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| --- | --- |
| **PRE**  **Pre-pretensioner module** | |
| **Summary** | This is the Software Detailed Design Document |

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| --- | --- | --- |
| **Author** | **Review** | **Approval** |
| Title: M. Obada | See Project Master Document for the roles and Project Members List for the name of people | See Project Master Document for the roles and Project Members List for the name of people |
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| See Project Master Document for the roles and Project Members List for the name of people | See Project Master Document for the roles and Project Members List for the name of people | See Project Master Document for the roles and Project Members List for the name of people |

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# General Information

## Revision history \*

|  |  |  |  |
| --- | --- | --- | --- |
| **Revision** | **Date** | **Author(s)** | **Description/comment** |
| 1.1.1.1 | 17/01/2022 | A. Negrea | First revision |
| 1.1.1.2 | 17/01/2022 | A. Negrea | Update with available cycles |
|  |  |  |  |

*\* Template history is found in the CM tool used for templates*

## Purpose and Scope

The review of this document is done thanks to …

The purpose of this document is to describe the design of the DAI MMA PRE Software Component.

## Referenced documents

### External documents

|  |  |  |
| --- | --- | --- |
| **Id** | **Title** | **Reference** |
|  |  |  |
|  |  |  |
|  |  |  |

### Internal Documents

|  |  |  |
| --- | --- | --- |
| **Id** | **Title** | **Reference** |
|  | SW architecture design interface description | E1355904 in PTC |
|  | ECU parameters specification | DOORS/PP4G/DES/  TF-J |
|  |  |  |
|  |  |  |

## Terminology and definitions

|  |  |
| --- | --- |
| **Terminology** | **Meaning** |
| AAU | Atomic architectural unit |
| MBD | Model Based Design |
| PRE | PrePreTensioning algorithm |
| SW | software |
|  |  |

# SW atomic architectural unit design

## Overview

The aim of the “PRE” component is to decide to trigger and to decide to abort the PRE cycles.

The design of the “PRE” component is handled by the MBD technology, with the support of tools such as MATLAB environment and a code generator tool such as Target Link for instance.

## Traceability

The traceability matrix is built from the system specification until the architecture document.

Then, refer to [Doc1] the get the traceability against the functional, design and safety requirements, related to this unit.

## Files structure

Below is the description of the files structure defined for this unit.

**PRE\_PreTensioningAlgo.h**

**PRE\_PreTensioningCommon.h**

**PRE\_PreTensioningAlgo.c**

**PRE\_PreTensioningCommon.c**

**PRE\_PretensioningAlgo.c**

It will gather:

* The main function of PRE algorithm, called PRE\_runPreTensioning (), which is the unique exported function in charge of providing:
  + the triggering decisions of the 2 available PRE cycles
  + the abortion decisions of the 2 available PRE cycles
  + the pre-conditions informations of the 2 available PRE cycles
  + the pre-activation informations of the 2 available PRE cycles
  + the triggering source informations of the 2 available PRE cycles.
* All the internal functions which provide the steps to decide to trigger and to abort all the PRE cycles.

**PRE\_PretensioningAlgo.h**

It will gather the definition of all exported constants and functions. Only the definition of the unique exported function is available: the PRE\_runPreTensioning () runnable.

**PRE\_PretensioningCommon.c**

It will gather the common functions between all PRE cycles, to prepare triggering and abortion decisions:

* The common functions to check common triggering conditions for all PRE cycles.
* The common functions to check common abortion conditions for all PRE cycles.

**PRE\_PretensioningCommon.h**

It will gather the definition of all common internal constants and functions, needed by every PRE cycles and used by all PRE algorithms implemented in PRE\_PreTensioningAlgo.c file.

# FEATURES

The purpose of this chapter is to only describe the internal implementation of the component.

For the description of the external implementation, please refer to [Doc1] (to get the list of services, types, variables and constants exported by this unit).

Actually, the description of the internal implementation is not necessary for this SW unit since its complexity is extremely low. Therefore, the current chapter shall not be treated. Then, refer to C-code implementation directly.

## Services

### Service Name

The list and the description of services are available in [Doc1].

Refer to this document for more details.

|  |  |  |
| --- | --- | --- |
| **Object** | | |
|  | | |
| **Prototype** | | |
|  | | |
| **Input Parameters** | | |
| Name | Type | Description |
|  |  |  |
| **Output Parameters :** | | |
| Name | Type | Description |
|  |  |  |
| **Return value** | | |
| Type | Description | |
|  |  | |
| **Dynamic aspect** | | |
| Who (callers) | Description | |
|  |  | |
| **Static aspect** | | |
|  | | |
| **Constraints** | | |
|  | | |

/

## Types

### Name Structure definition

The list and the description of types are available in [Doc1].

Refer to this document for more details.

|  |  |  |
| --- | --- | --- |
| **Field Name** | **Field Type** | **Field description** |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
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## Variables

The list and the description of variables are available in [Doc1].

Refer to this document for more details.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Name** | **Object** | **Type** | **Unit** | **Range** | **Dynamic Aspect** | **Constraints** |
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## Constants

The list and the description of constants are available in [Doc1].

Refer to this document for more details.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | **Object** | **Type** | **Value** | **Unit** | **Constraints** |
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|  |  |  |  |  |  |
|  |  |  |  |  |  |
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# EEPROM

The EEPROM parameters are all specified in [Doc2].

Refer to this document for more details.

# Configuration

# Compilation Options