|  |
| --- |
| Platform Harness Integration  Insert here the name of the project. |
| ISIS-TVL2-PRC-0004 |
|  |
| Version: 1.0 |
| CI Number: N/A |
| DRL ID: N/A |

Release Information

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Name | Function | Signature | Date |
| Prepared by: | C. Vos (CVOS) | SAIT Engineer |  |  |
| Reviewed by: | H. Santos (HSAN) |  |  |  |
| Approved by: | G. Coronel (GCOR) | SAIT Engineer |  |  |
| Authorized by: |  |  |  |  |

Execution Information

|  |  |  |  |
| --- | --- | --- | --- |
| Project = Insert here the name of the project.  WO = Insert here the number of the work order. | | | |
|  | Name (Initials) | Date | Signature |
| Performed by: |  |  |  |
| Peer-Reviewed by |  |  |  |
| QA inspection by: |  |  |  |

Distribution List

|  |  |  |
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Change Log

|  |  |  |  |
| --- | --- | --- | --- |
| Version | Date | Affects | Description |
| 1.0 | 2024-11-15 | All | First Version based on ISIS-1UPLT-PRC-0001 |

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Acronyms

| Name | Description |
| --- | --- |
| ABF | Apply Before Flight |
| ANTS1 | ISISPACE Antenna Subsystem (version 1) |
| CSKB | CubeSat Kit Bus |
| DB | IOBC Daughterboard |
| ESD | Electrostatic Discharge |
| GSE | Ground Support Equipment |
| ICEPS2 | ISISPACE Compact Electric Power System (version 2) |
| IOBC | ISISPACE On Board Computer |
| MGSE | Mechanical Ground Support Equipment |
| MMCX | Micro Miniature Coaxial connector |
| PCB | Printed Circuit Board |
| PLT | Platform |
| RX | Receiver |
| SAIT | System Assembly, Integration, and Test |
| STA1U | Stack Integration 1U Support Jig |
| STS | ISISPACE Structure |
| TRXVU | ISISPACE Transmiter/Receiver VHF/UHF |
| TX | Transmitter |

# Introduction

This document concerns the standard **1U platform**. This document contains the procedure to connect the harnesses of this platform.

The procedure is performed without payload. The connection of customer’s payload harnesses needs to be prepared by the customer itself as part of their satellite integration plan.

## 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 - Applicable Documents

|  |  |  |
| --- | --- | --- |
| **Reference** | **Name** | **Version** |
| ISIS-1UPLT-PLN-001 | 1U CubeSat Platform SAIT Plan | 2.0 |
| ISIS-1UPLT-DDD-0001 | 1U CubeSat Platform Design Description | 4.0 |

## Reference Documents

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

Table 2 - Reference Documents

|  |  |  |
| --- | --- | --- |
| Reference | Name | Version |
| ISIS.SAIT.GL.001 | SAIT guidelines | 1.0 |
| ISIS-QMS-PLN-0001 | Product Assurance Plan | 1.1 |
| ISIS.SAIT.POL.002 | SAIT Cleanliness and Contamination Control Policy | 1.0 |

# Required Equipment

## Satellite Equipment and Parts

| Item | Remark | ID / Serial number | Check |
| --- | --- | --- | --- |
| Platform Module | Assembled Platform Module (Payload/ICEPS/TRXVU/IOBC/DB) with frames and brackets | N/A |  |
| 1U STS | (4x) 6.35mm (0.250inch) Screw (Omnetics Screw) | N/A |  |
| Harnesses | (1x) #1 EPS Umbilical interface  (1x) #2 ABF-EPS  (1x) #3 OBC Umbilical interface  (1x) #4 ABF-OBC  (1x) #5 Separation Switches interface  (1x) #8 Antenna Power&Data interface  (1x) #9 TX RF Cable  (1x) #10 RX RF Cable  (1x) EGSE#1 UMB-EPS (EGSE) interface  (1x) EGSE#2 UMB-OBC (EGSE) interface  (1x) #11 Solar Panels +X /-X Power interface  (1x) #14 Solar Panel +X Data interface  (1x) #15 Solar Panel -X Data interface  (1x) #12 Solar Panels +Y /-Y Power interface  (1x) #16 Solar Panel +Y Data interface  (1x) #17 Solar Panel -Y Data interface  (1x) #13 Solar Panels +Z /-Z Power interface  (1x) #18 Solar Panel +Z Data interface  (1x) #19 Solar Panel -Z Data interface | N/A |  |

## Ground Support Equipment and tools

| Item | Remark | ID / Serial number | Check |
| --- | --- | --- | --- |
| Screwdrivers Hex 1.3 (Omnetics screwdriver) | Example: Wera Hex Key, 1.3mm Ball End (SW 1,3) |  |  |
| Additional screws | (4x) M2.5x12mm cilinder screws  (only applicable for Type A STS)  (1x) M2.5x5mm cilinder screw  (only applicable for Type B STS) |  |  |
| STA1U jig | Stack Integration 1U Support Jig  (only applicable for Type A STS) |  |  |
| VISJ | Vertical Integration Support Jig  (only applicable for Type B STS) |  |  |
| ESD wrist strap |  |  |  |

## Consumables

| Item | Remark | ID / Serial number | Check |
| --- | --- | --- | --- |
| Epoxy | Example: Scotch-Weld DP2216 Epoxy adhesive |  |  |
| Kapton Tape | Flight approved |  |  |
| Large ESD bag |  |  |  |

## Preparation

| Step | Description | Remark | Check |
| --- | --- | --- | --- |
|  | Collect all satellite equipment and parts, GSEs and Tools according to the checklists in this section | Make sure not to touch anything without gloves and ESD wrist strap attached |  |
|  | Make sure all fasteners are cleaned with ultrasound machine |  |  |
|  | Make sure also that all structural parts are clean. |  |  |
|  | Take high resolution pictures of during the execution of the procedure and store them in the appropriate folder following the subsequent naming guidelines |  |  |

# Harness Connection Procedure

| Step | Description | Check | Comment |
| --- | --- | --- | --- |
| 1. | **For type B STS**, place the Vertical Integration Satellite Jig (VISJ) on the bench    Label on the integration Jig the X+ and Y+ direction. Note the CSKB is on the Y+ side of the platform module.  Attach a grounding cable to the bottom bracket of the platform module with a (1) M2.5x5mm cilinder screw in a Solar Panel hole (not at the feet) |  |  |
|  | Verify that the following harnesses are connected to the **TRXVU:**     * **Harness** **#9, TRXVU-TX** side connected to the **TX** connector on **TRXVU.** The other side of the harness should be taped with **Kapton**. * **Harness** **#10, TRXVU-RX** side connected to the **RX** connector on **TRXVU.** The other side of the harness should be taped with **Kapton**.   **Note:** they are expected to be connected during the assembly of the Platform module. If they are not connected, **connect them at this step** |  |  |
|  | Make sure the **Harness** **#3, JTAG** side connected to the **J1** connector on **iOBC**:  따올==뱏  11  The other side of the harness should be taped with **Kapton**. |  |  |
|  | Connect the following harness to the **ICEPS**:  Diagram, schematic  Description automatically generatedDiagram, schematic  Description automatically generated   * **Harness** **#1, UMB1** connector to the **UMBILICAL 1** **(J10)** connector on the **ICEPS.** The other side of the harness should be taped with **Kapton**. * **Harness** **#1, UMB2** connector to the **UMBILICAL 2 (J9)** connector on the **ICEPS.** The other side of the harness should be taped with **Kapton**. * **Harness** **#5, SEP-SW** side connected to the **SEP SW (J8)** connector on the **ICEPS.** The other sides of the harness should be taped with **Kapton**. * **Harness** **#8, CH3-I2C** side connected to the **CH[3]-I2C (J12)** connector on the **ICEPS.** The other side of the harness should be taped with **Kapton**. * **Harness** **#11, SPA-CH1** side connected to the **SOLAR P. CH1 (J11\_CH1)** connector on the **ICEPS.** The other side of the harness should be taped with **Kapton**. * **Harness** **#12, SPA-CH0** side connected to the **SOLAR P. CH0 (J11\_CH0)** connector on the **ICEPS.** The other side of the harness should be taped with **Kapton**. * **Harness** **#13, SPA-CH2** side connected to the **SOLAR P. CH2 (J11\_CH2)** connector on the **ICEPS.** The other side of the harness should be taped with **Kapton**.   **Note:** Check that the end of the harness coming out of the battery pack is not connected to the PBP INTERFACE and it’s taped with **Kapton**. This connector will be only connected at the end of this procedure safety reasons. |  |  |
|  | Connect the following harness to the DB:  Diagram, schematic, qr code  Description automatically generated   * **Harness** **#14, iSPA4** side connected to the **iSPA4 (P4)** connector on the **DB.** The other side of the harness should be taped with **Kapton**. * **Harness** **#15, iSPA3** side connected to the **iSPA3 (P3)** connector on the **DB.** The other side of the harness should be taped with **Kapton**. * **Harness** **#16, iSPA5** side connected to the **iSPA5 (P5)** connector on the **DB.** The other side of the harness should be taped with **Kapton**. * **Harness** **#17, iSPA6** side connected to the **iSPA6 (P7)** connector on the **DB.** The other side of the harness should be taped with **Kapton**. * **Harness** **#18, iSPA1** side connected to the **iSPA1 (P1)** connector on the **DB.** The other side of the harness should be taped with **Kapton**. * **Harness** **#19, iSPA2** side connected to the **iSPA2 (P2)** connector on the **DB.** The other side of the harness should be taped with **Kapton**. |  |  |
|  | Route the harnesses with open connectors towards the appropriate sides:  ***To +X side:***   * **Harness** **#11, Power [X+] connector** (if applicable) * **Harness #14, Data [X+] connector** (if applicable)   ***To -X side:***   * **Harness** **#11, Power [X-] connector** (if applicable) * **Harness #15, Data [X-] connector** (if applicable)   ***To +Y side:***   * **Harness** **#12, Power [Y+] connector** (if applicable) * **Harness #16, Data [Y+] connector** (if applicable)   ***To -Y side:***   * **Harness** **#12, Power [Y-] connector** (if applicable) * **Harness #17, Data [Y-] connector** (if applicable)   ***To +Z side:***   * **Harness #1, UMB-EPS connector** * **Harness #3, UMB-OBC connector** * **Harness** **#13, Power [Z+] connector** (if applicable) * **Harness #18, Data [Z+] connector** (if applicable)   ***To -Z side:***   * **Harness #5, SEP-SWs connectors** * **Harness #8, ANTS connectors** * **Harness #9, ANTS-TX connectors** * **Harness #10, ANTS-RX connectors** * **Harness** **#13, Power [Z-] connector** (if applicable) * **Harness #19, Data [Z-] connector** (if applicable) |  |  |
|  | Check that all harnesses are routed inside of the side frames and that they are not touching or being trapped by CSKB pins, or touching any components |  |  |
|  | Connect **Harness #5 to the separation switches** according to the following instructions:   * Harness #5, SEP-SW1 connector to Harness #6, SW1 connector * Harness #5, SEP-SW2 connector to Harness #7, SW2 connector   **Note:** See the image below to see in which face each is the separation switches should be located.    Tape the metallic latches on each connector with FM Kapton. |  |  |
|  | On the **Small cut-out** side of the ABF Brackets, place and fasten the:   * **Harness** **#3, UMB-OBC connector**   Using **(2x) 6.35mm (0.250inch) Screw (Omnetics Screw)** |  |  |
|  | On the **Big cut-out** side of the ABF Brackets, place and fasten the:   * **Harness** **#3, UMB-OBC connector**   Using **(2x) 6.35mm (0.250inch) Screw (Omnetics Screw)** |  |  |
|  | Connect the harness coming out of the battery pack to the **ICEPS PBP INTERFACE** connector.  **Note** that some harnesses will remain disconnected after this step. Harness #8 will be connected as part of the AntS1 assembly procedure. Similarly, harnesses #11 to #19 will be connected as part of the solar panel assembly procedure (when applicable) |  |  |
|  | Take photos of the platform module from all sides. |  |  |
|  | **For type B STS**, unfix the ESD cable from the bottom bracket and remove the platform module from the **VISJ**. |  |  |
|  | Place the platform module in a safe place (e.g. ESD bag and Useful box). |  |  |
| **Activity performed by:** Initials  **Date:** Click here to enter a date. | | | |

# 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 |
| --- | --- | --- | --- | --- | --- |
| …… | …… | …… | …… | …… | …… |
| …… | …… | …… | …… | …… | …… |
| …… | …… | …… | …… | …… | …… |
| …… | …… | …… | …… | …… | …… |
| …… | …… | …… | …… | …… | …… |
| …… | …… | …… | …… | …… | …… |
| …… | …… | …… | …… | …… | …… |