SigAvlCheck' and 'MtrAgC SigAvlCheck' blocks.

## Processing

**Note:** ‘\* StallCntOutp\_Cnt\_T\_u08’ is an output of this function.

### Local Function #2

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Function Name** | TestOkCheck | Type | Min | Max |
| **Arguments Passed** | MotAgAMecl\_MotRev\_T\_u0p16 | uint16 | 0 | 65535 |
|  | MotAgBMecl\_MotRev\_T\_u0p16 | uint16 | 0 | 65535 |
|  | MotAgCMecl\_MotRev\_T\_u0p16 | uint16 | 0 | 65535 |
|  | \*MotAgOkA\_Cnt\_T\_lgc | boolean | FALSE | TRUE |
|  | \*MotAgOkB\_Cnt\_T\_lgc | boolean | FALSE | TRUE |
|  | \*MotAgOkC\_Cnt\_T\_lgc | boolean | FALSE | TRUE |
|  | \*MotAgABErrTerm\_T\_u0p16 | uint16 | 0U | 32768U |
|  | \*MotAgBCErrTerm\_T\_u0p16 | uint16 | 0U | 32768U |
|  | \*MotAgACErrTerm\_T\_u0p16 | uint16 | 0U | 32768U |
| **Return Value** | None |  |  |  |

## Design Rationale

Implementation of 'TestOk' check functionality. This function corresponds to blocks 'MotAgA vs MotAgB', 'MotAgA vs MotAgC', 'MotAgB vs MotAgC' and 'TestOk'.

## Processing

‘\*MotAgOkA\_Cnt\_T\_lgc’, ‘\*MotAgOkB\_Cnt\_T\_lgc’ and ‘\*MotAgOkC\_Cnt\_T\_lgc’ are outputs of this function

### Local Function #3

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Function Name** | MtrAgNotFailedCheck | Type | Min | Max |
| **Arguments Passed** | \* MotAgANotFailed\_Cnt\_T\_lgc | boolean | FALSE | TRUE |
|  | \* MotAgBNotFailed\_Cnt\_T\_lgc | boolean | FALSE | TRUE |
|  | \* MotAgCNotFailed\_Cnt\_T\_lgc | boolean | FALSE | TRUE |
|  | \* MotAgMeclIdptSig\_Cnt\_T\_u08 | uint8 | 0 | 3 |
|  | MotAgSigAvlA\_Cnt\_T\_lgc | boolean | FALSE | TRUE |
|  | MotAgSigAvlB\_Cnt\_T\_lgc | boolean | FALSE | TRUE |
|  | MotAgSigAvlC\_Cnt\_T\_lgc | boolean | FALSE | TRUE |
| **Return Value** | None |  |  |  |

## Design Rationale

Implementation of 'NotFailed' block functionality.

MotAgANotFailed\_Cnt\_T\_lgc, MotAgBNotFailed\_Cnt\_T\_lgc, MotAgCNotFailed\_Cnt\_T\_lgc and MotAgMeclIdptSig\_Cnt\_T\_u08 are outputs of this function.

## Processing

All arguments are outputs of this function

### Local Function #2

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Function Name** | CalcErrTerm | Type | Min | Max |
| **Arguments Passed** | MotAgAMecl\_MotRev\_T\_u0p16 | uint16 | 0 | 65535 |
|  | MotAgBMecl\_MotRev\_T\_u0p16 | uint16 | 0 | 65535 |
|  | MotAgCMecl\_MotRev\_T\_u0p16 | uint16 | 0 | 65535 |
| **Return Value** | ErrorTerm\_Rev\_T\_u0p16 | uint16 | 0 | 32768 |

## Design Rationale

MotAg“X” vs MotAg“Y” where X can be A,B and Y can be B, C block, the implementation will not result in negative values as sign of Switch2 and Abs are changed. Hence Abs1 function is redundant in implementation and ignored.. (Note: Switch 2 always results in MAX VALUE of U0P16 Datatype. So Subtraction of delta from it will not result in negative value)

## Processing

Delta between two input motor angle will outputs of this function

## GLOBAL Function/Macro Definitions

## GLOBAL Function #1

None

## Design Rationale

None

## processing

None

# Known Limitations with Design

None

# UNIT TEST CONSIDERATION

None

Abbreviations and Acronyms

| **Abbreviation or Acronym** | **Description** |
| --- | --- |
| FDD | Functional Design Document |

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 01.00.02 |
| 3 | [Software Naming Conventions.doc](http://misagweb01.nexteer.com/eRoomReq/Files/erooms8/NextGeneration/0_fc55f/Software%20Naming%20Conventions%2003x(In%20Work).doc) | EA4 01.00.02 |
| 4 | [Software Design and Coding Standards.doc](http://eroom1.nexteer.com/eRoomReq/Files/erooms8/NextGeneration/0_1a67a9/Software%20Design%20and%20Coding%20Standards.doc) | EA4 01.00.02 |
| 5 | ES249A\_MotAgCorrln\_Design | See Synergy subproject version |