**RESTRICTED ACCESS**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **DISTRIBUTION :** | **Firm** | **To** | **Ref** | **Copies** | **1st page** | **e-mail** |
|  | AEE-C | Xavier Christmann | 1 |  |  |  |
|  | AEE-C | Cedric Sauvage, | 1 |  |  |  |
|  | RBE | Mihai Ianos, Daniel Andris, Andreea Negrea, Stefan Dominte, Mirela Obada | 5 |  |  |  |
|  |  |  |  |  |  |  |
|  | AEE-C | Secretary ship | 1 |  |  |  |

**SW Architecture Design & Interface Description :**

**NVP sw UNIT**

OBJECT: This document is the description of the design & interfaces for *NVP* SW unit.

SUMMARY: This document provides a high-level view of the *NVP* SW unit. The inputs of this document are provided by the software requirement. It is linked to the DAIMLER\_MMA\_SWarchitectureDesignInterfaceDescription document.

CONCLUSION: Applicable from R06.1 SW release

**THIS DOCUMENT CONTAINS HIDDEN TEXT**

EVOLUTION OF THE DOCUMENT

|  |  |  |  |
| --- | --- | --- | --- |
| **Revision** | **Date** | **Author** | **Motive and nature of the modifications** |
| A00 | 31/08/2016 | C. Redon | First release (extract from the full PP4G architecture document) |
| A01 | 23/09/2016 | J. Lacroix | Update of requirement reference |
|  |  |  |  |
| Start DAI MMA description based on extended document | | | | |
| 1.1.3.1 | 22/12/2021 | A. Negrea | First revision on DAIMLER MMA |
| 1.1.3.2 | 22/12/2021 | A. Negrea | Duplicate revision |
| 1.1.3.3 | 15/02/2022 | A. Negrea | Update after review |
| 1.1.3.4 | 10/06/2022 | A. Negrea | Update for 2.0 release |
| 1.1.3.5 | 10/06/2022 | A. Negrea | Update traceability |
| 1.1.3.6 | 16/06/2022 | A. Negrea | Update number of bytes |
| 1.1.3.7 | 23/08/2022 | S. Dominte | Update for 3.0 release |
| 1.1.3.8 | 29/08/2022 | S. Dominte | Traceability updated |
| 1.1.3.9 | 29/08/2022 | S. Dominte | Traceability updated |
| 1.1.3.10 1.1.3.11 | 09/11/2022 14/11/2022 | A. Negrea T. Gligor | Update for 4.0 release  Update for 4.0 release |
| 1.1.3.12 | 18/11/2022 | A. Negrea | Update after review |
| 1.1.3.13 | 21/11/202 | A. Negrea | Update tags for traceability |
| 1.1.3.14 | 19/12/2022 | A. Negrea | Update with 5.0 TF\_J |
| 1.1.3.15 | 19/12/2022 | A. Negrea | Update with 5.0 TF\_G |
| 1.1.3.16 | 06/02/2023 | S. Dominte | NVP\_Init runnable added |
| 1.1.3.17  1.1.3.18  1.1.3.19 | 08/02/2023  14/02/2023  14/02/2023 | S. Dominte  T. Gligor  T. Gligor | Update after review  Update with new and missing TF\_E Requirements (R5.0)  Update missing TF\_E Requirement (R5.0) |
| 1.1.3.20 | 04/05/2023 | A. Negrea | Update with 6.0 blocks |
| 1.1.3.21 | 08/05/2023 | A. Negrea | Update after review. |
| 1.1.3.22 | 02/06/2023 | A. Negrea | Update prio of cycles |
| 1.1.3.23 | 19/06/2023 | A. Negrea | Update arch for R6.1 |
| 1.1.3.24 | 08/12/2023 | T.Gligor | Updates for R8.1 Release |

This document contains **18** pages.

**CONTENTS**

1. Documentation 5

1.1. Upper Level Relevant Documents 5

1.2. Design interface description Documents 6

1.3. Design Specification Documents 8

1.4. Tier2 Documents 9

1.5. HW Data 9

1.6. Other Documents 9

2. Glossary And Definition 10

3. Description 11

4. Technical functions 11

4.1. Automatic generation of EEPROM parameters 17

5. Runnables 17

5.1. NVP\_Init 17

5.1.1. Definition 17

5.1.2. Data flow / Parameters 17

6. MCU resources 18

**TABLE OF FIGURES**

[Figure 1 : NVP – Static diagram 11](#_Toc134457214)

# Documentation

## Upper Level Relevant Documents

This section presents all the documents needed to write the software architecture design document.

|  |  |  |  |
| --- | --- | --- | --- |
| **Nb.** | **Document** | **Reference** | **Company** |
|  | TF-A: To Manage the power supply | /RevAS/30\_DES\_Requirements/Technical Functions/  DES\_TF\_A\_To\_Manage\_The\_Power\_Supply | RBE/FCE |
|  | TF-B: To Manage the communication | /RevAS/30\_DES\_Requirements/Technical Functions/  DES\_TF\_B\_To\_Manage\_The\_Communication | RBE/FCE |
|  | TF-C: To Secure PP ECU functioning using Pictus MCU | /RevAS/30\_DES\_Requirements/Technical Functions/  DES\_TF\_C\_To\_Secure\_PP\_ECU\_Functioning\_Pictus | RBE/FCE |
|  | TF-D: To Program MCU | /RevAS/30\_DES\_Requirements/Technical Functions/DES\_TF\_D\_To\_Program\_MCU | RBE/FCE |
|  | TF-E: To Manage Diagnostic Requests | /RevAS/30\_DES\_Requirements/Technical Functions/DES\_TF\_E\_To\_Manage\_Diagnostic\_Requests | RBE/FCE |
|  | TF-F: To Perform Measurements | /RevAS/30\_DES\_Requirements/Technical Functions/DES\_TF\_F\_To\_Perform\_Measurements | RBE/FCE |
|  | TF-G: To Drive the Motor | /RevAS/30\_DES\_Requirements/Technical Functions/DES\_TF\_G\_To\_Drive\_the\_Motor | RBE/FCE |
|  | TF-H: To Perform Autotests | /RevAS/30\_DES\_Requirements/Technical Functions/DES\_TF\_H\_To\_Perform\_Autotests | RBE/FCE |
|  | TF-I: To Manage the Failure | /RevAS/30\_DES\_Requirements/Technical Functions/DES\_TF\_I\_To\_Manage\_The\_Failure | RBE/FCE |
|  | TF-J: To Manage NVM - NVP (Non Volatile Parameters) | /RevAS/30\_DES\_Requirements/Technical Functions/DES\_TF\_J\_To\_Manage\_NVM | RBE/FCE |
|  | TF-K: To Ensure ECU Protection and Integration | /RevAS/30\_DES\_Requirements/Technical Functions/DES\_TF\_K\_To\_Ensure\_ECU\_Protection\_And\_Integration | RBE/FCE |
|  | TF-L: To Ensure ECU Integration in Environment EMC ESD | /RevAS/30\_DES\_Requirements/Technical Functions/DES\_TF\_L\_To\_Ensure\_ECU\_Integration\_In\_Environment\_EMC\_ESD | RBE/FCE |
|  | TF-M: To generate time base | /RevAS/30\_DES\_Requirements/Technical Functions/DES\_TF\_M\_To\_Generate\_Time\_Base | RBE/FCE |
|  | TF-N: To evaluate belt data | /RevAS/30\_DES\_Requirements/Technical Functions/DES\_TF\_N\_To\_Evaluate\_Belt\_Data | RBE/FCE |
|  | TF-O: To schedule the SW | /RevAS/30\_DES\_Requirements/Technical Functions/DES\_TF\_O\_To\_Run\_SW | RBE/FCE |
|  | TF-P: To handle network management | /RevAS/30\_DES\_Requirements/Technical Functions/DES\_TF\_P\_To Handle\_Network\_Management | RBE/FCE |
|  | TF-Q: To Provide Data For Expertise | /RevAS/30\_DES\_Requirements/Technical Functions/DES\_TF\_Q\_To\_Provide\_Data\_For\_Expertise | RBE/FCE |
|  | TF-R: To Decide Belt Function Execution | /RevAS/30\_DES\_Requirements/Technical Functions/DES\_TF\_R\_To\_Decide\_Belt\_Function\_Execution | RBE/FCE |
|  | TF-S: To drive the boost | /RevAS/30\_DES\_Requirements/Technical Functions/DES\_TF\_S\_To\_Drive\_Boost | RBE/FCE |
|  | TF-X: To generate time base | /RevAS/30\_DES\_Requirements/Technical Functions/DES\_TF\_M\_To\_Generate\_Time\_Base | RBE/FCE |

## Design interface description Documents

This section presents all the documents that are linked to this software architecture design document.

Note: All links are related to S:\drive, to have them functional, please mount the S:\drive on your sandbox.

|  |  |  |  |
| --- | --- | --- | --- |
| **Nb** | **Document** | **Reference** | **Company** |
|  | EEPROM parameters | SBE\_4G\_NVP\_layout.xls | RBE/FCE |
|  | Design Interface description of AdcIf | N/A | RBE/FCE |
|  | Design Interface Description of Auto Tests Manager | [ATM-Design Interface Description.docx](ATM%20-%20Design%20Interface%20Description.docx) | RBE/FCE |
|  | Design Interface Description of Belt Function Decision | N/A | RBE/FCE |
|  | Design Interface Description of Belt Function Execution | [BFE - Design Interface Description.docx](file:///S:\Architectures\Application\Description\Associated_Documents\BFE%20-%20Design%20Interface%20Description%20.docx) | RBE/FCE |
|  | Design Interface Description of Belt Function Selection | [BFS - Design Interface Description.docx](file:///S:\Architectures\Application\Description\Associated_Documents\BFS%20-%20Design%20Interface%20Description%20.docx) | RBE/FCE |
|  | Design Interface Description of Belt Movement Monitoring | N/A | RBE/FCE |
|  | Design Interface Description of Belt Parking Algorithm | N/A | RBE/FCE |
|  | Design Interface Description of Belt Slack Reduction | [BSR - Design Interface Description.docx](file:///S:\Architectures\Application\Description\Associated_Documents\BFS%20-%20Design%20Interface%20Description%20.docx) | RBE/FCE |
|  | Design Interface Description of Basic Software Manager | N/A | RBE/FCE |
|  | Design Interface Description of Basic Software Manager Interface | N/A | RBE/FCE |
|  | Design Interface Description of Can Tranceiver Interface | N/A | RBE/FCE |
|  | Design Interface Description of Communication Interaction Layer | [CIL - Design Interface Description.docx](file:///S:\Architectures\Application\Description\Associated_Documents\CIL%20-%20Design%20Interface%20Description.docx) | RBE/FCE |
|  | Design Interface Description of Diagnostic Communication Manager Interface | N/A | RBE/FCE |
|  | Design Interface Description of Diagnostic Event Manager Interface | N/A | RBE/FCE |
|  | Design Interface Description of DiagOnCAN services management | [DIA - Design Interface Description.docx](file:///S:\Architectures\Application\Description\Associated_Documents\DIA%20-%20Design%20Interface%20Description.docx) | RBE/FCE |
|  | Design Interface Description of Electronic Control Unit Manager | N/A | RBE/FCE |
|  | Design Interface Description of Electronic Control Unit Manager Interface | N/A | RBE/FCE |
|  | Design Interface Description of End of life | [EOL - Design Interface Description.docx](file:///S:\Architectures\Application\Description\Associated_Documents\DIA%20-%20Design%20Interface%20Description.docx) | RBE/FCE |
|  | Design Interface Description of Error Handler | [ERH-Design Interface Description.docx](ERH%20-%20Design%20Interface%20Description.docx) | RBE/FCE |
|  | Design Interface Description of Haptic Warning | [HWA - Design Interface Description.docx](file:///S:\Architectures\Application\Description\Associated_Documents\DIA%20-%20Design%20Interface%20Description.docx) | RBE/FCE |
|  | Design Interface Description of Memory Integrity Control | N/A | RBE/FCE |
|  | Design Interface Description of Mode Management | [MMG - Design Interface Description.docx](file:///S:\Architectures\Application\Description\Associated_Documents\MMG%20-%20Design%20Interface%20Description.docx) | RBE/FCE |
|  | Design Interface Description of Network Management Interface | N/A | RBE/FCE |
|  | Design Interface Description of Non-Volatile Memory Interface | N/A | RBE/FCE |
|  | Design Interface Description of Non-Volatile Parameters | [NVP - Design Interface Description.docx](file:///S:\Architectures\Application\Description\Associated_Documents\NVP%20-%20Design%20Interface%20Description.docx) | RBE/FCE |
|  | Design Interface Description of Operating System Interface | N/A | RBE/FCE |
|  | Design Interface Description of Power Abstraction Layer | [PAL - Design Interface Description.docx](file:///S:\Architectures\Application\Description\Associated_Documents\PAL%20-%20Design%20Interface%20Description.docx) | RBE/FCE |
|  | Design Interface Description of Pre-Crash Master | N/A | RBE/FCE |
|  | Design Interface Description of Physical Measures Provider | [PMP - Design Interface Description.docx](file:///S:\Architectures\Application\Description\Associated_Documents\PMP%20-%20Design%20Interface%20Description.docx) | RBE/FCE |
|  | Design Interface Description of Port Interface | N/A | RBE/FCE |
|  | Design Interface Description of Pre Pre-Tensioning | [PRE - Design Interface Description.docx](file:///S:\Architectures\Application\Description\Associated_Documents\PMP%20-%20Design%20Interface%20Description.docx) | RBE/FCE |
|  | Design Interface Description of Production cycle function | N/A | RBE/FCE |
|  | Design Interface Description of Pulse Width Modulation Interface | N/A | RBE/FCE |
|  | Design Interface Description of Reset Cause Management | NA | RBE/FCE |
|  | Design Interface Description of SBC | N/A | RBE/FCE |
|  | Design Interface Description of System Context Management | N/A | RBE/FCE |
|  | Design Interface Description of Standard Function Recovery (releasing function) | [SFR - Design Interface Description.docx](file:///S:\Architectures\Application\Description\Associated_Documents\SFR%20-%20Design%20Interface%20Description.docx) | RBE/FCE |
|  | Design Interface Description of Serial Peripheral Interface Interface | N/A | RBE/FCE |
|  | Design Interface Description of Startup | N/A | RBE/FCE |
|  | Design Interface Description of System Time Management | N/A | RBE/FCE |
|  | Design Interface Description of Vehicle Dynamics algorithm | N/A | RBE/FCE |

## Design Specification Documents

This section presents all the documents that complete this software architecture design document.

Note: All links are related to S:\drive, to have them functional, please mount the S:\drive on your sandbox.

|  |  |  |  |
| --- | --- | --- | --- |
| **Nb** | **Document** | **Reference** | **Company** |
|  | Design document of AdcIf | N/A | RBE/FCE |
|  | Design document of Auto Tests Manager | [ATM - Detailed Design Document.docx](file:///S:\Architectures\Application\Description\Associated_Documents\BFE%20-%20Design%20Interface%20Description%20.docx) | RBE/FCE |
|  | Design document of Belt Function Decision | N/A | RBE/FCE |
|  | Design document of Belt Function Execution | [BFE - Detailed Design Document.docx](file:///S:\Architectures\Application\Description\Associated_Documents\BFE%20-%20Design%20Interface%20Description%20.docx) | RBE/FCE |
|  | Design document of Belt Function Selection | [BFS - Detailed Design Document.docx](file:///S:\Architectures\Application\Description\Associated_Documents\BFS%20-%20Design%20Interface%20Description%20.docx) | RBE/FCE |
|  | Design document of Belt Movement Monitoring | [BMM - Detailed Design Document.docx](file:///S:\Architectures\Application\Description\Associated_Documents\BFE%20-%20Design%20Interface%20Description%20.docx) | RBE/FCE |
|  | Design document of Belt Parking Algorithm | N/A | RBE/FCE |
|  | Design document of Basic Software Manager Interface | N/A | RBE/FCE |
|  | Design document of Communication Interaction Layer | [BSR - Detailed Design Document.docx](file:///S:\Architectures\Application\Description\Associated_Documents\BFS%20-%20Design%20Interface%20Description%20.docx) | RBE/FCE |
|  | Design document of Diagnostic Communication Manager Interface | [CIL - Detailed Design Document.docx](file:///S:\Architectures\Application\Description\Associated_Documents\CIL%20-%20Design%20Interface%20Description.docx) | RBE/FCE |
|  | Design document of Diagnostic Event Manager Interface | N/A | RBE/FCE |
|  | Design document of DiagOnCAN services management | [DIA - Detailed Design Document.docx](file:///S:\Architectures\Application\Description\Associated_Documents\DIA%20-%20Design%20Interface%20Description.docx) | RBE/FCE |
|  | Design document of End of life | [EOL - Detailed Design Document.docx](file:///S:\Architectures\Application\Description\Associated_Documents\BFS%20-%20Design%20Interface%20Description%20.docx) | RBE/FCE |
|  | Design document of Error Handler | [ERH - Detailed Design Document.docx](file:///S:\Architectures\Application\Description\Associated_Documents\BFS%20-%20Design%20Interface%20Description%20.docx) | RBE/FCE |
|  | Design document of Haptic Warning | N/A | RBE/FCE |
|  | Design document of Memory Integrity Control | [HWA - Detailed Design Document.docx](file:///S:\Architectures\Application\Description\Associated_Documents\BFS%20-%20Design%20Interface%20Description%20.docx) | RBE/FCE |
|  | Design document of Mode Management | N/A | RBE/FCE |
|  | Design document of Network Management Interface | [MMG - Detailed Design Document.docx](file:///S:\Architectures\Application\Description\Associated_Documents\MMG%20-%20Design%20Interface%20Description.docx) | RBE/FCE |
|  | Design document of Non-Volatile Memory Interface | N/A | RBE/FCE |
|  | Design document of Non-Volatile Parameters | SBE\_4G\_NVP\_layout.xls | RBE/FCE |
|  | Design document of Power Abstraction Layer | [NVP - Detailed Design Document.docx](file:///S:\Architectures\Application\Description\Associated_Documents\NVP%20-%20Design%20Interface%20Description.docx) | RBE/FCE |
|  | Design document of Physical Measures Provider | [PAL - Detailed Design Document.docx](file:///S:\Architectures\Application\Description\Associated_Documents\PAL%20-%20Design%20Interface%20Description.docx) | RBE/FCE |
|  | Design document of Port Interface | [PMP - Detailed Design Document.docx](file:///S:\Architectures\Application\Description\Associated_Documents\PMP%20-%20Design%20Interface%20Description.docx) | RBE/FCE |
|  | Design document of Production cycle function | N/A | RBE/FCE |
|  | Design document of Reset Cause Management | N/A | RBE/FCE |
|  | Design document of RTE If | [RCM - Detailed Design Document.docx](file:///S:\Architectures\Application\Description\Associated_Documents\PMP%20-%20Design%20Interface%20Description.docx) | RBE/FCE |
|  | Design document of System Context Management | N/A | RBE/FCE |
|  | Design document of Standard Function Recovery (releasing function) | N/A | RBE/FCE |
|  | Design document of Serial Peripheral Interface Interface | [SFR - Detailed Design Document.docx](file:///S:\Architectures\Application\Description\Associated_Documents\SFR%20-%20Design%20Interface%20Description.docx) | RBE/FCE |
|  |  | N/A |  |

## Tier2 Documents

This section presents all the documents that complete this software architecture design document.

|  |  |  |  |
| --- | --- | --- | --- |
| **Nb** | **Document** | **Reference** | **Company** |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

## HW Data

This section presents all the documents related to the HW components that complete this software architecture design document.

|  |  |  |  |
| --- | --- | --- | --- |
| **Nb** | **Document** | **Reference** | **Company** |
|  | Infineon-TLE9471-3ES datasheet | TLE9461-3ES-Infineon.pdf | Infineon |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

## Other Documents

This section presents all the documents that also have been needed to write this software architecture design document.

|  |  |  |  |
| --- | --- | --- | --- |
| **Nb** | **Document** | **Reference** | **Company** |
|  | Unified Modelling Language | 2.1.1 | OMG |

# Glossary And Definition

This section presents all the definitions and/or abbreviations used in this document.

*List of terms in alphabetical order:*

|  |  |
| --- | --- |
| ***Term*** | ***Meaning*** |
| ADC | Analog Digital Converter |
| AEC | Autoliv Error Code |
| API | Application Programming Interface |
| ASDM | Active Safety Domain Master |
| ASIC | Application Specific Integrated Circuit |
| ASY | Active SafetY |
| BSW | Basic SW modules |
| CAN | Controller Area Network |
| C/S | Chip Select |
| COP | Computer Operating Properly |
| eCPL | Electronic Crash Pole Locking |
| DART | Ditch - Airborne - Rough Terrain |
| DFLASH | Data FLASH |
| ECC | Error Code Correction |
| ECU | Electronic Control Unit |
| EOL | End Of Life |
| EEPROM | Electric Erasable and Programmable Read only Memory |
| HFPP | High Force Pre-Pre-Tensioning belt function |
| HF-PRE | High Force PRE pre-tensioning |
| HR | Hard Releasing |
| I/O | Input/Output |
| IMU | Inartial Measurements Unit |
| ISS | Integrated Safing System |
| LFPP | Low Force Pre-Pre-Tensioning belt function |
| MSA | Motor Start/Stop Automatic |
| MCAL | Micro-Controller Abstraction Layer |
| MCU | Micro-controller Unit |
| NMG | Mode ManaGement |
| NVM | Non Volatile Memory |
| OS | Operating System |
| PCM | Pre-Crash Master |
| PFLASH | Program FLASH |
| PIT | Periodic Interrupt Timer |
| PLL | Phase-locked loop |
| RAM | Random Access Memory |
| RCWM | Rear Collision Warning and Mitigation |
| RML | Left PP ECU |
| RMR | Right PP ECU |
| RMx | Both PP ECU |
| ROM | Read Only Memory |
| RSU | Remote Sensor Unit |
| RTE | Real Time Environment |
| RTOS | Real Time Operating System |
| SFR | Standard Function Recovery |
| SODL | Side Obstacle Detection Left |
| SPI | Serial Peripheral Interface |
| SRS | Supplementary Restraint System |
| TBC | To be confirmed |
| TBD | To be defined |
| TF | Technical Function |
| TFLASH | Test FLASH of the Pictus MCU (“one time programmable” memory) |
| W/D | Watchdog |

# Description

The purpose of the NVP SW unit is to provide an overview of the configured NVM blocks associated parameters.

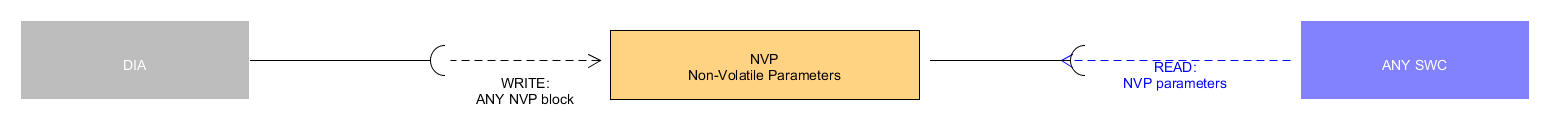


Figure : NVP – Static diagram

# Technical functions

|  |  |  |  |
| --- | --- | --- | --- |
| **Requirements** | **Criteria** | **Levels/Tolerances** | **Source** |
| ARCH\_SW\_NVP\_0000 | ***NVP\_BLOCK\_ID\_ECU\_LOCATION block***  shall be configured. Parameter NVP\_u8ECULocation should have 1byte with the following configuration:   * 0x9C: ECU Left side (default) * 0x99: ECU right side |  | ALV\_EXT\_TF\_J\_138 |
| ARCH\_SW\_NVP\_0001 | ***NVP\_BLOCK\_ID\_BELT\_ASSEMBLY\_MANUF\_DATE\_AND\_SN*** block shall be configured. Parameter NVP\_au8AssemblySerialNumber should have 28 bytes and should store belt assembly Serial Number written at ANG (default values 0xFF) |  | DAI\_EXT\_TF\_E\_80578; ALV\_EXT\_TF\_J\_132 |
| ARCH\_SW\_NVP\_0002 | ***NVP\_BLOCK\_ID\_HB\_CALIBRATION*** shall be configured to have the following parameters:   * NVP\_au16CalibADCRel 10 bytes; (default values : { 50; 137; 310; 1023; 1023 } ) * NVP\_au16CalibADCTens 10 bytes; (default values : { 51; 123; 264; 650; 1023} ) * NVP\_au16CurrentProbeRel 10 bytes; (default values : { 0; 1110; 2072; 7169; 7169 } ) * NVP\_au16CurrentProbeTens 10 bytes; (default values : { 0; 839; 1964; 5198; 8344} ) |  | DAI\_EXT\_TF\_R\_2380; DAI\_EXT\_TF\_R\_2381; DAI\_EXT\_TF\_R\_2383 |
| ARCH\_SW\_NVP\_0003 | ***NVP\_BLOCK\_ID\_AEE\_TRACEABILITY*** block shall be configured. Parameter NVP\_au8AeeTraceabilityNumber should have 12 bytes and should store AEE ECU Traceability number. (default values 0xFF) |  | DAI\_EXT\_TF\_E\_8105; ALV\_EXT\_TF\_J\_133 |
| ARCH\_SW\_NVP\_0004 | ***NVP\_BLOCK\_ID\_EXECUTION\_COUNTERS*** block shall be configured. Parameter NVP\_au32ExecutedCycleCounters should have 20 bytes and should store executed cycle counter.  Values:  {0x00000000  0x00000000  0x00000000  0x00000000  0x01} |  |  |
| ARCH\_SW\_NVP\_0005 | ***NVP\_BLOCK\_ID\_TESTS\_PARAM*** shall be configured to have the following parameters :   * NVP\_u32CheckMotorOrderMediumMaxDuration = 120 000 ms(4 bytes) * NVP\_u32MotorCurrentMediumMaxDuration = 120 000 ms (4 bytes) * NVP\_u32SWThermalProtectionValidationThrs = 160 000 AA(4 bytes) * NVP\_u32SWThermalProtectionDeskillingThrs = 32 000 AA (4 bytes) * NVP\_u16MotorCurrentHighResetTime = 300 ms (2 bytes) * NVP\_u16MotorCurrentMediumResetTime = 1000 ms (2 bytes) * NVP\_u16CheckMotorOrderHighMaxDuration = 2000 ms (2 bytes) * NVP\_u16MotorCurrentHighMaxDuration = 1200 ms (2 bytes) * NVP\_u16CheckMotorOrderHighResetTime = 100 ms (2 bytes) * NVP\_u16CheckMotorOrderMediumResetTime = 100 ms (2 byte ) * NVP\_u16CheckMotorOrderResetTime = 60 000 ms (2 bytes) * NVP\_u16MotorCurrentResetTime = 60 000 (2 bytes) * NVP\_u8MotorCurrentHighThrs = 25 A (1 byte) * NVP\_u8MotorCurrentMediumThrs = 10 A (1 byte) * NVP\_u8CheckMotorOrderHighThrs = 80% PWM (1 byte) * NVP\_u8CheckMotorOrderMediumThrs = 20% PWM (1 byte) |  | ALV\_EXT\_TF\_H\_341; ALV\_EXT\_TF\_H\_381 |
| ARCH\_SW\_NVP\_0006 | ***NVP\_BLOCK\_ID\_CYCLE\_0 – 34*** blocks should be configured. Parameter NVP\_au8BeltProfilesDefinitions should have 420 bytes.  NOTE: Cycles list:  ***Pre-Safe level 1 (Strong tensioning)***  ***Pre-Safe level 2 (Strong tensioning)***  ***Pre-Safe level 3 (Strong tensioning)***  ***Pre-Safe level 4 (Strong tensioning)***  ***Pre-Safe level 5 (Strong tensioning)***  ***Pre-Safe level 6 (Strong tensioning)***  ***Pre-Safe level 7 (Strong tensioning)***  ***Pre-Safe level 8 (Strong tensioning)***  ***Pre-Safe level 9 (Strong tensioning)***  ***Pre-Safe level 10 (Strong tensioning)***  ***Pre-Safe level 11 (Strong tensioning)***  ***Pre-Safe level 12 (Strong tensioning)***  ***Pre-Safe level 13 (Strong tensioning)***  ***Pre-Safe level 14 (Strong tensioning)***  ***Curve 1 (Smooth tensioning)***  ***Curve 2 (Smooth tensioning)***  ***Curve 3 (Smooth tensioning)***  ***Curve 4 (Smooth tensioning)***  ***Haptic 1-1 (Warning 1)***  ***Haptic 1-2 (Warning 1)***  ***Haptic 2-1 (Warning 2)***  ***Haptic 2-2 (Warning 2)***  ***Haptic 3-1 (Warning 3)***  ***Haptic 3-2 (Warning 3)***  ***Haptic 4-1 (Warning 4)***  ***Haptic 4-2 (Warning 4)***  ***BSR 1 (Comfort)***  ***BSR 2 (Comfort)***  ***BSR 3 (Comfort)***  ***Smooth Release***  ***Hard Release***  ***Backup Release***  ***Start-up Release***  ***ANG***  ***AEE*** |  | DAI\_EXT\_TF\_R\_2380; DAI\_EXT\_TF\_R\_2381; DAI\_EXT\_TF\_R\_2383; ALV\_EXT\_TF\_J\_136; ALV\_EXT\_TF\_H\_472;  DAI\_EXT\_TF\_E\_9970; DAI\_EXT\_TF\_J\_156;  DAI\_EXT\_TF\_J\_157 |
| ARCH\_SW\_NVP\_0017 | ***NVP\_BLOCK\_ID\_CYCLE\_5*** shall be configured with max duration of 5 sec and no following cycle. |  | DAI\_EXT\_TF\_J\_150; DAI\_EXT\_TF\_J\_152 |
| ARCH\_SW\_NVP\_0007 | ***NVP\_BLOCK\_ID\_STEP\_0 – 144*** blocks should be configured. Parameter NVP\_au8StepsDefinitions should have 1160 bytes. |  | DAI\_EXT\_TF\_R\_2380; DAI\_EXT\_TF\_R\_2381; DAI\_EXT\_TF\_R\_2383; ALV\_EXT\_TF\_J\_137; DAI\_EXT\_TF\_R\_2480; DAI\_EXT\_TF\_J\_156;  DAI\_EXT\_TF\_J\_157 |
| ARCH\_SW\_NVP\_0020 | ***Steps parameters shall be configured like :***   * ***Byte 4 = velocity control order type if***   ***0x02 = Velocity control order type enabled***  ***0x03 = Velocity control and PWM backup***  ***0x05 = velocity control and current backup***  ***0x06 = velocity control and Volatge backup***   * ***Byte 7 = velocity control order value [120 grades/s l 1200 grades/s]*** |  | DAI\_EXT\_TF\_G\_981; DAI\_EXT\_TF\_G\_982; DAI\_EXT\_TF\_G\_986; DAI\_EXT\_TF\_G\_987; DAI\_EXT\_TF\_G\_983; DAI\_EXT\_TF\_G\_984; DAI\_EXT\_TF\_G\_985 |
| ARCH\_SW\_NVP\_0021 | Velocity control regulation shall be used when the corresponding step order value has been set.Mean pat in speed shall be +-10% of what there has been condigured. |  | DAI\_EXT\_TF\_G\_973; DAI\_EXT\_TF\_G\_975; DAI\_EXT\_TF\_G\_976; DAI\_EXT\_TF\_G\_983; DAI\_EXT\_TF\_G\_984; DAI\_EXT\_TF\_G\_985; DAI\_EXT\_TF\_G\_967; DAI\_EXT\_TF\_G\_977 |
| ARCH\_SW\_NVP\_0011 | ***NVP\_BLOCK\_ID\_WARM\_RESET*** shall be used to store last warm reset cause and counter. {  NVP\_u32WarmResetCause – 4 bytes; NVP\_u32WarmResetCounter – 4 bytes } |  | ALV\_EXT\_TF\_J\_134; ALV\_EXT\_TF\_J\_135 |
| ARCH\_SW\_NVP\_0012 | ***NVP\_BLOCK\_ID\_MEASUREMENT\_FRAME\_CONFIG*** shall be used to configure measurement frames blocks. Following parameters have to be configured:  - NVP\_u8MeasFrameTiming 1 byte;  - NVP\_au8MeasFrameBlockConfig[3] 1 byte; |  | ALV\_EXT\_TF\_J\_142; ALV\_EXT\_TF\_J\_143; |
| ARCH\_SW\_NVP\_0010 | ***CALIB\_BLOCK\_ID\_BFS\_PRIO\_PARAM*** will contain the priority for the belt cycles :{  ***03 Pre-Safe level 1 (Strong tensioning)***  ***03 Pre-Safe level 2 (Strong tensioning)***  ***03 Pre-Safe level 3 (Strong tensioning)***  ***03 Pre-Safe level 4 (Strong tensioning)***  ***00 Pre-Safe level 5 (Strong tensioning)***  ***00 Pre-Safe level 6 (Strong tensioning)***  ***00 Pre-Safe level 7 (Strong tensioning)***  ***00 Pre-Safe level 8 (Strong tensioning)***  ***00 Pre-Safe level 9 (Strong tensioning)***  ***00 Pre-Safe level 10 (Strong tensioning)***  ***00 Pre-Safe level 11 (Strong tensioning)***  ***00 Pre-Safe level 12 (Strong tensioning)***  ***00 Pre-Safe level 13 (Strong tensioning)***  ***00 Pre-Safe level 14 (Strong tensioning)***  ***03 Curve 1 (Smooth tensioning)***  ***00 Curve 2 (Smooth tensioning)***  ***00 Curve 3 (Smooth tensioning)***  ***00 Curve 4 (Smooth tensioning)***  ***03 Haptic 1-1 (Warning 1)***  ***02 Haptic 1-2 (Warning 1)***  ***03 Haptic 2-1 (Warning 2)***  ***02 Haptic 2-2 (Warning 2)***  ***03 Haptic 3-1 (Warning 3)***  ***02 Haptic 3-2 (Warning 3)***  ***03 Haptic 4-1 (Warning 4)***  ***02 Haptic 4-2 (Warning 4)***  ***08 BSR 1 (Comfort)***  ***00 BSR 2 (Comfort)***  ***00 BSR 3 (Comfort)***  ***04 Smooth Release***  ***04 Hard Release***  ***04 Backup Release***  ***04 Start-up Release***  ***00 ANG***  ***00 AEE***  ***00 'Unused***  ***00 'Unused***  ***00 'Unused*** |  | DAI\_EXT\_TF\_R\_2533; DAI\_EXT\_TF\_R\_2610; |
| ARCH\_SW\_NVP\_0013 | Temperature compensaton tables should be stored:   * ***CALIB\_BLOCK\_ID\_WEIGHT\_TENS0\_TABLE*** * ***CALIB\_BLOCK\_ID\_WEIGHT\_TENS1\_TABLE*** * ***CALIB\_BLOCK\_ID\_WEIGHT\_TENS2\_TABLE*** * ***CALIB\_BLOCK\_ID\_WEIGHT\_TENS3\_TABLE***   -40°C (0x0000) 1.75 (0x70)  -25°C (0x0071) 1.234375 (0x4F)  -5°C (0x0109) 1.09375 (0x46)  30°C (0x01FC)) 1.046875 (0x43)  55°C (0x02D0) 1 (0x40)  77°C (0x0377) 1.046875 (0x43)  85°C (0x03B4) 1.09375 (0x46)  Note:  Temp[°C] = Raw \* 0.1318359375 - 40  Fact |  | ALV\_EXT\_TF\_J\_139; ALV\_EXT\_TF\_J\_140; ALV\_EXT\_TF\_J\_141;  ALV\_EXT\_TF\_J\_149; |
| ARCH\_SW\_NVP\_0014 | EOL counters should be defined as follows:   * ***NVP\_u32ComfortCyclesEOLThrs =60 000*** * ***NVP\_u32LowForceEOLThrs = 10 000*** * ***NVP\_u32HighForceEOLThrs = 1 500*** * ***NVP\_u32MaxForceEOLThrs = 50.*** |  | DAI\_EXT\_TF\_J\_145; DAI\_EXT\_TF\_J\_146; DAI\_EXT\_TF\_J\_147; DAI\_EXT\_TF\_J\_148 |
| ARCH\_SW\_NVP\_0015 | NVP\_BLOCK\_ID\_PRE\_SAFE\_RECORDER\_1 should be defined as follows:  NVP\_au8PreSafeRecorderStart[2];  NVP\_au8LocalVoltageStart[1];  NVP\_au8EcuTemperatureStart[2];  NVP\_au8SystemTimeStart[5];  NVP\_au8PreSafeRecorderStop[2];  NVP\_au8LocalVoltageStop[1];  NVP\_au8EcuTemperatureStop[2];  NVP\_au8SystemTimeStop[5];  NVP\_au8PreSafeRecorderState[2];  Total size of the Block = 22 bytes. |  | DAI\_EXT\_TF\_E\_9838; DAI\_EXT\_TF\_E\_9829; DAI\_EXT\_TF\_E\_9839; DAI\_EXT\_TF\_E\_9840; DAI\_EXT\_TF\_E\_9841; DAI\_EXT\_TF\_E\_9842; DAI\_EXT\_TF\_E\_9843; DAI\_EXT\_TF\_E\_9844; DAI\_EXT\_TF\_E\_9845; DAI\_EXT\_TF\_E\_9846; DAI\_EXT\_TF\_E\_9847; DAI\_EXT\_TF\_E\_9848; DAI\_EXT\_TF\_E\_9849; DAI\_EXT\_TF\_E\_9850; DAI\_EXT\_TF\_E\_9851; DAI\_EXT\_TF\_E\_9852; DAI\_EXT\_TF\_E\_9853; DAI\_EXT\_TF\_E\_9854; DAI\_EXT\_TF\_E\_9855; DAI\_EXT\_TF\_E\_9856; DAI\_EXT\_TF\_E\_9857; DAI\_EXT\_TF\_E\_9858; DAI\_EXT\_TF\_E\_9859; DAI\_EXT\_TF\_E\_9860; DAI\_EXT\_TF\_E\_9861; DAI\_EXT\_TF\_E\_9862; DAI\_EXT\_TF\_E\_9863; DAI\_EXT\_TF\_E\_9864; DAI\_EXT\_TF\_E\_9865; DAI\_EXT\_TF\_E\_9866; DAI\_EXT\_TF\_E\_9867; DAI\_EXT\_TF\_E\_9868; DAI\_EXT\_TF\_E\_9869; DAI\_EXT\_TF\_E\_9870; DAI\_EXT\_TF\_E\_10259; DAI\_EXT\_TF\_E\_10261 |
| ARCH\_SW\_NVP\_0016 | NVP\_BLOCK\_ID\_PRE\_SAFE\_RECORDER\_2 should be defined as follows: NVP\_au8PreSafeRecorderStart[2];  NVP\_au8LocalVoltageStart[1];  NVP\_au8EcuTemperatureStart[2];  NVP\_au8SystemTimeStart[5];  NVP\_au8PreSafeRecorderStop[2];  NVP\_au8LocalVoltageStop[1];  NVP\_au8EcuTemperatureStop[2];  NVP\_au8SystemTimeStop[5];  NVP\_au8PreSafeRecorderState[2];  Total size of the Block = 22 bytes. |  | DAI\_EXT\_TF\_E\_9871; DAI\_EXT\_TF\_E\_9872; DAI\_EXT\_TF\_E\_9873; DAI\_EXT\_TF\_E\_9874; DAI\_EXT\_TF\_E\_9875; DAI\_EXT\_TF\_E\_9876; DAI\_EXT\_TF\_E\_9877; DAI\_EXT\_TF\_E\_9878; DAI\_EXT\_TF\_E\_9879; DAI\_EXT\_TF\_E\_9880; DAI\_EXT\_TF\_E\_9881; DAI\_EXT\_TF\_E\_9882; DAI\_EXT\_TF\_E\_9883; DAI\_EXT\_TF\_E\_9884; DAI\_EXT\_TF\_E\_9885; DAI\_EXT\_TF\_E\_9886; DAI\_EXT\_TF\_E\_9887; DAI\_EXT\_TF\_E\_9888; DAI\_EXT\_TF\_E\_9889; DAI\_EXT\_TF\_E\_9890; DAI\_EXT\_TF\_E\_9891; DAI\_EXT\_TF\_E\_9892; DAI\_EXT\_TF\_E\_9893; DAI\_EXT\_TF\_E\_9894; DAI\_EXT\_TF\_E\_9895; DAI\_EXT\_TF\_E\_9896; DAI\_EXT\_TF\_E\_9897; DAI\_EXT\_TF\_E\_9898; DAI\_EXT\_TF\_E\_9899; DAI\_EXT\_TF\_E\_9900; DAI\_EXT\_TF\_E\_9901; DAI\_EXT\_TF\_E\_9902; DAI\_EXT\_TF\_E\_9903; DAI\_EXT\_TF\_E\_9904; DAI\_EXT\_TF\_E\_10262; DAI\_EXT\_TF\_E\_10263 |
| ARCH\_SW\_NVP\_0018 | ***NVP\_BLOCK\_ID\_VELOCITY\_PID\_PARAM*** shall be stored |  | DAI\_EXT\_TF\_J\_153; DAI\_EXT\_TF\_G\_977; DAI\_EXT\_TF\_G\_987 |
| ARCH\_SW\_NVP\_0019 | Power degradation table shall be stored : ***CALIB\_BLOCK\_ID\_POWER\_DEGRADATION***  Voltage Factor  8.95V (0x22F6) 0.835 (0x6B)  9V (0x2328) 0.835 (0x6B)  9.6V (0x2580) 0.89 (0x72)  10.2V (0x27D8) 0.945 (0x79)  10.8V (0x2A30) 1 (0x80)  13V (0x32C8) 1 (0x80)  Note:  Voltage[mV] = Raw \* 1mV  Factor |  | DAI\_EXT\_TF\_J\_151 |
| ARCH\_SW\_NVP\_0023 | ***CALIB\_BLOCK\_ID\_VEHICLE\_EQUIPMENT\_RomBlockData*** shall be used to store the vehicle equipment default data {  1 byte - NVP\_u8VehEquipFirstByte;  1 byte - NVP\_u8VehEquipSecondByte;  1 byte - NVP\_u8VehEquipThirdByte;  1 byte - NVP\_u8VehEquipFourthByte;  2 byte - NVP\_u16VehEquipmentUVAbort;  2 byte - NVP\_u16VehEquipmentUV;  2 byte - NVP\_u16VehEquipmentOVAbort;  2 byte - NVP\_u16VehEquipmentOV;  4 byte - NVP\_u32VehEquipPreSafeCycleAct;  } |  | DAI\_EXT\_TF\_E\_10223; DAI\_EXT\_TF\_E\_9516; DAI\_EXT\_TF\_E\_9514; DAI\_EXT\_TF\_E\_9512; DAI\_EXT\_TF\_E\_9510; DAI\_EXT\_TF\_E\_9509; DAI\_EXT\_TF\_E\_9508; DAI\_EXT\_TF\_E\_9507; DAI\_EXT\_TF\_E\_9506; DAI\_EXT\_TF\_E\_9505; DAI\_EXT\_TF\_E\_9504; DAI\_EXT\_TF\_E\_9503; DAI\_EXT\_TF\_E\_9502; DAI\_EXT\_TF\_E\_9501; DAI\_EXT\_TF\_E\_9500; DAI\_EXT\_TF\_E\_9499; DAI\_EXT\_TF\_E\_9498; DAI\_EXT\_TF\_E\_9497; DAI\_EXT\_TF\_E\_9496; |
| ARCH\_SW\_NVP\_0024 | ***NVP\_BLOCK\_ID\_CYCLE\_DELAYS\_MB*** shall be used with the following parameters:  ***NVP\_u16TimeoutPresafe5 = 0x1F4***  ***NVP\_u8PRESAFEAccelerationTimeout = 0x1E***  ***NVP\_u8Haptic1AccelerationTimeout = 0x1E***  ***NVP\_u8APIAccelerationTimeout = 0x1E***  ***NVP\_u8AfterBuckle = 0x14***  ***NVP\_u8AfterMd = 0x02***  ***NVP\_u8PwtDelay = 0x14***  ***NVP\_u8BSR1AccelerationTimeout = 0x1E*** |  | DAI\_EXT\_TF\_J\_156;  DAI\_EXT\_TF\_J\_157 |
| ARCH\_SW\_NVP\_0025 | ***NVP\_BLOCK\_ID\_HAPTIC\_CONFIG\_MB*** shall be used with the following parameters:  ***NVP\_u16DurationHaptic1 = 0x3E8***  ***NVP\_u16DurationHaptic2 = 0x3E8***  ***NVP\_u16DurationHaptic3 = 0x3E8***  ***NVP\_u16DurationHaptic4 = 0x3E8***  ***NVP\_u8HapticType = 0x00*** |  | DAI\_EXT\_TF\_J\_156;  DAI\_EXT\_TF\_J\_157 |
| ARCH\_SW\_NVP\_0026 | ***NVP\_BLOCK\_ID\_EOL\_MAPPING\_MB shall be used with the following parameters:***  ***NVP\_uAssociatedCounter = 0x0111111100000000000000***  ***NVP\_u8AssociatedCounterBSR = 0x00*** |  |  |
| ARCH\_SW\_NVP\_0027 | Based on structure ***NVP\_stVehicleEquipmentData*** with parameters:   * ***ReleaseOutOfMemory:*** * ***BSROutOfMemory*** * ***PreSafeOutOfMemory***   Blocks ***NVP\_BLOCK\_ID\_STEP\_0 – 144/ NVP\_BLOCK\_ID\_CYCLE\_0 – 34 / NVP\_BLOCK\_ID\_CYCLE\_DELAYS\_MB / NVP\_BLOCK\_ID\_HAPTIC\_CONFIG\_MB / NVP\_BLOCK\_ID\_EOL\_MAPPING\_MB***  can be used from   * ***EEPROM*** Varint coding services (0x0300; 0x0301; 0x0302) * ***ROM*** default , internal services (0xFD10) |  | DAI\_EXT\_TF\_J\_156;  DAI\_EXT\_TF\_J\_157 |
| ARCH\_SW\_NVP\_0028 | ***NVP\_BLOCK\_ID\_CAN\_INPUT\_SIGNALS shall be used with***   * ***NVP\_u8BeltSlkDecMode = 0x01*** * ***NVP\_u8SteeringWheelConfig = 0x01*** |  | DAI\_EXT\_TF\_B\_2309; DAI\_EXT\_TF\_B\_2157; DAI\_EXT\_TF\_J\_160; DAI\_EXT\_TF\_J\_162 |
| ARCH\_SW\_NVP\_0029 | ***System Context NVP\_BLOCK\_ID\_SYSTEM\_CONTEXT\_0 will be saved with the following info:***   * System Time * DeficiencyLevel * KL30 Lost * Executed Cycle * CPL Status * SystemContextChecksum |  | DAI\_EXT\_TF\_J\_158 |
|  |  |  |  |

NVP is first intended to totally hide the HW memory design. It means, the rest of the application will use only one SW interfaces (functions and macro) to access to all NVM parameters without knowing where the parameter is stored.

For that, NVP will propose different possibilities to access to the NVM parameters:

* **Direct access**, like accessing to usual SW data (based on cache memory use)
* Access block per block in non-volatile memory
* Access per address in non-volatile memory

The appropriate access will be selected by the SW unit depending on the needs:

* **Direct access** will be preferred for reading parameters but also for writing parameters (in cache memory) for which the storage can be done during the ECU shutdown
* Other access types will be preferred to directly read/write/erase in non-volatile memory

Futhermore, NVP will provide some services to synchronize the non-volatile and cache memories (in 1 call):

* “ReadAll” to load EEPROM parameters in memory cash
* “WriteAll” to record memory cash content in EEPROM

Finally, other services will also be provided to get information about parameters (characteristics, access status…). Refer to the following sub-sections for more details.

## Automatic generation of EEPROM parameters

Part of the NVP SW unit implementation will be automatically generated using a local method (based on excel file) .

By this way, all parameters located in a non-volatil memory will be specified and the associated binary and coding files will be automatically generated.

|  |  |  |  |
| --- | --- | --- | --- |
| **Requirements** | **Criteria** | **Levels/Tolerances** | **Source** |
| ARCH\_SW\_NVP\_0008 | The NVP configuration tool (excel file) shall allow specifying the EEPROM file version. |  |  |
| ARCH\_SW\_NVP\_0009 | The NVP configuration tool (excel file) shall manage the EEPROM memory clustering (using watermarks). |  |  |
| ARCH\_SW\_NVP\_00010 | The NVP configuration tool (excel file) shall allow specifying which blocks must be programmed |  |  |

# Runnables

## NVP\_Init

### Definition

|  |  |  |  |
| --- | --- | --- | --- |
| **Prototype** | | | |
| void NVP\_Init (void) | | | |
| **Object** | | | |
| NVP init function will be called periodicaly to check if vehicle equipment configuration data was written | | | |
| **Parameters** | | | |
| Name | Type | Direction | Description |
| NA | NA | NA | NA |
| **Returned value** | | | |
| Name | Description | | |
| NA | NA | | |
| **Dynamic aspect** | | | |
| Called every 10 ms | | | |
| **Requirements** | | | |
| ARCH\_SW\_NVP\_0022; | | | |

### Data flow / Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Requirements** | **Criteria** | **Levels/Tolerances** | **Source** |
| ARCH\_SW\_NVP\_0022 | If Vehicle Equipment Configuration Data has not valid data the default data from CALIB\_BLOCK\_ID\_VEHICLE\_EQUIPMENT\_RomBlockData block will be used instead. | CALIB\_BLOCK\_ID\_VEHICLE\_EQUIPMENT\_RomBlockData NVM block data shall be used. |  |

# MCU resources

The following requirements on resource consumption objectives apply to the module/package:

|  |  |  |  |
| --- | --- | --- | --- |
| **Requirements** | **Criteria** | **Levels/Tolerances** | **Source** |
| ARCH\_SW\_NVP\_9997 | The ROM size consumed by this component shall not exceed 7.5K bytes. |  |  |
| ARCH\_SW\_NVP\_9998 | The heap size consumed by this component shall not exceed 3K bytes. |  |  |