|  |
| --- |
| OBC Assembly Procedure |
| ISIS-TVL2-PRC-0001 |
|  |
| Version: 1.0 |
| CI Number: SS-001-003-001 |
| DRL ID: N/A |

Release Information

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Name | Function | Signature | Date |
| Prepared by: | C. Vos (CVOS) | SAIT Engineer |  |  |
| Reviewed by: | H. Santos (HSAN) | SAIT Engineer |  |  |
| Approved by: | G. Ferreira (GFER) | QA/PA Engineer |  |  |
| Authorized by: |  |  |  |  |

Assembly Execution Information

|  |  |  |  |
| --- | --- | --- | --- |
| **IOBC\_MB**  Serial Nr = | | **IOBC\_DB**  Model = IMU  Serial Nr = | |
| Allocated to WO = \_\_\_\_\_ | | | |
|  | Name (Initials) | Date | Signature |
| Performed by: |  |  |  |
| Peer-Reviewed by |  |  |  |
| QA inspection by: |  |  |  |

Distribution List

|  |  |  |
| --- | --- | --- |
| Name | Organization | Description |
| N/A | ISISPACE | Innovative Solutions In Space B.V. |

Disclaimer

The contents of this document are subject to the relevant provisions in the contract concluded between the parties. ISISPACE Group (“ISISPACE”) shall not be liable, in full or in part, for any damage arising out from the application or use of any product or circuit described herein, in case such application or use are carried out in a manner not in line with the instructions and warranties provided in the User Manual, Safety Manual, product information sheets or any other document provided by ISISPACE upon the delivery of the product (“Documents”). Further, ISISPACE shall not be liable for any damage caused by any use which exceeds the function(s) of the product, or does not conform to such function(s) as described in the Documents. ISISPACE shall not be liable for any damage arising from a use which is not carried out in a manner conforming to acceptable practices in the aerospace industry.

ISISPACE warrants that the product is supplied after relevant tests had shown the product is in good order and functioning, as far as these tests may indicate and predict product functionality.

Change Log

|  |  |  |  |
| --- | --- | --- | --- |
| Version | Date | Affects | Description |
| 1.0 | 2024-11-15 | All | First Version |

**Table of Contents**

[1 Introduction 5](#_Toc182583185)

[1.1 IOBC MB and DB background information 5](#_Toc182583186)

[1.1.1 General description 5](#_Toc182583187)

[1.2 Applicable Documents 6](#_Toc182583188)

[1.3 Reference Documents 6](#_Toc182583189)

[2 Required hardware 7](#_Toc182583190)

[2.1 Bill of Materials 7](#_Toc182583191)

[2.2 Special tools 7](#_Toc182583192)

[2.3 Consumables 7](#_Toc182583193)

[3 Assembly preparations 8](#_Toc182583194)

[3.1 Wearing PPE 8](#_Toc182583195)

[3.2 Cleaning components 8](#_Toc182583196)

[3.3 Inspecting components 8](#_Toc182583197)

[3.4 Storing Photos 8](#_Toc182583198)

[4 Assembly Procedure 9](#_Toc182583199)

[4.1 IOBC Motherboard and Daughterboard Assembly 9](#_Toc182583200)

[4.2 Torque and Epoxy application 10](#_Toc182583201)

[5 QA Inspection 12](#_Toc182583202)

[6 Procedure Variation Log 13](#_Toc182583203)

Figures

**No table of figures entries found.**

Tables

[Table 1‑1 Applicable Documents 7](#_Toc182583180)

[Table 1‑2 Reference Documents 7](#_Toc182583181)

[Table 3 - Bill of Materials (BOM) 8](#_Toc182583182)

[Table 4 - Special tools 8](#_Toc182583183)

[Table 5 - Consumables 8](#_Toc182583184)

Acronyms

|  |  |
| --- | --- |
| Name | Description |
| IOBC | ISISPACE On Board Computer |
| DB | Daughterboard |
| MB | Motherboard |
| PPE | Personal Protective Equipment |

# Introduction

This document describes the various steps required to assemble a IOBC Motherboard (MB) with a IOBC Daughterboard (DB).

**NOTE:** this procedure always must be performed by two persons. One person leads the execution of the procedures and the second person assists in the procedures by handing tools and equipment, taking photos, and filling in the paperwork. This second person must be focused on the activities as described in this procedure and not be preoccupied with any other activities.

**NOTE**: The images and instructions provided throughout this document are meant as a convenience to facilitate the test activities, but in any case, they do not supersede the information contained in the documentation provided with the different units that constitute the platform. In case of doubt, please refer to the relevant documentation.

## IOBC MB and DB background information

### General description

The IOBC MB is a CubeSat standard compatible On-Board Computer designed specifically for use in Nanosatellites. It provides a large variety of interfacing options as well as processing capability while still being very power efficient.

At the same time, an IOBC DB is plugged together with the IOBC MB to allow the user a great degree of flexibility. The daughterboard design is quite flexible and can be built to match different applications while keeping the motherboard the same. This allows customers to add additional interfacing capabilities as required for their application. The daughterboard also provides additional fan-out area for connectors.

## Applicable Documents

The table below contains documents which applicability is required. The contents of the present document follow the standards, guidelines and requirements here mentioned.

Table 1‑1 Applicable Documents

|  |  |  |
| --- | --- | --- |
| **Reference** | **Name** | **Version** |
| ISIS.ISIS-OBC.DS.01 | ISIS-OBC Datasheet | 1.3 |

## Reference Documents

The table below contains documents that are not fully applicable and will provide supplementary information relevant for the present document.

Table 1‑2 Reference Documents

|  |  |  |
| --- | --- | --- |
| Reference | Name | Version |
| --- | --- | --- |

# Required hardware

## Bill of Materials

Table 3 - Bill of Materials (BOM)

| UID | Manufacturer Code | Description | Quantity | Check |
| --- | --- | --- | --- | --- |
| UID201871 | ISIS.iOBC.1.1.003.A | IOBC Threaded Spacer 10mm | 4 |  |
| UID200341 | 7985TXA20020004 | M2x4mm Pan Screw | 8 |  |
| UID200296 | 125A00A20020000 | M2 Washer | 8 |  |

## Special tools

Table 4 - Special tools

| Tool | Remark | Check |
| --- | --- | --- |
| Adjustable Torque Screwdriver | 0.30 Nm. Example: A.301MT (T6 torx bit) |  |

## Consumables

Table 5 - Consumables

| Tool | Remark | Check |
| --- | --- | --- |
| Epoxy | Example: Scotch-Weld DP2216 Epoxy adhesive gray duo-pak cartdrige |  |
| Cocktail sticks | To mix the epoxy base and accelerator |  |
| Plastic Pallet | Example: AMI 338804 (17,5 cm diameter) |  |

# Assembly preparations

## Wearing PPE

It is very important that you wear the proper PPE’s while performing this task. Listed below are the required PPEs for this effort.

* ESD Wristband (mandatory)
* Gloves (mandatory)
* Lab-coat (as required by lab area cleanliness regulations)
* Hair-cover (as required by lab area cleanliness regulations)
* Shoe-cover (as required by lab area cleanliness regulations)
* Beard cover (as applicable)
* Face mask (as applicable)

## Cleaning components

Before you start working clean your workbench with alcohol wipes and check the ESD connection between your workbench and the socket in the wall.

All components should reach you cleaned and correct. However, there could be situations where you do have to clean hardware. For instance, think about the fasteners. Should you receive fasteners direct from storage, make sure you clean them proper in the ultrasonic alcohol bath before you use them.

Every time you need to walk away from your workbench, make sure it is clean and tidy and that the hardware is left protected and in a safe condition.

## Inspecting components

When receiving hardware, always be sure to perform a rough visual check to see if anything stands out from the rest. Should you encounter non-compliant hardware, take the following actions:

* Notify the work-prepper, planner, or team-lead of the issue.
* Start a Redmine issue (either a PR, problem report, or an NCR, Non Conformance Report) to register the problem when applicable.
* Discuss the options for the use of spare or replacement parts with the PM when applicable.

## Storing Photos

During the assembly of the IOBC Motherboard + Daughterboard, it is required to take photos before the assembly, in between significant steps, and after the assembly. These photos are used for QA purposes and for future reference.

# Assembly Procedure

|  |
| --- |
| NOTE 1: Only use QA approved items |
| NOTE 2: Only trained personnel can work on the activities described in this document. |
| NOTE 3: Take photos of the hardware in between every significant step of the procedure, as indicated by the text. |

## IOBC Motherboard and Daughterboard Assembly

|  |
| --- |
|  |

| Step | Part Reference (in the figure) | Description | Check |
| --- | --- | --- | --- |
|  | 1, 2, 3, and 4 | Insert the M2x4mm pan screws (part 1) together with the M2 washers (part 2) in the IOBC Motherboard mounting holes (the rounded side of the washers shall face to the board) on the SD cards side while at the same time into the IOBC Threaded Spacers (part 4) on the other side of the IOBC Motherboard |  |
|  | 3 and 5 | Plug the IOBC Daughterboard (part 5) into the IOBC Motherboard (part 3) |  |
|  | 6 and 7 | Insert the M2x4mm pan screws (part 6) together with the M2 washers (part 7) in the IOBC Daughterboard mounting holes (the rounded side of the washers shall face to the board) while at the same time into the IOBC Threaded Spacers (part 4) on the other side of the IOBC Daughterboard |  |
| Notes/Deviations | | | |
|  | | | |

## Torque and Epoxy application

|  |
| --- |
|  |

| Step | Part Reference (in the figure) | Description | Check |
| --- | --- | --- | --- |
|  | 1 | Torque (0.30Nm) the 4x fasteners on the Daughterboard side. |  |
|  | 2 | Torque (0.30Nm) the 4x fasteners on the Motherboard side  and store them in the following folder: |  |
|  | 1 | Epoxy the 4x fasteners on the Daughterboard side. |  |
|  | 2 | Epoxy the 4x fasteners on the Motherboard side. |  |
|  | 1 and 2 | Take high resolution pictures of the epoxied fasteners and store them in the project folder created following the requirements in section 3.4 |  |
|  | 1 and 2 | Place the sub-assembly in an ESD bag and place the bag in the appropriate Useful Plastic Box used in the project |  |

|  |
| --- |
| Notes/Deviations |
|  |

# QA Inspection

| Step | QA Initials | Description | Pass/Fail | Check |
| --- | --- | --- | --- | --- |
|  |  | Is this procedure filled in correctly? | Pass/Fail |  |
|  |  | Were the processes followed as mentioned in this manual? | Pass/Fail |  |
|  |  | General inspection of the assembly:  Does anything stand out and requires further inspections? Yes/No | Pass/Fail |  |
|  |  | Is the assembly ready for use in the subsequent AIT activity? | Pass/Fail |  |

# Procedure Variation Log

The following table shall be used to log all variations with respect to the original procedure. Please provide as much information as possible regarding the nature and cause of the change. Add pages as required.

| PV # | Section / Page / Step affected | Description | Reason for deviation | Initiated by (Initials) | QA Sign off |
| --- | --- | --- | --- | --- | --- |
| …… | …… | …… | …… | …… | …… |
| …… | …… | …… | …… | …… | …… |
| …… | …… | …… | …… | …… | …… |
| …… | …… | …… | …… | …… | …… |
| …… | …… | …… | …… | …… | …… |
| …… | …… | …… | …… | …… | …… |
| …… | …… | …… | …… | …… | …… |