**Module Design Document**

**For**

**DataAndAdrPar**

**Feb 27, 2017**

**Prepared For:**

**Software Engineering**

**Nexteer Automotive,**

**Saginaw, MI, USA**

**Prepared By:**

**Software Group,**

**Nexteer Automotive,**

**Saginaw, MI, USAChange History**

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | **Author** | **Version** | **Date** |
| Initial Version | Avinash James | 1 | 03/15/16 |
| Constant definition updates | Avinash James | 2 | 02/27/17 |

**Table of Contents**

[1 Introduction 5](#_Toc445734220)

[1.1 Purpose 5](#_Toc445734221)

[1.2 Scope 5](#_Toc445734222)

[2 DataAndAdrPar & High-Level Description 6](#_Toc445734223)

[3 Design details of software module 7](#_Toc445734224)

[*3.1* Graphical representation of DataAndAdrPar 7](#_Toc445734225)

[3.2 Data Flow Diagram 7](#_Toc445734226)

[3.2.1 Component level DFD 7](#_Toc445734227)

[3.2.2 Function level DFD 7](#_Toc445734228)

[4 Constant Data Dictionary 8](#_Toc445734229)

[4.1 Program (fixed) Constants 8](#_Toc445734230)

[4.1.1 Embedded Constants 8](#_Toc445734231)

[5 Software Component Implementation 9](#_Toc445734232)

[5.1 Sub-Module Functions 9](#_Toc445734233)

[5.1.1 Init:DataAndAdrParInit1 9](#_Toc445734234)

[5.1.1.1 Design Rationale 9](#_Toc445734235)

[5.1.1.2 Module Outputs 9](#_Toc445734236)

[5.1.2 Init:DataAndAdrParInit2 9](#_Toc445734237)

[5.1.2.1 Design Rationale 9](#_Toc445734238)

[5.1.2.2 Module Outputs 9](#_Toc445734239)

[5.2 Server Runables 9](#_Toc445734240)

[5.3 Interrupt Functions 9](#_Toc445734241)

[5.4 Module Internal (Local) Functions 9](#_Toc445734242)

[5.4.1 ChkForECMBit28 9](#_Toc445734243)

[5.4.1.1 Design Rationale 9](#_Toc445734244)

[5.4.1.2 Processing 9](#_Toc445734245)

[5.4.2 WrTestModeCtrReg 9](#_Toc445734246)

[5.4.2.1 Design Rationale 10](#_Toc445734247)

[5.4.2.2 Processing 10](#_Toc445734248)

[5.5 GLOBAL Function/Macro Definitions 10](#_Toc445734249)

[5.5.1 GLOBAL Function #1 10](#_Toc445734250)

[5.5.1.1 Design Rationale 10](#_Toc445734251)

[5.5.1.2 Processing 10](#_Toc445734252)

[6 Known Limitations with Design 11](#_Toc445734253)

[7 UNIT TEST CONSIDERATION 12](#_Toc445734254)

[Appendix A Abbreviations and Acronyms 13](#_Toc445734255)

[Appendix B Glossary 14](#_Toc445734256)

[Appendix C References 15](#_Toc445734257)

# Introduction

## Purpose

## Scope

The following definitions are used throughout this document:

* **Shall**: indicates a mandatory requirement without exception in compliance.
* **Should**: indicates a mandatory requirement; exceptions allowed only with documented justification.
* **May**: indicates an optional action.

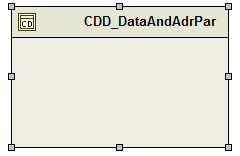
# DataAndAdrPar & High-Level Description

*See FDD*

# Design details of software module

## Graphical representation of DataAndAdrPar

## Data Flow Diagram



### Component level DFD

**N/A**

### Function level DFD

**N/A**

# Constant Data Dictionary

## Program (fixed) Constants

### Embedded Constants

#### Local Constants

|  |  |  |  |
| --- | --- | --- | --- |
| Constant Name | Resolution | Units | Value |
| VCIFERRSETBFRTEST\_CNT\_U32 | 1 | Counts | ((uint32)1U<<0U) |
| ECMERRSETBFRTEST\_CNT\_U32 | 1 | Counts | ((uint32)1U<<1U) |
| READOPERECMERR\_CNT\_U32 | 1 | Counts | ((uint32)1U<<2U) |
| WROPERECMERR\_CNT\_U32 | 1 | Counts | ((uint32)1U<<3U) |
| WROPERADRPARERR\_CNT\_U32 | 1 | Counts | ((uint32)1U<<4U) |
| CLRERRSTSFLGFAIL\_CNT\_U32 | 1 | Counts | ((uint32)1U<<5U) |
| TESTMODCTRLREGWRFAIL\_CNT\_U32 | 1 | Counts | ((uint32)1U<<6U) |
| TOUT\_CNT\_U16 | 1 | Counts | 1000U |

# Software Component Implementation

## Sub-Module Functions

## Init:DataAndAdrParInit1

## Design Rationale

*Non-RTE Init function to verify the Data Parity Data Transfer Path micro diagnostic. Refer FDD for more details*

## Module Outputs

*None*

## Init:DataAndAdrParInit2

## Design Rationale

*RTE empty Init function*

## Module Outputs

*None*

## Server Runables

*None*

## Interrupt Functions

*None*

## Module Internal (Local) Functions

## ChkForEcmBit28

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Function Name** | ChkForEcmBit28 | Type | Min | Max |
| **Arguments Passed** | None |  |  |  |
| **Return Value** | RetVal\_Cnt\_T\_logl | Boolean | 0 | 1 |

## Design Rationale

Static function to check whether ECM bit was set or not within a time out interval of max 2uSec

## Processing

To be called from DataAndAdrParInit1 function

## WrTestModeCtrReg

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Function Name** | WrTestModCtrlReg | Type | Min | Max |
| **Arguments Passed** | Val | Uint32 | 0 | 0xFFFFFFFF |
|  | ErrFlg\_Cnt\_T\_u32 | Uint32 | 0 | 0xFFFFFFFF |
| **Return Value** | None |  |  |  |

## Design Rationale

Static function to write to the Test Mode Control register and verify the write was successful

## Processing

To be called from DataAndAdrParInit1 function

## GLOBAL Function/Macro Definitions

## GLOBAL Function #1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Function Name** | (Exact name used) | Type | Min | Max |
| **Arguments Passed** | None | <Refer MDD guidelines[1]> | <Refer MDD guidelines[1]> | <Refer MDD guidelines[1]> |
|  |  |  |  |  |
| **Return Value** |  |  |  |  |

## Design Rationale

## Processing

# 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) | 2.0 |