**Integration Manual**

**For**

**MtrCntrl**

**VERSION: 5.0**

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**Location:** The official version of this document is stored in the Nexteer Configuration Management System.

**Revision History**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sl. No.** | **Description** | **Author** | **Version** | **Date** |
| 1 | Initial version | Selva | 1 | 25-Mar-13 |
| 2 | Updated TrqCanc\_Init in RTE Runnables and size of the NVM block CogTrqCal is changed from 512 to 521 | Selva | 2 | 21-Oct-13 |
| 3 | Added new NVM block “Rte\_Pim\_CogTrqRplComp” | Selva | 3 | 23-Oct-13 |
| 4 | Added new scheduling requirement for PICurrcntrl Initialisation | Selva | 4 | 5-Mar-15 |
| 5 | Updated per design rev. 19 | Rijvi | 5 | 25-July-2016 |

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# Abbrevations And Acronyms

|  |  |
| --- | --- |
| **Abbreviation** | **Description** |
| DFD | Design functional diagram |
| MDD | Module design Document |
|  | <ADD more to the table if applicable> |
|  |  |
|  |  |

# References

This section lists the title & version of all the documents that are referred for development of this document

|  |  |  |
| --- | --- | --- |
| **Sr. No.** | **Title** | **Version** |
| 1 | MDD Guidelines | Process 04.02.01 |
| 2 | Software Naming Conventions | Process 04.02.01 |
| 3 | Coding standards | Process 04.02.01 |
| 4 | FDD | Process 04.02.01 |
|  | <Add if more available> |  |

# Dependencies

## SWCs

|  |  |
| --- | --- |
| **Module** | **Required Feature** |
| **None** | <Addition of global data, function>\*. |

Note : Referencing the external components should be avoided in most cases. Only in unavoidable circumstance external components should be referred. Developer should track the references.

## Global Functions(Non RTE) to be provided to Integration Project

PICurrCntrl\_Per1()

TrqCogCancRefPer1()

# Configuration REQUIREMeNTS

## Build Time Config

|  |  |  |
| --- | --- | --- |
| **Modules** | **Notes** |  |
| PICurrentCntrl  TrqCanc | Optimization level greater than 3 |  |

## Configuration Files to be provided by Integration Project

MtrCtrl\_Cfg.h

\*Refer the template file MtrCtrl\_Cfg\_Template.h

## Da Vinci Parameter Configuration Changes

|  |  |  |
| --- | --- | --- |
| **Parameter** | **Notes** | **SWC** |
| **<Configurator Changes for parameters>** |  |  |

## DaVinci Interrupt Configuration Changes

|  |  |  |  |
| --- | --- | --- | --- |
| **ISR Name** | **VIM #** | **Priority Dependency** | **Notes** |
| **<Configurator Changes for Interrupts>** |  |  |  |

## Manual Configuration Changes

|  |  |  |
| --- | --- | --- |
| **Constant** | **Notes** | **SWC** |
| None |  |  |

# Integration DATAFLOW REQUIREMENTS

## Required Global Data Inputs

The global symbols mapping done in MtrCtrl\_Cfg.h.

## Required Global Data Outputs

The global symbols mapping done in MtrCtrl\_Cfg.h.

## Specific Include Path present

Yes

# Runnable Scheduling

This section specifies the required runnable scheduling.

|  |  |  |
| --- | --- | --- |
| **Init** | **Scheduling Requirements** | **Trigger** |
| CurrParamComp\_Init() | None | RTE (init) |
| PICurrCntrl\_Init() | None | RTE (init) |
| TrqCanc\_Init | Must be placed after CurrParamComp\_Init | RTE (init) |

|  |  |  |
| --- | --- | --- |
| **Runnable** | **Scheduling Requirements** | **Trigger** |
| QuadDet\_Per1 | Must run after TrqReasonable Diagnostics | RTE (2ms) |
| CurrCmd\_Per1 | Must run after QuadDet | RTE (2ms) |
| TrqCanc\_Per1 | Must run after CurrCmd\_Per1 | RTE (2ms) |
| CurrParamComp\_Per1() | Must be placed after TrqCanc\_Per1 | RTE (2ms) |
| PeakCurrEst\_Per1() | Must be placed after TrqCanc\_Per1 | RTE (2ms) |
| TrqCogCancRefPer1() | Must be placed in the motor control ISR, after MtrPos | Cyclic (ISR\*2) |
| PICurrCntrl\_Per1() | Must be placed in the motor control ISR after TrqCogCancRefPer1() | Cyclic (ISR\*2) |

\*Note: In motor control ISR include Ap\_MtrCtrl.h instead of CDD\_Func.h

Proper Initialization of input signals should occur before running each function for the first time. **(CurrParamComp\_Init).**

# Memory Map REQUIREMENTS

## Mapping

|  |  |  |
| --- | --- | --- |
| **Memory Section** | **Contents** | **Notes** |
| **CURRCMD\_START\_SEC\_VAR\_CLEARED\_32** |  |  |
| **CURRCMD\_START\_SEC\_VAR\_CLEARED\_16** |  |  |
| **CURRCMD\_START\_SEC\_VAR\_CLEARED\_UNSPECIFIED** |  |  |
| **PICURRCNTRL\_START\_SEC\_VAR\_CLEARED\_32** |  |  |
| **PICURRCNTRL\_START\_SEC\_VAR\_CLEARED\_UNSPECIFIED** |  |  |
| **PEAKCURREST\_START\_SEC\_VAR\_CLEARED\_32** |  |  |
| **TRQCANC\_START\_SEC\_VAR\_CLEARED\_32** |  |  |
| **TRQCANC\_START\_SEC\_VAR\_CLEARED\_16** |  |  |
| **TRQCANC\_START\_SEC\_CONST\_16** |  |  |
| **CURRPARAMCOMP\_START\_SEC\_VAR\_CLEARED\_32** |  |  |
| **QUADDET\_START\_SEC\_VAR\_INIT\_32** |  |  |
| **QUADDET\_START\_SEC\_VAR\_INIT\_8** |  |  |

\* Each …START\_SEC… constant is terminated by a …STOP\_SEC… constant as specified in the AUTOSAR Memory Mapping requirements.

## Usage

|  |  |  |
| --- | --- | --- |
| **Feature** | **RAM** | **ROM** |
| Full driver |  |  |

Table : ARM Cortex R4 Memory Usage

## NvM Blocks

|  |
| --- |
| Block Name Size |
| Rte\_Pim\_CogTrqCal 512 |
| Rte\_Pim\_CogTrqRplComp 9 |

# Compiler Settings

## Preprocessor MACRO

None

## Optimization Settings

Set optimization level greater than 3 for **PICurrentCntrl** and **TrqCanc** functions.

# Appendix

*None*